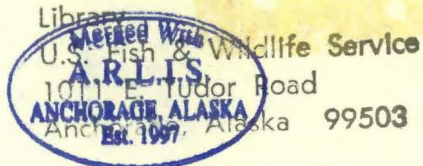


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US FISH & WILDLIFE SERVICE--ALASKA



FIELD INVESTIGATIONS REPORT FOR ALTERNATIVE PROPOSED
LOG TRANSFER FACILITIES ON CHICHAGOF ISLAND, ALASKA
1982 AND 1983.

PATTERSON BAY, FICK COVE, USHK BAY, DEEP BAY
MOSER ISLAND AND SITKOH BAY

BY

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Key Words: Log Transfer Facility
Subtidal Habitat Assessment
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Hoonah Sound
Peril Strait

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Field Investigations Report for Alternative
Proposed Log Transfer Facilities on Chichagof Island, Alaska

1982 and 1983

Patterson Bay

Fick Cove

Ushk Bay

Deep Bay

Moser Island

Sitkoh Bay

Sitka, Alaska

I. Introduction

Project investigations were conducted by the U.S. Fish & Wildlife Service (FWS) to provide biological assessment information to the U.S. Forest Service for development of the Alaska Lumber and Pulp Company's 1986-90 Operating Plan Environmental Impact Statement. The sale will provide approximately 522 million board feet of timber for harvest during the five-year operating period. Operations will require the construction of several new log transfer facilities (LTF) in the Chatham and Stikine Areas of the Tongass National Forest. This report evaluates ten alternative LTF sites in the Hoonah Sound-Peril Strait region of the Chatham Area. Field studies for the report were conducted during the 1982-83 field seasons.

II. Methods

A 100-meter Keson fiberglass transect tape was set perpendicular to the shorelines from approximate mean higher high water (MHHW) tide line and extended seaward to the end of the tape or 80-ft. water depth contour, whichever was reached first. Water depths were recorded at 10-meter intervals along the transect. Depths were determined with a portable electronic depth recorder mounted to a small skiff. The Deep Bay sites were an exception in that depths were determined with a Tekna sport-diving depth gauge worn by a diver. All depth measurements were adjusted for tidal stage and referenced to MHHW as 0 feet using the NOAA Tide Tables correction procedures. Taxa, general distribution, and relative abundance of marine life along the transect were noted and recorded on waterproof paper. The biologist-divers used standard sport-diving SCUBA equipment. General observations as to the substrate composition (e.g., sand, gravel, etc.) were noted and recorded. The sites were evaluated using the guidelines for site selection as set forth in the Southeast Alaska Area Guide (USFS, 1977).

III. Survey Results

Patterson Bay

Three proposed LTF sites were investigated in Patterson Bay (Figs. 1 & 2). There was minimal macrophyte development, and epibenthic invertebrates were relatively sparse at all sites.

Site 1: Site 1 is located about 200 meters north of the old LTF site. A depth-distance profile is given in Fig. 7. Plant and animal species observed are listed in Table I. Substrate and general distribution of epibenthic marine life are described below.

<u>Distance along transect (m)</u>	<u>Description</u>
0 - 10	Small gravel and coarse sand
10 - 20	Larger gravels/small angular cobbles
20 - 40	Cobble-gravel substrate; scattered barnacles; blue mussels and limpets.

<u>Distance along transect (m)</u>	<u>Description</u>
40 - 50	Angular cobbles & small boulders; green urchins (<u>S. droebachiensis</u>) and <u>Lithothamnium</u> .
50 - 90	Sand with some silt; scattered small boulders. Scattered <u>Laminaria</u> and <u>Agarum</u> ; lyre crab, seapeach, anenomes (<u>Metridium</u>); shells of <u>Saxidomus</u> , <u>Chlamys</u> & <u>Clinocardium</u> .

Site 1 is the FWS preferred development site.

Site 2: Site 2 is located at the old LTF site. The old bulkhead has been removed and the upland area has revegetated with alder. The subtidal area shows evidence of past disturbance--primarily gravel fill and bark debris. The depth-distance profile is given in Figure 7. Marine species are listed in Table I. Substrate and distribution of marine life along the transect are listed below.

<u>Distance along transect (m)</u>	<u>Description</u>
0 - 45	Gravel-cobble substrate. Sparse life zone--no apparent macrophytes.
45 - 50	Gravel-cobble substrate; sparse <u>Fucus</u> , blue mussel and barnacles.
50 - 55	Sand substrate. Unidentified filamentous algae. Bottom begins to slope steeply seaward at 55 m.
55 - 65	Silt-sand and bark debris; scattered <u>Laminaria</u> .
65 - 85	Gravel-sand substrate; steep slope; organic debris and unattached drift algae; sea cucumbers (<u>Parastichopus</u>). Three king crab were captured. Dungeness crab habitat observed just south of the site.

Site 2 would be an acceptable site for LTF development. However, due to its proximity to the estuarine tide flats at the head of the bay and the observed Dungeness crab habitat, it should be developed only as a second choice to Site 1.

Site 3: An additional alternative LTF site (Fig. 2) near the mouth of Patterson Bay was investigated during a 1982 cruise to the area. To our knowledge the site is not currently being considered for development. Substrate along the transect

was primarily sand and gravel. Plant and animal abundance was sparse.

<u>Distance along transect (m)</u>	<u>Description</u>
0 - 30	Sparse life zone
30 - 50	Scattered <i>Fucus</i> , <i>Desmarestia</i> and brown colored filamentous algae; green urchins; <i>Evasterias</i> ; <i>Hyas lyratus</i> .
50 - 85	Scattered <i>Laminaria</i> ; sea cucumber (<i>Parastichopus</i>); clam siphons (<i>Mya truncata</i>).
85 - 100	Very sparse life zone; great sculpin.

A depth-distance profile is shown in Figure 7. A small stream (~3 cfs) enters the cove immediately west of the survey site. The stream was not surveyed to determine the presence of fish, but it probably supports Dolly Varden and coho salmon. It is not listed as an ADF&G designated anadromous fish stream.

There are two eagle nest trees on the point of land in the vicinity of the proposed LTF site (Fig. 2). It appears that development of the site would encroach on at least one of the nest trees. Development of Site 3 would not have significant impacts to marine resources, however, we recommended that the site should not be developed unless the recommended 330-foot buffer around the nest trees can be maintained.

Moser Island-South Arm Hoonah Sound

A standard 100-meter transect survey was conducted along the northwest shore of Moser Island near the head of South Arm Hoonah Sound on May 4, 1982. The USFS is not considering the site for development. Subtidal slope is moderate. Water depth is 49 feet (ref. MHHW) at 100 meters from shore (see Fig. 8). Substrate is primarily sand and large gravel with occasional cobble size material. Intertidal and subtidal plant and animal species abundance and diversity were relatively sparse.

<u>Distance along transect (m)</u>	<u>Description</u>
0 - 12	Upper intertidal; no apparent vegetation.
12 - 50	Mid to low intertidal; scattered <i>Fucus/Mytilus</i> & <i>Balanus</i> complex.
50 - 80	Sparse vegetation; scattered green urchins; limpets and barnacles.

<u>Distance along transect (m)</u>	<u>Description</u>
80 - 90	Moderate concentration of <u>Laminaria</u> .
90 - 100	Scattered <u>Laminaria</u> , sea cucumber (<u>Parastichopus</u>) great sculpin; king crab carapace.

An eagle nest tree (tag # A226) is located within 100 meters of the proposed LTF site, and there are 10 other nest trees within one mile of the proposed LTF site. Access to Moser Island would be across a narrow isthmus ("Half-Tide Neck") which is partly vegetated and partly intertidal. Impacts to wildlife habitat from the loss of high value beach fringe would probably be significant. Therefore, we would not recommend development on Moser Island unless wildlife impacts are fully evaluated and any adverse impacts adequately mitigated.

Fick Cove

The Fick Cove proposed LTF site is located on the southeast shore near the mouth of the cove (Fig. 3). The bottom slope is moderately steep (Fig. 9), reaching a depth of 71 feet (MHHW) at a distance of 74 meters from shore. However, the bay shoaled abruptly from the survey area toward the head of the cove. The inner portion of the cove has a maximum depth of approximately 50 feet. The bathymetric configuration of the bay would probably trap bark debris that would be lost from the operation of a LTF. There is excellent Dungeness crab habitat in the inner bay within a 100 meters of the proposed LTF site. Plant and animal species are listed in Table 2.

<u>Distance along transect (m)</u>	<u>Description</u>
0 - 20	Gravel & small cobble substrate. No apparent macrophyte development.
20 - 28	Gravel-cobble substrate; natural organic debris (bark and algal drift).
28 - 40	Cobble-sand substrate; <u>Ulva/Monostroma</u> complex; blue mussels; barnacles; sea stars (<u>Pisaster</u>); green urchins (<u>S. droebachiensis</u>).
40 - 65	Silt and shell debris with some small size gravel and shell debris. Various clams (<u>Mya truncata</u> , <u>Protothaca</u> , <u>Chlamys</u> , and <u>Saxidomus</u> shells.

We recommend that the Fick Cove site should not be developed as an LTF due to its proximity to the head of the bay, shallow inner basin, and adjacent excellent Dungeness crab habitat. If a LTF is needed in the area, we recommend that alternative sites should be investigated toward the mouth of the bay.

Ushk Bay

Two alternative sites were investigated (Fig. 4). Depth-distance profiles are graphed in Figure 10. Plant and animal species are listed in Table 2.

Site 1: Site 1 is located in a small bite near the alluvial tide flats at the head of the bay (Fig. 4). The bite is very shallow, reaching a depth of 34 feet (MHHW) at 100 meters from shore.

<u>Distance along transect (m)</u>	<u>Description</u>
0 - 30	Cobble-boulder substrate; <u>Fucus</u> and barnacles.
30 - 40	Sand
40 - 50	Unidentified filamentous algae; <u>Ulva/Monostroma</u> .
50 - 60	Sand & shell with scattered cobbles; <u>Mytilus</u> and <u>Fucus</u> .
60 - 70	Sand bottom; many cockle shells (<u>Clinocardium</u>).
70 - 80	Sand bottom covered with a diatomaceous brown scum.
80 - 90	Silt and sand; lyre crabs (<u>Hyas lyratus</u>); pagurid hermit crabs very abundant.
90 - 100	Silt and sand covered with diatomaceous layer; scattered attached algae (<u>Laminaria</u>); clam shells (<u>Protothaca</u> and <u>Saxidomus</u>).

Site 1 is very shallow and too close to the head of the bay to meet LTF site selection guidelines. We recommend that it not be developed.

Site 2: This is the USFS preferred site in Ushk Bay (Fig. 4). The bottom slope along the transect is somewhat steeper than that at Site 1, however, it is still relatively shallow, reaching a depth of 51 feet (MHHW) at 100 meters from shore (Fig. 10).

<u>Distance along transect (m)</u>	<u>Substrate</u>
0 - 25	Cobble-gravel
25 - 40	Gravel-cobble with some small boulders
40 - 45	Boulder
55 - 65	Gravel and sand
65 - 70	Gravel-cobble
70 - 90	Sand & gravel
<u>Species Distribution</u>	
0 - 25	Sparse life zone.
25 - 30	Dense growth of <u>Fucus</u> on the larger cobbles and small boulders.
30 - 40	Sparse life zone; unstable gravel cobble---high energy wave zone; some sparse <u>Balanus</u> .
40 - 45	Dense <u>Fucus</u> on large boulders; moderate concentrations of barnacles and <u>Mytilus</u> .
45 - 50	Dense <u>Balanus</u> with scattered <u>Mytilus</u> and <u>Fucus</u> . Infauna clams (<u>Protothaca</u>) and worms abundant; unidentified sponges.
50 - 55	Macroinvertebrates abundant; many top snails (<u>Calliostoma</u>); pagurids; limpets (<u>N. pelta</u>); <u>Evasterias</u> ; urchins (<u>S. droebachiensis</u>); scattered <u>Fucus</u> with dense covering of brown colored diatomaceous scum; <u>Lithothamnium</u> .
55 - 65	Sparse vegetation; many clam siphons (<u>Mya truncata</u>).
65 - 70	Moderate density of brown kelps -- <u>Agarum</u> & <u>Laminaria</u> ; green urchins; sea cucumber (<u>Cucumaria miniata</u>); anemones (<u>Metridium</u>).
70 - 90	Scattered <u>Laminaria</u> and <u>Agarum</u> ; many <u>Mya truncata</u> siphons; <u>Metridium</u> ; serpulids, <u>H. lyratus</u> ; shells of <u>Clinocardium</u> , <u>Pododesmus</u> , <u>Natica clausia</u> ; two female and two male king crab.

One of the biologist-divers conducted a reconnaissance dive in the small cove just east of the proposed Site 2 LTF near the support vessel anchorage. Large numbers of adult king crab were observed in the cove (35 adult king crab were captured). We estimate that there were at least 500 to 1000 crab in the immediate vicinity. Many of the male and female crab were grasping in a mating situation.

Neither Site 1 nor Site 2 should be considered for development as a LTF site. Site 1 is far too shallow and Site 2 is adjacent to excellent king crab habitat. Any log storage in the area would also increase the risk of habitat degradation. We recommend that additional scoping and field investigations should be initiated to find an alternative site in a less sensitive area within Ushk Bay.

Deep Bay

Two sites within 100 meters of each other were investigated in Deep Bay. Both sites are along the south shore near the head of the bay (Fig. 5). Depth-distance profiles for the sites are given (Fig. 11). Plant and animals species observed along the transects are listed in Table 1.

Site 1:

<u>Distance along transect (m)</u>	<u>Substrate</u>
0 - 10	Bedrock-boulder
10 - 20	Cobble-gravel-sand
20 - 35	Silty sand and gravel
35 - 50	Silt & gravel with some shell debris and occasional boulders
50 - 65	Silt over alluvial gravels
65 - 90	Silt
<u>Species Distribution</u>	
0 - 5	Sparse life zone.
5 - 15	Barnacles, limpets; scattered <u>Mytilus</u> & <u>Fucus</u> .
15 - 20	<u>Ulva/Callophyllis</u> zone; scattered <u>Laminaria</u> ; <u>Halosaccion</u> ; barnacles and limpets; <u>Henricia</u> .

<u>Distance along transect (m)</u>	<u>Species Distribution</u>
20 - 35	Moderate concentration of <u>Laminaria</u> ; many small planktonic crustaceans; <u>Ulva/Monostroma</u> ; <u>Telmessus</u> crab; starfish (<u>Henricia</u> & <u>Pisaster</u>); <u>Mya truncata</u> shells.
35 - 50	Scattered <u>Laminaria</u> & <u>Rhodomenia pertusa</u> ; many small pagurids and top snails (<u>Calliostoma</u>).
60 - 90	Moderate Dungeness crab habitat; lyre crab; tunicates (<u>Corrella willmeriana</u>); <u>Saxidomus</u> & <u>Climocardium</u> shells.

Site 2:

<u>Distance along transect (m)</u>	<u>Substrate</u>
0 - 4	Boulder
4 - 9	Boulder & cobble
9 - 14	Cobble
14 - 35	Sand & silt over gravel
35 - 70	Silt over gravel
70 - 85	Silt and shell debris over gravel
	<u>Species Distribution</u>
0 - 4	Scattered barnacles; limpets.
4 - 9	Relatively barren, some scattered <u>Fucus</u> , barnacles and <u>Mytilus</u> .
9 - 15	<u>Fucus</u> , <u>Mytilus</u> , <u>Ulva/Monostroma</u> complex; littorine snails and <u>Thais</u> snails; limpets.
15 - 25	<u>Alaria</u> and <u>Ulva/Monostroma</u> ; <u>Callophyllis</u> ; <u>Protothaca</u> shells.
25 - 35	Moderate concentration of <u>Laminaria</u> ; <u>Ulva/Monostroma</u> ; <u>Pisaster brevispinus</u> , <u>Pycnopodia</u> ; <u>Evasterias</u> .

<u>Distance along transect (m)</u>	<u>Substrate</u>
35 - 55	Scattered <u>Agarum</u> & <u>Laminaria</u> ; small planktonic crustaceans; top snails (<u>Calliostoma</u>).
55 - 85	Scattered <u>Agarum</u> & <u>Laminaria</u> . One Dungeness crab observed; <u>Hyas</u> <u>lyratus</u> ; <u>Chlamys</u> ; <u>Halocynthia</u> ; many shells of <u>Clinocardium</u> , <u>Protothaca</u> , <u>Chlamys</u> , and <u>Saxidomus</u> .

Both sites have adequate slope to meet LTF site selection guidelines. However, Site 1, nearest to the head of the bay, has some excellent Dungeness crab habitat along the deeper portion of the transect. Site 2 would be the preferred development location.

Although no king crab were observed in the transect survey areas, Deep Bay is known to provide habitat for king crab during the winter and spring mating and molting season. King crab are taken for subsistence use by Sitka residents. Since the bay is within small craft operating range from Sitka, it is a popular destination anchorage for deer hunters. Any planned timber development in Deep Bay should take into consideration these recreation and subsistence uses.

Sitkoh Bay

A standard 100-meter transect survey was conducted at the existing LTF site on the east side of Sitkoh Bay directly across from the old cannery (Fig. 6). The bottom slope is quite steep (Fig. 12). Much of the area in the vicinity of the old LTF is covered with bark debris. Plant and animal species observed along the transect are listed in Table 2.

<u>Distance along transect (m)</u>	<u>Description</u>
0 - 10	Angular cobble and gravel fill materials. No apparent algae or invertebrates. Unstable substrate.
10 - 40	Thick bark deposits (about one foot deep); <u>Metridium</u> common on large pieces of bark and other debris; some <u>Parastichopus</u> ; <u>Evasterias</u> , <u>Pisaster</u> , <u>Henrica</u> ; scattered <u>Laminaria</u> and <u>Fucus</u> .
40 - 80	Bark debris thins out but still prevalent. Substrate composed of sand and shell debris. Shells of <u>Humularia</u> (very common), <u>Saxidomus</u> , <u>Tresus</u> , <u>Pododesmus</u> and <u>Chlamys</u> <u>rubida</u> ; some <u>Agarum</u> ; <u>Parastichopus</u> , <u>Corella</u> ; <u>Metridium</u> and <u>Telia</u> .

From a subtidal habitat standpoint the existing LTF would be an acceptable site for additional development. However, sport, commercial and subsistence fishery and recreation values associated with Sitkoh Lake and Sitkoh River must be a primary consideration in any decision to commit Sitkoh Bay to a major terminal facility for timber harvest from Tenakee Inlet-Peril Strait area. Transportation systems and LTF site alternatives that do not require major development in the bay should be fully evaluated in the DEIS. We would have no objection to reactivating the existing site for small salvage sales, but we recommend against development of the bay as a major transfer facility.

IV. Acknowledgments

Bill Hughes (FWS, Sitka Substation) participated in all the field investigations and was responsible for preparation and writing of the final report. Bob Schultz (FWS), Chuck Osborn (FWS) and Dave Gibbons (USFS) participated in field investigations at Patterson, Fick, Ushk and Sitkoh Bay. Bob Schultz, Dick Nadeau (FWS) and Duane Peterson (NMFS) participated in the Deep Bay survey. Ted Estrada (FWS) served as skipper aboard the FWS support vessel M/V CURLEW. Sharon Howell final typed the report and tabular materials.

Approval Page

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Figure 1... Preproject Log Transfer Facility Investigation
Sites at Patterson Bay on Chichagof Island, AK.

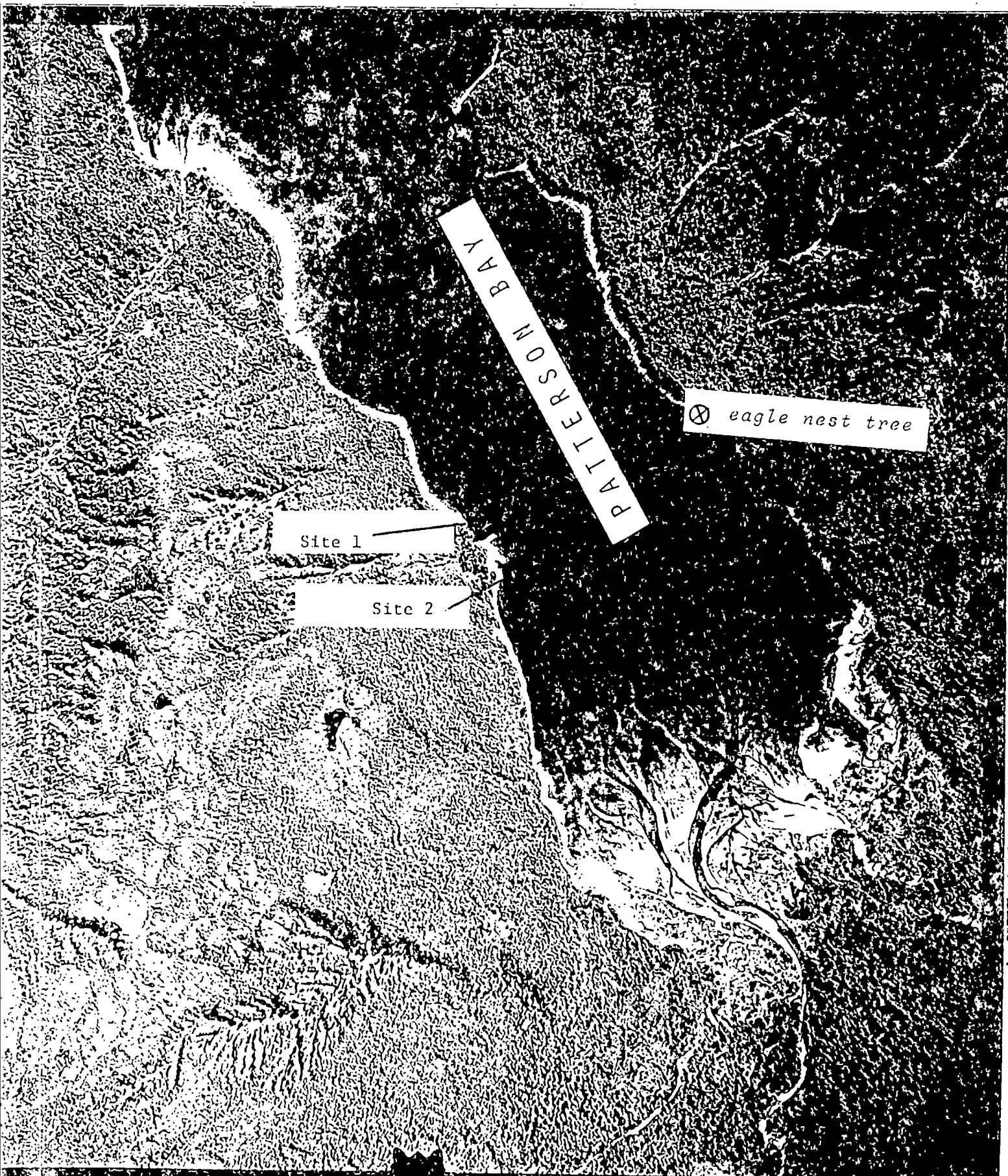


Figure 2. Preproject Log Transfer Facility Investigation Sites at Patterson Bay and Moser Island, Hoonah Sound, AK.

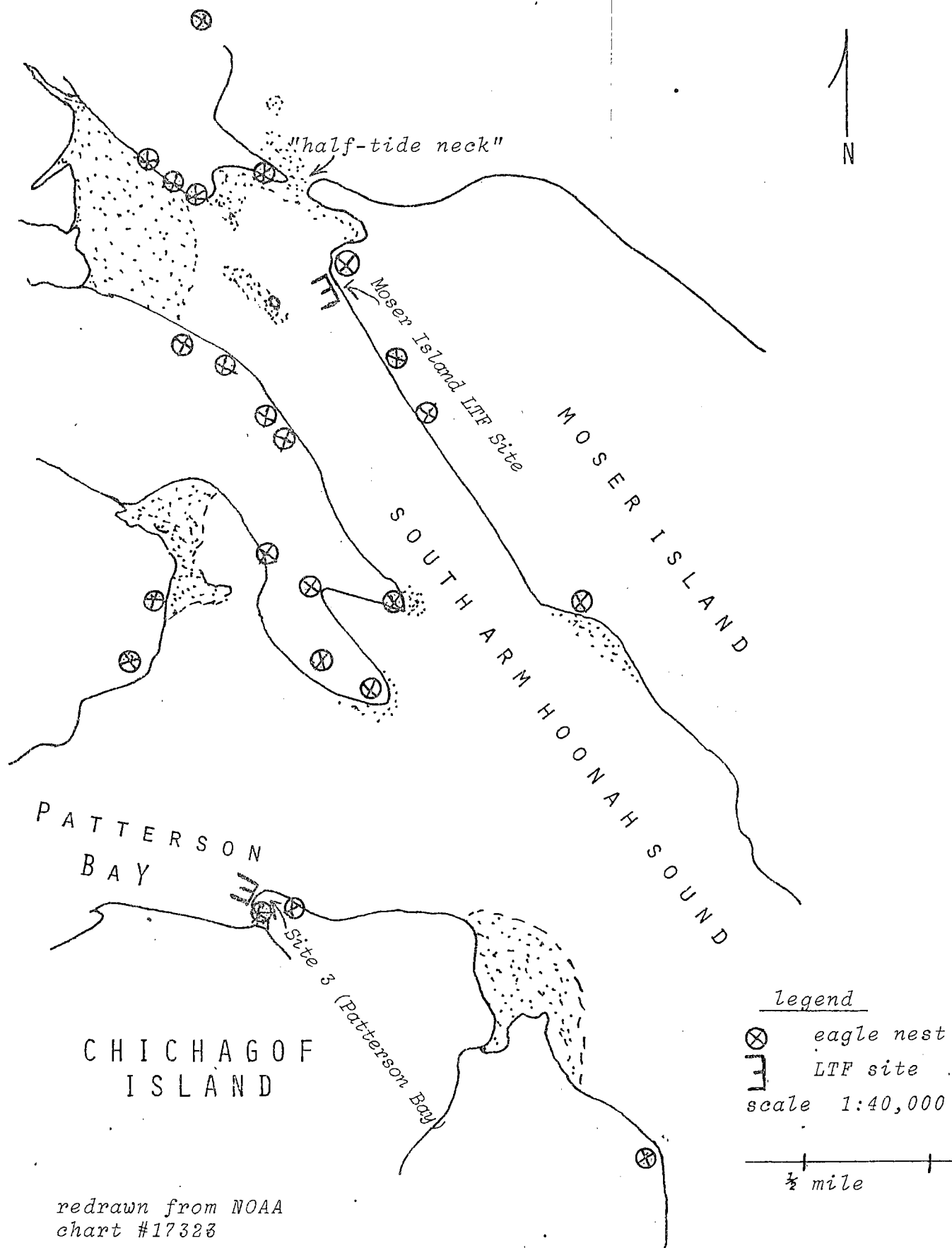


Figure 3. Preproject Log Transfer Facility Investigation Site at Fick Cove on Chichagof Island.

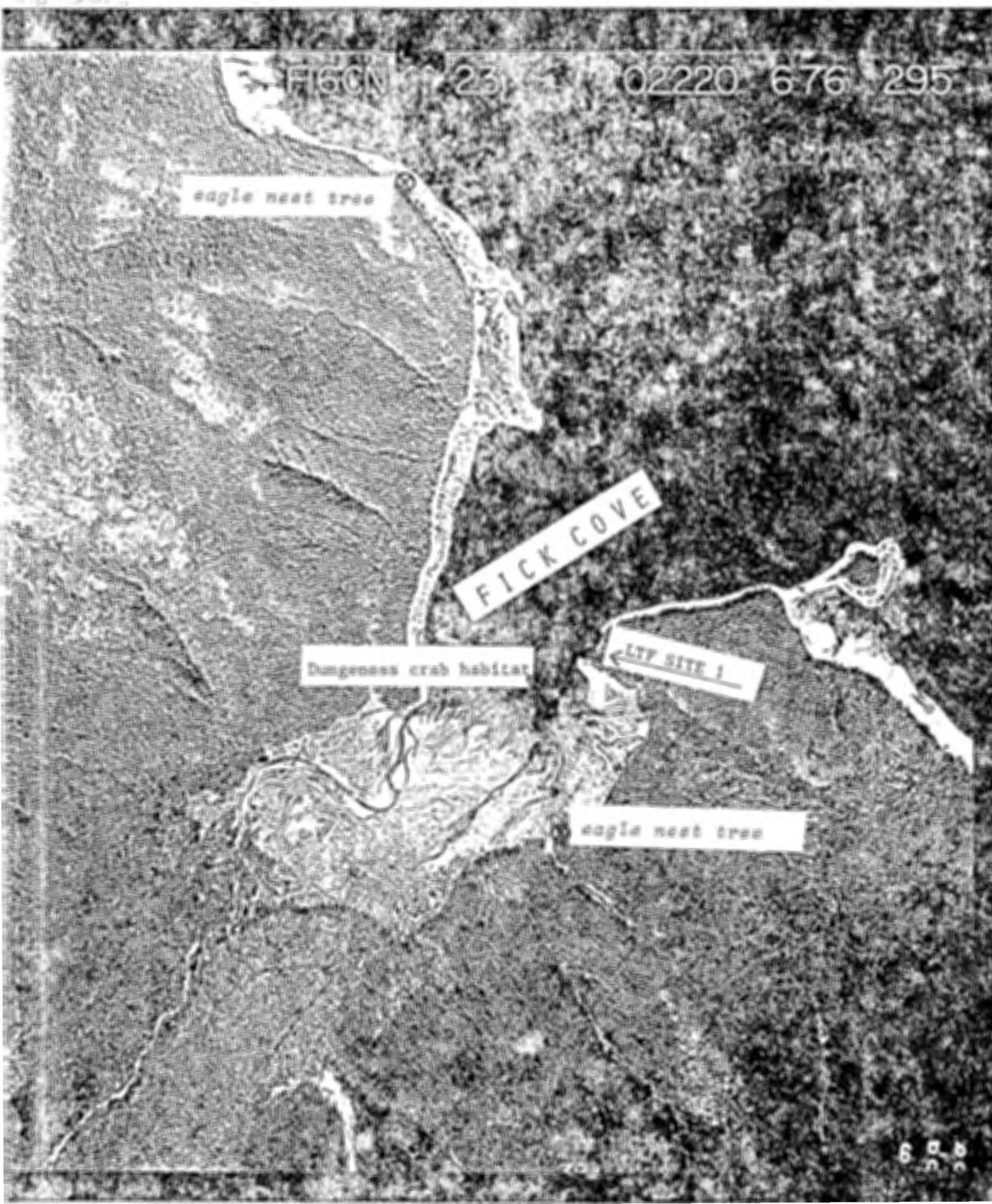


Figure 4. Preproject Log Transfer Facility Investigation Sites at Ushk Bay on Chichagof Island

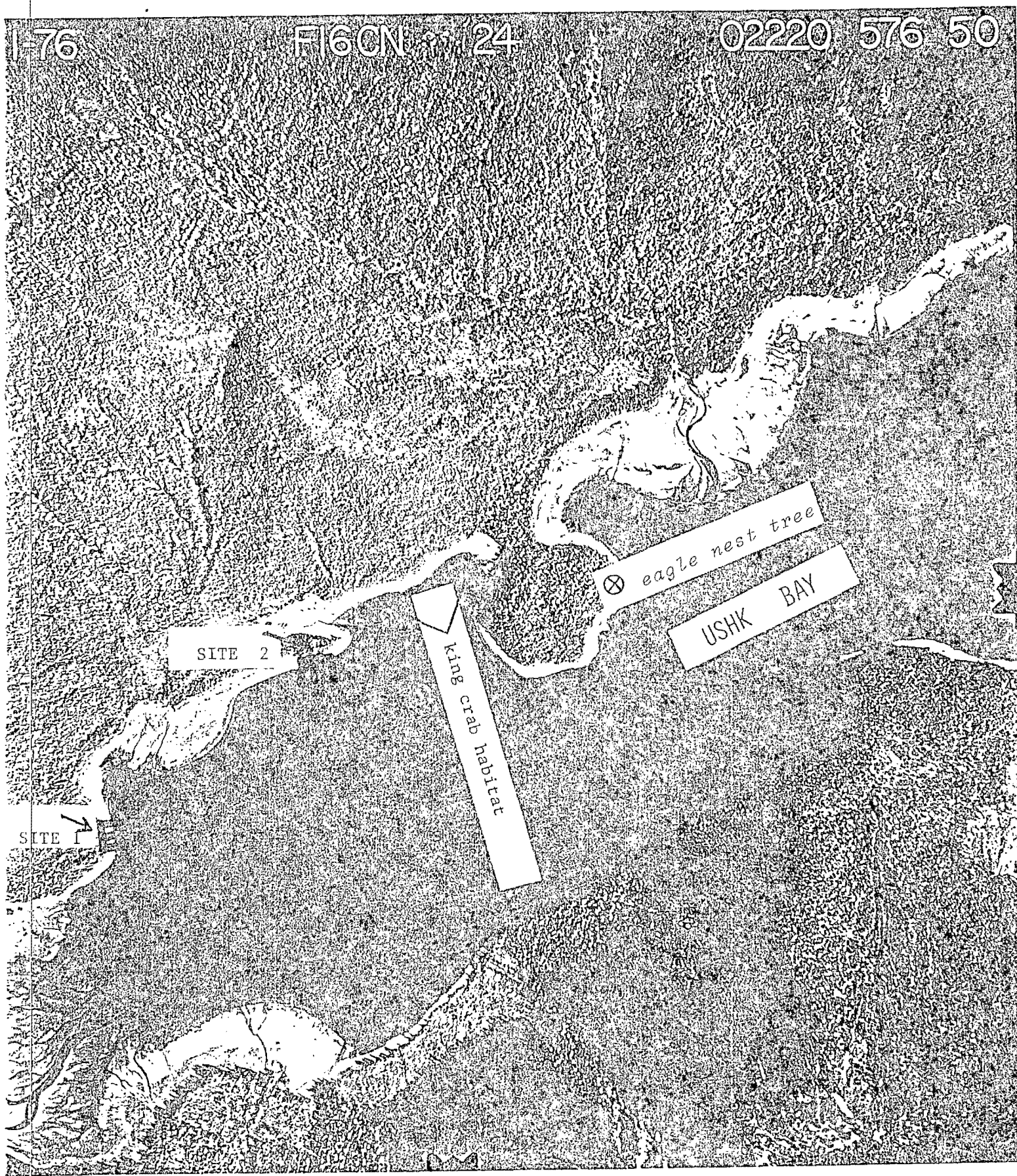


Figure 5. Preproject Log Transfer Facility Investigation Sites at Deep Bay on Chichagof Island.

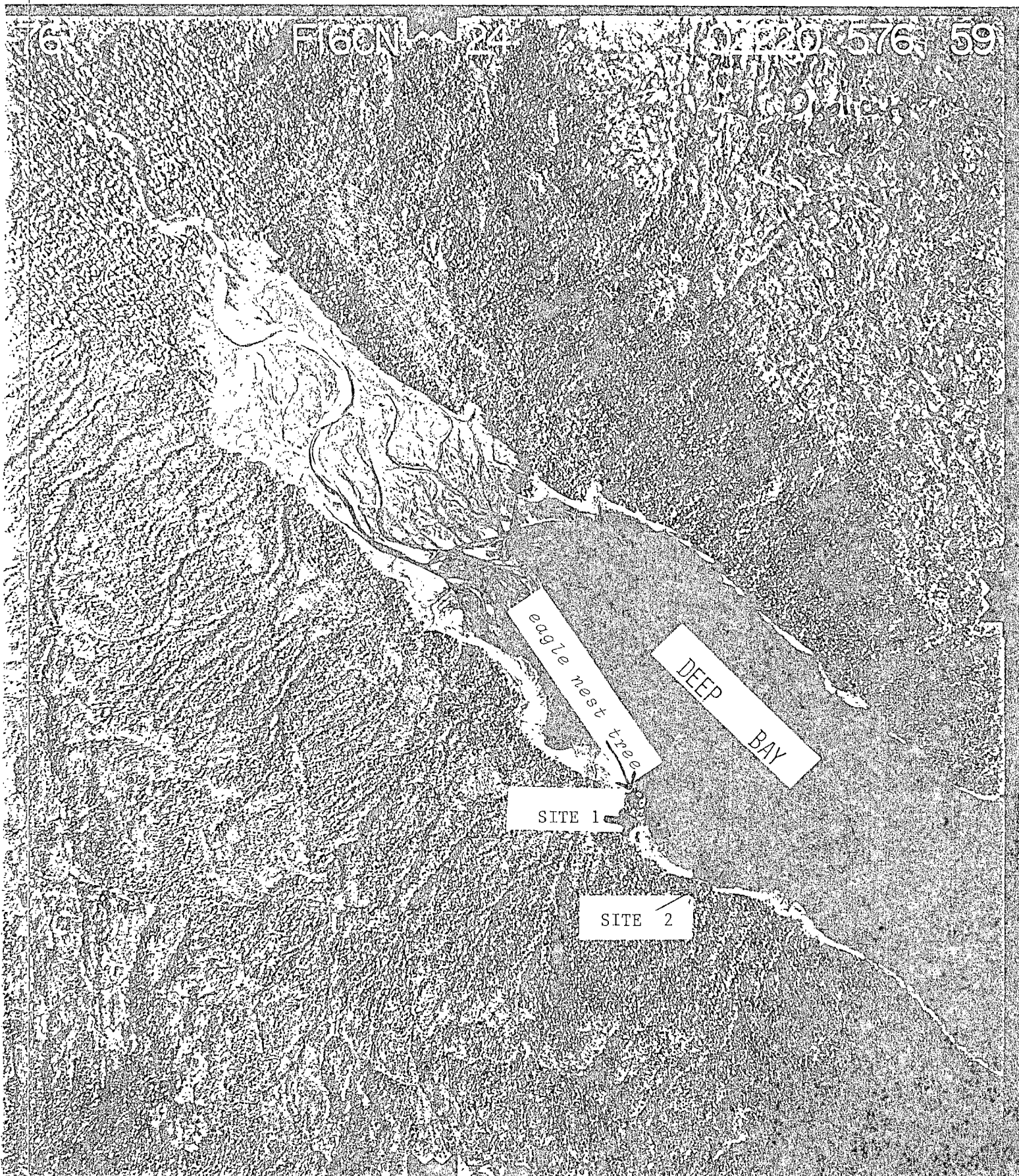


Figure 6.4 Preproject Log Transfer Facility Investigation Site at Sitkoh Bay on Chichagof Island.

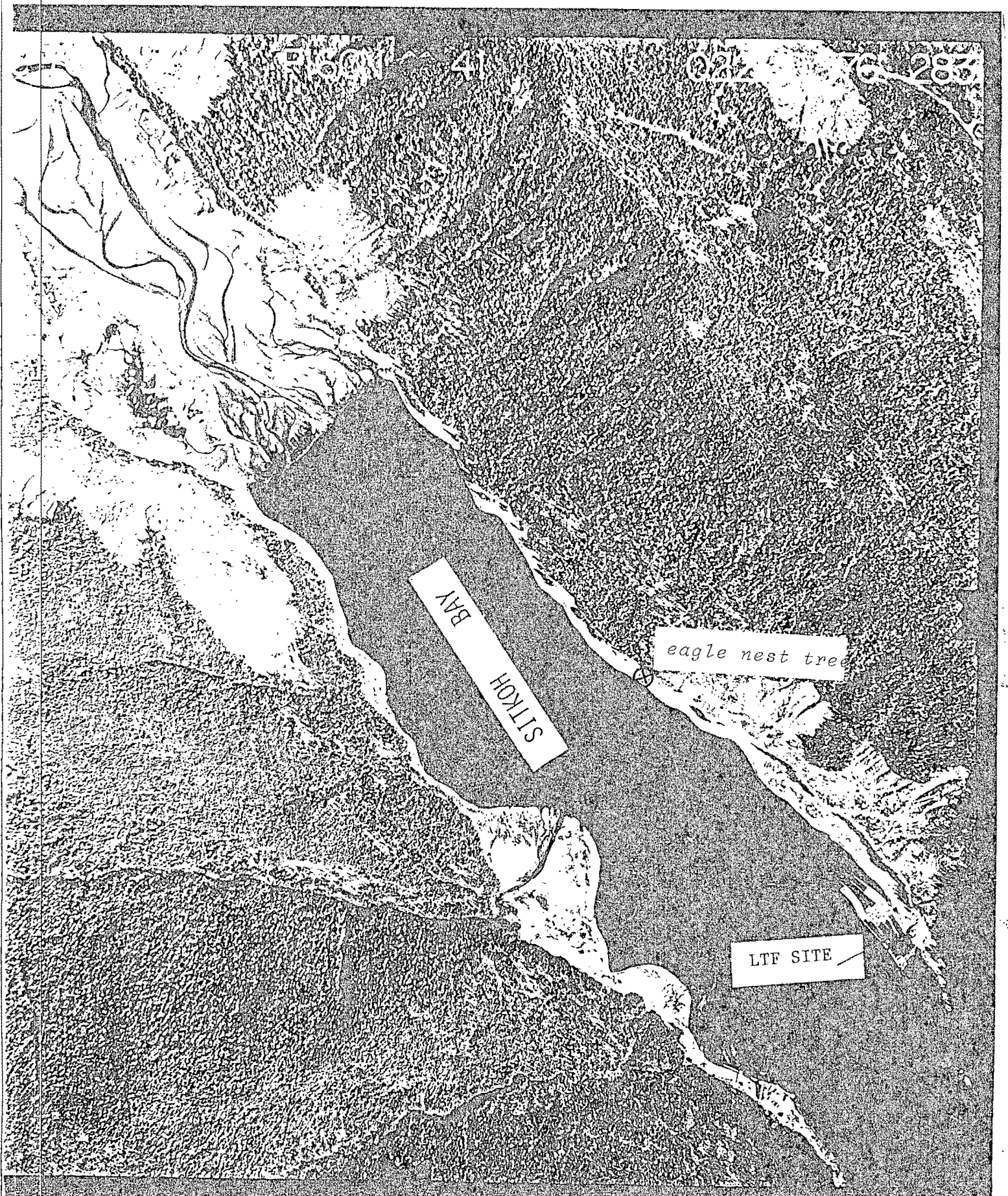


Figure 7. Dive Transect Depth Profiles at Proposed Log Transfer Facility
 Sites at Patterson Bay on Chichagof Island, Alaska.

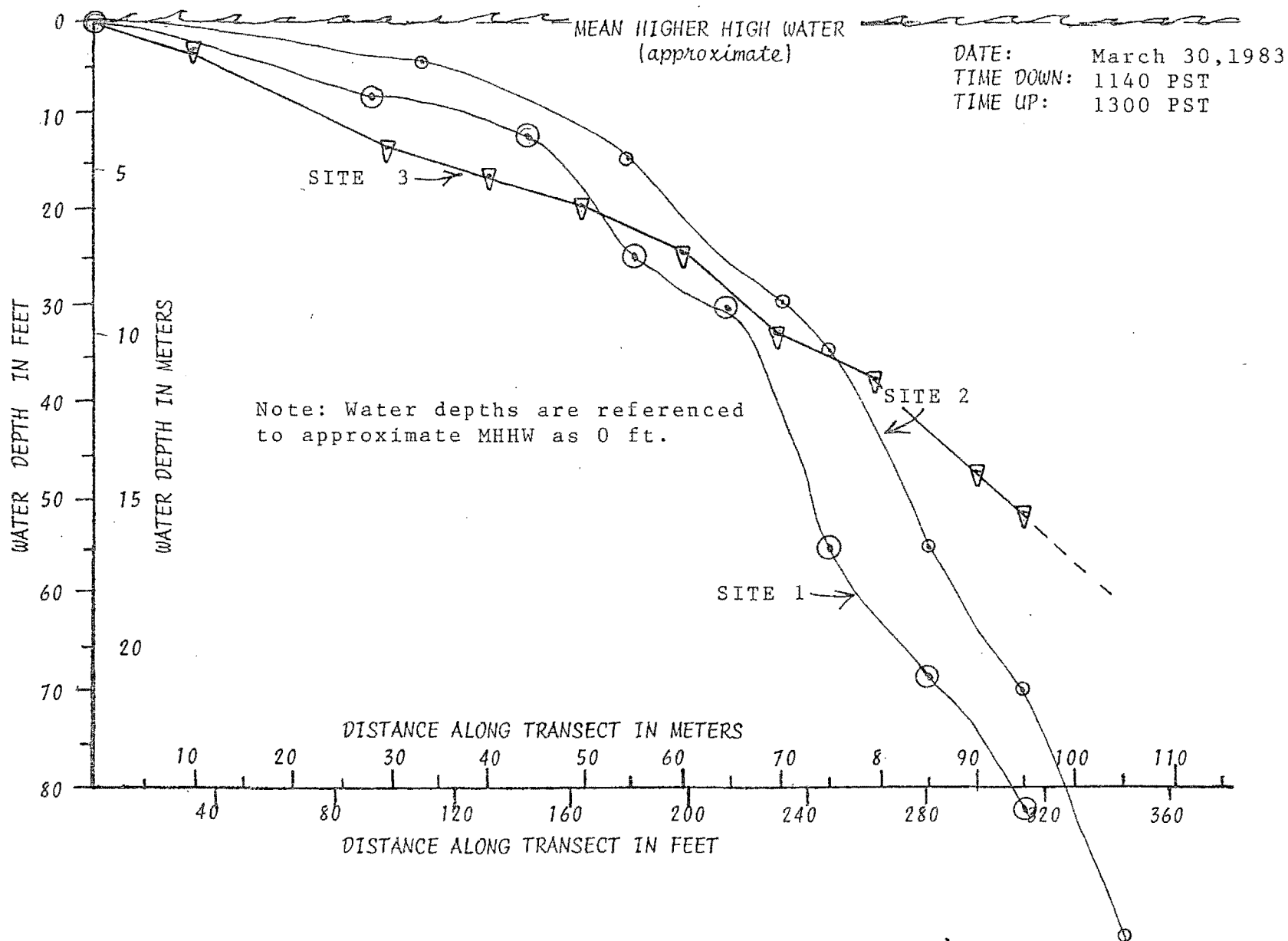


Figure 8. Dive Transect Depth Profile at Proposed Log Transfer Facility Sites at Moser Island in Hoonah Sound, Chichagof Island, Alaska.

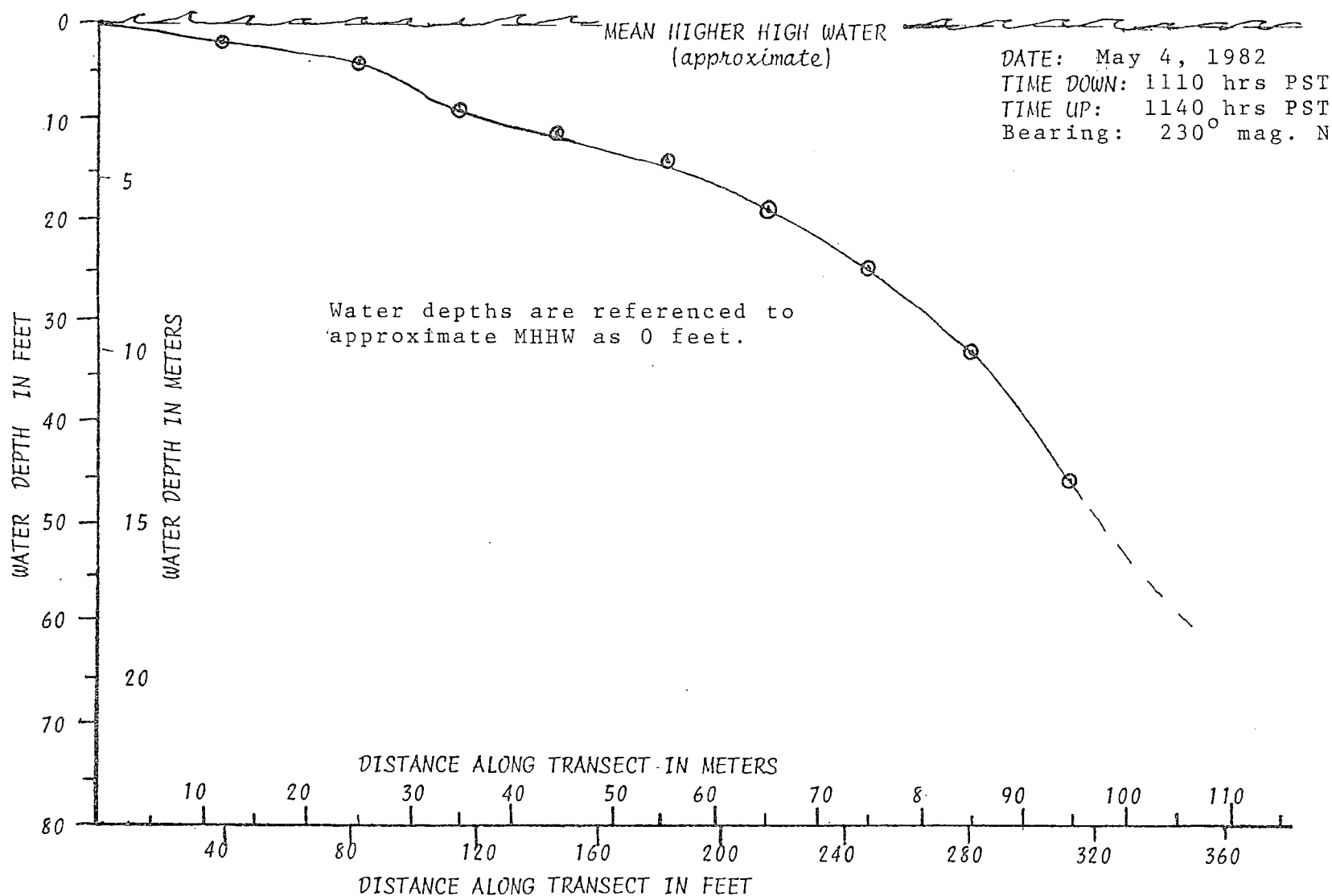


Figure 9. Dive Transect Depth Profile at Proposed Log Transfer Facility Site at Fick Cove, Chichagof Island, Alaska.

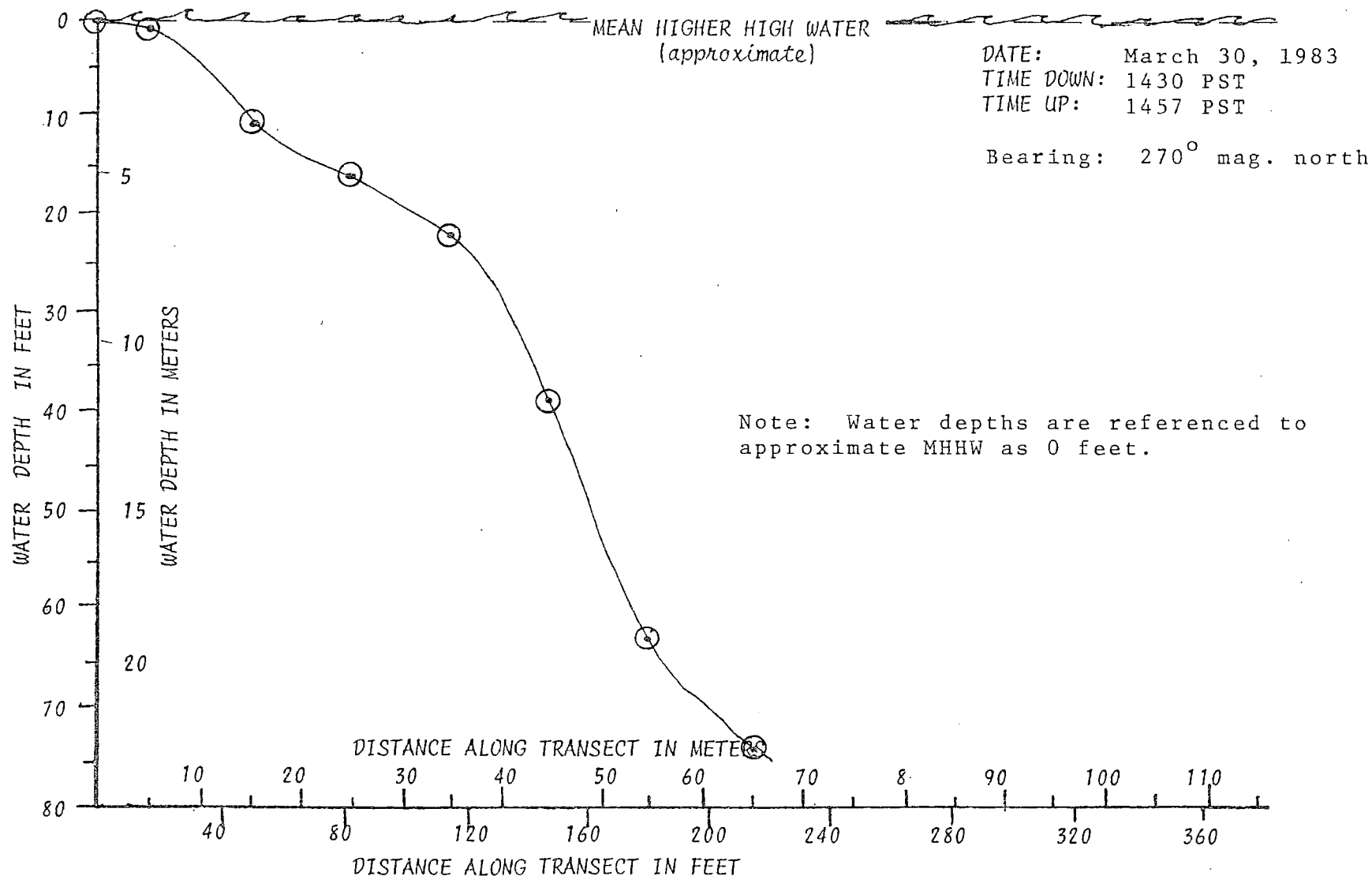


Figure 10. Dive Transect Depth Profile at Proposed Log Transfer Facility Sites at Ushk Bay on Chichagof Island, Alaska.

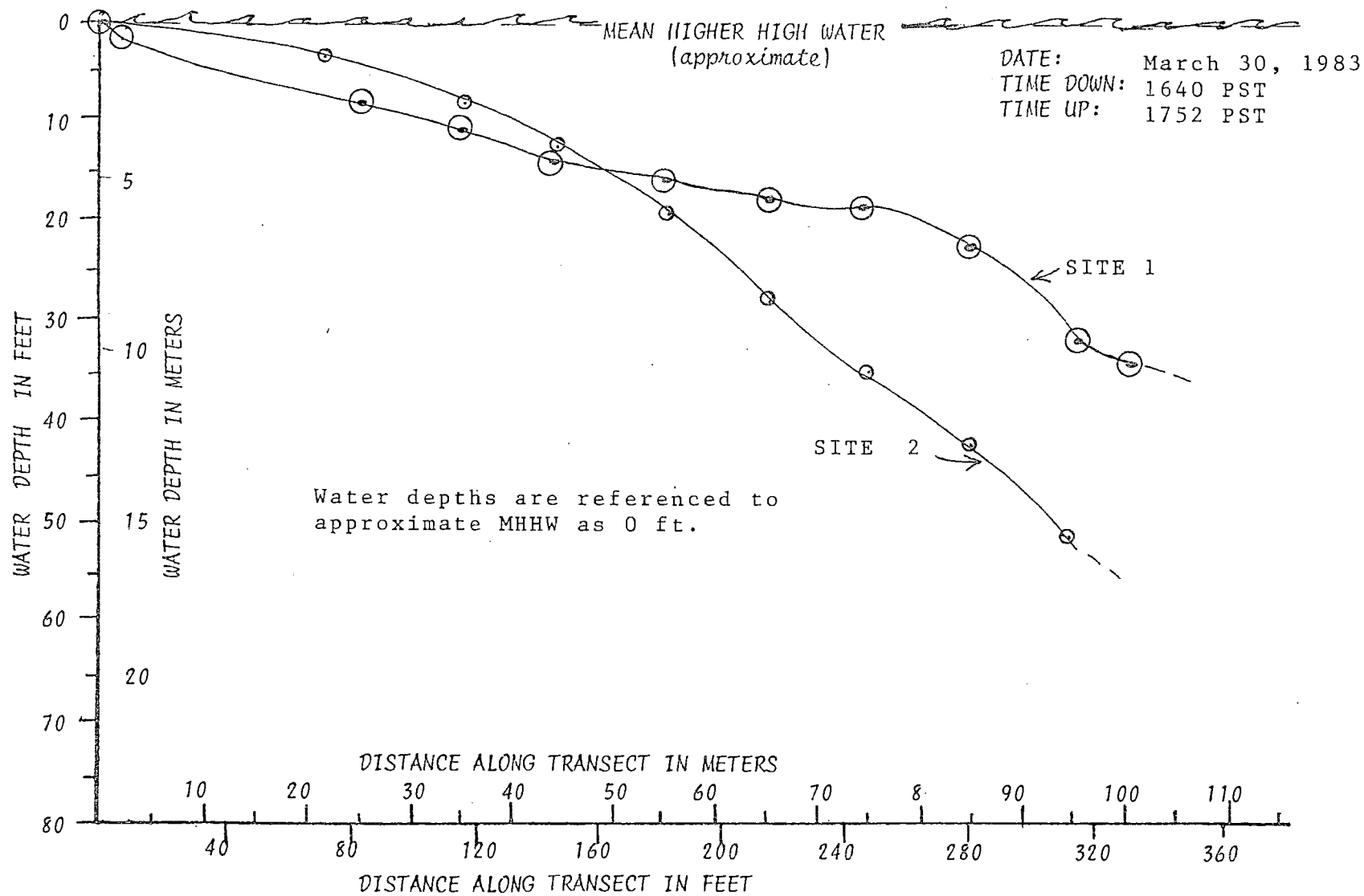


Figure 11. Dive Transect Depth Profile at Proposed Log Transfer Facility Sites at Deep Bay, Chichagof Island, Alaska.

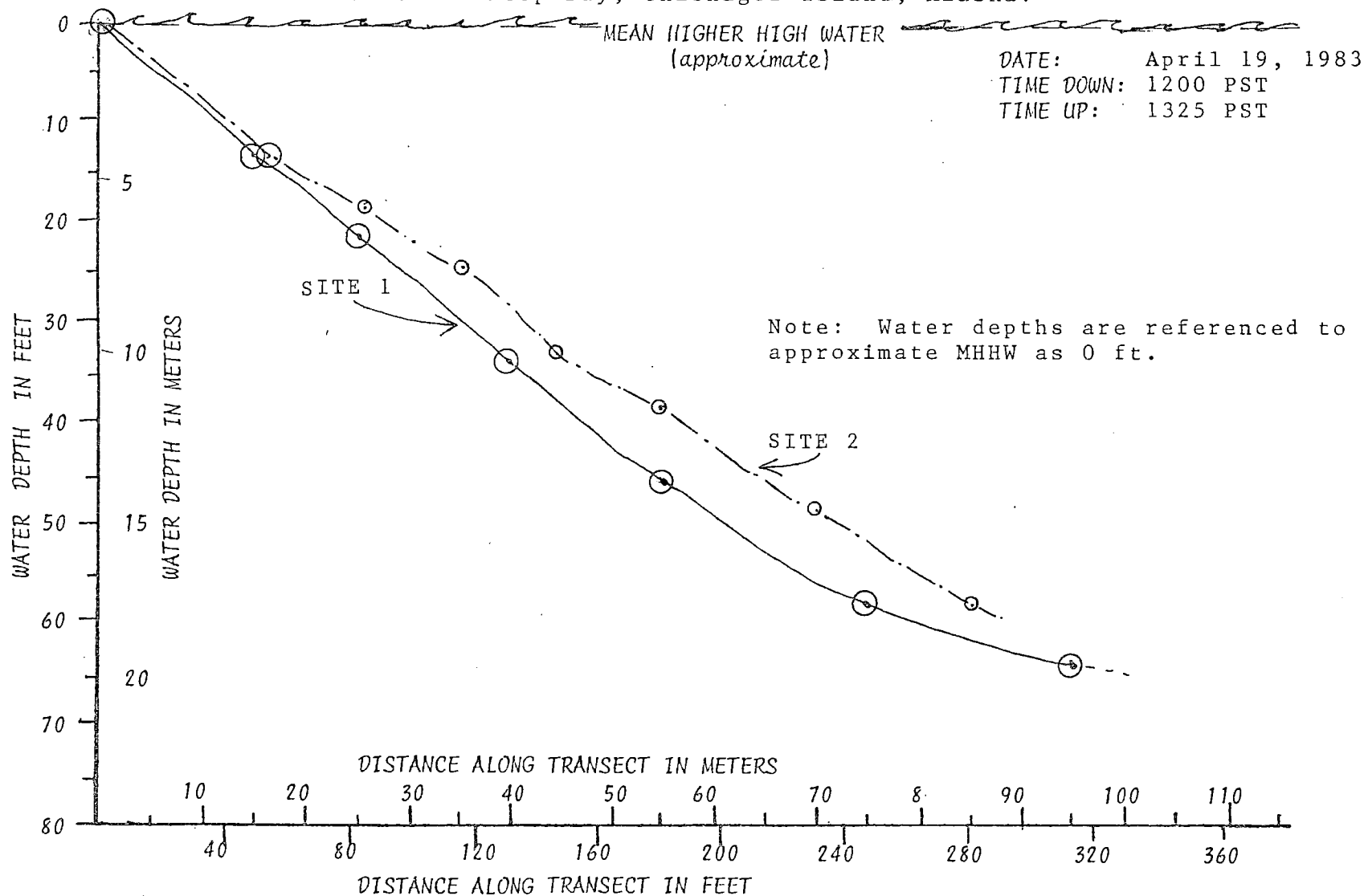


Figure 12. Dive Transect Depth Profile at Sitkoh Bay Log Transfer Facility on Chichagof Island, Alaska.

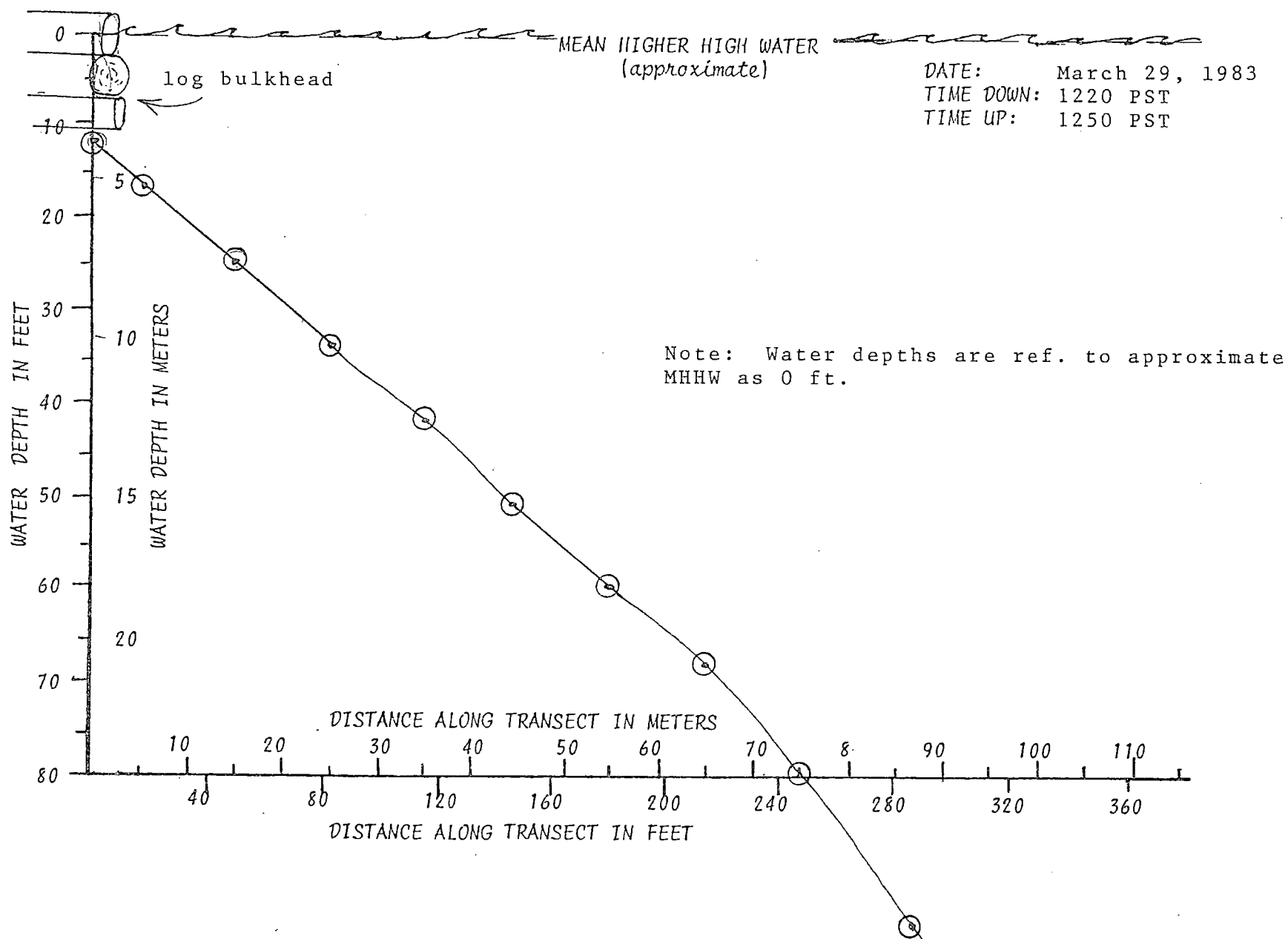


Table I. List of plant and animal species observed along dive transect surveys at Patterson Bay and Deep Bay.

	Patterson Bay Site #1	Patterson Bay Site #2	Patterson Bay Site #3	Deep Bay Site #1	Deep Bay Site #2
Marine Plants					
Filamentous green algae (unid.)		X	X		
<i>Ulva/Monostroma</i>				X	X
<i>Agarum cribrosum</i>	X				X
<i>Alaria marginata</i>					X
<i>Desmarestia</i> sp.			X		
<i>Fucus</i> sp.	X	X	X	X	X
<i>Laminaria</i> sp.	X	X	X	X	X
<i>Callophyllis</i> sp.				X	X
<i>Halosaccion glandiforme</i>				X	
<i>Lithothamnium/Lithophyllum</i>	X				
<i>Rhodymenia pertusa</i>				X	
Marine Invertebrates & Fish					
<i>Metridium senile</i> , white plumed anemone	X				
<i>Calliostoma ligatum</i> , blue top snail				X	
<i>Calliostoma</i> sp. (<i>ligatum?</i>) top snail					X
<i>Chlamys rubida</i> , smooth pecten					X
<i>Chlamys</i> sp., scallop	X			X	
<i>Clinocardium nuttallii</i> , heart cockle	X			X	X
<i>Collisella pelta</i> , shield limpet	X			X	X
<i>Littorina sitkana</i> , periwinkle					X
<i>Mya truncata</i> , truncated Mya			X	X	
<i>Mytilus edulis</i> , blue mussel	X	X		X	X
<i>Protothaca staminea</i> , littleneck clam					X
<i>Saxidomus giganteus</i> , butter clam	X			X	X
<i>Serpula vermicularis/Crucigera</i> sp. complex - plume worm	X				
<i>Balanus</i> sp., barnacle		X		X	X
<i>Cancer magister</i> , Dungeness crab				X	X
<i>Chthamalus dalli</i> , barnacle					X

Table 1. (cont.)

Marine Invertebrates & Fish	Patterson Bay Site #1	Patterson Bay Site #2	Patterson Bay Site #3	Deep Bay Site #1	Deep Bay Site #2
<i>Hyas lyratus</i> , lyre crab	X		X	X	X
Pagurid (unid.), hermit crab	X			X	
<i>Telmessus cheiragonus</i> , hairy horse crab				X	
<i>Evasterias troschelii</i> , mottled star			X		
<i>Henricia leviuscula</i> , blood star				X	
<i>Parastichopus californicus</i> , sea cucumber		X	X		
<i>Pisaster brevispinus</i> , slender seastar					X
<i>Pycnopodia helianthoides</i> , sunflower star					X
<i>Strongylocentrotus droebachiensis</i> , green urchin	X				
<i>Boltenia villosa</i> , hairy seasquirt				X	
<i>Corella willmeriana</i> , transparent seasquirt				X	
<i>Halocynthia aurantium</i> , sea peach	X				X
<i>Myoxocephalus polyacanthocephalus</i> , great sculpin			X		

Table 21. List of plant and animal species observed along dive transect surveys at Ushk Bay, Fick Cove, Moser Island and Sitkoh Bay.

	Ushk Bay Site #1	Ushk Bay Site #2	Fick Cove Site #1	Moser Is. Site #1	Sitkoh Bay Site #1
<u>Marine Plants</u>					
Filimentous green algae (unid.)	X	X			
<i>Ulva/Monostroma</i>	X		X		
<i>Agarum cribrosum</i>		X			X
<i>Fucus</i> sp.	X	X	X	X	X
<i>Laminaria</i> sp.	X	X		X	X
<i>Lithothamnium/Lithophyllum</i>		X			
<u>Marine Invertebrates & Fish</u>					
unidentified sponge		X			
<i>Metridium senile</i> , white plumed anemone		X			X
<i>Tealia crassicornis</i> , anemone					X
<i>Calliostoma</i> sp. (<i>ligatum?</i>) top snail		X			
<i>Chlamys rubida</i> , smooth pecten					X
<i>Chlamys</i> sp., scallop		X	X		
<i>Clinocardium nuttallii</i> , heart cockle	X	X			
<i>Collisella pelta</i> , shield limpet		X		X	
<i>Humilaria kennerlyi</i> , Kennerly's venus					X
<i>Mya truncata</i> , truncated Mya		X	X		
<i>Mytilus edulis</i> , blue mussel	X	X	X	X	
<i>Natica clausa</i> , moon snail		X			
<i>Pododesmus cepio</i> (<i>macroschisma</i>), jingle shell		X			X
<i>Protothaca staminea</i> , littleneck clam	X	X	X		
<i>Saxidomus giganteus</i> , butter clam	X		X		X
<i>Tresus capax</i> , horse clam					X
<i>Serpula vermicularis</i> / <i>Crucigera</i> sp. complex - plume worm		X			X
<i>Balanus glandula</i> , acorn barnacle			X		
<i>Balanus</i> sp., barnacle	X	X	X	X	X
<i>Cancer magister</i> , Dungeness crab			X		

Table 2. (cont.)

Marine Invertebrates & Fish	Ushk Bay Site #1	Ushk Bay Site #2	Fick Cove Site #1	Moser Is. Site #1	Sitkoh Bay Site #1
<i>Hyas lyratus</i> , lyre crab	X	X			
<i>Paralithodes camtschatica</i> , king crab		X	X		X
Pagurid (unid.), hermit crab	X	X			
<i>Cucumaria miniata</i> , sea cucumber		X			
<i>Evasterias troschelii</i> , mottled star		X			X
<i>Henricia leviuscula</i> , blood star					X
<i>Ophiura</i> sp., brittle star					X
<i>Parastichopus californicus</i> , sea cucumber					X
<i>Pisaster brevispinus</i> , slender seastar			X	X	X
<i>Strongylocentrotus droebachiensis</i> , green urchin		X	X	X	
<i>Corella willmeriana</i> , transparent seasquirt					X
<i>Myoxocephalus polyacanthocephalus</i> , great sculpin				X	

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