Skagit County Creosote Inventory and Removal Project: Phase II

Skagit County Marine Resources Committee

Final Report -- June 2007

Creosote Subcommittee

Paul Dinnel, Neil Borman, Keeley O'Connell, Erica Pickett, Jim Ramaglia, Michael See and Paul Sund

Skagit MRC

WASHINGTON STATE DEPARTMENT OF Natural Resources
Doug Sutherland - Commissioner of Public Lands

NORTHWEST STRAITS
marine conservation initiative

County: Skagit
Grant No: G0600049

PROJECT TITLE: Treated Wood Inventory and Removal

DELIVERABLES FOR TASK NO: 8

PROGRESS REPORT: [ ] FINAL REPORT [**X**]

PERIOD COVERED: 1 July 2005 to 30 June 2007

DATE SUBMITTED: 29 June 2007

This report was funded in part through a cooperative agreement with the National Oceanic and Atmospheric Administration.

Acknowledgments

The Skagit Marine Resources Committee thanks the following for their invaluable assistance with our treated wood inventory and removal project:

Funding Sources: Northwest Straits Commission and Washington Department of Natural Resources

Project Management: Michael See, Skagit County Public Works

Skagit MRC Creosote Subcommittee: Paul Dinnel, Neil Borman, Keeley O'Connell, Erica pickett, Jim Ramaglia, Michael See and Paul Sund

Volunteers: Too many to list here. Please see Table 1

Contract Coordinators: Sharon Riggs, Padilla Bay Reserve, Sasha Horst, Northwest Straits Commission and Lisa Kaufman, Washington Department of Natural Resources

Project Contractor: Dunlap Towing, La Conner, WA. Many thanks to Jim Sanford, , Ken Hansen, Jason Justice and Rick Culver and others. You did a great job!

Partner Organizations: Skagit Beach Watchers, Washington Department of Natural Resources, Upper Skagit Tribe and Shannon Point Marine Center

This report is dedicated to Tony Frantz, Island County, who started the Puget Sound Creosote Awareness Project. Thank you Tony!

National Oceanic & Atmospheric Administration

Washington State Department of Ecology

Northwest Straits Marine Conservation Initiative

This report was developed, in part, with funds from the National Oceanic & Atmospheric Administration. The views expressed herein are those of the authors and do not necessarily represent NOAA or any of its sub-agencies. CZM Grant #G0600049, administered by Washington State Department of Ecology and the Northwest Straits Commission, was awarded to Skagit County Public Works Department.

Table of Contents

List of Tables and Figures

Skagit County Creosote Inventory and Removal Project: Phase II

Introduction

A large number of docks, trestles, marina structures, floats and bulkheads have been built in the waters of Puget Sound. Most of these structures have been built using a variety of treated woods, although the vast majority has used pressure-treated creosote pilings and timbers.

The term "creosote" as used in this report refers to a variety of products that are mixtures of many chemicals including wood creosote, coal tar creosote, coal tar and coal tar pitch. The most common form of creosote used in the U.S. is coal tar creosote. It is a thick, oily liquid that is typically amber to black in color and is a distillation of coal tar. Creosote pilings and timbers can contain almost 300 chemicals, many of which can be toxic to marine life and can cause abnormalities and death. Up to about 60% of the compounds in creosote solutions are polycyclic aromatic hydrocarbons (PAHs). Creosote-associated compounds can cause human health problems including skin rashes, chemical burns, eye irritation, mental confusion, and kidney and liver problems, even with relatively brief exposures. Longer exposures can cause unconsciousness and death, and some creosote compounds are known to be human carcinogens (http://www.nsc.org/library/chemical/Creosote.htm).

Research with Pacific herring (*Clupea pallasi*) has shown that egg hatching success is reduced by 50% at creosote concentrations of 50 parts per billion (ppb) and that hatching success is significantly reduced when embryos were exposed to 3 ppb (Vines et al. 2000). Zooplankton microcosm studies with creosote found that a 50% reduction in abundance occurred at 2.9 ppb (Sibley et al. 2001) and Karrow et al. (1999) found a Lowest Observed Effect Concentration (LOEC) of 0.6 ppb for suppression of rainbow trout immune responses. Fish studies summarized by Weis and Weis (1989) indicate that hatching success of several other fish species is adversely affected in pentachlorophenol (PCP – a compound in creosote) concentrations in the range of 10 to 200 ppb. Other authors have described the effects of a plethora of creosote-related contaminants in marine sediments and sea-surface microlayers to adult fish, developing fish eggs and invertebrates (e.g., see Malins et al. 1984; Kocan et al. 1987; Hardy et al. 1987; PTI Environmental Services 1990; Misitano et al. 1994; Stratus Consulting 2005).

The newer generation of treated woods is primarily of two types: Ammoniacal copper zinc arsenate (ACZA) and chromated copper arsenate (CCA). These treated woods mostly contain metals that can be toxic to marine life in certain situations but these compounds do not generally pose bioaccumulation hazards that some creosote-related compounds might. These compounds may also pose health hazards to children who may be routinely exposed to treated wood chemicals by way of playground equipment and decking materials. While this project primarily targeted creosote-treated wood, both types of wood products were inventoried and removed during recovery operations.

Creosote compounds and other wood preservatives continually drip or leach from treated wood used in marine and aquatic situations (Figs. 1 and 2). Treated wood is often eroded into smaller particles due to the abrasive action of boat traffic, storms and contact with shorelines when pilings break off. Some of these compounds can accumulate in marine sediments (Westin Solutions 2006) where they can cause direct toxicity or they may be mobilized into higher trophic levels via the food chain. Other compounds can be leached into the surface microlayer where they can adversely affect floating fish eggs, invertebrate larvae and plankton. Forage fish feeding on these organisms may then accumulate some compounds from the microlayer and pass them to higher trophic levels (marine fish, sea birds, marine mammals, and humans). Contaminants found in the surface microlayer eventually are deposited on shorelines (the bath tub ring effect), which are rich in marine life, including surf smelt and sand lance eggs, molluscan shellfish, juvenile fish, and crustaceans of many species. Indeed, the conclusions of a recently completed risk evaluation for NOAA (Stratus Consulting 2005) concluded that

> "Based on the findings of this report, that creosote moves into the environment under a variety of realistic conditions, and environmental levels of contaminants originating from creosote-treated wood are often toxic, precautions to avoid creosote-treated wood where practical, and measures to isolate potential toxic effects appear to be justified. We recommend that similar precautions be implemented by regulating agencies throughout the United States."

Given the hundreds of thousands (perhaps millions) of creosote-treated pilings and timbers used in Puget Sound waters, there is little doubt that this is one of many significant sources of non-point source pollution. Several Washington State agencies (e.g., WDFW, WDOE, WDNR, WDOT) now encourage the use of non-creosote containing pilings and timbers for both new and replacement purposes. WDOT is now in the process of replacing creosote pilings at most of its ferry terminals with concrete or steel pilings). Additionally, many creosote-treated wood products have ceased to function as they were intended but still leach toxic compounds into Puget Sound waters. These include rogue logs and timbers (those that have broken free and now reside on beaches) and derelict pilings (those still standing in place but that no longer serve a constructive function).

The fact that treated wood products contribute toxic compounds to sensitive parts of our marine environment (bottom sediments, surface microlayer, upper beaches important as spawning areas for forage fish) means that their removal improves estuarine habitats in two ways: 1) net gain in high value habitat and 2) increase in key marine indicator species (i.e., forage fish whose eggs may be adversely affected by toxic contaminants in spawning sand and gravel or in the surface microlayer).

Whatcom County, under the direction of Ms. Joni Cameron and the Whatcom County Marine Resources Committee, removed a substantial amount of treated wood products from their beaches about 4-5 years ago. Skagit MRC's inventory and removal project was modeled after Whatcom County's successful efforts. The Padilla Bay Research

Reserve has carried out two creosote removal efforts in recent years, accounting for the removal of about 30 tons of treated wood from Padilla Bay (Riggs 2004; Riggs and Anderson 2005). The Washington Department of Natural Resources has also been carrying out extensive treated wood removal operations in several counties in the past several years, including about 150 tons removed from the Dungeness Spit Wildlife Refuge (WDNR 2006) and a project to remove more than 600 creosote pilings and 15,000 square feet of dock structure from Bellingham Bay (WDNR 2007). The total amount of treated wood removed to date is now approaching about 1,000 tons. However, WDNR estimates that more than 20,000 tons will eventually need to be removed from Puget Sound waters (WDNR 2007).

Methods

Treated Wood and Spartina Inventory

Approximately 1/2 of Skagit County shorelines were surveyed by volunteers for treated wood products during 2004 and 2005 (Dinnel et al. 2005). Most of the remaining county shorelines were inventoried in 2006 and 2007. A volunteer recruitment and training meeting was held in May 2006 on Fidalgo Island (Fig. 3 and see Appendix 1 for a copy of the meeting agenda). Volunteers were provided with information on the identification of various types of treated wood (creosote, ACZA, CCA) and given color shoreline maps (printed from the WDOE shoreline aerial photos web site [http://apps.ecy.wa.gov/shorephotos/]) for their respective portions of the county shorelines. The volunteers were instructed to survey their beaches and record the locations, types and sizes of all treated wood products including wood lying on beaches or still in use. All photos and the resulting survey data were returned to Paul Dinnel for collation and analysis. Volunteers were also trained to find and identify the invasive cordgrass, Spartina, so that both minor and major infestation sites would be identified. Further, some volunteers were given training and guidelines for surveying shorelines from small boats and kayaks for those cases where shoreline access was limited (see Appendix 1 for boat survey instructions).

Resurveys of Selected Shorelines

Four beaches were resurveyed for treated wood products approximately one and two years following the original (Phase I) inventory and removal operations. These four beaches were: 1) the "Casino" beach, just east of the Northern Lights Casino located at the north end of the Swinomish Channel, 2) Crandall Spit shoreline in Fidalgo Bay, 3) a small pocket beach just outside the entrance to Cap Sante marina in Fidalgo Bay, and 4) about 2/3 of the southern shoreline of Guemes Island.

Treated Wood Removal Operations

Inventory data collected by the volunteers were used to prioritize locations for removal of treated wood products. The inventory data clearly showed locations where treated wood

accumulated in high densities as a result of currents and proximity to sources. These sites were given highest priority for removal operations, which took place from December 2006 through January 2007. Removal operations were conducted under the auspices of a Hydraulic Project Approval (HPA) permit issued by the Washington Department of Fish and Wildlife to the Washington Department of Natural Resources.

Treated wood removal in 2006-2007 was accomplished using a small tug/barge/work skiff combination provided by a hired contractor (Dunlap Towing of La Conner, WA) in combination with community volunteers (Figs. 4 and 5). Recovery operations targeted the highest daytime fall and winter high tides so that the tug could best approach the treated wood and pull it off the beaches. Removal was accomplished in the following

way: two to five volunteers surveyed the beach ahead of the tug crew and marked each piece with a red flag or fluorescent orange paint. The tug crew then fixed chokers around each piece and pulled it from the beach with the tug (Fig. 5). Once a dozen or so pieces were gathered by the tug, the pieces were then loaded onto the small barge using a hydraulic crane. This operation was repeated until the barge was full (about 10-15 tons) upon which time the tug and barge returned to Dunlap Towing's log yard in La Conner to offload the wood to a temporary storage yard (Fig. 6). Volunteers also assisted recovery by picking up smaller pieces of treated wood and carrying these to the barge or work skiff. Additionally, volunteers filled plastic bags with beach debris (mostly plastics) and recovered old tires for disposal.

All recovered treated wood products and old tires were stored at Dunlap Towing's log yard until disposal (Fig. 6). Disposal was accomplished by loading the treated wood and tires into large cargo containers, which were then trucked to Bellingham. From Bellingham, the containers were transported by rail to the hazardous waste landfill site located at Roosevelt, WA.

Results

Volunteers and Community Education/Outreach

Prior to any field work being accomplished, about 15-20 community volunteers received training in identification of treated wood products and Spartina, and were shown a Power Point presentation on the potential hazards of treated wood to the environment and human health. This workshop was held in May 2006 at the Hope Island Fire Hall, La Conner (Fig. 3 and Appendix 1). A total of 37 MRC, Skagit Beach Watcher, and community volunteers assisted with the shorelines inventory and/or the treated wood removal operations. These volunteers accounted for an estimated total of 526 hours of effort (Table 1). This is in addition to the approximately 200 hours expended by the project contractor, Dunlap Towing, La Conner.

Treated Wood and Spartina Inventory

Approximately ½ of Skagit County shorelines were surveyed for treated wood products in 2004-2005 (Fig. 7; Phase I – see Dinnel et al. 2005). Most of the remaining Skagit County shorelines were surveyed in 2006 and 2007, the exception being the southern reaches of the Skagit River delta. In 2006-2007, volunteers surveyed the Burrows Bay, Deception Pass and northern Skagit Bay shorelines, a few sections of the Skagit River delta and the following islands: Jack, Vendovi, Cones, Sinclair, Cypress, Strawberry, Burrows, Young's, Allen, Williamson Rocks, Northwest, Kiket, Skagit, Hope and Deadman (Fig. 8).

The total number of treated wood pieces or structures observed within the 2006-2007 Skagit MRC inventory area was 1,638, which amounted to approximately 19,299 cubic feet (Table 2). Approximately 49%, in terms of number of pieces observed, were pilings, most of these still in use. However, the pilings amounted to approximately 82% of the total in terms of cubic feet of treated wood. The number of logs (i.e., rogue pilings) washed up on beaches was 256, which equaled 1,559 cubic feet of treated wood (almost all creosote). The second most frequently observed form of treated wood was dimensional timbers, which accounted for 35% and 7 % in terms of number of pieces and cubic feet, respectively. Many of these timbers were still in use on dock and trestle structures, although some were also found washed up on beaches. Detailed summaries of log, piling, timber and structure sizes may be found in Tables 3 and 4. A copy of the entire Phase II inventory on a beach-by-beach basis may be found in Appendix 2. Spartina was found at a few locations during the Phase II inventory. Locations where Spartina was found are described in Appendix 3.

The total amount of treated wood products found on Skagit County shorelines, combining the results of Phase I (Dinnel et al. 2005) and Phase II (this report) inventories, is now 42,116 pieces of wood, which equals a total of 1,255,710 cubic feet.

Resurveys of Selected Shorelines

The first resurvey of treated wood on four selected beaches took place during the fall/winter of 2005-2006, approximately one year following removal of treated wood from these beaches. The second resurvey took place along these same four beaches during the fall/winter of 2006-2007, approximately two years following removal operations. Each of these four beaches was resurveyed for wood that had repopulated the beaches from floating debris. Fixed pilings and structures were not included in these resurveys. Results of these resurveys (summarized in Tables 6-9) showed that a moderate amount of treated wood had returned to these shorelines, mostly as a result of resuspension and redistribution of wood during winter storms. Overall, the amount of new treated wood found on these four beaches (in terms of cubic feet) during the first resurvey was 19% of the amount of wood found during the original survey (all removed at that time) and 28% during the second resurvey.

Treated Wood Removal Operations

Treated wood removal operations were conducted on 6 different days (Table 5). The total amount of treated wood removed by Phase II efforts was 105 tons. Most of this wood was removed from the shorelines of Guemes Island, Fidalgo Island (south shore of Guemes Channel, Crandall Spit, the Casino area – including two of the sand islands to the north, and along the Swinomish Channel (Fig. 8). The total cost of the project was approximately $35,000. Thus, the cost to remove and dispose of the treated wood was in the $325-350/ton range, which included actual removal, trucking, rail transport and all disposal fees. In addition to treated wood removal, volunteers also recovered approximately 3,100 pounds of beach debris (mostly plastics). Skagit County Public Works took the lead in disposing of this trash.

The total amounts of treated wood and trashed removed during both Phase I and Phase II operations is now 180.1 tons of treated wood and 100 bags of trash and 50 tires (Phase I) plus 3,100 pounds of trash (Phase II).

Discussion

Once again this project successfully used community volunteers to inventory treated wood products on county shorelines and a local contractor to remove beached logs and timbers. The use of a small tug/barge/work skiff combination during periods of high daytime tides has proven to be very cost efficient. This is especially true since most of shorelines had very little access from uplands and we targeted the beaches with the highest densities of treated wood products. The cost of recovery by this method may increase somewhat as the density of treated wood decreases, but most county shorelines have little access other than by boat. Removal of treated wood from some areas (e.g., extensive marsh areas more than about 100 meters from a navigation channel) will require removal by hand or by helicopter, as was accomplished by Riggs (2004) at two locations in Padilla Bay.

It is clear from the resurvey data that derelict treated wood products are resuspended from Puget Sound beaches and redistributed to new beaches during winter storm events. Thus, once beaches are cleaned of treated wood products, removal operations may need to be repeated in subsequent years. However, this may not be all bad, since some shorelines act as magnets (accretion beaches) to concentrate the treated wood, which then facilitates its removal. Some of this new wood is coming from continued failure of derelict structures by storms or accidents. Such an occurrence happened along Guemes Channel during a storm in 2006 when the Guemes Island ferry broke free of its moorings and subsequently broke off several dozen derelict creosote pilings near downtown Anacortes. Some of these derelict pilings were subsequently removed during our Phase II recovery operations. A program to remove derelict structures before they fail would be helpful.

In the last few years a number of other projects in Skagit County have been responsible for additional removals of treated wood in or near county shorelines (Table 9). However,

a vast amount of treated wood is still in use in county marine waters, primarily in the form of docks, trestles, bulkheads and marina structures. Some of these pilings/structures are derelict (standing but no longer in use) and could be removed. Most other pilings and structures are still in use and should eventually be replaced with non-toxic alternatives such as steel, concrete or plastics (e.g., plastic pilings, lumber and railroad ties made from recycled plastic – see http://www.plasticpilings.com/ for examples).

Washington State might wish to consider a legislative ban on the manufacture and use of creosote, or at least a tax on the industry to assist with public cleanup efforts. Such a ban now exists in about 40 countries around the world, including all of the European Union countries, which banned the sale and use of creosote in June 2003. A substantial number of alternatives to using creosote-treated wood now exist and the overall costs of using non-toxic alternatives (steel, concrete, plastics) is considered to be less than for creosote because of greater material life expectancies.

Table 1. Creosote project volunteer names and estimated hours.

Name	Hours
Paul Dinnel, Project Lead	
• Inventory	60
• Meetings	12
• Presentations	5
• Removal operations	50
• Data entry and analysis	45
• Final report preparation	40
Sean Hewitt	45
Rich Hoover	2
Marilyn Woods	5
Ken Taylor	5
Bob Barry	10
Kathleen Murphy	10
Keeley O'Connell	20
Chrys Berteloto	15
Catherine Davis	15
Buddy Brown	10
Charline Brown	10
Lyn Bishop	10
Eric Shen	5
Nate McNeil	5
Michael Meldahl	2
Jean Nelson	10
Raffi Manion	5
Gwen Berthiez	10
Michael See	5
Eddy Fitzsimmons	5
Michelel Myers	5
Tim Shelton	5
Brandon Jensen	5
Wyatt Leighton	10
Jim O'Neil	10
Pam David	5
Cindy Ridgeway	2
Phil Cohen	5
Dixon Elder	5
Nate Schwark	3
Paul Sund	10
Erica Pickett	10
Vicki McNeil	10
Ferdi Businger	15
Neil Borman	5
Jim Ramaliga	5
Total volunteers hours =	**526**

Table 2. Summary of the number and estimated cubic feet of treated wood inventoried on Skagit County shorelines in 2006-2007.

Wood Form	Number Observed	Total Cubic Feet
Beached logs	256	1,559
Pilings*	801	15,832
Dimensional timbers	572	1,263
Derelict structures	9	645
Total =	1,638	19,299

* Inventoried piling lengths were measured from the sediment surface upward. This amount corrects for the sub-sediment portion of the pilings and assumes the average piling depth is 20 feet and the average piling diameter is 12".

Table 3. Lineal feet and volumes of treated wood logs on beaches and standing pilings inventoried along Skagit County shorelines during 2006 and 2007.

Logs on Beaches:

Diameter (inches)	Lineal Feet	Cubic Feet
6	81	15.9
8	175	61.1
10	332	181.1
12	865	679.4
14	276	295.0
16	122	170.3
18	41	72.5
20	16	34.9
24	12	37.7
26	3	11.1
	Total	1559.0

Pilings:

Diameter (inches)	Lineal Feet	Cubic Feet
6	1	0.2
8	53	18.5
10	1,288	702.5
12	3,209	2520.3
14	14	15.0
	Total	3256.5

Table 4. Lineal feet and volumes of treated dimensional timbers on beaches and in use along Skagit County shorelines during 2006 and 2007.

Timber Dimensions (inches)	Lineal Feet	Cubic Feet
1 x 6	14	0.6
1 x 12	40	3.3
2 x 2	5	0.1
2 x 4	91	5.1
2 x 6	116	4.8
2 x 8	72	8.0
2 x 10	32	4.4
2 x 12	228	38.0
3 x 8	25	4.2
3 x 10	55	11.5
4 x 4	80	8.9
4 x 6	222	37.0
4 x 8	242	53.8
4 x 10	35	9.7
4 x 12	586	195.3
4 x 16	9	4.0
5 x 5	5	0.9
6 x 6	110	27.5
6 x 8	271	90.3
6 x 10	44	18.3
6 x 12	4	2.0
6 x 16	4	2.7
8 x 8	97	43.1
8 x 10	115	63.9
8 x 12	16	10.7
8 x 16	12	10.7
9 x 9	17	9.6
10 x 10	172	119.4
10 x 12	24	20.0
12 x 12	398	398.0
12 x 16	4	5.3
12 x 36	10	30.3
14 x 14	13	17.7
16 x 16	2	3.6
	Total	1262.7

Table 5. Summary of wood removal dates, hours and locations in 2006-07.

Date	Location	Number of Hours*
12-11-06	Swinomish Channel	6
12-12-06	Sand islands, north of Swinomish Channel	7
12-13-06	Sand Islands, Casino shore and Swinomish Channel	8
1-26-07	Ship Harbor	6
1-29-07	Fidalgo Bay & South shore of Guemes Channel	6
1-30-07	South shore of Guemes Island	7
	Total field hours =	**40**

* Number of field hours for each volunteer. The number of contractor hours is greater due to running and unloading times.

Table 6. Summary of the numbers of pieces and cubic footage of treated wood found on four different beaches during the original survey (fall/winter of 2004-05), the first resurvey (fall/winter 2005-06) and the second resurvey (fall/winter 2006-07). Wood removals took place only following the original and second resurveys. This summary only includes loose wood on the beaches -- no fixed pilings or structures. See Appendix 4 for detailed survey findings.

	Logs		Timbers*		Total	
Location/Survey	**Pieces**	**Cubic Feet**	**Pieces**	**Cubic Feet**	**Pieces**	**Cubic Feet**
Casino**						
Original Survey (2004-05)	31	283.5	37	399.8	68	399.8
First Resurvey (2005-06)	6	31.1	11	65.1	17	96.2
Second Resurvey (2006-07)	7	27.2	1	60.0	8	87.2
Crandall Spit						
Original Survey	7	70.9	2	30.7	9	101.6
First Resurvey	1	0.5	17	187.6	18	188.1
Second Resurvey	6	31.6	19	92.2	25	123.8
Cap Sante Pocket Beach						
Original Survey	6	46.9	9	4.1	15	51.0
First Resurvey	1	2.1	1	0.2	2	2.3
Second Resurvey	1	2.1	3	2.3	4	4.4
South Guemes Island						
Original Survey	119	1198.6	68	193.2	187	1391.8
First Resurvey	10	103.6	24	26.5	34	130.1
Second Resurvey	63	314.4	57	80.5	120	394.9

*Includes the occasional treated wood derelict structure found loose on the beach (e.g., old floats and docks).
**Casino site is the area east of the Northern Lights Casino at the north end of the Swinomish Channel.

Table 7. Summary of the total pieces of treated wood found during the orignial, first resurvey and second resurvey, all four sites combined.

	Logs		Timbers		Total	
Survey	**Pieces**	**Cubic Feet**	**Pieces**	**Cubic Feet**	**Pieces**	**Cubic Feet**
Original	163	1559.9	116	627.8	279	2187.7
First Resurvey	18	137.3	53	279.4	71	416.7
Second Resurvey	77	375.3	80	235.0	157	610.3

Table 8. Treated wood found on the four resurveyed beaches (combined) as **percentages** of the amounts found on the original surveys.

	Logs		Timbers		Total	
Survey	**Pieces**	**Cubic Feet**	**Pieces**	**Cubic Feet**	**Pieces**	**Cubic Feet**
First Resurvey	11.0	8.8	45.7	44.5	25.4	19.0
Second Resurvey	47.2	24.0	69.0	37.4	56.3	27.9

Table 9. Summary of treated wood products removed along Skagit County shorelines from 2004 to 2007.

Project	Treated Wood Removed
Cap Sante Marina (Port of Anacortes)	200 pilings
Guemes Island Ferry Docks (Skagit County)	About 60 pilings
Tommy Thompson Trail (City of Anacortes)	About 3,700 railroad ties
Skagit Marine Resources Committee, 2004-05	75.1 tons
Skagit Marine Resources Committee, 2006-07	105 tons
Swinomish Spit (Padilla Bay Reserve)*	19.9 tons
Sullivan Minor Marsh (Padilla Bay Reserve)**	10 tons

*Riggs 2004
**Riggs and Anderson 2005

Figure 1. Creosote compounds leaching from an old piling in South Fidalgo Bay.

Figure 2. Creosote compounds leaking from a beached log (source: http://www.pscap.net/id19.htm).

Figure 3. Volunteers attending the creosote/ Spartina workshop held in May 2006.

Figure 4. Part of the recovery crew.

Figure 5. Pulling a treated log from beach.

Figure 6. Part of the treated wood recovered from Skagit County beaches in 2006-07.

Figure 7. Locations of treated wood inventory and removal operations in Skagit County in 2004 and 2005 by Skagit MRC and Padilla Bay Res.

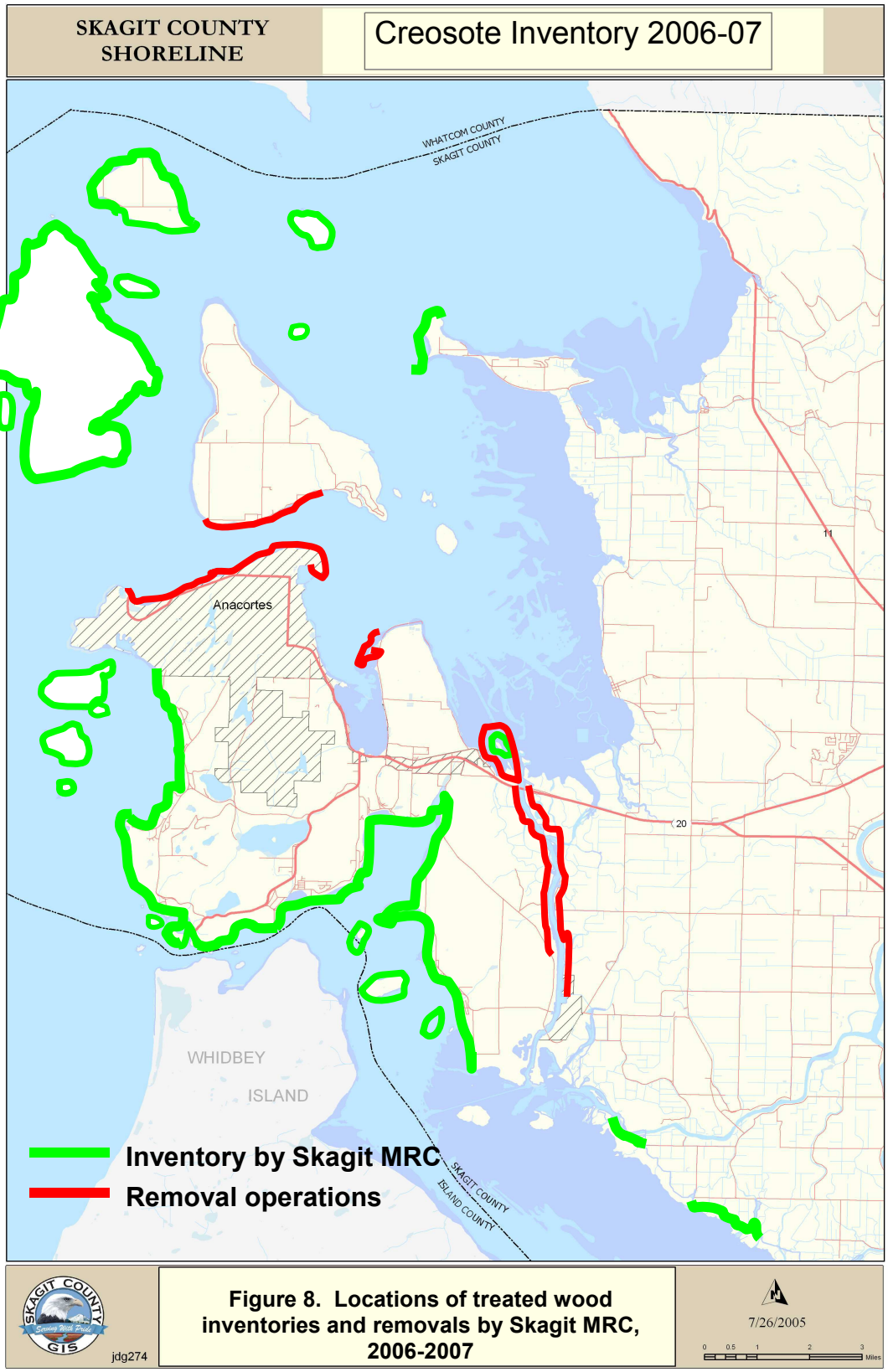


Figure 8. Locations of treated wood inventories and removals by Skagit MRC, 2006-2007

References

Dinnel, P, M. Schwertner, R. Knowles, E. Pickett, P. Sund, R. Barsh and R. Haley. 2005. Skagit County creosote inventory and removal project: Phase I. Final Report for the Northwest Straits Commission and the Washington Department of Natural Resources by Skagit County Marine Resources Committtee, Mount Vernon, WA. 105 pp.

Hardy, J., S. Kiesser, L. Antrim, A. Stubin, R. Kocan and J. Strand. 1987. The sea-surface microlayer of Puget Sound: Part I. Toxic effects on fish eggs and larvae. Mar. Environ. Res. 23:227-249.

Karrow, N.A., H.J. Boermans, D.G. Dixon, A. Hontella, K.R. Solomon., J.J. Whyte and N.C. Bols. 1999. Characterizing the immunotoxicity of creosote to rainbow trout (*Oncorhynchus mykiss*): A microcosm study. Aquatic Toxicology 45(4):223-239.

Kocan, R.M., H. von Westernhagen, M.L. Landolt and G. Furstenberg. 1987. Toxicity of sea-surface microlayer: Effects of hexane extract on Baltic herring (*Clupea harengus*) and Atlantic cod (*Gadus morhua*) embryos. Mar. Environ. Res. 23:291-305.

Malins, D.C., B.B. McCain, D.W. Brown, S. Chan, M.S. Myers, J.T. Landahl, P.G. Prohaska, A.J. Friedman, L.D. Rhodes, D.G. Burrows, W.D. Gronlund and H.O. Hodgins. 1984. Chemical pollutants in sediments and diseases of bottom-dwelling fish in Puget Sound, Washington. Environ. Sci. Technol. 18:705-713.

Misitano, D.A., E. Casillas and C.R. Haley. 1994. Effects of contaminated sediments on viability, length, DNA and protein content of larval surf smelt, *Hypomesus pretiosus*. Marine Environ. Res. 37:1-21.

PTI Environmental Services. 1990. Puget Sound Microlayer Workshop: Summary Report. Final Report for U.S. EPA, Region 10, Seattle, WA. EPA 910/9-90-008. 17 pp.

Riggs, S. 2004. Rouge creosote log removal at one site in Padilla Bay, Washington. Final report for the Washington Department of Ecology by the Padilla Bay NEER, Mount Vernon, WA. 15 pp. + appendices.

Riggs, S. R. and M. Anderson. 2005. Rogue creosote log removal at Sullivan Minor salt marsh and comparison of two methods of rogue creosote log removal in Padilla Bay. Final Report for the Washington State Department of Ecology by the Padilla Bay Reserve, Mount Vernon, WA.

Sibley, P.K., M.L. Harris, K.T.J. Bestari, T.A. Steele, R.D. Robinson, R.W. Gensemer, K.E. Day and K.R. Solomon. 2001. Response of zooplankton communities to creosote-impregnated Douglas fir pilings in freshwater microcosms. Environmental Toxicology and Chemistry 20(2):394-405.

Stratus Consulting, Inc. 2005. Creosote-treated wood in aquatic environments: Technical review and use recommendations. Final Report for NOAA Fisheries, Southwest Division, Habitat Conservation Division, Santa Rosa, CA.

Vines, C.A., T. Robbins, F.J. Griffin and G.N. Cherr. 2000. The effects of Aquatic Toxicol. 51:225-239.

WDNR (Washington Department of Natural Resources). 2006. Helicopters pull creosote logs from Dungeness Spit Wildlife Refuge. WDNR News Release, 2 October 2006 (www.dnr.wa.gov/htdocs/adm/comm/2006_news_releases/nr06_111.html).

WDNR (Washington Department of Natural Resources). 2007. Creosote cleanup in Bellingham Bay. WDNR News Release, 12 February 2007 (www.dnr.wa.gov/htdocs/adm/comm/2007_news_releases/nr07_015.html).

Weis, J.S. and P Weis. 1989. Effects of environmental pollutants on early fish development. Aquatic Sciences 1 (1): 45-73.

Westin Solutions. 2006. Jimmycomelately piling removal monitoring project. Final Report for the Jamestown S'Klallam Tribe, Sequim, WA. 116 pp.

Appendix 1

Creosote Log and Spartina Survey Training

May 13, 2006
Hope Island Fire Hall, La Conner

AGENDA

9 AM	Welcome / Introductions *Chrys Berteloto, Skagit Beach Watchers*
9:05	Creosote in the Marine Environment *Presenter: Paul Dinnel, Western Washington University Shannon Point Marine Center*
9:45	Spartina – On the Retreat *Presenter: Keeley O'Connell, People for Puget Sound*
10:15	Creosote Log Survey: Collecting Quality Data *Presenter: Paul Dinnel, Western Washington University Shannon Point Marine Center*
11:00	BREAK and Head to the Beach
11:10	Field Session Main Elements: *Presenter: Lisa Kaufman, WA Dept. of Natural Resources* Creosote Log ID GPS Use Data Collection Practice Run
11:50	Beach Sign Up and Training Evaluation
12:00	Go Home!

Water-Based Survey Protocol

- Exit boat and walk stretches of beach whenever possible using same protocol as foot-based surveys
- If the survey must be done from the boat due to no access or posted no trespassing signs:
    - Survey for creosote when the tide is between +4 and +6 in order to get as close into shore as possible
    - Survey for Spartina when tide is +2 to +4 to maximize Spartina's exposed range
    - When taking your GPS reading, paddle in as close to shore as possible and note on your inventory form approximately how far your boat is from the creosote log or Spartina patch that you are getting a GPS coordinate for
    - Plan your trip with very careful consideration of the tides in order to accomplish surveying for both targets in a single trip- i.e. on an incoming tide, survey for Spartina when the tide is lower, then survey for creosote on your return trip when the tide is higher
    - Bring binoculars with you to get a closer scan of the beach from your boat
- Complete a safety check prior to leaving shore and DO NOT paddle in an area where you are unfamiliar or uncomfortable.
- Be sure to check the tide and current information before leaving shore and plan your trip accordingly
- Use extreme caution when paddling around rocky headlands
- Paddle with a buddy - it is safer and it is very difficult to carry and use all of the equipment/data forms/maps on your own.

Prepared by Keeley O'Connell, People for Puget Sound and Skagit MRC

APPENDIX 2

Phase II Treated Wood Inventory

Skagit County Shorelines Phase II Treated Wood Inventory, 2006-2007

By

Skagit County Marine Resources Committee, Skagit County Beach Watchers, People For Puget Sound, Washington Department of Natural Resources, and Community Volunteers

West Side of Samish Island

Southwest side of Samish Island at Camp Kirby
Shoreline Aerial Photo #SKA0277
Surveyed by Paul Dinnel and Rich Hoover, May 2007

1. Creosote fixed piling 240” x 12” dia.

Vendovi Island

Southwest side of Vendovi Island
Shoreline Aerial Photo #SKA0093
Surveyed by Paul Dinnel, Lin Folsom, Erica Pickett, Vicki McNeil, October 2006

1. 1 creosote log, 3’ x 18” dia.

Northwest side of Vendovi Island
Shoreline Aerial Photo #SKA0101
Surveyed by Paul Dinnel, Lin Folsom, Erica Pickett, Vicki McNeil, October 2006

1. Creosote fixed piling 20’ x 12” dia.
2. Creosote fixed piling 20’ x 12” dia.

Other areas of Vendovi Island did not have any treated wood

Jack Island

Shoreline Aerial Photo #SKA0105
Surveyed by Paul Dinnel, Lin Folsom, Erica Pickett, Vicki McNeil, October 2006

No treated wood

Cone Islands
Shoreline Aerial Photo #SKA0195
Surveyed by Paul Dinnel, Lin Folsom, Erica Pickett, Vicki McNeil, October 2006

No treated wood

Sinclair Island

North end Sinclair Island
Shoreline Aerial Photo #SKA0001
Surveyed by Ferdi Bussinger, August-October 2006

1. Small timber, no size given
2. Creosote log, no size given
3. Creosote stub, 6” x 14” dia.
4. Creosote log 10” x 8” dia.
5. Creosote log, partially buried, length unknown, 15” dia.

Northwest side Sinclair Island
Shoreline Aerial Photo #SKA0002
Surveyed by Ferdi Bussinger, August-October 2006

1. Creosote log, 6’ x 12” dia.

West side of Sinclair Island
Shoreline Aerial Photo #SKA0003
Surveyed by Ferdi Bussinger, August-October 2006

1. Creosote log, 3’ x 16” dia.
2. Creosote log, 5’ x 12” dia.

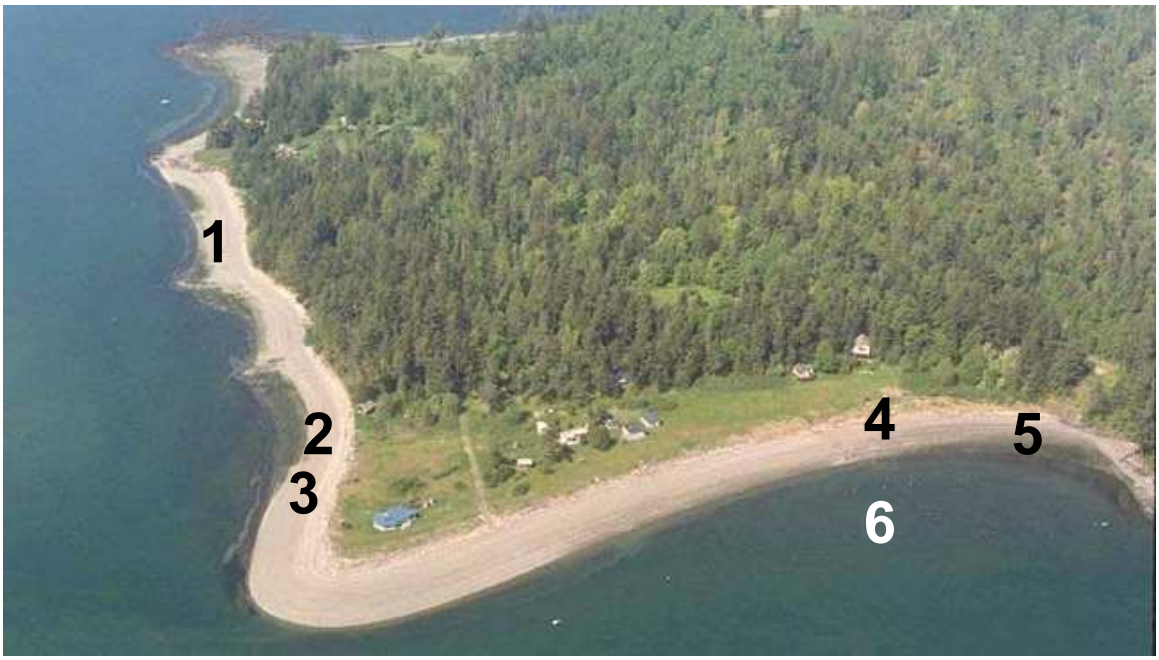
West side of Sinclair Island
Shoreline Aerial Photo #SKA0004
Surveyed by Ferdi Bussinger, August-October 2006

1. Creosote stub, 2’ x 14” dia.
2. Creosote stub, 3’ x 10” dia.

Southwest corner Sinclair Island
Shoreline Aerial Photo #SKA0006
Surveyed by Ferdi Bussinger, August-October 2006

1. Creosote log 30+' x 12" dia.

Southwest side of Sinclair Island
Shoreline Aerial Photo #SKA0008
Surveyed by Ferdi Bussinger, August-October 2006



1. Timber (creosote?), 15' x 12" x 12"
2. Small timber pieces (creosote) bolted together
3. Creosote log, 10' x 12" dia.
4. 3 creosote logs, 6-10' x 8-12" dia.

5. Creosote stub, 1’ x 12” dia. And 2 pieces treated timbers
6. Several creosote pilings

Southwest side of Sinclair Island
Shoreline Aerial Photo #SKA0009
Surveyed by Ferdi Bussinger, August-October 2006

1. Unknown number of creosote pilings (county dock)

South side of Sinclair Island
Shoreline Aerial Photo #SKA0010
Surveyed by Ferdi Bussinger, August-October 2006

2. 40’ plank (creosote?)

Note: The remaining south shore of Sinclair Island (Shoreline Photos #SKA0010 to 0018) was surveyed by boat by Paul Dinnel and Rich Hoover, May 2007. No treated wood was observed, but some may have been missed. Most of the shoreline was rocky headlands.

East side of Sinclair Island
Shoreline Aerial Photo #SKA0020
Surveyed by Ferdi Bussinger, August-October 2006

1. Creosote log, 10’ x 10” dia.
2. 2’ piece of treated timber
3. 3’ piece of creosote timber
4. Creosote stub, 4’ x 8” dia.
5. Creosote stub, 2’ x 12” dia.

East side of Sinclair Island
Shoreline Aerial Photo #SKA0021
Surveyed by Ferdi Bussinger, August-October 2006

1. L-shaped section of timber, no size given
2. Creosote log 10’ x 14” dia.

Northeast side of Sinclair Island
Shoreline Aerial Photo #SKA0022
Surveyed by Ferdi Bussinger, August-October 2006

1. Creosote stub, 3’ x 15” dia.

North side of Sinclair Island
Shoreline Aerial Photo #SKA0023
Surveyed by Ferdi Bussinger, August-October 2006

1. Creosote log, 12’ x 8” dia.

Strawberry Island
Shoreline Aerial Photo #SKA0142
Surveyed by Sean Hewitt, May 2006

No treated wood

Cypress Island

South Cypress Island
Shoreline Aerial Photo #SKA0153
Surveyed by Sean Hewitt, October 2006

1. Creosote timber, 48” x 16” x 8”
2. Creosote log, 72” x 7” dia.

South Cypress Island
Shoreline Aerial Photo #SKA0154
Surveyed by Sean Hewitt, October 2006

1. Creosote timber, 30” x 16” x 5”
2. Creosote railroad tie, 50” x 9” x 9”
3. Creosote timber, 36” x 2” x 4”
4. Creosote timber 72” x 8” x 3”
5. Creosote timber 120” x 10” x 3”
6. Creosote railroad tie 60” x 9” x 9”
7. Creosote log 30” x 14” dia.

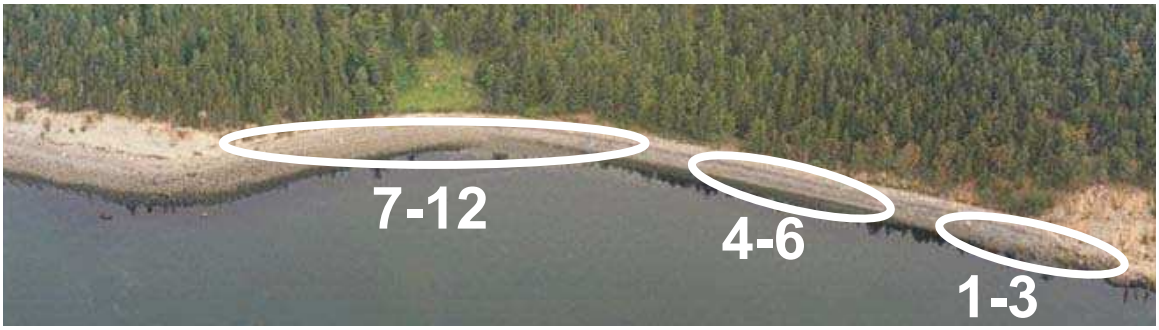
South Cypress Island
Shoreline Aerial Photo #SKA0155
Surveyed by Sean Hewitt, October 2006

1. Creosote log 60” x 10” dia.
2. Creosote log 60” x 14” dia.
3. Creosote log 240” x 12” dia.

South Cypress Island
Shoreline Aerial Photo #SKA0156
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 12” x 12” x 12”
2. Creosote timber 120” x 12” x 12”
3. Creosote timber 36” x 6” x 4”
4. Creosote timber 60” x 5” x 3”
5. Creosote timber 84” x 8” x 6”
6. Creosote and timber pieces 60” x 8” x 3”

South Cypress Island
Shoreline Aerial Photo #SKA0157
Surveyed by Sean Hewitt, October 2006



1. Creosote timber 60” x 5” x 5”
2. Creosote timber 30” x 6” x 6”
3. Creosote log 120” x 12” dia.
4. Creosote timber 18” x 12” x 12”
5. Creosote timber 30” x 18” x 8”
6. Creosote railroad tie 24” x 9” x 9”
7. Creosote log 20” x 20” dia.
8. Treated timber 72” x 6” x 4
9. Creosote timber 120” x 36” x 12”
10. Creosote timber 60” x 12” x 12”
11. Creosote timber 240” x 12” x 12”
12. Creosote log 48” x 16” dia.

Southwest Cypress Island
Shoreline Aerial Photo #SKA0158
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 120” x 8” x 8”
2. 6 Creosote fixed pilings, each 360” x 10”
3. 5 Creosote fixed pilings, each 240” x 12” dia.
4. 3 Creosote fixed pilings, each 175” x 12” dia.
5. Creosote log 96” x 14” dia.
6. Creosote log 72” x 14” dia.
7. Creosote timber 192” x 6” x 6”
8. Creosote timber 48” x 12” x 12”
9. Treated timber 144” x 6” x 4”
10. Creosote timber 36” x 10” x 3”
11. Creosote log 72” x 14” dia.
12. Creosote timber 60” x 6” x 4”

Secret Harbor, Cypress Island
Shoreline Aerial Photo #SKA0162
Surveyed by Sean Hewitt, October 2006

1. Creosote log 24” x 12” dia.
2. 10 Creosote pilings for dock & float, each 168” x 12” x 10” dia.
3. 11 Creosote timbers for dock, each 96” x 10” x 11”
4. Creosote log 72” x 10” dia.
5. 2 Creosote fixed pilings, derelict, each 240” x 9” dia.
6. Creosote fixed piling stub derelict 6” x 6” dia.
7. 3 Creosote fixed pilings, derelict, each 36” x 9” dia.
8. 3 Creosote logs, each 36” x 12” dia.

Secret Harbor, Cypress Island
Shoreline Aerial Photo #SKA0165
Surveyed by Sean Hewitt, October 2006

1. 2 Creosote fixed pilings, each 144” x 12” dia.
2. 2 Creosote fixed pilings, each 120” x 12” dia.
3. 40+ fixed pilings, concrete enclosed (creosote??). No sizes given

North end of Deepwater Bay, Cypress Island
Shoreline Aerial Photo #SKA0171
Surveyed by Sean Hewitt, October 2006

1. Creosote fixed piling, derelict, 36” x 9” dia.
2. Creosote fixed piling, derelict 36” x 12” dia.
3. Creosote log 396” x 13” dia.
4. Creosote timber 40” x 10” x 10”
5. Creosote timber 30” x 10” x 2”
6. Creosote timber 36” x 6” x 2”
7. Creosote timber 96” x 8” x 8”
8. Creosote timber 156” x 12” x 12”
9. Creosote log 96” x 13” dia.
10. Creosote log 480” x 9” dia.
11. Creosote log 48” x 10” dia.
12. Creosote fixed piling 360” x 10” dia.
13. 8 Creosote fixed pilings, each 144” x 10” dia.
14. 6 Creosote fixed pilings, each 24” x 10” dia.
15. Creosote log 18” x 12” dia.

North of Cypress Head, Cypress Island
Shoreline Aerial Photo #SKA0177
Surveyed by Sean Hewitt, October 2006

1. Creosote log 54” x 6” dia.
2. Creosote timber 38” x 8” x 6”

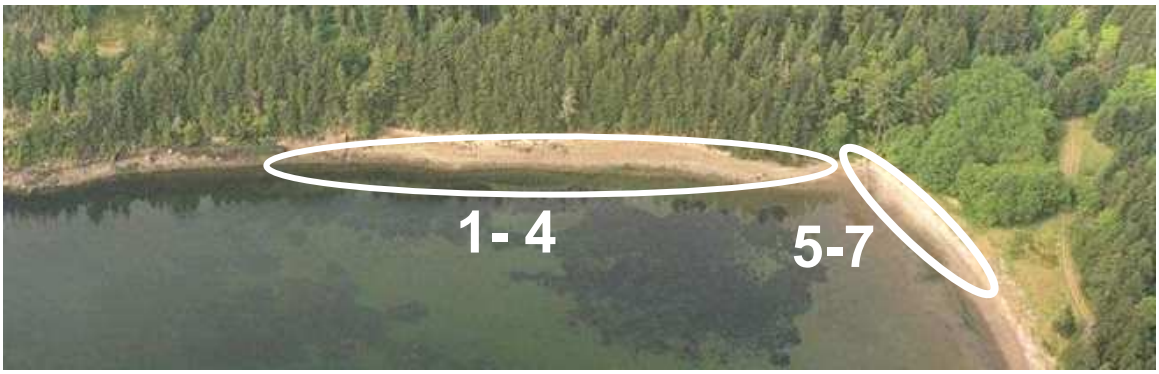
Between Cypress Head and Eagle Harbor, Cypress Island
Shoreline Aerial Photo #SKA0180
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 18” x 8” x 6”
2. Creosote timber 30” x 6” x 4”
3. Treated timber 96” x 6” x 4”
4. Treated timber 50” x 4” x 4”

Just south of Eagle Harbor, Cypress Island
Shoreline Aerial Photo #SKA0182
Surveyed by Sean Hewitt, October 2006

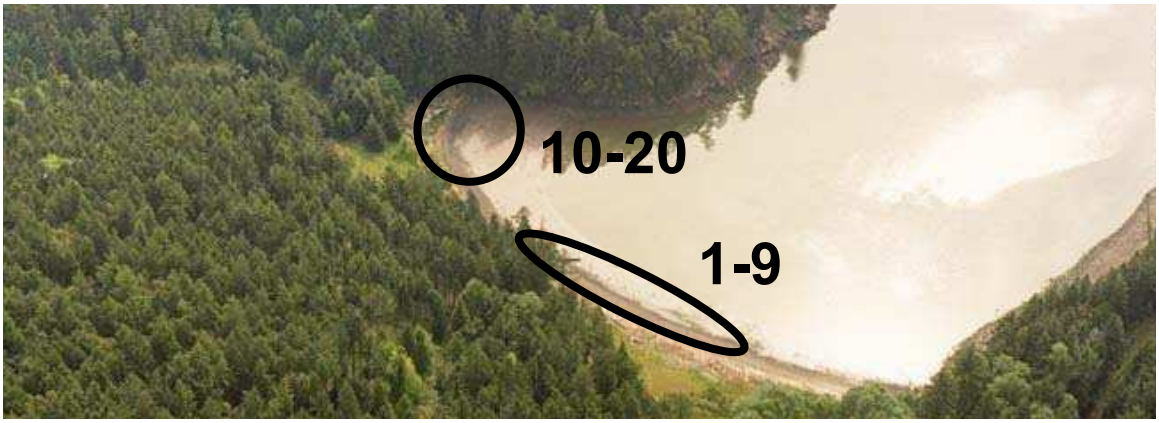
1. 2 Creosote fixed pilings, each 480” x 10” dia.
2. Creosote log 560” x 10” dia.
3. Creosote timber 18” x 8” x 6”
4. Creosote timber 30” x 12” x 12”
5. Creosote log 60” x 10” dia.

Eagle Harbor, west side, Cypress Island
Shoreline Aerial Photo #SKA0183
Surveyed by Sean Hewitt, October 2006



1. Creosote log 42” x 16” dia.
2. Creosote log 26” x 12” dia.
3. Creosote timber 18” x 8” x 3”
4. Creosote log 24” x 12” dia.
5. Creosote log 40” x 16” dia.
6. Creosote timber 18” x 12” x 6”
7. Creosote timber 30” x 12” x 6”

Eagle Harbor, north end, Cypress Island
Shoreline Aerial Photo #SKA0185
Surveyed by Sean Hewitt, October 2006



1. 3 Creosote (?) timber pieces, total 24” x 6” x 6”
2. Creosote timber 60” x 6” x 4”
3. Treated timber 72” x 4” x 2”
4. Creosote log 24” x 14” dia.
5. Creosote timber 60” x 6” x 3”
6. Creosote log 40” x 12” dia.
7. Creosote log 48” x 16” dia.
8. Creosote timber 48” x 6” x 6”
9. Creosote beam 24” x 12” x 12”
10. Creosote timber 72” x 2” x 8”
11. Creosote timber 132” x 3” x 12”
12. Creosote log 48” x 12” dia.
13. Creosote log 14” x 14” dia.
14. Creosote log 24” x 12” dia.
15. Creosote log 192” x 15” dia.
16. Creosote timber 120” x 4” x 5”
17. Creosote log 72” x 8” dia.
18. Creosote log 30” x 14” dia.
19. Creosote log 108” x 10” dia.
20. Creosote log 120” x 14” dia.

North of Eagle Harbor, Cypress Island
Shoreline Aerial Photo #SKA0189
Surveyed by Sean Hewitt, October 2006

1. Creosote log 64” x 10” dia.
2. Creosote log 72” x 18”
3. Creosote log 480” x 10” dia.
4. Creosote timber 84” x 12” x 12”

North of Eagle Harbor, Cypress Island
Shoreline Aerial Photo #SKA0190
Surveyed by Sean Hewitt, October 2006

1. Creosote log 24” x 18” dia.
2. Creosote log 12” x 12” dia.
3. Creosote timber 60” x 12” x 2”

North of Eagle Harbor, Cypress Island
Shoreline Aerial Photo #SKA0191
Surveyed by Sean Hewitt, October 2006

1. Creosote log 168” x 11” dia.

North of Eagle Harbor, Cypress Island
Shoreline Aerial Photo #SKA0194
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 24” x 6” x 3”
2. Treated timber 12” x 6” x 6”
3. Creosote log 360” x 12” dia.
4. Creosote log 144” x 24” dia.

Northwest corner, Cypress Island
Shoreline Aerial Photo #SKA0124
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 108” x 10” x 10”
2. Creosote log 264” x 11” dia.

Northwest corner, Cypress Island
Shoreline Aerial Photo #SKA0125
Surveyed by Sean Hewitt, October 2006

1. Creosote log 72” x 20” dia.
2. Creosote log 60” x 14” dia.
3. Creosote log 40” x 12” dia.

North of Tide Point, Cypress Island
Shoreline Aerial Photo #SKA0130
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 24” x 8” x 6”
2. Creosote log 72” x 11” dia.

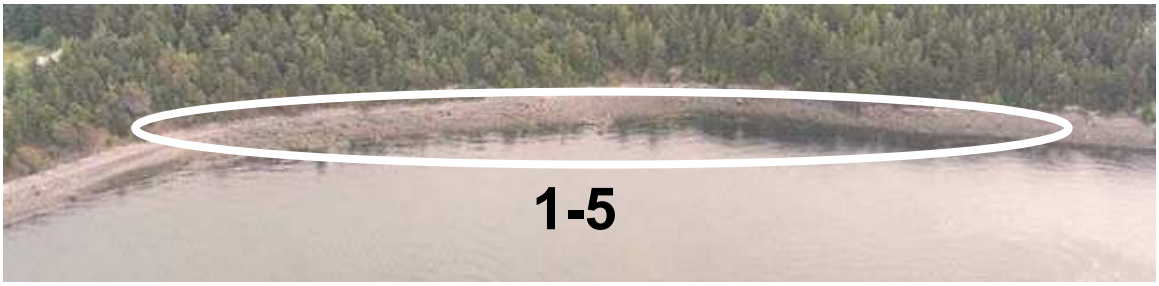
North of Tide Point, Cypress Island
Shoreline Aerial Photo #SKA0131
Surveyed by Sean Hewitt, October 2006

1. Creosote log 460” x 10” dia.
2. Creosote log 60” x 12” dia.

North side of Tide Point, Cypress Island
Shoreline Aerial Photo #SKA0132
Surveyed by Sean Hewitt, October 2006

1. Creosote log 48” x 11” dia.
2. Creosote log 72” x 10” dia.
3. Creosote log 204” x 14” dia.
4. Creosote log 36” x 11” dia.
5. Creosote timber 12” x 8” x 4”
6. Creosote log 84” x 14” dia.
7. Treated timber 54” x 6” x 6”
8. Treated timber 36” x 6” x 6”
9. Creosote timber 24” x 8” x 6”
10. Creosote log 24” x 12” dia.
11. Creosote timber 72” x 8” x 8”
12. Creosote timber 60” x 12” x 12”
13. Creosote timber 18” x 10” x 4”
14. Creosote timber 12” x 12” x 6”
15. Creosote timber 36” x 8” x 3”
16. Creosote log 24” x 10” dia.
17. Creosote timber 120” x 12” x 12”
18. Creosote timber 72” x 6” x 6”
19. Creosote timber 84” x 10” x 3”

South side of Tide Point, Cypress Island
Shoreline Aerial Photo #SKA0134
Surveyed by Sean Hewitt, October 2006



1. Creosote timber 30” x 12” x 2”
2. Treated timber 36” x 12” x 2”
3. Treated timber 84” x 6” x 2”
4. Treated timber 96” x 4” x 2”
5. Treated timber 36” x 6” x 2”

South of Tide Point, Cypress Island
Shoreline Aerial Photo #SKA0135
Surveyed by Sean Hewitt, October 2006

1. Treated timber 84” x 6” x 6”
2. Creosote timber 3” x 6” x 2”
3. Treated log 36” x 14” dia.
4. Creosote log 30” x 14” dia.
5. Creosote timber 6” x 3” x 2”
6. Creosote timber 72” x 6” x 4”
7. Creosote log 84” x 10” dia.
8. Creosote log 72” x 12” dia.

South of Tide Point, Cypress Island
Shoreline Aerial Photo #SKA0136
Surveyed by Sean Hewitt, October 2006

1. Treated log 30” x 20” dia.
2. Creosote timber 48” x 5” x 4”
3. Creosote log 60” x 12” dia.
4. Creosote timber 30” x 4” x 4”
5. Creosote log 30” x 14” dia
6. Creosote log 96” x 12” dia.

North of Strawberry Bay, Cypress Island
Shoreline Aerial Photo #SKA0139
Surveyed by Sean Hewitt, October 2006

1. Creosote log 12” x 12” dia.
2. Creosote log 72” x 9” dia.

Strawberry Bay, Cypress Island
Shoreline Aerial Photo #SKA0140
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 24” x 12” x 12”
2. Creosote log 48” x 12” dia.
3. Creosote log 240” x 12” dia.
4. Creosote log 60” x 20” dia.
5. Creosote log 24” x 16” dia.
6. Creosote fixed piling 168” x 10” dia
7. Creosote fixed piling 168” x 10” dia.
8. 44 Creosote fixed pilings, each 168” x 10” dia.
9. Creosote fixed piling 168” x 10” dia.

Strawberry Bay, Cypress Island
Shoreline Aerial Photo #SKA0141
Surveyed by Sean Hewitt, October 2006

1. Creosote log 72” x 9” dia.
2. Creosote timber 36” x 4” x 4”
3. Creosote log 72” x 10” dia.
4. Creosote log 48” x 14” dia.
5. Creosote log 48” x 7” dia.
6. Creosote timber 60” x 12” x 12”
7. Creosote log 144” x 12” dia.
8. Creosote log 60” x 18” dia.
9. Creosote log 72” x 10” dia.
10. Creosote log 108” x 14” dia.
11. Creosote log 40” x 14” dia.
12. Creosote log 48” x 10” dia.
13. Creosote log 60” x 10” dia.
14. Creosote log 120” x 14” dia.
15. Creosote timber 48” x 9” x 9”
16. Creosote timber 36” x 10” x 3”
17. Creosote timber 144” x 10” x 3”
18. Creosote timber 36” x 10” x 6”
19. Creosote log 12” x 10” dia.
20. Treated timber 72” x 8” x 8”
21. Creosote timber 18” x 12” x 4”
22. Treated timber 24” x 6” x 4”

South of Strawberry Bay, Cypress Island
Shoreline Aerial Photo #SKA0145
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 48” x 4” x 4”
2. Creosote log 18” x 12” dia.

South of Strawberry Bay, Cypress Island
Shoreline Aerial Photo #SKA0146
Surveyed by Sean Hewitt, October 2006

1. Creosote timber 40” x 8” x 4”
2. Creosote timber 60” x 16” x 8”
3. Creosote timber 216” x 12” x 12”
4. Creosote timber 24” x 16” x 16”

Southwest side, Cypress Island
Shoreline Aerial Photo #SKA0147
Surveyed by Sean Hewitt, October 2006

1. Creosote log 144” x 10” dia.
2. Creosote timber 60” x 6” x 6”
3. Creosote timber 120” x 6” x 1”
4. Creosote timber 30” x 12” x 4”
5. Creosote timber 60” x 10” x 3”

Southwest side, Cypress Island
Shoreline Aerial Photo #SKA0148
Surveyed by Sean Hewitt, October 2006

1. Creosote railroad tie 30” x 9” x 9”
2. Treated timber 144” 10” x 2”
3. Creosote log 84” x 9” dia.
4. Creosote timber 72” x 14” x 14”
5. Creosote timber 30” x 6” x 2”

Southwest side, just north of Reef Point, Cypress Island
Shoreline Aerial Photo #SKA0149
Surveyed by Sean Hewitt, October 2006

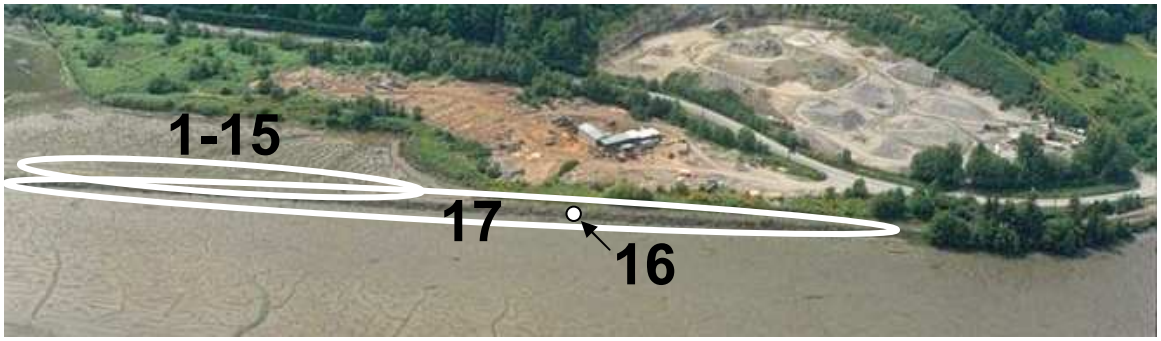
1. Treated timber 180” x 8” x 6”
2. Treated timber 48” x 6” x 1”
3. Creosote timber 24” x 8” x 4”
4. Creosote log 20” x 14” dia.

North End of Swinomish Channel to March’s Point

Southeast corner of March’s Point
Shoreline Aerial Photo #SKA0352
Surveyed by Paul Dinnel by kayak, September 2006

1. Misc. pieces of creosote railroad ties cast off along railroad tracks

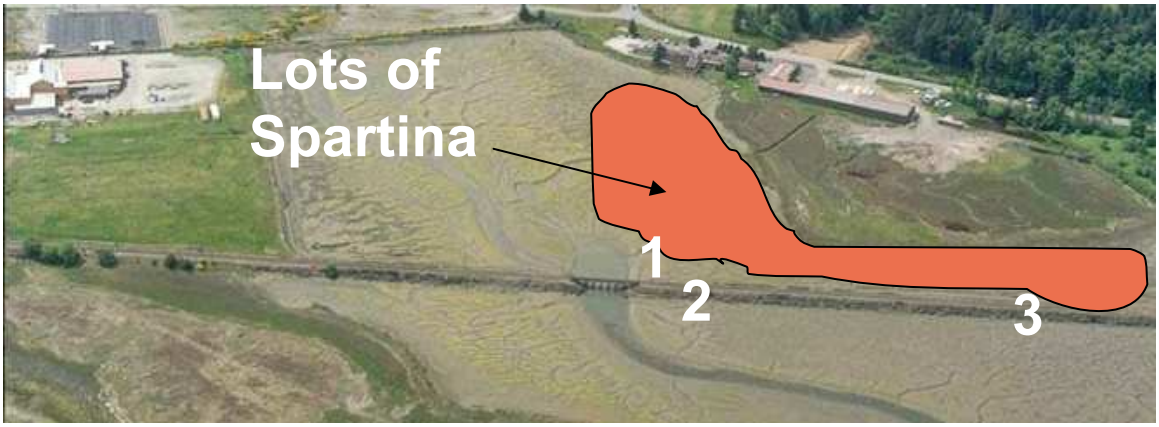
Along Railroad Tracks north of Swinomish Casino
Shoreline Aerial Photo #SKA0351
Surveyed by Paul Dinnel by kayak, September 2006



1. Creosote fixed post 48” x 2” dia.
2. Creosote railroad tie piece 36” x 2” x 4”
3. Creosote railroad tie piece 36” x 2” x 6”
4. Creosote fixed post 48” x 12” dia.
5. Creosote railroad tie piece 48” x 8” x 10”
6. Creosote fixed post 48” x 12” dia.
7. Creosote railroad tie piece 36” x 8” x 10”
8. Creosote railroad tie piece 24” x 8” x 10”
9. Creosote railroad tie piece 48” x 8” x 10”
10. Creosote railroad tie piece 36” x 4” x 6”
11. Creosote railroad tie piece 36” x 4” x 6”
12. Creosote fixed post 60” x 12” dia.
13. Creosote fixed post 48” x 12” dia.
14. Creosote log 48” x 12” dia.
15. Creosote fixed post 36” x 12” dia.
16. Creosote log 12” x 12” dia.
17. About 40 pieces of cast off railroad tie pieces along track (average ~ 36” x 4” x 8”)

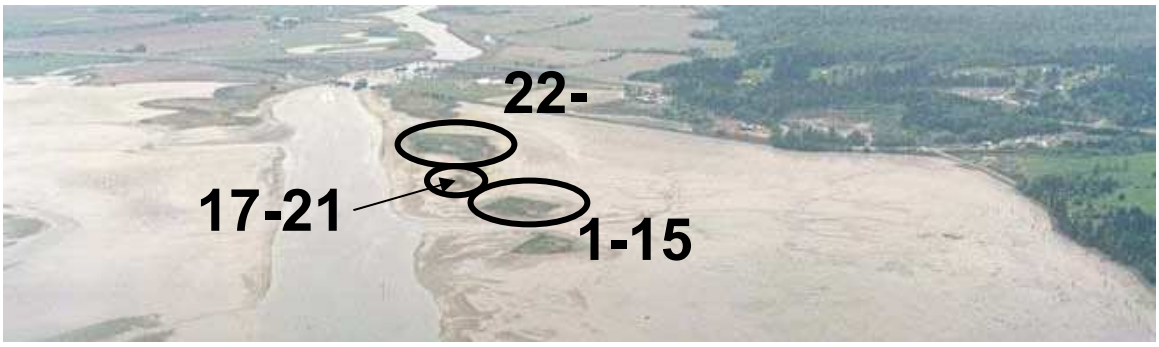
Noted also ~ 25 additional pieces of cast off railroad tie pieces in area 1-15, each averaging ~ 36” x 4” x 6” in size.

In lagoon just north of Swinomish Casino
Shoreline Aerial Photo #SKA0350
Surveyed by Paul Dinnel by kayak, September 2006



1. Creosote fixed utility pole 360” x 10” dia.
2. Creosote railroad tie piece 96” x 4” x 8”
3. Creosote railroad tie (new) 96” x 8” x 12”

Sand islands north of Swinomish Casino
Shoreline Aerial Photo #SKA0360
Surveyed by Paul Dinnel, September 2006



1. Creosote log 72” x 12” dia.
2. Creosote log 48” x 12” dia.
3. Creosote log 48” x 12” dia.
4. Creosote log 72” x 12” dia.
5. Creosote log 24” x 14” dia.
6. Creosote log 24” x 14” dia.
7. Creosote log 12” x 12” dia.
8. Creosote log 48” x 12” dia.
9. Creosote log 24” x 12” dia.
10. Treated timber 48” x 6” x 2”
11. Creosote log 12” x 12” dia.
12. Creosote timber 48” x 12” x 16”
13. Creosote log 72” x 10” dia.

14. Creosote timber 72” x 12” x 12”
15. Creosote timber 60” x 8” x 12”
16. (No number 16)
17. Creosote timber 36” x 12” x 12”
18. Creosote log 24” x 12” dia.
19. Treated timber 4” x 4” x 4”
20. Creosote log 84” x 14” dia.
21. Creosote log 360” x 12” dia.
22. Treated timber 6” x 4” x 8”
23. Creosote timber 24” x 6” x 8”
24. Creosote log 60” x 12” dia.
25. Creosote log 36” x 16” dia.
26. Creosote timber 240” x 4” x 8”
27. Creosote timber 12” x 2” x 8”
28. Creosote log 36” x 14” dia.
29. Creosote log 120” x 8” dia.
30. Treated timber 12” x 4” x 8”
31. Creosote log 48” x 10” dia.
32. Creosote log 48” x 6” dia.
33. Creosote log 36” x 12” dia.
34. Creosote fixed derelict piling 48” x 10” dia.
35. Creosote fixed derelict piling 48” x 10” dia.
36. Creosote log 72” x 18” dia.
37. Creosote log 288” x 16” dia.
38. Creosote log 36” x 26” dia.
39. Creosote log 96” x 12” dia.
40. Treated timber 8” x 2” x 12”
41. Creosote timber 24” x 4” x 12”
42. Creosote timber 12” x 8” x 12”
43. Creosote timber 18” x *’ x 12”
44. Creosote log 12” x 10” dia.
45. Creosote log 48” x 16” dia.
46. Creosote log 12” x 14” dia.
47. Creosote log 36” x 14” dia.
48. Creosote log 60” x 12” dia.
49. Creosote timber 36” x 4” x 12”
50. Creosote log 72” x 14” dia.
51. Creosote log 12” x 12” dia.
52. Creosote timber 72” x 4” x 12”
53. Creosote timber 86” x 4” x 12”
54. Creosote log 72” x 12” dia.
55. Creosote log 6” x 14” dia.
56. Creosote timber 48” x 6” x 16”
57. Creosote log 12” x 12” dia.
58. Creosote log 144” x 10” dia.
59. Creosote log 36” x 12” dia.

60. Creosote timber 36” x 4” x 12”
61. Creosote log 48” x 12” dia.
62. Creosote timber 192” x 4” x 12”
63. Creosote log 36” x 12” dia.
64. Creosote log 48” x 14” dia.
65. Creosote log 216” x 12” dia.
66. Creosote log 48” x 14” dia.
67. Creosote log 120” x 12” dia.
68. Creosote timber 36” x 4” 12”
69. Creosote log 60” x 16” dia.
70. Creosote log 6” x 10” dia.
71. Creosote timber 192” x 4” x 12”
72. Creosote timber 12” x 4” x 6”
73. Creosote log 48” x 14” dia.
74. Treated timber 24” x 4” x 12”
75. Creosote log 108” x 12” dia.
76. Creosote log 36” x 12” dia.
77. Creosote log 12” x 12” dia.
78. Creosote log 36” x 12” dia.
79. Creosote timber 144” x 4” x 10”
80. Creosote log 48” x 12” dia.
81. Creosote log 36” x 12” dia.
82. Creosote log 60” x 12” dia.
83. Creosote log 24” x 12” dia.
84. Creosote log 180” x 14” dia.
85. Creosote log 24” x 16” dia.
86. Creosote timber 12” x 12” x 12”
87. Creosote log 648” x 12” dia.
88. Creosote timber 18” x 2” x 6”
89. Creosote timber 12” x 4” x 4”
90. Creosote log 8” x 6” dia.
91. Treated timber 60” x 4” x 6”

Burrows Bay

Burrows Island, south side
Shoreline Aerial Photo #SKA0681
Surveyed by boat by Paul Dinnel and Nate Schwarck, October 2006

1. Creosote railroad tie 96” x 10” x 10”

Burrows Island, east side
Shoreline Aerial Photo #SKA0684
Surveyed by boat by Paul Dinnel and Nate Schwarck, October 2006

1. Treated timber 60” x 4” x 8”

Young's Island
Shoreline Aerial Photo #SKA0682
Surveyed by boat by Paul Dinnel and Nate Schwarck, October 2006

No treated wood

Allen Island
Shoreline Aerial Photo #SKA0693
Surveyed by boat by Paul Dinnel and Nate Schwarck, October 2006

1. Creosote timber 180" x 10" x 10"

Allen Island
Shoreline Aerial Photo #SKA0695
Surveyed by boat by Paul Dinnel and Nate Schwarck, October 2006

1. 37 Fixed piles in use for dock. Each pile averages about 240” x 12” dia. In addition, about 20 creosote timbers averaging 120” x 12” x 2”.

Williamson Rocks
Shoreline Aerial Photo #SKA0697
Surveyed by boat by Paul Dinnel and Nate Schwarck, October 2006

No treated wood

Burrows Bay shoreline, just east of Skyline Marina
Shoreline Aerial Photo #SKA0440
Surveyed by Paul Dinnel, October 2006

1. Creosote log 144” x 12” dia.

Northeast corner of Burrows Bay
Shoreline Aerial Photo #SKA0441
Surveyed by Paul Dinnel, October 2006

1. Creosote timber 180” x 8” x 10”
2. Creosote timber 72” x 6” x 8”

Alexander Beach, east side of Burrows Bay
Shoreline Aerial Photo #SKA0444
Surveyed by Paul Dinnel, October 2006

1. Creosote timber 72” x 10” x 10”
2. Creosote fixed piling on beach, in use, 48” x 10” dia.
3. Creosote fixed piling on beach, in use, 48” x 12” dia.
4. Creosote timber 96” x 10” x 10”

Alexander Beach, east side of Burrows Bay
Shoreline Aerial Photo #SKA0445
Surveyed by Paul Dinnel, October 2006

1. Creosote log 10” x 12” dia.
2. Creosote timber 36” x 4” x 6”
3. Creosote log 18” x 16” dia.
4. Creosote log 300” x 14” dia.
5. Creosote timber 36” x 12” x 12”
6. Creosote log 180” x 12” dia.

East side of Burrows Bay
Shoreline Aerial Photo #SKA0449
Surveyed by Paul Dinnel, October 2006

1. Treated timber 24” x 4” x 10”
2. Creosote timber 24” x 4” x 6”
3. Treated timber 12” x 4” x 8”
4. Creosote log 216” x 16” dia.
5. Creosote log 336” x 16” dia. (nasty!)

East side of Burrows Bay
Shoreline Aerial Photo #SKA0450
Surveyed by Paul Dinnel, October 2006

1. Creosote timber 96” x 10” x 10”

Langley Bay, southeast side of Burrows Bay
Shoreline Aerial Photo #SKA0454
Surveyed by Paul Dinnel, October 2006

1. Treated timber 12” x 6” x 6”

Langley Bay, southeast side of Burrows Bay
Shoreline Aerial Photo #SKA0455
Surveyed by Paul Dinnel, October 2006

1. Creosote timber 120” x 6” x 10”

Langley Bay, southeast side of Burrows Bay
Shoreline Aerial Photo #SKA0456
Surveyed by Paul Dinnel, October 2006

1. Creosote timber 180” x 12” x 12”

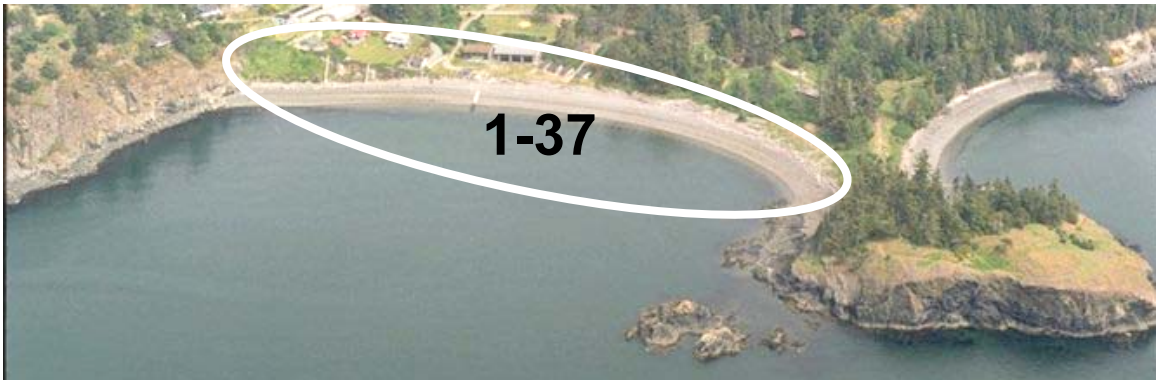
Langley Bay, southeast side of Burrows Bay
Shoreline Aerial Photo #SKA0458
Surveyed by Paul Dinnel, October 2006

1. Dock (in use) with 14 creosote piles, each 180” x 12” dia. Plus ~ 450 feet of creosote timbers 4” x 12” in size plus 9 creosote timbers, each 72” x 12” x 12”

Sares’ Head
Shoreline Aerial Photo #SKA0462
Surveyed by Marilyn Wood and Kathleen Murphy, September 2006

1. Creosote log 12” x 2” dia.
2. Creosote log 6” x 8” dia.
3. Treated log 30” x 2” dia.
4. Treated timber 96” x 4” x 4”
5. Creosote log 480” x 6” dia.

Rosario Bay & Head
Shoreline Aerial Photo #SKA0468
Surveyed by Marilyn Wood and Ken Taylor, August 2006



1. Creosote timber pieces, totoal of 18” x 3” x 1”
2. Treated timber 20” x 3” x 3”
3. Creosote timber 36” x 8” x 6”
4. Creosote timber 60” 12” x 12”
5. Creosote timber 60” 12” x 12”
6. Creosote timber 52” x 8” x 8”
7. Creosote log 60” x 6” dia.
8. Creosote timber 120” x 8” x 8”
9. Creosote timber 180” x 10” x 10”
10. Creosote timber 96” x 8” x 8”
11. Creosote timber 36” x 4” x 4”
12. Creosote timber 36” x 10” x 8”
13. Creosote timber 84” x 8” x 10”
14. Creosote timber 24” x 1” x 2”
15. Creosote timber piece 6” x 2” x 1”
16. Creosote log 36” x 18” dia.
17. Creosote log 60” x 12” dia.
18. Creosote log 144” x 18” dia.
19. Creosote timber 48” x 8” x 4”
20. Creosote timber 96” x 10” x 8”
21. Creosote timber 52” x 12” x 12”
22. Creosote timber 24” x 8” x 10”
23. Creosote timber 48” x 8” x 4”
24. Creosote timber 12” x 8” x 8”
25. Treated timber pieces, total of 84” x 6” x 2”
26. Creosote timber pieces, total of 8” x 8” x 6”
27. Treated timber 48” x 6” x 4”
28. Creosote log 24” x 12” dia.
29. 2 treated timber pieces, 18” x 8” x 6” and 96” x 2” x 6”
30. Treated timber 8” x 2” x 2”

31. Creosote timber 96” x 8” x 10”
32. Creosote log 26” x 12” dia.
33. Treated timber 144” x 4” x 8”
34. Creosote timber 18” x 2” x 4”
35. Creosote log 54” x 12” dia.
36. Creosote timber 120” x 10” x 8”
37. 2 creosote railroad ties, each 60” x 8” x 10” (also noted is a creosote piling wall)

North shore of Bowman Bay
Shoreline Aerial Photo #SKA0470
Surveyed by Marilyn Wood Ken Taylor and Bob Barry, July/August 2006

1. Creosote log 18” x 3” dia.
2. Creosote log 17” x 14” dia.

Bowman Bay
Shoreline Aerial Photo #SKA0471
Surveyed by Bob Barry, Kathleen Murphy and Keeley O’Connell, June/July 2006

1. Creosote log 400” x 12” dia.
2. Creosote timber 14” x 1” x 2”

Bowman Bay
Shoreline Aerial Photo #SKA0472
Surveyed by Bob Barry, Kathleen Murphy and Keeley O'Connell, June/July 2006

1. Dock with ~120 fixed pilings (in use), each ~ 240" x 12" dia.
2. Creosote log 44" x 14" dia.
3. Creosote log 95" x 10" dia.
4. Treated timber 108" x 6" x 4"
5. Creosote timber 234" x 8" x 4"
6. Creosote timber 228" x 8" x 4"
7. Creosote log 108" x 12" dia.
8. Creosote log 48" x 18" dia.
9. Creosote log piece 18" x 2" dia.
10. Creosote timber piece 12" x 1" x 1"
11. Creosote timber piece 14" x 1 " x 1"

Headland south of Bowman Bay
Shoreline Aerial Photo #SKA0474
Surveyed by Kathleen Murphy and Keeley O'Connell, June 2006

1. Treated timber 240" x 2" x 6"

Headland south of Bowman Bay
Shoreline Aerial Photo #SKA0475
Surveyed by Kathleen Murphy and Keeley O'Connell, June 2006

1. Creosote timber piece 5" x 3" x 3"

Skagit Bay, Deception Pass to Swinomish Channel

Yokeko Point, inside Deception Pass
Shoreline Aerial Photo #SKA0483
Surveyed by boat by Paul Dinnel and Nate Schwarck, May 2007

1. 2 creosote fixed piles in use, each about 300" x 10" dia. Also, wooden floats with treated timbers, size ~ 30" x 4"
2. 4 creosote fixed piles in use, each about 300" x 12" dia. Also, wooden floats with treated timbers, size ~ 40" x 4"
3. 2 creosote fixed piles in use (holding up a deck), 144" x 12" dia.
4. 2 creosote fixed piles holding up deck, each 36" x 12" dia. Also, 1 other pile 48" x 14" dia.
5. 3 creosote timbers, each 300" x 12" x 12"
6. 4 creosote derelict piles, 300" x 12" dia.
7. 8 creosote piles, in use, averaging 360" x 12" dia.

Yokeko Point, inside Deception Pass
Shoreline Aerial Photo #SKA0486
Surveyed by Catherine Davis, July 2006

1. 3 Creosote fixed pilings, derelict, size not given; est. 120” x 12” dia. each
2. Creosote timber 94” x 12” x 4”

Dewey Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0487
Surveyed by Catherine Davis, July 2006

1. 8 creosote fixed derelict pilings, no size given; est. 120” x 12” dia. each
2. 3 creosote fixed derelict pilings, no size given; est. 120” x 12” dia. each

Dewey Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0488
Surveyed by Catherine Davis, July 2006

1. Treated timber 42” x 4” x 15”
2. Treated timber 14” x 6” x 4”
3. Treated timber 47” x 6” x 6”
4. Creosote timber 12” x 12” x 8”

Dewey Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0489
Surveyed by Catherine Davis, July 2006

1. Creosote timber 35” x 15” x 4”
2. Creosote log 80” x 6” dia.
3. Creosote derelict fixed piling 26” x 12” dia.
4. Creosote log 13” x 7” dia.
5. Creosote log 60” x 15” dia.
6. Treated timber 240” x 6” x 2”
7. 2 creosote logs, 50” x 8” dia. and 18” x 8” dia.
8. Treated timber 48” x 7” x 2”
9. Creosote log 91” x 9” dia.
10. Treated timber 94” x 7” x 4”
11. Treated timber 24” x 12” x 2”
12. Creosote timber 96” x 8” x 7”
13. Creosote derelict fixed piling 9” x 8” dia.

Dewey Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0490
Surveyed by Catherine Davis, July 2006

1. Creosote timber 28” x 5” x 3”
2. Creosote timber 120” x 8” x 8”
3. ~36 creosote derelict fixed pilings, average 60” tall x 12” dia.
4. Treated timber 96” x 5” x 4”
5. Creosote log 38” x 14” dia.
6. Treated timber 68” x 6” x 2”
7. Treated timber bulkhead, no size given

Gibraltar Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0493
Surveyed by Catherine Davis, July 2006

1. Treated timber pieces, very small
2. Treated timber 48” x 4” x 4”
3. Treated timber 58” x 6” x 4”
4. Treated timber 48” x 4” x 1”
5. Creosote log 48” x 4” dia.
6. Creosote timber, very small
7. Creosote timber 48” x 3” x 2”
8. Treated timber 30” x 4” x 2”
9. Creosote timber 27” x 9” x 3”
10. Creosote timber 32” x 8” x 7”

Gibraltar Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0494
Surveyed by Catherine Davis, July 2006

1. Creosote timber 33” x 4” x 3”
2. Treated timber 94” x 4” x 4”
3. Creosote timber 57” x 9” x 6”
4. Treated timber 27” x 4” x 3”
5. Creosote timber 38” x 3” x 3”
6. Creosote timber 65” x 3” x 2”
7. Creosote timber 108” x 8” x 3”
8. Creosote timber 104” x 2” x 2”
9. Treated timber piece, very small
10. Creosote timber 49” x 9” x 6”
11. Creosote log 84” x 12” dia.

Gibraltar Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0495
Surveyed by Catherine Davis, July 2006

1. Creosote log 104” x 12” dia.
2. Treated timbers, 5 pieces, all very small
3. Creosote timber 72” x 3” x 2”
4. Treated timber 24” x 2” x 6”
5. Creosote log 50” x 12” dia.
6. Creosote log 36” x 12” dia.

Gibraltar Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0496
Surveyed by Catherine Davis, July 2006

1. Treated timber pieces, all very small
2. Creosote timber 102” x 7” x 3”
3. Creosote timber 14” x 10” x 5”

South of Gibraltar Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0497
Surveyed by Catherine Davis, July 2006

1. Creosote timber 142” x 12” x 4”
2. Creosote timbers pieces, not measured
3. 3 creosote derelict fixed pilings, two 240” x 12” dia., one 96” x 12” dia.
4. Creosote timber 60” x 12” x 11”
5. Creosote timber 224” x 12” x 10”
6. Treated timber 55” x 4” x 3”
7. Treated timber 64” x 4” x 3”
8. Treated timber 115” x 11” x 1”

North of Similk Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0498
Surveyed by Catherine Davis, July 2006

1. 2 treated timbers, each 120” x 12” x 4”
2. Creosote log 69” x 12” dia.
3. Creosote timber 96” x 8” x 7”
4. Creosote log 30” x 12” dia.

Similk Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0501
Surveyed by Catherine Davis, July 2006

1. Creosote timber 28” x 8” x 8”
2. Creosote log 8” x 13” dia.
3. Treated timbers, total size = 540” x 6” x 4”
4. Treated timbers 60” x 9” x 2”
5. Creosote timber 34” x 13” x 13”
6. Creosote timber 41” x 13” x 13”
7. Creosote log 24” x 7” dia.
8. Treated timber 72” x 8” x 4”
9. Creosote timber 62” x 9” x 7”

Similk Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0502
Surveyed by Buddy & Phil Char, August 2006

1. Treated timbers (part of old dock), total size = 474” x 6” x 3”
2. 2 treated timbers, one 72” x 12” x 14”, the other 36” x 14” x 14”
3. Treated timber 36” x 14” x 14”
4. 2 treated timbers, each 144” x 6” x 6”
5. Creosote railroad tie 60” x 8” x 8”

Similk Beach, north Skagit Bay
Shoreline Aerial Photo #SKA0503
Surveyed by Buddy & Phil Char, August 2006

1. 3 creosote logs, each 22” x 13” dia.
2. Creosote log 300” x 12” dia.

Turner’s Bay, north Skagit Bay
Shoreline Aerial Photo #SKA0506
Surveyed by Buddy & Phil Char, August 2006

1. Creosote log 70” x 10” dia.
2. 100+ fixed pilings (dock - in use?), no sizes given (assume 120” x 12” dia. each)
3. Creosote log 48” x 12” dia.
4. Old dock structure with several 100 derelict fixed pilings (creosote?) no sizes given

Turner's Bay, north Skagit Bay
Shoreline Aerial Photo #SKA0508
Surveyed by Buddy & Phil Char, August 2006

1. 15 treated railroad ties (old launch), each 144" x 8" x 6"
2. Treated railroad tie 60" x 8" x 6"

Turner's Bay, north Skagit Bay
Shoreline Aerial Photo #SKA0509
Surveyed by Buddy & Phil Char, August 2006

1. Derelict float with several treated timbers, each 120" x 48" x 4"
2. Old dock with ~20 treated timbers, each 240" x 8" x 10"
3. Treated timber 120" x 12" x 4"
4. 5 treated timbers, each averaging 200" x 12" x 12"
5. 2 creosote logs, 300" x 14" dia. and 132" x 16" dia.
6. Creosote log 96" x 13" dia.
7. 3 creosote logs, 2 at 360' x 12" dia. and one at 120" x 12" dia.
8. Creosote log 12" x 14" dia.

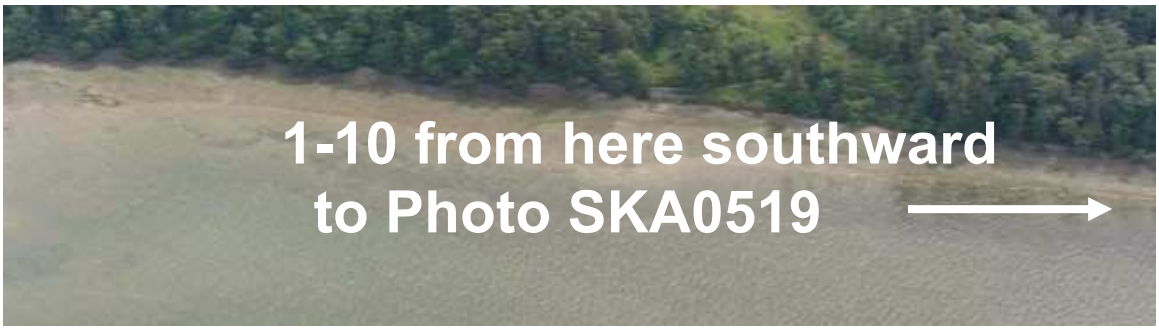
Turner's Bay, north Skagit Bay
Shoreline Aerial Photo #SKA0511
Surveyed by Buddy & Phil Char, August 2006

1. Treated timber 156" x 12" x 4"

Turner's Bay, north Skagit Bay
Shoreline Aerial Photo #SKA0513
Surveyed by Buddy & Phil Char, August 2006

1. Derelict fixed piling 240" x 14" dia.

Turner's Bay, north Skagit Bay
Shoreline Aerial Photo #SKA0514-519
Surveyed by Lyn Bishop and Eric Shen, September 2006



1. Treated timber 55" x 2" x 4"

2. Creosote log 166” x 12” dia.
3. Creosote log 51” x 10” dia.
4. Treated timber 53” x 8” x 2”
5. Creosote log 30” x 12” dia.
6. Treated timber 82” x 4” x 2”
7. 20 creosote fixed pilings, 9” dia., but lengths not given
8. Creosote timber 175” x 10” x 4”
9. Creosote log 165” x 12” dia.
10. Creostoe timber 137” x 12” x 4”

Kiket Island, Skagit Bay
Shoreline Aerial Photo #SKA0521
Surveyed by Paul Dinnel and Nate McNeil, September 2006

1. Creosote timber 180” x 8” x 10”
2. Creosote log 12” x 12” dia.

Kiket Island, Skagit Bay
Shoreline Aerial Photo #SKA0523
Surveyed by Paul Dinnel and Nate McNeil, September 2006

1. Creosote railroad tie piece 48” x 8” x 10”
2. Creosote railroad tie 96” x 8” x 10”
3. Creosote railroad tie 96” x 8” x 10”
4. Creosote log 12” x 12” dia.

Kiket Island, Skagit Bay
Shoreline Aerial Photo #SKA0531
Surveyed by Paul Dinnel and Nate McNeil, September 2006

1. Creosote log 96” x 12” dia.
2. Creosote timber 300” x 6” x 10”

South base of Kiket Island, Skagit Bay
Shoreline Aerial Photo #SKA0533
Surveyed by Paul Dinnel and Nate McNeil, September 2006

1. Creosote log 240” x 12” dia.
2. Treated timber bulkhead, ~60 feet long x 4 feet high with 4” x 12” timbers

Skagit Island, Skagit Bay
Shoreline Aerial Photo #SKA0526
Surveyed by Paul Dinnel and Nate McNeil, September 2006

No treated wood found on Skagit Island

South of Kiket Island, Skagit Bay
Shoreline Aerial Photo #SKA0534
Surveyed by Paul Dinnel and Nate McNeil, September 2006

1. Creosote timber bulkhead, ~100 feet long and 4 feet high, 6” x 12” timbers
2. 15 creosoted fixed pilings, in use, each 72” x 12” dia.
3. Creosote log 120” x 12” dia.

South of Kiket Island, Skagit Bay
Shoreline Aerial Photo #SKA0535
Surveyed by Paul Dinnel and Nate McNeil, September 2006

1. Dock with 7 creosote fixed piles (in use) averaging 72” x 12” dia. Dock made out of treated timbers of varying sizes.

Hope Island, east end, Skagit Bay
Shoreline Aerial Photo #SKA0538
Surveyed by Paul Dinnel, September 2006

1. Creosote log 24” x 12” dia.

Hope Island, south side, Skagit Bay
Shoreline Aerial Photo #SKA0544
Surveyed by Paul Dinnel, September 2006

1. Creosote log 180” x 12” dia.
2. Creosote log 132” x 14” dia.

Hope Island, south side, Skagit Bay
Shoreline Aerial Photo #SKA0545
Surveyed by Paul Dinnel, September 2006

1. Creosote log 60” x 12” dia.
2. Creosote log 12” x 20” dia.
3. Creosote log 36” x 12” dia.

Hope Island, southeast side, Skagit Bay
Shoreline Aerial Photo #SKA0546
Surveyed by Paul Dinnel, September 2006

1. Creosote timber 12” x 2” x 6”
2. Creosote log 36” x 12” dia.
3. Creosote log 60” x 12” dia.
4. Creosote log 192” x 10” dia.
5. Treated timber 48” x 4” x 4”
6. Treated timber 192” x 2” x 6”

Snee-Oosh Point, Skagit Bay
Shoreline Aerial Photo #SKA0550
Surveyed by Paul Dinnel and Michael Meldahl, October 2006

1. Creosote log 24” x 12” dia.
2. Treated timber 36” x 6” x 6”
3. Creosote timber 36” x 8” x 10”
4. Creosote timber 36” x 2” x 4”
5. Creosote log 72” x 12” dia.
6. Creosote timber 120” x 8” x 8”
7. Creosote timber 24” x 8” x 10”
8. Creosote log 24” x 12” dia.

South of Snee-Oosh Point, Skagit Bay
Shoreline Aerial Photo #SKA0552
Surveyed by Paul Dinnel, October 2006

1. Creosote log 156” x 12” dia.
2. Creosote log 72” x 14” dia.
3. Creosote timber 48” x 8” x 8”
4. Treated timber 36” x 2” x 6”
5. 5 creosote timbers, each 72” x 6” x 6”
6. Creosote timber 24” x 8” x 10”
7. Creosote timber 48” x 4” x 8”
8. Treated timber 12” x 2” x 6”
9. Creosote timber 24” x 12” x 12”

10. Spartina clump
11. Creosote timber 8” x 8” x 8”
12. 2 creosote timbers, total 144” x 6” x 8”
13. Creosote timber 96” x 6” x 6”
14. Treated timber 96” x 2” x 4”
15. Creosote timber 120” x 12” x 12”

South of Snee-Oosh Point, Skagit Bay
Shoreline Aerial Photo #SKA0553
Surveyed by Paul Dinnel, October 2006

1. Stairway with treated timbers, total of ~150 lineal feet of 2” x 8” timbers
2. Stairway with treated timbers, total of ~ 300 board feet of timbers
3. Treated timber 48” x 4” x 4”
4. **Two Spartina clumps**
5. 8 pieces of creosote/treated timber pieces, ~ 10 board feet total
6. Stairway with treated timbers & bulkhead, ~ 250 board feet total
7. Creosote timber 24” x 4” x 8”
8. Creosote log 48” x 12” dia.
9. Treated wood stairway, ~ 60 board feet total
10. Treated timber 96” x 2” x 10”
11. Treated timbers (derelict stairway), ~ 40 board feet total

South of Snee-Oosh Point, Skagit Bay
Shoreline Aerial Photo #SKA0554
Surveyed by Paul Dinnel, October 2006

1. Creosote log 48” x 12” dia.

2. Treated timber 72” x 2” x 8”
3. Treated timber 60” x 2” x 10”
4. Treated fixed post 36” x 4” x 4”
5. Dock with treated timbers, estimate ~ 2,000 board feet

South of Snee-Oosh Point, Skagit Bay
Shoreline Aerial Photo #SKA0555
Surveyed by Paul Dinnel, October 2006

1. Creosote log 12” x 14” dia.
2. Creosote timber 24” x 10” x 10”
3. Treated timber stairway, ~40 board feet
4. Creosote timber 48” x 8” x 8”
5. Treated wood stairway, ~30 board feet
6. Treated wood stairway, ~50 board feet
7. Treated wood stairway, ~100 board feet
8. Creosote log 24” x 12” dia.
9. Creosote timber 24” x 14” x 14”
10. Treated timber 72” x 2” x 4”

Indian Road Beach, Skagit Bay
Shoreline Aerial Photo #SKA0556
Surveyed by Paul Dinnel, October 2006

1. Treated timber 24” x 2” x 6”
2. About 12 treated timbers = ~ 20 board feet

3. Creosote log 72” x 12” dia.
4. Treated timber 48” x 4” x 4”

Indian Road Beach, Skagit Bay
Shoreline Aerial Photo #SKA0557
Surveyed by Paul Dinnel, October 2006

1. 2 creosote fixed posts, each 48” x 8” x 8”

Deadman Islands, Skagit Bay
Shoreline Aerial Photo #SKA0562
Surveyed by Paul Dinnel, October 2006

No treated wood found

Fir Island, Skagit River Delta

Fir Island, North of Craft Island, South Skagit Bay
Shoreline Aerial Photo #SKA0650
Surveyed by Paul Dinnel, October 2006

No treated wood

Fir Island, at Craft Island, South Skagit Bay
Shoreline Aerial Photo #SKA0651
Surveyed by Paul Dinnel, October 2006

1. Creosote timber 144” x 2” x 12”
2. Creosote log 16” x 14” dia.

3. Treated timber 24” x 6” x 6”

Fir Island, Hall Slough, South Skagit Bay
Shoreline Aerial Photo #SKA0654
Surveyed by Paul Dinnel, October 2006

1. **Lots of Spartina!**

Fir Island, south of Hall Slough, South Skagit Bay
Shoreline Aerial Photo #SKA0655
Surveyed by Paul Dinnel, October 2006

1. Creosote timber 144” x 4” x 4”
2. Treated timber 36” x 2” x 12”
3. Treated timber 60” x 3” x 10”
4. Creosote log 24” x 12” dia.
5. Creosote timber 36” x 4” x 10”
6. Creosote timber 48” x 10” x 10”
7. **A few patches of Spartina throughout area**

Fir Island, south of Hall Slough, South Skagit Bay
Shoreline Aerial Photo #SKA0656
Surveyed by Paul Dinnel, October 2006

1. Creosote log 48” x 12” dia.
2. Creosote timber 72” x 10” x 10”
3. Treated timber 48” x 2” x 6”
4. Creosote log 36” x 10” dia.
5. Creosote log 72” x 16” dia.
6. Treated timber 12” x 6” x 10”
7. Treated timber 48” x 4” x 4”
8. Creosote log 300” x 12” dia.
9. **A few patches of Spartina throughout this area**

Fir Island, Brown Slough, South Skagit Bay
Shoreline Aerial Photo #SKA0657
Surveyed by Paul Dinnel, October 2006

1. Treated timber 36” x 4” x 6”

Fir Island, Brown Slough, South Skagit Bay
Shoreline Aerial Photo #SKA0658
Surveyed by Paul Dinnel, October 2006

1. Treated timber 18” x 6” x 8”
2. Treated timbers (dock structure?), ~50 board feet
3. Creosote log 48” x 12” dia.

End 2006-2007Survey

APPENDIX 3

Locations Where Spartina Was Found During the 2006-2007 Inventory

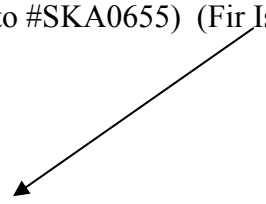
Spartina Locations Reported During Skagit County Creosote/Spartina Inventory Surveys, Summer/Fall of 2006

Skagit County Marine Resources Committee and Skagit Beach Watchers

1. Skagit Bay, Ecology Photo #SKA05552
   Small patch in outflow of stream south of Snee-oosh Beach
   Latitude: 48.23.728N, Longitude: 122.32.321W

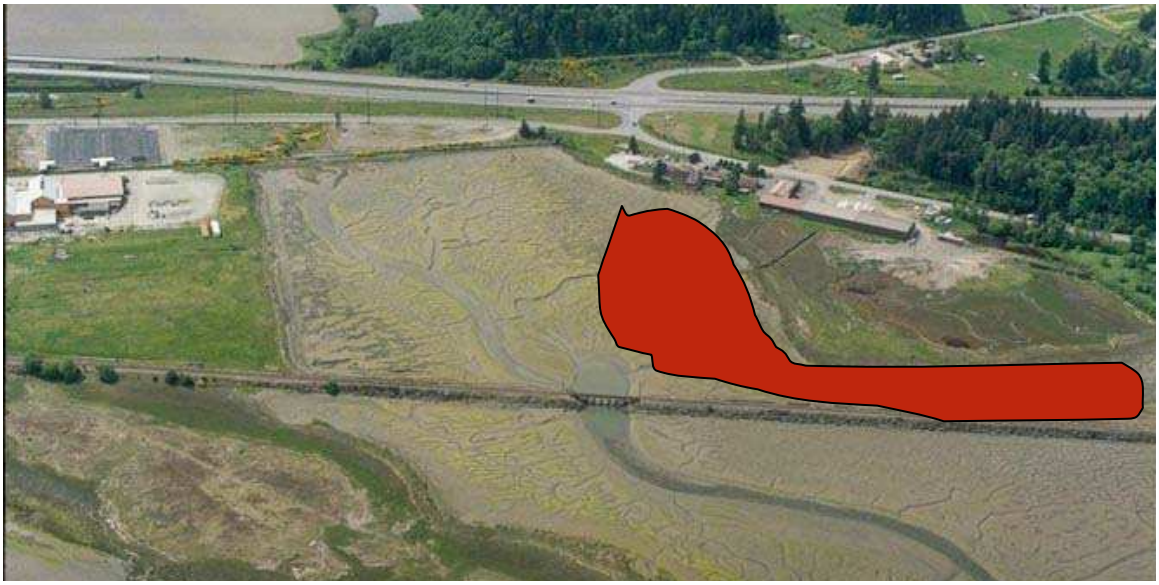
2. Skagit Bay Ecology Photo #SKA0654
   Lots of Spartina patches in Hall Slough, Fir Island and scattered patches extending to the south (dotted line)
   Latitude: 48.20.435N, Longitude: 122.26.419W

3. And continuing southward (Ecology Photo #SKA0655) (Fir Island Public Access)



4. And continuing southward (Ecology Photo # SKA0656 –Fir Island)

5. Southwest corner of Padilla Bay at Whitmarsh Junction (Ecology Photo # SKA0350) in lagoon just north of the Swinomish Tribal Casino off of Highway 20. Lots of Spartina patches, with seed heads. (no latitude/longitude coordinates).



APPENDIX 4

Results of the First and Second Treated Wood Resurveys on Four Selected Beaches

Resurvey of Selected Areas for Repopulation of Treated Wood on Cleaned Shorelines

1. Resurvey and removal of treated wood at the north end of the Swinomish Channel, just east of the Swinomish Casino. Original survey was in October 2004. At that time, 72 pieces of treated wood were recorded and all but a few pieces were removed. The first resurvey was in January 2006 and the second resurvey was in December 2006.

First resurvey, 7 January 2006
Shoreline Aerial Photo #SKA0349
Surveyed by Paul Dinnel and Vicki McNeil

1. Massive 120" x 18" x 48" creosote railroad timber alongside tracks. This was not removed in 2004. This is not a new item.
2. Creosote log, 24" x 6" dia.
3. Treated timber, 6" x 8" x 4"

Second resurvey, 13 December 2006
Shoreline Aerial Photo #SKA0349
Surveyed by Paul Dinnel

1. Massive 120” x 18” x 48” creosote railroad timber alongside tracks. This was not removed in 2004, but was removed in 2006. This is not a new item.

First resurvey, 7 January 2006
Shoreline Aerial Photo #SKA0350
Surveyed by Paul Dinnel and Vicki McNeil

1. Creosote log, 24” x 14” dia.
2. Treated timber, 48” x 6” x 4”
3. Creosote log, 240” x 10” dia.
4. Creosote log, 60” x 16” dia.
5. Creosote log, 60” x 14” dia.
6. Creosote log, 36” x 14” dia.
7. 2 Creosote timbers, each 36” x 6” x 6”
8. Treated timber, 12” x 12” x 2”
9. Treated timber, 6” x 6” x 4”
10. Treated timber, 36” x 6” x 2”
11. Treated timber, 12” x 6” x 2”
12. Creosote timber, 240” x 8” x 2”

Second resurvey, 13 December 2006
Shoreline Aerial Photo #SKA0350
Surveyed by Paul Dinnel

1. Creosote log, 70” x 12” dia.
2. Creosote log, 48” x 12” dia.
3. Creosote log, 96” x 12” dia.
4. Creosote log, 144” x 12” dia.
5. Creosote log, 24” x 14” dia.
6. Creosote log, 24” x 12” dia.
7. Creosote log, 480” x 12” dia.

Only item #5 was not a new item – it was present in 2004 and not removed in 2004. Items 6 and 7 were removed in 2006, but the others were left in place due to being inaccessible by tug & barge at the time. In summary, 6 new treated wood items were found in this location in 2006, compared to 72 pieces observed in 2004.

2. Resurvey and removal of treated wood at Crandall Spit, north Fidalgo Bay. Original survey was in August 2004. At that time, 8 pieces of treated wood were recorded and all were removed in 2004. The first resurvey was in December 2005 and the second resurvey was in January 2007.

First resurvey (and removal), 8 December 2005
Shoreline Aerial Photo #SKA0370
Surveyed by Paul Dinnel

1. Creosote timber, 240” x 12” x 4”
2. Dock structure – creosote and treated timbers, size 324” x 48” x 18”
3. Creosote timber, 240” 12” x 4”
4. Creosote log piece, 8” x 10” dia.
5. Treated timber, 36” x 4” x 4”
6. 2 treated timbers, both 12” x 12” x 14”

Second resurvey (and removal), 29 January 2007
Shoreline Aerial Photo #SKA0370
Surveyed by Paul Dinnel and other volunteers

1. Treated timber, 168” x 4” x 8”
2. Treated timber, 12” x 4” x 6”
3. Treated timber, 18” x 4” x 6”
4. Treated log piece, 2” x 12” dia.
5. Creosote log, 72” x 12” dia.
6. Treated timber, 156” x 10” x 4”
7. Treated timber, 24” x 4” x 4”

First resurvey, 8 December 2005
Shoreline Aerial Photo #SKA0371
Surveyed by Paul Dinnel

1. Creosote timber 240” x 12” x 4”
2. Creosote timber, 12” x 6” x 4”
3. 2 Treated timber pieces – 48” x 8” x 2” and 6” x 8” x 2”

4. Treated timber, 36” x 4” x 2”
5. Creosote timber, 36” x 6” x 4”
6. Treated timber, 4” x 6” x 2”
7. Treated timber, 48” x 6” x 2”
8. Treated timber, 12” x 6” x 4”
9. Creosote timber, 24” x 12” x 4”
10. Creosote timber, 12” x 6” x 4”

Second resurvey (and removal), 29 January 2007
Shoreline Aerial Photo #SKA0371
Surveyed by Paul Dinnel and other volunteers

1. Treated timber, 12” x 4” x 4”
2. Treated timber, 192” x 16” x 18”
3. Treated timber 84” x 16” x 8”
4. Treated timber, 12” x 12” x 10”
5. Treated timber, 6” x 8” x 4”
6. Treated timber, 108” x 10” x 6”
7. Treated timber, 48” x 4” x 2”
8. Treated timber, 12” x 10” x 6”
9. Treated timber, 192” x 12” x 4”
10. Creosote log piece, 4” x 10” dia.
11. Float with creosote timbers, two 216” x 8” x 8” timbers and seven 216” x 10” x 2” timbers
12. Creosote log, 60” x 14” dia.
13. Treated timber, 48” x 12” x 4”
14. Creosote log, 120” x 14” dia.
15. Treated timber, 12” x 10” x 12”
16. Creosote log, 60” x 20” dia.
17. Treated timber, 36” x 4” x 2”
18. Treated timber, 12” x 4” x 2”

Twenty-five new pieces of treated wood were found on Crandall Spit in January 2007. All were removed in January 2007. This compares with just 8 pieces reported in 2004; however, this may have been an underestimate, as more pieces than that were later removed in 2004 (exact number removed not recorded).

3. Resurveys of treated wood at a pocket beach just outside and to the east of the entrance to Cap Sante Marina, approximately one and two years following removal activities in 2004. Original survey was in November 2004. At that time, 15 pieces of treated wood were recorded and all were removed in 2004. The first resurvey was on 30 November 2005 and the second resurvey was on 29 May 2007.

First resurvey, 30 November 2005
Shoreline Aerial Photo #SKA0402
Surveyed by Paul Dinnel

1. Treated timber, 12” x 8” x 2”
2. Creosote log, 24” x 14” dia.

Second resurvey, 29 May 2007
Shoreline Aerial Photo #SKA0402
Surveyed by Paul Dinnel

1. Treated timber, 96" x 8" x 4"
2. Treated timber, 36" x 6" x 2"
3. Treated timber, 18" x 12" x 4"
4. Creosote log, 24" x 12" dia.

Only 2 new pieces of treated wood were found on the Cap Sante pocket beach during the first resurvey in November 2005 and 4 pieces were found on the second resurvey in May 2007. This compares with 15 pieces reported in 2004, all of which were removed in 2004.

4. Resurveys of treated wood along the south shore of Guemes Island, approximately one and two years following removal activities in 2004. Original survey was in August 2004. At that time, 189 pieces of treated wood were recorded and all were removed in 2004 (not including a few fixed pilings). The first resurvey was on 28 November 2005 and the second resurvey (and removal) was on 30 January 2007.

First resurvey, 28 November 2005
Shoreline Aerial Photo #SKA0047, south shore, west of ferry dock
Surveyed by Paul Dinnel

1. Treated timber, 12’ x 4” x 4”
2. Creosote timber, 12” x 4” x 4”
3. Creosote timber, 6” x 6” x 6”
4. Creosote timber, 240” x 6” x 4”

First resurvey, 28 November 2005
Shoreline Aerial Photo #SKA0048, west of ferry dock
Surveyed by Paul Dinnel

1. Creosote timber, 6” x 10” x 4”
2. Treated timber, 6” x 4” x 2”
3. Treated timber, 24” x 8” x 4”
4. Treated timber, 8” x 4” x 2”
5. Creosote timber, 16” x 8” x 4”

First resurvey, 28 November 2005
Shoreline Aerial Photo #SKA0049, south shore, west of ferry dock
Surveyed by Paul Dinnel

1. Creosote log, 24” x 16” dia.
2. Treated timber, 60” x 12” x 4”
3. Creosote log, 276” x 12” dia.
4. Creosote timber, 36” x 4” x 1”
5. Creosote timber, 12” x 10” x 4”
6. Creosote timber, 6” x 6” x 3”

7. Treated timber, 8” x 4” x 4”
8. Treated timber, 12” x 10” x 4”

First resurvey, 28 November 2005
Shoreline Aerial Photo #SKA0050, west of ferry dock
Surveyed by Paul Dinnel

1. Treated timber, 10” x 4” x 2”
2. Creosote timber, 36” x 16” x 8”

First resurvey, 28 November 2005
Shoreline Aerial Photo #SKA0051, south shore,west of ferry dock
Surveyed by Paul Dinnel

1. Creosote timber, 36” x 16” x 8”

Note: Creosote pilings/timbers associated with the ferry dock were not counted

First resurvey, 6 January 2006
Shoreline Aerial Photo #SKA0052, east of ferry dock
Surveyed by Dixon Elder

1. Creosote timber, 78” x 12” x 12”
2. Creosote log, 120” x 16” dia.
3. Treated timber, 240” x 8” x 4”
4. Creosote log piece, 8” x 12” dia.

First resurvey, 6 January 2006
Shoreline Aerial Photo #SKA0053, south shore, east of ferry dock
Surveyed by Dixon Elder

1. Creosote timber 12” x 10” x 10”
2. Treated timber 10” x 10” x 6”
3. Treated post 60” x 4” dia.
4. Creosote log 72” x 12” dia.
5. Creosote log 28” x 16” dia.

First resurvey, 6 January 2006
Shoreline Aerial Photo #SKA0054, south shore, east of ferry dock
Surveyed by Dixon Elder

1. Creosote log 72” x 14” dia.

First resurvey, 6 January 2006
Shoreline Aerial Photo #SKA0055, south shore, east of ferry dock
Surveyed by Dixon Elder

1. Treated timber 36” x 8” x 4”
2. Creosote timber 16” x 10” x 12”
3. Creosote log 600” x 14” dia.

First resurvey, 6 January 2006
Shoreline Aerial Photo #SKA0056, south shore, east of ferry dock
Surveyed by Dixon Elder

1. Creosote log end 4” x 16” dia.
2. Creosote log piece 84” x 4” dia.

End of First Resurvey, November 2005. 35 new pieces of treated wood were found during the November 2005 resurvey. This compares to the 189 pieces originally found (and removed) in 2004.

Second Resurvey, South shore of Guemes Island, January 2007. Note: This resurvey covers the same shoreline as the First Resurvey in November 2005. Almost all treated wood observed during the second survey was also removed on the same date.

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0047, south shore, west of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers

1. Creosote timber 144” x 8” x 4”
2. Treated timber 6” x 6” x 6”
3. Creosote log 36” x 16” dia.
4. Treated timber 24” x 8” x 8”
5. Creosote log 240” 14” dia.
6. Creosote log 36” x 12” dia.
7. 4 creosote timbers in use, total 720” x 10” x 4”
8. Treated timber 24” x 8” x 6”
9. Treated timber 6” x 4” x 4”
10. Creosote log 24” x 12” dia.
11. Creosote log 72” x 12” dia. (under railroad tracks)
12. Treated timber 24” x 8” x 4”
13. Treated timber 72” x 6” x 6”
14. Treated timber 144” x12” x 4”
15. Creosote log 12” x 16” dia.
16. Creosote log 12” x 14” dia.

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0048, south shore, west of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers

1. Creosote log 72” x 14” dia.
2. Treated timber 12” x 8” x 8”
3. Treated timber 6” x 8” x 6”
4. Treated timber 36” x 10” x 4”
5. Creosote log piece 6” x 8” dia.
6. Creosote log piece 8” x 12” dia.
7. Treated timber 12” x 8” x 4”
8. Creosote log 36” x 14” dia.
9. Creosote log 96” x 16” dia.
10. Creosote log 72” x 14” dia.
11. Creosote log 36” x 10” dia.
12. Creosote log 6” x 8” dia.
13. Creosote log 36” x 12” dia.

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0049, south shore, west of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers

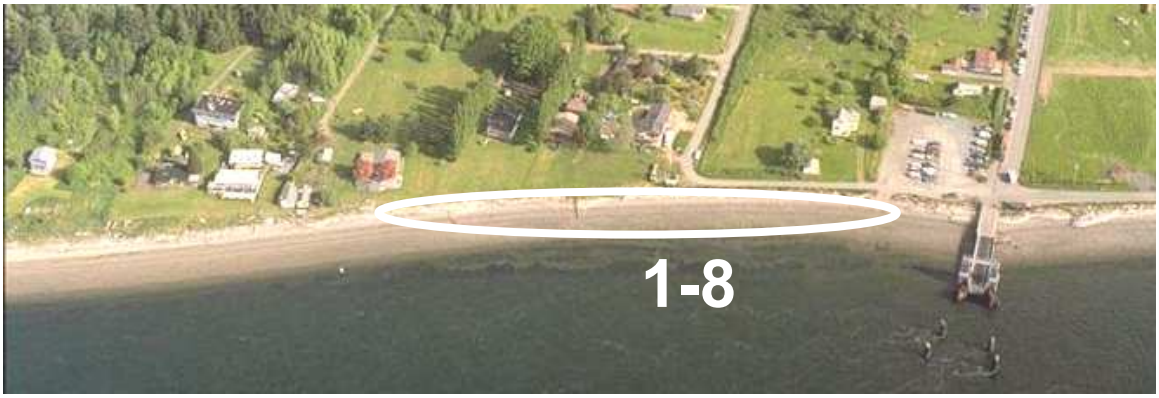
1. Treated timber 8” x 6” x 4”
2. Creosote log 24” x 14” dia.
3. Creosote log 18” x 14” dia.
4. Creosote log 12” x 14” dia.

5. Treated timber 60” x 14” x 14”
6. Treated timber 12” x 6” x 4”
7. Treated timber 60” x 10” x 4”
8. Creosote log 12” x 12” dia.
9. Treated timber 24” x 8” x 4”
10. Creosote timber 180” 8” x 4”
11. Creosote log 26” x 16” dia.
12. Creosote log 48” x 18” dia.
13. Creosote log 36” x 12” dia.
14. Treated timber 24” x 8” x 4”
15. Treated timber 6” x 6” x 4”
16. Treated timber 18” x 6” x 4”
17. Treated timber 12” x 10” x 2”
18. Creosote log 36” x 12” dia.
19. Creosote log 48” x 12” dia.

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0050, south shore, west of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers

1. Creosote log 18” x 12” dia.
2. Creosote log 30” x 12” dia.
3. Creosote log 216” x 16” dia.
4. Creosote log 96” x 12” dia.
5. Creosote log 12” x 12” dia.
6. Creosote log 48” x 12” dia.
7. Treated timber 36” x 10” x 4”

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0051, south shore, west of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers



1. Creosote log 72” x 18” dia.
2. Treated timber 12” x 12” x 12”
3. Treated timber 48” x 4” x 2”
4. Treated timber 48” x 12” x 8”
5. Creosote log 24” x 14” dia.
6. Creosote log 216” x 12” dia.
7. Creosote timber 120” x 8” x 6”
8. Creosote timber 12” x 8” x 6”

Note: Creosote pilings/timbers associated with the ferry dock were not counted

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0052, south shore, east of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers

1. Creosote timber 12” x 12” x 12”
2. Treated timber 36” x 6” x 2”
3. Creosote log 24” x 10” dia.
4. Creosote log 240” x 14” dia.
5. Treated timber 12” x 6” x 2”

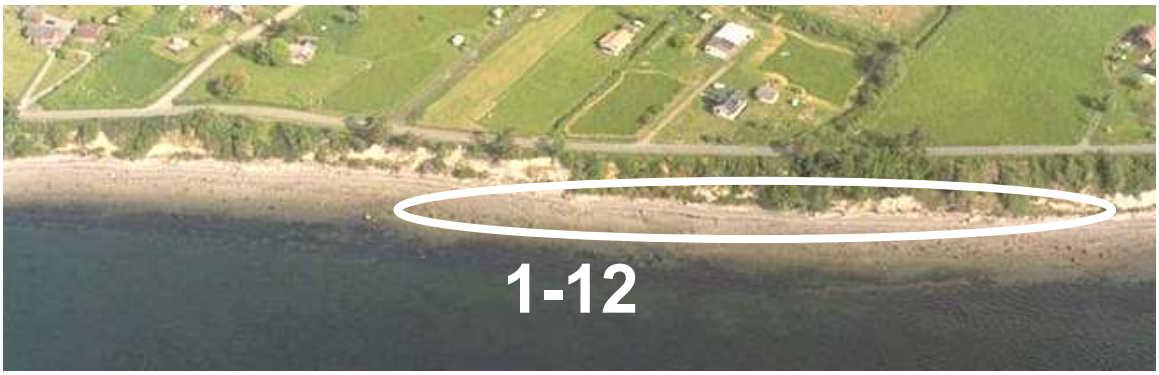
6. Creosote log 12” x 14” dia.
7. Treated timber 120” x 6” x 4”
8. Creosote log 96” x 12” dia.
9. Creosote timber 84” x 6” x 4”
10. Treated timber 12” x 6” x 2”
11. Creosote timber 12” x 4” x 4”
12. Creosote timber 48” x 4” x 4”
13. Creosote log 96” x 12” dia.
14. Creosote log 12” x 10” dia.
15. Creosote timber 36” x 12” x 12”
16. Creosote log 48” x 14” dia.
17. Creosote log 48” x 16” dia.
18. Creosote log 12” x 14” dia.
19. Creosote log 60” x 12” dia.

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0053, south shore, east of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers

1. Treated timber 6” x 6” x 4”
2. Treated timber 12” x 4” x 4”
3. Creosote log 24” x 12” dia.
4. Creosote log 36” x 8” dia.
5. Creosote timber 60” x 6” x 4”
6. Creosote log 120” x 12” dia.
7. Treated timber 48” x 12” x 4”
8. Creosote log 360” x 12” dia.
9. Creosote log 18” x 12” dia.
10. Creosote log 336” x 12” dia.
11. Treated timber 72” x 12” x 4”
12. Creosote log 36” x 12” dia.
13. Creosote log 12” x 12” dia.
14. Creosote log 48” x 12” dia.
15. Creosote log 24” x 14” dia.
16. Treated timber 36” x 6” x 2”
17. Treated timber 24” x 10” x 4”

18. Creosote log 36” x 18” dia.

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0054, south shore, east of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers



1. Creosote log 24” x 12” dia.
2. Creosote timber 12” x 10” x 8”
3. Treated timber 12” x 8” x 4”
4. Treated timber 120” x 12” x 2”
5. Treated timber 18” x 12” x 12”
6. Creosote log 36” x 12” dia.
7. Creosote log 48” x 12” dia.
8. Creosote log 288” x 12” dia.
9. Creosote log 84” x 12” dia.
10. Creosote log 72” x 12” dia.
11. Treated timber 48” x 4” x 2”
12. Creosote timber 120” x 10” x 8”

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0055, south shore, east of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers

1. Treated timber 12” x 12” x 4”
2. Treated timber 12” x 4” x 2”

3. Treated timber 12” x 10” x 2”
4. Treated timber 18” x 4” x 2”
5. Creosote log 12” x 12” dia.
6. Creosote log 12” x 8” dia.
7. Creosote timber 120” x 8” x 4”
8. Creosote timber 180” x 10” x 8”
9. Treated wood structure 144” x 18” x 12”

Second resurvey, 30 January 2007
Shoreline Aerial Photo #SKA0056, south shore, east of ferry dock
Surveyed by Paul Dinnel and Beach Watcher/MRC volunteers

1. Creosote log 24” x 10” dia
2. Treated timber 24” x 6” x 4”

End Second Resurvey, January 2007. 122 pieces of treated wood were found during the November 2005 resurvey. This compares to the 189 pieces originally found (and removed) in 2004 and the 35 pieces (not removed) found during the first resurvey in January 2006.