

Underwater Bark Debris Survey  
Saginaw Bay Log Transfer Facility  
Kuiu Island, Alaska

Submitted to: USDA Forest Service, Region 10  
Ketchikan Area, Tongass National Forest  
Federal Building, 648 Mission Street  
Ketchikan, AK 99901

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June 12 & 13, 2001

**Introduction:**

An underwater survey requested to determine the extent of bark debris accumulation at the Saginaw Bay Log Transfer Facility, Kuiu Island, Alaska, was performed on June 12 & 13, 2001. The purpose of the survey was to determine the areal extent of bark deposition at this facility. The protocol for operating a bark monitoring program is given in the EPA General Permit.

**Methods:**

The permanent reference point location was located at the position marked by Forest Service personnel, directly below and at the base of the log bulkhead, and established as close as possible to the Mean Low Low Water (MLLW) depth to facilitate relocation for future surveys. The standard five transects were established, plus one additional transect to assess the continuous cover that extended more than fifteen feet beyond the lateral transect, radiating from the reference point origin at 30 degree intervals. The magnetic compass bearings were the identifying labels for the transects.

Each transect was sampled at 15-foot intervals starting from the origin at the permanent reference point. Debris depth measurements were made with a hand-held ruler at the sample point. The measurement was taken by vertically inserting the ruler into the debris until the natural substrate was felt or its location estimated as closely as possible. Periodically, when the confidence level in the measurement decreased due to the substrate type and/or bark amount, the bark depth was confirmed by digging by hand through the bark layer to the natural substrate. Percentage of areal coverage by bark debris was determined by using the ruler, which was randomly dropped at the sample point, as the base of a visually estimated 3-foot square. The percent cover was estimated by the amount of bark cover within that square.

Sample points were established along a transect until a water depth of 60 feet MLLW was reached or the measured bark debris depth became insignificant (usually interpreted to mean that less than one inch of bark depth, less than 10 % cover, and a clear decreasing trend is apparent towards the end of the transect). At each sample location several data points were recorded by the diver: water depth; debris depth; percent coverage of debris; direction and strength of current; visibility; and the presence of any significant operational debris.

Photographs were taken of representative sample points along the transects to document substrate, bark debris, algal and animal life, and any other debris/objects that may be of concern. Water depth measurements were taken from a Suunto Vyper dive computer with an accuracy of +/- 1%. A Suunto compass attached to the 4-foot measuring ruler was used to navigate the transect compass headings.

The total survey surface area was determined by calculating the total area of the 30<sup>0</sup> triangles formed by adjacent transects, and the total square footage of the debris field area was a summation of all the triangle areas for the number of transects performed. This

figure was converted to acres as required by the guidelines. The calculation method used in this report is outlined in the ADEC publication "**Required Method for Bark Monitoring Surveys under the LTF General Permits**", June 9, 2000. The method for calculating continuous and discontinuous areas also follows this prescribed method.

### **Results:**

DGPS position of the reference point, taken by positioning the boat directly over the point, was 56° 51.170 North, 134° 10.483 West.

Weather conditions at survey time on the evening of the 12th were mostly cloudy skies, with southwesterly winds at 15 knots. The diving started at 1700, taking place during the end of a flooding tide cycle. High tide occurred at 1845 with a height of 6.4 feet (corrected to subordinate station # 1717, Saginaw Bay, Kuiu Island, from the Juneau reference station) and a tidal range of 5.9 feet. No noticeable current was present during the survey dive. Water temperature was measured at 46 degrees at depth. Underwater visibility was estimated to be 4-8 feet, with the visibility reduced in a dense plankton bloom.

Weather conditions at survey time on the morning of the 13th were overcast skies, with southwesterly winds at 20 knots, and light rainshowers. The diving started at 0845, taking place during the middle of an ebbing tide cycle. High tide occurred at 0618 with a height of 10.5 feet and a tidal range of 8.1 feet. A light current running approximately parallel to the shoreline from the northwest to southeast was present during the survey dive. Water temperature was measured at 46 degrees at depth. Underwater visibility was still estimated to be 4-8 feet.

A total of 121 sample points were taken on the six transects, and all sample points had at least a trace of bark debris. The total area covered by the dive survey was 3.1 acres. The area covered by 100 % bark cover was 1.7 acres. The area covered by discontinuous bark debris was 1.4 acres.

<b>Bark Deposition Summary</b>		
<b>Total Survey Area</b>	<b>Area with Continuous Bark Cover</b>	<b>Area with Discontinuous Bark Cover</b>
3.1 Acres	1.7 Acres	1.4 Acres

### **Observations:**

The LTF was not operational at survey time. It is located near the head of Saginaw Bay on the southern shoreline. The reference point location was established directly below the pink ribbon marking the approximate center of the old log bulkhead, on the fill rock. Transect 330 terminates near the point of a curving shoreline extension. Transect 000

terminates on top of a rock reef (which appears to come close to baring at low tide), while transect 030 (the center transect) just crosses the eastern base of this reef. The substrate over the rest of the survey area is varying mixtures of silt, sand, gravel, and shell. The additional transect (120) terminated as it ascended into the intertidal zone of the curving shoreline.

The zone of deposit covers the entire dive survey area. The bark depth measurement data show a decreasing trend towards the ends of all transects, with most of the 100 % bark accumulation extending out a considerable distance in the direction of transects 060 and 090. It appears that the shoreline extension and reef system in the northern portion of the area blocks bark deposition in that direction, as well as probably preventing operational activity in that direction. Character and size of the observed bark debris varied, depending on the area. Most of the bark debris to the east consisted of bark chips and chunks. The debris to the northwest, and along transect 120, consisted primarily of much finer, smaller bark particles and pieces. Scattered sunken logs were noted occasionally over the survey area.

No significant manmade debris was observed in the survey area other than the typical, minor operational debris.

If there are any questions regarding this report, please contact me at 907-826-3481 or by email at [craigdiv@aptalaska.net](mailto:craigdiv@aptalaska.net). Thank you for allowing Craig's Dive Center to be of service.

Respectfully submitted,

A handwritten signature in black ink that reads "Craig Sempert". The signature is written in a cursive style with a large, stylized initial "C" and a long horizontal stroke extending to the right.

Craig Sempert  
Diver

July 4, 2001

**TABLE 1**  
**Transect Data**

Transect/Sample Pt.	Depth from MLLW	Debris Depth (in)	Percent Coverage
Ref. Pt.	1	<1	10
120/1	0	<1	25
120/2	0	<1	50
120/3	0	<1	75
120/4	0	<1	90
120/5	1	<1	75
120/6	3	<1	75
120/7	4	<1	90
120/8	5	<2	100
120/9	5	3	100
120/10	5	4	100
120/11	0	<1	25
120/12	+2	T	T
090/1	3	<1	25
090/2	3	1	50
090/3	6	1	50
090/4	8	<1	50
090/5	15	<1	50
090/6	20	6	100
090/7	21	8	100
090/8	22	8	100
090/9	25	7	100
090/10	27	7	100
090/11	28	8	100
090/12	29	8	100
090/13	30	7	100
090/14	31	6	100
090/15	33	2	100
090/16	34	2	90
090/17	36	1	75
090/18	37	<1	50
090/19	37	1	75
090/20	38	2	100
090/21	39	3	100
090/22	39	2	100
090/23	40	2	100
090/24	40	2	100
090/25	39	2	100
090/26	39	1	100

**TABLE 1 (cont.)**  
**Transect Data**

Transect/Sample Pt.	Depth from MLLW	Debris Depth (in)	Percent Coverage
090/27	38	<1	90
090/28	38	<1	90
090/29	36	<1	90
090/30	36	<1	50
090/31	35	<1	25
090/32	35	<1	25
090/33	34	<1	10
060/1	2	<1	10
060/2	3	<1	25
060/3	4	<1	25
060/4	5	2	50
060/5	13	3	100
060/6	17	9	100
060/7	19	11	100
060/8	21	13	100
060/9	22	12	100
060/10	24	10	100
060/11	26	8	100
060/12	27	7	100
060/13	27	6	100
060/14	28	6	100
060/15	28	6	100
060/16	29	6	100
060/17	30	6	100
060/18	31	5	100
060/19	32	5	100
060/20	33	5	100
060/21	33	5	100
060/22	34	5	100
060/23	35	5	100
000/24	36	5	100
000/25	36	5	100
000/26	37	4	100
000/27	37	3	100
000/28	37	2	100
000/29	37	2	100
000/30	38	1	90
000/31	37	<1	90
000/32	37	<1	75

**TABLE 1 (cont.)**  
**Transect Data**

Transect/Sample Pt.	Depth from MLLW	Debris Depth (in)	Percent Coverage
060/33	36	<1	25
060/34	36	<1	10
030/1	4	<1	10
030/2	7	<1	10
030/3	11	2	90
030/4	16	24	100
030/5	19	19	100
030/6	19	12	100
030/7	19	15	100
030/8	19	8	100
030/9	18	3	100
030/10	16	<1	25
030/11	15	<1	25
030/12	14	<1	10
030/13	14	<1	25
030/14	15	<1	25
030/15	15	<1	25
030/16	16	<1	10
000/1	1	<1	50
000/2	2	6	100
000/3	4	13	100
000/4	8	21	100
000/5	8	19	100
000/6	9	15	100
000/7	9	7	100
000/8	8	1	90
000/9	7	1	90
000/10	5	<1	50
000/11	+1	T	T
330/1	4	<1	10
330/2	8	6	100
330/3	8	12	100
330/4	9	12	100
330/5	9	13	100
330/6	9	13	100
330/7	9	13	100
330/8	10	7	100

**TABLE 1 (cont.)  
Transect Data**

<b>Transect/Sample Pt.</b>	<b>Depth from MLLW</b>	<b>Debris Depth (in)</b>	<b>Percent Coverage</b>
330/9	7	3	100
330/10	6	2	90
330/11	6	<1	50
330/12	6	<1	25
330/13	5	<1	10
330/14	4	T	T

<b>Key to Substrate Type</b>	
Brk	Bedrock
Gr	Gravel
Rk	Rock
Sa	Sand
Sh	Shell
Si	Silt

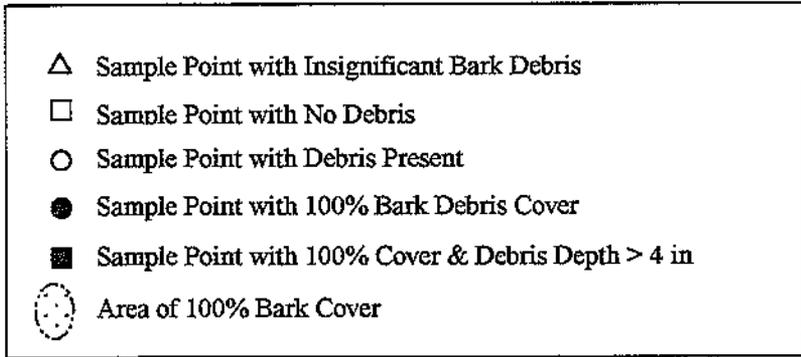
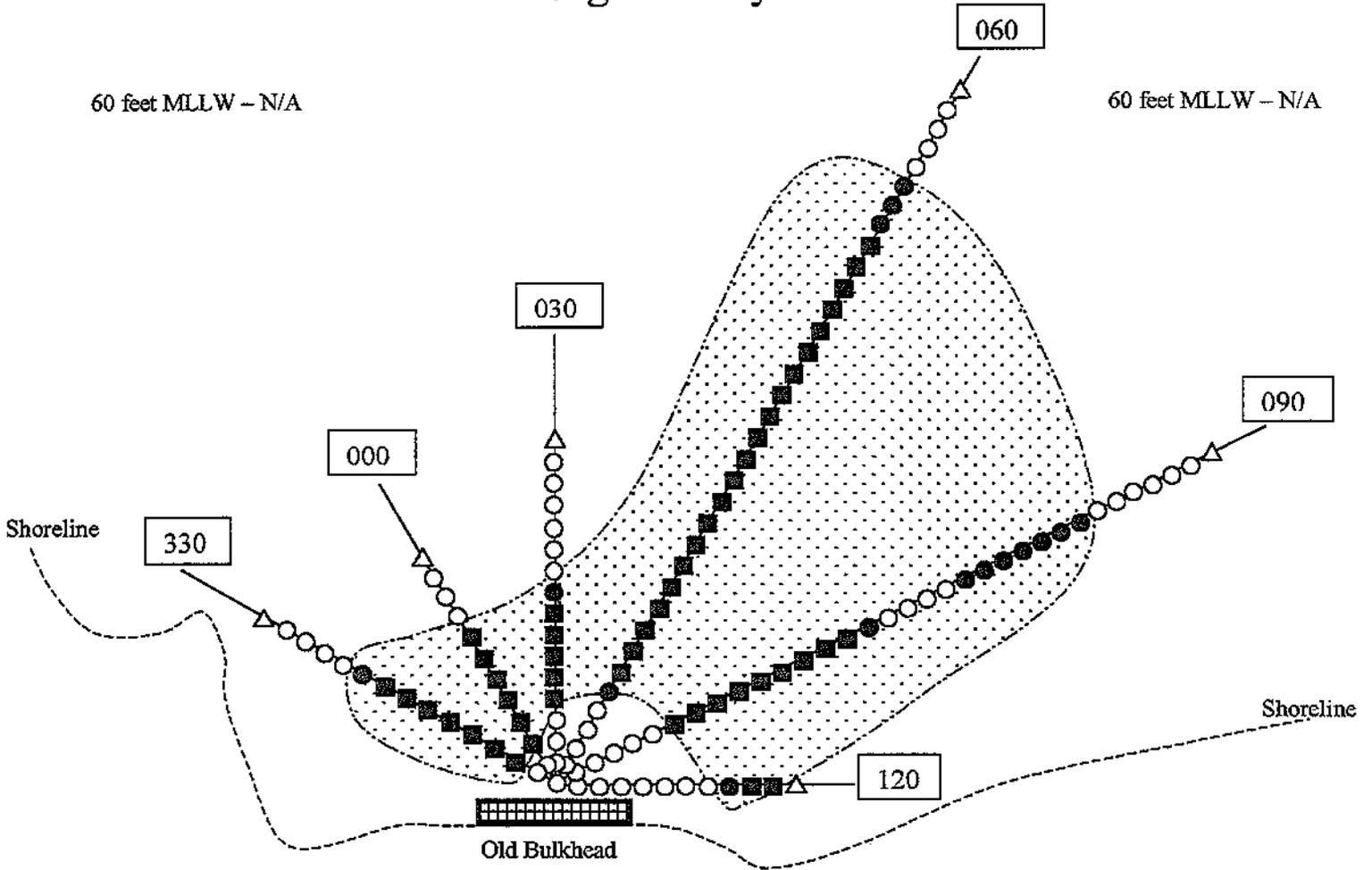


Diagram Not To Scale



### Saginaw Bay



### 6/12 & 13/01 Saginaw Bay LTF Dive Survey

