

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

Submitted to: USDA Forest Service, Region 10
Ketchikan Area, Tongass National Forest
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Introduction:

An underwater survey requested to determine the extent of bark debris accumulation at the Rowan Bay Log Transfer Facility, Kuiu Island, Alaska, was performed on June 12, 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 relocated at the position staked by Forest Service personnel, and established as close as possible to the Mean Low Low Water (MLLW) depth to facilitate relocation for future surveys. The five transects from the previous survey were re-established, plus one additional 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° 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° 40.101 North, 134° 15.324 West.

Weather conditions at survey time were partly cloudy skies, with southwesterly winds at ten to 15 knots. The diving started at 1020, taking place during a low slack tide cycle. Low tide occurred at 1209 with a height of 0.6 feet (corrected to subordinate station # 1775, Tebenkof Bay, Kuiu Island, from the Sitka reference station) and a tidal range of 8.8 feet. No noticeable current was present during the survey dive. Water temperature was measured at 48 degrees. Underwater visibility was estimated to be 2-12 feet, with the visibility decreasing with depth. The narrow, shallow entrance into Rowan Bay might be causing this unusual reversal of typical visibility conditions, preventing complete tidal flushing in the bay.

A total of 95 sample points were taken on the six transects, and all sample points had some bark debris. The total area covered by the dive survey was 1.9 acres. The area covered by 100 % bark cover was 0.6 acres. The area covered by discontinuous bark debris was 1.3 acres.

Bark Deposition Summary		
Total Survey Area	Area with Continuous Bark Cover	Area with Discontinuous Bark Cover
1.9 Acres	0.6 Acres	1.3 Acres

Observations:

The LTF was not operational at survey time. It is located approximately in the middle of the northern shoreline of Rowan Bay. The stake marking the reference point location was midway between a low-angle rail slide and an old bulkhead. What appears to be a relatively new fill rock causeway to a circular sheet pile bulkhead is located just to the west of the slide, and partly encloses the survey area. Transect 330 parallels the fill rock structure on which the reference point is located until it terminates at the curving shoreline. Transect 120 terminates at the causeway structure. The substrate over most of the survey area is silt, except for some sand, gravel, and shell at sample points just below the shoreline. There is a small low-profile bedrock reef approximately 90 feet out transect 060. The end of transect 090 has considerable rock protruding up through the silt, possibly from the close proximity of the circular bulkhead. What appears to be an

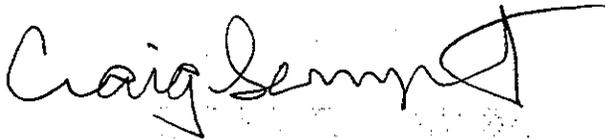
impact crater from log bundle entry on the rail slide disrupts the 100 % bark accumulation continuity for the first few sample points along transects 060, 090, and 120.

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 the 100 % bark accumulation located just out from the fill rock structure marked by the reference stake. Character and size of the observed bark debris varied considerably. Most of the bark could be characterized as bark dust, chips, chunks, and small wood pieces. The bark accumulation becomes mixed with silt to such a degree that it could no longer be measured as 100 % debris. This transition was estimated to occur at a distance of 9-12 sample points out from the reference point. Scattered sunken logs were noted occasionally over the survey area, some nearly entirely buried by the bark and/or silt.

The only significant manmade debris observed in the survey area, other than the typical, minor operational debris, was a pile of large steel I-beams along transect 030.

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

Respectfully submitted,



Craig Sempert
Diver

June 29, 2001

TABLE 1
Transect Data

Transect/Sample Pt.	Depth from MLLW	Debris Depth (in)	Percent Coverage
Ref. Pt.	4	<1	10
120/1	4	10	100
120/2	6	14	100
120/3	8	1	25
120/4	6	18	100
120/5	5	10	100
120/6	4	<1	50
090/1	4	19	100
090/2	6	7	100
090/3	8	13	100
090/4	8	2	100
090/5	7	8	100
090/6	9	18	100
090/7	16	22	100
090/8	22	20	100
090/9	26	22	100
090/10	30	13	100
090/11	33	10	100
090/12	36	7	100
090/13	42	6	90
090/14	43	6	75
090/15	47	3	25
090/16	50	<1	10
060/1	7	28	100
060/2	10	22	100
060/3	14	24	100
060/4	16	22	100
060/5	16	8	100
060/6	24	4	90
060/7	33	9	100
060/8	36	12	100
060/9	40	10	100
060/10	42	6	75
060/11	43	6	75
060/12	43	4	50
060/13	42	4	50
060/14	42	4	25

TABLE 1 (cont.)
Transect Data

Transect/Sample Pt.	Depth from MLLW	Debris Depth (in)	Percent Coverage
060/15	42	3	25
060/16	41	2	10
060/17	41	2	10
030/1	5	21	100
030/2	7	18	100
030/3	10	26	100
030/4	14	20	100
030/5	17	12	100
030/6	18	15	100
030/7	20	10	100
030/8	23	10	100
030/9	25	10	100
030/10	29	8	100
030/11	30	8	100
030/12	31	8	100
030/13	33	9	90
030/14	36	5	90
030/15	35	5	90
030/16	33	8	90
030/17	33	6	75
030/18	32	5	75
030/19	32	2	25
030/20	32	2	25
030/21	32	<1	10
030/22	31	<1	10
000/1	6	28	100
000/2	8	13	100
000/3	12	23	100
000/4	15	20	100
000/5	17	14	100
000/6	19	15	100
000/7	20	10	100
000/8	21	6	100
000/9	23	6	100
000/10	23	4	75
000/11	24	6	50
000/12	25	6	50
000/13	25	6	50

TABLE 1 (cont.)
Transect Data

Transect/Sample Pt.	Depth from MLLW	Debris Depth (in)	Percent Coverage
000/14	25	6	50
000/15	25	6	50
000/16	25	6	50
000/17	24	6	50
000/18	24	6	25
000/19	24	4	25
000/20	24	4	25
000/21	24	3	25
000/22	24	3	10
330/1	4	17	100
330/2	5	21	100
330/3	7	18	100
330/4	8	24	100
330/5	11	31	100
330/6	12	19	100
330/7	11	18	100
330/8	11	20	100
330/9	10	6	75
330/10	10	3	50
330/11	8	<1	10

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

△ Sample Point with Insignificant Bark Debris
□ Sample Point with No Debris
○ Sample Point with Debris Present
● Sample Point with 100% Bark Debris Cover
■ Sample Point with 100% Cover & Debris Depth > 4 in
⊙ Area of 100% Bark Cover

Diagram Not To Scale

