PAC 6609
Juan de Fuca

B.C. Parks Personnel
Malahat District
2930 TransCanada Highway
Victoria, B.C. V9B 5T9

June 17, 1992

To Whom it May Concern, ***

Enclosed is a report summarizing the research done at Botany Beach by our marine biology class from the University of Washington's Friday Harbor Labs. We have attached data sheets and maps, and below we describe our censusing procedures. Our overall goal was to identify, mark, and census permanent transects and several tidepools, with the intent of returning to these areas each spring and watching for changes in the distribution and abundance of organisms. If significant changes are seen through time in areas that are heavily used by the public, this may indicate that people are having a substantial negative impact on the flora and fauna. In addition, these permanent plots will provide a baseline dataset should other disasters, e.g. an oil spill, impact the region.

This work was done on June 3 and 4, 1992. As recommended to us by Don Lassey, we chose as our study areas two sites where human impact is likely to be severe. These were named (on the spot) Palm Point, the long sandstone bench just around the headland to the west from the trail down to the beach (so named because of the plentiful population of sea palms, Postelsia, on the tip of the point), and Trailhead Point, the flat sandstone area directly in front of (south of) the trail to the parking area. In our 4 days on the shore, we indeed observed plentiful human use of both of these areas, especially of Trailhead Point.

At each site we established 2 transects and did 3 tidepool censuses. The transects run parallel to the shore in the high and mid intertidal zones. The elevation of the mid transect is 1 m below that of the high. [Time did not permit the establishement of low transects, especially since the extremely high algal and invertebrate diversity and structural complexity in this zone would have made censusing very time-consuming. In addition, the relatively few hours per year that this zone is exposed means that human impact (and scientific working time!) are low.] The beginning of each transect is marked with a stainless steel screw and large stainless washer (with a letter stamped in it) so that their relocation is not too difficult. Locations for permanent quadrats (5 on each transect) were chosen using a random number table to eliminate bias in site selection; only if the quadrat landed in the middle of a large pool or crevice (unrepresentative habitats) did we move its location. Each quadrat is marked on two corners with 1 to 1.5" diameter dots of putty (olive green) with the number of the quadrat inscribed. Whenever possible, these dots were placed at the higher two corners of the quadrat (on the transect line, since quadrats were always placed below [seaward] of the line). Where one of the upper corners fell in the middle of a mussel bed, we opted to put the putty dot in another corner rather than destroying part of the bed to establish a marker. The data tables show the location of the putty dots for each quadrat. At each site, quadrats on the high transect line are numbered 1-5, and on the

*** copied for Rik Simmons, Rosemary Maier and David Fraser

mid line are 6-10. The high line at each location encompasses sparse flora and fauna (except in pools), while the mid line runs through the mussel bed. Three pools in the vicinity of the transects were chosen, spanning the intertidal range of the transect lines. A putty dot was put next to each of the pools censused, and labelled H, M, or L for high, mid, and low pool.

Censusing techniques for the permanent quadrats followed standard procedures that we and others have used extensively in the intertidal zone. The 50 X 50 cm quadrat frames are strung such that the area is divided into 25 equal small squares; these aid in visual estimates of percentage cover of the organisms. For each alga and each sessile animal species (e.g., barnacles or mussels) we estimated "canopy cover", or the proportion of the whole quadrat frame occupied by the alga's blades, and/or "substratum cover", or the proportion of the rock surface that is covered by the holdfast of the algae or the bases of barnacles and similar organisms. Mobile organisms (limpets, chitons, worms, etc.) were counted, either throughout the quadrat or (for very numerous species) in several of the small squares as a subsample. The attached data tables list which of these two measures (% or #) are given for each species. We list scientific species names (as precisely as we could determine without destructive sampling) rather than common names, since most of these species have no common names, and because the latter are often imprecise.

For the tidepools, the whole pool was treated like one quadrat -- thus, for example, we list the % of the pool's surface that is occupied by surfgrass blades, and the % of the pool's bottom that is covered by mussels. In addition, for the Trailhead Point Pools, we censused an area 20 cm in width around the perimeter of the pool (outside the pool); this was in reponse to concerns of the Parks personnel that significant trampling may occur in this area as people stand over pools to look into them. Time did not permit us to do this sampling at the Palm Point pools, but we will attempt to gather these data next year.

Lastly, we set one team of students to the problem of mapping or estimating the population of Postelsia that are on the end of Palm Point. We are especially sensitive about this species because it is rare along the northwest coast, because it disperses extremely poorly and thus is susceptible to local extinction, and because it is edible and thus in danger of unauthorized harvesting. Attached is the map drawn by the students; we enclose it as is rather than attempting to reproduce it. The top of the map represents the tip of Palm Point, where the majority of the Postelsia population is, and at the bottom of the map are distances of this region from the transect bolts (A and B). Two putty dots (NP for north putty and SP for south putty) were put on bare rock spots in the thickest part of the Postelsia bed, thus creating two ends of a 2-m wide swath (see map) in which the individual plants were counted. We hope that these dots can be relocated in future years, allowing us to continue to follow the numbers of this species in a precise location. The students counted over 1000 plants in this swath, and estimated that this might represent 40% of that local population (not counting the plants on the high "islet" that is across a surge channel to the south). We fear that you may not be able to follow this map precisely, but it is important that you know that we

are attempting to follow this population. We assume that the rangers may already discourage visitors from walking in this region?

All the data we collected, including drawings of the pools, maps, etc. and data tables are appended. Our intention is to revisit these sites every spring and perform the same censuses in the same way; at least one of us (MND) is likely to be teaching this class every spring, and can provide continuity of method. Data from future years will be entered on the same spreadsheets, and we will obviously keep you informed of our progress and conclusions. We thank B.C. Parks for allowing us to continue to use the Botanical Beach site for research, and hope that the data we collect will prove to be of use in future years. Please contact either of us at the addresses below if you have any questions, comments, or suggestions.

Sincerely,

Megan Dethier

Dr. Megan Dethier
Friday Harbor Labs
University of Washington
Friday Harbor, WA. 98250
USA

Dr. Sandra Lindstrom
13965 64th Ave.
Surrey, B.C.
V3W 1Y7
CANADA

PalmPoint High 1992

	A	B	C	D	E	F	G
1	SPECIES		QUADRAT 1	QUADRAT 2	QUADRAT 3	QUADRAT 4	QUADRAT 5
2	Distance from Bolt A (m)		4.2	5.6	12	22.3	31.1
3							
4	Hildenbrandia rubra %		0	6	0.5	8	2
5	Corallina vancouveriensis		0	2	0	1	0
6	Mastocarpus papillatus %		0.5	0.5	1	0.5	2
7	Ralfsia californica %		0	0.5	0	0	0
8	Endocladia muricata %		0.5	0	0.5	0	0.5
9	Petrocelis %		1	0	1	2	0.5
10	Neorhodomela larix %		0	0	0	0.5	0
11							
12	Mytilus edulis %		4	5	0.5	4	0
13	Semibalanus cariosus %		0.5	14	0.5	0.5	0.5
14	Balanus glandula %		21	4	16	18	35
15	Chthamalus dalli %		4	2	10	2	5
16	Lottia digitalis #		200	125	120	100	115
17	Lottia strigatella #		50	250	2	100	7
18	amphipods #		3	20	5	10	0
19	Littorina scutulata #		0	2	10	0	40
20	Littorina sitkana #		175	0	275	270	80
21	polychaetes #		0	0	2	0	0
22	Anthopleura elegantissima		0	0	0	3	0
23	Nucella emarginata #		0	0	0	1	0
24							
25	Bare rock %		74	75	70	70	56
26							
27	All putty dots in upper left and upper right corners						

Bolt A = at 245° from bolt in high rock (highest point of Palm Point.)

Compass direction of transect line = 245°.