HAGGITT CONSULTING

2007 Bark Monitoring Dive and Video Survey Report

Twelvemile Arm LTF/LSA

MAY 16, 2007 THROUGH MAY 19, 2007 SURVEY

Twelvemile Arm Log Transfer Facility and Log Storage Area

Submitted to:
Alaska Department of Environmental Conservation
Division of Water
410 Willoughby Avenue
Juneau, Alaska 99801

Prepared By:
Haggitt Consulting
6991 Hwy 112
Sekiu WA 98381

Contract Number:
18-2019-11

Submitted On:

December 22, 2007

Abstract

An underwater reconnaissance was conducted on May 16 through May 19, 2007 at the former Twelvemile Arm Log Storage Area (LSA) and Log Transfer Facility (LTF) to determine the extent of bark debris accumulation on the ocean bottom. Twelvemile Arm is located on the east coast of Prince of Wales Island, Alaska.

This investigation was done under contract to the Alaska Department of Environmental Conservation to assess the current extent of bark debris coverage at the LSA and LTF.

The Plan View Video parallel pattern used on the east side of Twelvemile Arm to survey the LTF site consisted of 15 transects at 100 foot spacing intervals. This survey covered 11.79 acres. The Plan View Video parallel pattern used to survey the LSA on the west side of Twelvemile Arm consisted of three transects at a 200 foot spacing interval. This survey covered 3.72 acres. The sampling frequency was at 50 foot intervals using video survey methods at both the LTF and LSA.

The dive survey used to investigate conditions at the east side LTF used three transects spaced approximately 100 feet apart. This survey sampled the substrate at intervals of 25 feet. The total survey area was 1.06 acres.

The survey documented that the LSA contained no continuous coverage by bark debris and only a few small patches of discontinuous cover by bark debris. The survey using the Plan View Video and dive survey methods quantified the extent and type of both continuous and discontinuous coverage as 0.00 acres of bark debris.

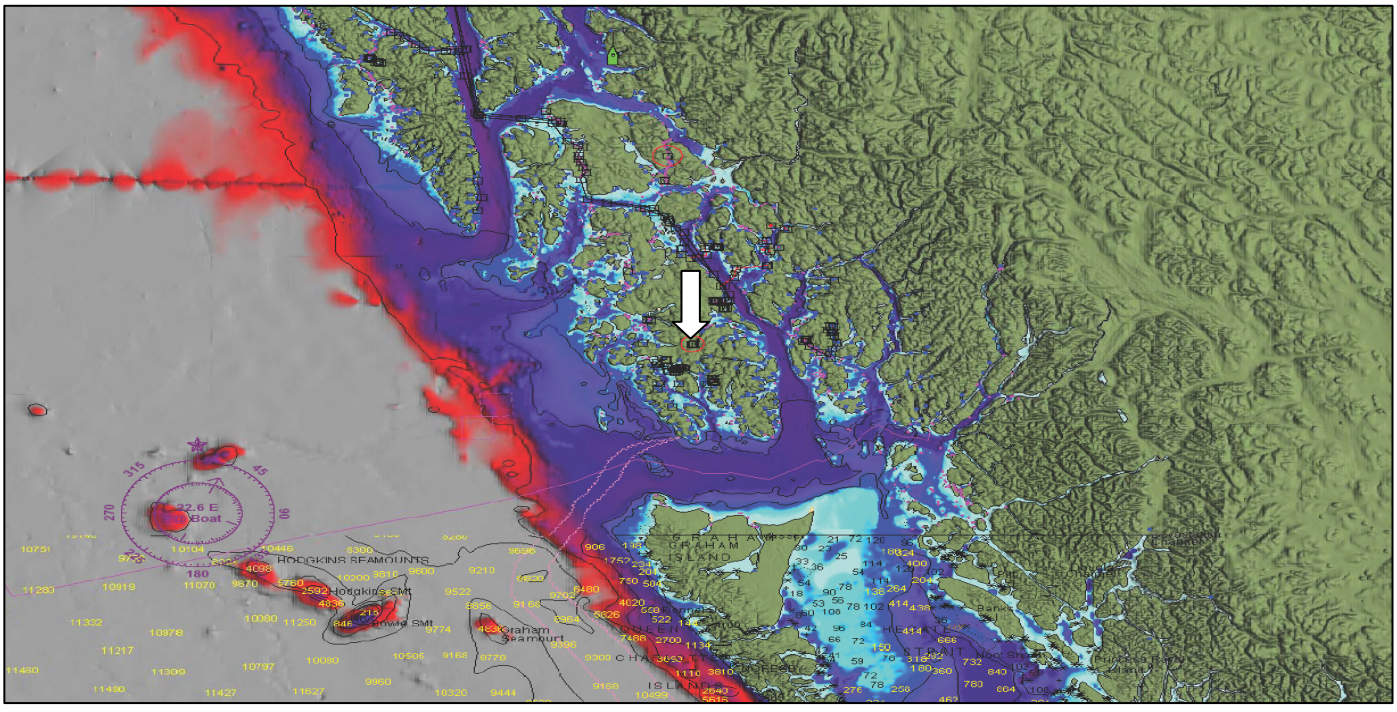


Table of Contents

Introduction

The Twelvemile Arm LTF and LSA have not operated for several years. The LTF and LSA are located on the east side of Prince of Wales Island, in the southern most tip of Twelvemile Arm, with a northern exposure. The weather conditions were good, but the underwater visibility was poor during this bark assessment survey. The bathymetric conditions at the site are that of a flat grade at an average elevation of -35 ft MLLW. Bark debris was not observed on the surface of the substrate during the survey.

A small area of natural woody debris, such as limbs and branches with some bark chips, was observed near the mouth of a nearby creek.

A summary of the approach and techniques used in the LSA survey is provided below in the Methods Section. The result of the survey is then presented together with estimates of the spatial extent and thickness of bark cover on the seafloor.

Figure 1 LTF

Figure 2 LSA

Dive Survey Methods

Standard diving methods were used to survey the Twelvemile Arm Log Transfer Facility. The methods used can be found in the publication "Required Method for Bark Monitoring Surveys under the LTF General Permits."

Vessel based personnel monitored the surface supplied air diver's progress and used radio/diver-telephone communications for course adjustments. Transect end points were recorded on DGPS to provide actual headings traveled.

The parallel transect interval spacing was set at 100 feet. The center three of the Plan View Video transects that documented the substrate, were resurveyed using dive methods. The transects were terminated by the requisite of beyond the area of significant bark accumulation, or at a depth of 75 feet MLLW if the cover is discontinuous. In the event continuous cover is observed at 75 feet MLLW transects were still terminated due to contractual requirements with ADEC.

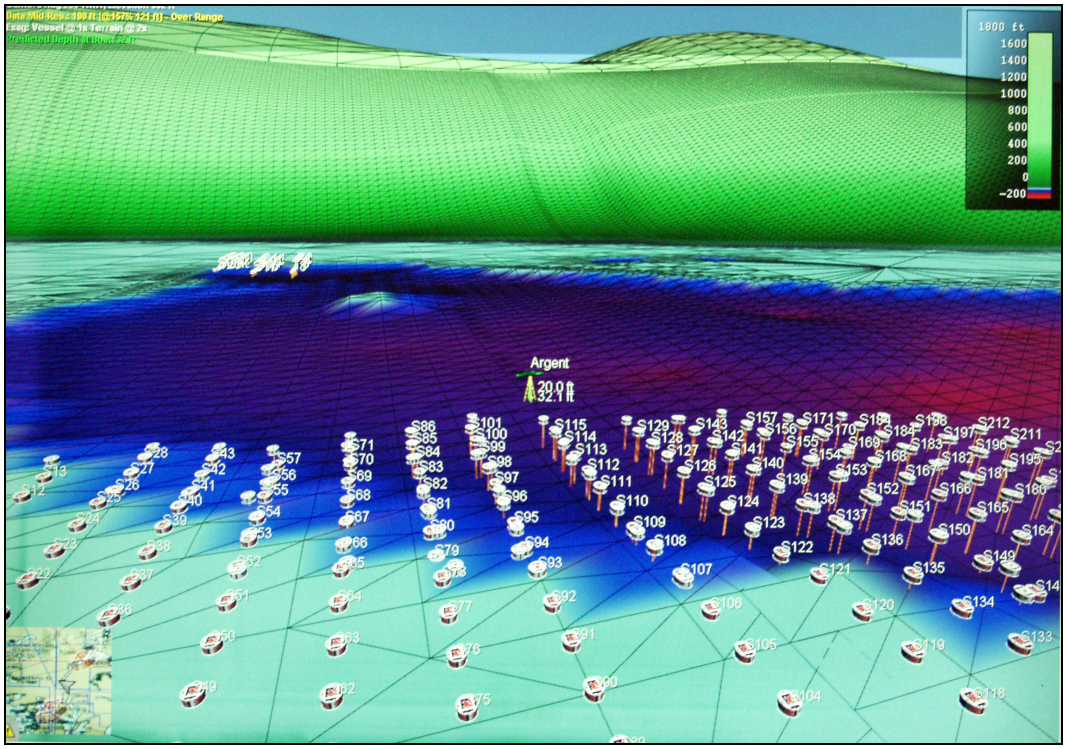


Figure 3 Bathymetric view looking from the LTF towards the LSA

Observations were taken at sample point intervals of 25 linear feet along each parallel transect. This interval distance was established with the use of a rolling tape measure, the accuracy is reported as +/- 3 inches at 1000 feet. Each sample point was an approximate three-foot square on the bottom surface. At each sample point the "percent coverage" by bark was recorded to the nearest 10 percent. The estimated thickness of the bark cover was measured by probing with a handheld ruler. A plan view photograph of the bottom surface was taken with a Olympus professional digital camera to record bark debris present, algal life, animal life, and substrate. At each sample point observations were noted on the abundance and type of marine organisms present, the native vegetation, and composition of the substrate. Data including the water depth, current direction, and estimated current velocity also were incorporated into the field notes. Each of the sample points also included relevant observations on operational debris and existing bark debris. Sample location depth notations are based on readings from a Cochran Consulting Nemeses IIA dive computer calibrated for saltwater and altitude.

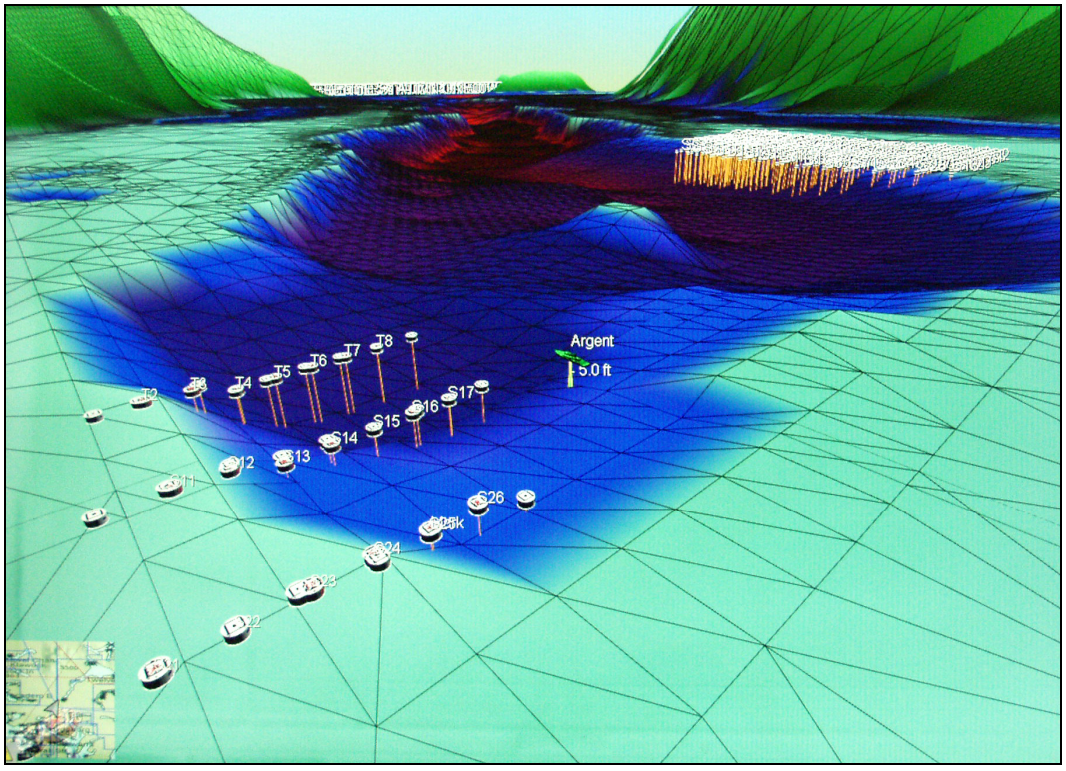


Figure 4 Bathymetric view of the LSA

Video Survey Methods

The Video survey system is comprised of a 12 channel satellite receiver providing DGPS and WAAS coordinates to shipboard navigation and infrared camera equipment. The satellite receiving antenna is located directly above the sample point being observed. The camera is weighted and lowered on lead line from the vessel to within 2 vertical feet of the sample point. The infrared camera records the substrate condition for at least 60 seconds, this video feed is combined with a live satellite data stream that includes; Latitude and Longitude (to the fourth decimal point), speed, heading, time (Greenwich mean time) and date. The video is then edited to the 30 second segment that includes the projected sample point location. This survey also included Video "stills".

The live data and tapes that result from this survey are reviewed by professional bark monitoring divers to determine the percent of bark coverage at each sample point. Observations of the debris viewed over the full 60 seconds of tape are compared against the representative clip of the sample point to ensure fair portrayal of the intended sample point. Observations are recorded in data tables and a coverage map is produced. Each report includes a video appendix of the sample points observed.

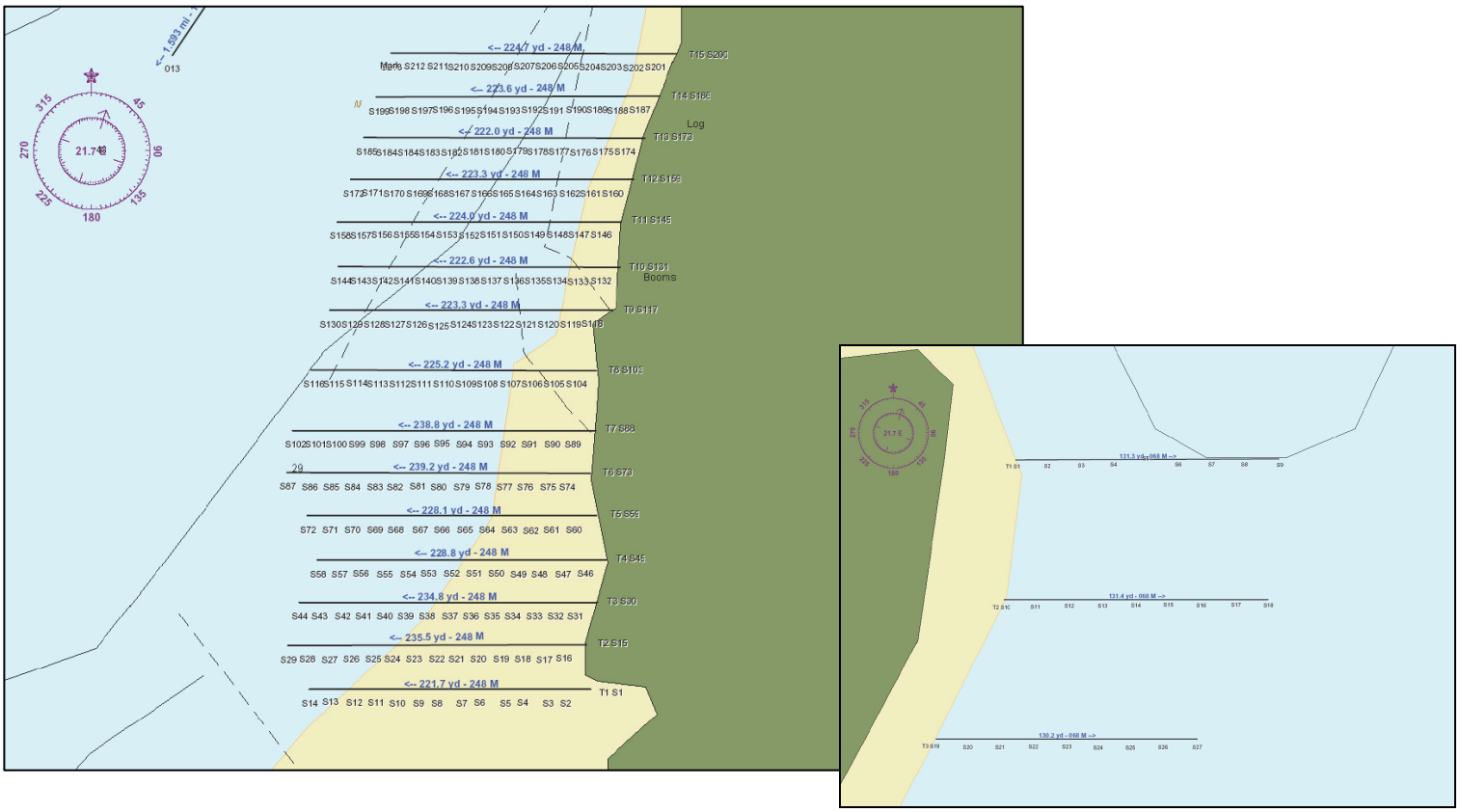


Figure 5 Pre-plotted survey chart

A pre-drafted and approved survey design is completed and recorded in the Quality Assurance Project Plan. However, individual site conditions present at the time of the survey may require that plan be altered to account for unexpected conditions or to best delineate the debris at the site. In such cases the fixed hub reference points for the transects delineating bark debris areas are selected by observing the site conditions, operational history and positioning the hubs (baseline) in a location that would provide the best survey coverage of the area used as a Log Storage Area or Log Transfer Facility. This survey did not require adjustments to the survey design contained in the Quality Assurance Project Plan.

During the survey DGPS/WAAS coordinates are acquired at the hub and each sample point along the transect to facilitate relocation. Transects were established at 249 degrees magnetic and 100 foot intervals for the Plan View Video Survey. Transects and sample points were pre-plotted onto an electronic chart, with coordinates. The vessel tracked on this chart using a satellite receiver that provides data for the electronic chart software to trace the vessels progress along the transect. Transect sample point intervals were set at 50 feet.

The transects were terminated by the requisite of beyond the area of significant bark accumulation, physical barrier or the required scope of services.

Area of Bark Cover

For each survey, the percentage of bark coverage was determined by using the protocol for operating a bark-monitoring program given in the EPA General Permit. The area calculation used in this report is outlined in the ADEC publication "Required Method for Bark Monitoring Surveys under the LTF General Permits".

Area calculations were accomplished by drafting scaled transect diagrams from the sample point tables in TurboCAD Professional V10. The TurboCAD program then accomplished the area calculations. ADEC has approved the use of AutoCAD programs for area calculations.

Chapter

1

Twelvemile Arm LTF/LSA Dive and Plan View Video Survey

Surveyed on May 16, 2007 through May 19, 2007

The survey was conducted under contract to the Alaska Department of Environmental Conservation. An underwater reconnaissance was requested to determine the representative condition of an area formally operating as a Log Transfer Facility (LTF) and a Log Storage Area (LSA). The video survey was conducted May16, 2007 through May 19th, 2007. The site surveyed is located in Twelvemile Arm, Prince of Wales Island, Alaska.

This investigation documented findings according to the Alaska Department of Environmental Conservation (ADEC), Environmental Protection Agency (EPA) and NPDES requirements. The percentage of bark coverage was determined by using the protocol for operating a bark-monitoring program given in the EPA General Permit. The area calculation used in this report is outlined in the ADEC publication **"Required Method for Bark Monitoring Surveys under the LTF General Permits".**

Findings

Survey Type	Continuous Coverage	Discontinuous Coverage
PVV EAST	0.0 Acres / 0.0 M_2	0.00 Acres / 0.00 M_2
PVV WEST	0.0 Acres / 0.0 M_2	0.00 Acres / 0.00 M_2
DIVE EAST	0.0 Acres / 0.0 M_2	0.00 Acres / 0.00 M_2

Weather conditions during the survey consisted of overcast skies with winds at less than 5 knots. Surveying by video camera commenced on May 16, 2007; during high water. The tidal station (subordinate station #1491) was used to correct depths to MLLW. The station reported a tide level of 17.5 ft at 2 p.m. The current conditions remained negligible. Seawater temperature was recorded at 46 degrees F. The horizontal visibility was estimated to be <5 feet.

Fifteen parallel Plan View Video transects, emanating from a bearing line located at the east side of the bay, traversed the bottom on bearings labeled: T1 - T15 at 249 degrees magnetic. A total of 119 sample locations at a 100-foot interval distance were assessed. On the west side of the bay three transects at 200 foot interval and bearing 069 degrees magnetic traversed the bottom on bearings labeled T1- T3. A total of 27 sample locations were assessed at this location by Plan View Video. The dive survey placed a parallel transect, perpendicular to shore, at the center of the input area and than one on each side of the structure. This Survey sampled a total of 29 stations.

Site conditions remained fairly steady with winds less between 5 knots and 15 knots. The sky remained overcast. Surveying concluded at 9 a.m. on May 19, 2007 during minus tide. The tidal station (subordinate station #1491) was used for depth corrections, reporting an -3.5 ft tide level at 9 a.m. The tidal current velocity was estimated to be 0.0 knots. The horizontal visibility remained constant and was estimated to be <5 foot. The grade for these transects remained fairly flat at 10:1 grade.

Observations

Bark debris was not encountered as either continuous or discontinuous surface coverage. The Plan View Video did encounter a minor patch of 100 percent bark cover near the mouth of a small creek; this debris was a mix of branches twigs and small pieces of wood that appeared to be a natural discharge from the creek. However, this point was not close enough to a designated sample location to be recorded as a station result.

Visibility conditions remained constant throughout the balance of the survey. As is typical for this time of year; the light penetrating from the surface reduced quickly with the descent of the camera. In typical conditions of similar Alaska bays in winter, the camera automatically switches from a color standard light mode at about sixty feet in depth, to an infra red/infra white- black and white mode. In Twelvemile Arm in May, this automatic switch based on available light conditions occurred at a depth of about 5 feet.

In the near bottom, the horizon of visibility reduced to about 1.0 feet of linear visibility. The visibility did hamper the assessments of surface bark debris by standard photographic methods. Infra red and Infra white diodes in the PVV camera have the

ability to penetrate suspended particles with out producing "backscatter" that a standard strobe causes film to record. For this reason the camera was able to record images clear enough to produce quantifiable results.

The camera needed to be suspended at an altitude of 4 to 6 inches off the bottom to produce a clear view; as closer made the image out of focus and farther away allowed too much of distance between the bottom and camera to allow for a clear image. While the video images remained fairly clear, still images of individual video frame required that the moving camera also be stopped in order to prevent the motion blur that normally occurs at speeds over 0.5 knots and 24 frames per second. For this reason, observations recorded in the tables of percent of cover were made off the moving video, at the point nearest the intended sample point; and the still images contained in the Appendix B, were at the point nearest to the intended sample point that the survey vessel was able to arrest the camera movement.

Generally, the dive survey revealed a fairly flat grade with a surface layer of silt varying from 4 to 8 inches in thickness. Just beneath the layer of silt was a large subcutaneous deposit of bark debris. Although this deposit was not noticeable on the surface of the silt, the bark layer beneath it extended to the limit of the measurement device (48 inches), in many of the dive sample locations. The bark appeared to be brittle small chunks and pieces, and had evidence of Beggiatoa mixed in at the surface of the bark layer. A strong odor of Sulfur Dioxide was present and the bark appeared to be dark in color and in a state of decomposition. The fine sediment cap of silt was easily disturbed and the diver noted that in each of his footprints that were left on his outbound journey to the transect terminus was filled with bark debris as he followed those same steps back to the original transect hub.

The bark debris appears to be brittle, and well covered by a layer of silty deposits that averaged about six inches deep. Marine life is considered low in abundance at the time of the survey in comparison with other bays with comparative flushing. However, the video did note small shrimp and crabs in common abundance throughout the survey area.

This determination is based on the calculations derived from the transect data collected for this report only. For further service regarding this report, please direct inquiries to (253) 209-9380 or e-mail at Haggitt1@juno.com.

Respectfully submitted,

Stephen Haggitt
December 22, 2007

Chapter 2

Survey Summary

The results from the video LTF survey indicated that the site has reached an acceptable level of recovery through heavy silt deposits. The LTF Dive survey indicated that the layer of bark just beneath the silt cover is easily disturbed and covers a considerable area.

The results of both surveys indicate minimal presence of bark debris on the surface from industrial sources. However, storm forces or an increase to the flow of water from the nearby stream could dramatically change the state of bark cover at the LTF site.

The LSA located on the west side of the bay had a harder sand bottom and no traces of bark debris were noted in that location. However, at the minus tides evidence of fine bark particles was noted lining the depressions in the delta the lead to the LSA. It is not known if these deposits were of industrial nature or natural deposits as they were at a distance over 100 yards away from the intended survey area and unreachable; due to the fact that even at the higher tides, there was less than three feet of water covering them.

This survey used standard reporting methods and included only coverage that was determined to be 10% to 90% in the reported discontinuous coverage area. Determinations of bark debris coverage at 100% are reported as continuous coverage and determinations of bark debris coverage of less than 10% are reported as zero or trace coverage.

Tidal Graphs

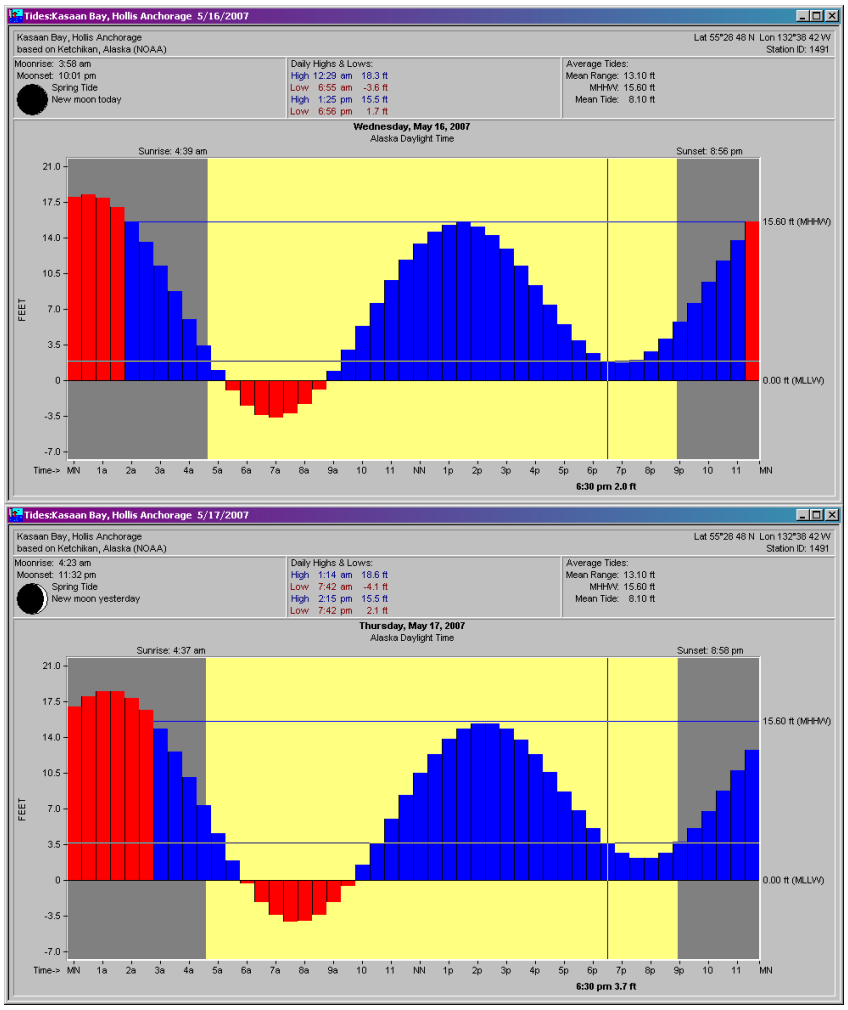


Figure 6 Tidal Graph May 16 and 17, 2007

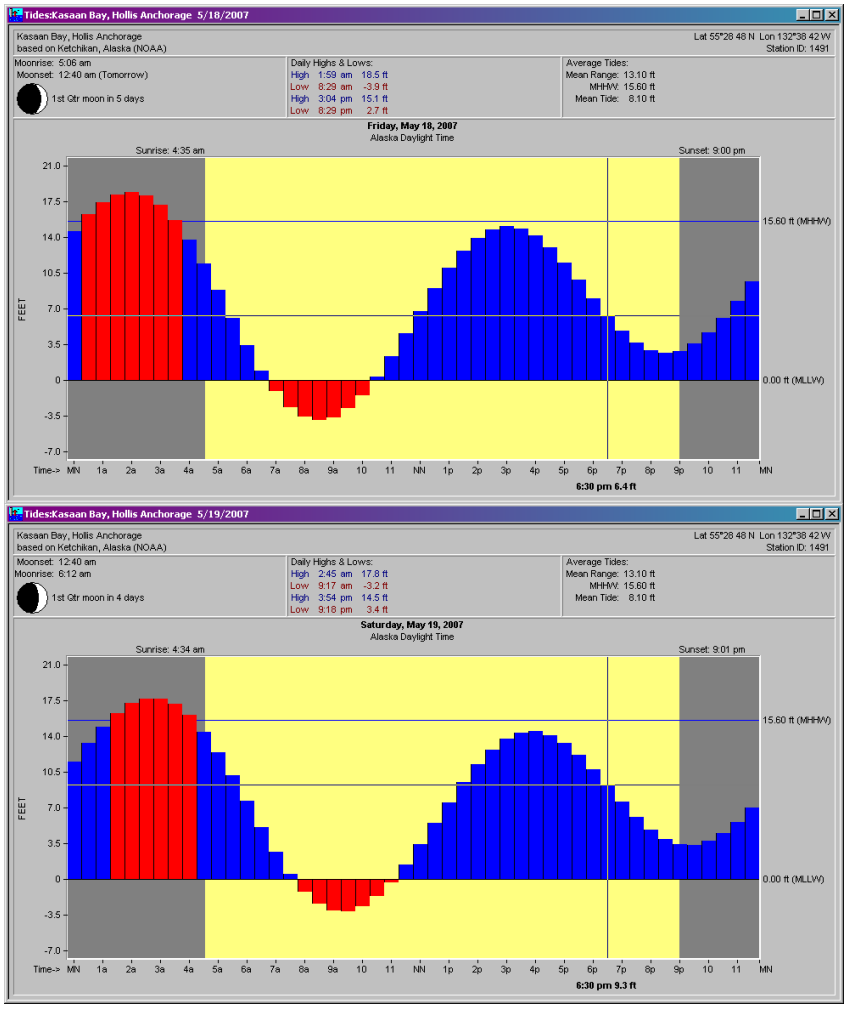


Figure 7 Tidal Graph May 18 and 19, 2007

Location Maps

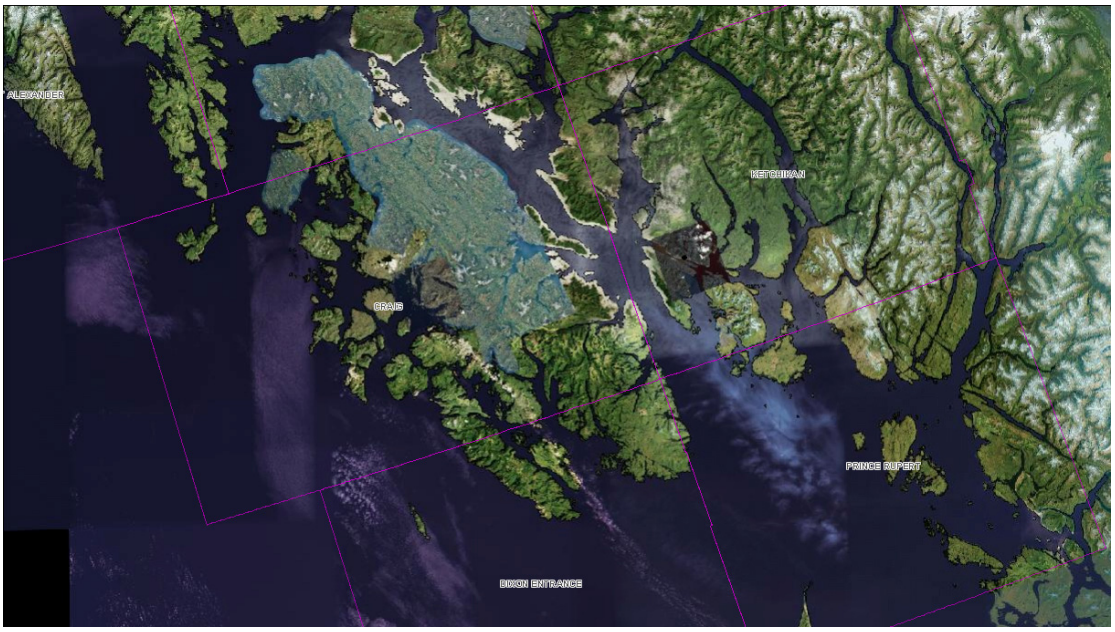


Figure 8 DNR ownership map

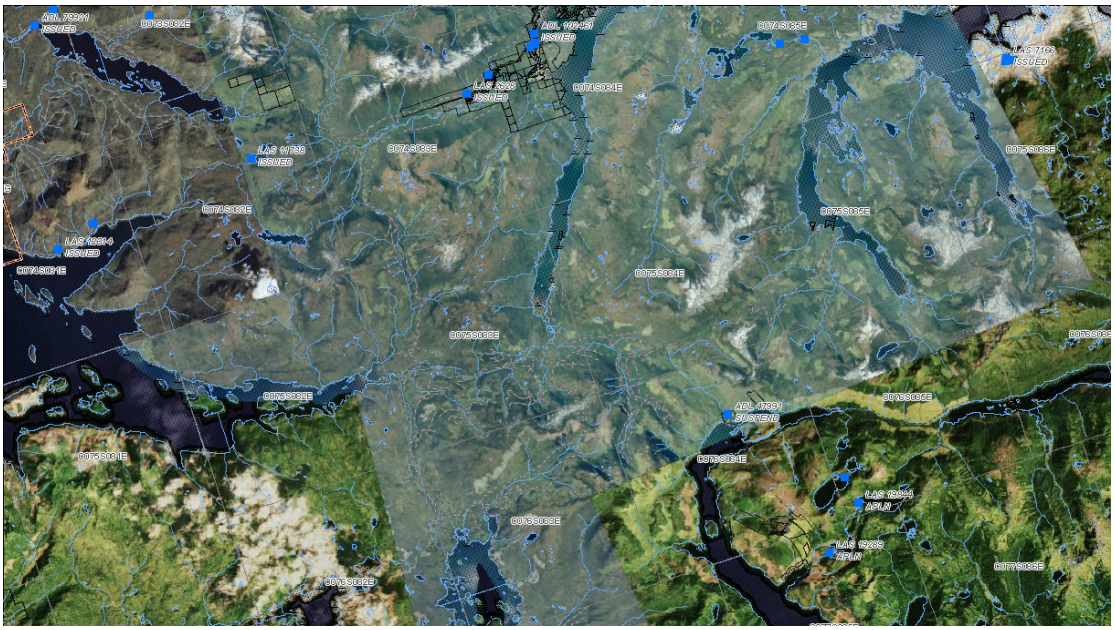


Figure 9 DNR enhanced view of Twelvemile

Figure 10 Satellite image of LTF and LSA site

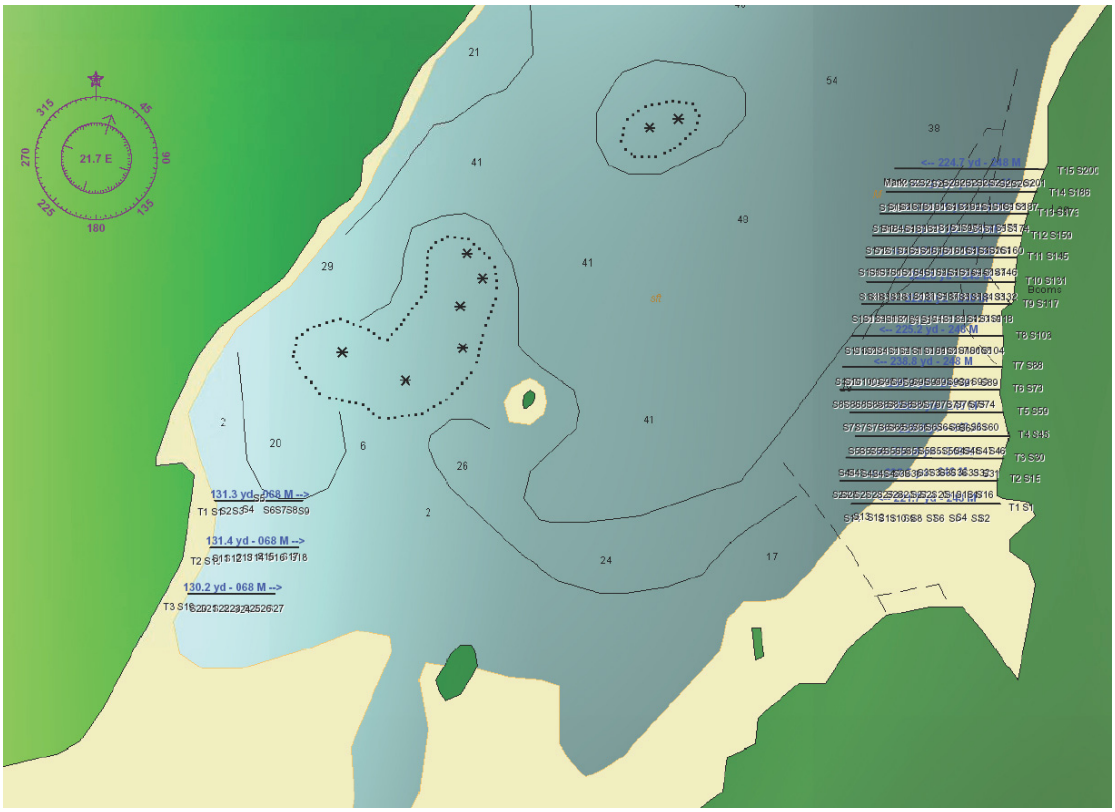


Figure 11 Vector map with transect overlays

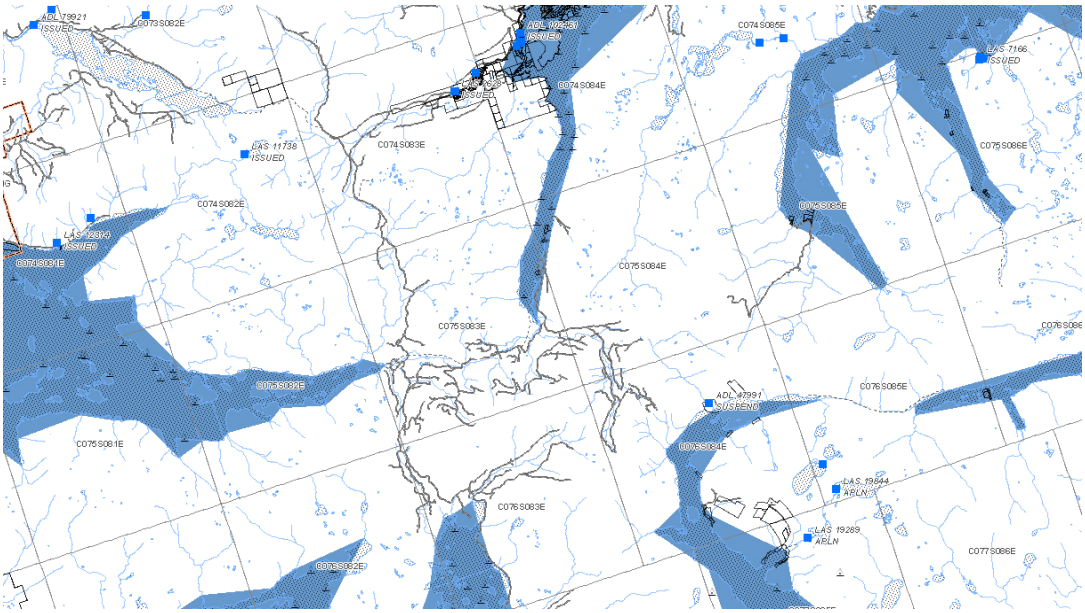


Figure 12 DNR land use designation map

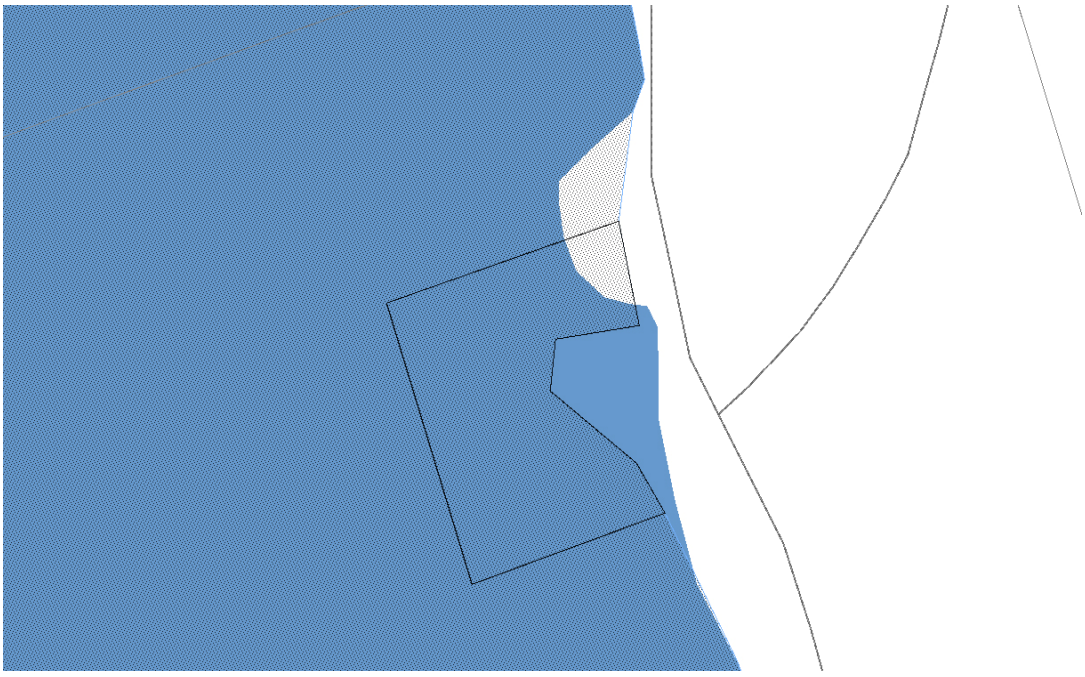


Figure 13 DNR enhanced view of LTF site

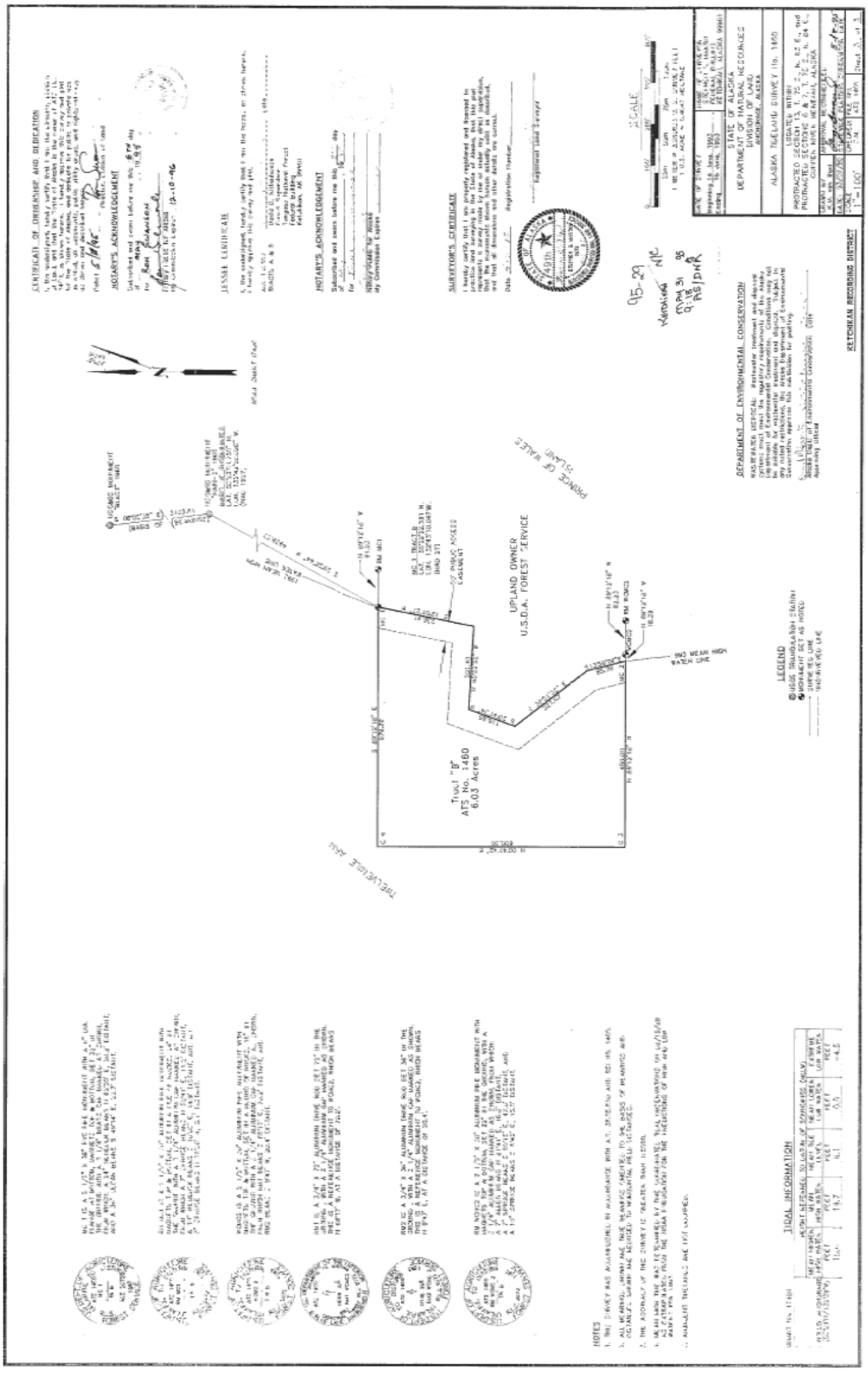


Figure 14 LTF plat map sheet 1

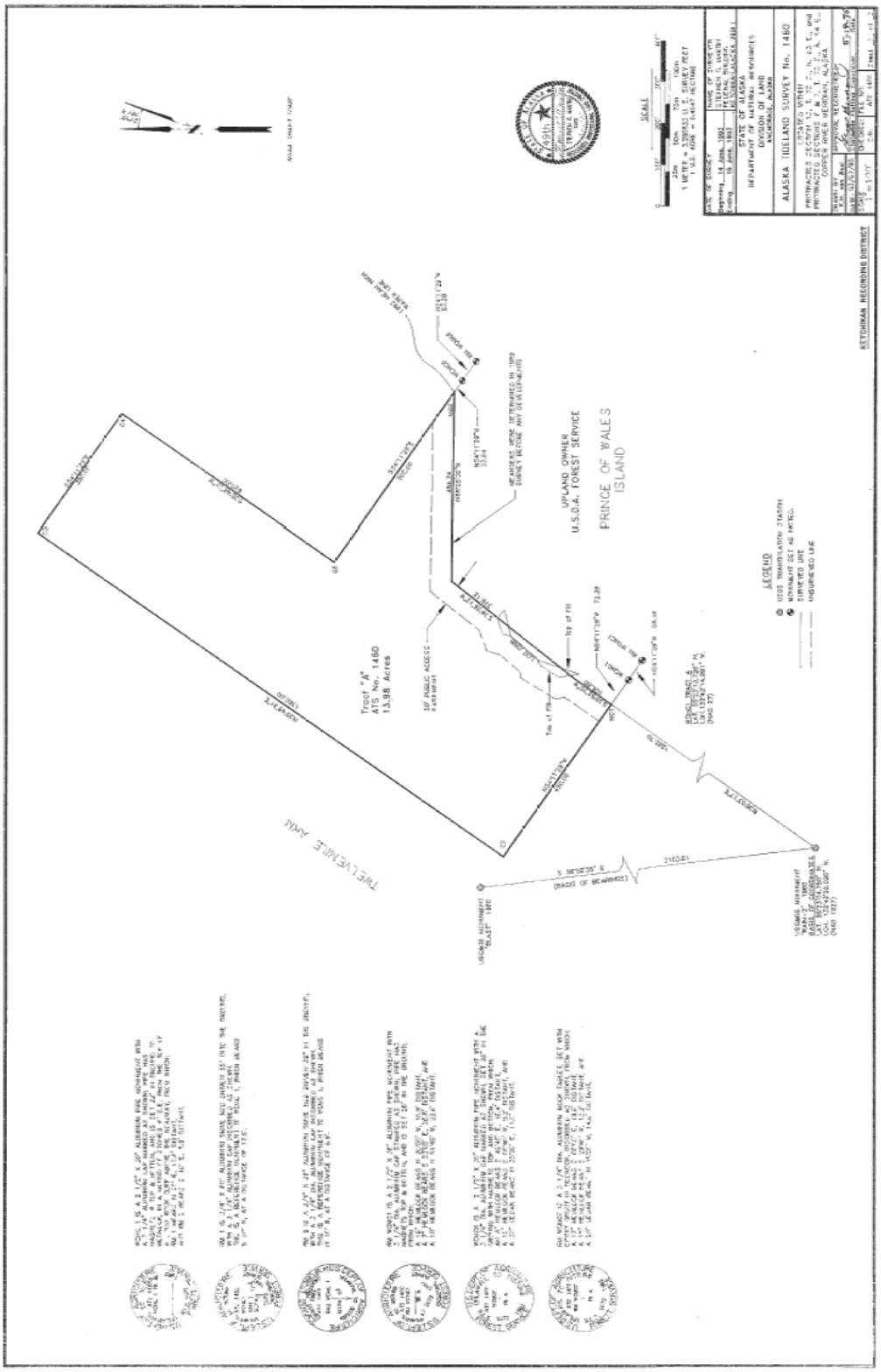


Figure 15 LTF plat map sheet 2

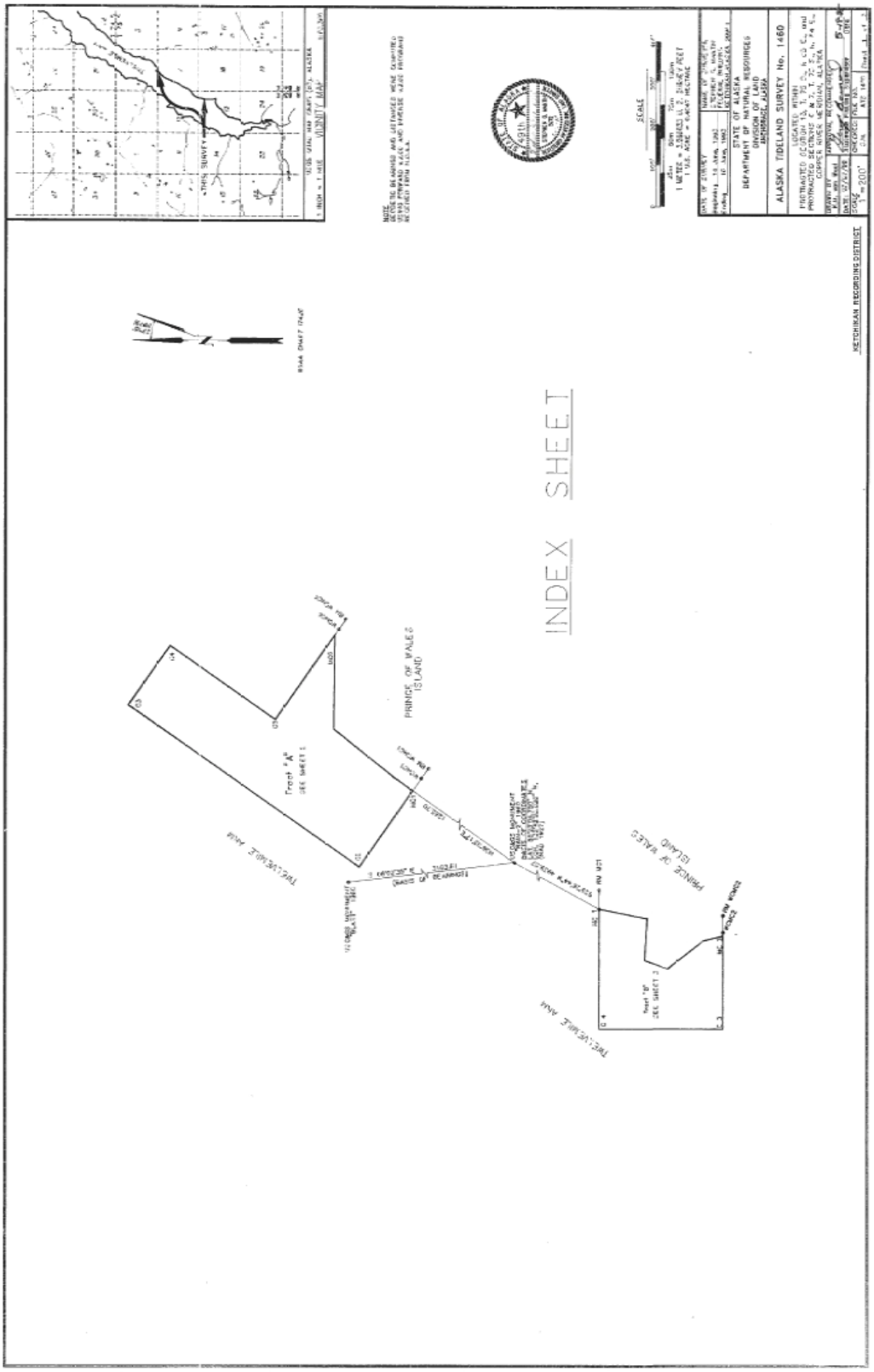
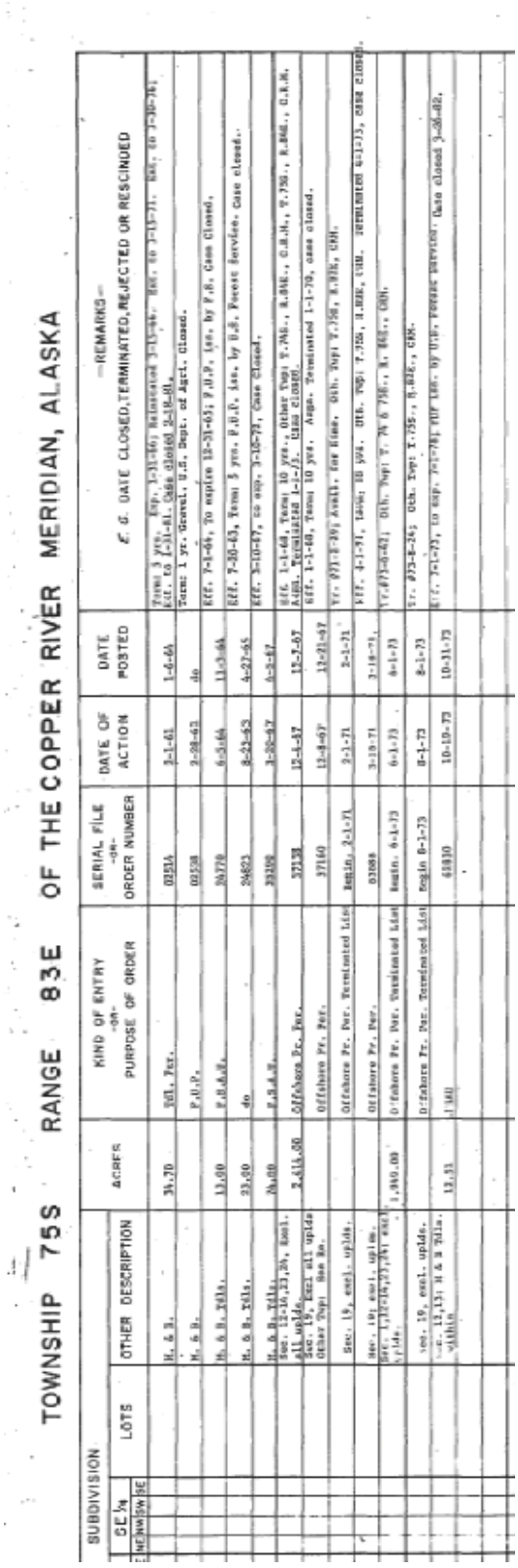


Figure 16 LTF plat map sheet 3

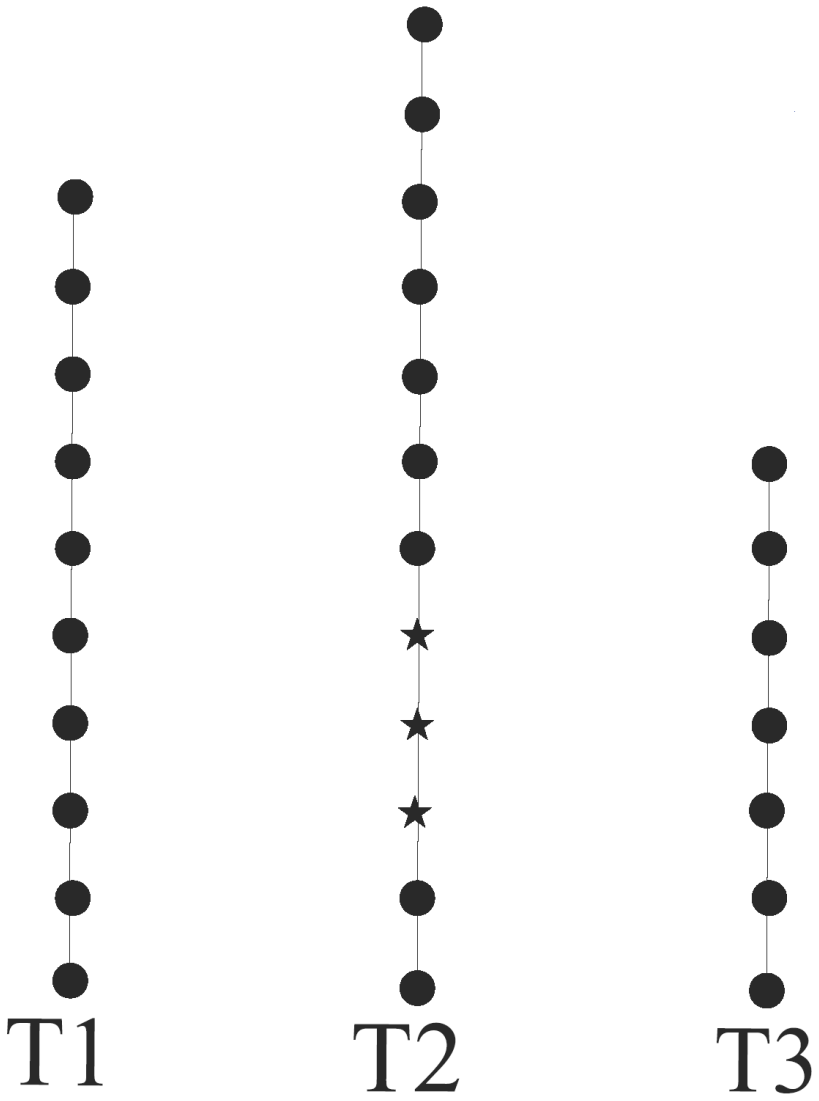


TOWNSHIP 75S RANGE 83E OF THE COPPER RIVER MERIDIAN, ALASKA

SUBDIVISION		LOTS	OTHER DESCRIPTION	ACRES	KIND OF ENTRY -OR- PURPOSE OF ORDER	SERIAL FILE -OR- ORDER NUMBER	DATE OF ACTION	DATE POSTED	—REMARKS— E. G. DATE CLOSED, TERMINATED, REJECTED OR RESCINDED
NE¼NW¼SE¼									
			H. & B.	34.70	Sch. Per.	02514	2-1-61	1-6-61	Term: 3 yrs. Exp. 1-31-64; Reinstated 3-15-64.- Rev. to 7-30-71. Ext. to 1-31-81. Case closed 2-18-81.
			H. & B.		P.U.P.	02528	2-28-62	do	Term: 1 yr. Gravel. U.S. Dept. of Agri. Closed.
			H. & B. Hds.	13.00	P.U.P.	24770	6-3-64	11-3-64	Eff. 7-1-64, to expire 12-31-65; P.U.P. Lse. by P.S. Case Closed.
			H. & B. Hds.	33.00	do	24823	8-12-65	4-27-65	Eff. 7-30-65, Term: 5 yrs. P.U.P. Lse. by U.S. Forest Service. Case closed.
			H. & B. Hds.	34.00	P.U.P.	33198	3-10-67	4-2-67	Eff. 3-10-67, to exp. 3-10-72. Case closed.
			Sec. 13,14,23,24, Umil. all uplds.	2,416.00	Offshore Pr. Per.	37138	12-4-67	12-7-67	Eff. 1-1-68, Term: 10 yrs. Other Dupl T.74S., R.84E., C.R.M., T.73S., R.84E., C.R.M. Assn. Terminated 1-1-73. Case closed.
			Sec. 19, Umil all uplds Other Dupl See Re.		Offshore Pr. Per.	37140	12-4-67	12-21-67	Eff. 1-1-68, Term: 10 yrs. Assn.- Terminated 1-1-73, case closed.
			Sec. 19, excl. uplds.		Offshore Pr. Per. Terminated 1-1-73	Begin. 2-1-71	2-1-71	2-1-71	Yr. 971-8-29; Assit. for Rese. Oth. Dupl T.73S., R.83E; CRM.
			Sec. 19, excl. uplds.		Offshore Pr. Per.	03088	3-10-71	3-10-71	Eff. 4-1-71, Term: 10 yrs. Oth. Dupl T.73S., R.83E, CRM. Terminated 4-1-73, case closed.
			Sec. 1,11-14,23,24 excl. uplds.	1,840.00	Offshore Pr. Per. Terminated 1-1-73	Begin. 4-1-73	4-1-73	4-1-73	Yr. 973-6-42; Oth. Dupl T. 74 & 75S., R. 84E., CRM.
			Sec. 19, excl. uplds.		Offshore Pr. Per. Terminated 1-1-73	Begin 8-1-73	8-1-73	8-1-73	Yr. 973-8-24; Oth. Dupl T.73S., R.83E., CRM.
			Sec. 13,15; N & E Hds. within	13.33	Lease	48930	10-10-73	10-31-73	Eff. 7-1-73, to exp. 7-1-78; Off the- by U.S. Forest Service. Case closed 3-26-82.

Figure 17 Archived records from 1961 to 1983

Dive Survey Calculation Diagram



Blocks 100% Cover
Stars 10%--99% Cover
Circle 0%--9% Cover

Dive Data Tables

Transect 1 248 Degrees

Sample Point	Depth at MLLW	Bark Depth *(Inches)*	% of Cover	Substrate Type
1	6		0	4”silt over bark
2	14		0	4”silt over bark
3	32		0	4”silt over bark
4	36		0	4”silt over bark
5	40	1” layer mixed	0	4”silt over bark
6	45		0	4”silt over bark
7	47		0	4”silt over bark
8	53		0	4”silt over bark
9	48		0	4”silt over bark
10	51		0	4”silt over bark
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				

Key:
Substrate Type; S=Sand, M=Mud, SL=Silt, R=Rock, C=Cobble, G=Gravel
Bark Depth Recorded in Inches

Transect 2 248 Degrees

Sample Point	Depth at MLLW	Bark Depth *(Inches)*	% of Cover	Substrate Type
1	6	0	0	S
2	17	0	Trace	S
3	24	<1	40	S
4	32	<1	10	S
5	36	<1	10	S
6	38	0	0	S
7	40	0	0	S
8	42	0	0	S
9	33	0	0	S
10	44	0	0	S
11	48	0	0	S
12	49	0	0	
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				

Key:

Substrate Type; S=Sand, M=Mud, SL=Silt, R=Rock, C=Cobble, G=Gravel
Bark Depth Recorded in Inches

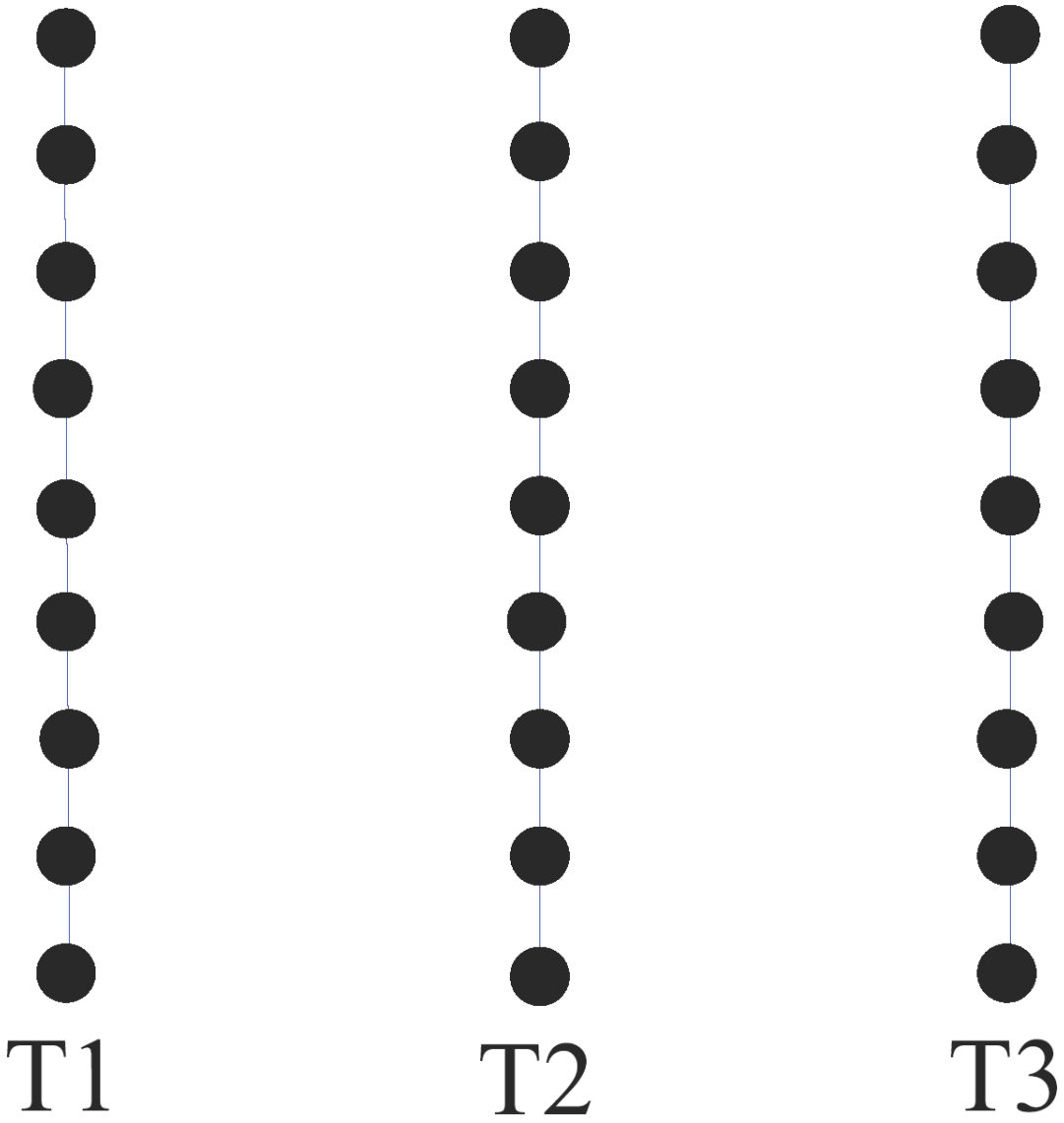
Transect 3 248 Degrees

Sample Point	Depth at MLLW	Bark Depth *(Inches)*	% of Cover	Substrate Type
1	6	0	0	Rock
2	20	0	0	Rock
3	28	0	T	Silt
4	34	0	T	Silt
5	39	0	0	Silt
6	41	0	0	Silt
7	44	0	0	Silt
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				

Key:

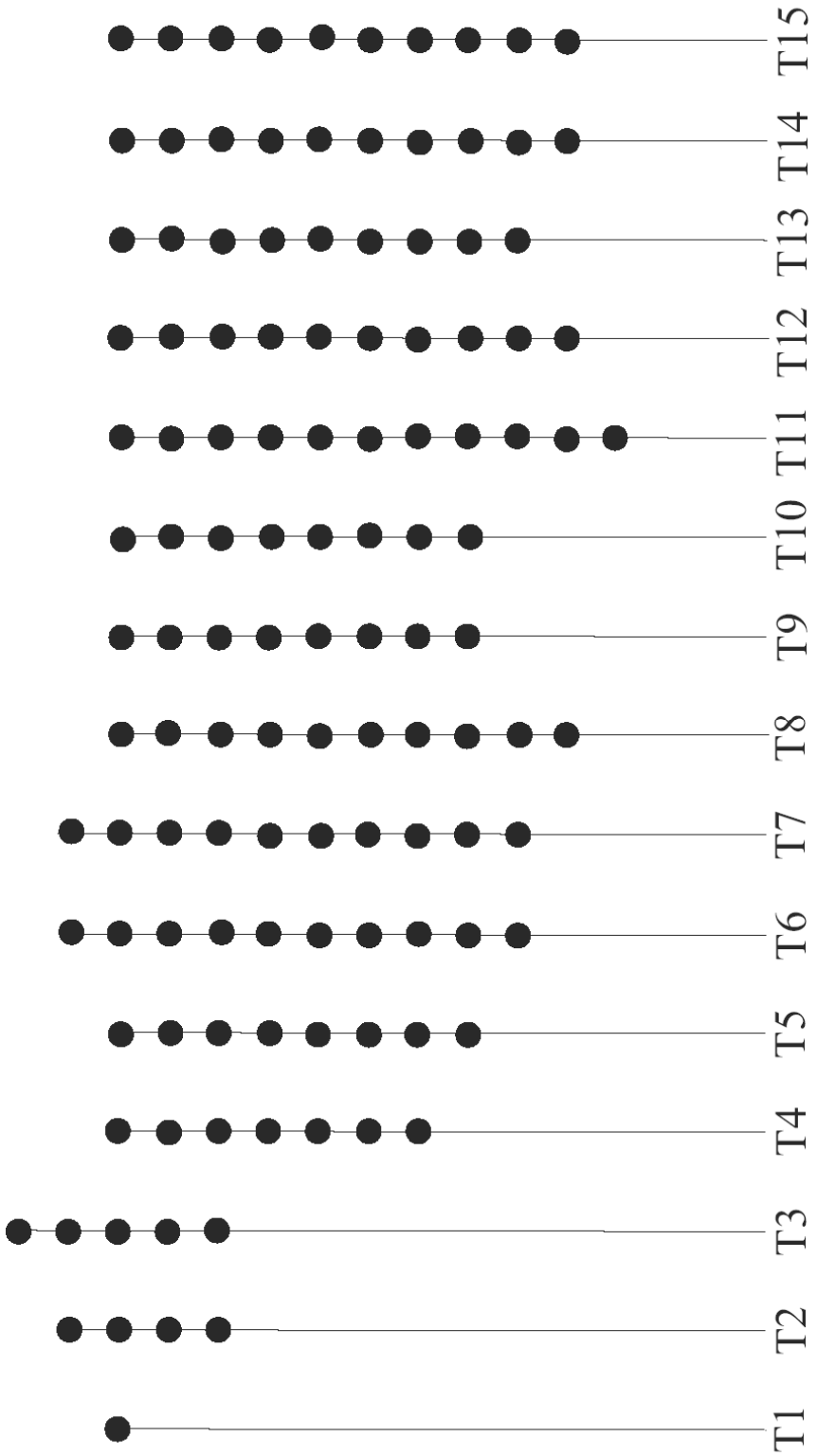
Substrate Type; S=Sand, M=Mud, SL=Silt, R=Rock, C=Cobble, G=Gravel
Bark Depth Recorded in Inches

Plan View Video LSA Calculation Diagram



Blocks 100% Cover
Stars 10%--99% Cover
Circle 0%--9% Cover

Plan View Video LTF Calculation Diagram



Blocks 100% Cover
Stars 10%--99% Cover
Circle 0%--9% Cover

PVV Results

DEPTH MLLW	Transect ID	Percent of Cover by Bark Debris	Substrate Type
0	TMET1S1	0	Silt
0	TMET1S2	0	Silt
0	TMET1S3	0	Silt
0	TMET1S4	0	Silt
0	TMET1S5	0	Silt
0	TMET1S6	0	Silt
0	TMET1S7	0	Silt
0	TMET1S8	0	Silt
0	TMET1S9	0	Silt
0	TMET1S10	0	Silt
0	TMET1S11	0	Silt
0	TMET1S12	0	Silt
0	TMET1S13	0	Silt
5	TMET1S14	0	Silt
0	TMET2S15	0	Silt
0	TMET2S16	0	Silt
0	TMET2S17	0	Silt
0	TMET2S18	0	Silt
0	TMET2S19	0	Silt
0	TMET2S20	0	Silt
0	TMET2S21	0	Silt
0	TMET2S22	0	Silt
0	TMET2S23	0	Silt
0	TMET2S24	0	Silt
0	TMET2S25	0	Silt
5	TMET2S26	0	Silt
9	TMET2S27	0	Silt
23	TMET2S28	0	Silt
26	TMET2S29	0	Silt
0	TMET3S30	0	Silt
0	TMET3S31	0	Silt
0	TMET3S32	0	Silt
0	TMET3S33	0	Silt
0	TMET3S34	0	Silt
0	TMET3S35	0	Silt
0	TMET3S36	0	Silt
0	TMET3S37	0	Silt
0	TMET3S38	0	Silt
0	TMET3S39	0	Silt

DEPTH MLLW	Transect ID	Percent of Cover by Bark Debris	Substrate Type
7	TMET3S40	0	Silt
7	TMET3S41	0	Silt
15	TMET3S42	0	Silt
27	TMET3S43	0	Silt
30	TMET3S44	0	Silt
0	TMET4S45	0	Silt
0	TMET4S46	0	Silt
0	TMET4S47	0	Silt
0	TMET4S48	0	Silt
0	TMET4S49	0	Silt
0	TMET4S50	0	Silt
0	TMET4S51	0	Silt
8	TMET4S52	0	Silt
14	TMET4S53	0	Silt
25	TMET4S54	0	Silt
25	TMET4S55	0	Silt
26	TMET4S56	0	Silt
29	TMET4S57	0	Silt
30	TMET4S58	0	Silt
0	TMET5S59	0	Silt
0	TMET5S60	0	Silt
0	TMET5S61	0	Silt
0	TMET5S62	0	Silt
0	TMET5S63	0	Silt
0	TMET5S64	0	Silt
7	TMET5S65	0	Silt
13	TMET5S66	0	Silt
28	TMET5S67	0	Silt
32	TMET5S68	0	Silt
34	TMET5S69	0	Silt
34	TMET5S70	0	Silt
32	TMET5S71	0	Silt
34	TMET5S72	0	Silt
0	TMET6S73	0	Silt
0	TMET6S74	0	Silt
0	TMET6S75	0	Silt
0	TMET6S76	0	Silt
0	TMET6S77	0	Silt
8	TMET6S78	0	Silt
12	TMET6S79	0	Silt
24	TMET6S80	0	Silt

DEPTH MLLW	Transect ID	Percent of Cover by Bark Debris	Substrate Type
29	TMET6S81	0	Silt
36	TMET6S82	0	Silt
36	TMET6S83	0	Silt
37	TMET6S84	0	Silt
38	TMET6S85	0	Silt
39	TMET6S86	0	Silt
42	TMET6S87	0	Silt
0	TMET7S88	0	Silt
0	TMET7S89	0	Silt
0	TMET7S90	0	Silt
0	TMET7S91	0	Silt
0	TMET7S92	0	Silt
9	TMET7S93	0	Silt
17	TMET7S94	0	Silt
23	TMET7S95	0	Silt
36	TMET7S96	0	Silt
39	TMET7S97	0	Silt
41	TMET7S98	0	Silt
42	TMET7S99	0	Silt
42	TMET7S100	0	Silt
43	TMET7S101	0	Silt
44	TMET7S102	0	Silt
0	TMET8S103	0	Silt
0	TMET8S104	0	Silt
0	TMET8S105	0	Silt
0	TMET8S106	0	Silt
6	TMET8S107	0	Silt
10	TMET8S108	0	Silt
17	TMET8S109	0	Silt
34	TMET8S110	0	Silt
39	TMET8S111	0	Silt
40	TMET8S112	0	Silt
43	TMET8S113	0	Silt
45	TMET8S114	0	Silt
46	TMET8S115	0	Silt
48	TMET8S116	0	Silt
0	TMET9S117	0	Silt
0	TMET9S118	0	Silt
0	TMET9S119	0	Silt
0	TMET9S120	0	Silt
0	TMET9S121	0	Silt
0	TMET9S122	0	Silt

DEPTH MLLW	Transect ID	Percent of Cover by Bark Debris	Substrate Type
15	TMET9S123	0	Silt
35	TMET9S124	0	Silt
46	TMET9S125	0	Silt
47	TMET9S126	0	Silt
49	TMET9S127	0	Silt
55	TMET9S128	0	Silt
57	TMET9S129	0	Silt
59	TMET9S130	0	Silt
0	TMET10S131	0	Silt
0	TMET10S132	0	Silt
0	TMET10S133	0	Silt
0	TMET10S134	0	Silt
0	TMET10S135	0	Silt
0	TMET10S136	0	Silt
33	TMET10S137	0	Silt
36	TMET10S138	0	Silt
46	TMET10S139	0	Silt
50	TMET10S140	0	Silt
51	TMET10S141	0	Silt
49	TMET10S142	0	Silt
51	TMET10S143	0	Silt
51	TMET10S144	0	Silt
0	TMET11S145	0	Silt
0	TMET11S146	0	Silt
0	TMET11S147	0	Silt
12	TMET11S148	0	Silt
15	TMET11S149	0	Silt
29	TMET11S150	0	Silt
36	TMET11S151	0	Silt
42	TMET11S152	0	Silt
46	TMET11S153	0	Silt
50	TMET11S154	0	Silt
48	TMET11S155	0	Silt
37	TMET11S156	0	Silt
38	TMET11S157	0	Silt
38	TMET11S158	0	Silt
0	TMET12S159	0	Silt
0	TMET12S160	0	Silt
0	TMET12S161	0	Silt
0	TMET12S162	0	Silt
6	TMET12S163	0	Silt
15	TMET12S164	0	Silt

DEPTH MLLW	Transect ID	Percent of Cover by Bark Debris	Substrate Type
22	TMET12S165	0	Silt
30	TMET12S166	0	Silt
32	TMET12S167	0	Silt
33	TMET12S168	0	Silt
34	TMET12S169	0	Silt
35	TMET12S170	0	Silt
37	TMET12S171	0	Silt
38	TMET12S172	0	Silt
0	TMET13S173	0	Silt
0	TMET13S174	0	Silt
0	TMET13S175	0	Silt
0	TMET13S176	0	Silt
0	TMET13S177	0	Silt
14	TMET13S178	0	Silt
23	TMET13S179	0	Silt
30	TMET13S180	0	Silt
32	TMET13S181	0	Silt
34	TMET13S182	0	Silt
36	TMET13S183	0	Silt
37	TMET13S184	0	Silt
38	TMET13S185	0	Silt
0	TMET14S186	0	Silt
0	TMET14S187	0	Silt
0	TMET14S188	0	Silt
0	TMET14S189	0	Silt
10	TMET14S190	0	Silt
22	TMET14S191	0	Silt
27	TMET14S192	0	Silt
29	TMET14S193	0	Silt
31	TMET14S194	0	Silt
32	TMET14S195	0	Silt
32	TMET14S196	0	Silt
36	TMET14S197	0	Silt
36	TMET14S198	0	Silt
36	TMET14S199	0	Silt
0	TMET15S200	0	Silt
0	TMET15S201	0	Silt
0	TMET15S202	0	Silt
0	TMET15S203	0	Silt
15	TMET15S204	0	Silt
24	TMET15S205	0	Silt
27	TMET15S206	0	Silt

DEPTH MLLW	Transect ID	Percent of Cover by Bark Debris	Substrate Type
29	TMET15S207	0	Silt
30	TMET15S208	0	Silt
33	TMET15S209	0	Silt
35	TMET15S210	0	Silt
35	TMET15S211	0	Silt
36	TMET15S212	0	Silt
38	TMET15S213	0	Silt
5	TMWT1S1	0	Silt
13	TMWT1S2	0	Silt
15	TMWT1S3	0	Silt
18	TMWT1S4	0	Silt
12	TMWT1S5	0	Silt
15	TMWT1S6	0	Silt
11	TMWT1S7	0	Silt
7	TMWT1S8	0	Silt
8	TMWT1S9	0	Silt
3	TMWT2S10	0	Silt
5	TMWT2S11	0	Silt
7	TMWT2S12	0	Silt
8	TMWT2S13	0	Silt
9	TMWT2S14	0	Silt
7	TMWT2S15	0	Silt
9	TMWT2S16	0	Silt
10	TMWT2S17	0	Silt
9	TMWT2S18	0	Silt
3	TMWT3S19	0	Silt
5	TMWT3S20	0	Silt
8	TMWT3S21	0	Silt
5	TMWT3S22	0	Silt
6	TMWT3S23	0	Silt
6	TMWT3S24	0	Silt
7	TMWT3S25	0	Silt
8	TMWT3S26	0	Silt
10	TMWT3S27	0	Silt

Coordinate Tables

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
0	TMET1S1	55º 22.157′ N	132º 43.286′ W	PROPOSED
0	TMET1S2	55º 22.157′ N	132º 43.301′ W	PROPOSED
0	TMET1S3	55º 22.157′ N	132º 43.315′ W	PROPOSED
0	TMET1S4	55º 22.157′ N	132º 43.330′ W	PROPOSED
0	TMET1S5	55º 22.157′ N	132º 43.345′ W	PROPOSED
0	TMET1S6	55º 22.158′ N	132º 43.360′ W	PROPOSED
0	TMET1S7	55º 22.157′ N	132º 43.374′ W	PROPOSED
0	TMET1S8	55º 22.157′ N	132º 43.389′ W	PROPOSED
0	TMET1S9	55º 22.157′ N	132º 43.404′ W	PROPOSED
0	TMET1S10	55º 22.157′ N	132º 43.419′ W	PROPOSED
0	TMET1S11	55º 22.158′ N	132º 43.433′ W	PROPOSED
0	TMET1S12	55º 22.158′ N	132º 43.449′ W	PROPOSED
0	TMET1S13	55º 22.158′ N	132º 43.464′ W	PROPOSED
5	TMET1S14	55º 22.157′ N 55º 22.155′ N	132º 43.478′ W 132º 43.481′ W	PROPOSED PVV
0	TMET2S15	55º 22.175′ N	132º 43.289′ W	PROPOSED
0	TMET2S16	55º 22.175′ N	132º 43.304′ W	PROPOSED
0	TMET2S17	55º 22.175′ N	132º 43.318′ W	PROPOSED
0	TMET2S18	55º 22.175′ N	132º 43.333′ W	PROPOSED
0	TMET2S19	55º 22.175′ N	132º 43.348′ W	PROPOSED
0	TMET2S20	55º 22.175′ N	132º 43.362′ W	PROPOSED
0	TMET2S21	55º 22.175′ N	132º 43.377′ W	PROPOSED
0	TMET2S22	55º 22.175′ N	132º 43.392′ W	PROPOSED
0	TMET2S23	55º 22.175′ N	132º 43.406′ W	PROPOSED
0	TMET2S24	55º 22.175′ N	132º 43.421′ W	PROPOSED
0	TMET2S25	55º 22.175′ N	132º 43.436′ W	PROPOSED
5	TMET2S26	55º 22.175′ N 55º 22.174′ N	132º 43.450′ W 132º 43.451′ W	PROPOSED PVV
9	TMET2S27	55º 22.175′ N 55º 22.174′ N	132º 43.465′ W 132º 43.466′ W	PROPOSED PVV
23	TMET2S28	55º 22.175′ N 55º 22.174′ N	132º 43.480′ W 132º 43.481′ W	PROPOSED PVV
26	TMET2S29	55º 22.175′ N 55º 22.174′ N	132º 43.493′ W 132º 43.492′ W	PROPOSED PVV
0	TMET3S30	55º 22.191′ N	132º 43.281′ W	PROPOSED
0	TMET3S31	55º 22.191′ N	132º 43.296′ W	PROPOSED
0	TMET3S32	55º 22.191′ N	132º 43.310′ W	PROPOSED
0	TMET3S33	55º 22.191′ N	132º 43.325′ W	PROPOSED

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
0	TMET3S34	55º 22.191′ N	132º 43.340′ W	PROPOSED
0	TMET3S35	55º 22.191′ N	132º 43.354′ W	PROPOSED
0	TMET3S36	55º 22.191′ N	132º 43.368′ W	PROPOSED
0	TMET3S37	55º 22.191′ N	132º 43.383′ W	PROPOSED
0	TMET3S38	55º 22.191′ N	132º 43.397′ W	PROPOSED
0	TMET3S39	55º 22.191′ N	132º 43.412′ W	PROPOSED
7	TMET3S40	55º 22.191′ N	132º 43.427′ W	PROPOSED
		55º 22.191′ N	132º 43.428′ W	PVV
7	TMET3S41	55º 22.191′ N	132º 43.442′ W	PROPOSED
		55º 22.191′ N	132º 43.441′ W	PVV
15	TMET3S42	55º 22.191′ N	132º 43.456′ W	PROPOSED
		55º 22.191′ N	132º 43.456′ W	PVV
27	TMET3S43	55º 22.191′ N	132º 43.471′ W	PROPOSED
		55º 22.191′ N	132º 43.472′ W	PVV
30	TMET3S44	55º 22.191′ N	132º 43.485′ W	PROPOSED
		55º 22.191′ N	132º 43.484′ W	PVV
0	TMET4S45	55º 22.208′ N	132º 43.274′ W	PROPOSED
0	TMET4S46	55º 22.208′ N	132º 43.290′ W	PROPOSED
0	TMET4S47	55º 22.208′ N	132º 43.305′ W	PROPOSED
0	TMET4S48	55º 22.208′ N	132º 43.321′ W	PROPOSED
0	TMET4S49	55º 22.208′ N	132º 43.336′ W	PROPOSED
0	TMET4S50	55º 22.208′ N	132º 43.351′ W	PROPOSED
0	TMET4S51	55º 22.208′ N	132º 43.366′ W	PROPOSED
8	TMET4S52	55º 22.208′ N	132º 43.382′ W	PROPOSED
		55º 22.208′ N	132º 43.380′ W	PVV
14	TMET4S53	55º 22.208′ N	132º 43.396′ W	PROPOSED
		55º 22.208′ N	132º 43.399′ W	PVV
25	TMET4S54	55º 22.208′ N	132º 43.412′ W	PROPOSED
		55º 22.208′ N	132º 43.412′ W	PVV
25	TMET4S55	55º 22.208′ N	132º 43.427′ W	PROPOSED
		55º 22.204′ N	132º 43.428′ W	PVV
26	TMET4S56	55º 22.208′ N	132º 43.443′ W	PROPOSED
		55º 22.207′ N	132º 43.442′ W	PVV
29	TMET4S57	55º 22.208′ N	132º 43.458′ W	PROPOSED
		55º 22.206′ N	132º 43.455′ W	PVV
30	TMET4S58	55º 22.208′ N	132º 43.473′ W	PROPOSED
		55º 22.205′ N	132º 43.475′ W	PVV
0	TMET5S59	55º 22.225′ N	132º 43.282′ W	PROPOSED
0	TMET5S60	55º 22.225′ N	132º 43.297′ W	PROPOSED
0	TMET5S61	55º 22.225′ N	132º 43.312′ W	PROPOSED
0	TMET5S62	55º 22.225′ N	132º 43.327′ W	PROPOSED

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
0	TMET5S63	55º 22.225′ N	132º 43.342′ W	PROPOSED
0	TMET5S64	55º 22.225′ N	132º 43.357′ W	PROPOSED
7	TMET5S65	55º 22.225′ N	132º 43.372′ W	PROPOSED
		55º 22.226′ N	132º 43.375′ W	PVV
13	TMET5S66	55º 22.225′ N	132º 43.387′ W	PROPOSED
		55º 22.225′ N	132º 43.385′ W	PVV
28	TMET5S67	55º 22.225′ N	132º 43.403′ W	PROPOSED
		55º 22.225′ N	132º 43.404′ W	PVV
32	TMET5S68	55º 22.225′ N	132º 43.419′ W	PROPOSED
		55º 22.225′ N	132º 43.419′ W	PVV
34	TMET5S69	55º 22.225′ N	132º 43.434′ W	PROPOSED
		55º 22.225′ N	132º 43.434′ W	PVV
34	TMET5S70	55º 22.225′ N	132º 43.449′ W	PROPOSED
		55º 22.225′ N	132º 43.453′ W	PVV
32	TMET5S71	55º 22.225′ N	132º 43.464′ W	PROPOSED
		55º 22.224′ N	132º 43.470′ W	PVV
34	TMET5S72	55º 22.225′ N	132º 43.480′ W	PROPOSED
		55º 22.225′ N	132º 43.481′ W	PVV
0	TMET6S73	55º 22.242′ N	132º 43.286′ W	PROPOSED
0	TMET6S74	55º 22.242′ N	132º 43.301′ W	PROPOSED
0	TMET6S75	55º 22.242′ N	132º 43.316′ W	PROPOSED
0	TMET6S76	55º 22.242′ N	132º 43.330′ W	PROPOSED
0	TMET6S77	55º 22.242′ N	132º 43.345′ W	PROPOSED
8	TMET6S78	55º 22.242′ N	132º 43.360′ W	PROPOSED
		55º 22.244′ N	132º 43.364′ W	PVV
12	TMET6S79	55º 22.242′ N	132º 43.375′ W	PROPOSED
		55º 22.242′ N	132º 43.374′ W	PVV
24	TMET6S80	55º 22.242′ N	132º 43.389′ W	PROPOSED
		55º 22.243′ N	132º 43.389′ W	PVV
29	TMET6S81	55º 22.242′ N	132º 43.404′ W	PROPOSED
		55º 22.242′ N	132º 43.402′ W	PVV
36	TMET6S82	55º 22.242′ N	132º 43.419′ W	PROPOSED
		55º 22.242′ N	132º 43.418′ W	PVV
36	TMET6S83	55º 22.242′ N	132º 43.434′ W	PROPOSED
		55º 22.242′ N	132º 43.434′ W	PVV
37	TMET6S84	55º 22.242′ N	132º 43.449′ W	PROPOSED
		55º 22.240′ N	132º 43.449′ W	PVV
38	TMET6S85	55º 22.241′ N	132º 43.464′ W	PROPOSED
		55º 22.241′ N	132º 43.464′ W	PVV
39	TMET6S86	55º 22.242′ N	132º 43.479′ W	PROPOSED
		55º 22.241′ N	132º 43.480′ W	PVV

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
42	TMET6S87	55º 22.242′ N	132º 43.494′ W	PROPOSED
0	TMET7S88	55º 22.258′ N	132º 43.283′ W	PROPOSED
0	TMET7S89	55º 22.258′ N	132º 43.297′ W	PROPOSED
0	TMET7S90	55º 22.258′ N	132º 43.312′ W	PROPOSED
0	TMET7S91	55º 22.258′ N	132º 43.327′ W	PROPOSED
0	TMET7S92	55º 22.258′ N	132º 43.341′ W	PROPOSED
9	TMET7S93	55º 22.258′ N	132º 43.357′ W	PROPOSED
		55º 22.258′ N	132º 43.356′ W	PVV
17	TMET7S94	55º 22.258′ N	132º 43.372′ W	PROPOSED
		55º 22.257′ N	132º 43.371′ W	PVV
23	TMET7S95	55º 22.258′ N	132º 43.387′ W	PROPOSED
		55º 22.258′ N	132º 43.384′ W	PVV
36	TMET7S96	55º 22.258′ N	132º 43.402′ W	PROPOSED
		55º 22.258′ N	132º 43.401′ W	PVV
39	TMET7S97	55º 22.258′ N	132º 43.417′ W	PROPOSED
		55º 22.258′ N	132º 43.411′ W	PVV
41	TMET7S98	55º 22.258′ N	132º 43.431′ W	PROPOSED
		55º 22.259′ N	132º 43.432′ W	PVV
42	TMET7S99	55º 22.258′ N	132º 43.446′ W	PROPOSED
		55º 22.257′ N	132º 43.446′ W	PVV
42	TMET7S100	55º 22.258′ N	132º 43.461′ W	PROPOSED
		55º 22.260′ N	132º 43.460′ W	PVV
43	TMET7S101	55º 22.258′ N	132º 43.476′ W	PROPOSED
		55º 22.258′ N	132º 43.476′ W	PVV
44	TMET7S102	55º 22.258′ N	132º 43.490′ W	PROPOSED
		55º 22.260′ N	132º 43.490′ W	PVV
0	TMET8S103	55º 22.282′ N	132º 43.282′ W	PROPOSED
0	TMET8S104	55º 22.282′ N	132º 43.297′ W	PROPOSED
0	TMET8S105	55º 22.282′ N	132º 43.312′ W	PROPOSED
0	TMET8S106	55º 22.282′ N	132º 43.327′ W	PROPOSED
6	TMET8S107	55º 22.282′ N	132º 43.342′ W	PROPOSED
		55º 22.282′ N	132º 43.340′ W	PVV
10	TMET8S108	55º 22.282′ N	132º 43.359′ W	PROPOSED
		55º 22.282′ N	132º 43.359′ W	PVV
17	TMET8S109	55º 22.281′ N	132º 43.372′ W	PROPOSED
		55º 22.282′ N	132º 43.370′ W	PVV
34	TMET8S110	55º 22.282′ N	132º 43.387′ W	PROPOSED
		55º 22.282′ N	132º 43.386′ W	PVV
39	TMET8S111	55º 22.282′ N	132º 43.403′ W	PROPOSED
		55º 22.281′ N	132º 43.403′ W	PVV
40	TMET8S112	55º 22.282′ N	132º 43.417′ W	PROPOSED
		55º 22.282′ N	132º 43.414′ W	PVV

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
43	TMET8S113	55º 22.282′ N 55º 22.280′ N	132º 43.432′ W 132º 43.429′ W	PROPOSED PVV
45	TMET8S114	55º 22.282′ N 55º 22.281′ N	132º 43.447′ W 132º 43.446′ W	PROPOSED PVV
46	TMET8S115	55º 22.282′ N 55º 22.282′ N	132º 43.462′ W 132º 43.459′ W	PROPOSED PVV
48	TMET8S116	55º 22.282′ N 55º 22.281′ N	132º 43.478′ W 132º 43.477′ W	PROPOSED PVV
0	TMET9S117	55º 22.305′ N	132º 43.271′ W	PROPOSED
0	TMET9S118	55º 22.305′ N	132º 43.286′ W	PROPOSED
0	TMET9S119	55º 22.305′ N	132º 43.300′ W	PROPOSED
0	TMET9S120	55º 22.305′ N	132º 43.315′ W	PROPOSED
0	TMET9S121	55º 22.305′ N	132º 43.331′ W	PROPOSED
0	TMET9S122	55º 22.305′ N	132º 43.346′ W	PROPOSED
15	TMET9S123	55º 22.305′ N 55º 22.305′ N	132º 43.361′ W 132º 43.361′ W	PROPOSED PVV
35	TMET9S124	55º 22.305′ N 55º 22.305′ N	132º 43.376′ W 132º 43.376′ W	PROPOSED PVV
46	TMET9S125	55º 22.305′ N 55º 22.305′ N	132º 43.391′ W 132º 43.389′ W	PROPOSED PVV
47	TMET9S126	55º 22.305′ N 55º 22.304′ N	132º 43.405′ W 132º 43.406′ W	PROPOSED PVV
49	TMET9S127	55º 22.305′ N 55º 22.305′ N	132º 43.421′ W 132º 43.422′ W	PROPOSED PVV
55	TMET9S128	55º 22.305′ N 55º 22.306′ N	132º 43.435′ W 132º 43.434′ W	PROPOSED PVV
57	TMET9S129	55º 22.305′ N 55º 22.305′ N	132º 43.450′ W 132º 43.449′ W	PROPOSED PVV
59	TMET9S130	55º 22.305′ N 55º 22.306′ N	132º 43.465′ W 132º 43.465′ W	PROPOSED PVV
0	TMET10S131	55º 22.322′ N	132º 43.265′ W	PROPOSED
0	TMET10S132	55º 22.322′ N	132º 43.280′ W	PROPOSED
0	TMET10S133	55º 22.322′ N	132º 43.295′ W	PROPOSED
0	TMET10S134	55º 22.322′ N	132º 43.310′ W	PROPOSED
0	TMET10S135	55º 22.322′ N	132º 43.324′ W	PROPOSED
0	TMET10S136	55º 22.322′ N	132º 43.339′ W	PROPOSED
33	TMET10S137	55º 22.322′ N 55º 22.322′ N	132º 43.355′ W 132º 43.351′ W	PROPOSED PVV
36	TMET10S138	55º 22.322′ N 55º 22.324′ N	132º 43.370′ W 132º 43.367′ W	PROPOSED PVV

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
46	TMET10S139	55º 22.322′ N 55º 22.322′ N	132º 43.385′ W 132º 43.384′ W	PROPOSED PVV
50	TMET10S140	55º 22.322′ N 55º 22.323′ N	132º 43.399′ W 132º 43.399′ W	PROPOSED PVV
51	TMET10S141	55º 22.322′ N 55º 22.323′ N	132º 43.414′ W 132º 43.415′ W	PROPOSED PVV
49	TMET10S142	55º 22.322′ N 55º 22.323′ N	132º 43.429′ W 132º 43.428′ W	PROPOSED PVV
51	TMET10S143	55º 22.322′ N 55º 22.321′ N	132º 43.444′ W 132º 43.444′ W	PROPOSED PVV
51	TMET10S144	55º 22.322′ N 55º 22.321′ N	132º 43.459′ W 132º 43.460′ W	PROPOSED PVV
0	TMET11S145	55º 22.339′ N	132º 43.265′ W	PROPOSED
0	TMET11S146	55º 22.340′ N	132º 43.280′ W	PROPOSED
0	TMET11S147	55º 22.340′ N	132º 43.295′ W	PROPOSED
12	TMET11S148	55º 22.340′ N 55º 22.337′ N	132º 43.310′ W 132º 43.311′ W	PROPOSED PVV
15	TMET11S149	55º 22.340′ N 55º 22.343′ N	132º 43.325′ W 132º 43.320′ W	PROPOSED PVV
29	TMET11S150	55º 22.340′ N 55º 22.340′ N	132º 43.340′ W 132º 43.340′ W	PROPOSED PVV
36	TMET11S151	55º 22.340′ N 55º 22.342′ N	132º 43.355′ W 132º 43.353′ W	PROPOSED PVV
42	TMET11S152	55º 22.339′ N 55º 22.339′ N	132º 43.369′ W 132º 43.366′ W	PROPOSED PVV
46	TMET11S153	55º 22.340′ N 55º 22.341′ N	132º 43.385′ W 132º 43.385′ W	PROPOSED PVV
50	TMET11S154	55º 22.340′ N 55º 22.341′ N	132º 43.400′ W 132º 43.400′ W	PROPOSED PVV
48	TMET11S155	55º 22.340′ N	132º 43.414′ W	PROPOSED
37	TMET11S156	55º 22.340′ N 55º 22.340′ N	132º 43.429′ W 132º 43.433′ W	PROPOSED PVV
38	TMET11S157	55º 22.339′ N 55º 22.339′ N	132º 43.444′ W 132º 43.442′ W	PROPOSED PVV
38	TMET11S158	55º 22.339′ N 55º 22.338′ N	132º 43.459′ W 132º 43.461′ W	PROPOSED PVV
0	TMET12S159	55º 22.356′ N	132º 43.257′ W	PROPOSED
0	TMET12S160	55º 22.356′ N	132º 43.272′ W	PROPOSED
0	TMET12S161	55º 22.356′ N	132º 43.286′ W	PROPOSED
0	TMET12S162	55º 22.356′ N	132º 43.301′ W	PROPOSED

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
6	TMET12S163	55º 22.356′ N 55º 22.356′ N	132º 43.316′ W 132º 43.316′ W	PROPOSED PVV
15	TMET12S164	55º 22.356′ N 55º 22.356′ N	132º 43.331′ W 132º 43.332′ W	PROPOSED PVV
22	TMET12S165	55º 22.356′ N 55º 22.356′ N	132º 43.347′ W 132º 43.346′ W	PROPOSED PVV
30	TMET12S166	55º 22.356′ N	132º 43.361′ W	PROPOSED
32	TMET12S167	55º 22.356′ N 55º 22.356′ N	132º 43.376′ W 132º 43.375′ W	PROPOSED PVV
33	TMET12S168	55º 22.356′ N 55º 22.355′ N	132º 43.391′ W 132º 43.391′ W	PROPOSED PVV
34	TMET12S169	55º 22.356′ N 55º 22.353′ N	132º 43.406′ W 132º 43.402′ W	PROPOSED PVV
35	TMET12S170	55º 22.356′ N 55º 22.356′ N	132º 43.421′ W 132º 43.424′ W	PROPOSED PVV
37	TMET12S171	55º 22.356′ N 55º 22.356′ N	132º 43.436′ W 132º 43.437′ W	PROPOSED PVV
38	TMET12S172	55º 22.356′ N 55º 22.356′ N	132º 43.451′ W 132º 43.446′ W	PROPOSED PVV
0	TMET13S173	55º 22.372′ N	132º 43.249′ W	PROPOSED
0	TMET13S174	55º 22.372′ N	132º 43.263′ W	PROPOSED
0	TMET13S175	55º 22.372′ N	132º 43.278′ W	PROPOSED
0	TMET13S176	55º 22.372′ N	132º 43.293′ W	PROPOSED
0	TMET13S177	55º 22.372′ N	132º 43.308′ W	PROPOSED
14	TMET13S178	55º 22.372′ N 55º 22.371′ N	132º 43.323′ W 132º 43.323′ W	PROPOSED PVV
23	TMET13S179	55º 22.372′ N 55º 22.372′ N	132º 43.338′ W 132º 43.335′ W	PROPOSED PVV
30	TMET13S180	55º 22.372′ N 55º 22.372′ N	132º 43.352′ W 132º 43.354′ W	PROPOSED PVV
32	TMET13S181	55º 22.372′ N 55º 22.370′ N	132º 43.367′ W 132º 43.370′ W	PROPOSED PVV
34	TMET13S182	55º 22.372′ N 55º 22.369′ N	132º 43.382′ W 132º 43.382′ W	PROPOSED PVV
36	TMET13S183	55º 22.372′ N 55º 22.371′ N	132º 43.397′ W 132º 43.400′ W	PROPOSED PVV
37	TMET13S184	55º 22.372′ N 55º 22.372′ N	132º 43.412′ W 132º 43.414′ W	PROPOSED PVV
38	TMET13S185	55º 22.327′ N 55º 22.372′ N	132º 43.426′ W 132º 43.427′ W	PROPOSED PVV
0	TMET14S186	55º 22.388′ N	132º 43.238′ W	PROPOSED
0	TMET14S187	55º 22.388′ N	132º 43.253′ W	PROPOSED

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
0	TMET14S188	55º 22.388′ N	132º 43.268′ W	PROPOSED
0	TMET14S189	55º 22.388′ N	132º 43.282′ W	PROPOSED
10	TMET14S190	55º 22.388′ N	132º 43.297′ W	PROPOSED
		55º 22.388′ N	132º 43.297′ W	PVV
22	TMET14S191	55º 22.388′ N	132º 43.312′ W	PROPOSED
		55º 22.388′ N	132º 43.313′ W	PVV
27	TMET14S192	55º 22.388′ N	132º 43.327′ W	PROPOSED
		55º 22.388′ N	132º 43.327′ W	PVV
29	TMET14S193	55º 22.388′ N	132º 43.342′ W	PROPOSED
		55º 22.389′ N	132º 43.343′ W	PVV
31	TMET14S194	55º 22.388′ N	132º 43.357′ W	PROPOSED
		55º 22.386′ N	132º 43.357′ W	PVV
32	TMET14S195	55º 22.388′ N	132º 43.373′ W	PROPOSED
		55º 22.387′ N	132º 43.372′ W	PVV
32	TMET14S196	55º 22.388′ N	132º 43.388′ W	PROPOSED
		55º 22.389′ N	132º 43.385′ W	PVV
36	TMET14S197	55º 22.388′ N	132º 43.403′ W	PROPOSED
		55º 22.390′ N	132º 43.401′ W	PVV
36	TMET14S198	55º 22.388′ N	132º 43.418′ W	PROPOSED
		55º 22.388′ N	132º 43.418′ W	PVV
36	TMET14S199	55º 22.388′ N	132º 43.433′ W	PROPOSED
		55º 22.386′ N	132º 43.434′ W	PVV
0	TMET15S200	55º 22.405′ N	132º 43.227′ W	PROPOSED
0	TMET15S201	55º 22.405′ N	132º 43.242′ W	PROPOSED
0	TMET15S202	55º 22.405′ N	132º 43.257′ W	PROPOSED
0	TMET15S203	55º 22.405′ N	132º 43.272′ W	PROPOSED
15	TMET15S204	55º 22.405′ N	132º 43.287′ W	PROPOSED
		55º 22.405′ N	132º 43.289′ W	PVV
24	TMET15S205	55º 22.405′ N	132º 43.302′ W	PROPOSED
		55º 22.405′ N	132º 43.306′ W	PVV
27	TMET15S206	55º 22.405′ N	132º 43.317′ W	PROPOSED
		55º 22.404′ N	132º 43.317′ W	PVV
29	TMET15S207	55º 22.405′ N	132º 43.332′ W	PROPOSED
		55º 22.405′ N	132º 43.333′ W	PVV
30	TMET15S208	55º 22.405′ N	132º 43.347′ W	PROPOSED
		55º 22.402′ N	132º 43.351′ W	PVV
33	TMET15S209	55º 22.405′ N	132º 43.362′ W	PROPOSED
		55º 22.404′ N	132º 43.363′ W	PVV
35	TMET15S210	55º 22.405′ N	132º 43.377′ W	PROPOSED
		55º 22.405′ N	132º 43.378′ W	PVV
35	TMET15S211	55º 22.405′ N	132º 43.392′ W	PROPOSED
		55º 22.404′ N	132º 43.390′ W	PVV

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
36	TMET15S212	55º 22.405′ N 55º 22.407′ N	132º 43.407′ W 132º 43.406′ W	PROPOSED PVV
38	TMET15S213	55º 22.405′ N 55º 22.402′ N	132º 43.422′ W 132º 43.426′ W	PROPOSED PVV
5	TMWT1S1	55º 22.160′ N 55º 22.160′ N	132º 44.308′ W 132º 44.308′ W	PROPOSED PVV
13	TMWT1S2	55º 22.160′ N 55º 22.160′ N	132º 44.294′ W 132º 44.295′ W	PROPOSED PVV
15	TMWT1S3	55º 22.160′ N 55º 22.162′ N	132º 44.280′ W 132º 44.277′ W	PROPOSED PVV
18	TMWT1S4	55º 22.160′ N 55º 22.160′ N	132º 44.266′ W 132º 44.266′ W	PROPOSED PVV
12	TMWT1S5	55º 22.160′ N 55º 22.160′ N	132º 44.252′ W 132º 44.255′ W	PROPOSED PVV
15	TMWT1S6	55º 22.160′ N 55º 22.161′ N	132º 44.237′ W 132º 44.240′ W	PROPOSED PVV
11	TMWT1S7	55º 22.160′ N 55º 22.161′ N	132º 44.223′ W 132º 44.225′ W	PROPOSED PVV
7	TMWT1S8	55º 22.160′ N 55º 22.160′ N	132º 44.209′ W 132º 44.209′ W	PROPOSED PVV
8	TMWT1S9	55º 22.160′ N 55º 22.160′ N	132º 44.194′ W 132º 44.192′ W	PROPOSED PVV
3	TMWT2S10	55º 22.125′ N 55º 22.125′ N	132º 44.313′ W 132º 44.316′ W	PROPOSED PVV
5	TMWT2S11	55º 22.125′ N 55º 22.126′ N	132º 44.299′ W 132º 44.300′ W	PROPOSED PVV
7	TMWT2S12	55º 22.126′ N 55º 22.127′ N	132º 44.285′ W 132º 44.284′ W	PROPOSED PVV
8	TMWT2S13	55º 22.125′ N 55º 22.128′ N	132º 44.270′ W 132º 44.270′ W	PROPOSED PVV
9	TMWT2S14	55º 22.125′ N 55º 22.127′ N	132º 44.256′ W 132º 44.256′ W	PROPOSED PVV
7	TMWT2S15	55º 22.125′ N 55º 22.125′ N	132º 44.242′ W 132º 44.242′ W	PROPOSED PVV
9	TMWT2S16	55º 22.125′ N 55º 22.126′ N	132º 44.227′ W 132º 44.225′ W	PROPOSED PVV
10	TMWT2S17	55º 22.126′ N 55º 22.125′ N	132º 44.213′ W 132º 44.213′ W	PROPOSED PVV
9	TMWT2S18	55º 22.125′ N 55º 22.126′ N	132º 44.198′ W 132º 44.198′ W	PROPOSED PVV
3	TMWT3S19	55º 22.091′ N 55º 22.091′ N	132º 44.342′ W 132º 44.359′ W	PROPOSED PVV

-TABLE 1. TWELVEMILE ARM SAMPLING LOCATION COORDINATES				
DEPTH MLLW	Transect ID	Latitude	Longitude	Comments
5	TMWT3S20	55º 22.091′ N 55º 22.091′ N	132º 44.328′ W 132º 44.332′ W	PROPOSED PVV
8	TMWT3S21	55º 22.091′ N 55º 22.091′ N	132º 44.314′ W 132º 44.314′ W	PROPOSED PVV
5	TMWT3S22	55º 22.091′ N 55º 22.091′ N	132º 44.301′ W 132º 44.301′ W	PROPOSED PVV
6	TMWT3S23	55º 22.091′ N 55º 22.092′ N	132º 44.286′ W 132º 44.288′ W	PROPOSED PVV
6	TMWT3S24	55º 22.091′ N 55º 22.090′ N	132º 44.272′ W 132º 44.271′ W	PROPOSED PVV
7	TMWT3S25	55º 22.091′ N 55º 22.091′ N	132º 44.258′ W 132º 44.257′ W	PROPOSED PVV
8	TMWT3S26	55º 22.091′ N 55º 22.091′ N	132º 44.243′ W 132º 44.243′ W	PROPOSED PVV
10	TMWT3S27	55º 22.091′ N 55º 22.090′ N	132º 44.229′ W 132º 44.229′ W	PROPOSED PVV

Abundance Tables

Scientific Name	Common Name	Abundance
Plants		
Ulva / Monstroma spp.	Sea lettuce	C
Lithothamnion spp.	Crustose red algae	L
Agarum clathratum	Sieve Kelp	L
Laminaria saccharina	Suger kelp	L
Zostera marina	Eel Grass	L
Invertebrates		
Mediaster aequalis	Red star	L
Luidia foliolata	Sand star	L
Pycnopodia helianthoides	Sunflower star	L
Pisaster ochraceus	Ochre star	L
Pododesmus macrochisma	Jingle	L
Cucumaria miniata	Orange sea cucumber	L
Dermasterias imbricata	Leather star	L
Solaster sp.	Sun star	L
Ophiuroidea spp.	Brittle star	L
Chionoecetes bairdi	Tanner crab	L
Cancer products	Red rock crab	L
Pandalus spp.	Shrimp	A
Pagurus spp.	Hermit crab	C
Bankia setacea	Shipworm	L
Protothaca staminea	Littleneck clam	C
Beggiatoa sp.	Bacteria	L
Polyplacophora spp.	Chiton	L
Unidentified Benthic Infauna	Benthic Infauna	L
Metridium senile	Anemone	L
Parastichopus californicus	Sea cucumber	L
Invertebrates		
Cottidae spp.	Sculpin	L
Hexagrammos decagrammus	Kelp greenling	L