Biological Assessment of the Northern Sea Otter
Enhydra lutris kenyoni
For the Akutan Airport Project

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Table of Contents

1.0 Introduction and Background ... 1
1.1 Project Location ... 1
1.2 Description of Project ... 1
1.3 Purpose and Need for Akutan Airport ... 2
1.4 Economic Benefits of the Project ... 4
1.5 Alternatives Considered But Dismissed ... 4
1.5.1 Hot Springs Bay Alternative ... 4
1.5.2 Head of the Bay Alternative ... 4
1.5.3 Sarana Bay Alternative ... 5
1.5.4 Broad Bight Alternative ... 5
1.6 Project Alternatives Carried Forward ... 6
1.6.1 Fish Banks Alternative ... 6
1.6.2 Akun Preferred Alternative ... 8
1.6.3 No Action Alternative ... 14
2.0 Description of the Project Area ... 14
2.1 General Information ... 14
2.2 Overview of Project Area Natural Resources ... 17
3.0 Delineating the Project Action Area ... 21
4.0 Sea Otter Biology ... 21
4.1 Critical Habitat Designations ... 22
4.2 Range, Abundance, and Identification of Stocks ... 22
4.2.1 Stock Status ... 23
4.2.2 Species Description ... 24
4.2.3 Site Fidelity ... 25
4.2.4 Diet ... 25
4.2.5 Causes of Mortality ... 26
4.3 Existing Perturbations in Project Action Area ... 27
4.3.1 Distribution of Sea Otters in Project Action Area ... 29
4.3.2 Food Resources near the Project Site ... 30
5.0 Effects Analysis ... 30
5.1 Direct Effects ... 30
5.1.1 Noise from Construction ... 31
5.1.2 Airborne Noise Impacts ... 31
5.2 Underwater Noise Impacts ... 32
5.2.1 Disturbance/Displacement ... 34
5.2.2 Oiling of Sea Otters ... 35
5.2.3 Hovercraft Collisions ... 35
5.3 Indirect Effects ... 35
5.4 Effects from Interrelated and Interdependent Actions ... 35
5.5 Cumulative Effects ... 36
5.6 Summary of Avoidance and Minimization Measures ... 36
6.0 Effects Determination ... 37
7.0 Literature Cited ... 38

List of Tables

Table 1. Principal Characteristics of BHT 130 Hovercraft 12
Table 2. Cut and Fill Quantities for Akun Alternative 13
Table 3. Population Estimates for the Southwest Alaska Stock of Sea Otters 24
Table 5.1 Airborne Noise Project Action Area Noise Attenuation 32
Table 5.2 BHT 130 Above Water Sound measurements……32
Table 5.3 Underwater Noise Project Action Area Noise Attenuation 34

List of Figures

On or following page

Figure 1. Akutan Island Location and Vicinity 1
Figure 2. Akun Island Preferred Alternative 2
Figure 3. Akun Alternative Footprint 2
Figure 4. Fish Banks Alternative Alignment 8
Figure 5. Akun Island Runway Alignment 10
Figure 6. BHT-130 Hovercraft outboard profile and exterior deck arrangement 12
Figure 7. Elevations & Bathymetry of Akutan Island, Akun Island, Akutan Bay & Akun Strait. 15
Figure 8. Historical and current range of the sea otter 21
Figure 9. Range of the three stocks of northern sea otter in Alaska 23
Figure 10. Sea otter abundance during Steller Eider Surveys Winter 2004 30
Figure 11. Sea otter abundance along Proposed Hovercraft Route, January 2006.....30
Figure 12. Sea otter abundance along Proposed Hovercraft Route, February 2006.....30
Figure 13. Sea otter abundance along Proposed Hovercraft Route, March 2006.....30

1.0 Introduction and Background

A biological assessment (BA) is required under Section 7(c) of the Endangered Species Act of 1973 (Act) if listed species or their critical habitat are present in the area affected by any Federal action. The United States Fish and Wildlife Service (USFWS) listed the northern sea otter *(Enhydra lutris kenyoni)* in southwest Alaska as threatened under the Endangered Species Act (ESA) on August 9, 2005 (70 FR 46366). Sea otters are known to occur in the project action area year-round. No critical habitat has been proposed. The Service will develop a recovery plan to identify the cause of the decline, monitor population trends, and help recover the sea otter population in southwest Alaska.

This BA evaluates potential effects of the Akutan Airport project on sea otters and their habitat. The BA will determine if formal consultation with the U.S. Fish and Wildlife Service will be required. The following criteria are considered by the Federal Action Agency (Federal Aviation Administration [FAA]) for the proposed action:

- Relative abundance from current and historical surveys in the action area
- Distribution and use of habitat in the action area
- Probable direct, indirect and interrelated effects of the proposed action on sea otters and their habitat

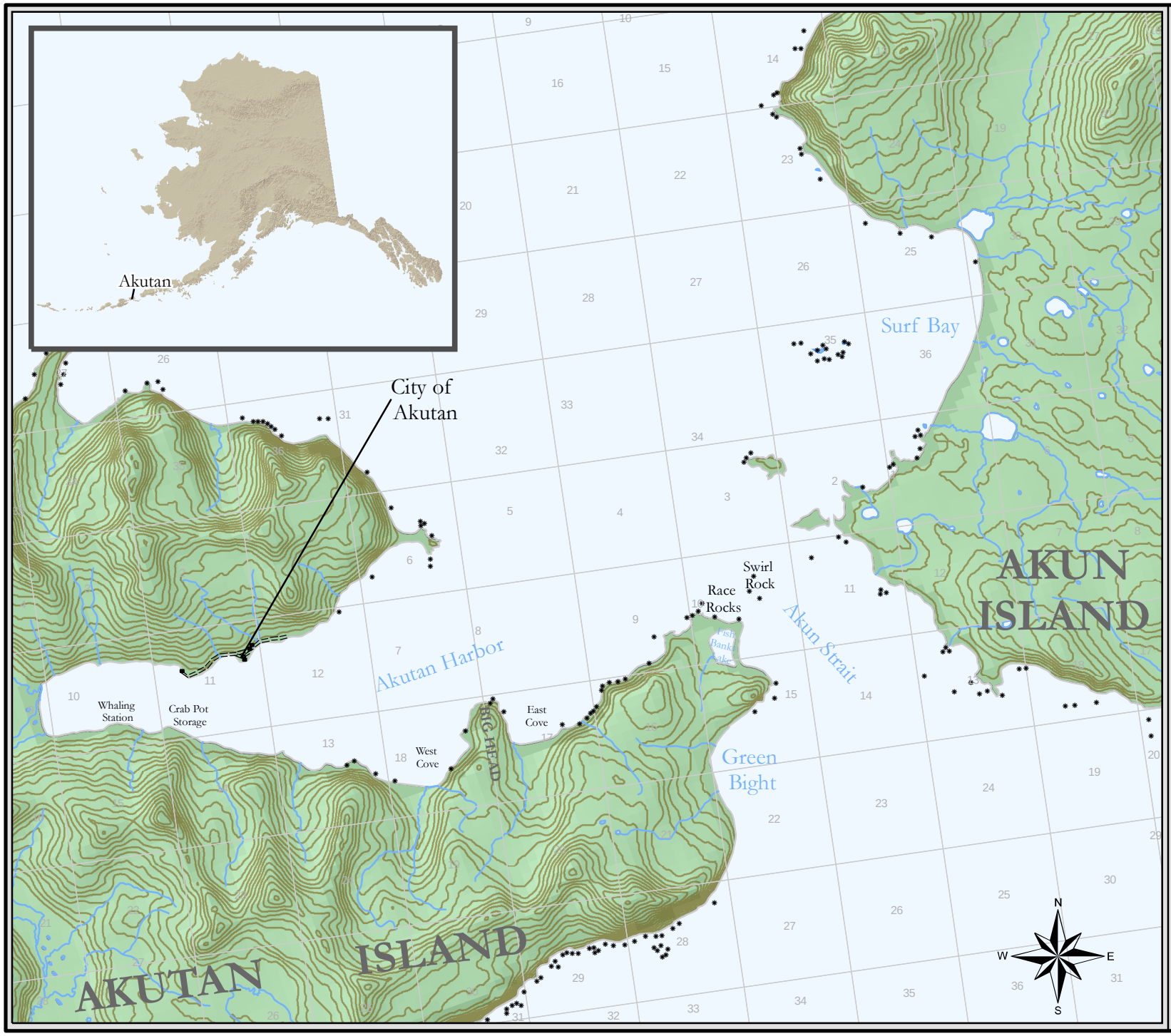
1.1 Project Location

The project area consists of Akutan Island, Akun Island, and marine waters in between the islands (Figure 1). Akutan is located on a small bay, on Akutan Island, in the eastern region of the Aleutian Islands. Akutan Island is located 35 miles east of Unalaska and 766 miles southwest of Anchorage. Akutan lies at approximately 54.1355560° north latitude and 165.77306° west longitude. The community of Akutan, located on the north side of Akutan Harbor, sits on a narrow bench of relatively flat land between the harbor and 1,500 to 1,700-foot (ft) mountains to the north of the community. Uninhabited Akun Island lies approximately seven miles east from the mouth of Akutan Harbor across Akutan Bay. Surf Bay occupies a large bight on the east side of Akun Island.

The number of Akutan's permanent residents is around 100. Akutan Island is home to Trident Seafood processing plant. Population in the community varies due to influxes of 150 to 1,000 seasonal employees at Trident. Marine and aviation transportation systems play an important role in the Akutan community's economic and social life because Akutan is an island community. Currently there is no land based airport in Akutan.

1.2 Description of Project

The Aleutians East Borough (AEB), in conjunction with the Alaska Department of Transportation and Public Facilities (ADOT&PF) and the Federal Aviation Administration (FAA), is proposing to construct a land based airport to serve the



Akutan Airport Master Plan

Akutan Island Location and Vicinity

April 2006

LEGEND

- Rocks
- Streams

DATA SOURCE: ADOT&PF, HDR, and USGS

0 365 730 1,460 2,190
Meters

Figure 1

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community of Akutan. An airport ensures safe, reliable, and continued access to Akutan by air. The new airport will comply with FAA and ADOT&PF standards and meet the current and future needs of the community. The proposed new location for the airport is on Akun Island and will consist of a 4,500-foot-long by 75-foot-wide runway, apron, and snow removal equipment building/public terminal. Service from the City of Akutan to Akun Island will be provided by a hovercraft. The existing seaplane ramp on Akutan Island will serve as the hovercraft terminal on Akutan. A hovercraft storage and maintenance facility will be constructed at the head of Akutan Harbor. The hovercraft will travel approximately 7 miles across Akutan Bay to the proposed landing at Surf Bay on Akun Island (Figure 2). The one-way passage will take approximately ten minutes at a nominal hovercraft service speed of 40 knots.

The Akun Airport Access Road will connect the hovercraft terminal at Surf Bay to the proposed apron of the Akun Airport Alternative location. The access road will be a 0.5 miles long by 24 ft wide, two-lane all-weather gravel road (Figure 3).

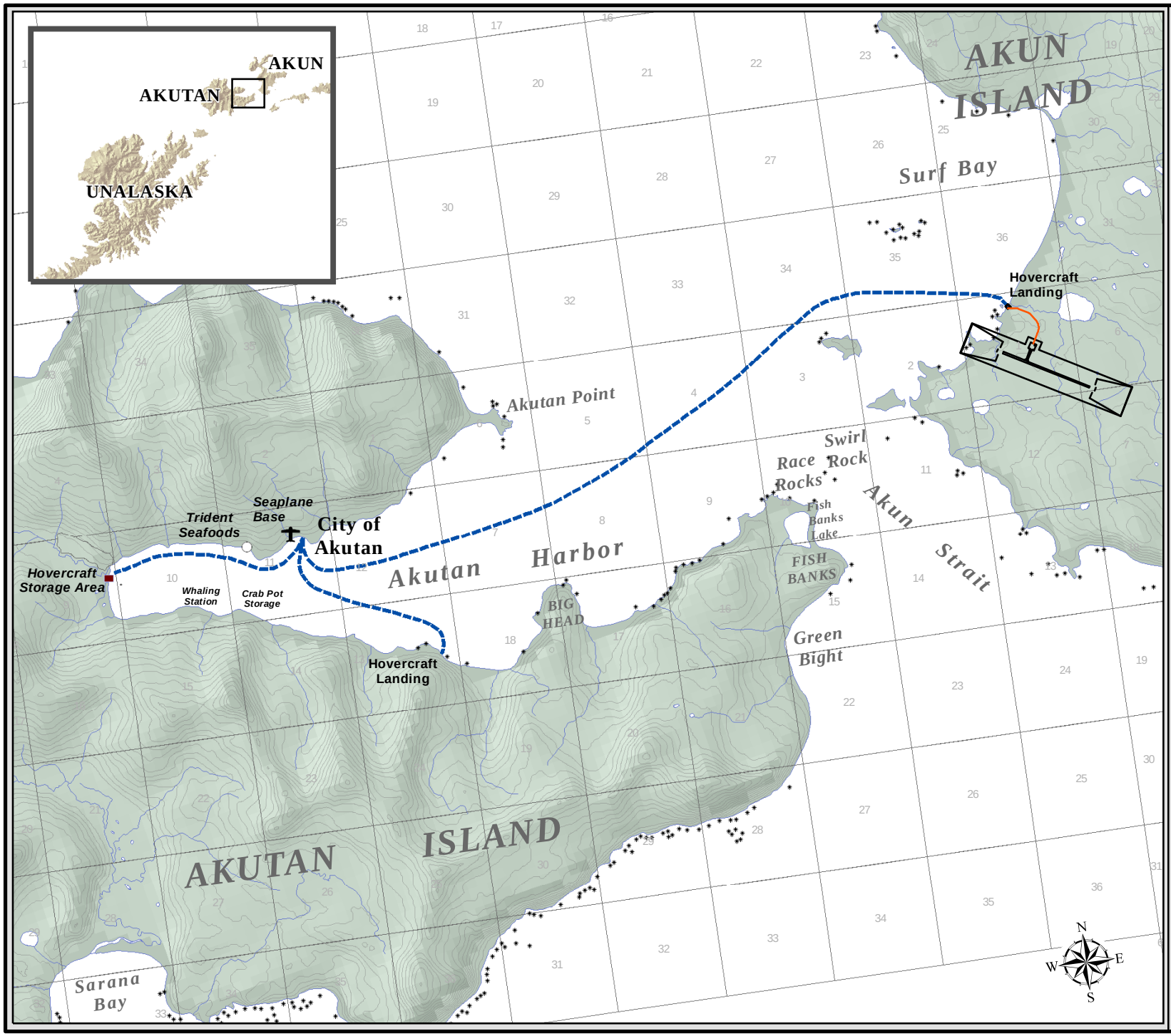
1.3 Purpose and Need for Akutan Airport

Currently, transportation to Akutan is limited to boat and amphibious aircraft. There is no land based airport in the community. A Grumman Goose, an amphibious plane, serves the community out of Unalaska. The Grumman Goose lands on its belly in Akutan Harbor, and uses a seaplane pull-out and turnaround area located west of the village for loading and unloading. The Grumman Goose is the sole aircraft that is able to access Akutan because of rough wave conditions in Akutan Harbor. Other aircrafts, such as Cessna's with floats, are not durable enough to land in the harbor. The Grumman Goose has a small capacity (nine passenger maximum) and is often delayed due to adverse weather conditions. The Alaska Marine Highway System provides monthly ferry service from Kodiak to Unalaska/Dutch Harbor between May and September. The ferry service stops at several communities along the Alaska Peninsula, including Akutan. There is no ferry service to Akutan during the winter months. Personal or company boats are often used to transport people between Unalaska and Akutan. Additionally, multiple day-long delays can result due to the reduced service by air carriers between Anchorage and Unalaska.

The purpose of the Akutan Airport Project is to provide reliable, aircraft service to Akutan.

Akutan needs an airport for a number of reasons.

- **There is a need for a land-based airport before the Grumman Goose is no longer operational, or the community will be without air service.** The plane that currently services Akutan, the Grumman Goose, is the sole aircraft that is able to access Akutan. Other aircraft, such as a Cessna with floats, are not durable enough to land in the harbor. However, The Grumman Goose is no longer being made (production ceased in 1945) (Brown 2006) and is expensive and difficult to maintain. Replacement parts can not be found. There are three Grumman Goose in Peninsula Airway's fleet, but only one landing gear. Peninsula Airways,



Akutan Airport

Akun Preferred Alternative Alignment

LEGEND

- Airport Alternative
- Access Road
- Hovercraft Route
- Hovercraft Landing
- Streams
- Rocks

DATA SOURCE: ADOT&PF, HDR, and USGS

0 2,500 5,000 7,500
Feet

Figure 2

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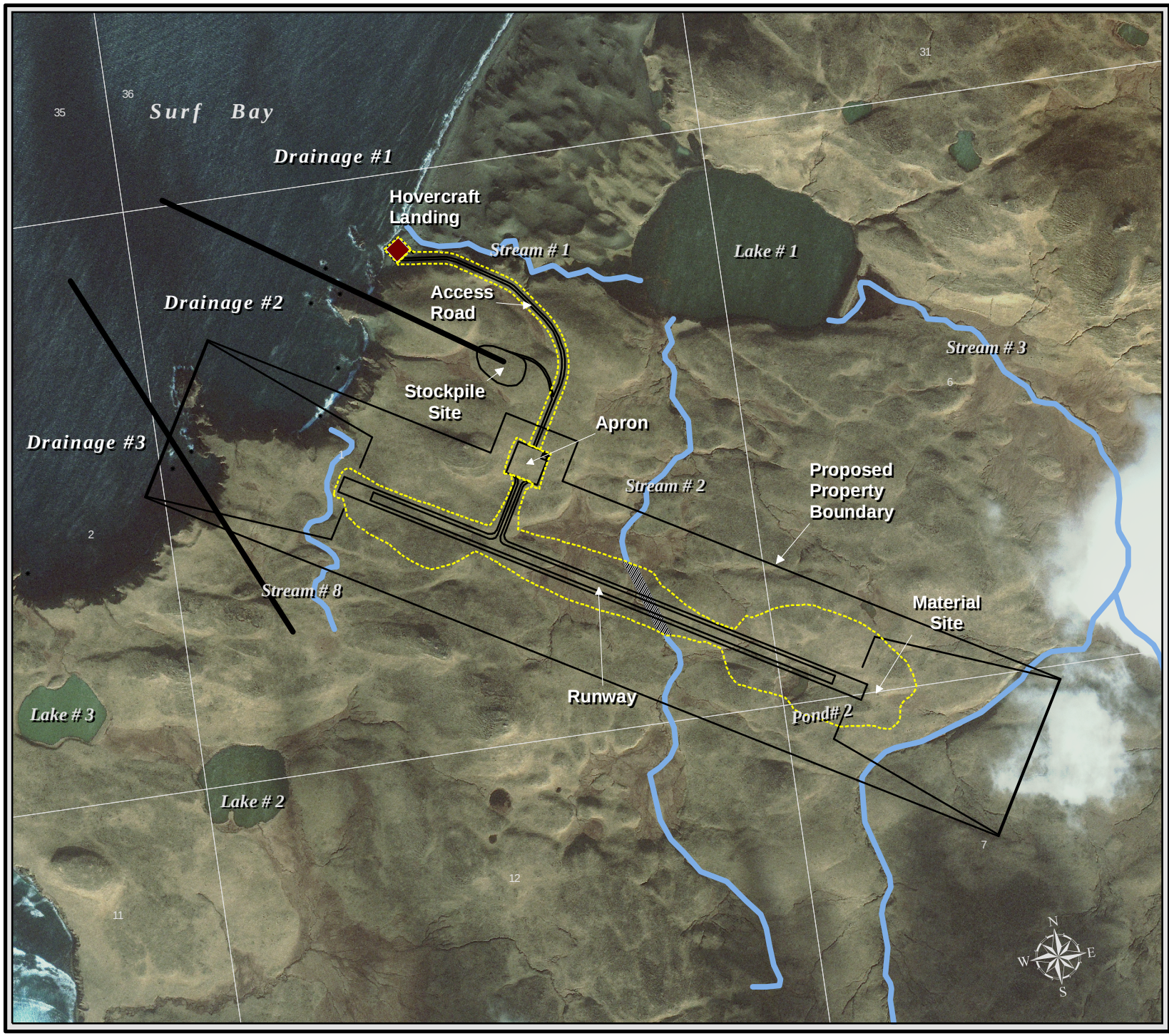

Akutan Airport

Akun Alternative Footprint

LEGEND

- Hovercraft Landing
- Culvert
- Cut/Fill Area
- Airport Alternative
- Anadromous Streams
- Drainage Boundary

DATA SOURCE: ADOT&PF, HDR, and USGS

0 400 800 1,200
Feet

Figure 3

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commonly called PenAir, is the sole provider of commercial air service to Akutan.

- **There is a need for a land-based airport because the current system is not dependable during many weather conditions.** A considerable number of people are often significantly delayed at the Unalaska Airport or in Akutan when the Goose cannot fly because of severe weather. The rough wave conditions, low cloud cover, and high winds (over 25 knots), that are common in and around Akutan Harbor often cause flight cancellations. For example, by the end of January 2006, two tons of mail had backlogged in Dutch Harbor resulting in the inability of Akutan residents to receive items such as their bills, their checks, and mail-order purchases. Difficulties also arise when contractors are necessary for repairs in town. Electrical contractors were scheduled to work on the generators in Akutan in December of 2005, but adverse weather kept them in Dutch Harbor for five days, at the city's expense, before they finally returned to Anchorage, never reaching the intended destination.

- **There is a need for a land-based airport because the current system has limited passenger capacity.** The Grumman Goose, with its nine-passenger capacity, neither efficiently nor effectively moves passengers. The community and Trident Seafoods would like an aviation transportation system that could better accommodate travel by community groups and the local fish processing plant workers (which can number 1,000 during the fishing season change out). Also, if there have not been flights for some time, the Grumman Goose is unable to transport the backlog of passengers efficiently or in a timely manner.

- **A land-based airport is needed to improve the health and safety of the community.** The Grumman Goose has a small hatch (approximately 4 feet [ft] by 2 ft), which makes enplaning difficult for the elderly or injured. Weather and repair cancellations cause the community to be without emergency air service for long periods of time. A better system is also needed to accommodate community-wide emergency evacuations, such as volcano eruptions.

- **A land-based airport is needed to influence additional commercial operators to service Akutan.** Because the Grumman Goose is the only aircraft that can fly into Akutan, there is no competition for air services which results in no flight choices and potentially higher costs.

The construction of the proposed airport will make it possible for land-based aircraft to reliably access the community of Akutan, and will therefore ensure that Akutan will remain accessible by air travel after the Grumman Goose are no longer operational.

1.4 Economic Benefits of the Project

The new airport would benefit the existing population and accommodate growth in the community. Larger aircraft with increased payloads could increase the amount of supplies coming into Akutan and the amount of goods bought and sold in the community. Larger twin-engine aircraft could allow commercial operators to fly with instruments during lower visibility weather conditions, making air travel more reliable and more profitable for air carriers. Finally, construction of the new airport facility could employ residents and benefit the local economy directly and indirectly in the short term.

1.5 Alternatives Considered But Dismissed

Six potential build alternatives were identified for evaluation and analyzed using the design criteria for a community class airport, accessibility, and community input. Four of the alternatives were dismissed after thorough consideration of their feasibility: Hot Springs Bay, Head of the Bay, Sarana Bay, and Broad Bight Alternatives (HDR 2000).

1.5.1 Hot Springs Bay Alternative

Hot Springs Bay is located approximately three miles west of the community of Akutan. After initial evaluation, this site was eliminated from further evaluation for the following reasons:

- Federal Aviation Requirements (FAR) Part 77 surface penetrations would be abundant at this location.
- Topographical constraints would limit aircraft to only one direction for approaches and departures.
- Reliability of access to the community would be poor because of a long access road crossing a high mountain pass.
- Volcano hazard would be high as a runway at this location would be in a zone of pyroclastic flow and 14 centimeter ash accumulation (USGS 1998; HDR 2003c).
- The airport would not be visible from the community.

1.5.2 Head of the Bay Alternative

Head of the Bay is located approximately two miles west of the community. After initial evaluation this site was eliminated from further evaluation for the following reasons:

- FAR Part 77 surface penetrations would be abundant, limiting adequate runway length.
- Topographical constraints would limit aircraft to only one direction for approaches and departures.
- Limited space at this location would only accommodate a 3,300 ft runway thus precluding the design aircraft from using the facility.
- A new harbor project is planned at this location causing a conflicting land use.

1.5.3 Sarana Bay Alternative

Sarana Bay is located approximately four miles southwest of the community. This site was eliminated from further evaluation for the following reasons:

- FAR Part 77 surface penetrations would be so abundant that this site is not feasible for reliable airport operation.
- Topographical constraints would allow aircraft only one direction for approaches and departures.
- The airport would not be visible from the community.
- Reliability of access to the community would be poor due to a long road over a high mountain pass.
- Limited space at this location would only accommodate a 3,300 ft runway thus precluding the design aircraft from using the facility.

1.5.4 Broad Bight Alternative

Broad Bight is located approximately seven miles southwest of the community. An airport at this site was analyzed during the first phase of the project, then considered more fully during the second phase (HDR 2003a). While this site is flat with minimal FAR Part 77 surface penetrations, a combination of factors raises serious concerns about the reliability of and access to an airport at Broad Bight. This airport location alternative was dismissed from further consideration after detailed analysis for a number of reasons including:

- The box canyon shape of the Broad Bight valley would eliminate approaches and departures of design aircraft, the SAAB 340, from the north.
- In the event of an eruption of Akutan Volcano, and possible community evacuation, the Broad Bight site would be in the path of lava flow which may render any evacuation activities impossible.[1]
- This site has deep volcanic ash that would be difficult to use as a base material for a runway.
- The access road leading to Broad Bight would be approximately 6.5 miles long, originating from the end of the proposed Harbor Road, traveling through steep topography. The road would have to negotiate treacherous terrain such as multiple wetlands, anadromous fish streams, and mountains with the potential for fog, snowdrifts, rock falls, and avalanche hazard. Adequate maintenance, that would guarantee consistent access to the airport, may not be possible.
- While weather is extreme island-wide, the Broad Bight location experiences particularly harsh weather. Weather systems coming from the Pacific Gulf move

[1] According to a U.S. Geological Survey (USGS) report, small eruptions of Akutan Volcano will continue to occur. While large eruptions are considered unlikely it is important to note that Broad Bight Valley is considered a "probable pathway for pyroclastic flows and surges if there is a large explosive eruption inside the caldera." Broad Bight valley is also considered an area "likely to be inundated by lahars, lahar-runout flows, and floods" during an event similar to the one that formed the caldera approximately 1,600 years ago (USGS 1998).

into the poorly protected southern area and create the potential for turbulent cross winds.

1.6 Project Alternatives Carried Forward

There are three alternatives that are being evaluated in the environmental document. These alternatives include an airport located on Akun Island (preferred alternative), an airport located at Fish Banks, and the No Action alternative.

1.6.1 Fish Banks Alternative

The Fish Banks Alternative is being evaluated in the Environmental Assessment as a possible alternative. Fish Banks is located approximately six kilometers east of Akutan, across Akutan Harbor from the community. An airport at this site was analyzed using the airport design criteria described in Pre NEPA Analysis, HDR Alaska (2003) and Alternative Analysis Memo, HDR Alaska (2004a). The Fish Banks alternative has been carried forward for further evaluation due to the following positive attributes:

- FAR Part 77 surface penetrations would be minimal at this site and a dual approach runway would be possible.
- Reliability of access is good.
- Volcano hazard is low in this area compared to other sites.
- A runway at this location would be visible from the community.

Description of Alternative
The Fish Banks alternative is located approximately 4 miles east of the community and across Akutan Harbor. The Fish Banks alternative has been carried forward for further evaluation due to the following positive attributes:

- FAR Part 77 surface penetrations would be minimal at this site and approaches from both ends of the runway would be possible.
- The SAAB 340 could fly to Fish Banks, accommodating about 17 passengers per flight under weight restrictions.
- Electronic navigation facilities would be available, allowing planes to operate in adverse weather.
- Planes landing at this location would be visible from the community.
- Airport improvements would allow direct emergency evacuations to Anchorage.
- A land based airport would allow multiple air carries to access the community.
- Marine service by hovercraft between the community of Akutan and West Cove would satisfy passenger comfort and weather operability goals.
- A protected hovercraft landing area in West Cove could be developed to serve this airport location.

Access to the Fish Banks Airport would be provided by hovercraft from the City of Akutan to West Cove. West Cove is located immediately to the west of Big Head on the south side of Akutan Harbor. A 4.9 mile road would connect the hovercraft landing pad in West Cove to the runway at Fish Banks located on the easternmost tip of the island

(Figure 4). A bus would be used to transport passengers between the hovercraft and aircraft. When not in use, the hovercraft would be stored in a building at the head of Akutan Harbor.

The Fish Banks Alternative would:

- Construct a 150 ft long by 150 ft wide stabilized hovercraft landing pad at West Cove.
- Construct a 100 ft by 120 ft hovercraft storage and maintenance facility on a 145 ft by 150 ft pad at the head of Akutan Harbor.
- Construct a 150 ft by 150 ft hovercraft maneuvering pad adjacent to the storage and maintenance facility, and a 100 ft by 160 ft ramp from the facility to the water.
- Construct a 4,000 ft long by 75 ft wide paved runway.
- Construct a 4,600 ft long by 150 ft wide runway safety area (RSA).
- Construct a 250 ft long by 35 ft wide taxiway.
- Construct a 30,000 sq. ft aviation support area.
- Construct a 10,000 sq. ft snow removal equipment building (SREB) pad.
- Construct a new SREB, which would be a heated, two-bay building, approximately 44 ft wide by 50 ft long.
- Equip the SREB building with a generator for heat and water holding capacity and septic to provide a passenger waiting area and restroom facility.
- Equip the airport with a Precision Approach Path Indicator (PAPI) system for approaches on both runway ends.
- Construct a 4.9 mile long, 24 ft wide, two-lane all-weather gravel road for travel between the hovercraft landing site at West Cove and the proposed airport facilities at Fish Banks.
- Construct several culverts or small bridge structures to cross approximately 27 drainages along the road.
- Purchase of a hovercraft and bus.

Figure 4. Fish Banks Runway Alignment

Since this alternative is not preferred, it is not being evaluated in the BA. For more detailed information on this alternative refer to the Alternative Analysis Memo, HDR Alaska, 2004 or the Environmental Assessment, HDR Alaska, 2006.

1.6.2 Akun Preferred Alternative

The proposed location for the new airport to serve the community of Akutan is on the southwestern portion of Akun Island, approximately 7 miles east, across Akun Strait, from the community. Investigation of the Akun Alternative began in March 2005 due to concerns that all other alternatives would not provide reliable access from the City of Akutan. The Akun alternative is proposed for a number of reasons:

- The gradual terrain on Akun facilitates a 4,500 ft runway. FAR Part 77 surface penetrations would be minimal at this site and approaches from both ends of the runway would be possible.
- Because a 4,500 ft runway is possible on Akun, the SAAB 340 could fly to Akun without weight restriction, accommodating approximately 30 passengers per flight.
- Electronic navigation facilities would be available, allowing planes to operate in adverse weather.
- Planes landing at this location would be visible from the community.
- Airport improvements would allow direct emergency evacuations to Anchorage.
- Volcanic hazard is less in this area compared to other sites.
- A land based airport would allow multiple air carriers to access the community.

- Marine service by hovercraft between the community of Akutan and Surf Bay on Akun Island would satisfy passenger comfort and weather operability goals.
- Surf Beach offers a protected hovercraft landing area.

Description of Alternative
The Akun Alternative would:

- Construct a 150 ft long by 150 ft wide stabilized hovercraft landing pad at Surf Beach.
- Construct a 100 ft by 120 ft hovercraft storage and maintenance facility on a 145 ft by 150 ft pad at the head of Akutan Harbor.
- Construct a 150 ft by 150 ft hovercraft maneuvering pad adjacent to the storage and maintenance facility, and a 100 ft by 160 ft ramp from the facility to the water.
- Construct a 4,500 ft long by 75 ft wide paved runway.
- Construct a 5,100 ft long by 150 ft wide RSA.
- Construct a 300 ft long by 35 ft wide taxiway.
- Construct a 35,000 sq. ft aviation support area.
- Construct a 10,000 sq. ft SREB pad.
- Construct a new SREB, which would be a heated, two-bay building, approximately 44 ft wide by 50 ft long.
- Equip the SREB building with a generator for heat and water holding capacity and septic to provide a passenger waiting area and restroom facility.
- Equip the airport with a PAPI system for approaches on both runway ends.
- Construct a 3,000 ft, 24 ft wide, two-lane all-weather gravel road for travel between the hovercraft landing site at Surf Beach and the proposed airport facilities on the above bench.
- Construct one culvert along the runway.
- Purchase of a hovercraft and bus.

Access to the Akun Airport would be provided by hovercraft from the City of Akutan to Surf Beach. A 3,000 ft road would connect the hovercraft landing pad on Surf Beach to the runway located on the bench above the beach. A bus would be used to transport passengers between the hovercraft and aircraft. When not in use, the hovercraft would be stored in a building at the head of Akutan Harbor.

Functional Analysis

Design Aircraft. The SAAB 340 would be the design aircraft anticipated to use the airport. The aircraft has capacity for 28,500 lbs of cargo and passengers, or about 30-35 passengers with approximately 20,000 lbs of cargo. Such an airport would serve community needs by allowing a larger carrying capacity, capabilities for emergency evacuation to Anchorage, and more reliable flight service as calm water will no longer be a prerequisite to landings.

Runway Alignment. The Akun Island airport alignment extends southeast from a bench above Surf Bay across relatively flat lowlands (Figure 5).

Figure 5. Akun Island Runway Alignment

Midway down the runway a drainage system crosses the alignment. A culvert would bridge this crossing. Near its southeastern end, the runway alignment approaches more mountainous terrain. The surface of the airport would be finished with a layer of crushed rock at least 6 inches thick, covered by four inches of pavement.

Airport Access Road. The access road would be a two-lane all-weather gravel road that is 3000 ft long by 24 ft wide. The road alignment would climb from the beach near a stream to the bench where the runway is located. This ascent would immediately cover about 55 vertical feet, and then would enter a side-cut along the northeastern side of a hill as it would continue to rise 20 feet in elevation. Erosion protection would be necessary to prevent undercutting of the roadway by the large cut bank of the stream. Much of the route would be constructed on wet, interbedded ash using cut and fill sections. The westernmost portion of the road would be constructed on dune sand using cut and fill sections (Duane Miller and Associates 2005).

Hovercraft Access. Marine transportation by a BHT 130 hovercraft is proposed to access the airport (Figure 6). The hovercraft would travel approximately seven miles across Akun Strait to a landing pad at Surf Beach on Akun Island. The proposed hovercraft route is outlined in Figure 2.

The BHT 130 hovercraft is a "half-well" configuration with vehicle bow ramp that carries approximately 50 passengers and up to four vehicles or a similar amount of freight in the open well deck. Table 1 shows the characteristics of the BHT 130 hovercraft.

At a nominal hovercraft service speed of 40 knots, the one-way passage will take approximately 10 minutes. Surf Beach is suitable for hovercraft landing and departure operations under all conditions in which the hovercraft can cross Akun Strait. Hovercraft transportation to Surf Bay meets 90% operability for all months (Glosten & Associates 2005).

Hovercraft landing areas will be necessary on both Akutan and Akun Islands. The existing concrete Seaplane Base would serve as the hovercraft terminal for loading and unloading in the community of Akutan. A 150 ft by 150 ft landing pad would be constructed at Surf Bay to serve as the Akun hovercraft landing site (Figure 3). The hovercraft would be stored at the head of Akutan Bay in a 100 ft by 120 ft storage and maintenance facility that will be constructed on a 145 ft by 150 ft pad. This facility would be located just north of the planned harbor project. A 150 ft by 150 ft hovercraft maneuvering pad will be constructed adjacent to the storage and maintenance facility, and a 100 ft by 160 ft hovercraft ramp will provide access between the facility and the water.

Hovercraft Operation. A hovercraft is a high speed, amphibious vessel that has been operating in locations around the world since the 1960s. The hovercraft floats on a cushion of air and is able to cross water and sea ice in a variety of sea conditions.

The hovercraft route will travel south from the Akutan terminal into the middle of Akutan Harbor and travel straight across Akun Strait, north of Green Island and into Surf Bay (Figure 2). The hovercraft would travel the proposed route two times per day, seven days a week, except for January. There will be an increased number of flights into the airport during the month of January to accommodate the influx of seasonal workers at Trident. This will require the number of daily hovercraft trips to increase to approximately four trips per day during January. While shuttling passengers and cargo, the hovercraft will also transport diesel to Akun Island to supply a 2,000-gallon above ground storage tank with fuel to operate the airport maintenance equipment.

The BHT 130 hovercraft is a "half-well" configuration with vehicle bow ramp that carries approximately 50 passengers and up to four vehicles or a similar amount of freight in the open well deck (Figure 6). Operation of the hovercraft would comply with United States Coast Guard (USCG) safety requirements for passengers carrying vessels. Table 1 shows the principal characteristics of the BHT 130 Hovercraft.

Figure 6. BHT-130 Hovercraft

Table 1. Principal Characteristics of BHT 130 Hovercraft

Length	95 ft
Beam	46 ft
Skirt Depth	5.4 ft
Propellers	11.5 ft
Speed	Up to 60 knots in calm conditions*
Propulsion Power	2 x 1,300 = 2,600 HP
Lift Fan Power	2 x 1,300 = 2,600 HP

*While the BHT-130 has a claimed maximum speed of 60 knots when operating lightly loaded under calm conditions, a service speed of **40 knots** has been presumed for the operating speed.

Material Sites. Rock types in the project area vary, but most would serve as embankment fill material. Columnar basalt from borrow sources north and south of the runway will likely provide construction material for the runway and parking apron and roadway. In addition the columnar basalt will be suitable for riprap if the joint patterns provide suitably sized rock (2005 Geotechnical Exploration Report). Most bedrock cuts will require blasting. In an effort to balance the job most fill will be used from the cuts associated with the project. A wasting site for excess material will be located on uplands just southwest of the runway. Table 2 shows cut and fill quantities for the Akun Island Alternative.

Table 2: Cut and Fill Quantities for Akun Alternative

	Cut CY	Fill CY
Airport	1,010,000	810,000
Access Road	11,000	5,000
Surf Bay Hovercraft Pad	6,000	3,000
Head of Bay Hovercraft Storage and Maintenance Facility	5,000	13,000
Total	1,032,000	831,000

Power. Power will be provided for the airport by an onsite diesel generator. The generator will provide power for the SREB, which is a heated, two bay building approximately 44 ft wide by 50 ft long. The generator will also power runway lights, a beacon, and a lighted wind cone. No other utilities are anticipated.

Lighting. Lighting would need Alaska Aviation Systems Plan recommendations and would include: radio-controlled medium intensity runway lighting and medium intensity taxi way lighting, a rotating beacon, and a lighted wind cone and segmented circle. Airfield aids would include a supplemental unlighted wind cone, reflective cones, and threshold panels.

The airport rotating beacon projects a beam of light in two directions, 180 degrees apart. The rotating beacon produces alternative clear and green flashes of light with a flash rate of 24-30 flashes per minute. The runway and taxi lighting would be turned on by the pilot as the plane approaches the airport. These lights would stay on for approximately 15 minutes before powering off. The majority of flights will be during the daytime when runway lighting is not necessary.

Fuel Storage and Delivery. There is an existing fuel storage area located in the village of Akutan near the small boat harbor. Currently, there are four 20,000 gallon tanks in the tank farm at the facility. A fueling station and an operator are also available. Standard spill response equipment is located on the dock, and the USCG has inspected and licensed the facility. The USCG has also reviewed Akutan's spill response plan. This would be used for fuel storage for hovercraft operations. During construction activities, fuel will be transported from Akutan to Akun in vessels. The contractor would refuel construction equipment from a storage area located near the proposed airport apron on Akun. All fuel moved by boat would comply with USCG regulations.

On-land storage, transportation, and refueling would comply with the State of Alaska and Environmental Protection Agency (EPA) requirements. The fuel storage and delivery systems would be operated and maintained in compliance with EPA Spill Prevention, Countermeasure, and Control (SPCC) regulations. A site specific SPCC Plan for the facility would be developed and submitted to the EPA and State of Alaska for review and approval.

Construction. The construction activities would begin in summer 2007 and end in fall 2008. Construction activities during winter months will be limited due to heavy winds and snow squalls. It is anticipated that the contractor will use tanker trailers on a self-propelled landing craft, or a tug and barge to get construction equipment onto Akun.

1.6.3 No Action Alternative

Description of Action

Under the No-Action Alternative, no improvements would be made to the existing aviation system and these problems of limited access would continue. The No-Action Alternative also would not address the fact that at some future date the Grumman Goose, an antiquated plane with parts no longer being made, will be unable to fly to the community. Furthermore, there is no replacement aircraft in design or production. Thus, the No Action Alternative does not plan for the community's long-term aviation transportation needs, and ultimately the No Action Alternative could result in a lack of air service for the community. While this alternative does not represent a solution to residents' and pilots' concerns, it is nonetheless an option available to the community and will be evaluated along with the alternatives to construct a new airport during this project development.

2.0 Description of the Project Area

2.1 General Information

Akutan Island is approximately 30 kilometers long (along an east-west axis) and 20 kilometers wide. Akutan Island to the west and Akun Island to the east form the boundaries of Akutan Bay (Figure 7). Akutan Bay is open to the Bering Sea to the north. Akun Strait provides access to the North Pacific (Gulf of Alaska) to the south, but Akun Strait is a shoal and is subject to strong currents. Refraction around Rootok Island (southwest of Akun Strait) and shoaling and wave breaking in Akun Strait prevent most of the wave energy generated in the Gulf of Alaska from penetrating into Akutan Bay, but can cause a confused and severe breaking wave environment within Akun Strait. While these features protect Akutan Bay from Pacific swell from the south, Akutan Bay is subject to Bering Sea swell arriving from the north. Akutan Bay opens into Akutan Harbor extending along an east-west axis towards the west.

Akutan Harbor is a glacially-formed fjord about 6.3 kilometers long and approximately 3 kilometers wide at its mouth, narrowing to about 1 kilometer at its head. The harbor is a large and naturally deep harbor with a relatively flat bottom, and is conducive to the operations of deep-draft commercial fishing vessels. The head of the harbor is a flat valley with a gradually increasing slope, while the northern and southern shorelines are rocky and steep. The inner portion of the harbor, west of a line from Akutan Point to Big Head is substantially sheltered from incoming Bering Sea swell. Winds are generally easterly and westerly with westerly winds predominating.

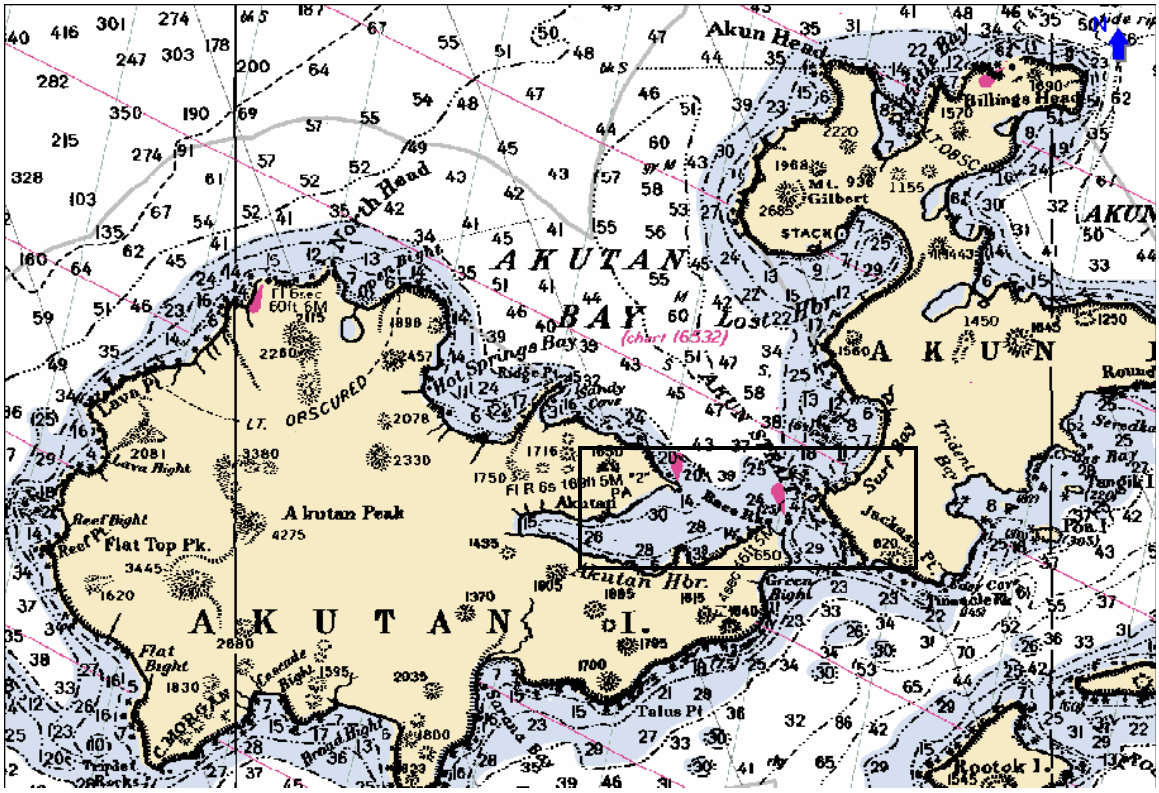

Figure 7: Elevations and Bathymetry of Akutan Island, Akun Island, Akutan Bay and Akun Strait

The bathymetry of Akutan Harbor is not complex. There is little littoral habitat except at Akutan Harbor head and the north and south shorelines are steep with an 8:1 slope that drops to 18.3 meters within 146.3 meters of shore. The seafloor is relatively flat and gradually deepens from 26.8 meters near the head to 61 meters near the mouth (USACE 2001a).

Akutan is in the maritime climate zone, with mild winters and cool summers. Mean temperatures range from 22°F to 55°F. Site specific weather data for Akutan is unavailable, however Dutch Harbor, which lies 56 kilometers to the west and has a similar climate, receives an average of 146.5 cm per year. High winds and storms are frequent in the winter, and fog is common in the summer.

The village of Akutan began in 1878 as a fur storage and trading port for the Western Fur & Trading Company. The company's agent established commercial cod fishing and processing business that quickly attracted nearby Aleuts to the community. A Russian Orthodox Church and a school were built in 1878. Alexander Nevsky Chapel was built in 1918 to replace the original structure. The Pacific Whaling Company built a whale processing station across the bay from Akutan in 1912. It was the only whaling station in the Aleutians and operated until 1939. After the Japanese attacked Unalaska in June 1942, the U.S. government evacuated Akutan residents to the Ketchikan area. The village was re-established in 1944, although many villagers chose not to return. The City of Akutan was incorporated in 1979 (USACE 2001a).

Akutan is a fishing community and is the site of a traditional Aleut village. The community has approximately 100 year-round residents; the majority of the population is transient fish processing workers that live in group-quarters.

Commercial fish processing dominates Akutan's cash-based economy, and many residents are seasonally employed. Trident Seafood operates a large processing plant west of the community for cod, crab, Pollock, and fish meal. The population of Akutan can double during processing months. Eight residents hold commercial fishing permits. Subsistence foods include seal, salmon, herring, halibut, clams, wild cattle, and game birds.

Water is supplied by a local stream and dam, originally constructed in 1927. Water is treated and piped into all homes. Funds have been requested to develop two new water catchment dams, and construct a new 125,000-gallon water storage tank and treatment plant. Sewage is piped to a community septic tank, with effluent discharge through an ocean outfall. Refuse is collected three times a week; a new landfill site and incinerator were recently completed. The city recycles aluminum. Trident Seafood operates its own water, sewer, and electric facilities.

Akutan has no airstrip due to the steep terrain; however, a seaplane base is available. Daily air service is provided from Dutch Harbor; however, high waves limit accessibility during winter months. A dock is available, but there is no harbor. The Alaska State ferry system operates between Kodiak and Akutan bi-monthly between May and October. Cargo is delivered weekly by freighter from Seattle.

Akun Island is an approximately 21 by 19 kilometer uninhabited island. Akun Island is located approximately seven miles across Akutan Bay from the community of Akutan. Akun Island is home to 1,200 head of cattle scattered across the island. The cattle are owned by the Aleut Corporation. Tentative plans have been made to displace some of the cattle to Edmonton, Alberta, Canada. There is also a sulfur deposit on Akun located northeast of Mt. Gilbert, which is outside of the project area. Mt. Gilbert is the highest point on Akun Island, an active 820 meter high volcano. According to Darryl Pelkey, the Akutan Corporation President, Akutan Corporation owns approximately 90% of the land on Akun Island. There is a small amount of subsistence activity on Akun, and there are two still-standing cabins and the partially buried remains of an older structure located near the hovercraft landing site at Surf Bay. It is unlikely that the structures will pose a problem for the development of the area, and the limited financial investment in these structures would make removal a reasonable option if necessary (Pelkey 2005).

The Surf Bay landing site on Akun Island is partially protected from Bering Sea swell by rocks and islets to the north and, more locally, by a reef. Furthermore, the beach is sandy with a very gentle slope (approximately 4.5°), which will result in diffused breaking of the surf resulting from the Bering Sea swell. The long, gently sloping inshore bottom at Surf Bay on Akun Island creates an extended breaking zone where incident wave energy is dissipated more slowly over an extended distance.

2.2 Overview of Project Area Natural Resources

Akutan Natural Resources. Vegetation on Akutan Island is primarily moist tundra and alpine tundra/barren ground. Shoreline meadows occur along sand and gravel shorelines and consist of species such as sea lyme grass, blue-joint reedgrass, salmonberry, and hemlock-parsley. Grass-forb meadows occur along the steeper side slopes and are dominated by black crowberry, blue-joint reedgrass, and may flower. Sedge marshes can be found at the head of Akutan Harbor on a large alluvial fan between two anadromous fish streams that enter Akutan Harbor. This plant community is dominated by Russet's cottongrass and tall cottongrass, as well as various sedge species. Tree species on Akutan are limited to a few low-growing willows near water sources (HDR 2003c).

Akutan Island is used by a variety of bird species for feeding, nesting, molting, and wintering. The USFWS documented 33 bird species using the marine and near-shore areas of the bay during the summers of 1980 and 1981 and two days in August 1998 (USFWS 1998). The most abundant bird species in Akutan Harbor appear to be seabirds and waterfowl. Shorebirds and waterfowl commonly use the wetlands at the head of the harbor during migration and winter. Songbirds such as gray-crowned rosy finches, song sparrows, American pipits, and snow buntings are resident species on Akutan Island. Waterfowl (green-winged teal, greater scaup, goldeneye, and mergansers) and sea ducks (Steller's eider, harlequin ducks, and scoters) concentrate in Akutan Harbor during the winter. Emperor geese, harlequin duck, and long-tailed ducks have been observed in nearshore marine waters in the project area during winter surveys for Steller's eiders in 2004 and 2006 (HDR 2006). The seafood waste plume from the Trident Seafood plant attracts small numbers of larids and alcids. These birds are likely attracted to fish waste particles and/or to fish feeding on the food particles. The gurry scow vessel that transports fish waste from the harbor processors out to Akun Straits attracts a large number of black-legged kittiwakes, northern fulmars, glaucous-winged gulls, and herring gulls. Bald eagles are year-round residents in the project area.

There are only a few freshwater streams in Akutan Harbor that support fish: Whale Bone Creek, Picnic Creek, and Stream #4. Streamlets in the same area support stickleback and Dolly Varden. Fish surveys were conducted by LGL Alaska Research Associates, Inc. (LGL 2001) at the head of the Akutan Harbor in 2000. Their results indicate the return of adult pinks peaked in August, and the estimated pink salmon returns were an order of magnitude higher in North Creek than in South Creek (15,000 vs. 1,500). Although the adult pink run appeared to peak in August, it continued through September, and was near completion by mid-October. Adult coho were observed only in the North Creek system during the 2000 survey. A total of six coho were sighted in September and three were sited in October. Dolly Varden were present year round throughout the stream drainages at the head of the harbor. Adult Dolly Varden were observed in spawning colors during October. The North Creek watershed provides good habitat for coho juveniles, and they rear in the stream year round. Rearing coho were observed using North Creek approximately 3.1 km upstream from the stream mouth. Multiple size groups of coho caught in North Creek indicate there are multiple year classes of juveniles rearing in this system. Juvenile coho salmon were only captured in the lower 260 meters of South

Creek, and a few coho juveniles were trapped in Middle Creek, approximately nine meters from the mouth (USFWS 1998).

The tidal range in Akutan Harbor is relatively low and consequently the intertidal zone is typically between mean higher high water (MHHW: +1.2 meters) and extreme low water (ELW: -0.87 meters). The majority of the Akutan Harbor shoreline is steep and the associated intertidal zone narrow. However, at the head of the harbor and other lowland areas, the intertidal zone can extend hundreds of meters offshore before dropping suddenly to great depths.

A variety of barnacles and limpets constitute the primary fauna on bedrock and boulders of the uppermost shoreline around the entire harbor. In areas where intertidal substrate consists of gravel and cobble, littorines and limpets can be found grazing on the annual algae that become established each spring and summer. Rockweed (*Fucus gardneri*), sea lettuce (*Ulvaceae*), and sea laver (*Porphyra* spp.) are common in the upper intertidal zones. At lower intertidal elevations on rocky or boulder shores, a wide variety of algae and animals becomes increasingly abundant (Pentec 2004).

Some reaches of the Akutan shoreline, especially in the inner portions of the harbor have sandy or mixed gravel, sand, and shell, with varied amounts of silt. The areas support a suite of animals living within the sediments including bivalves, polychaetes, and crustaceans. This infauna provides prey for flatfish that range up the shoreline during high tide. Areas with dense concentrations of blue mussels (*Mytilus trossulus*) are found either in the midtide range on rocky shorelines or lower on low gradient gravel shores; in both cases, their distribution is limited by predation by sea stars and drills (Pentec 2004).

A typical Alaska-wide pattern of low numbers of near-shore fish in winter (March) and large numbers of juvenile salmon in June occurs in Akutan Harbor. Approximately 99% of the 6,445 fish captured during a June 2000 near-shore fish survey were pink salmon (USFWS 2000a). Of the 14 total species captured, adult rock sole and Dolly Varden were the next most abundant species captured. Several key forage species, including sand lance, capelin, and Pacific cod, were also captured. These June survey results are a sharp contrast to the 11 fish caught in 15 sets during March.

Akun Habitat and Wildlife. Vegetation on Akun Island consists primarily of moist tundra and alpine tundra. Uplands observed in the project area were located on hills and slopes with well-drained soils. Vegetation communities on Akun consist of dwarf scrub, forb and graminoid, and palustrine emergent wetlands. Dwarf scrub communities are found on well-drained hillsides and consist of crowberry, arctic willow, lupine, reedgrass, and sedges. Forb meadows occur on well-drained hillsides and consist of broad-leaved herbaceous plants such as fireweed, northern geranium, Lupine, and Alaska violet. Wet graminoid communities occur in concave valley bottoms, depressions, or swales. Dominant plant species in this community type include narrow-leaved cottongrass, several-flowered sedge, three-stamen rush, and Lyngbye's sedge (HDR Alaska 2005).

Wetland types observed on Akun Island include palustrine emergent wetlands with persistent vegetation that is saturated, seasonally flooded, or semi-permanently flooded. Sedges dominate the wetlands on Akun Island. All wetland areas identified in the field had wet graminoid herbaceous plant communities (HDR Alaska 2005).

There are three lakes located within the Akun project area footprint (Figure 3). Surf Bay Lake, located north of the proposed access road and airport runway, drains into Surf Bay. The substrate of Surf Bay Lake consists of sands and silts. There are two small lakes (Lake #2 and Lake #3), located in the southwest corner of Akun Island, which have streams connecting them to Surf Bay and Akutan Strait. Waterfowl were observed in all three lakes during summer 2005 and winter 2006 field studies. Mallards, green-winged teal, and common mergansers were observed in Surf Bay Lake in February 2006 (HDR Alaska 2006). Tundra swans have been observed in these lakes during the summer and fall. Gray-crowned rosy finches and song sparrows are resident songbirds on Akun Island. Red foxes were observed on Akun during winter 2006 field surveys.

Cattle using Akun Island cause substantial slope erosion; some of the entrained soil may be retained in the downslope wetlands, thus maintaining stream water and substrate quality. Plants growing in the wetlands provide food for the cattle and small herbivores, and invertebrates supported by the plants provide food for birds. Bird nesting is likely limited on Akun Island by cattle and foxes. The cattle cycle nutrients back to the wetlands and promote plant growth. Organic material from the wetlands' sedges and mosses and from the organisms that consume those plants is likely washed downstream where it supports stream and marine food webs.

HDR Alaska surveyed streams on Akun in August 2005 to determine the presence of anadromous fish species. Eight streams, one lake, and one pond were examined in an effort to determine the presence of anadromous fish species and habitat in the proposed Akun Airport and hovercraft landing area. Three streams and one lake in the Surf Bay drainage were found to support anadromous fish populations. Although other anadromous fish species such as chum salmon are common in the Aleutian region, pink, sockeye, and coho salmon, and Dolly Varden were the anadromous species identified during this survey. Of the anadromous fish observed during this survey, pink salmon was the most abundant adult and Dolly Varden was the most abundant juvenile (HDR Alaska 2005a).

Surf Bay Marine Habitat. In general, species diversity of the biota in rocky habitats around Surf Beach is low and consists of species with broad geographic distributions and wide environmental tolerances. Intertidal surveys of Akutan Harbor during July 2004 identified 70 taxa of algae and 35 taxa of animals. Similar surveys conducted in July 2005 on the shorelines of Surf Bay yielded 47 taxa of algae and 29 taxa of animals with by far the greatest number of taxa from rocky habitats. An additional 11 taxa of mostly subtidal species was seen in accumulations of drift algae. In contrast, diversity on some wave exposed benches and boulders in the area tended to be higher. The sand beaches of Surf Bay represent a little studied habitat that may include unrecognized ecological functions (Pentec 2005).

Lower intertidal areas support a variety of kelps including *Alaria marginata*, *Laminaria longipes*, *A. fistulosa*. Algae present in this zone include the reds *Odonthalia floccosa* and *Pterosiphonia bipinnata*. *Palmaria hecatensis* was rare on the low bedrock in Drainages 1 and 2. Like the flora, the fauna on the lowest intertidal rock substrates was far less diverse than at low rock in Akutan Harbor, probably because rock habitats examined were generally surrounded by sand flats rather than by lower (subtidal) rock (Pentec 2005).

Within lower tide pools a greater variety of animals was present: limpets, hermit crabs (*P. hirsutiusculus*), *Nucella*, sculpins, and beds of colonial sand tube worms (probably *Schizobranchia insignis*) were abundant. Anemones, the green sponge *Halichondria panacea*, the black chiton *Katharina tunicata*, encrusting spirorbid polychaetes, and encrusting bryozoans were common. Algae included articulated and encrusting corallines and in some pools, the kelp, *Laminaria groenlandica*. The rocky bench that bisects the beach of Drainage 2 (Figure 3) is of a type of basalt that leaves a highly pocked surface with numerous microhabitats, including mini-tide pools. This feature may contribute to the high abundance of *Nucella* seen on this bench and the resulting scarcity of mussels here.

At and below the low tide line of the northeastern-most cove of Drainage 2, boulders in the sand/cobble matrix had a wide range of algae including young *Alaria* sp., the reds Neorhodomela larix and *Palmaria hecatensis*, and the green *Blidingia minima*. In the sand between the boulders, the alga *Chorda filum* reached lengths of over a meter.

Unlike Akutan Harbor, sand is a dominant habitat type along the south shore of Surf Bay. Broad beaches and extensive dunes of medium sand occupy much of the shoreline of the area of Drainage 1. A small stream enters the west edge of the beach. The dunes had scattered vegetation including seabeach sandwort (*Honkenya peploides*) and beach groundsel (*Senecio pseudo-arnica*), and lesser amounts of dune grass (*Elymus mollis*). Cattle trails led from the adjacent uplands to the beach and there was evidence of heavy grazing on the sandwort. American pipits (*Anthus rubescens*), gulls (*Larus* spp.) beach hoppers (*Talitridae*) were very abundant. In the drift, many species of algae (especially *Alaria fistulosa*), shells of sand dollars (*Echinarachnius parma*), razor clams (*Siliqua patula*), the bivalve *Macoma* sp., numerous exuvia of small Dungeness crab (*Cancer magister*) and a few stranded jelly fish (*Anthozoa*) were found. Wave action on this beach was sufficient to form noticeable sand waves. This feature is indicative of considerable beach instability and results in a relatively impoverished infauna. Offshore of Drainage 1 (Figure 3), the bottom is very sandy and as a result, little offshore kelp is present off this beach. The sand beaches on the northeast edge of the Drainage 2 shoreline were somewhat firmer than those of Drainage 1 and were backed much more closely by sand bluffs and rock cliffs. Pipits were abundant in the upper drift and the large kelps, *Alaria fistulosa* and *Nereocystis luetkeana* (some with the epiphyte, *Porphyra nereocystis*) contributed the majority of the drift.

The lowest rock faces below the lowest intertidal areas had much the same biota as seen intertidally. Rock near the subtidal sand bottom was dominated by the kelps, *Alaria marginata* and *Cymathaere triplicata*. Slightly deeper subtidal rocky habitats support dense kelp beds formed primarily by the kelp *Alaria fistulosa* and a very few *Nereocystis luetkeana*. Areas within subtidal kelp beds can be expected to support many of the same associated understory plants and animals reported above on the lowest intertidal rocky and boulder habitats. In addition to *Alaria*, subtidal boulders off of the east portion of the Drainage 2 beach had the kelp *Laminaria yezoensis*, *Palmaria hecatensis*, *Ulva* sp., and *Acrosiphonia* sp.

As seen from offshore, Drainage 3 (Figure 3) shorelines were generally rocky or boulder covered with a wide *Alaria fistulosa* bed along the shore. A wide *Nereocystis luetkeana* bed lay on the outside of the *Alaria* bed at the south end of the bight. There is a rock reef and point between Drainage 3 and the next drainage to the southwest with heavy use by cormorants and gulls. The kelp beds extend well off the reef point, making shore access difficult. The Drainage 3 beach is backed by high rocky cliffs that would make upland access from the beach very difficult.

3.0 Delineating the Project Action Area

Subsection A, Section 402.02 of the [Endangered Species] Act defines "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The Project Action Area is determined by identifying the geographic area potentially affected by the proposed project. For the purpose of establishing baseline conditions from which to evaluate potential effects of the project, the project activities, as well as physical site conditions such as substrate composition were examined and evaluated.

Project components that will generate impacts include construction vehicle operation and vessels, and hovercraft operation and maintenance. These activities are expected to generate airborne and underwater noise impacts and result in increased activity levels over the existing baseline conditions.

4.0 Sea Otter Biology

Historically sea otters occurred in nearshore marine waters around the North Pacific rim from Hokkaido, Japan, through the marine coastal areas of Russia and the Pacific coastal areas of the United States and Canada (Figure 8). Sea otters were hunted nearly to extinction between the years of 1742-1911 for the fur trade. Sea otters were protected by the passage of the International Fur Seal Treaty in 1911 after expatriation from most of their range. Only small remnant groups of sea otters survived the fur

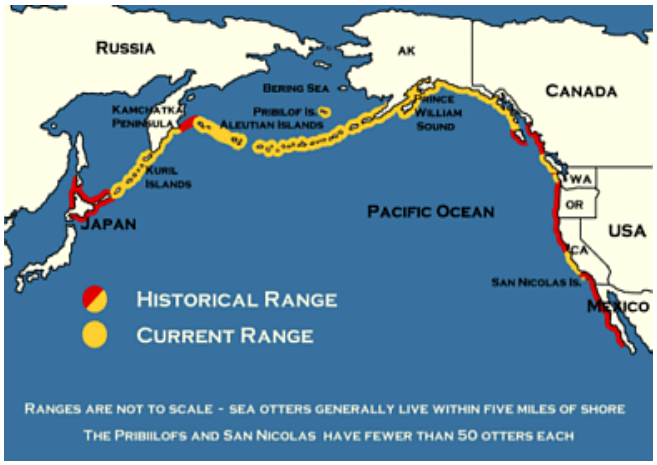

Figure 8. Historical and current range of the sea otter (source: Friends of the Sea Otter web page).

hunting period. The surviving populations in British Columbia and Mexico disappeared leaving only two small populations of sea otters: one in Alaska and another along the Big Sur coast of California (Kenyon 1969). By the 1950's, sea otter populations in parts of the central Aleutian Islands had recovered to pre-harvest numbers (Estes in litt; Kenyon in litt). By the 1980's between 55,000 and 74,000 animals inhabited the archipelago and continued population growth was anticipated. (Calkins and Schneider, in litt; Estes in litt; Rotterman and Simon-Jackson in litt; Schneider in litt.) Between 1965 and 2000, sea otter numbers in the Aleutian Islands decreased by 88% to 8,742 (Doroff *et al.* 2003). Three population stocks of sea otters exist in Alaska today, where the current statewide population is believed to number around 65,000 animals (USFWS 2005).

Sea otters in the United States are protected from hunting and harassment by the Marine Mammal Protection Act of 1972 (MMPA). The USFWS is the federal agency responsible for maintaining healthy populations of sea otters. The USFWS, State governments, and several wildlife organizations are actively conducting research to determine the cause of the decline. In August 2001 the Center for Biological Diversity (CBD 2001), a non-profit organization, petitioned the USFWS to designate the Alaska stock of sea otter as depleted under the MMPA. The USFWS responded to the petition in November 2001 (USFWS 2001) citing the petition lacked sufficient information on the status of sea otter stocks in Alaska to warrant depleted status. The northern sea otter was proposed for listing as a Threatened species under the ESA on February 11, 2004 (69 FR 6600). The USFWS listed the northern sea otter as threatened under the ESA on August 9, 2005 (70 FR 46366).

The information in Sections 5.1 through 5.1.5 is verbatim excerpts from the USACE's 2003 Biological Assessment of the Sea Otter *Enhydra lutris* for Harbor Construction at Unalaska, Alaska (USACE 2003).

4.1 Critical Habitat Designations

Critical Habitat for sea otters has not yet been identified. Work is currently underway to characterize important breeding and feeding habitat for sea otters in Alaska. Features such as calm, protected waters with a diverse forage base will likely be prioritized if habitat protection measures are sought to improve the recovery of sea otters.

4.2 Range, Abundance, and Identification of Stocks

Sea otters are divided into three subspecies based on slight cranial variations: the southern sea otter *Enhydra lutris nereis* found in California, the Alaskan sea otter *Enhydra lutris lutris* ranging from southeast Alaska across the Aleutians to Commander Island, and the Asian sea otter *Enhydra lutris gracile* from Kurile Islands and the east coast of the Kamchatka Peninsula (Kenyon, 1981; Reidman, 1990, Bodkin et al. 1999).

The historical distribution of sea otters followed the range of kelp and extended from the northern islands of Japan north and east across the Aleutian chain to the mainland of North America then south along the west coast to central Baja California, Mexico (Riedman and Estes 1990).

An estimated 150,000 sea otters are found along the north Pacific rim from the Kuril Islands into the Kamchatka Peninsula, the Commander Islands east across the Aleutian Islands to Prince William Sound, and spotted populations along the west coast of North America at southeast Alaska, Vancouver Island, Washington from Pt. Grenville to Pillar Pt. and central California from Point Sur to Diablo Canyon (Paine 1993). The 2001 USGS Washington sea otter census counted 555 otters along the Washington coast and the 2002 USGS California sea otter census counted 2,139 sea otters in California. At present more than 90% of the world's sea otters live in coastal Alaska waters (Lentfer 1988).

Three stocks of sea otters are recognized in Alaska and one stock in California. The Alaska stocks are known as the southwestern, southcentral and southeastern stocks (Figure 9). The southeastern stock has been translocated to areas in British Columbia and Washington.

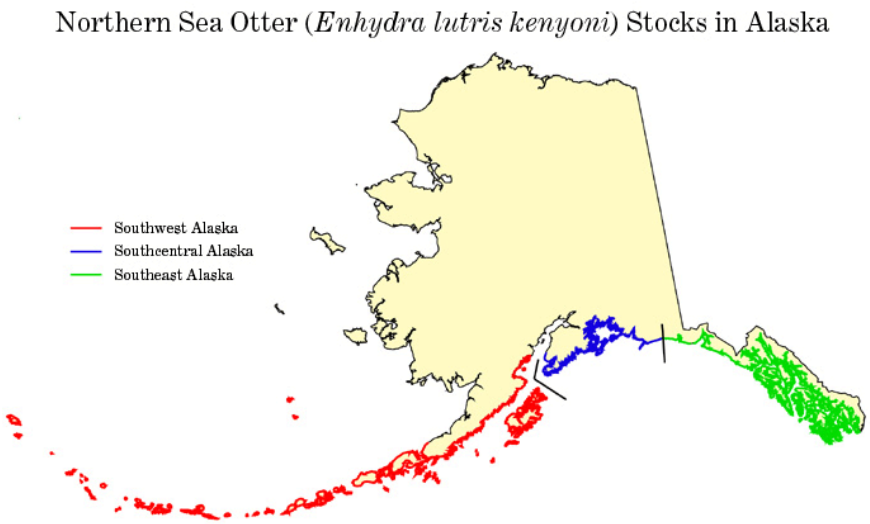

Figure 9. Range of the three stocks of northern sea otter in Alaska (source: http://alaska.fws.gov/fisheries/mmm/seaotters/reports)

4.2.1 Stock Status

The southcentral Alaska stock is considered to be stable and the southeastern Alaska stock and its translocated populations are expanding. The southwestern Alaska stock is undergoing a dramatic decline. The USFWS compared trends in abundance of the southwestern stock from 1986 to and 2001 (Table 3).

Table 3. Population Estimates for the Southwest Alaska Stock of Sea Otters

Location	Year	Count	Estimate decline
Aleutian Islands	1992	8,044	
	2000	2,442	70%
North Alaska Peninsula	1986	9,061-13,091	
	2000	5,756	36-56%
South Alaska Peninsula	1986	15,346-17,835	
	2001	1,344	91-92%
Kodiak Archipelago	1989	13,526	
	1994	9,817	
	2001	5,983	56%
	2004	6,284	54%

Source: Doroff *et al*. (in press).

The southwestern stock in the Aleutian Islands was down 70 percent between surveys conducted in 1992 and 2000, but the Fox Island group in whose range Akutan Island and the project site is located, was down 56 percent (USFWS Unpublished data). Unpublished USFWS survey data from 2003 in the west and central Aleutian Islands suggests that this decline is continuing and that there may be as few as 3,261 sea otters remaining in the entire Aleutian Island group (Doreoff *et al*. 2004).

Specific causes of this dramatic decline are unknown and under study. Springer *et al.* (2003) hypothesized that the sea otter collapse may be the result of extensive post World War II commercial whaling. The North Pacific whaling harvests resulted in a dramatic decline in populations of great whales which where a prey species for killer whales. With the reduction in prey, killer whales may have met their metabolic needs by shifting their diet to include sea otters and pinnipeds.

4.2.2 Species Description

Adult male sea otters grow from 1.5 to 2 meters in length and to over 45 kilograms in weight. Females are considerably smaller. The average length and weight for pups is about 0.6 meters and 2 kilograms (Orr and Helm, 1989). The otter's head is rounded with small ears and a broad snout; the body is long with the tail broad at the base but tapering and equal to about a fourth of the body length (Orr and Helm, 1989). The forepaws are stumpy yet highly mobile with retractile claws, while the hind feet are flipper-like and are used for propulsion through the water (Mason and MacDonald, 1986). Their skeletal structure is loosely articulated and lacks a clavicle, which allows for increased flexibility in swimming and grooming. The forelimbs are used primarily for grooming and foraging instead of swimming. Their teeth are designed for crushing hardshelled food such as clams, urchins and crabs. The sea otter is the only carnivore to have four incisor teeth in its lower jaw. These are used to break open the shells of crabs.

Sea otters normally live between 15 and 20 years. The average life span of a sea otter is believed to be about 12 to 16 years in the wild (Van Blaricom and Estes 1988). Breeding occurs year round and pups may be born in any season, but in Alaska most pups are born

in late spring (USFWS 2000). Males become sexually mature around 4 to 6 years of age, but may not hold a breeding ground until several years later. Female sea otters will have their first pups around the ages of 2 to 5 years and will breed annually until age 20. Sea otter females gestate for about 8 months and give birth to a single pup or very rarely two (Mason and MacDonald 1986). Pups are capable of some independent activity at birth and are capable of eating solid food after 17 days and diving after a few months (Mason and MacDonald 1986). The otter pup is dependent on the mother for at least a few months and weaned at one year, but may remain with mother after she has a new pup (Kenyon 1981). The fur of newborn pups is a light brown, wooly coat blending to beige at the neck, which is covered within a few weeks by a coat of longer guard hair with a distinctive yellowish tinge (Kenyon 1981). The adult fur grows in after a few months and is variable in color from light beige to almost black, with sparse dark or silvery white guard hairs (Kenyon 1981). Sea otter fur is very dense and has a greater number of hair follicles per inch than any other mammal. Sea otters molt throughout the year (Kenyon 1969), which historically resulted in their being hunted in all seasons.

Sea otters can act as a keystone species by preying on sea urchins and controlling urchin overgrazing on kelp forests. In areas where sea otters have been removed from the ecosystem, sea urchins may establish dominance and overgraze the macroalgea until the areas become nearly devoid of kelp. These areas are commonly referred to as 'barren grounds.' Near Vancouver Island, British Columbia sea otters were re-introduced and the community shifted from urchin dominated to algae dominated in less than six months (Watson in litt). However, the role of sea otters as keystone species in Alaska may complicated by other ecosystem variables such as population density (Konar 2000).

4.2.3 Site Fidelity

Sea otters usually remain within a few kilometers of their established feeding grounds (Kenyon, 1981), however, translocated populations are known to shift and expand their distribution in favorable habitats (Jameson 2002). Otters prefer a protected inshore area with a rocky bottom and an abundance of kelp, especially giant kelp, which are used for rest (they wrap themselves while napping to keep from drifting) and provide the ideal foraging grounds (Riedman 1990). Local and temporary shifts of sea otter distribution to avoid heavy sea ice along the northern shore of the Alaska Peninsula are known to occur (Schneider and Faro 1975).

4.2.4 Diet

Sea otters eat a variety of marine life including sea urchins, abalone, clams, mussels, crabs, and squid. Sea urchins are consumed in great quantities, and in the Aleutian Islands this food source may constitute up to 60 % of a sea otter's diet (Tinker and Estes, 1999). When preferential prey are scarce otters will also eat kelp crabs, clams, turban snails, octopuses, barnacles, sea stars, scallops, rock oysters, fat innkeeper worms, and chitons (Reidman 1990). Individual otters will normally specialize in one or two prey items (Reidman, 1990). The different sea otter subspecies have been shown to include different average proportions of prey type in their diets (Mason and MacDonald, 1986).

Sea otters sometimes use rocks as tools to open shellfish while floating on their backs. Feeding occurs both day and night (Orr and Helm 1989).

In Alaska, otters will sometimes dive to 90 meters or more while foraging but a typical dive is up to 18 meters (Schneider 1999). Dives can last up to 5 minutes. Sea otters have little or no body fat, but have an increased metabolism to keep them warm in the cold water. Sea otters in captivity usually consume up to 25 percent of their body weight in food each day.

4.2.5 Causes of Mortality

Sea otter mortality varies among populations, but can include disease, parasite infestations, predation, subsistence hunting, entanglement in fishing gear, boat strikes, starvation, stranding, abandonment of pups, severe sea ice formation, pollution including oil spills, and illegal killings (Rotterman and Simon-Jackson 1988).

Sea otter predators include white sharks in the southern range and north to southeastern Alaska, and killer whales in all areas. Killer whales have been a key player in the decline of the southwestern Alaska stock of sea otters, but the extent of predation and its potential impact on the population as a whole has not been determined. Sea otter pups may occasionally be taken by bald eagles or sea lions (Rotterman and Simon-Jackson 1988).

Significant conflict with human needs also exists in some areas of the sea otter's range. Conflicts mostly involve competition with subsistence and commercial harvests of shellfish. Conflicts are not as prevalent with the southwestern stock as they are with the southeastern stock and translocated stocks in British Columbia and Washington. Conflict with commercial harvesters of clams and abalone are also suspect in illegal killings of sea otters. A relatively small number of sea otters are taken by Alaska Natives for subsistence crafts.

Entanglement in active and discarded fishing nets and gear also contributes to sea otter mortality. A 240-kilometer-long section of coast in California was closed to fishing with gillnets to protect the southern stock from entanglement. There is little fishing with gill nets in areas occupied by the southwestern stock, but entanglement in cast aside seine and trawl nets could result in occasional mortality. Disease and parasitism takes a toll on sea otters. In 1999 up to 100 sea otters from the southcentral stock in Alaska were found dying of Anisakidae infestation (Little 1999). Waste from fish processing plants were suspect in these sea otter deaths (Rotterman and Simon-Jackson 1988).

Sea otters rely on air trapped in their fur for warmth and buoyancy. An oil spill drastically reduces the insulative value of the fur and oil is ingested during grooming, thereby causing detrimental affects to sea otters that come into contact with oil spills. An estimated 3,905 sea otters died as a result of the 1989 Exxon Valdez oil spill in Prince William Sound, Alaska (DeGange *et al*. 1994).

4.3 Existing Perturbations in Project Action Area

Sea otters and their habitat in Akutan Harbor currently experience a range of disturbances from existing human activities such as the operation of commercial and fishing vessels; subsistence and recreational activities; harbor-related operations; and the individual and collective pollution from these activities.

Many vessels currently move into and out of Akutan Harbor, and in doing so, displace sea otters within their path and wake. Vessels travel into Akutan Harbor to: (1) off-load their catch at the Trident seafood processing plant; (2) repair their vessels; (3) store fishing equipment at a limited number of upland storage areas; (4) bring in supplies to the Akutan community; (5) off-load passengers; and, (6) escape storms and other types of bad weather.

The single largest commercial use of the harbor is associated with the fishing fleet that off-loads its catch at the Trident plant. The approximately 76 vessels that conduct business with Trident primarily fish in the Bering Sea. The Trident plant is busy between November and March, and is busiest during the "A" season pollock fishery, which normally lasts about 15 days in the January/February timeframe. The "B" season pollock fishery begins in August and lasts for about a month. The pollock fishing grounds center around the 100-fathom line extending north from Akutan to St. Matthew Island and west towards Russia. The Trident plant is also busy during the blue king crab and opilio crab season, which varies each year but generally begins in January and March, respectively.

The Akutan community is regularly visited by barges and is served by the Alaska State Ferry System. It is also common for vessels to moor themselves in the harbor's protective waters during storms and other periods of bad weather. Akutan residents also transit the harbor in skiffs for recreational and subsistence purposes.

Petroleum spills of various types are associated with the operation of vessels in and around Akutan Harbor. Approximately 65 spills were reported to have occurred in Akutan Harbor between 1991 and 1999, the largest being approximately 10,000 gallons (Day and Pritchard 2000). Diesel fuel appears to be the most common product spilled. Operator error and equipment failure accounted for 49% and 34% of the spills (Day and Prichard 2000).

Approximately 26 petroleum spills were reported in Akutan Harbor from 2000 to 2005. The majority of these spills were reported to have occurred from Trident Seafood Plant operations and include diesel and waste oil from the plant and plant vessels. The majority of the spills were small spills resulting from overfill of tanks and leaks in pipes (ADEC 2006a).

Akutan Harbor was originally on the 1996 Section 303 (d) list of impaired bodies of water. The ADEC prepared a waterbody assessment and TMDL to address the water quality issues within this waterbody, and Trident Seafoods' National Pollutant Discharge Elimination System (NPDES) permit was amended to reflect this information. The harbor was removed from the Section 303(d) list in 1998 and remains in Category 4a for

2003. The Trident Seafoods Facility is currently under a consent decree that requires a 12% BOD5 reduction in addition to the limitations on the NPDES permit. The associated revised NPDES permit had discharge limits consistent with a TMDL Assessment (ADEC 2006). There are no water quality concerns for Surf Bay.

The primary source of water quality degradation in the harbor was and continues to be related to the discharge and accumulation of seafood processing wastes (USEPA 1993). There has been a relatively long history of seafood processing in Akutan Harbor, and for many years sea otters in the Harbor have been exposed to deteriorating water quality conditions. The largest seafood processing waste pile in Akutan Harbor lies off the Trident plant at a depth of 26.8 meters and is composed of both crab and finfish waste. The pile is estimated to cover 12.6 acres and to have a maximum height of 8 to 10 meters. In addition, shoreline inspections conducted by ADEC and the U.S. Environmental Protection Agency report floating scum and particulate accumulations along the shoreline east and west of the Trident facility (USEPA 1993).

Currently the PenAir Grummen Goose services the village two times a day whenever the weather allows. Sea otters are temporarily displaced during aircraft takeoffs and landings.

Many vessels currently enter Akun Strait and Akutan Harbor to: (1) off-load their catch at the Trident seafood processing plant; (2) repair their vessels; (3) store fishing equipment at a limited number of upland storage areas; (4) bring in supplies to the Akutan community; (5) off-load passengers; and, (6) escape storms and other types of bad weather.

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Akutan Harbor was declared an impaired water body by the Alaska Department of Environmental Conservation (ADEC) in 1990 and was de-listed by 1998 (Grant, personal communication). The primary source of water quality degradation in the harbor was and continues to be related to the discharge and accumulation of seafood processing wastes (USEPA 1993). There has been a relatively long history of seafood processing in Akutan Harbor, and for many years the harbor's sea otter population has been exposed to deteriorating water quality conditions. The largest seafood processing waste pile in Akutan Harbor lies off the Trident plant at a depth of 26.8 meters and is composed of both crab and finfish waste. The pile is estimated to cover 12.6 acres and to have a maximum height of 8 to 10 meters. In addition, shoreline inspections conducted by ADEC and the U.S. Environmental Protection Agency report floating scum and particulate accumulations along the shoreline east and west of the Trident facility (USEPA 1993).

The collective results of all the aforementioned existing vessel uses and activities in the harbor may already be causing sea otters to: (1) become displaced from their feeding and resting areas; (2) increase their risk of collision with vessels; and (3) have their habitat become degraded due to the accidental release of organic waste and petroleum products into the nearshore environment, or as a result of normal operations.

4.3.1 Distribution of Sea Otters in Project Action Area

Sea otters have been observed in the project area during all biological surveys, beginning in 1983. LGL observed sea otters in Akutan Harbor during their winter 1999/2000 surveys conducted in Nov., Jan., Feb., and March. Approximately 30 sea otters were observed at the head of the bay in January 2001. At least 29 sea otters were observed in near-shore environments, generally as singles or pairs. A raft of 18 individuals was observed at the northwest corner of the harbor (Schroeder 2001). USFWS surveys in February 2001 observed two relatively large groups of sea otters, one group of seven at Akutan Point and one group of 12 near the mouth of South Creek.

In July, 2004, USFWS performed aerial surveys of Akutan and Akun islands. Two sea otters were observed near-shore and directly south of the City of Akutan; 11-20 were observed approximately 2.5 km west of the proposed hovercraft landing; and three were observed two kilometers north of the hovercraft landing. A second aerial survey was performed in August and three sea otters were spotted along southern shore of Akutan Harbor, and one sea otter was seen in Akutan straight. Additional sea otters were observed on both islands, and between 121 and 168 individuals were spotted around the shoreline of Akun Island. (USFWS unpublished data, 2004).

HDR Alaska observed sea otters in Akutan Harbor during the winter 2004 Steller's eider surveys, and during January, February and March 2006 surveys. The 2004 surveys covered nearshore habitats within Akutan Harbor, and 2006 surveys covered the proposed hovercraft route and nearshore habitats at Akun Island. These surveys were conducted to coincide with wintering congregations of Steller's eiders. The 2004 surveys found small numbers of sea otters scattered among all transects during the surveys, but

transects 3 and 5 contained the highest numbers of sea otters. Groups of up to 20 sea otters were observed on several occasions in nearshore areas of transect 3 near the whaling station and crab pot storage area (Figure 10). A group of 11 sea otters was observed in transect 5 during the February 2004 surveys (HDR Alaska 2004).

Surveys for sea otters were conducted in winter 2006 as part of the field investigations for the Akun Alternative. These surveys were conducted by HDR Alaska, Inc. in January, February, and March 2006 in conjunction with Steller's eiders surveys in Akutan Harbor, Akun Strait, and Surf Bay along the proposed Akun airport hovercraft route. Sea otter numbers were highest in January (22), with declines in February (17) and by March only 7 otters were observed. Otter locations for Winter 2006 surveys are illustrated in Figures 11, 12, and 13. Preferred habitat appeared to include protected areas in Akutan Harbor near the village of Akutan (transects 1 and 2) and along nearshore habitats at Akun and Green Island (transects 4 and 5). Transects 4 and 5 are located along nearshore habitat with kelp beds which is an important habitat feature for sea otters. Most of the otters sighted were individuals and only one female with a pup was observed during the winter surveys (Results taken from HDR 2006, Sea Otter Survey Report).

4.3.2 Food Resources near the Project Site

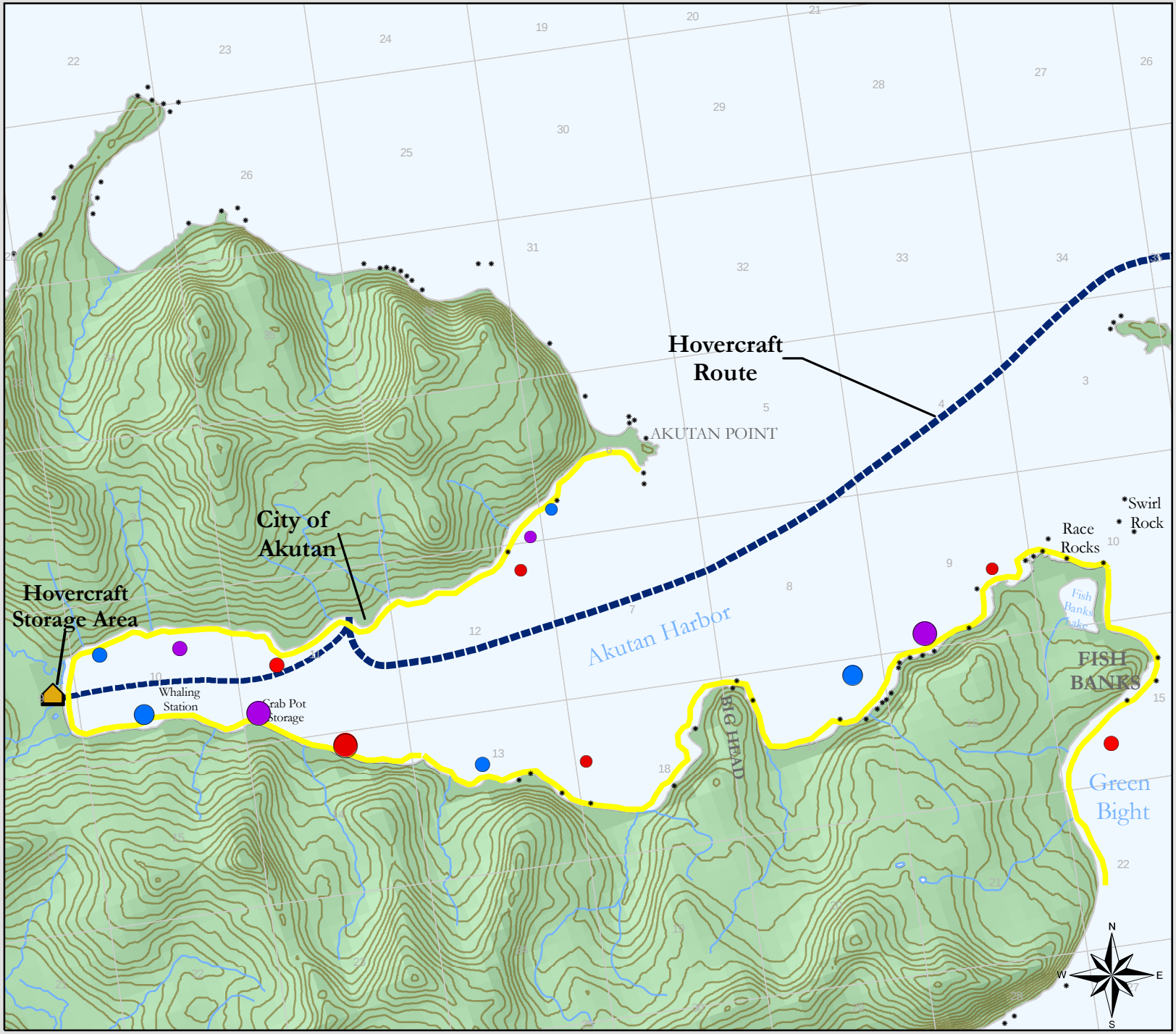
Sea otters preferred prey includes urchins, clams, crabs, and cephalopods. When their preferred prey is scarce they will also feed on sea stars and blue mussels. The U.S. Fish and Wildlife Service surveyed Akutan Harbor by diving and observed numerous species that could be considered prey for sea otters, including an abundant population of green sea urchins (Schroder 2001). If sea otters from other locations outside of Akutan Harbor move in search of productive foraging areas, they would likely find an abundance of preferred foods in Akutan Harbor. The abundance of macroalgae, clams, and sea urchins within some areas of Akutan Harbor indicated sea otters are not exerting appreciable predatory effect on sea urchin populations, however, it also appears that sea otters are becoming more abundant in the winter (Schroder 2001). They will often feed at a site until suitable prey organisms are below an efficient foraging threshold and then move on to another area. Suitable foraging habitat is also available at nearshore areas near Green Island and the southwest shoreline of Akun Island based on observations of kelp locations during winter 2006 surveys.

5.0 Effects Analysis

The following discussion will focus on the direct and indirect effects the proposed action will have on sea otters. These effects include habitat effects, disturbance effects, foodchain effects and collisions.

5.1 Direct Effects

Direct impacts from project construction and operation of an airport and hovercraft could include construction disturbances and displacement, risk of collision with the hovercraft, displacement/disturbance from foraging habitat, and exposure to oiling and ingestion of oils. A loss of approximately 1.2 acres of marine habitat would occur as a result of the construction of hovercraft landing ramps at Surf Bay (approximately 0.7 acres) and at the



Akutan Airport Master Plan

Sea Otter Abundance during Steller's Eider Surveys Winter 2004

Akutan Harbor

Sea Otter Abundance

January: 1-5, 5-10, 10-25

February: 1-5, 5-10, 25-50

March: 1-5, 5-10, 25-50

Transects

Hovercraft Route

Storge building

MAP NOTES:

All Sea Otter sitings from January, February, March 2004

Map created April 2006

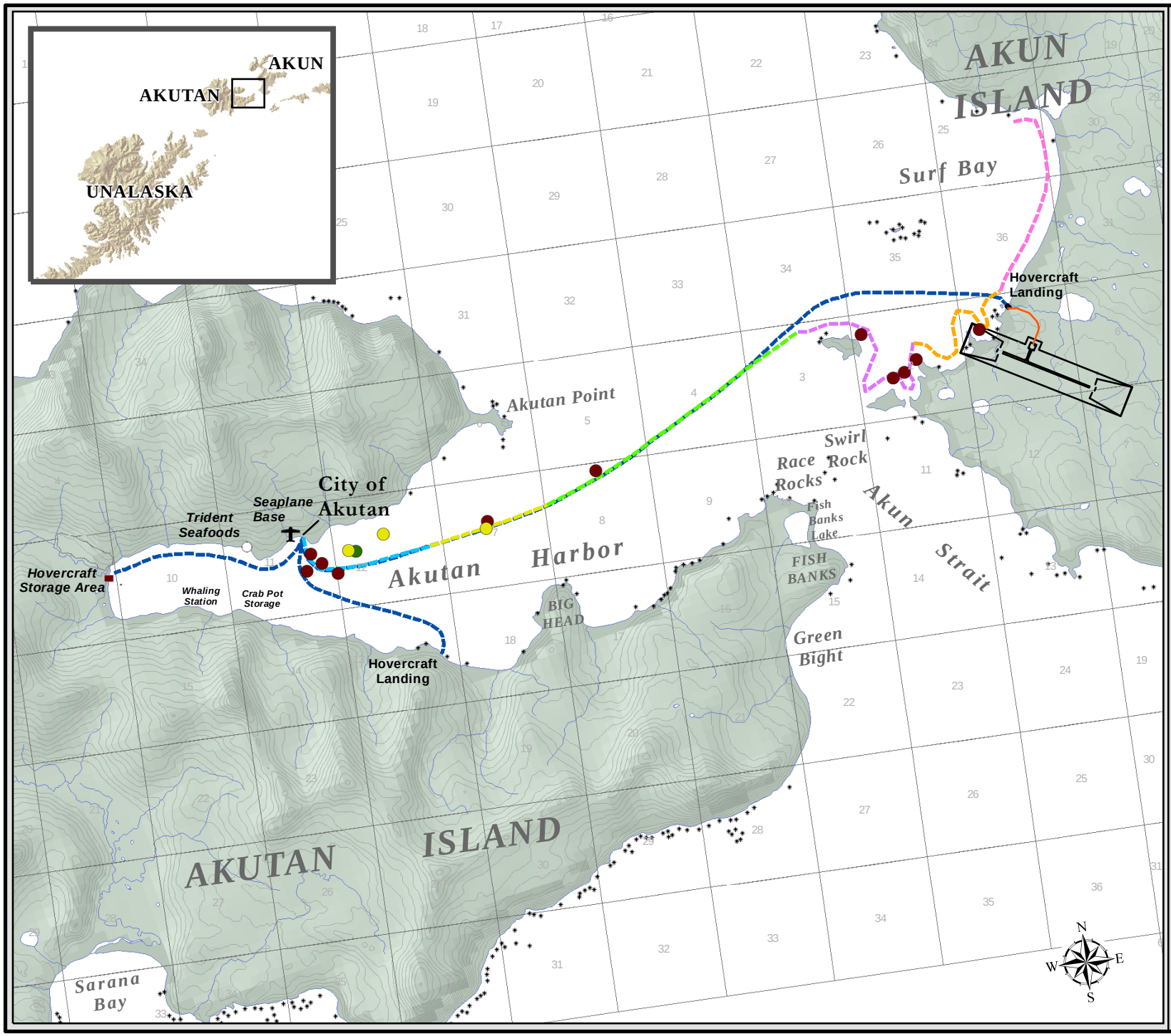
DATA SOURCE: ADOT&PF, HDR, and USGS

0 250 500 1,000 1,500

Meters

Figure 10

PREPARED FOR:



Akutan Airport

Distribution of Sea Otter along Proposed Hovercraft Route

LEGEND

Sea Otter Sighting January 2006

Sea Otter
- 1/27/2006
- 1/28/2006
- 1/29/2006
- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Airport Alternative
- Access Road
- Hovercraft Route
- Hovercraft Landing
- Streams
- Rocks

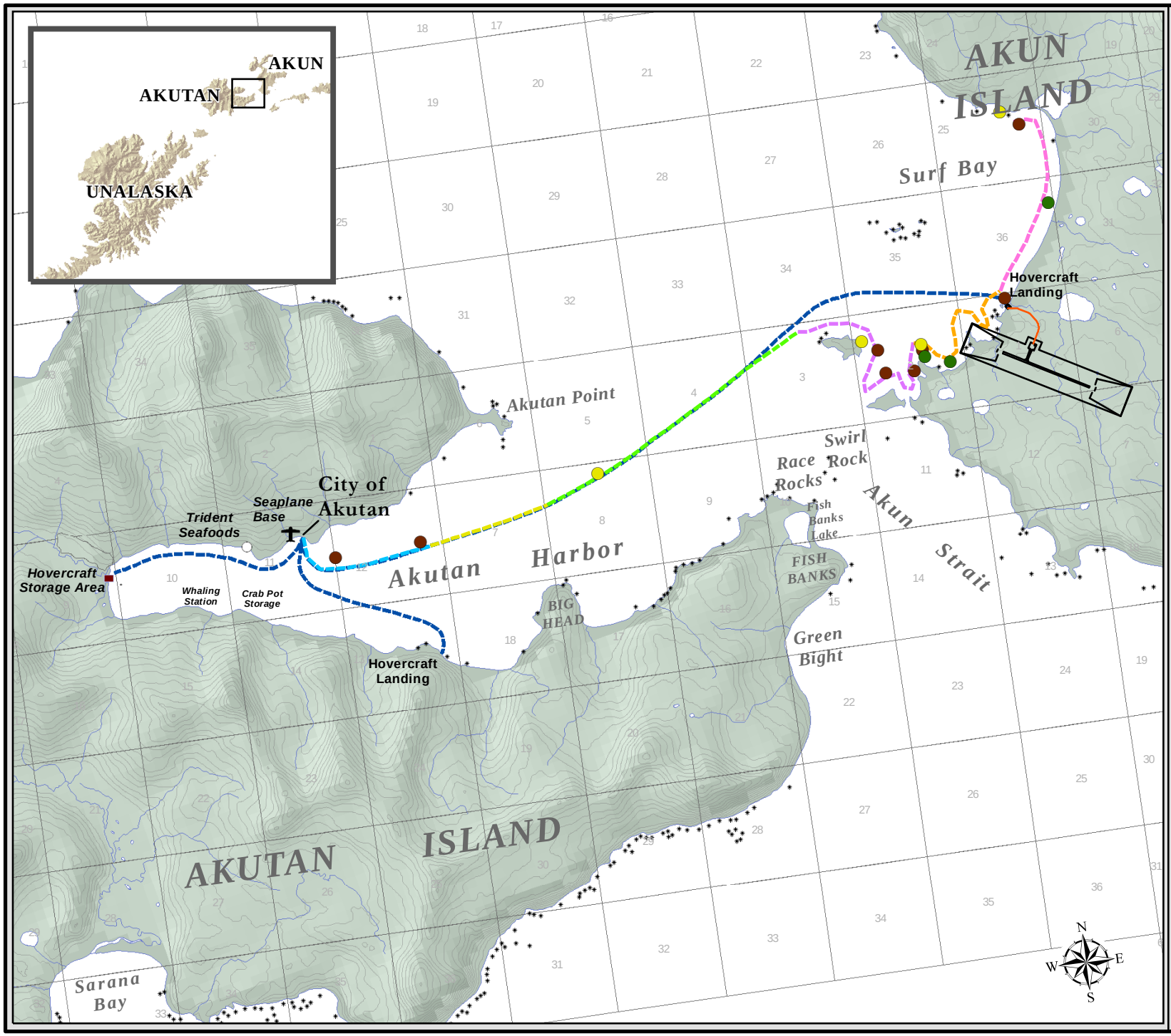
MAP NOTES:
All otter sitings from January 2006

DATA SOURCE: ADOT&PF, HDR, and USGS

0 2,500 5,000 7,500
Feet

Figure 11

PREPARED FOR:



Akutan Airport

Distribution of Sea Otter along Proposed Hovercraft Route

LEGEND

Sea Otter Sighting February 2006

Sea Otter
- 2/20/2006
- 2/22/2006
- 2/23/2006
- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Airport Alternative
- Access Road
- Hovercraft Route
- Hovercraft Landing
- Streams
- Rocks

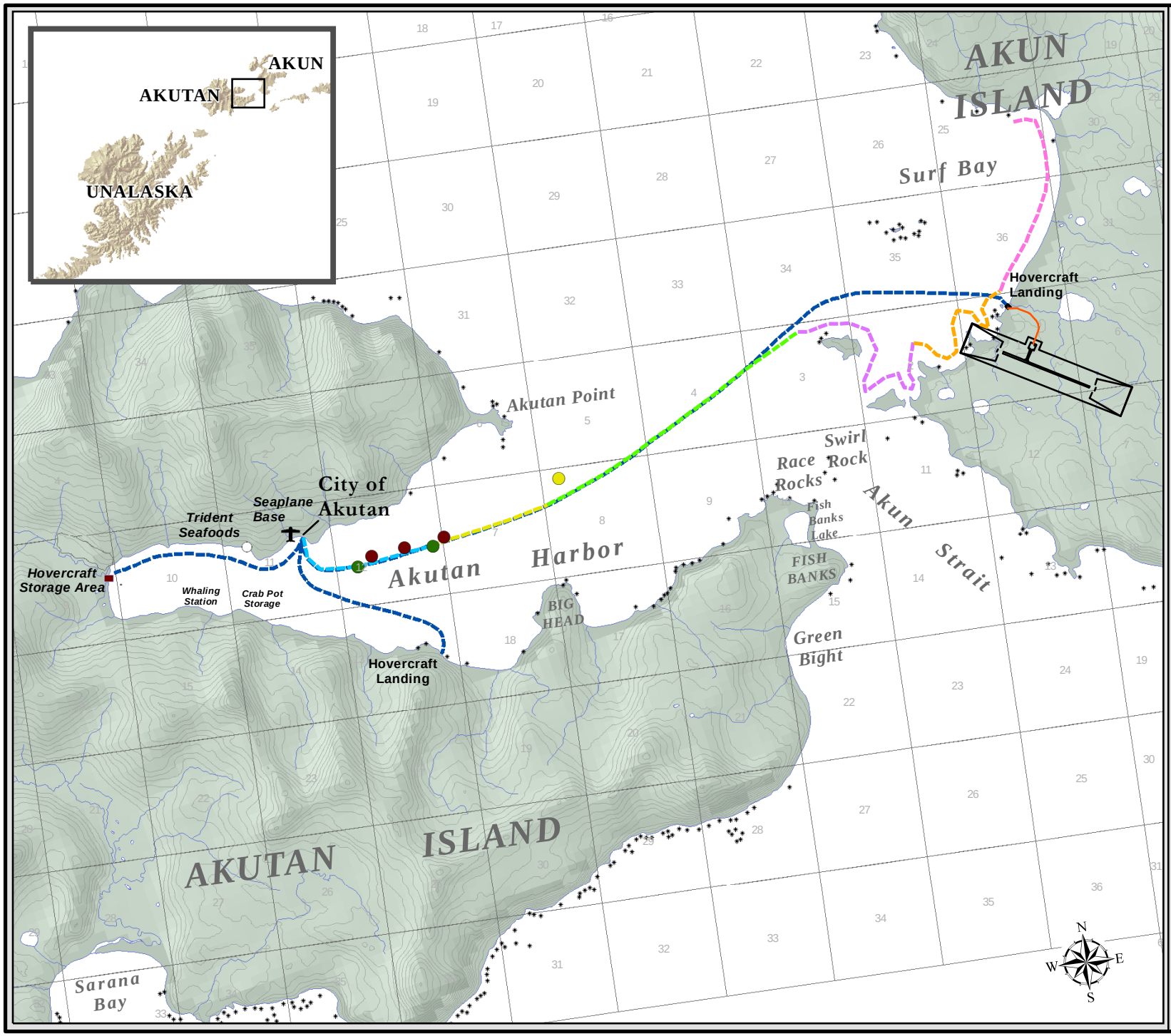
MAP NOTES:
All otter sitings from February 2006

DATA SOURCE: ADOT&PF, HDR, and USGS

0 2,500 5,000 7,500
Feet

Figure 12

PREPARED FOR:



Akutan Airport

Distribution of Sea Otter along Proposed Hovercraft Route

LEGEND

Sea Otter Sighting March 2006

Sea Otter
- 3/26/2006
- 3/30/2006
- 4/1/2006
- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Airport Alternative
- Access Road
- Hovercraft Route
- Hovercraft Landing
- Streams
- Rocks

MAP NOTES:
All otter sitings from March 2006

DATA SOURCE: ADOT&PF, HDR, and USGS

0 2,500 5,000 7,500
Feet

Figure 13

PREPARED FOR:

head of Akutan Harbor (approximately 0.5 acres). Additional direct impacts to sea otter preferred nearshore habitat would be avoided because the hovercraft would operate in deeper marine waters.

5.1.1 Noise from Construction

The most obvious project related direct effects from this project will occur during construction. There will be a large amount of activity during two consecutive construction seasons. Crews will be operating vessels, operating land-based construction equipment, and will be working on the beaches where the proposed landing platforms will be constructed. Bedrock cuts will likely require blasting. The need for blasting will be determined by the contractor as part of the construction phase of this project. Combined, these activities will cause a significant increase in noise in the vicinity of sea otters. Noise disturbance has the potential to frighten sea otters from the area, or make them wary and less attentive to natural predators, such as killer whales.

No injury threshold is available for sea otters related to underwater noise levels, but the National Marine Fisheries Service uses 190 decibels (dBs) as a threshold injury level for Steller's sea lion. It is expected that sea lions rely on intraspecies communication over greater distances than sea otters, and may be more susceptible to underwater noise. Noise levels from the construction equipment expected to be used for this project will be in the 97 dB range, well below the injury threshold. The noise expected from construction will also not be acute or very loud at any one moment in a way that has shown injury, like pile driving. Because sea otters spend about 80% of their time at the sea surface, they are more susceptible to airborne disturbances than other marine mammals. Sea otter mothers protecting their pups have been known to inadvertently drown their pups when avoiding sudden disturbances.

5.1.2 Airborne Noise Impacts

For determining the extent of project related noise from construction activities, a noise attenuation model developed for transportation projects by the Washington Department of Transportation was used. Using this model we assumed that typical construction equipment would be used for the construction of the facility and that no pile driving or blasting would be required. Construction vehicles will generate airborne noise levels approaching 97 dBs. Ambient, or normal baseline airborne noise levels have not been monitored, but are expected to be low due to the remote setting. Weather conditions such as wind or rainfall can increase baseline noise levels. The steady winds experienced at the project area probably elevate ambient noise levels during a significant part of the year. The steep, rocky terrain will also serve to limit the extent of airborne noise impacts. Therefore we assumed that ambient noise levels would be close to 45 dB. Since the area is open and dominated by open water there are few noise attenuating features and noise is expected to carry well. Given a natural attenuation of 6 dBs per the doubling distance (Table 4) from the source, noise from construction is expected to be audible at 3,901 meters from the source. This represents the outer limit of the Project Action Area for the airborne noise part of the project.

Table 5.1 Airborne Noise Project Action Area Noise Attenuation

Distance from Source (meters)	Heavy Equipment Construction Noise (-6dB)	Diesel Generator (-6 dB)
15.2	97	82
30.4	91	76
60.8	85	70
121.6	79	64
243.2	73	58
486.4	67	52
972.8	61	46
1945.6	55	
3,901 (attenuation distance)	**49**	

There would be additional airborne noise resulting from a hovercraft transporting passengers between the community and airport and traveling to the hovercraft storage area at the head of Akutan Harbor. A recent above water sound survey of the BHT-150 shows that the hovercraft emits 82 dBA at 0 ft and about 72 dBA at 300 ft away when approaching (Table 5.2) (DLI Engineering Corporation 2006).[2] When departing, the hovercraft noise is around 95 dBA at 0 ft and approximately 75 dBA at 600 ft (Table 5.2).

Table 5.2 BHT 130 Above Water Sound measurements.

Ship Condition	*Distance (ft)*	*3-Second Mean Sound Level(dBA)*
	3,000	
	2,400	*Noise did not exceed ambient* [1]
	1,800	
Hovercraft Approaching	*1,200*	*61.6*
	600	*65.9*
	300	*71.9*
	0	*82.3*
	0	*95*
	600	*74.9*
Hovercraft Departing	*1,200*	*69.9*
	1,800	*62.5*
	2,400	*Noise did not exceed ambient* [1]

Source: DLI Engineering Corporation 2006.
[1] the primary source of the ambient noise was a light shore break.

[2] **60 dBA= Noise level** of conversation in restaurant, office, background music, air conditioning unit at 100 ft**;** 70 dBA=**Noise level of a p**assenger car at 65 mph at 25 ft (77 dB), freeway at 50 ft from pavement edge 10 a.m. (76 dB), radio or TV-audio, vacuum cleaner (70 dB)**;** 80 dBA= noise level of a garbage disposal, dishwasher, propeller plane flyover at 1,000 ft (88 dB); diesel truck 40 mph at 50 ft (84 dB), food blender (88 dB); garbage disposal (80 dB).

The noise would be above 70 dBA for approximately 2-5 minutes while the hovercraft approaches or departs a landing area. Since the hovercraft would only make one to two round trips daily, seven days a week, noise impacts would be nominal. At most, the sound levels would be above 70 dBA for no more than 10 minutes total.

5.2 Underwater Noise Impacts

Underwater noise attenuates at different rates and, therefore, the Project Action Area is different for underwater noise. No in water construction will be required for this project. The most significant underwater noise generating activity will be the operation of the hovercraft. Underwater noise would be blocked by rocky shoreline and bathymetric conditions, and would not necessarily be audible in all areas, under all weather conditions. Ambient underwater noise levels are expected to be somewhat high within the Akutan Bay part of the route due to fish processing vessels that anchor within the bay between January and May each year. No direct measurements of ambient noise levels have been conducted in this area.

A similar hovercraft operation was recently proposed for Cold Bay. That project commissioned a study to evaluate potential noise impacts to sea otters that could result from the hovercraft (D.F. Dickins Associates 2003). The Dickins study concluded that, while very little data exists to describe the range of underwater noise sensitivity inherent to sea otters, noise from the passing hovercraft would not represent harm to a diving animal. By assuming sensitivities known for surrogate marine mammals, such as Harbor Seals or Steller's sea lions, they conclude that sea otters may not even register higher decibel sounds, sounds above the 100 dB range. They further conclude that vehicle speed is such that animals will experience elevated underwater sound levels of short duration of 12 seconds. These data suggest that underwater noise that results from the hovercraft operation may be audible, but may not represent the type of disturbance to cause alarm or injury.

Blackwell and Greene conducted a study on the Griffon 2000TD hovercraft in 2003 to measure underwater and in-air sound from a fixed point in the water as a hovercraft passed. The Griffon hovercraft used in the study is smaller and has a different configuration than the design hovercraft for the Akutan airport project (BHT 130), but the data that was collected enabled Blackwell and Greene to identify a relationship between thrust horsepower and measured underwater sound pressure that gives an indication of expected noise levels associated with the use of a BHT 130 hovercraft. The BHT 130 is expected to create less underwater sound overall compared to a comparable-sized conventional vessel. A BHT 130 passing at approximately 33 meters away would be expected to produce approximately 123 dB at approximately 23 meters water depth. In comparison, a conventional crew boat produced 130 dB of sound at about 400 meters away. This is due to the insulating effects of the air cushion, which separates the hull from the water by several feet and prevents the engine and other machinery noise from being transmitted through the hull and directly into the water as with conventional vessels. In addition, the hovercraft would operate at higher speeds in open water

compared to a similar-sized conventional vessel and therefore the hovercraft's underwater sound would be present for a shorter time duration (Blackwell and Greene 2005).

Table 5.3 Underwater Noise Project Action Area Noise Attenuation

Distance from Source (meters)	Hovercraft (-3dB)
15.2	124
30.4	121
60.8	118
121.6	115
243.2	112
486.4	109
972.8	106
1945.6	103
3,901	100
7,803	97
15,605.8	94
102,400(attenuation distance)	**91**

5.2.1 Disturbance/Displacement

Sea otters within Akutan Harbor are exposed to a large number of vessels; including large and small fishing vessels, small skiffs, and barges on a daily basis. Sea otters typically respond to an approaching vessel by swimming from the area. Noise and visual presence of the hovercraft would likely disturb sea otters in the Harbor and along the proposed hovercraft alignment. USFWS observations of sea otters along Akutan Harbor's north shore indicate that feeding sea otters are easily disturbed by human presence along the shoreline (USACE 2004). The disturbance from the hovercraft would be temporary and would only last for a short duration. The proposed hovercraft route avoids most of the nearshore waters in Akutan Harbor and avoids the kelp beds near Green Island and Surf Bay. Sea otters may endure some stress and exert energy to move from the disturbance. Sea otters would likely habituate to the hovercraft operations. Unavoidable disturbances to sea otters would occur on a regular basis for short periods of time (10 minutes/one way route) each day. These impacts are not likely to adversely impact sea otters.

The hovercraft would be stored in a building at the head of Akutan Harbor. A Harbor Project is also being proposed at the head of Akutan Harbor. Refer to the USACE 2004 EIS and USFWS 2003 Biological Opinion for details about the proposed Harbor Project. The hovercraft would travel from the Village of Akutan down the middle of the Harbor to the Storage area twice a day, seven days a week. Sea otters using the head of Akutan Harbor would be displaced by the hovercraft each day during a short duration that the hovercraft is present.

There will be minimal impacts to marine habitat. The hovercraft landing location at the head of Surf Bay would fill approximately 0.5 acres of marine waters. At the head of Akutan Harbor, the hovercraft landing location would fill approximately 0.7 acres of

marine waters. The hovercraft storage area at the head of Akutan Harbor will be constructed in an area where sea otters have been observed. Animals seen in this area were thought to be resting, since the area provides limited foraging opportunities and better foraging habitat is located nearby. The loss of this resting opportunity will occur when the machine is moved to the maintenance area. No other habitat loss is expected from this project. It is unlikely that project components or their construction would impact otters.

5.2.2 Oiling of Sea Otters

The addition of a hovercraft traveling across Akutan Harbor and Akun Strait may increase the risk of fuel spills in the vicinity of sea otters. Spills associated with hovercraft operations could occur during refueling of the hovercraft, collisions between hovercraft and other vessels, or the grounding of a hovercraft. In addition to operational fuel, the hovercraft will also periodically shuttle diesel to fill a 2,000 gallon above ground storage tank at the proposed airport. Sea otters are susceptible to oiling because they depend of their insulation of dense fur to keep warm and they tend to ingest oil during grooming and feeding (USACE 2003). Akutan Harbor has a history of petroleum spills that have already impacted the water quality of Akutan Harbor for sea otters. There is a potential for direct oiling of sea otters if a spill occurred in the head of the Harbor and the potential for contamination of their food sources in the Harbor. A fuel spill in Akun Strait would be less of an impact because it would quickly be circulated out of the area.

5.2.3 Hovercraft Collisions

Sea otters could be struck by the hovercraft along the proposed route. The operational speed for the hovercraft is 40 knots. This is significantly faster than other large craft operating in the area, but within the range of speeds used by skiffs and other small craft. Unlike small craft, the hovercraft has a wide beam, approximately 14 meters, and evasive actions may be more difficult. Also unlike conventional craft, the hovercraft will not affect underwater habitat and the animals could evade the craft by simply diving below the surface. The suddenness of these disturbances that is primarily related to the speed of the traveling hovercraft may increase the likelihood of collision or disturbance related mortality relative to conventional craft.

5.3 Indirect Effects

Because the Akun airport project has been developed to solve an existing transportation problem, and is not expected expand or increase service to a new area, no indirect effects are expected from the project. The more reliable flight service to Akutan could make fish processors look to the Akutan Harbor as a potential staging area, but no plans have been proposed at this time. Aside from facilities needed to operate the airport at Akun, it is unlikely that the project will result in any further activities on that island either.

5.4 Effects from Interrelated and Interdependent Actions

In order to construct the airport at Akun, a quarry site will have to be established and roads to this facility will be required. The location of this facility has not yet been

determined, but geological explorations at the site confirm that suitable material is available at the site, and inland from the shoreline. Depending on the location of this quarry, human activity on the island of Akun could be expanded as there would now be easy access to other parts of the property. Ferral cattle that now roam on Akun may also need to be moved or eliminated.

5.5 Cumulative Effects

In addition to the impacts of the proposed airport and hovercraft service, the impacts of this project combined with other projects in the action area need to be considered. The only other proposed project in the action area is the construction of a new boat harbor at the head of Akutan Harbor.

Constructing a harbor at Akutan could result in the development of harbor-related businesses, such as fueling stations, vessel repair shops, vessel storage, grocery/supply stores, equipment storage areas, etc. Additional seafood processing facilities might become established in the harbor. Power generation, water, and waste disposal would need to be established at the harbor. Much of the development would likely occur on upland areas constructed from the mooring basin's dredged disposal material; however, some fill in wetlands or intertidal areas could occur.

The impacts of the new harbor may be amplified by the development of the new Akutan Airport. The proposed airport would improve the consistency and frequency of transportation to and from Akutan for the shipment of goods, as well as the transport of people. With more regular arrival of product shipments, the market may become more stable and accommodate the development of new businesses in Akutan. The location of new business establishment and development would occur in the Head of the Harbor, as described above, and in the city of Akutan.

More reliable transportation to and from Akutan may also result in an increase in the year-round population of Akutan. Seasonal residents may decide to permanently relocate to Akutan when transportation is easier to obtain to and from of the island.

These actions could combine to result in a loss or degradation of sea otter habitat in the Harbor. The increase in the number of vessels in Akutan Harbor that will result from the construction of the harbor and the hovercraft operation would also increase the likelihood of fuel spills that would degrade available habitat in Akutan Harbor. With the increased development, human activity would also increase on the island and may cause an increase in poaching or subsistence hunting of sea otters.

5.6 Summary of Avoidance and Minimization Measures

To limit the potential for unwanted discharges of sediments during construction, a temporary Sediment and Erosion Control Plan will be developed. This plan will set forth Best Management Practices (BMPs) that will be implemented during construction. This BMPs detail how soil stockpiles are treated, how erodable slopes will be stabilized, and how site drainage will function. Special precautions are often required for land close to

streams or other water bodies. To limit the potential impact associated with accidental spills, the project will develop a spill response plan that will set forth the procedures to employ in the event of an accident. This plan catalogs the type of toxic substance at the site, and prescribes containment measures. The plan also lays out fueling locations and chemical handling areas prior to construction so proper facilities can be prepared to handle expected risks. Once the facility has been constructed and is operational, drainage will be treated prior to discharge to receiving waters. This treatment facility will require occasional maintenance to function properly.

6.0 Effects Determination

The project is expected to have periodic disturbance-related impacts to individual sea otters along the hovercraft route. Operation of the hovercraft may result in occasional strikes, or disturbance-related avoidance effects, such as inadvertent pup drowning. Since the hovercraft will primarily operate in deeper parts of the bay, away from primary foraging areas or loafing sites, and since the open part of the bay provides clear observation pathways for animals that may be in the vicinity, the actual number of collisions may be quite small. Sea otter surveys revealed that most of the animals observed within the center part of the bay were adults and not family groups, these individuals may be better at habituating to the sound and lessen project impacts. Animals may even tend to avoid open water areas in the future.

There will be minimal impacts to marine habitat. The hovercraft landing location at the head of Surf Bay would fill approximately 0.5 acres and the hovercraft landing location would fill approximately 0.7 acres of marine waters. The hovercraft storage area at the head of Akutan Harbor will be constructed near an area where sea otters have been observed resting. The loss of this resting opportunity will occur when the hovercraft is travels to and from the storage facility twice a day.

Increased human activity levels on the island of Akun could affect sea otters, but most construction activity is planned for inland areas, well away from sea otter habitat. For these reasons the FAA finds that the proposed action may effect, but is unlikely to significantly impact, the southwest Alaska population of sea otters, or their habitat.

In cooperation with the U.S. Coast Guard, a Route Operational Manual (ROM) will be developed prior to when the hovercraft is ready to begin service. The ROM will include a chapter on environmental issues including marine birds and mammals. The ROM will include procedures to avoid impacts to sea otters.

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