

## Blomquist Residence

Address: **Shorebrook Dr. NW**

Region: **Eastern Shore of Hood Canal just south of the Hood Canal Bridge**

Designer: **Bart Berg Landscape**

Contractor: **Bart Berg Landscape**

Owner: **G. Stenman**

Shoreline Type: **Historic Beach with stream**

Project Type: **Large Woody Debris  
Minor Nourishment**

Wave Energy: **Medium**

Tides: **MHHW: +10.71  
Extreme High: +14.0  
Extreme Low: -4.5**

Cost: **~\$15500 (\$166/ft)**

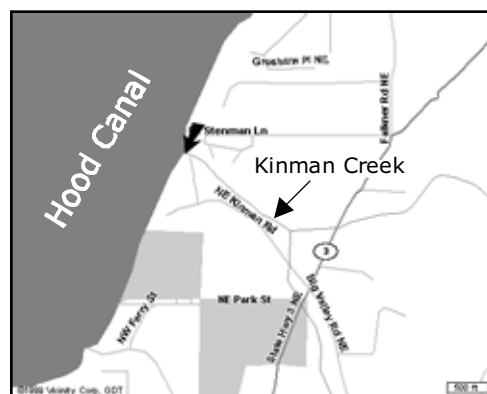
Date Completed: **September 1999**



Location: Blomquist in Puget Sound

### Site History / Description

The site is located on Hood Canal just south of the Hood Canal Bridge. It is unique in this report in that it is situated such that a small creek passes down the north side of the property adding to erosion concerns and the complexity of the erosion protection. Kinman Creek may have once had a healthy salmon run but at this time there are few returning fish due to a culvert up the creek just past the site. The topography offshore is shallow and is exposed at low tide for at least 100-200 feet, marking the stream's delta. Finally, neighboring properties to both sides are heavily armored and the beaches in front of these houses are significantly damaged by scour. The rip-rap bulkhead to the north is of particular interest because wave energy appears to reflect off of it onto the Blomquist beach.



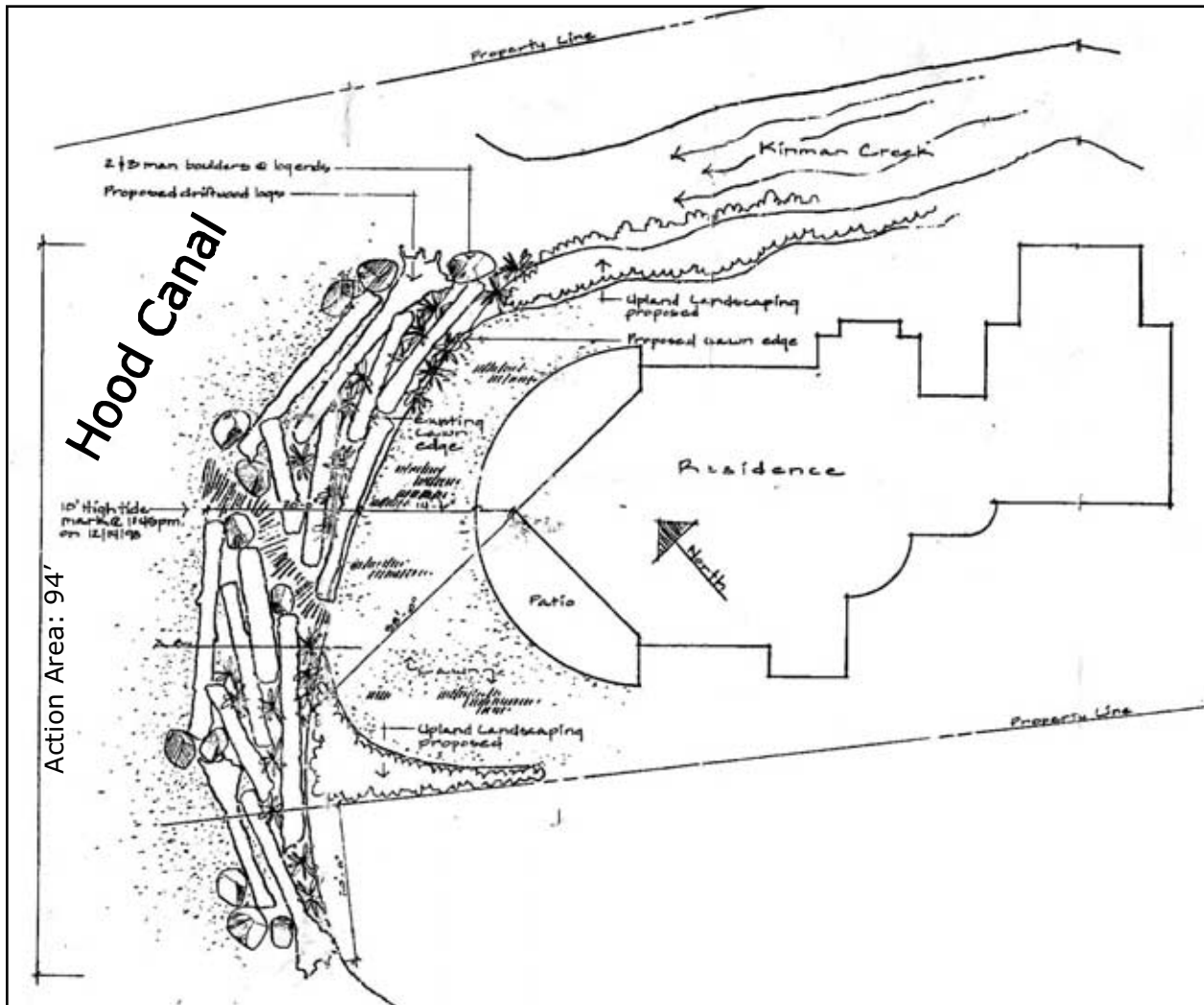
Location: Blomquist close up

The house on the site was built in 1993 relatively close to the water. In 1996, approximately ten feet of beach/backshore was lost during storms. The homeowner at that time proposed to construct a rock bulkhead, but the application was denied by the Department of Fish & Wildlife due to biological

concerns. The home was sold the following year to Blomquist, who attempted to prevent further erosion by placing riprap along the shoreline. This was done without permits and as a result, WDFW required its removal, but allowed replacement with the softer solution described here.

### Project Description

The project area begins at Kinman Creek and stretches south for 94'. This extends the project area into the neighboring, undeveloped lot which the homeowner would like to purchase. The project entails filling the beach with a 7/8" gravel mix and anchoring coarse woody debris to dissipate wave energy and retain sediment. The logs are anchored with concrete parking curbs or ecology blocks depending on their size. The ecology block can be used on this site because access to the beach by heavy machinery is not limited and large blocks could be brought in. They allow the larger logs to be anchored with just two cables (4 curbs would have been needed). The owner was concerned that the cables would ruin the



Site Plan: Blomquist Residence

## Blomquist Residence

natural effect the design was attempting to achieve. Using ecology block is a way to reduce the number of visible cables by reducing the number of anchors per log.

### **Monitoring**

There is no official monitoring plan for the site. The homeowner expects that the site will need periodic renourishment and intends to maintain the level of access he now possesses so that this can be accomplished easily and cost effectively in the future.

### **Success**

The project just been completed and success can not be determined yet.

### **Alternatives Considered**

Like on many other sites the first proposal was to build a rock bulkhead or revetment.

### **Contacts**

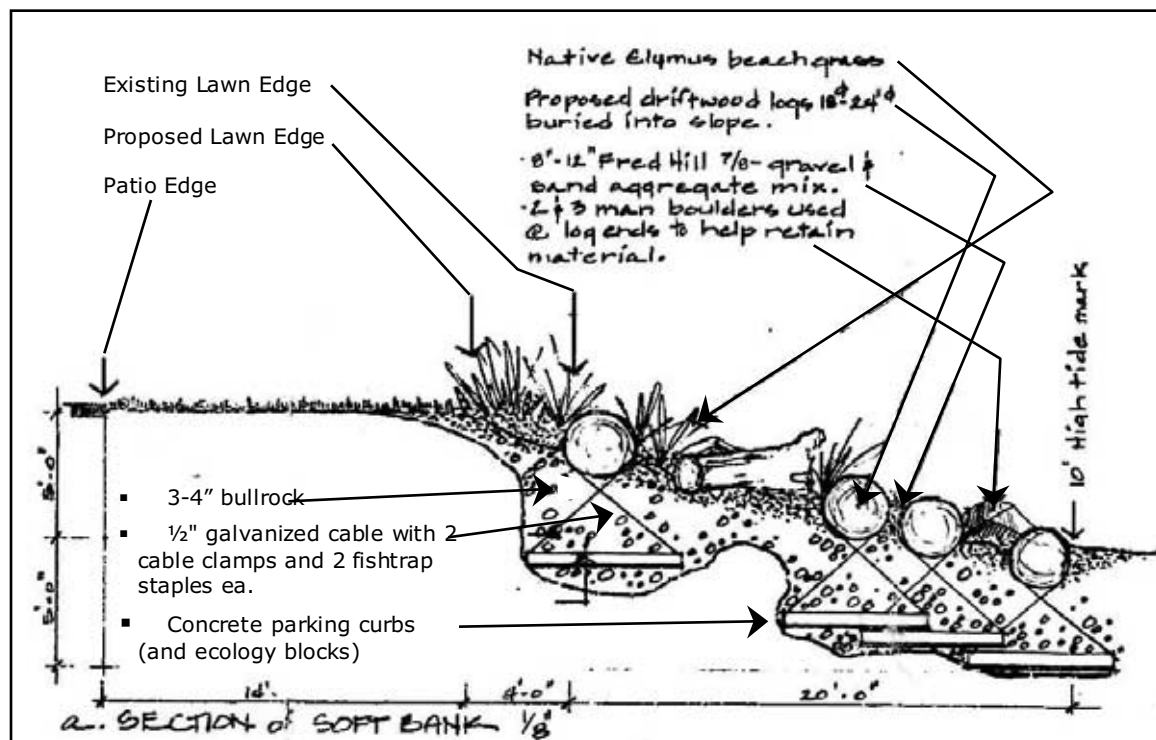
Department of Fish and Wildlife:

J. Brennan (now with King County DNR)

Bart Berg Landscape:

B. Berg

### Project Design Profile



Blomquist Residence: Project Profile

Blomquist Residence



Figure 1. View north toward mouth of Kinman Creek, prior to construction. One concern was that waves reflecting off of bulkhead north of creek impacted the Blomquist beach.



Figure 2. Construction. Note minimal setback and broad gravelly beach.



## Cormorant Cove

**Address:** 3707 Beach Drive SW  
**Region:** Alki Beach  
**Designer:** Galloway & Barker  
**Contractor:** Not Yet Built  
**Owner:** Seattle Parks Dept.  
**Shoreline Type:** Historic Beach  
**Project Type:** Bulkhead redesign and relocation  
 Beach reconstruction  
**Wave Energy:** High  
**Tides:** MHHW: +11.40  
 Extreme High: +15.0  
 Extreme Low: -4.5  
**Cost:** \$250,000 (projected)  
**Date Completed:** Not yet built



Location: Cormorant Cove in Puget Sound

### Site History / Description

Cormorant Cove is a 1/3 acre site located on the west side of Alki Beach. It has approximately 215 feet of marine shoreline. There is a 5-9' tall vertical rock bulkhead that runs for 204' from the north end of the site towards the south. Below the bulkhead is a sandy beach with concrete rubble strewn at the south end. Above the rockery there is a lawn area that gently slopes from Beach Drive down to the top of the rip-rap. The property is flanked by multi-family residences to the north and south. The property to the north is protected by a vertical bulkhead while the one to the south is a large condo complex built on pilings out over the water.

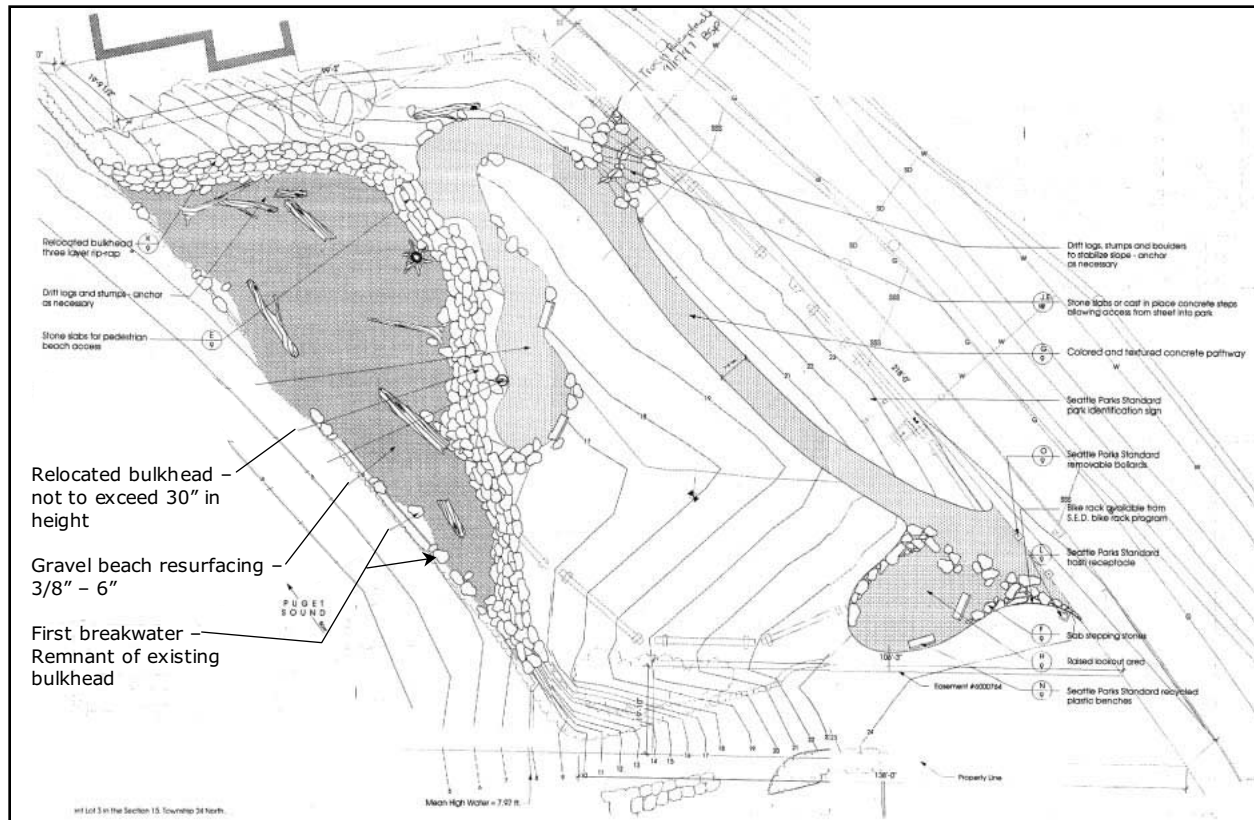


Location: Cormorant Cove on Alki Beach

The Cormorant Cove project is a result of the citizens of Alki Beach, the Alki Community Council and the Beach Drive Shoreline Parks Committee. Significant community involvement has gone into the project at all levels. The site was purchased by the Seattle Parks Department in 1995 with funds from the Shoreline Park Improvement Fund. Final permitting is pending and additional funds are being raised for construction, which is hoped to occur in the summer of 2000.

## Project Description

The Cormorant Cove project will result in the creation of a perched, pocket beach by removing most of the existing bulkhead, reestablishing the bankline landward of the existing bulkhead, and adding sand and gravel to the regraded beach. The addition of a sloping, partially buried revetment along the bankline will be added to prevent further toe erosion, and woody debris will be incorporated into the beach to add stability and habitat structure. The bankline and uplands will be landscaped to include a path to the beach, a narrow vegetative buffer at the top of the bank, and lawn and landscape plantings on the upland portion of the site. A southern promontory will be maintained on the uplands as a view point and picnic



area.

The project will begin by removing all but the lowest tier of the existing vertical rock bulkhead. This last level of rock, which is presently found below beach grade, will be left in place to act as a sill for the new pocket beach. A new rip-rap revetment will be built up to 45' landward of the present bulkhead. The structure will be no more than 30" tall and the face will be angled at a minimum of 2H:1V.



## Cormorant Cove

The area between the old bulkhead and the new revetment will be a pocket beach or “cove”. It is designed not only as an aesthetic improvement but as a depositional area and a habitat improvement. To create this new beach 820 yd<sup>3</sup> of material will be excavated. Once the appropriate grade is reached the beach will be resurfaced with a 3/8”-6” gravel/cobble mix with most of the material falling into the 2-3” range. Coarse woody debris will be anchored to the beach as necessary to further protect the site from erosion.

To create the uplands, 1468 yd<sup>3</sup> will be added. The 820 yd<sup>3</sup> cut from the beach will make up a substantial part of this fill. Once the land is graded and the concrete pathway is built, 920 native plants will be added to the site. These will help secure the sediments against erosion and improve habitat.

### **Monitoring**

N/A

### **Success**

N/A

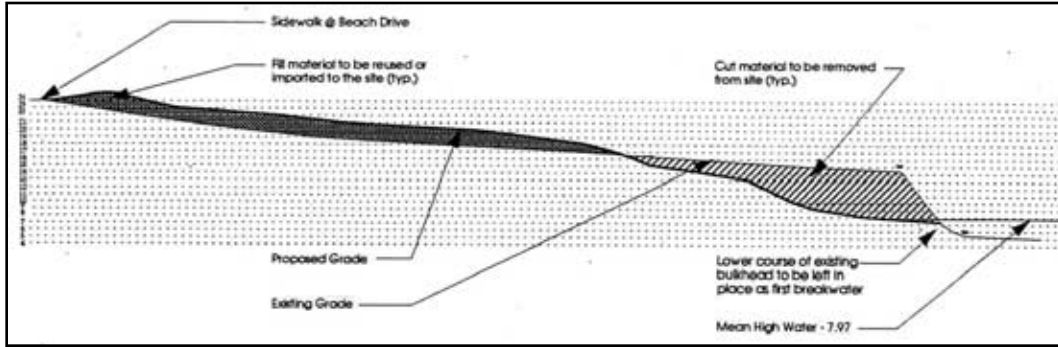
### **Alternatives Considered**

N/A

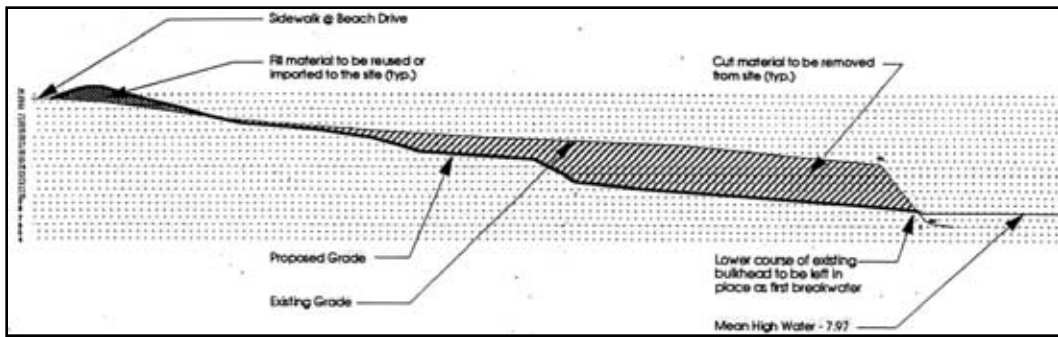
### **Contacts**

Seattle Parks Department	K. Stoops
Alki Community Council	L. Jane
Galloway & Barker	J. Barker
King County DNR	J. Brennan
Coastal Geologic Services	J. Johannessen

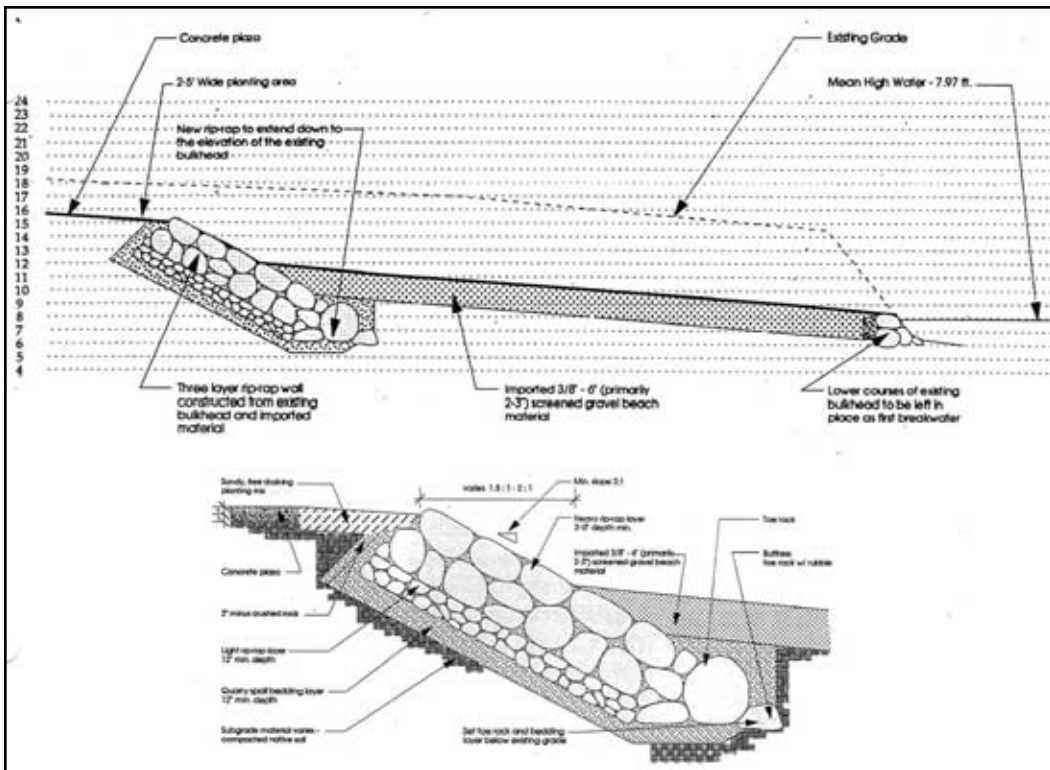
Project Design Profiles



Typical Profile: North End.



Typical Profile: South End.



Rip-Rap Revetment: Three layer design with first breakwater

Cormorant Cove



Figure 1. View of Cormorant Cove site from the beach at low tide. Much of the rock bulkhead will be removed when the project is constructed.



Figure 2. View to the north from 3701 Beach Drive, showing hardened shoreline and intrusion of bulkhead onto upper beach.



## Dick residence

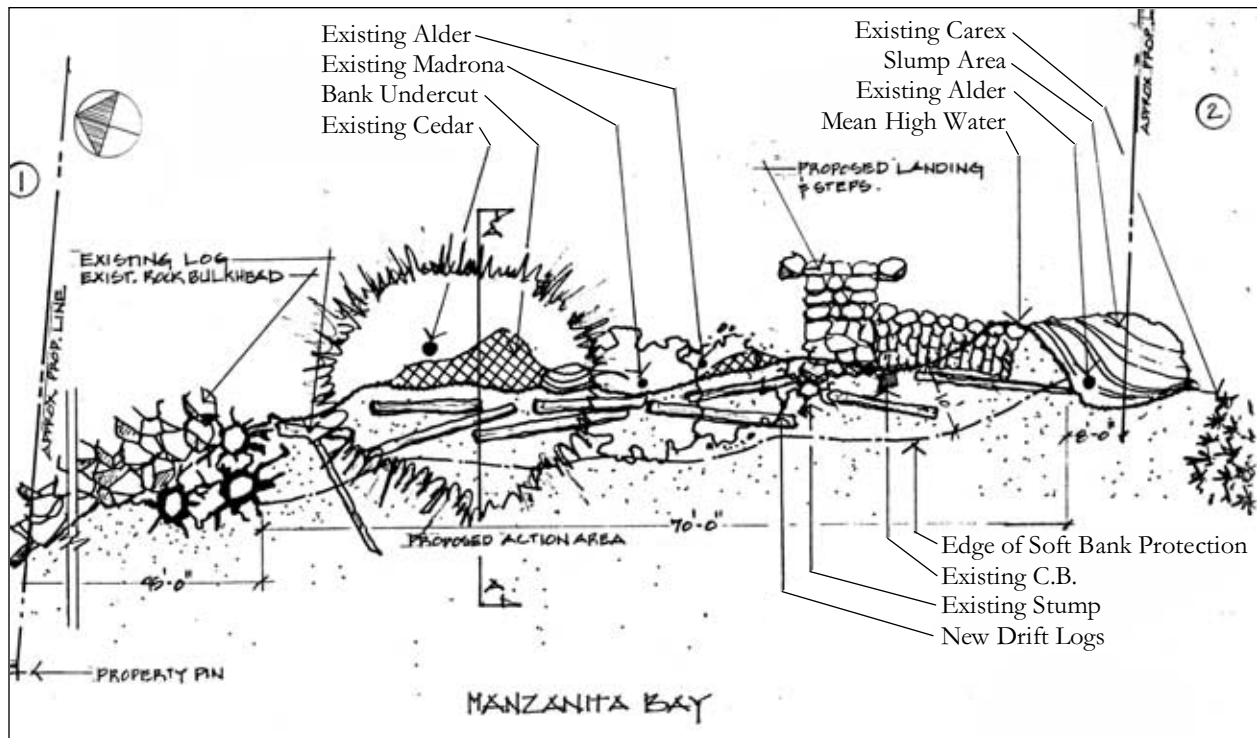
**Address:** Bergman Rd., Bainbridge Island  
**Region:** NW side of Bainbridge Island, Manzanita Bay  
**Designer:** Bart Berg Landscape  
**Contractor:** Bart Berg Landscape  
**Owner:** Lee & Elizabeth Dick  
**Shoreline Type:** 14' Bluff  
**Project Type:** Fill undercut and add geotextile, spall, logs and plants.  
**Wave Energy:** Very Low  
**Tides:** MHHW: +11.4  
Extreme High: +15.5  
Extreme Low: -4.5  
**Cost:** N/A  
**Date Completed:** Summer 1998



Location: Dick Res. in Manzanita Bay

### Site History / Description

The Dick site runs for a total of 123' along the shore of Little Manzanita Bay, on the northwest side of



Dick Residence: Bird's Eye View of the Site.

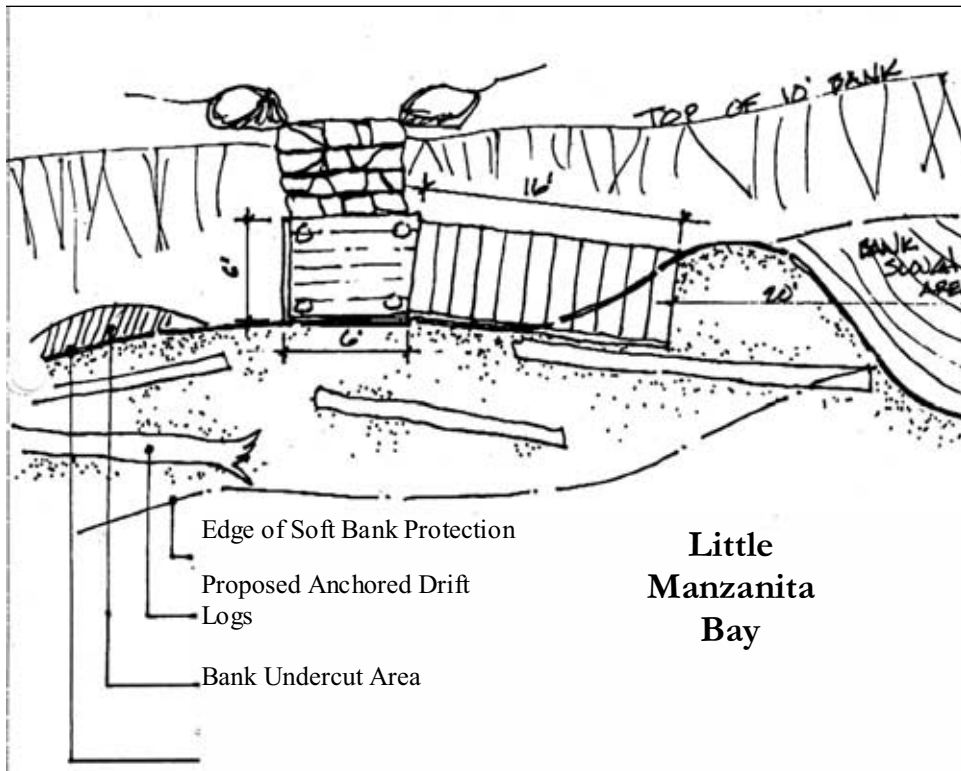
Bainbridge Island. The steep, 14-foot bank is topped by several existing trees (cedar, madrone, and alder). An existing riprap revetment, placed as an emergency action for bank failure on the adjacent property several years earlier, lies to the north.

Prior to this project a short segment of the bank spanning the south property line was slumping and at least two sections were being undercut by wave action. The property owner applied for a rock bulkhead, but was persuaded by the Department of Fish and Wildlife to select a more environmentally sound approach.

### Project Description

The project was constructed in several stages. The undercut areas were protected with geotextile and hand-packed 4-6 inch basalt quarry spalls. Bank protection was accomplished by burying and anchoring logs into the beach. The beach and spalls were then capped with sand and gravel that slightly increased beach slope and elevation. The logs helped retain the beach sediment. American dune grass (*Elymus*) was planted to help stabilize the upper portion of the beach and the toe of the bank.

Where the bank had slumped onto the beach, existing vegetation was retained and the face of the



Dick Residence: Project Proposal

colluvium was lined with quarry spall and gravel to dissipate wave energy and reduce erosion. Finally, a rock stair was added to provide the homeowner access to the beach.

## Dick Residence

The project involved the placement of 70 cubic yards of mixed sand and gravel over approximately 70 lineal feet of shoreline.

### **Monitoring**

There is no monitoring plan in place.

### **Success**

The beach is quite natural in appearance and is protected sufficiently for the level of wave energy present. The WDFW habitat biologist for the site was extremely pleased with the final result.

### **Alternatives Considered**

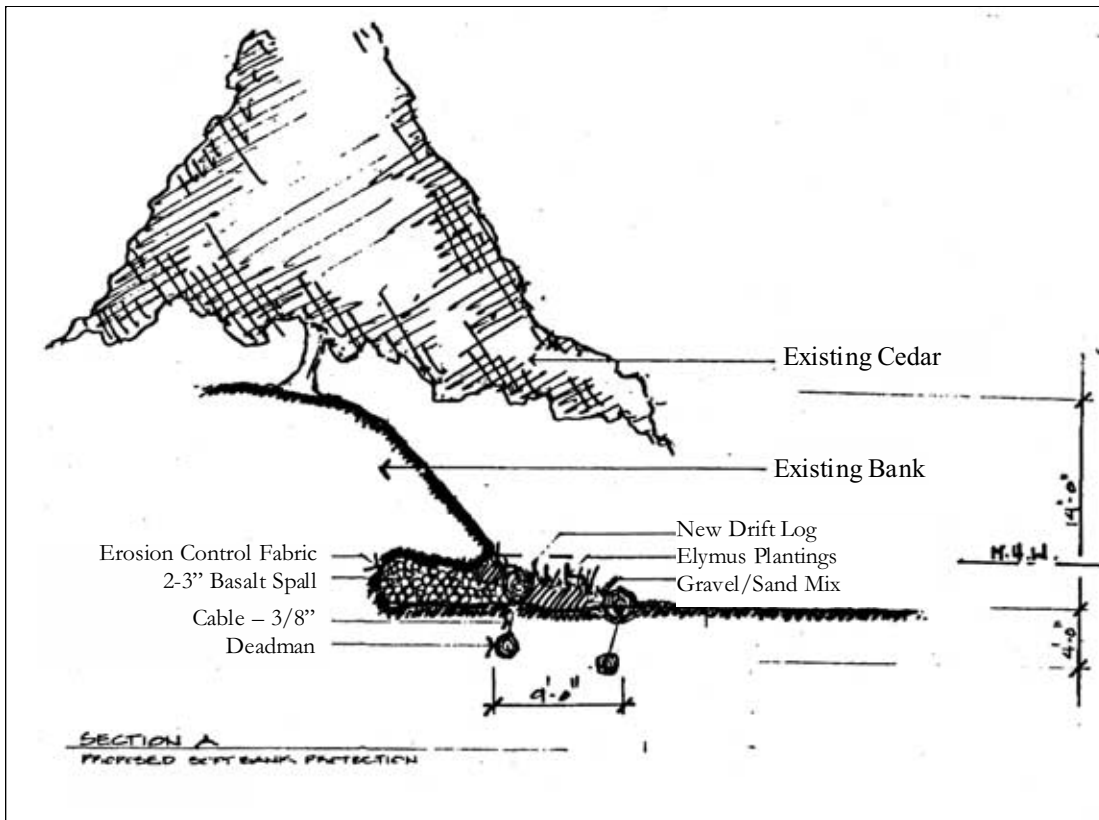
N/A

### **Contacts**

Washington Department of Fish and Wildlife: J. Brennan (now with King County DNR)

Bart Berg Landscaping: B. Berg

### Project Design Profile



Dick Residence: Project Profile



## Dick Residence



Figure 1. The Dick residence is sited well back from the water and trees north of the house were left. The riprap bulkhead on the north end of the site was installed by neighbors as an emergency measure prior to construction of the Dick's home (Photo: Jim Brennan).



Figure 2. The toe of the bank had been undercut prior to construction. Quarry spall was placed in undercut area and logs anchored into the beach. Anchor cables are just visible.



Figure 3. View southeast along beach shows anchored logs and added gravel. Compare to Figure 4 below of property to the north.



Figure 4. Riprap bulkhead/revetment located on northern end of Dick property and neighboring property.

## ***Driftwood Beach, Blakely Island***

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Address: **Driftwood Beach, NE Blakely Island, WA**

Region: **West Shore of Rosario Strait,  
San Juan Islands**

Designer: **Coastal Geologic Services, Inc., Bellingham**

Contractor: **JTC, Inc., Seattle**

Owners: **Blakely Island Maintenance Commission**

Shoreline Type: **Historic Barrier Berm**

Project Type: **Beach Nourishment**

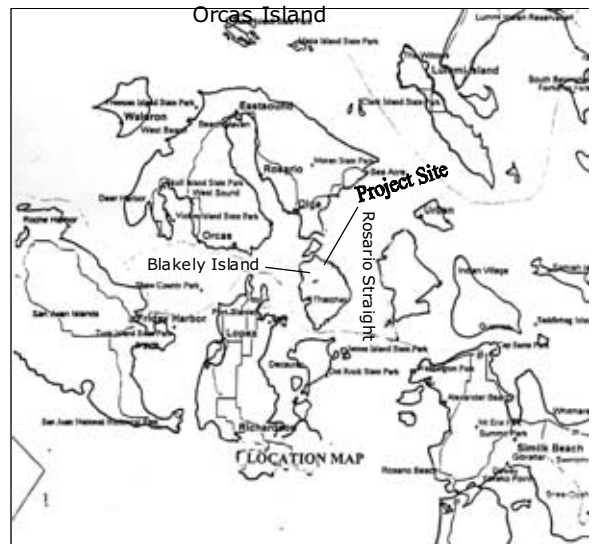
Wave Energy: **Medium**

Tides: **MHHW: +8.2  
Extreme High: +10.5-11.0  
Extreme Low: -4.0**

Cost: **\$90,000 + volunteer contributions.  
(\$100/ft)**

Date Completed: **March 1999**

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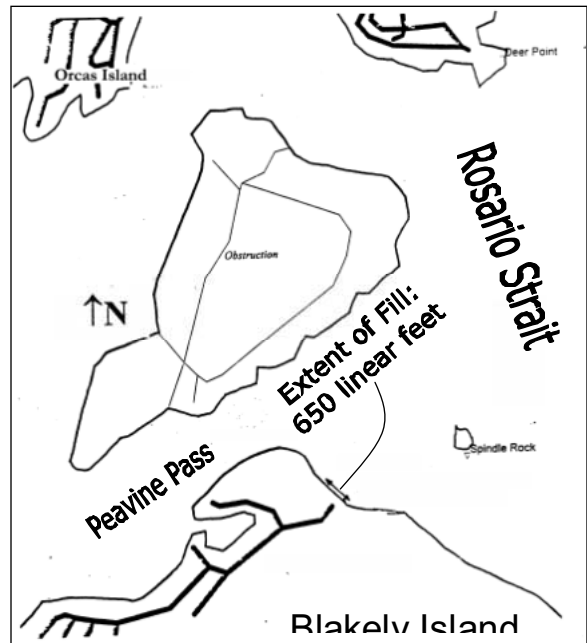
Location: Blakely Island in San Juan Islands

### **Site History / Description**

Driftwood Beach is located at the north end of Blakely Island in San Juan County. The beach is 900 feet in length. Six hundred feet are owned by BIMC while the remaining 300 are divided between two individual owners.

The site was historically a gravel barrier berm that fronted a salt-water lagoon. The lagoon has been filled and is now a grass field. The beach was originally mined for road fill between 30 and 35 years ago. The beach was partially filled ten to twenty years ago with stumps and debris.

The wave energy at the site can be described as medium to high for Puget Sound. This is especially true in the winter months when severe northeast and southeast storm conditions are common.

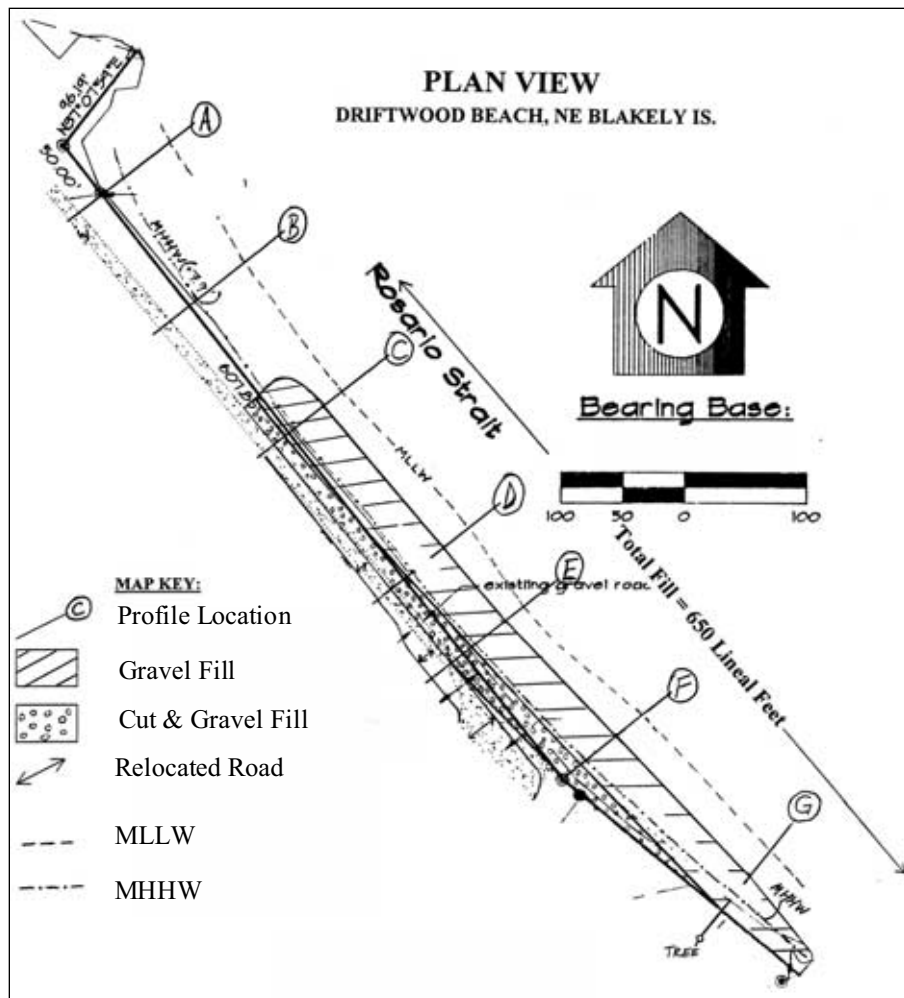


Location: Driftwood Beach in Blakely Is.

## Alternative Bank Protection Methods on Puget Sound

The Blakely Island Maintenance Commission owns a narrow strip of land (25-40' wide) that runs the length of the site. This strip is located between privately held uplands and tidelands. This narrow piece of land provides the only public access to the site. The BIMC was concerned that they could lose this site as a valuable recreation area if the beach was allowed to further erode and access was lost.

The beach was subject to significant erosion during the winter of 1996-1997. Most of the backshore was scarped which reduced the width of the beach access road. Before the nourishment the majority of beach sediment was cobble (1.25" – 10.0") and pebble (1/8" – 1.25").



Driftwood Beach Plan / Profile Locations

## Project Description

Driftwood Beach was completed using nourishment to rebuild the beach and vegetation and woody debris to secure and protect it. The project was intended to restore the degraded beach in terms of form and function to something approximating its predevelopment state.

## Driftwood Beach, Blakely Island

Approximately 210 cubic yards of gravelly, silty sand was cut from the waterward side of the existing roadway and 1600 cubic yards of gravel were brought to the site by barge. These were added to the beach and worked to create a berm and backshore area between 10 and 15 feet wide. The backshore was then used to hold logs which in turn provided protection for vegetation (*Salicornia* and other salt tolerant species). In addition the uplands were planted extensively with additional native species including Douglas fir, shore pine, American dune grass, and ocean spray by community volunteers.

### **Monitoring**

Both the profile and the sediments of the beach are being monitored yearly. This will occur for five years in the month of June or July. The profile is measured along seven predetermined transects (see site plan). Sediments are sampled at three elevations along transects B, D, & F (9 samples). This will:

- Provide information about changes in beach volume and sediment transport.
- Supply precise information about sediment size and composition along the site.

Coastal Geologic Services submitted the initial monitoring report to agencies in March, 2000, based on surveys conducted in May and August of 1999. [*Johannessen, J., 2000, 1999 Beach Monitoring Report for Protective Berm-Beach, Driftwood Beach, Blakely Island Maintenance Commission, NE Blakely Island, San Juan County, WA.*]

### **Success**

The project looks good. The construction had been completed for almost six month at the time photos for this report were taken. However, the site has not passed through its first winter. The cobble was not feathered into the beach at the ends as well as the designer had hoped and the site in general still needs to be reworked. Winter storms should provide the energy to do both of these. Revegetation was carried out promptly and with great diligence. The level of community involvement has been exceptional.

### **Alternatives Considered**

In addition to nourishment, a rip rap revetment and no action were considered. There were problems with both of these alternatives.

In this location a rip rap revetment, even if constructed of five foot rock, might not be stable. The beach is pure sand and gravel and the rock would have been undermined. Failure would be likely in this environment. A rip rap revetment would also increase erosion at the site. The hard surfaces would increase turbulence at the base of the structure as well as increase reflected wave energy. Both of these effects would combine to increase erosion and undermine the structure.

## Alternative Bank Protection Methods on Puget Sound

No action would have allowed the continued, gradual erosion of the site. In other words, the problem would have continued to worsen until something was done or the community beach access was lost.

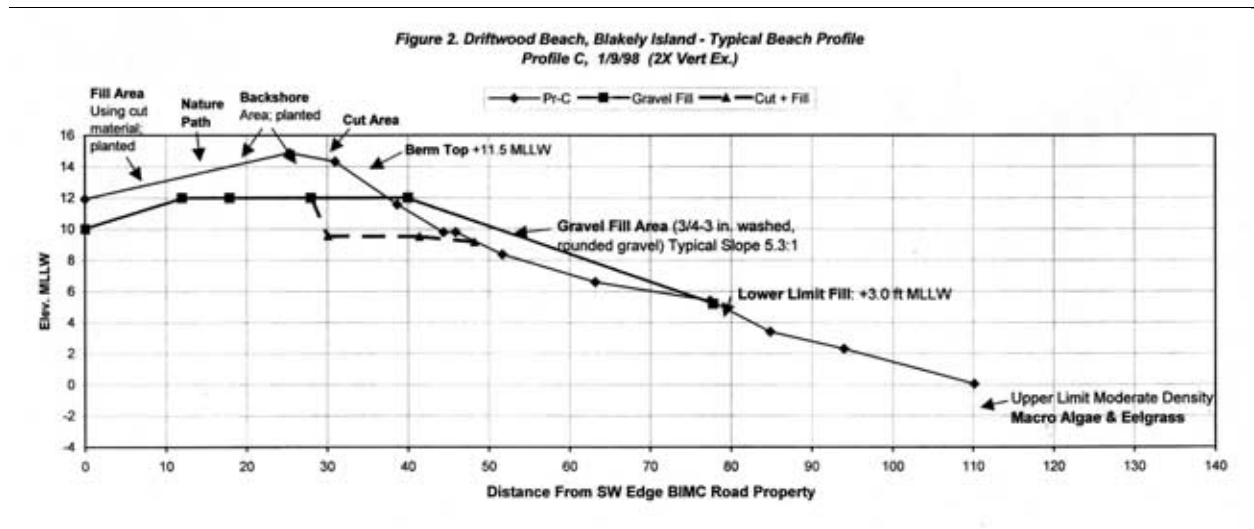
Nourishment will increase the beach's capacity to absorb wave energy. It will create a "dynamic revetment" that can shape itself to best dissipate incoming waves.

### **Contacts**

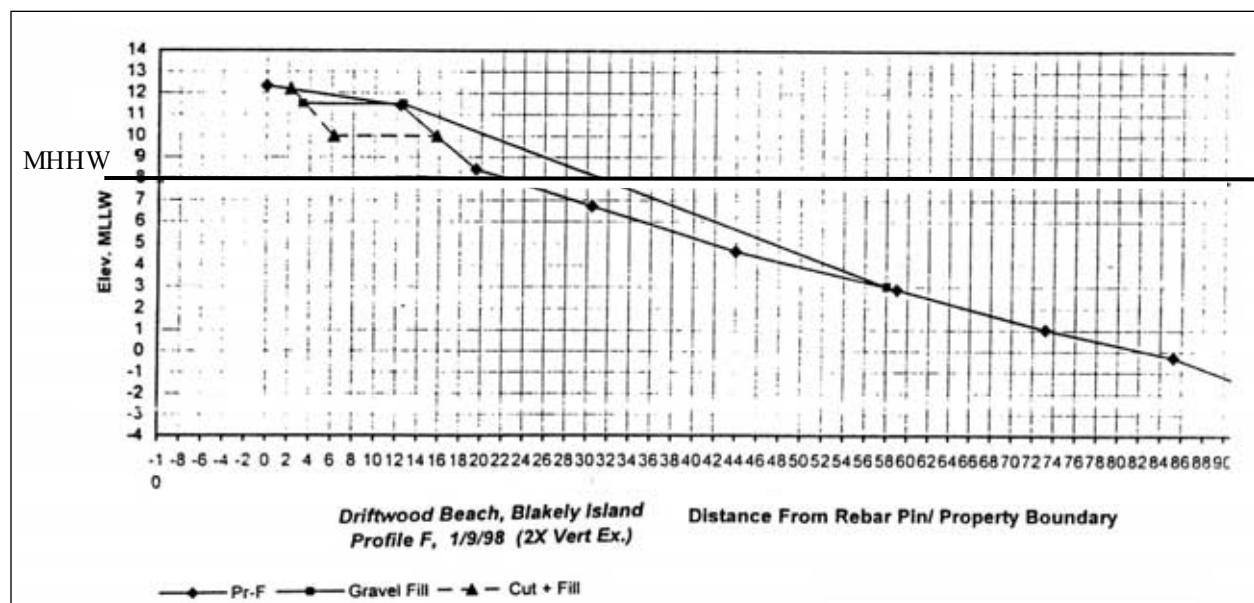
Department of Fish and Wildlife:	B. Williams
Department of Ecology:	H. Shipman
United States Army Corp of Engineers:	C. Quate
Blakely Island Maintenance Commission:	L. Douglas
Coastal Geologic Services, Inc.	J. Johannessen

Driftwood Beach, Blakely Island

Project Design Profiles: Transects C & F



Profile for Transect C



Profile for Transect F



Figure 1. Aerial view of Driftwood Beach. Upland revegetation and restoration extends entire length of beach, whereas beach nourishment was limited to area indicated by arrows. Lawn area on right side of photo was marsh prior to filling several decades ago.



Figure 2. Close up view of berm and backshore. Note coarse gravel berm and drift logs. Also, a sandy berm has been created farther landward and planted with American Beach Grass.



Driftwood Beach, Blakely Island



Figure 3. View north of completed gravel beach.



Figure 4. View north showing gravel berm, drift logs, and vegetated backshore. Road has been relocated landward.



Figure 5. View north of project area prior to construction, showing erosional scarp in old fill, damage to road, and riprap (*Photo: provided by Jim Johannessen, Coastal Geologic Services, and Blakely Island Maintenance Commission*).