SOUTHEAST ALASKA SEA CUCUMBER RESEARCH REPORT

1993

by

Robert Larson
Tim Minicucci
and
Doug Woodby

April 1995

Alaska Department of Fish and Game
Commercial Fisheries Management and Development Division
Juneau, Alaska

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AUTHORS

Robert C. Larson is Southeast Alaska herring/dive fisheries research project leader for the Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, P.O. Box 667, Petersburg, AK 99833.

Tim Minicucci is assistant herring/dive fisheries research project leader for the Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, 2030 Sea Level Drive, Ketchikan, AK 99901.

Doug Woodby is Southeast Alaska shellfish biometrician for the Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development, P.O. Box 240020, Douglas, AK 99824.

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ABSTRACT

The giant red sea cucumber *Parastichopus californicus*, supports a commercial fishery and is an important food resource for residents of southern Southeast Alaska. The 1993 commercial fishery occurred in 13 fishing areas that were opened concurrently on October 2 for a total guideline harvest of 1,816,444 cucumbers. Each area was closed by emergency order as its guideline harvest level was reached. A total of 2,246,676 cucumbers, weighing 964,340 lbs, was landed during the 1993/94 season by 320 divers in 18 fishing days. The average price per pound was $1.05, for a total exvessel value of $1,012,557.

Assessment surveys to estimate the total sea cucumber population were conducted in these areas and in two additional areas to establish a control and to monitor the effect of a previous fishery. The point estimate for the average number of cucumbers per meter of shore was 9.7 for the 15 surveys. The average amount of shoreline within each Subdistrict management area was 94,200 meters.

The average weights of cucumbers within each open area ranged from 90 to 332 grams during the assessment cruises, and from 118 to 246 grams during the commercial fishery.

INTRODUCTION

The commercial fishery for the giant red sea cucumber *Parastichopus californicus* in Southeast Alaska developed rapidly between 1988 and 1989. The fishery was controlled through experimental fishing permits and quickly became one of the most controversial and complicated fisheries in Southeast. Due to the department's inability to adequately manage the resource, the commissioner closed the fishery in the spring of 1990. An interim management plan, which specified how quotas were to be computed, a number of areas closed to commercial fishing, weekly fishing periods, and a 3-year rotational fishing schedule, was prepared during the summer of 1990 and adopted by the Alaska Board of Fisheries (Board) during its 1991 spring meeting. Provisions of the plan required a population survey prior to each fishery and reducing the mean population estimate by a precision factor to account for the variability in the population estimate. The current plan also has a 3-year rotational fishing schedule in which an area is open one year and then closed for two years. Since that time, the open periods have been reduced from 23 weeks during 1990/91, the first season managed with the interim management plan, to only 5 weeks during the current season (1993/94). This is due to an increase in the number of divers from 143 during the 1990/91 season to approximately 320 in the 1993/94 season. The total catch has not increased appreciably, but the price has increased from $0.69/lb to $1.05/lb. The department encountered difficulties in managing for the fishing quotas and obtaining adequate catch sampling at the catch rates seen in the fall 1993 fishery. The Board considered changes in the fishery management plan during November 1993. The principal issue was reducing the catch rate. Subsequent changes made by the Board will be reported in the 1994 sea cucumber research report. Summaries of the region's 1993 commercial sea cucumber fisheries and stock assessment activities are included herein.

COMMERCIAL FISHERIES

Methods and Procedures

The 1993 fishery management plan goal was to maximize the overall long-term benefit of the sea cucumber resource to the State of Alaska and its residents while providing for conservation of sea cucumber populations and their habitats. Four objectives toward attainment of this goal were:

1) Biological conservation: to ensure long-term reproductive viability and habitat protection.
2) Subsistence: to ensure that traditional uses are accommodated.
3) Sustainable and orderly fishery: to ensure conduct of manageable fisheries that promote stable employment opportunities and consistently high quality products.
4) Research and experimental management: to gather information on sea cucumber biology, population dynamics, and stock response to harvest strategies.

Management measures to attain these objectives specified that each diver was required to have a current Interim Use Permit obtained from the Commercial Fisheries Entry Commission (CFEC) and a Sea Cucumber Registration obtained from local area offices of the Alaska Department of Fish and Game. Logbooks were also required.

The commercial sea cucumber fishery opened at 12:01 a.m. Saturday, October 2, 1993, with the first fishing period occurring from 12:01 a.m. Saturday, October 2, through 11:59 p.m. Sunday, October 3, 1993. The second opening was from 12:01 a.m. Wednesday, October 6, through 11:59 p.m. Thursday, October 7, 1993. Subsequent weekly openings consisted of two 48-hour periods each week from 12:01 a.m. Saturday through 11:59 p.m. Sunday, and from 12:01 a.m. Wednesday through 11:59 p.m. Thursday.

A total of 13 rotational fishing areas were opened during the 1993/94 season. The fishery in each area was monitored inseason to determine catch rates. Areas were closed by emergency order when their respective guideline harvest levels (GHLs) were reached. The open fishing areas and GHLs were as follows:

District 1:

Thorne Arm (Subdistrict 101-43): opened for a guideline harvest level of 56,500 sea cucumbers in those waters north and east of a line from the northwesternmost tip of Cone Point at 55°14′57″ N. latitude, 131°18′54″ W. longitude to an unnamed point southwest of the entrance of Moth Bay at 55°15′42″ N. latitude, 131°20′28″ W. longitude.

East Behm Canal (Subdistrict 101-53): opened for a guideline harvest level of 77,100 sea cucumbers in those waters north of a line from a point at 55°11′47″ N. latitude, 131°05′08″ W. longitude, located on Point Sykes, to a point at 55°12′13″ N. latitude, 131°05′42″ W. longitude, located ½ mile northwest of Point Sykes to Point Alava and south of the latitude of the northernmost tip of Point Nelson.

West Behm Canal (Subdistrict 101-85) was opened for a guideline harvest level of 82,500 sea cucumbers in those waters along the southeastern shore of Cleveland Peninsula from the southernmost tip of Caamano Point to the northernmost tip of Snail Point.

District 2:

Moira Sound (Subdistrict 102-30): opened for a guideline harvest level of 341,500 sea cucumbers in those waters of Moira Sound west of a line from 55°05′03″ N. latitude, 132°02′40″ W. longitude, to 55°02′02″ N. latitude, 132°02′02″ W. longitude.

Clarence Strait (Subdistrict 102-70): opened for a guideline harvest level of 34,700 sea cucumbers in the waters along the north shore of Kasaan Peninsula north of a line between a point located inside of Street Island at 55°28′18″ N. latitude, 132°08′45″ W. longitude and a point on the southwest side of Cleveland Peninsula northwest of Caamano Point, at 55°31′00″ N. latitude, 132°01′15″ W. longitude, and south of a line from Narrow Point at 55°47′30″ N. latitude, 132°28′35″ W. longitude, to the northernmost tip of Lemesurier Point at 55°46′04″ N. latitude, 132°16′55″ W. longitude, with the following restrictions:

Thorne Bay, Tolstoi Bay, Snug Anchorage and contiguous waters: closed south and west of a line from the northern end of Tolstoi Point at 55°40′17″ N. latitude, 132°23′37″ W. longitude to an unnamed point, east of Snug Anchorage, at 55°42′07″ N. latitude, 132°27′00″ W. longitude.

District 3:

Saint Nicholas Channel (Subdistrict 103-70): opened for a guideline harvest level of 53,856 sea cucumbers in those waters north and east of a line from the westernmost tip of Point St. Isidor to a point on Noyes Island 55°27′16″ N. latitude, 133°38′23″ W. longitude, to the Point Incarnation Light to the southernmost tip of Esquibel Island, and south and west of a line from the southernmost tip of Esquibel Island to the southernmost tip of St. Phillips Island to the southernmost tip of Point Animas to a point on the northwest side of San Fernando Island at 55°31′32″ N. latitude, 133°26′49″ W. longitude, to a point on the northeast side of Lulu Island at 55°30′37″ N. latitude, 133°28′05″ W. longitude.

Eastern shore of Dall Island and Soda Bay (Subdistrict 103-40): opened for a guideline harvest level of 103,988 sea cucumbers in those waters north and west of a line from Halibut Point on the western shoreline of Prince of Wales Island, to Reef Point on the eastern shoreline of Dall Island, including all waters adjacent to Dall Island north of Reef Point and south of Tlevak Narrows and Soda Bay.

District 13:

Sitka Sound (Subdistrict 113-41 and 113-38): opened for a guideline harvest level of 160,500 sea cucumbers in the waters of Sitka Sound from Deep Inlet to Kanga Bay, south of a line from Shoals Point to the westernmost tip of Long Island to a point at the northern side of the entrance to Deep Inlet at 56°59′37″ N. latitude, 135°18′40″ W. longitude, and north and east of a line from a point at 56°53′33″ N. latitude 135°22′40″ W. longitude (at the northwest entrance to Kanga Bay) to Shoals Point.

Baranof Island Shoreline, Necker, and Rakof Islands (Subdistrict 113-31): opened for a guideline harvest level of 271,100 sea cucumbers in the waters of the Necker Islands, the Rakof Islands, Hot Springs Bay, Windy Passage, Middle Channel, Walker Channel and all contiguous waters south of 56°53′33″ W. latitude (at the northwest entrance to Kanga Bay), and north of the latitude of North Cape (56°35′50″ W. latitude), with the following restrictions:

West Crawfish Inlet: closed east of 135°16′50″ W. longitude.

Crawfish Inlet: closed east of 135°15′00″ W. longitude in Middle Channel and east of the longitude of Aspid Cape in Walker Channel (135°13′45″ W. longitude).

Necker Bay: north of 56°40′00″ N. latitude, managed as a separate area - see below.

Whale Bay: closed.

West Crawfish Inlet (Subdistrict 113-32): opened for a guideline harvest level of 33,500 sea cucumbers in the waters of West Crawfish Inlet east of 135°16′50″ W. longitude and north of 56°47′12″ N. latitude in Cedar Pass.

Crawfish Inlet (Subdistrict 113-33): opened for a guideline harvest level of 102,900 sea cucumbers in the waters of Crawfish Inlet, Middle Channel, and Walker Channel east of 135°15′00″ W. longitude in Middle Channel and east of 135°13′45″ W. longitude in Walker Channel, and south of 56°47′12″ N. latitude in Cedar Pass.

Necker Bay (Subdistrict 113-34): opened for a guideline harvest level of 27,600 sea cucumbers in the waters of Necker Bay and Secluded Bay north of 56°40′00″ N. latitude.

Peril Strait (Subdistricts 113-51, 52, 53, 54, and 59): opened for a guideline harvest level of 470,700 sea cucumbers in the waters of Peril Strait, Rodman Bay, Saook Bay, Hanus Bay, and Sitkoh Bay east of a line from the easternmost tip of Nismeni Point to the Broad Island light to a point on the Chichagof Island shore at 57°35′48″ N. latitude, 135°22′50″ W. longitude, and west of a line from Point Thatcher to Point Hayes.

Results and Discussion

The fishery was opened for a total of ten 2-day periods from October 2 through November 4, 1993. Of the 13 areas opened, 10 either reached or exceeded their GHL by the fourth opening, with the remaining three closing by November 4, 1993. Average catches per diver per fishing period ranged from 300 lbs to over 3,400 lbs. The overall average weekly catch for all areas was 96,434 lbs taken by an average of 86 divers. Effort ranged between 1 and 77 divers in each area during each fishing period. As a result of increased fishing pressure and the short duration of the fishery, the overall GHL was exceeded by 24%.

A total of 2,246,676 cucumbers weighing 964,340 lbs was landed during the 1993/94 season (Table 1) by 320 divers in 20 fishing days (Table 2). The average price was $1.05/lb and the total exvessel value was $1,012,557.

POPULATION ASSESSMENT SURVEYS

Methods and Procedures

The sea cucumber population assessment technique for estimating numbers of sea cucumbers was first utilized in 1990. Density estimates were made by SCUBA divers along 2-m-wide strip transects running perpendicular to the shore. These transects served as the primary sampling units. Transects extended from zero to a maximum 15 m (50 ft) depth. Transect length varied depending on the steepness of the bottom. Dives were limited to 15 m because deeper dives severely limit total bottom times for SCUBA divers and pose safety risks when conducted repetitively over several days. Dives to 15 m include the majority of habitat in which commercial divers normally operate.

Two divers swam as a team along each transect, with diver No. 1 holding a 2-m rod (2.1-cm-diameter white PVC tube) in a horizontal position, perpendicular to the census path. Transect direction was maintained by reference to a compass mounted on the rod. Diver No. 1 swam the

distance and counted sea cucumbers 1 m to the left of the center of the measuring rod. Diver No. 2 counted the number of cucumbers on the right half of the rod and recorded the total number of sea cucumbers occurring within that section on a preprinted data form. Data were recorded every 5 m or whenever there were changes in substrate or cover type.

Diver No. 1 used hand signals to indicate to the second diver the distance covered (m) and the count of sea cucumbers seen in each segment. After recording the count for each segment, diver No. 2 recorded depth, substrate, vegetative cover, and the presence of other species of interest, including sea urchins and abalone. Substrate type was recorded for the two most common types on each segment, with the most prevalent type listed first. Possible substrate types included rock, boulder, cobble, gravel, sand, mud, shells and shell remnants, and woody debris. Presence of vegetation in each segment was recorded as "percent cover" for up to two types, including *Alaria*, *Agarum*, *Fucus*, *Nereocystis*, *Ulva*, *Zostera*, coralline algae, filamentous algae, fir kelp, hair kelp, large brown kelp, leafy red algae, and red hair kelp.

The beginning and ending times for each transect were recorded to allow for later standardization to the mean lower low water (MLLW) tide stage. Transects were paired so that a dive team censused one strip while descending, and then a second strip when returning to shore. The second transect in each pair was approximately 20 m to the right (when facing shore) of the first transect.

Density estimates for each area were calculated as the average number of sea cucumbers per meter of shoreline length:

$$\bar{d} = \frac{\Sigma c_i}{2n}$$

where c is the count of sea cucumbers on each transect i from 1 to n. The factor "2" in the denominator is a correction for the 2-m width of each transect.

Number and Location of Transects

The assessment program calls for surveying areas on a 3-year rotation schedule, such that the 15 areas surveyed in 1993 (Figure 1, Table 3) were, with several exceptions, the same areas surveyed from September 1990 through February 1991. The exceptions were Subdistricts 105-10, 105-20, and 112-38, which were not surveyed in 1993 because densities in the original survey were low, 101-27, which was added as a control site, and 103-70 and 103-90, which were added as new survey locations. The survey in 103-90 was conducted to establish a baseline population estimate, and the area was not subsequently opened for commercial harvest. That area had substantial harvests in early 1990 prior to establishment of the quota system, and there were no assessment data available prior to the 1993 survey.

A maximum of 30 transects was sampled in each area. A sample size of 26 transects is generally sufficient to achieve our statistical objective of the lower bound of the one-sided 90% confidence interval being within 70% of the mean density estimate, as based on prior surveys (data in preparation). Practical considerations including weather and vessel schedules frequently resulted in fewer transects completed per area.

Transects were sampled at mostly the same locations as in 1990. The original transects in those Subdistricts, and new transects in the previously unsurveyed Subdistricts (Subdistricts 103-70, 103-90, 113-59), were systematically distributed along the shorelines of each harvest area. The location of the first transect pair was randomly chosen, and subsequent transect pairs were located at equal intervals along the shoreline. The shoreline distance between transect pairs equaled the total length of shoreline divided by the number of transect pairs allocated to each area (as allocated in 1990 for the original transects). There were no permanent markers at the transect sites to show the survey team where to dive; rather, transect sites were located using nautical charts showing transect locations. Relocation is accurate to within 20 m, depending on the scale of the nautical chart used.

Transects were added in Subdistricts 101-53, 101-85, and 102-70 by placing new transect pairs midway between the prior transect pairs. Two and five transect pairs were added, respectively, in Subdistricts 113-32 and 113-33, using a new systematic layout with a random start as for the original transects. Original transect pairs were randomly selected for deletion in Subdistricts 113-31 and 113-41, and 2 of 5 original transect pairs were systematically chosen to be sampled in Subdistrict 113-38.

Guideline Harvest Levels

Annual guideline harvest levels (GHLs) for sea cucumbers were established for each Subdistrict to achieve the biological conservation objective by preventing overfishing (Table 3). Due to limitations in our understanding of sea cucumber population dynamics and stock conditions, yield assessments were based on a conservative application of surplus production models (Woodby et al., 1993). The GHL was estimated in numbers of sea cucumbers calculated as a product:

$$GHL = 3 \times CF \times GF \times M \times P_0$$

where

- CF = 0.4 scaling factor relating maximum sustainable fishing mortality to unexploited population size;
- GF = 0.5 correction factor to allow for errors in assumptions upon which the surplus production model is based;
- M = 0.32 estimated instantaneous mortality rate for sea cucumbers; and
- P = population size, taken as the lower bound of the one-sided 90% confidence interval.

Population size was estimated for each management unit (Subdistrict) by

$$P = \text{density} \times \text{shoreline length}$$

where density is the average number of sea cucumbers per linear meter of shoreline.

All Subdistricts in Southeast Alaska open to commercial harvest of sea cucumbers are assigned to one of three rotation groups scheduled to open once every three years. The GHL equation includes a factor of three to account for the rotational schedule. The GHL is three times the annual yield once every three years to account for the two years of closure. Some small Subdistricts were grouped into one area that is managed as a unit. For example, Subdistricts 113-51, 52, 53, 54, and 59 were assigned a single GHL. Also, the department may partition some Subdistricts into smaller units, with individual GHLs in order to avoid local depletion, as may occur in the vicinity of processing centers.

Results and Discussion

The first survey for 1993 was initiated in the control site, Subdistrict 101-27, on April 26 with the last survey completed in Subdistrict 104-40a on September 19. The estimated total population for these areas was 11,283,180 cucumbers (sum of the lower bounds of the one-sided 90% confidence intervals). Maps of the survey area, transect locations, and individual transect data are presented in Appendix A. The average sea cucumber assessment area (management Subdistrict group) included 94,242 m of shore, 9.7 cucumbers per m, 73.5% precision for a population 90% lower bound estimate of 752,212 cucumbers per area (Table 3). A discussion of these results relative to observations made in other years and locations is in preparation.

WEIGHT SAMPLING PROGRAM

Methods and Procedures

Individual sea cucumbers were collected from each management Subdistrict during the assessment surveys and during the commercial fishery. During the commercial fishery, a target of 200 sea cucumbers were collected after being eviscerated by the divers and dewatered at the processing facility. The sea cucumbers were stored in buckets and weighted to the nearest gram. During the assessment cruises, approximately 200 were collected in bags from approximately three transect pairs. The cucumbers were transported back to the support vessel where they were eviscerated with a longitudinal cut and stripped by hand. They were then stored in buckets without additional sea water and weighed to the nearest gram.

Results and Discussion

Due to the rapid catch rates experienced in this fishery, and the concurrent abalone and geoduck fisheries, the number of individual cucumbers weighed, and the areas represented by the samples, was less than desired. A total of 1,150 cucumbers was weighed from six Subdistrict groups

(Appendix B). The average weight ranged from 118 g in Subdistrict 101-43 to 246 g in Subdistrict 113-32 (Figure 3).

The average weights used to determine numbers of individual cucumbers from total weights were derived as follows:

Area 101-43: Average of department portside sampling at processors combined with average weights taken during department assessment cruise in this Subdistrict.

Area 101-53,85,70: Average weights taken from department assessment cruise in this Subdistrict.

Area 103-40: Average weight taken from department assessment cruise in this Subdistrict.

Area 103-70: Average weight taken from average of all Subdistricts sampled during department assessment cruise.

Area 113-33,34: Average weight taken from department assessment cruise in these Subdistricts.

Area 113-41,38,31,32,51: Average weight taken from department portside sampling at processors.

The average weight as indicated on fish tickets for Subdistricts 113-31, 32, 33, 34, 41, 51, 52, 53, 54 and 59 was 0.48 lbs.

A total of 1,819 individual cucumber weights were taken from 12 of the 13 areas subsequently opened to commercial fishing during the assessment surveys (Appendix C). In addition, 105 individual weights were collected from Subdistrict 103-90c, which was not opened for harvest. These average weights ranged from 90 g in Subdistrict 101-53 to 332 g in 103-90c (Figure 2).

LITERATURE CITED

Woodby, D. A., G. H. Kruse, and R. C. Larson. 1993. A conservative application of a surplus production model to the sea cucumber fishery in Southeast Alaska. Pages 191-202 in G. Kruse, D. M. Eggers, R. J. Marasco, C. Pautzke, and T. J. Quinn II, eds. Proceedings of the International Symposium on Management Strategies for Exploited Fish Populations. Alaska Sea Grant College Program Report No. 93-02, University of Alaska Fairbanks.

Table 1. Southeast Alaska sea cucumber harvest by area, 1993.

SOUTHEAST ALASKA SEA CUCUMBER HARVEST, 1993-94

CATCH (lbs) PER SUBDISTRICT BY FISHING PERIOD

	Thorne Arm	East Behm	West Behm	Moira Sound	Clarence Strait	E. Dall Is/Soda Bay	St. Nicholas Channel	Baranof Island	W. Crawfish Inlet	Crawfish Inlet	Necker Bay	Sitka sound	Peril Straits	TOTAL
Subdistrict	101-43	101-53	101-85	102-30	102-70	103-40	103-70	113-31	113-32	113-33	113-34	113-38,41	113-51*	
Quota (cucumbers)	56,500	77,100	82,500	341,500	34,700	103,988	53,856	271,100	33,500	102,900	27,600	160,500	470,700	1,816,444
Fishing Period						Catch in pounds of cucumbers								
2,3-Oct-93	3,528	*	3,450	95,944	8,001	19,722	7,111	12,918	*	11,117	0	9,287	114,424	285,502
6,7-Oct-93	16,640	16,479	53,516	32,582	32,302	37,777	20,645	12,898	0	27,429	0	6,758	124,141	381,167
9,10-Oct-93	31,232	18,974		18,859				50,496	8,047	15,300	5,546	38,135		186,589
13,14-Oct-93								34,410	0		5,010	28,769		68,189
16,17-Oct-93								25,962	0		0			25,962
20-Oct-93								0	*		0			*
23,24-Oct-93								*	*		0			6,205
27,28-Oct-93									5,550		810			6,360
31-Oct-93											612			*
4-Nov-93											1,534			1,534
Total catch (pounds)	51,400	35,793	56,966	147,385	40,303	57,499	27,756	137,823	20,543	53,846	13,512	82,949	238,565	964,340
Avg catch per opening	17,133	17,727	28,483	49,128	20,152	28,750	13,878	22,781	2,719	17,949	1,351	20,737	119,283	96,434
Avg. Wt. (lbs/cuc.)	0.34	0.20	0.38	0.42	0.51	0.52	0.45	0.47	0.54	0.53	0.52	0.47	0.46	0.45
Total of individuals	151,176	181,690	150,704	348,428	78,563	110,575	62,373	296,394	38,043	101,788	26,135	176,487	524,319	2,246,676
Remaining Catch(Ind)	-94,676	-104,590	-68,204	-6,928	-43,863	-6,587	-8,517	-25,294	-4,543	1,112	1,465	-15,987	-53,619	-430,232
harvest as % of quota	268%	236%	183%	102%	226%	106%	116%	109%	114%	99%	95%	110%	111%	124%

Peril Strait 113-51*= Subdistricts 113-51,52,53,54 and 59 combined.

Note: * indicates confidential information

Table 2. Southeast Alaska sea cucumber effort, 1993.

SOUTHEAST ALASKA SEA CUCUMBER HARVEST, 1993-94

EFFORT PER SUBDISTRICT BY FISHING PERIOD

	Thorne Arm	East Behm	West Behm	Moira Sound	Clarence Strait	E. Dall Is./Soda Bay	St. Nicholas Channel	Baranof Island	W. Crawfish Inlet	Crawfish inlet	Necker Bay	Sitka Sound	Peril Straits	TOTAL
Subdistrict	101-43	101-53	101-85	102-30	102-70	103-40	103-70	113-31	113-32	113-33	113-34	113-38,41	113-51*	
Quota (cucumbers)	56,500	77,100	82,500	341,500	34,700	103,988	53,856	271,100	33,500	102,900	27,600	160,500	470,700	1,816,444
Fishing Period			Number of divers per period											
2,3-Oct.-93	6	1	7	86	4	17	3	12	2	7	0	10	74	155
6,7-Oct.-93	20	18	41	37	21	23	14	11	0	16	0	8	80	214
9,10-Oct.-93	39	23	closed	38	closed	closed	closed	49	6	15	7	31	closed	208
13,14-Oct.-93	closed	closed		closed				37	0	closed	9	37		84
16,17-Oct.-93								25	0		0	closed		25
20-Oct-93								0	2		0			2
23,24-Oct.-93								1	6		0			7
27,28-Oct.-93								closed	6		2			8
31-Oct.-93									closed		2			2
4-Nov.-93											3			3
											closed			

CATCH (lbs) PER UNIT EFFORT PER SUBDISTRICT BY PERIOD

Fishing Period			Catch (lbs) per diver per fishing period											
2,3-Oct.-93	588	*	493	1,116	2,000	1,160	2,370	1,077	*	1,588	0	929	1,546	1,252
6,7-Oct.-93	832	916	1,305	881	1,538	1,642	1,475	1,173	0	1,714	0	845	1,552	1,319
9,10-Oct.-93	801	825		496				1,031	1,341	1,020	792	1,230		897
13,14-Oct.-93								930	0		557	778		822
16,17-Oct.-93								1,038	0		0			1,038
20-Oct-93								0	*		0			*
23,24-Oct.-93								*	*		0			886
27,28-Oct.-93									925		*			795
31-Oct.-93											*			*
4-Nov.-93											511			511
Avg catch/diver/period	740	693	899	831	1,769	1,401	1,922	912	506	1,441	257	945	1,549	838
Avg # divers/period	22	14	24	55	13	20	9	19	3	13	2	22	77	86

NOTE: 325 TOTAL REGISTERED DIVERS IN SOUTHEAST WITH 320 TOTAL DIVERS MAKING LANDINGS

Note: * indicates confidential information

Table 3. Sea cucumber population assessment survey results, 1993.

Subdistrict (Area)	101-27	101-43	101-53	101-85	102-30	102-70	103-40a	103-70
Date	26-Apr	7-Jun	7-Jun	2-Jun	5-Jun	3-Jun	18-Sep	14-Sep
Number of transects	24	19	20	22	30	23	30	30
sum cucumbers	899	278	366	304	820	225	417	349
sum meters	48	38	40	44	60	46	60	60
Cucumbers/meter	18.7	7.3	9.2	6.9	13.7	4.9	7.0	5.8
standard deviation	14.6	6.46	8.85	7.32	10.37	3.57	6.79	8.32
t value	1.32	1.33	1.33	1.32	1.31	1.32	1.31	1.31
Percent precision	79.1	73.1	71.2	70.2	81.8	79.9	76.6	65.8
Lower bound 90% C.I	14.8	5.3	6.5	4.8	11.2	3.9	5.3	3.8
Shoreline meters	68,802	53,442	61,570	89,268	159,004	46,300	99,000	92,600
Estimated Totals:								
Sea cucumbers	1,018,945	285,640	401,374	432,859	1,778,558	180,923	527,297	354,413
Fishery quota (ind)	195,638	54,843	77,064	83,109	341,483	34,737	101,241	68,047

Subdistrict (Area)	103-90c	113-31	113-32	113-33	113-34	113-41b	113-51	Average
Date	16-Sep	17-Jun	16-Jun	15-Jun	15-Jun	17-Jun	19-Jun	1993
Number of transects	28	22	20	20	16	24	34	24.1
sum cucumbers	515	636	188	375	112	530	1374	492.5
sum meters	56	44	40	40	32	48	68	48.3
Cucumbers/meter	9.2	14.5	4.7	9.4	3.5	11.0	20.2	9.7
standard deviation	9.61	15.81	3.58	9.40	2.92	10.35	29.81	9.8
t value	1.31	1.32	1.33	1.33	1.34	1.32	1.31	1.32
Percent precision	74.1	69.1	77.4	70.2	72.1	74.7	66.9	73.5
Lower bound 90% C.I	6.8	10.0	3.6	6.6	2.5	8.3	13.5	7.1
Shoreline meters	156,957	141,122	47,946	81,488	56,949	101,304	157,883	94,242
Estimated Totals:								
Sea cucumbers	1,069,863	1,410,477	174,332	536,141	143,700	836,017	2,132,645	752,212
Fishery quota (ind)	205,414	270,812	33,472	102,939	27,590	160,515	409,468	144,425

Subddistrict 101-27 is a control site with no commercial fishery. Fishery quota indicated is for comparison only.
Data for subdistrict 113-51 includes data for 113-51, 52, 53, 54, and 59.

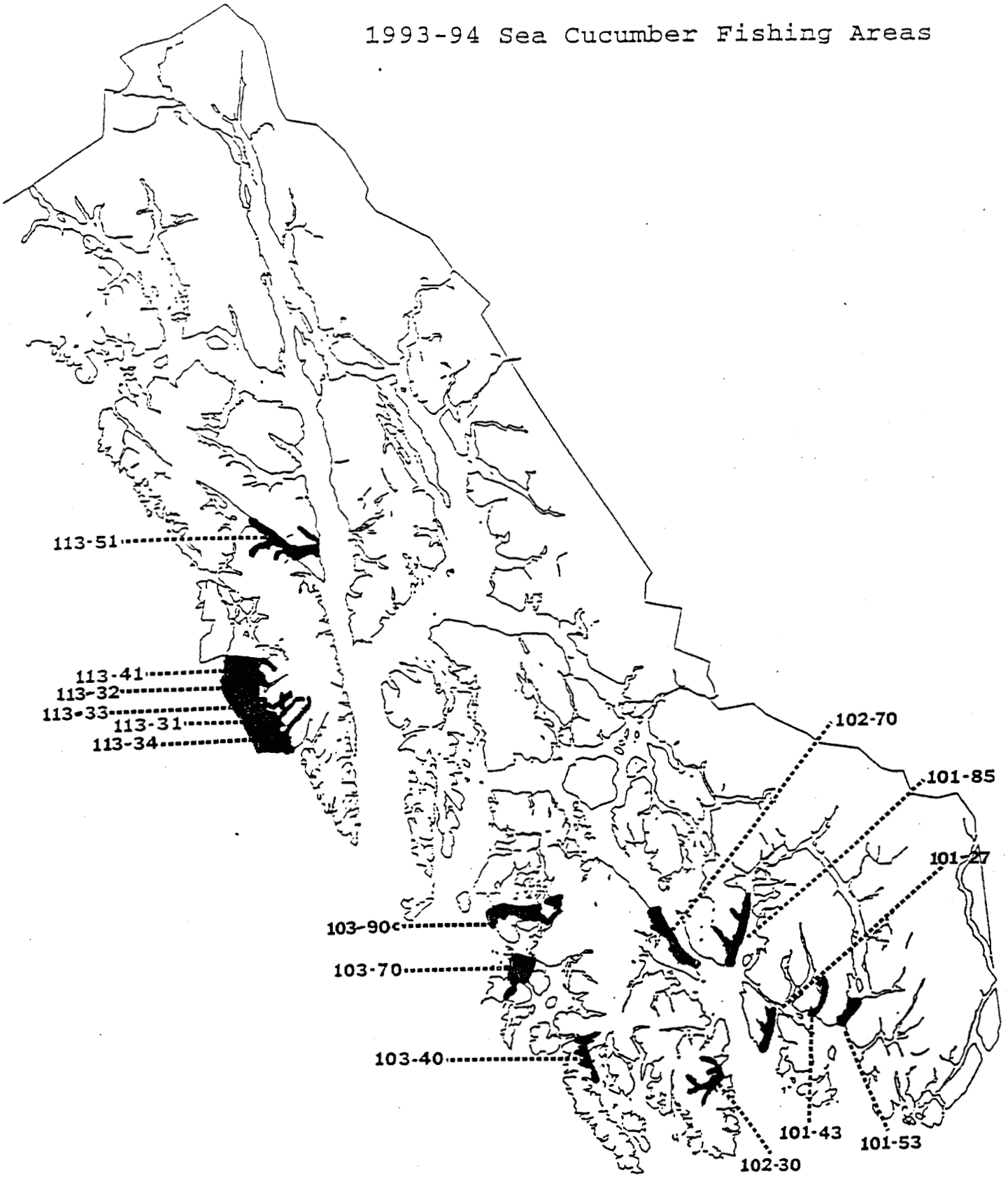


Figure 1. Sea Cucumber assessment survey locations, 1993.

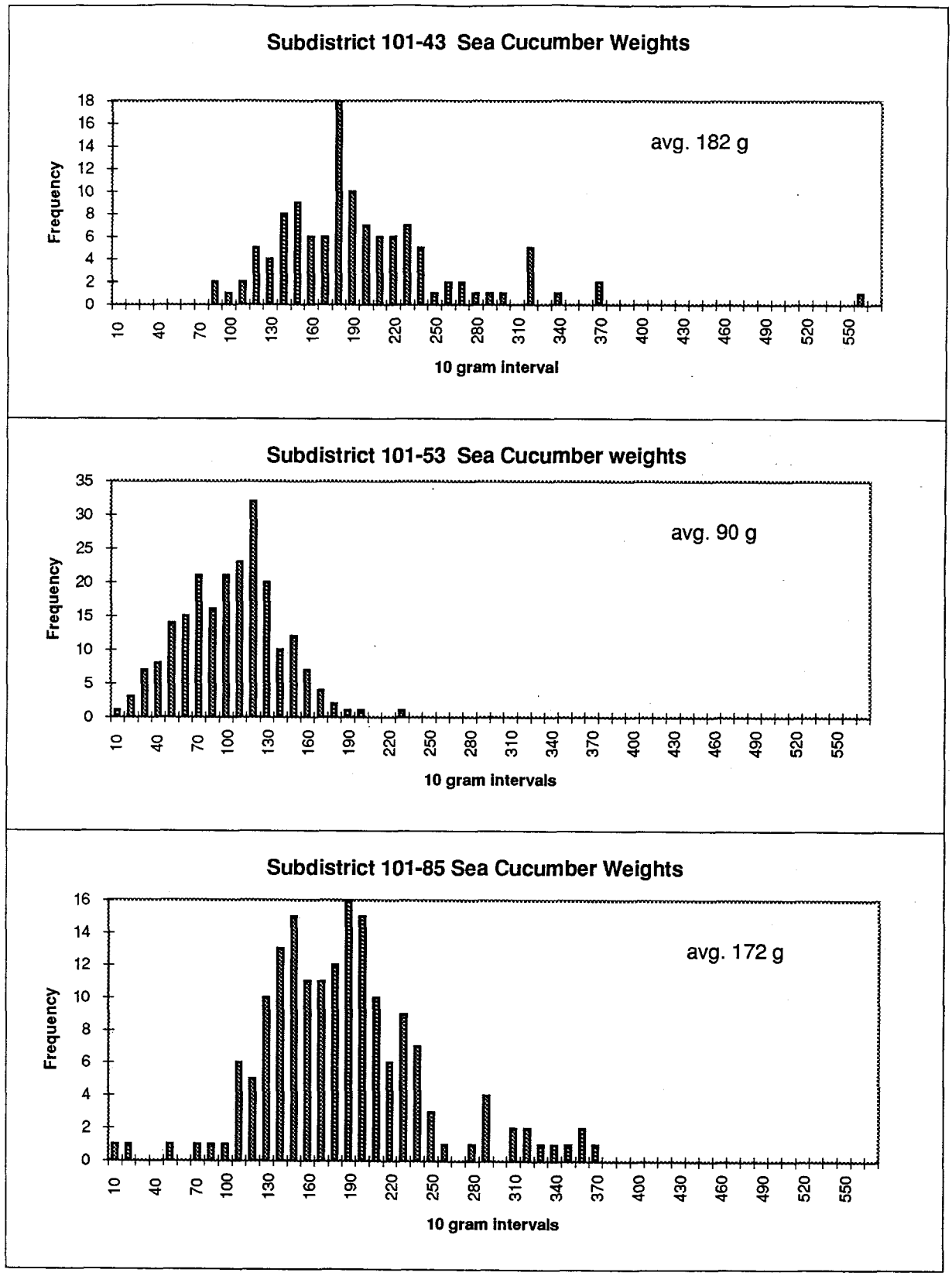


Figure 2. Individual sea cucumber weights taken during assessment surveys, 1993.

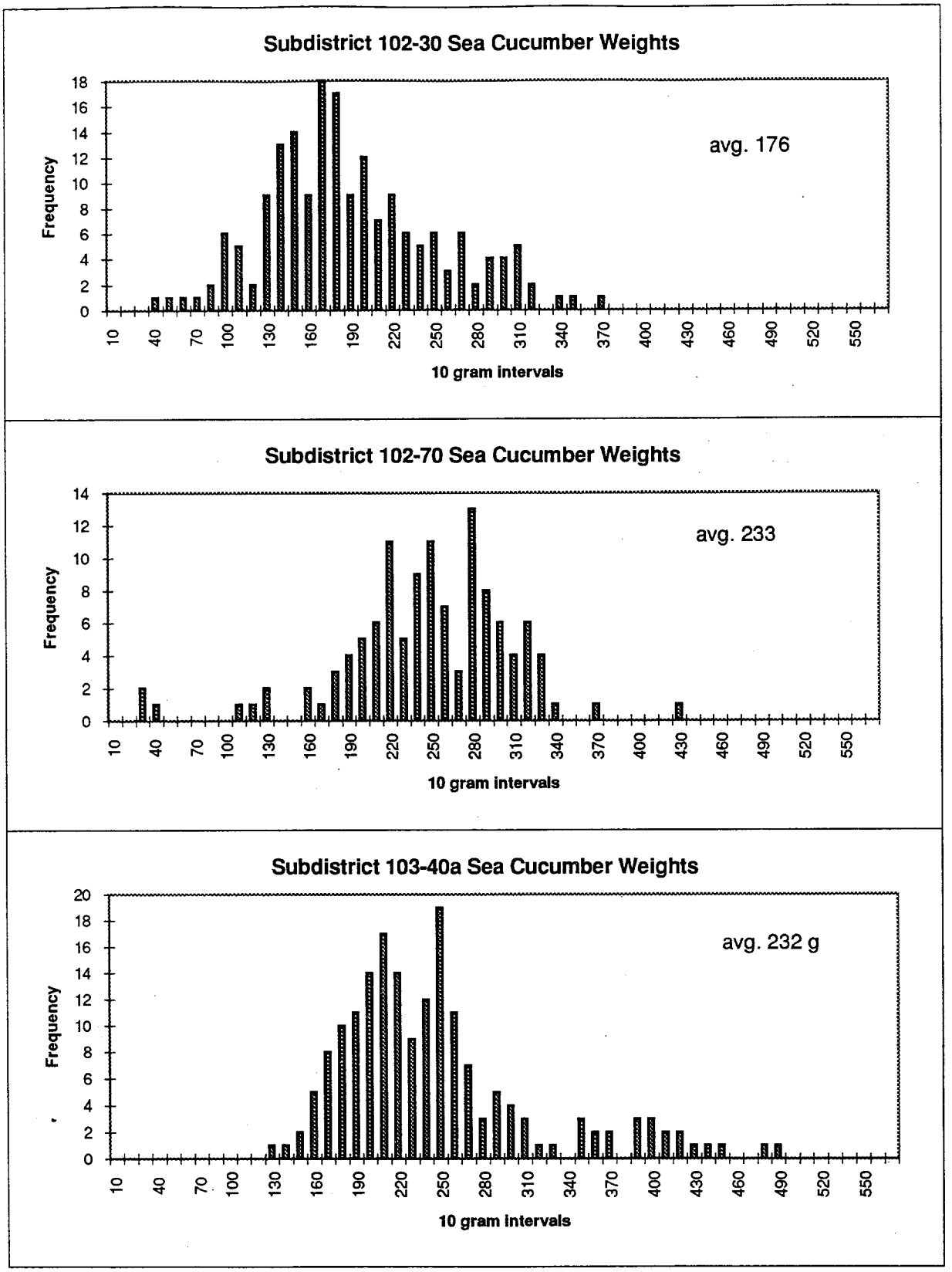


Figure 2. cont.

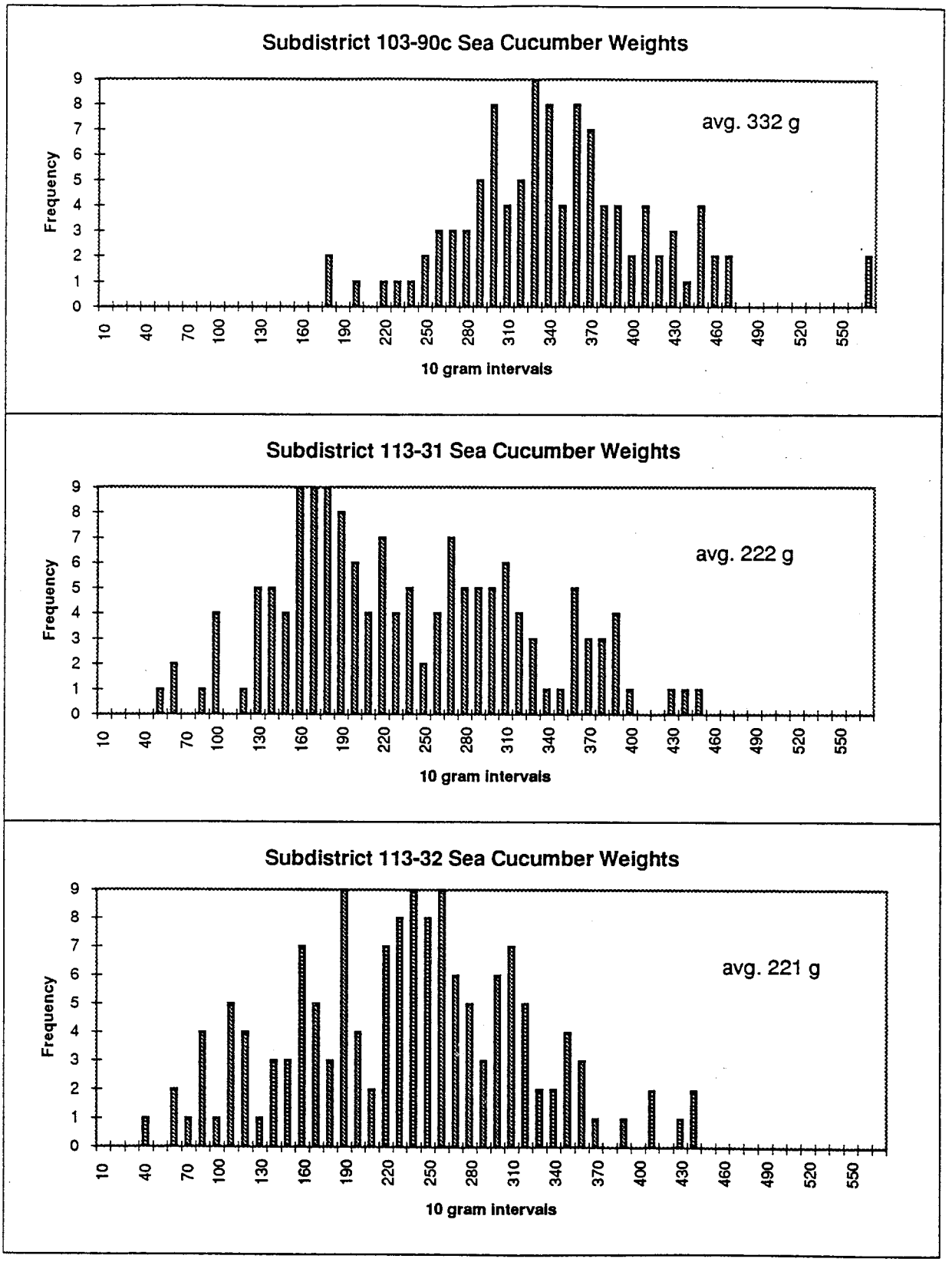


Figure 2. cont.

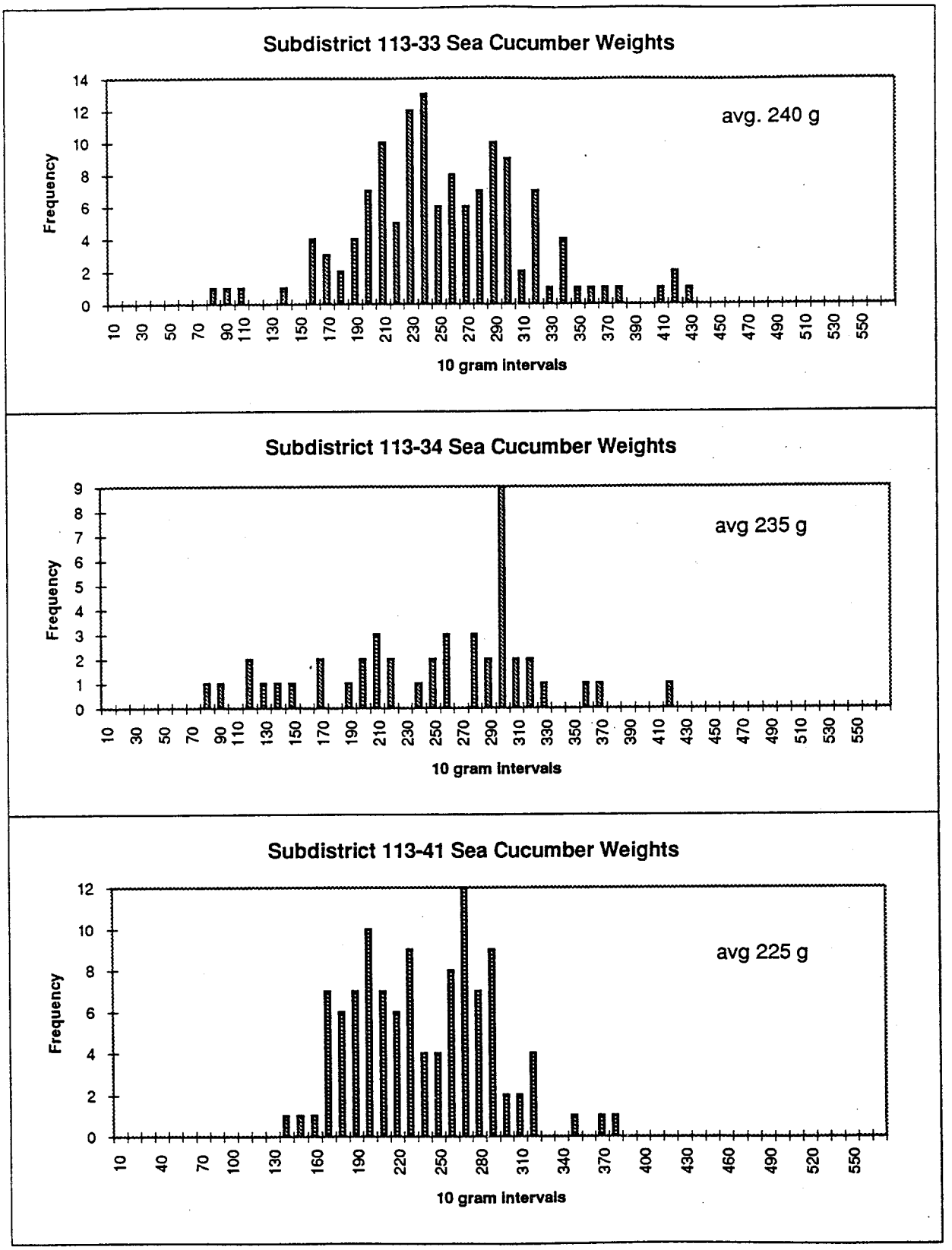
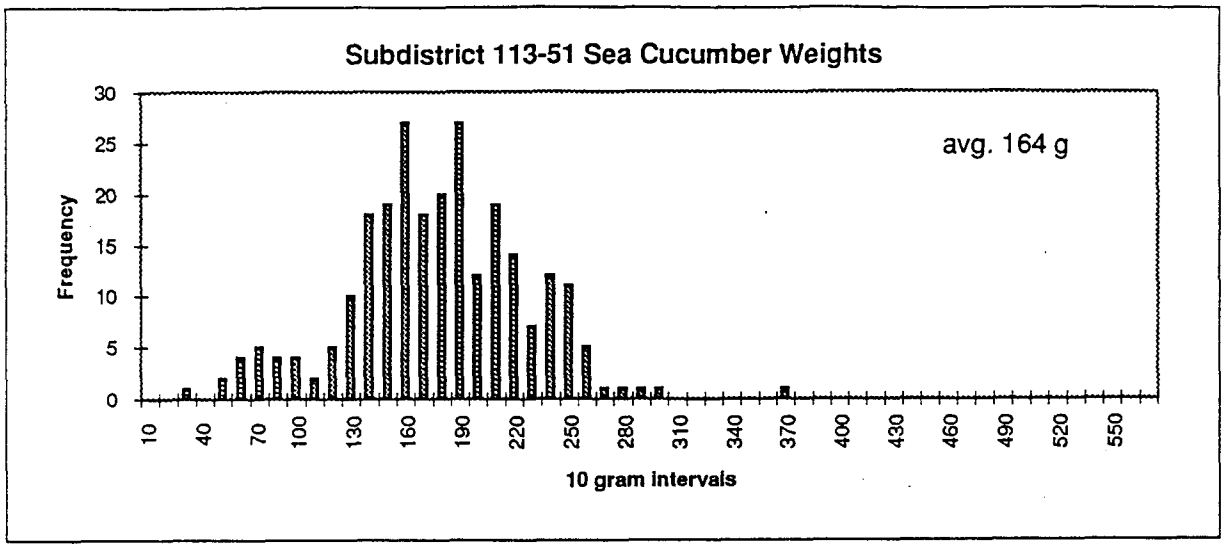


Figure 2. cont.


Subdistrict 113-51 Sea Cucumber Weights
avg. 164 g
Frequency
30
25
20
15
10
5
0
10
40
70
100
130
160
190
220
250
280
310
340
370
400
430
460
490
520
550
10 gram intervals

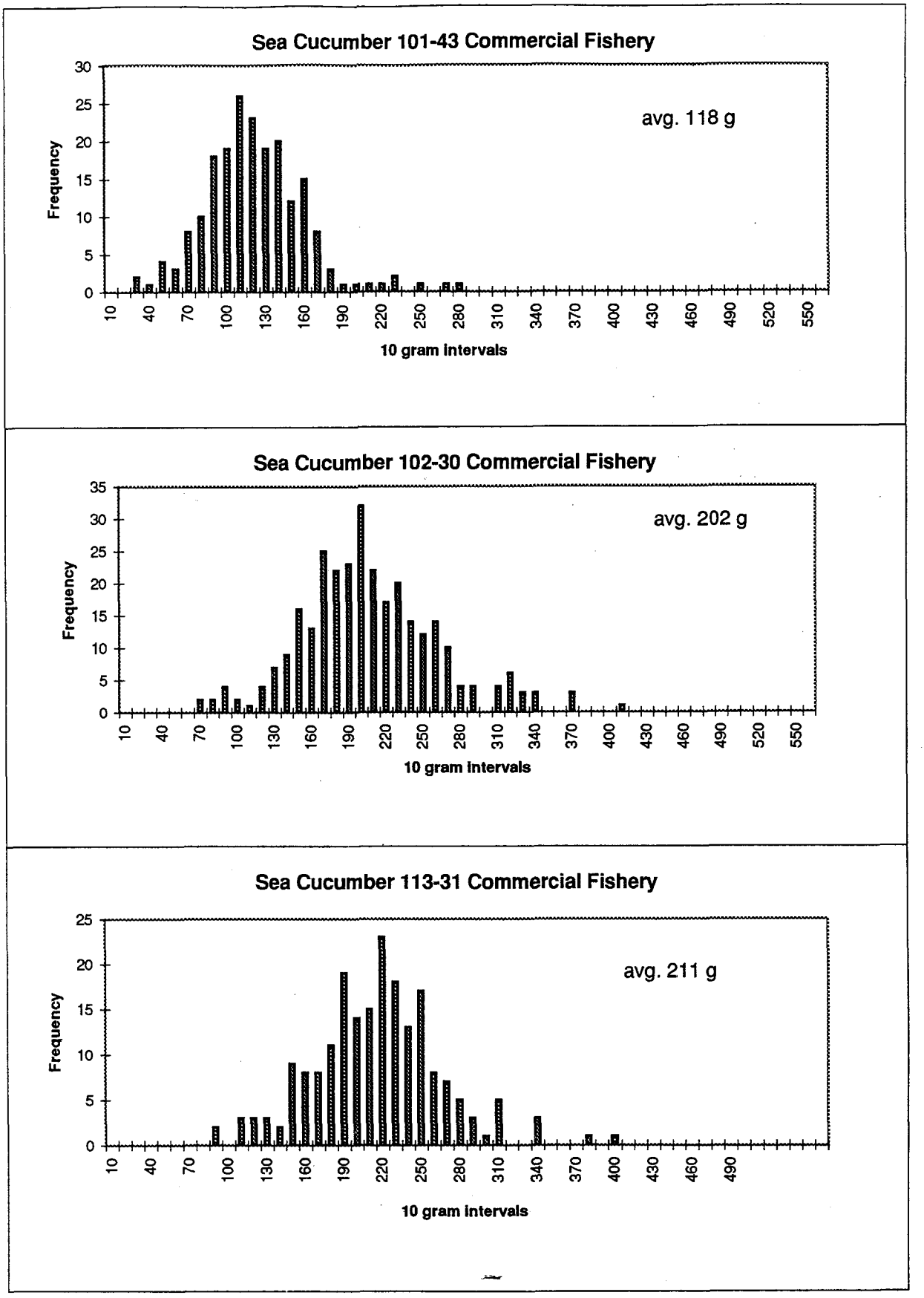


Figure 3. Individual sea cucumber weights taken during commercial fisheries, 1993.

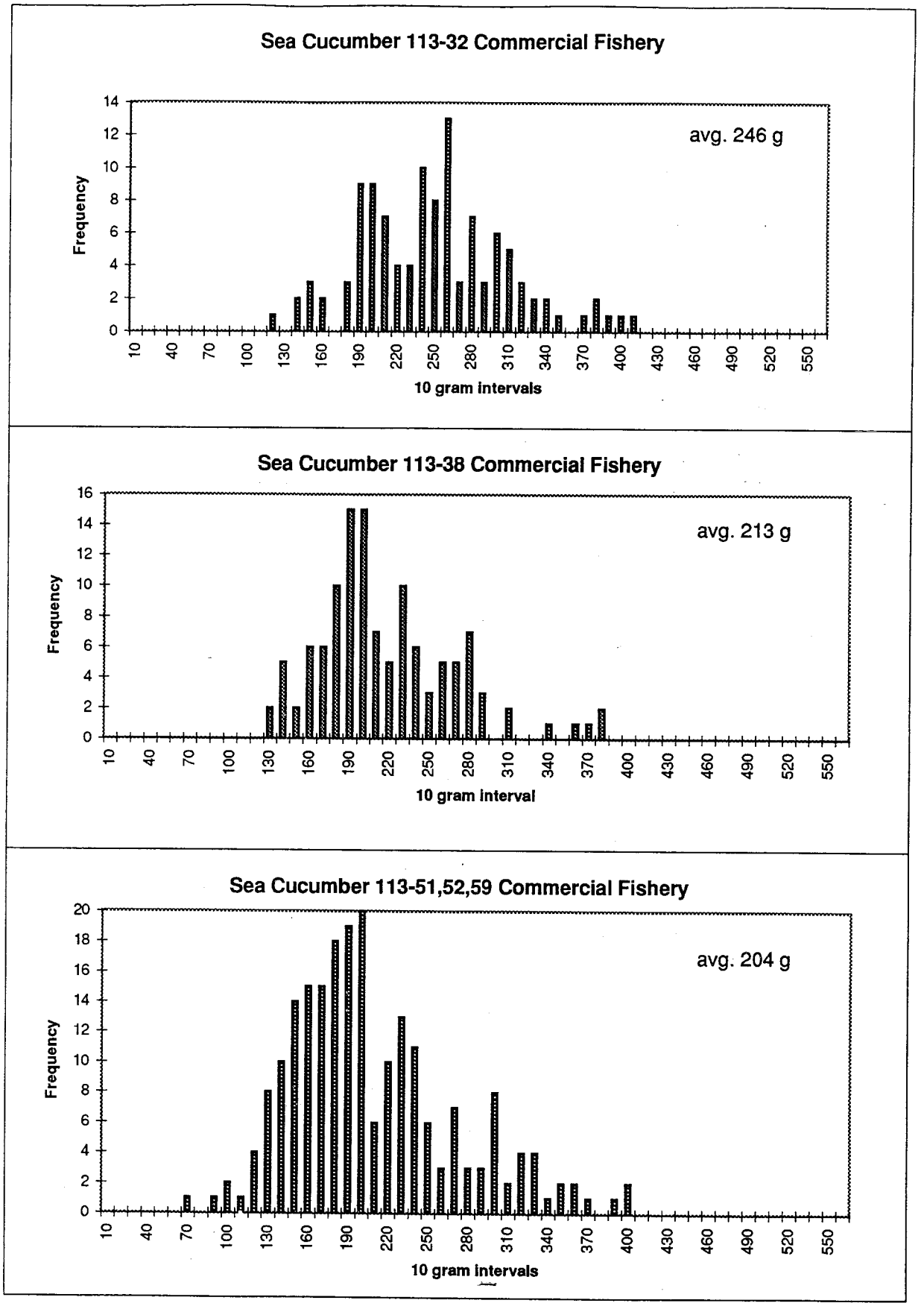
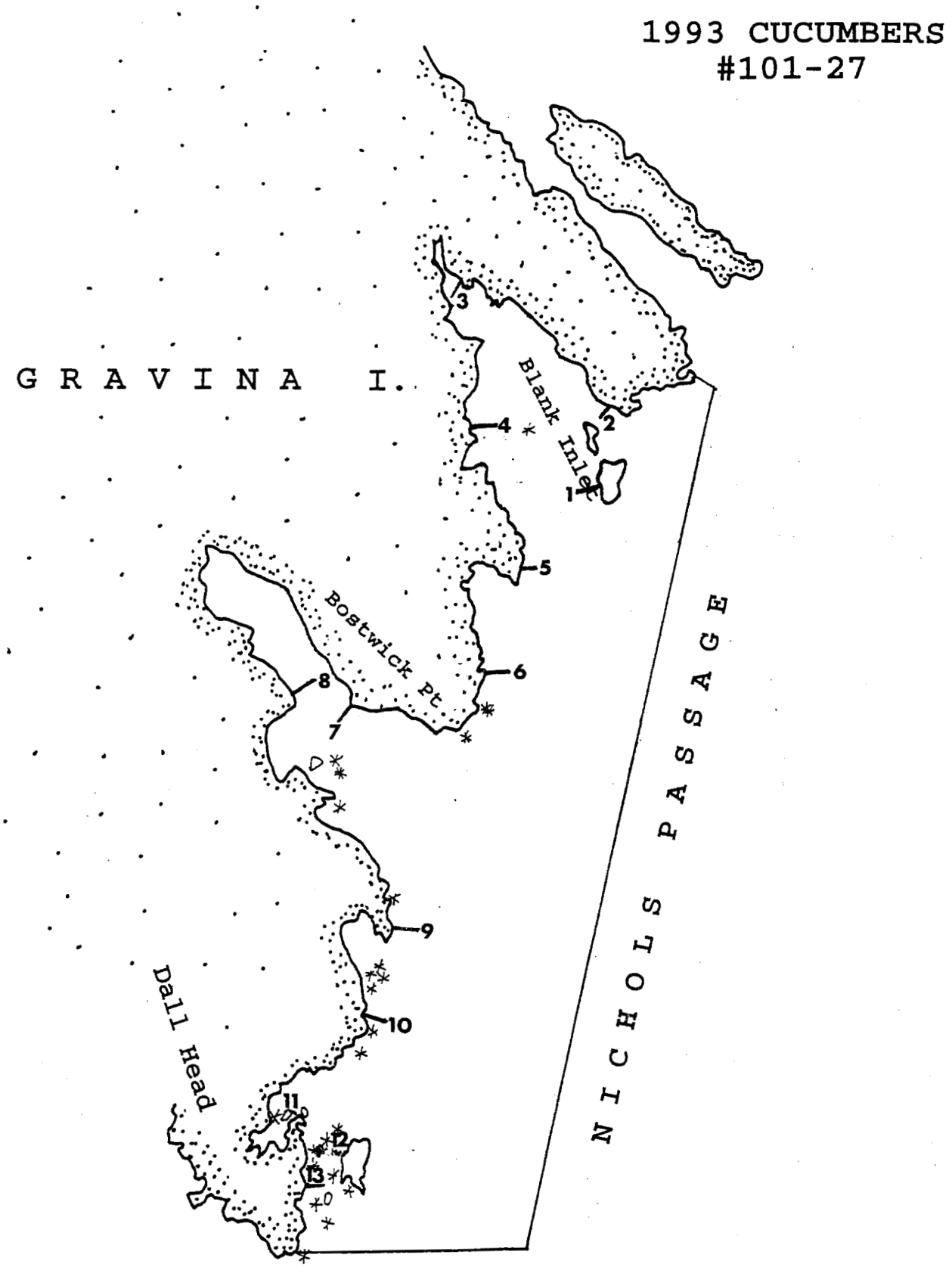


Figure 3. cont.

APPENDIX A: Sea cucumber assessment surveys, 1993



Map of transect locations in subdistrict 101-27.

SEA CUCUMBER TRANSECT DETAILS

Survey Area: 101-27
Cruise Date: April 26 - 28, 1993

Divers: Phil Doherty (PD), Tim Koeneman (TK), Robert Larson (RL), Tim Minicucci (TM)

Tide Datum: Ketchikan/MHW Avg. -15 ft.

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
26-Apr-93	1a	1625	1649	24	13.0	RL	TM	2	5	15	17	2	4	0		bld			lbk		
									5	17	19	4	6	0		bld			lbk		
									5	19	20	6	7	0		bld			lbk		
									5	20	22	7	9	0		gvl			lbk		
									5	22	19	9	6	0		rck			lbk		
									5	19	16	6	3	0		rck			lbk		
									5	16	19	3	6	0		rck			lbk		
									5	19	20	6	7	0		rck			lbk		
									5	20	24	7	11	0		rck					
									5	24	32	11	19	0		rck					
									2.5	32	38	19	25	2		rck					
									2.5	38	46	25	33	2		rck					
									2.5	46	50	33	37	0		rck					
									2.5	50	54	37	41	2		cbl			cor		
									5	54	58	41	45	4		cbl			cor		
									5	58	62	45	49	1		cbl			cor		
									5	62	67	49	54	0		cbl			cor		
									5	67	72	54	59	2		cbl			cor		
								Total	80					13							MLLW tide correction
27-Apr-93	2a	849	856	7	4.0	PD	TK	2	5	4	10	0	6	0		rck			ner		
									5	10	13	6	9	4		rck					
									5	13	20	9	16	3		rck					
									5	20	24	16	20	0		rck					
									5	24	28	20	24	1		gvl					urchins present
									5	28	32	24	28	2		gvl					urchins present
									5	32	40	28	36	4		gvl	shl				urchins present
									5	40	45	36	41	6		gvl	shl				
									5	45	49	41	45	4		gvl	shl				
								Total	45					24							MLLW tide correction
27-Apr-93	2b	856	903	7	3.5	PD	TK	2	5	50	43	47	40	1		gvl	shl				urchins present
									5	43	38	40	35	7		gvl	shl				urchins present
									5	38	33	35	30	1		gvl	shl				urchins present
									5	33	24	30	21	1		gvl	shl				most urchins in this depth
									5	24	19	21	16	0		bld	shl				most urchins in this depth
									5	19	12	16	8.5	1		rck			lbk		most urchins in this depth
									5	12	5	8.5	1.5	1		rck			lbk		urchins present
									5	5	0	1.5	-4	0		rck			lbk		
								Total	40					12							MLLW tide correction
27-Apr-93	3a	910	922	12	3.0	RL	TM	2	3	0	12	-3	9	2		rck		8	lbk		upper end of line
									5	12	18	9	15	2		cbl	shl	6	lbk		
									5	18	20	15	17	3		cbl	shl	5	lbk		
									5	20	23	17	20	8		cbl	shl	4	lbk		
									5	23	28	20	25	4		gvl	shl	3	lbk		
									5	28	33	25	30	3		snd	shl	1	lbk		
									5	33	36	30	33	6		snd	shl	1	lbk		
									5	36	40	33	37	3		snd	wdy	0			
									5	40	45	37	42	6		gvl	wdy	0			
									5	45	47	42	44	0		snd	wdy	0			
									5	47	53	44	50	1		snd	slt	0			
									5	53	56	50	53	0		slt	wdy	0			

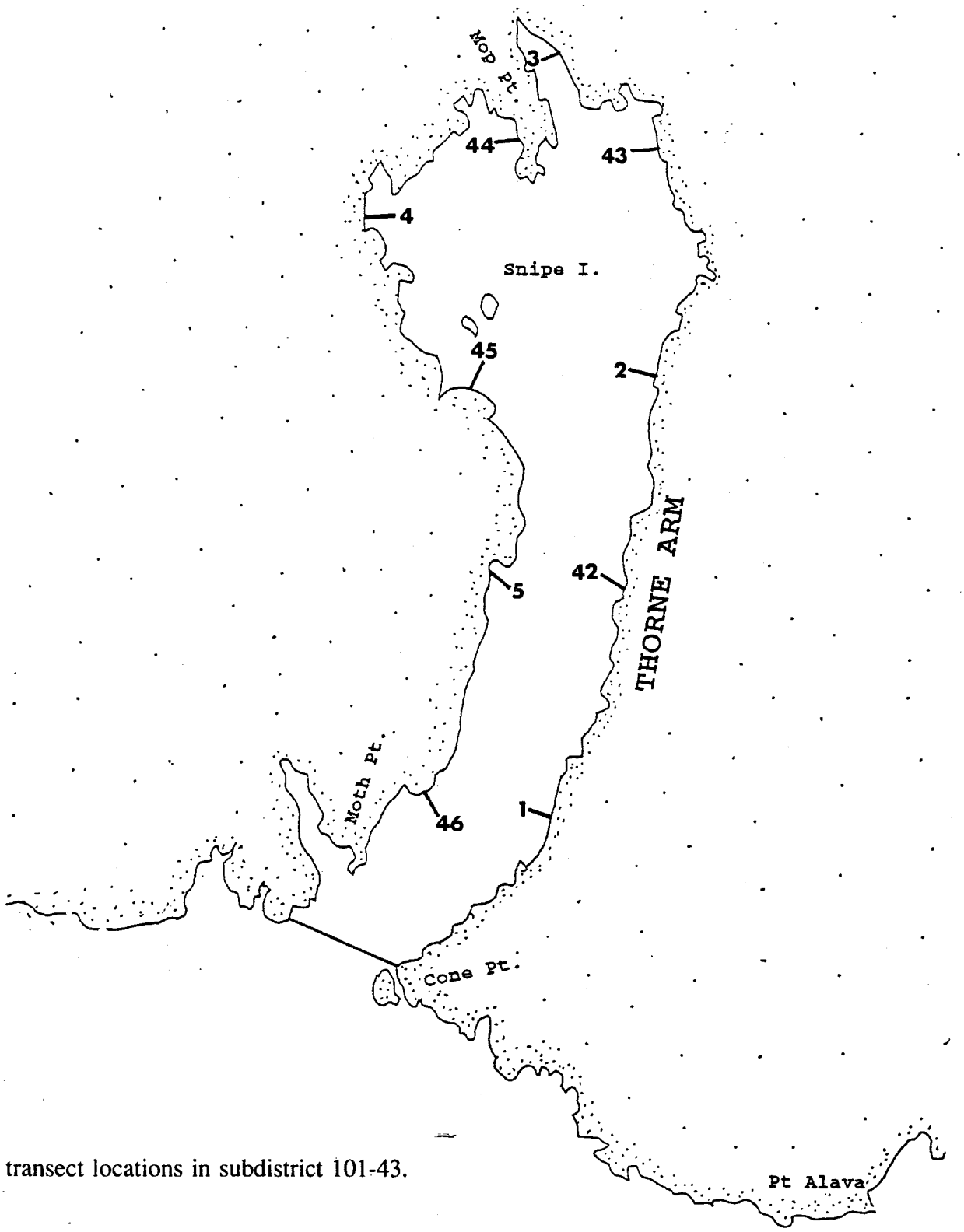
								5	56	60	53	57	1	slt	wdy	0		
								5	60	62	57	59	0	slt	wdy	0		
								5	62	64	59	61	0	slt	wdy	0		
								5	64	66	61	63	0	slt	wdy	0		
							Total	78					39					MLLW tide correction
27-Apr-93	3b	922	933	11	2.5	RL	TM	2	5	66	62	64	60	0	slt	wdy		
									5	62	59	60	57	0	slt	wdy		
									5	59	57	57	55	2	slt	wdy		
									5	57	55	55	53	2	slt	wdy		
									5	55	52	53	50	2	slt	wdy		
									5	52	47	50	45	2	slt	wdy		
									5	47	45	45	43	2	slt	wdy		
									5	45	40	43	38	4	shl	wdy		
									5	40	37	38	35	4	shl	wdy		
									5	37	33	35	31	3	shl	wdy		
									5	33	28	31	26	2	snd	shl	1	lbk	
									5	28	23	26	21	2	snd	shl	2	lbk	
									5	23	20	21	18	6	gvl	shl	3	lbk	
									5	20	18	18	16	4	rck	shl	6	lbk	
									5	18	16	16	14	3	rck		8	lbk	
									3	16	10	14	7.5	0	rck		9	lbk	
									3	10	5	7.5	2.5	0	rck		8	lbk	
									2	5	0	2.5	-3	0	rck		8	fuc	
							Total	83					38					MLLW tide correction
28-Apr-93	4a	1533	1550	17	7.5	TM	RL	2	5	6	9	-2	1.5	0	rck	shl	95	lbk	upper end of line
									5	9	13	1.5	5.5	0	rck		90	lbk	
									5	13	20	5.5	13	6	rck		50	lbk	
									5	20	26	13	19	4	rck	snd	30	lbk	
									5	26	31	19	24	4	cbl	snd	20	lbk	
									5	31	36	24	29	3	rck	snd	10	lbk	
									5	36	40	29	33	6	cbl	rck			
									5	40	46	33	39	5	rck	shl			
									5	46	50	39	43	4	cbl	shl			
									5	50	56	43	49	12	cbl	shl			
									5	56	60	49	53	2	cbl	shl			
									5	60	65	53	58	5	cbl	shl			
							Total	60					51					MLLW tide correction
27-Apr-93	5a	921	927	6	2.5	PD	TK	2	5	0	14	-3	12	2	rck		50	lbk	
									5	14	23	12	21	8	rck				
									5	23	31	21	29	5	rck				lingcod
									5	31	46	29	44	10	rck				
									5	46	50	44	48	2	rck	snd			
							Total	25					27					MLLW tide correction
27-Apr-93	5b	927	933	6	2.0	PD	TK	2	5	50	39	48	37	5	rck				
									5	39	30	37	28	3	rck				
									5	30	19	28	17	5	rck				
									5	19	11	17	9	2	rck		30	lbk	
									5	11	0	9	-2	0	rck		90	lbk	
							Total	25					15					MLLW tide correction
27-Apr-93	6a	1013	1020	7	0.5	RL	TM	2	5	0	5	-1	4.5	0	rck			lbk	urchins 7-10/m2 in 30' band
									5	5	7	4.5	6.5	0	bld			ner	
									5	7	13	6.5	13	3	bld				
									5	13	22	13	22	4	bld		20	lbk	
									5	22	29	22	29	4	bld				
									5	29	35	29	35	5	rck				
									5	35	43	35	43	5	rck				
									5	43	49	43	49	4	rck				
									5	49	60	49	60	0	gvl				
							Total	45					25					MLLW tide correction
27-Apr-93	6b	1020	1027	7	0.5	RL	TM	2	5	60	42	60	42	7	gvl	shl			
									5	42	32	42	32	6	rck	gvl			
									5	32	23	32	23	4	rck				
									5	23	19	23	19	3	gvl	shl			
									5	19	13	19	13	6	rck				

									5	13	8	13	7.5	0	rck		3	lbk		
									5	8	6	7.5	5.5	0	rck		90	lbk		
									5	6	4	5.5	3.5	0	rck		90	lbk		
								Total	40					26						MLLW tide correction
27-Apr-93	7a	1003	1014	11	1.0	PD	TK	2	5	0	6	-1	5	0	snd			lbk		
									5	6	7	5	6	0	bld			lbk		
									5	7	8	6	7	0	bld			lbk		cucumari
									5	8	10	7	9	0	bld			lbk		
									5	10	11	9	10	0	bld			lbk		
									5	11	14	10	13	0	cbl			lbk		
									5	14	16	13	15	1	cbl			lbk		
									5	16	20	15	19	0	gvl			lbk		
									5	20	22	19	21	0	snd			lbk		
									5	22	25	21	24	0	snd					geoducks present
									5	25	32	24	31	0	snd					6 new soft male dungeness
									5	32	40	31	39	0	snd					
									5	40	49	39	48	0	snd					
								Total	65					1						MLLW tide correction
27-Apr-93	7b	1014	1024	10	0.5	PD	TK	2	5	50	40	50	40	0						
									5	40	32	40	32	0	snd					
									5	32	29	32	29	0	snd					
									5	29	23	29	23	0	gvl			lbk		
									5	23	19	23	19	3	cbl			lbk		
									5	19	16	19	16	2	cbl			lbk		
									5	16	11	16	11	1	cbl			lbk		cucumbers present
									5	11	10	11	9.5	0	cbl			lbk		
									5	10	7	9.5	6.5	0	cbl			lbk		
									5	7	5	6.5	4.5	0	cbl			lbk		
									10	5	0	4.5	-1	0	rck			elg	red	
								Total	60					6						MLLW tide correction
28-Apr-93	8a	906	924	18	6.0	PD	TK	2	20	0	7	-6	1	0	snd	cbl	90	elg	fir	
									30	7	8	1	2	0	cbl		90	elg	fir	
									15	8	10	2	4	0	cbl	snd	90	elg	lbk	
									5	10	12	4	6	3	cbl		90	lbk		
									5	12	15	6	9	5	snd	snd	50	lbk		
									5	15	15	9	9	6	snd	cbl	50	lbk		
									5	15	16	9	10	0	snd		40	lbk		
									5	16	19	10	13	0	snd		40	lbk		
									5	19	21	13	15	3	snd	cbl	40	lbk		
									5	21	22	15	16	0	snd	cbl	30	lbk		
									5	22	24	16	18	1	snd	cbl	30	lbk		
									5	24	26	18	20	0	snd	cbl	20	lbk		
									20	26	31	20	25	0	snd	cbl	10	lbk		
									40	31	38	25	32	0	mud	snd				
									40	38	46	32	40	0	mud					
									5	46	49	40	43	0	mud					
								Total	215					18						MLLW tide correction
28-Apr-93	8b	924	941	17	5.0	PD	TK	2	20	49	20	44	15	0	snd	cbl	20	lbk		
									20	20	15	15	10	0	snd	cbl	50	lbk		
									10	15	13	10	8	0	snd	cbl	70	lbk		
									10	13	9	8	4	0	cbl	snd	90	lbk		
									5	9	8	4	3	0	cbl	rck	90	lbk		
									5	8	6	3	1	0	cbl	rck	90	lbk		
									5	6	5	1	0	0	cbl	rck	90	fir	elg	
									20	5	5	0	0	0	cbl	snd	70	elg		
								Total	95					0						MLLW tide correction
28-Apr-93	9a	1008	1017	9	3.0	PD	TK	2	10	5	10	2	7	0	rck			ala		
									10	10	10	7	7	0	rck			red		
									10	10	18	7	15	0	rck					
									5	18	19	15	16	6	cbl					urchins present
									5	19	23	16	20	8	cbl					
									5	23	27	20	24	8	cbl					
									5	27	30	24	27	3	cbl					
									5	30	37	27	34	1	cbl					

								5	37	45	34	42	2	cbl				
								5	45	50	42	47	0	cbl	wdy			
							Total	65					28					MLLW tide correction
28-Apr-93	9b	1017	1025	8	3.0	PD	TK	2	5	50	42	47	39	4	cbl			
									5	42	37	39	34	1	cbl	gvl		
									5	37	33	34	30	7	cbl	gvl		
									5	33	30	30	27	3	cbl			
									5	30	25	27	22	0	rck			
									5	25	19	22	16	0	rck			
									5	19	17	16	14	3	rck			
									5	17	15	14	12	0	rck		lbk	
									5	15	12	12	9	3	rck			
									15	12	8	9	5	0	rck	gvl	lbk	
							Total	60					21					MLLW tide correction
28-Apr-93	10a	1431	1448	17	5.0	PD	TK	2	5	0	15	-5	10	3	rck	80	lbk	
									5	15	18	10	13	3	rck	cbl	60	lbk
									5	18	20	13	15	9	rck	cbl	60	lbk
									5	20	22	15	17	3	cbl	snd	30	lbk
									5	22	24	17	19	5	snd	cbl	10	lbk
									5	24	26	19	21	12	snd		10	lbk
									5	26	31	21	26	12	snd	cbl	10	lbk
									5	31	32	26	27	5	snd	cbl	10	lbk
									5	32	33	27	28	3	cbl	snd	10	lbk
									5	33	34	28	29	7	cbl	snd	10	lbk
									5	34	36	29	31	11	cbl	snd	10	lbk
									5	36	38	31	33	6	snd	cbl	10	lbk
									5	38	41	33	36	9	snd	cbl	5	lbk	geoducks
									5	41	43	36	38	4	snd	cbl	5	lbk
									5	43	47	38	42	5	snd	cbl	5	lbk
									5	47	50	42	45	5	snd	cbl	5	lbk
							Total	80					102					MLLW tide correction
28-Apr-93	10b	1448	1504	16	5.5	PD	TK	2	5	50	45	45	40	8	snd	cbl	5	lbk
									5	45	42	40	37	3	snd	cbl	5	lbk
									5	42	40	37	35	5	snd	cbl	5	lbk
									5	40	40	35	35	5	snd	cbl	5	lbk
									5	40	38	35	33	4	cbl	snd	10	lbk
									5	38	34	33	29	4	cbl	snd	10	lbk
									5	34	34	29	29	8	cbl	snd	30	lbk
									5	34	33	29	28	5	cbl	snd	30	lbk
									5	33	31	28	26	6	cbl	snd	50	lbk
									5	31	30	26	25	2	cbl	rck	70	lbk
									5	30	27	25	22	5	cbl	bld	70	lbk
									5	27	26	22	21	3	cbl	bld	70	lbk
									5	26	24	21	19	0	cbl		70	lbk
									5	24	22	19	17	7	cbl		70	lbk
									5	22	19	17	14	11	cbl		60	lbk
									5	19	18	14	13	4	cbl		60	lbk
									5	18	14	13	8.5	9	cbl		30	lbk
									5	14	8	8.5	2.5	0	cbl	rck	90	lbk
							Total	90					89					MLLW tide correction
28-Apr-93	11a	1040	1050	10	2.0	TM	RL	2	5	0	7	-2	5	0	cbl		100	lbk
									5	7	10	5	8	2	cbl		100	lbk
									5	10	12	8	10	2	cbl		100	lbk
									5	12	16	10	14	1	cbl		90	lbk
									5	16	20	14	18	3	cbl	shl	90	lbk
									5	20	22	18	20	6	cbl	shl	70	lbk
									5	22	25	20	23	5	cbl	shl	70	lbk
									5	25	31	23	29	5	cbl	shl	70	lbk
									5	31	35	29	33	4	cbl	shl	60	lbk
									5	35	38	33	36	0	gvl	shl	20	lbk
									5	38	43	36	41	2	gvl	shl		
									5	43	48	41	46	1	snd			
									5	48	52	46	50	1	snd			
							Total	65					32					MLLW tide correction

28-Apr-93	11b	1050	100	10	1.5	TM	RL	2	5	50	43	49	42	1	gvl	shl				
									5	43	39	42	38	2	gvl	shl				
									5	39	36	38	35	4	gvl	shl				
									5	36	31	35	30	3	snd	shl	1	lbk		
									5	31	26	30	25	1	cbl	shl	3	lbk		
									5	26	22	25	21	4	cbl	shl	6	lbk		
									5	22	20	21	19	4	cbl		3	lbk		
									5	20	16	19	15	5	cbl		100	lbk		
									5	16	12	15	11	2	cbl		100	lbk		
									5	12	8	11	6.5	5	rck		100	lbk		
									5	8	5	6.5	3.5	2	rck		100	lbk	fil	
									5	5	1	3.5	-1	1	rck					
								Total	60					34						MLLW tide correction
28-Apr-93	12a	947	1001	14	4.0	TM	RL	2	5	0	12	-4	8	8	rck	snd	95	lbk		
									5	12	16	8	12	8	bld	snd	60	lbk		
									5	16	19	12	15	7	cbl	snd	40	lbk		
									5	19	22	15	18	9	rck	snd	60	lbk		
									5	22	24	18	20	8	rck	snd	60	lbk		
									5	24	25	20	21	13	cbl	snd	40	lbk		
									5	25	26	21	22	9	cbl	snd	30	lbk		
									5	26	27	22	23	13	rck	snd	20	lbk		
									5	27	36	23	32	3	rck	snd	5	lbk		
									5	36	43	32	39	4	cbl	snd	20	fir		
									5	43	49	39	45	2	cbl	snd				
								Total	55					84						MLLW tide correction
28-Apr-93	12b	1001	1014	13	3.5	TM	RL	2	5	50	40	47	37	3	cbl	snd				immature cucs 2-3"
									5	40	40	37	37	2	cbl	snd				
									5	40	35	37	32	8	cbl	snd				
									5	35	29	32	26	9	cbl	snd				
									5	29	24	26	21	8	rck	snd	30	lbk		
									5	24	19	21	16	11	rck	shl	50	lbk		
									5	19	19	16	16	9	rck	shl	30	lbk		
									5	19	17	16	14	9	rck	shl	40	lbk		
									5	17	16	14	13	4	cbl	shl	50	lbk		
									5	16	11	13	7.5	9	rck	shl	70	lbk		
									5	11	4	7.5	0.5	4	rck	shl	80	lbk	fir	
								Total	55					76						MLLW tide correction
28-Apr-93	13a	908	916	8	6.0	TM	RL	2	5	0	16	-6	10	17	bld		8	lbk		
									5	16	26	10	20	11	bld		9	lbk		
									5	26	30	20	24	6	shl		7	lbk		
									5	30	35	24	29	7	shl	cbl	5	lbk		
									5	35	40	29	34	10	shl		1	lbk		
									5	40	45	34	39	8	shl					
									5	45	50	39	44	11	shl					
								Total	35					70						MLLW tide correction
28-Apr-93	13b	916	924	8	5.5	TM	RL	2	5	50	36	45	31	8	shl					
									5	36	30	31	25	15	cbl		10	lbk		
									5	30	24	25	19	9	bld		40	lbk		
									5	24	16	19	11	18	bld		80	lbk		
									5	16	10	11	4.5	11	bld		90	lbk		
									5	10	1	4.5	-5	7	bld		80	fil		
								Total	30					68						MLLW tide correction

1993 CUCUMBERS
#101-43



Map of transect locations in subdistrict 101-43.

SEA CUCUMBER TRANSECT DETAILS:

Survey Area: 101-43 Thorne Arm
Cruise Dates: June 7 & 8, 1993

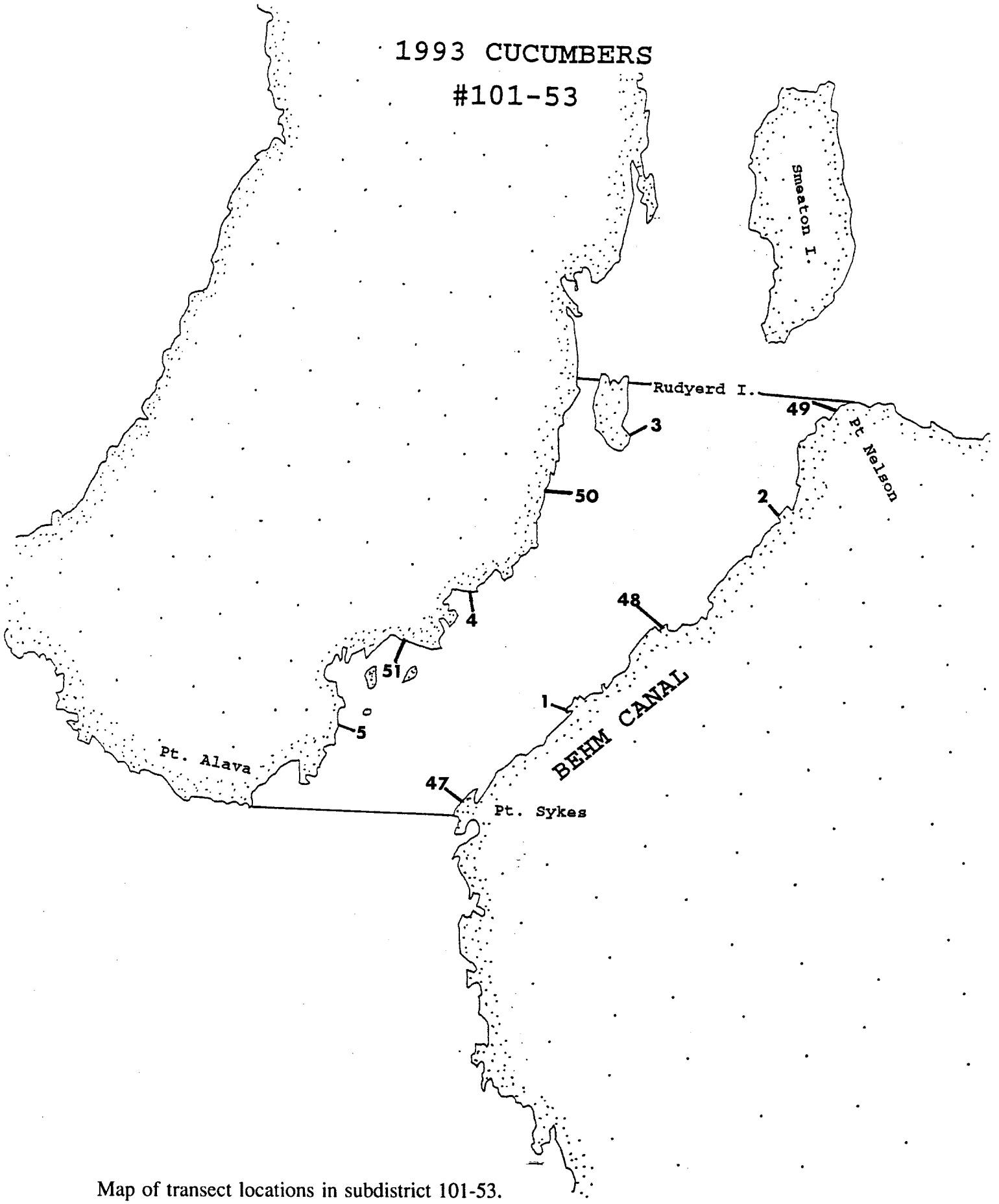
Divers: Don Ingledue (DI), Robert Larson (RL), Randy Timothy (RT), Doug Woodby (DW), Scott Walker (SW)

Tide Datum: Mop Pt., Thorne Arm/MHW Avg. -14'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
08-Jun-93	1a	952	959	7	-1.0	DI	SW	2	5	0	10	1	11	1		rck		70	lbk		
									3	10	20	11	21	1		rck		50	lbk		
									3	20	30	21	31	3		rck					
									4	30	40	31	41	1		rck					
									5	40	50	41	51	1		rck					
									3	50	55	51	56	0		rck					no urhcins, no abs
								Total	23					7							MLLW tide correction
08-Jun-93	1b	959	1005	6	-1.0	DI	SW	2	3	55	50	56	51	0		rck					
									4	50	36	51	37	2		rck					
									5	36	27	37	28	4		rck		20	lbk		cuc's small
									5	27	11	28	12	1		rck		50	lbk		
									3	11	0	12	1	0		rck		50	lbk		no urchins
								Total	20					7							MLLW tide correction
08-Jun-93	2a	826	834	8	1.0	RL	DW	2	5	0	3	-1	2	0		rck		100	fuc	fir	
									5	3	6	2	5	0		cbl	snd	80	lbk		
									5	6	13	5	12	1		bld	snd	90	lbk		
									5	13	21	12	20	6		snd	cbl	80	lbk		
									5	21	30	20	29	8		snd	cbl	60	lbk		
									5	30	34	29	33	4		snd	cbl				
									5	34	50	33	49	5		snd	shl				no cucs to 55 FSW
								Total	35					24							MLLW tide correction
08-Jun-93	2b	834	842	8	0.5	RL	DW	2	5	48	40	47.5	39.5	5		snd	shl				no cucs to 50 ft.
									5	40	32	39.5	31.5	4		snd	cbl				
									5	32	22	31.5	21.5	3		snd	slt	10	lbk		
									5	22	14	21.5	13.5	5		snd	slt	10	lbk		
									5	14	5	13.5	4.5	0		cbl	snd	90	lbk		
									9	5	0	4.5	-0.5	0		cbl	snd	70	fir	elg	cucs collected
								Total	34					17							MLLW tide correction
07-Jun-93	3a	1838	1848	10	8.5	RL	DI	2	5	0	5	-8.5	-3.5	0		bld		30	fuc		
									5	5	8	-3.5	-0.5	0		bld		60	fuc	fil	
									6	8	12	-0.5	3.5	0		cbl		80	fil		
									5	12	24	3.5	15.5	4		cbl		60	lbk		
									5	24	39	15.5	30.5	3		snd		10	lbk		
									5	39	50	30.5	41.5	3		gvl					
									4	50	55	41.5	46.5	3		gvl					look to 55 FSW
								Total	35					13							MLLW tide correction
07-Jun-93	3b	1848	1857	9	8.0	RL	DI	2	6	58	47	50	39	5		snd					
									5	47	40	39	32	6		snd	gvl				
									5	40	29	32	21	5		snd		10	lbk		
									5	29	22	21	14	2		cbl		60	lbk		small cuc
									5	22	11	14	3	3		bld		80	fil		
									3	11	7	3	-1	0		bld		90	fil	fuc	
									10	7	0	-1	-8	0		bld		50	fuc		
								Total	39					21							MLLW tide correction
07-Jun-93	4a	1655	1704	9	13.0	DW	DI	2	15	0	11	-13	-2	0		cbl					
									15	11	14	-2	1	0		cbl					
									10	14	18	1	5	0		cbl					
									5	18	21	5	8	0		snd		30	elg		
									10	21	28	8	15	0		mud					
									5	28	29	15	16	1		mud					
									5	29	34	16	21	1		mud	rck	10	lbk		
									10	34	41	21	28	0		mud					
									8	41	49	28	36	0		mud					
								Total	83					2							MLLW tide correction

07-Jun-93	4b	1704	1713	9	12.5	DW	DI	2	20	50	35	37.5	22.5	0	mud					
									10	35	26	22.5	13.5	2	mud					
									6	26	22	13.5	9.5	0	mud					
									5	22	19	9.5	6.5	0	snd		30	elg		
									10	19	15	6.5	2.5	0	cbl		70	fil		
									18	15	12	2.5	-0.5	0	cbl		70	fil	fuc	
									13	12	3	-0.5	-9.5	0	rck		60	fuc		
								Total	82					2						MLLW tide correction
08-Jun-93	5a	819	827	8	1.0	SW	DI	2	2	0	3	-1	2	0	rck			fuc	fil	
									5	3	6	2	5	0	rck			lbk	fil	
									15	6	13	5	12	0	snd			elg		
									10	13	5	12	4	0	mud					
									5	5	39	4	38	4	mud	wdy				
									5	39	50	38	49	0	mud					
									5	50	55	49	54	0	mud					no uchins, no abs
								Total	47					4						MLLW tide correction
08-Jun-93	5b	827	834	7	1.0	SW	DI	2	15	55	30	54	29	0	mud					
									8	30	12	29	11	2	snd		50	lbk		baby cucs at 35 FSW
									6	12	4	11	3	0	rck			hir	fil	
									1	4	0	3	-1	0	rck			fuc		
								Total	30					2						MLLW tide correction
08-Jun-93	6a	900	906	6	-0.5	RL	DW	2	3	0	3	0.5	3.5	0	rck		80	fil	fuc	
									5	3	8	3.5	8.5	0	snd		10	lbk	fuc	
									3	8	18	8.5	18.5	0	snd	slt	10	lbk		
									5	18	28	18.5	28.5	0	snd	slt				
									5	28	42	28.5	42.5	3	snd	slt				
									4	42	50	42.5	50.5	4	snd	slt				
									3	50	54	50.5	54.5	0	snd	slt				
								Total	28					7						MLLW tide correction
08-Jun-93	6b	906	912	6	-0.5	RL	DW	2	5	54	44	54.5	44.5	0	snd	slt				
									5	44	33	44.5	33.5	0	snd	slt				
									5	33	21	33.5	21.5	0	snd	slt				
									5	21	8	21.5	8.5	0	snd	slt	10	lbk		
									5	8	3	8.5	3.5	0	snd	slt	40	lbk		
									4	3	0	3.5	0.5	0	rck	cbl				
								Total	29					0						MLLW tide correction
08-Jun-93	43a	745	755	10	3.0	RL	DW	2	8	0	3	-3	0	0	cbl		50	fuc		
									11	3	8	0	5	0	cbl		90	fil		
									10	8	22	5	19	3	cbl		90	lbk		
									5	22	28	19	25	2	cbl		70	lbk		
									5	28	32	25	29	1	gvl	shl	10			
									10	32	40	29	37	4	snd	shl				
									10	40	49	37	46	5	snd	shl				
									2	49	50	46	47	1	snd	shl				
								Total	61					16						MLLW tide correction
08-Jun-93	43b	755	805	10	2.5	RL	DW	2	5	50	47	47.5	44.5	0	snd					
									5	47	41	44.5	38.5	1	snd					
									10	41	33	38.5	30.5	3	snd					
									8	33	26	30.5	23.5	0	snd					
									15	26	10	23.5	7.5	3	snd		90	lbk		
									4	10	7	7.5	4.5	0	cbl		100	lbk		numerous 1-2 cm cucs under
									11	7	0	4.5	-2.5	0	cbl		80	fil	fuc	flat rocks at 7 fsw
								Total	58					7						MLLW tide correction
07-Jun-93	44a	1743	1758	15	11.0	RL	DW	2	7	0	6	-11	-5	0	bld		5	fuc		transect moved N 250m
									12	6	12	-5	1	0	cbl		30	fil	fuc	
									15	12	15	1	4	0	slt		90	elg		
									10	15	20	4	9	11	slt		70	elg		
									5	20	21	9	10	5	slt		5	elg		
									6	21	23	10	12	1	rck		80	lbk		
									5	23	27	12	16	4	rck		90	lbk		
									4	27	34	16	23	1	rck		90	lbk		
									10	34	38	23	27	7	snd	sil				
									10	38	38	27	27	13	snd	sil	10	lbk		
									10	38	42	27	31	5	snd	sil	10	lbk		
									6	42	50	31	39	4	snd	sil	10	lbk		
								Total	100					51						MLLW tide correction
07-Jun-93	44b	1758	1812	14	10.0	RL	DW	2	5	53	48	43	38	1	snd	slt				
									8	48	40	38	30	7	snd	slt				
									13	40	32	30	22	13	snd	slt				
									7	32	22	22	12	1	rck	slt	70	lbk		
									10	22	19	12	9	8	slt	snd				
									5	19	15	9	5	2	slt	snd	10	elg		
									5	15	12	5	2	0	cbl	slt				
									10	12	7	2	-3	0	cbl	slt	60	fir	fuc	tiny cucs 1 to 2 cm under rocks

									10	7	5	-3	-5	0		cbl	gvl	30	fuc		
								Total	73					32							MLLW tide correction
08-Jun-93	45a	741	750	9	3.0	DI	SW	2	2	0	4	-3	1	0		rck			fuc	fil	
									5	4	7	1	4	1		snd			elg		
									5	7	15	4	12	4		snd			lbk		
									5	15	24	12	21	4		snd		40	lbk		
									5	24	31	21	28	6		snd			lbk		
									5	31	38	28	35	3		gvl		20	lbk		
									5	38	50	35	47	6		snd					
									10	50	60	47	57	1		snd					no urchins, no abs
								Total	42					25							MLLW tide correction
08-Jun-93	45b	750	759	9	2.5	DI	SW	2	5	60	50	57.5	47.5	1		snd					
									5	50	41	47.5	38.5	3		snd		20	lbk		
									5	41	33	38.5	30.5	7		snd		50	lbk		
									5	33	20	30.5	17.5	3		snd		80	lbk		
									5	20	11	17.5	8.5	3		rck		100	lbk		
									6	11	4	8.5	1.5	3		rck			fil		
									2	4	0	1.5	-2.5	0		rck			fuc		
								Total	33					20							MLLW tide correction
08-Jun-93	46a	900	909	9	-0.5	DI	SW	2	5	0	8	0.5	8.5	2		rck		50	lbk		
									5	8	13	8.5	13.5	1		rck		50	lbk		
									5	13	26	13.5	26.5	3		rck					1 red urchin
									5	26	41	26.5	41.5	2		rck					
									5	41	50	41.5	50.5	4		snd					2 red urchins
									5	50	55	50.5	55.5	3		snd					
								Total	30					15							MLLW tide correction
08-Jun-93	46b	909	917	8	-0.5	DI	SW	2	5	55	50	55.5	50.5	0		snd					
									5	50	38	50.5	38.5	1		rck					small 6" cuc
									5	38	28	38.5	28.5	7		rck		30	lbk		2 red urchins
									5	28	19	28.5	19.5	7		rck		50	lbk		3 red urchins
									5	19	8	19.5	8.5	7		rck		70	lbk		
									5	8	0	8.5	0.5	1		rck		50	lbk		
								Total	30					23							MLLW tide correction



Map of transect locations in subdistrict 101-53.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 101-53 East Behm Canal
Cruise Dates: June 7 & 8, 1993

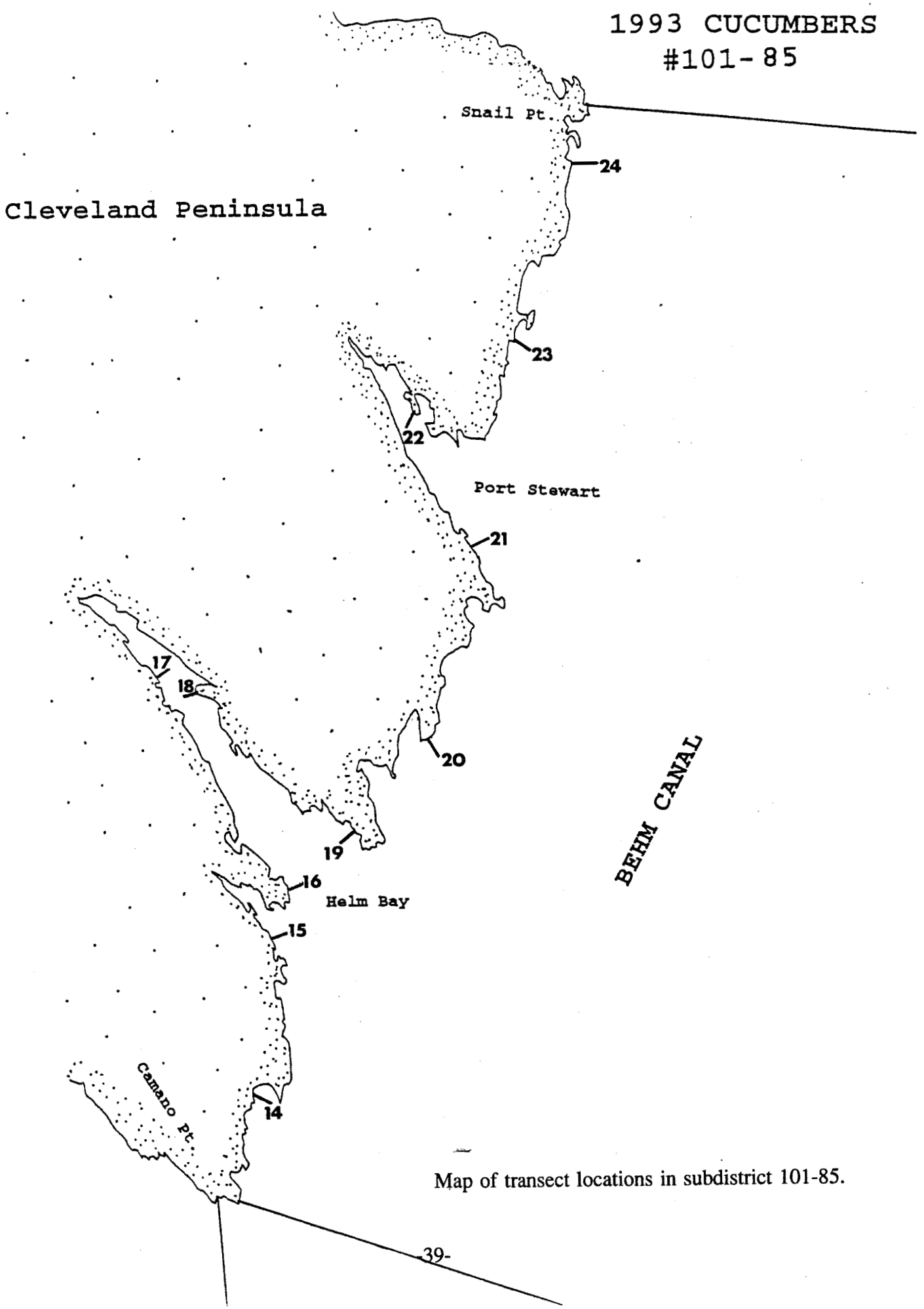
Divers: Don Ingledue (DI), Robert Larson (RL), Randy Timothy (RT), Doug Woodby (DW), Scott Walker (SW)

Tide Datum: Alava Bay/MHW Avg. -14'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
07-Jun-93	1a	1139	1151	12	3.0	DI	RL	2	5	0	7	-3	4	0		bld		90	lbk	ner	1 - 6" cuc
									5	7	17	4	14	5		bld		80	lbk		
									5	17	28	14	25	4		gvl	rck	40	lbk		4 red urchins, 3 small cucs
									5	28	43	25	40	3		cbl	shl	10			6 red urchins, 2 small cucs
									7	43	54	40	51	2		cbl	gvl				
								Total	27					14							
07-Jun-93	1b	1151	1203	12	3.5	DI	RL	2	4	54	46	51	43	0		rck		90	other		soft coral like cover?,2 sm cucs
									5	46	35	43	32	5		cbl		10	lbk		6 red urchins
									5	35	26	32	23	3		cbl	bld	30	lbk		4 red urchins, 2 small cucs
									5	26	16	23	13	8		rck		70	lbk		1 abalone
									3	16	10	13	6.5	9		rck		90	lbk		
									8	10	0	6.5	-4	5		rck		90	lbk		all cucs seen were fairly small
								Total	30					30							
07-Jun-93	2a	1004	1012	8	-1.5	DI	DW	2	5	0	10	1.5	12	0		rck	snd	70	lbk		
									5	10	24	12	26	3		rck	snd	10	lbk		5 red urchins
									5	24	43	26	45	4		rck	snd				red urchin
									2	43	50	45	52	2		rck	snd				1 small (3") cuc
									3	50	55	52	57	3		snd	rck				data from looking to 5 ft below
								Total	20					12							
07-Jun-93	2b	1012	1020	8	-1.5	DI	DW	2	4	60	50	62	52	1		rck	snd				
									5	50	36	52	38	4		rck	snd				
									5	36	20	38	22	2		rck	snd	10	lbk		
									5	20	6	22	7.5	2		rck		70	lbk		aprox. 4 sm. cucs (3" long) seei
									3	6	0	7.5	1.5	1		rck		90	lbk		between transects
								Total	22					10							
07-Jun-93	3a	838	848	10	-1.5	DW	SW	2	2	0	3	1.5	4.5	0		rck			fuc		
									5	3	8	4.5	9.5	0		rck			lbk		
									5	8	14	9.5	16	23		snd		50	lbk		
									5	14	17	16	19	17		snd			lbk		
									5	17	22	19	24	2		rck			lbk		
									5	22	27	24	29	3		rck		60	lbk		
									5	27	34	29	36	8		rck	snd	40	lbk		
									5	34	36	36	38	5		snd			lbk		
									5	36	41	38	43	2		snd			lbk		
									5	41	45	43	47	1		snd					
									3	45	47	47	49	0		snd					
								Total	50					61							
07-Jun-93	3b	848	858	10	-2.0	DW	SW	2	5	50	44	52	46	3		rck					
									3	44	38	46	40	3		rck					
									5	38	32	40	34	1		rck			lbk		1 red urhcin
									5	32	23	34	25	1		rck			lbk		
									5	23	18	25	20	0		rck					3 red urchins, green urchin
									5	18	14	20	16	1		rck					
									5	14	8	16	10	1		rck					
									5	8	4	10	6	0		rck					
									4	4	0	6	2	0		rck					
								Total	42					10							
08-Jun-93	4a	1225	1237	12	4.0	DW	RL	2	3	0	6	-4	2	0		rck	snd	90	fuc	fil	
									3	6	7	2	3	0		snd	bld	100	elg	lbk	
									10	7	10	3	6	0		snd		0			
									15	10	13	6	9	0		snd		0			
									15	13	17	9	13	0		snd		0			
									15	17	20	13	16	0		snd		0			
									15	20	25	16	21	0		snd		0			
									15	25	33	21	29	0		snd		0			

									10	33	41	29	37	0	snd		0			1 geoduck
									4	41	50	37	46	0	snd		0			no urchins, no abalone
								Total	105					0						
08-Jun-93	4b	1237	1250	13	4.5	DW	RL	2	5	55	48	51	44	0	snd		0			
									5	48	38	44	34	0	snd		0			1 geoduck
									5	38	33	34	29	0	snd		0			
									10	33	26	29	22	0	snd		0			
									15	26	23	22	19	0	snd		10	lbk		
									15	23	19	19	15	0	snd	gvl	10	lbk		
									15	19	18	15	14	0	snd	gvl	10	lbk		
									15	18	14	14	9.5	0	rck	snd	70	lbk		
									15	14	12	9.5	7.5	0	rck		70	lbk		
									15	12	7	7.5	2.5	0	rck	snd	60	lbk		
									11	7	7	2.5	2.5	0	snd	rck	100	elg	lbk	
									15	7	5	2.5	0.5	0	snd		20	ulv		
									8	5	3	0.5	-2	0	snd	cbl	10	fuc		
									15	3	0	-2	-5	0	bld	snd	40	fuc		no urchins, no abalone
								Total	164					0						
08-Jun-93	5a	1320	1338	18	7.0	DW	RL	2	3	0	10	-7	3	0	rck		90	lbk		
									10	10	18	3	11	0	bld		100	lbk		
									5	18	13	11	6	0	rck		100	lbk		
									5	13	16	6	9	0	rck		100	lbk		
									5	16	22	9	15	0	rck		100	lbk		
									10	22	18	15	11	0	rck		100	lbk		
									10	18	25	11	18	0	rck		70	lbk		4 red urchins
									10	25	32	18	25	2	rck		20	lbk		6 red urchins
									10	32	37	25	30	0	rck		0			4 red urchins
									10	37	42	30	35	0	rck		0			14 red urchins
									11	42	44	35	37	0	rck		0			4 red urchins
									8	44	50	37	43	1	rck		0			2 red urchins, no abs
								Total	97					3						
08-Jun-93	5b	1338	1356	18	8.0	DW	RL	2	5	50	44	42	36	3	rck		0			
									10	44	44	36	36	7	rck		60	red		
									10	44	32	36	24	2	rck		40	lbk		
									10	32	31	24	23	0	rck		50	lbk		
									10	31	33	23	25	5	rck		20	lbk		8 red urchins
									20	33	24	25	16	2	rck		60	lbk		20 red urchins
									10	24	34	16	26	3	rck		20	lbk		6 red urchins
									7	34	46	26	38	2	rck		10	lbk		8 red urchins
									10	46	33	38	25	1	rck		10	lbk		6 red urchins
									5	33	22	25	14	3	rck		0	lbk		10 red urchins
									5	22	10	14	2	0	rck		80	lbk		
									5	10	0	2	-8	0	rck		80	fuc		no abs
								Total	107					28						
07-Jun-93	47a	839	847	8	-1.5	DI	RL	2	4	0	6	1.5	7.5	4	rck		50	lbk		10 red urchins
									4	6	17	7.5	19	0	rck		20	lbk		13 red urchins
									4	17	23	19	25	1	rck		0			5 red urchins
									4	23	33	25	35	3	rck		0			7 red urchins, + one 6" cuc
									8	33	45	35	47	3	rck		0			8 red urchins, +three 6"cucs
									3	45	52	47	54	2	rck		0			soft corals, tube worms, no abs
								Total	27					13						
07-Jun-93	47b	847	856	9	-2.0	DI	RL	2	3	58	52	60	54	0	rck		0			
									5	52	44	54	46	7	rck		0			two 4" cucs
									4	44	32	46	34	4	rck		0			1 red urchin
									5	32	22	34	24	6	rck		0			7 red urchins and two 6"cucs
									5	22	9	24	11	5	rck		30	lbk		7 red urchins
									5	9	0	11	2	0	rck		90	lbk		13 red urchins, no abs
								Total	27					22						
07-Jun-93	48a	928	934	6	-2.0	DI	RL	2	5	0	7	2	9	3	bld		90	lbk		
									5	7	14	9	16	8	bld	snd	70	lbk		
									5	14	18	16	20	8	snd		10	lbk		
									5	18	22	20	24	3	snd		70	lbk		
									5	22	27	24	29	9	snd		0			
									5	27	35	29	37	2	snd		0			
									5	35	43	37	45	5	snd	shl	0			
									6	43	50	45	52	4	snd	shl	0			no urchins, no abalone
								Total	41					42						
07-Jun-93	48b	934	939	5	-2.0	DI	RL	2	5	50	45	52	47	0	snd		0			
									5	45	38	47	40	0	snd		0			
									5	38	29	40	31	0	snd		0			
									5	29	22	31	24	2	snd		0			
									5	22	15	24	17	0	snd		10	lbk		
									5	15	9	17	11	0	snd		10	lbk		
									6	9	0	11	2	1	bld		50	lbk		no urchins, no abalone

								Total	36					3					
07-Jun-93	49a	1046	1054	8	0.0	DW	RL	2	1	0	3	0	3	0	rck		100	lbk		
									4	3	10	3	10	4	rck		80	lbk		
									5	10	20	10	20	2	rck		80	lbk		
									5	20	33	20	33	5	rck		20	lbk		three 6"cucs
									6	33	50	33	50	3	rck	snd	0			no urchins, no abalone
								Total	21					14						
07-Jun-93	49b	1054	1102	8	0.5	DW	RL	2	5	54	46	54	46	0	shl	snd	0			
									5	46	33	46	33	2	snd	shl	5	lbk		
									5	33	27	33	27	1	rck	snd	20	lbk		
									5	27	19	27	19	2	rck	snd	40	lbk		
									4	19	9	19	8.5	0	rck	snd	80	lbk		three small cucs
									4	9	6	8.5	5.5	1	rck		80	lbk		
									2	6	0	5.5	-1	0	rck		60	lbk	fil	no urchins, no abalone
								Total	30					6						
08-Jun-93	50a	1236	1247	11	4.5	SW	DI	2	2	0	6	-5	1.5	0	rck		0			
									5	6	18	1.5	14	1	rck		70	lbk		
									5	18	25	14	21	2	rck		70	lbk		
									5	25	30	21	26	7	snd		10	lbk		
									5	30	35	26	31	16	snd		0			
									5	35	38	31	34	14	snd		0			
									5	38	44	34	40	8	shl	snd	0			
									4	44	50	40	46	7	shl	snd	0			
									5	50	55	46	51	2	shl	snd	0			no urchins, no abalone
								Total	41					57						
08-Jun-93	50b	1247	1258	11	5.0	SW	DI	2	4	51	40	46	35	1	rck		0			
									5	40	34	35	29	9	rck	snd	10	lbk		
									5	34	30	29	25	5	snd		10	lbk		
									4	30	27	25	22	3	snd	shl	20	lbk		
									4	27	16	22	11	4	rck		80	lbk		
									4	16	7	11	2	3	rck		80	lbk		
									3	7	0	2	-5	0	rck		0			no urchins, no abalone
								Total	29					25						
08-Jun-93	51a	1328	1342	14	7.5	SW	DI	2	5	0	8	-8	0.5	0	rck		100	fir		
									5	8	20	0.5	13	0	rck		100	lbk		
									5	20	28	13	21	0	rck		70	lbk		
									5	28	35	21	28	2	bld		0			3 red urchins
									5	35	49	28	42	2	bld		0			3 red urchins
									4	49	55	42	48	0	bld		0			no abalone
								Total	29					4						
08-Jun-93	51b	1342	1355	13	8.5	SW	DI	2	3	55	47	47	39	0	bld		0			
									4	47	38	39	30	5	bld		0			
									5	38	34	30	26	6	bld		10	lbk		10 red urchins
									5	34	28	26	20	1	bld		30	lbk		
									5	28	23	20	15	0	bld		60	lbk		
									5	23	16	15	7.5	0	rck		100	lbk		
									2	16	13	7.5	4.5	0	rck		100	lbk		
									6	13	0	4.5	-9	0	rck		90	fir		no abalone
								Total	35					12						MLLW tide correction



Map of transect locations in subdistrict 101-85.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 101-85 West Behm Canal
Cruise Dates: June 2 & 3, 1993

Divers: Don Ingledue (DI), Robert Larson (RL), Randy Timothy (RT), Doug Woodby (DW), Scott Walker(SW)

Tide Datum: Ketchikan/MHW Avg. -15'

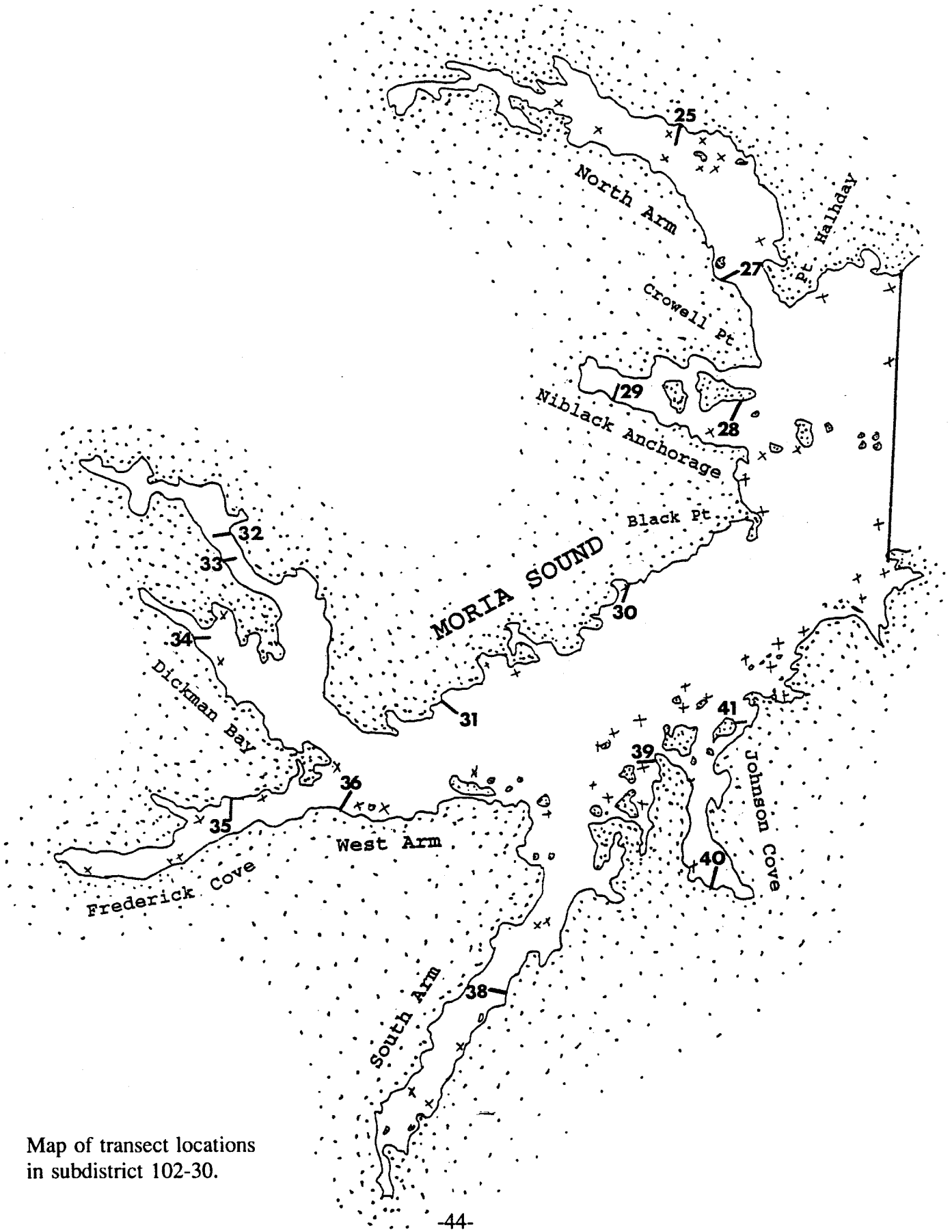
Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
03-Jun-93	14a	1120	1134	14	12.5	RL	RT	2	15	3	11	-9.5	-1.5	0		rck		100	fil	fuc	off end of rock
									5	11	15	-1.5	2.5	0		rck		50	lbk		
									10	15	19	2.5	6.5	0		rck		90	lbk		
									10	19	26	6.5	13.5	0		rck		90	lbk		
									10	26	32	13.5	19.5	0		rck		90	lbk		
									5	32	34	19.5	21.5	1		snd		10	lbk		no geoducks
									15	34	39	21.5	26.5	0		snd		10	lbk		geoducks
									5	39	45	26.5	32.5	0		snd		10	lbk		no geoducks
									5	45	54	32.5	41.5	0		snd		10	lbk		
								Total	80					1							
03-Jun-93	14b	1134	1147	13	13.0	RL	RT	2	5	55	48	42	35	0		snd					
									5	48	42	35	29	0		snd					
									5	42	39	29	26	0		snd					
									5	39	36	26	23	0		snd					geoducks start
									10	36	33	23	20	0		snd					geoducks 2/m2
									10	33	32	20	19	0		snd					upper geoducks
									11	32	31	19	18	0		snd					
									13	31	28	18	15	0		snd					
									10	28	25	15	12	1		rck		90	lbk		
									10	25	21	12	8	0		rck		70	elg		
									15	21	17	8	4	0		snd		70	elg		
									10	17	16	4	3	0		snd			elg		
									15	16	9	3	-4	0		snd			elg		
								Total	124					1							
03-Jun-93	15a	1004	1013	9	7.5	RL	RT	2	5	0	13	-7.5	5.5	0		rck		90	fuc	fil	
									4	13	22	5.5	14.5	0		rck		80	lbk		
									5	22	30	14.5	22.5	8		snd	shl	10	lbk		
									5	30	36	22.5	28.5	2		snd					
									5	36	42	28.5	34.5	7		snd					
									5	42	50	34.5	42.5	2		snd	wdy				
									5	50	58	42.5	50.5	1		snd					
								Total	34					20							
03-Jun-93	15b	1013	1021	8	8.0	RL	RT	2	4	55	50	47	42	1		rck					
									5	50	42	42	34	2		gvl	wdy				
									5	42	34	34	26	4		gvl					
									5	34	27	26	19	5		gvl					
									5	27	22	19	14	4		gvl		10	lbk		
									5	22	16	14	8	8		gvl		50	elg	lbk	
									5	16	12	8	4	0		gvl		60	lbk		
									10	12	6	4	-2	0		gvl					
									10	6	2	-2	-6	0		gvl					
								Total	54					24							
03-Jun-93	16a	941	951	10	6.0	SW	DI	2	10	0	4	-6	-2	0		bld					
									5	4	7	-2	1	0		bld					
									10	7	10	1	4	0		bld		90	ulv	fir	
									5	10	11	4	5	0		bld		100	lbk	fir	
									5	11	17	5	11	0		bld		100	lbk	fir	
									5	17	20	11	14	4		snd		30	elg		
									5	20	29	14	23	1		snd					
									5	29	41	23	35	10		snd					
									5	41	49	35	43	3		snd					
									5	49	54	43	48	12		mud					
									5	54	60	48	54	12		mud					
								Total	65					42							
03-Jun-93	16b	951	1000	9	6.5	SW	DI	2	5	55	50	48.5	43.5	9		wdy	mud				

									5	50	45	43.5	38.5	4	gvl	wdy	10	agm		1 urchin
									5	45	39	38.5	32.5	8	gvl	wdy	10	agm		1 urchins
									5	39	32	32.5	25.5	8	gvl	wdy				
									5	32	26	25.5	19.5	12	gvl	wdy	30	agm		
									5	26	19	19.5	12.5	7	gvl		60	agm		
									5	19	15	12.5	8.5	2	gvl		100	lbk		1 urchin
									5	15	11	8.5	4.5	0	bld	gvl	100	lbk		
									5	11	2	4.5	-4.5	0	bld	rck	100	ulv	fir	
									2	2	0	-4.5	-6.5	0	rck					
								Total	47					50						
03-Jun-93	17a	854	910	16	3.0	RL	RT	2	5	0	5	-3	2	0	rck		50	fuc		
									5	5	7	2	4	0	gvl		90	fil		
									12	7	12	4	9	0	snd		80	elg		
									10	12	14	9	11	0	snd					
									9	14	17	11	14	6	snd					
									10	17	16	14	13	6	rck		90	lbk		
									5	16	24	13	21	6	snd					
									5	24	27	21	24	2	snd					
									5	27	34	24	31	1	rck					
									5	34	42	31	39	2	rck		10	lbk		
									5	42	49	39	46	2	snd					
									4	49	58	46	55	0	snd	rck				
								Total	80					25						
03-Jun-93	17b	910	925	15	4.0	RL	RT	2	5	50	44	46	40	0	snd					
									5	44	37	40	33	3	snd	slt				
									5	37	32	33	28	1	snd	shl				
									5	32	30	28	26	2	snd					
									5	30	28	26	24	6	snd					
									5	28	26	24	22	4	snd					
									5	26	24	22	20	2	snd	wdy				
									5	24	23	20	19	2	snd	slt				
									5	23	21	19	17	2	snd	slt				
									5	21	18	17	14	1	snd					
									5	18	15	14	11	0	snd					
									10	15	10	11	6	0	snd		100	elg		
									10	10	2	6	-2	0	rck		100	fil	fuc	
								Total	75					23						
03-Jun-93	18a	833	842	9	1.5	DI	SW	2	5	0	4	-1.5	2.5	0	grv					
									5	4	5	2.5	3.5	0	mud		100	elg		2 weathervane scallops - 40'
									5	5	9	3.5	7.5	0	mud		100	elg		
									5	9	16	7.5	14.5	0	mud					
									15	16	33	14.5	31.5	0	mud		10	lbk		Dungeness crabs
									10	33	50	31.5	48.5	3	mud					
								Total	45					3						
03-Jun-93	18b	842	851	9	2.0	DI	SW	2	20	51	22	49	20	0	mud					
									5	22	1	20	-1	0	mud					
									20	1	4	-1	2	0	mud			elg		
									5	4	3	2	1	0	snd					
									10	3	0	1	-2	0	snd					
								Total	60					0						
02-Jun-93	19a	1557	1609	12	5.0	RL	RT	2	5	0	7	-5	2	0	rck		100	fir	fuc	
									5	7	12	2	7	0	rck		100	fir	red	
									5	12	21	7	16	0	rck		100	lbk		
									5	21	28	16	23	1	rck		70	red	lbk	
									5	28	30	23	25	1	cbl		30	red	lbk	
									5	30	31	25	26	0	snd		0			
									5	31	32	26	27	0	snd		0			
									5	32	33	27	28	0	snd		0			
									5	33	34	28	29	0	snd		0			
									5	34	33	29	28	9	rck		0			
									5	33	34	28	29	5	rck		0			
									5	34	38	29	33	6	rck		0			
									5	38	40	33	35	5	rck		0			
									5	40	45	35	40	4	rck		0			scattered red urchins
									5	45	50	40	45	0	snd		0			clean sand below, 0 cucs
								Total	75					31						
02-Jun-93	19a	1609	1621	12	4.0	RL	RT	2	20	55	50	51	46	0	snd					
									20	50	45	46	41	0	snd					scattered geoducks
									5	45	40	41	36	1	rck					no geoducks
									5	40	36	36	32	4	rck					
									5	36	31	32	27	1	rck	snd				
									5	31	31	27	27	1	rck	snd				
									5	31	29	27	25	2	rck	snd				
									5	29	27	25	23	0	rck		80	red	lbk	

									5	27	21	23	17	2	rck		30	lbk	red	
									5	21	12	17	8	0	rck		80	lbk		
									5	12	7	8	3	0	rck		100	fuc		
									5	7	2	3	-2	0	rck		100	fuc		
								Total	90					11						
02-Jun-93	20a	1545	1556	11	5.5	DI	DW	2	5	0	3	-5.5	-2.5	0	rck		40	fuc	ulv	
									5	3	7	-2.5	1.5	0	rck		40	fuc	ulv	
									5	7	12	1.5	6.5	0	rck	snd	30	lbk	elg	
									4	12	17	6.5	11.5	0	rck	snd	20	elg	lbk	
									5	17	18	11.5	12.5	0	snd					
									6	18	24	12.5	18.5	0	snd					
									5	24	29	18.5	23.5	0	snd					
									5	29	34	23.5	28.5	0	snd					
									5	34	39	28.5	33.5	0	snd					
									5	39	45	33.5	39.5	0	snd					
									5	45	50	39.5	44.5	0	snd					sand below, cucs numerous
								Total	55					0						
02-Jun-93	20b	1556	1606	10	5.0	DI	DW	2	5	50	41	45	36	0	snd					
									5	41	37	36	32	0	snd					
									5	37	32	32	27	0	snd					
									5	32	28	27	23	0	snd					
									5	28	25	23	20	0	snd					
									5	25	23	20	18	0	snd					
									5	23	21	18	16	0	snd					
									5	21	19	16	14	0	snd					
									5	19	17	14	12	0	snd					
									3	17	15	12	10	0	snd					
									5	15	11	10	6	0	rck		90	lbk		
									5	11	8	6	3	0	rck		70	elg	lbk	
									5	8	3	3	-2	0	rck		80	lbk	fuc	
									5	3	2	-2	-3	0	rck		80	fuc	ulv	
									5	2	0	-3	-5	0	rck		80	fuc	ulv	
								Total	73					0						
02-Jun-93	21a	1443	1502	9	8.5	RL	RT	2	5	0	8	-8.5	-0.5	0	rck		70	lbk		
									5	8	14	-0.5	5.5	2	rck		80	lbk		
									5	14	19	5.5	10.5	7	cbl		60	lbk		cuc sample taken
									5	19	23	10.5	14.5	8	snd					
									5	23	30	14.5	21.5	0	snd					
									5	30	38	21.5	29.5	1	snd					
									5	38	46	29.5	37.5	3	snd					horse clam
									5	46	53	37.5	44.5	0	snd					
								Total	40					21						
02-Jun-93	21b	1502	1510	8	7.5	RL	RT	2	5	57	50	49.5	42.5	1	gvl					
									5	50	44	42.5	36.5	0	gvl					
									5	44	34	36.5	26.5	3	gvl		10	lbk		
									5	34	25	26.5	17.5	3	cbl		40	lbk		
									5	25	19	17.5	11.5	3	cbl		70	lbk		
									5	19	15	11.5	7.5	5	cbl		90	lbk		
									5	15	10	7.5	2.5	7	cbl		70	lbk	red	
									5	10	1	2.5	-6.5	0	rck		90	fil	fuc	
								Total	40					22						
02-Jun-93	22a	1121	1155	34	13.5	DI	DW	2	5	0	4	-14	-9.5	0	rck		90	fuc		
									5	4	9	-9.5	-4.5	0	cbl	shl	10	fuc		
									5	9	8	-4.5	-5.5	0	rck		10	fuc		
									5	8	14	-5.5	0.5	0	rck	snd	20	fil		
									5	14	17	0.5	3.5	0	snd	gvl	10	elg		
									5	17	15	3.5	1.5	0	snd	gvl				
									5	15	15	1.5	1.5	0	snd	gvl				
									5	15	15	1.5	1.5	0	snd					
									5	15	14	1.5	0.5	0	snd					
									5	14	15	0.5	1.5	0	snd					
									5	15	14	1.5	0.5	0	snd	wdy				
									5	14	14	0.5	0.5	0	snd		90	elg		
									5	14	15	0.5	1.5	0	snd		90	elg		
									5	15	15	1.5	1.5	0	snd		90	elg		
									5	15	15	1.5	1.5	0	snd	wdy	70	elg		
									5	15	15	1.5	1.5	0	snd	wdy	80	elg		
									5	15	15	1.5	1.5	0	snd	wdy	10	elg		
									5	15	15	1.5	1.5	0	snd					
									5	15	14	1.5	0.5	0	snd					
									5	14	14	0.5	0.5	0	snd					
									25	14	15	0.5	1.5	0	snd					
									5	15	16	~~1.5~~	2.5	0	snd	gvl				
									30	16	15	2.5	1.5	0	snd	gvl				

									5	15	17	1.5	3.5	0	snd	gvl				
									5	17	18	3.5	4.5	0	snd	gvl				
									5	18	17	4.5	3.5	0	snd	gvl				
									5	17	15	3.5	1.5	0	snd	gvl				
									5	15	14	1.5	0.5	0	snd		10	elg		
									5	14	15	0.5	1.5	0	snd		10	elg		
									20	15	15	1.5	1.5	0	snd		10	elg		
								Total	210					0						
02-Jun-93	22b	1208	1234	26	14.0	DI	DW	2	20	14	14	0	0	0	snd	shl	10	elg		(center of bay)
									20	14	13	0	-1	0	snd					
									20	13	14	-1	0	0	snd					
									20	14	13	0	-1	0	snd	gvl				1 1/2" mussels
									20	13	14	-1	0	0	snd	cbl				
									20	14	18	0	4	0	snd	gvl				
									20	18	17	4	3	0	gvl	snd				
									20	17	17	3	3	0	snd	gvl				
									20	17	17	3	3	0	snd					
									20	17	12	3	-2	0	snd	cbl	10	fuc		
									20	12	9	-2	-5	0	snd	cbl	30	elg		
									20	9	8	-5	-6	0	snd		90	elg	fuc	
									15	8	5	-6	-9	0	snd	gvl				
									5	5	0	-9	-14	0	snd	gvl				
								Total	260					0						
02-Jun-93	23a	1223	1228	5	14.0	RL	RT	2	5	0	12	-14	-2	0	rck		50	fuc		
									5	12	20	-2	6	1	rck		20	ala		
									5	20	19	6	5	0	rck		20	lbk		
									5	19	29	5	15	0	rck		60	lbk		
									5	29	35	15	21	0	rck		20	lbk		
									5	35	40	21	26	2	rck		20	lbk		
									5	40	55	26	41	1	rck		10	lbk		
								Total	35					4						
02-Jun-93	23b	1232	1245	13	14.0	RL	RT	2	5	58	47	44	33	3	rck					
									5	47	35	33	21	5	rck		20	agm		
									5	35	25	21	11	3	rck		40	lbk		
									5	25	12	11	-2	1	rck		60	lbk	red	
									5	12	0	-2	-14	0	rck		20	mus	fuc	
								Total	25					12						
02-Jun-93	24a	1437	1447	10	9.0	DI	DW	2	5	0	8	-9	-1	0	rck		10	fuc		
									5	8	21	-1	12	2	rck		20	lbk		
									2	21	26	12	17	1	rck	snd	20	lbk		
									3	26	30	17	21	3	rck	snd	10	lbk		
									3	30	38	21	29	2	rck	snd	20	lbk		
									3	38	50	29	41	3	rck		40	lbk		
								Total	21					11						
02-Jun-93	24b	1447	1457	10	8.5	DI	DW	2	5	50	40	41.5	31.5	1	rck		40	lbk		
									5	40	23	31.5	14.5	0	rck		60	agm		
									5	23	11	14.5	2.5	2	rck		80	agm		
									5	11	0	2.5	-8.5	0	rck		10	fuc		
								Total	20					3						

1993 CUCUMBERS
#102-30



Map of transect locations in subdistrict 102-30.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 102-30 Moira Sound
Cruise Dates: June 5 & 6, 1993

Divers: Don Ingledue (DI), Robert Larson (RL), Randy Timothy (RT), Doug Woodby (DW), Scott Walker (SW)

Tide Datum: Niblack Anchorage, Moira Sound/MHW Avg. -14'

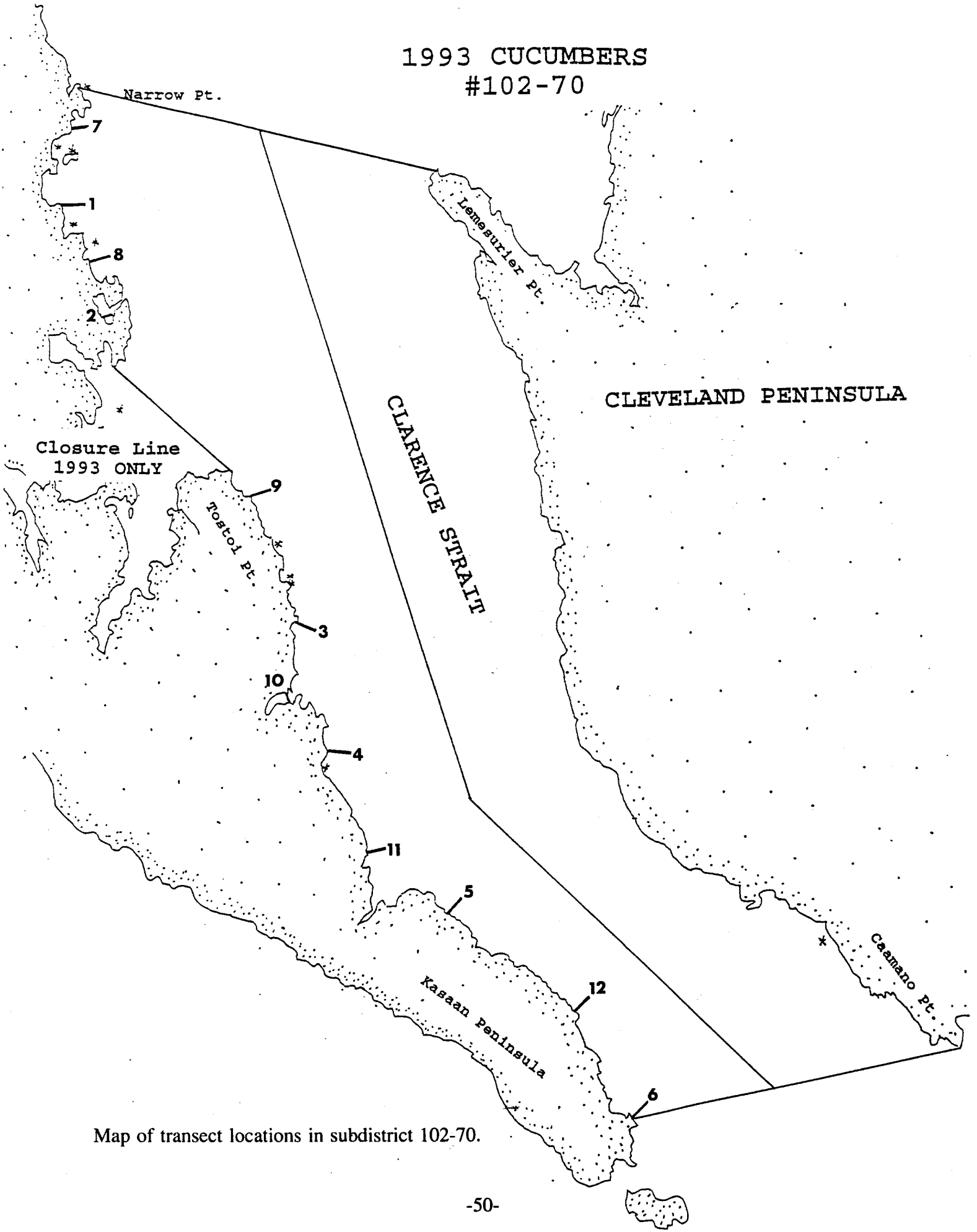
Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
06-Jun-93	25a	959	1011	12	-1.0	RT	SW	2	5	0	3	1	4	0		rck		50	fuc		
									5	3	10	4	11	1		snd		40	lbk		
									5	10	15	11	16	4		snd		60	lbk		
									5	15	14	16	15	1		rck		80	lbk		
									5	14	22	15	23	2		rck		80	lbk		
									5	22	28	23	29	3		rck		60	lbk		
									5	28	37	29	38	1		rck		10	lbk		
									5	37	44	38	45	1		rck		10	lbk		
									5	44	50	45	51	0		rck		10	lbk		no urchins or abalone
								Total	45					13							
06-Jun-93	25b	1011	1022	11	-0.5	RT	SW	2	5	50	47	50.5	47.5	1		cbl		20	lbk		
									5	47	35	47.5	35.5	1		cbl		20	lbk		
									5	35	29	35.5	29.5	3		snd		20	lbk		
									5	29	25	29.5	25.5	3		snd		50	lbk		
									5	25	17	25.5	17.5	8		rck		60	lbk		
									5	17	8	17.5	8.5	2		rck		80	lbk		
									6	8	0	8.5	0.5	5		rck		50	fuc		no abs, no urchins
								Total	36					23							
06-Jun-93	27a	1046	1101	15	1.0	SW	RT	2	2	0	5	-1	4	0		rck		50	fil	fuc	
									5	5	9	4	8	1		rck		50	lbk		
									5	9	15	8	14	6		snd		50	lbk		
									5	15	17	14	16	3		cbl		50	lbk		
									5	17	22	16	21	7		snd		50	lbk		
									5	22	24	21	23	10		snd		50	lbk		
									5	24	27	23	26	3		snd		30	lbk		
									5	27	28	26	27	6		snd		30	lbk		
									5	28	26	27	25	4		rck		50	lbk		
									5	26	30	25	29	7		rck		50	lbk		
									5	30	34	29	33	4		snd		30	lbk		
									5	34	38	33	37	4		snd		20	lbk		
									5	38	41	37	40	0		cbl		20	lbk		
									5	41	44	40	43	10		snd		20	lbk		
									5	44	47	43	46	6		snd		20	lbk		
									5	47	49	46	48	7		snd		20	lbk		no abs, no urchins
								Total	77					78							
06-Jun-93	27b	1101	1116	15	2.0	SW	RT	2	5	50	47	48	45	6		rck		30	lbk		
									5	47	37	45	35	6		rck		30	lbk		
									5	37	36	35	34	7		rck		30	lbk		
									5	36	38	34	36	5		rck		50	lbk		
									5	38	43	36	41	2		rck		50	lbk		
									11	43	44	41	42	2		rck		50	lbk		
									10	44	33	42	31	1		rck		50	lbk		
									5	33	25	31	23	1		rck		50	lbk		
									5	25	28	23	26	2		rck		50	lbk		
									5	28	30	26	28	7		snd		40	lbk		
									5	30	29	28	27	2		snd		50	lbk		
									5	29	27	27	25	8		snd		30	lbk		
									5	27	24	25	22	4		snd		30	lbk		
									5	24	21	22	19	5		snd		30	lbk		
									5	21	15	19	13	2		rck		50	lbk		
									5	15	14	13	12	2		snd		50	lbk		
									7	14	0	12	-2	0		rck		60	fuc		no abs, no urc
								Total	98					62							
06-Jun-93	28a	1050	1057	7	1.0	RL	DW	2	3	0	3	-1	2	0		rck		90	fir		
									5	3	9	2	8	0		rck		60	lbk		

									5	9	17	8	16	1	rck		100	lbk		
									5	17	26	16	25	2	rck		60	lbk		
									5	26	37	25	36	0	bld	snd	40	lbk		
									8	37	51	36	50	1	bld	snd	10	lbk		1 red urchin, no abalone
								Total	31					4						
06-Jun-93	28b	1057	1103	6	1.5	RL	DW	2	5	55	49	53.5	47.5	0	bld	snd	0			
									5	49	40	47.5	38.5	2	bld	snd	10	lbk		
									5	40	33	38.5	31.5	4	bld	snd	20	lbk		
									5	33	24	31.5	22.5	4	rck	snd	60	lbk		
									5	24	15	22.5	13.5	2	rck	snd	70	lbk		
									5	15	5	13.5	3.5	0	rck		100	lbk		
									2	5	0	3.5	-1.5	0	rck		100	flr		no abs, no urchins
								Total	32					12						
06-Jun-93	29a	959	1005	6	-1.5	RL	DW	2	6	0	3	1.5	4.5	0	snd	cbl	60	fil		
									5	3	9	4.5	10.5	7	snd	gvl	20	lbk		
									5	9	17	10.5	18.5	6	snd	gvl	20	lbk		loose fucus on bottom
									5	17	25	18.5	26.5	3	snd	shl	10	lbk		
									5	25	33	26.5	34.5	4	snd	shl	10	lbk		
									5	33	42	34.5	43.5	0	snd	gvl	10	lbk		
									5	42	52	43.5	53.5	0	snd	gvl	0			no abs, no urchins
								Total	36					20						
06-Jun-93	29b	1005	1011	6	-1.0	RL	DW	2	5	50	44	51	45	1	snd	cbl	0			
									5	44	37	45	38	0	snd	cbl	0			
									5	37	29	38	30	2	snd	cbl	10	lbk		
									5	29	20	30	21	3	snd	cbl	20	lbk		
									5	20	12	21	13	6	snd	shl	40	lbk		
									5	12	5	13	6	2	snd		30	lbk		some woody debris
									5	5	0	6	1	0	snd		60	fil	fuc	no abs, no urchins
								Total	35					14						
05-Jun-93	30a	1714	1726	12	8.5	DW	SW	2	3	0	4	-8.5	-4.5	0	rck			fuc		
									5	4	7	-4.5	-1.5	0	rck			fil		
									5	7	10	-1.5	1.5	0	rck			fil		
									5	10	11	1.5	2.5	0	rck			lbk		
									5	11	12	2.5	3.5	0	rck			lbk	fil	
									5	12	16	3.5	7.5	0	rck			lbk		
									4	16	26	7.5	17.5	1	rck			lbk		
									5	26	28	17.5	19.5	1	rck			lbk		
									5	28	31	19.5	22.5	1	snd		50	lbk		
									5	31	41	22.5	32.5	5	snd			lbk		
									5	41	45	32.5	36.5	1	mud					
									5	45	47	36.5	38.5	0	mud					
									5	47	49	38.5	40.5	1	mud					
									5	49	50	40.5	41.5	0	mud					
								Total	67					10						
05-Jun-93	30b	1726	1738	12	7.5	DW	SW	2	5	50	44	42.5	36.5	4	mud					
									15	44	40	36.5	32.5	4	mud					
									15	40	35	32.5	27.5	3	mud					
									10	35	29	27.5	21.5	2	mud			lbk		
									4	29	23	21.5	15.5	4	rck			lbk		
									5	23	17	15.5	9.5	2	rck			lbk		
									3	17	12	9.5	4.5	0	rck			lbk		
									6	12	3	4.5	-4.5	0	rck			fuc		
									4	3	0	-4.5	-7.5	0	rck			fuc		
								Total	67					19						
05-Jun-93	31a	1155	1223	28	9.0	RT	RL	2	10	0	5	-9	-4	0	rck		90	fuc		
									5	5	8	-4	-1	0	rck		90	fuc		
									10	8	15	-1	6	2	rck		90	lbk		
									5	15	22	6	13	2	rck		90	lbk		
									7	22	25	13	16	4	rck		90	lbk		
									7	25	43	16	34	1	rck		50	lbk		
									5	43	50	34	41	0	rck		20	lbk		
								Total	49					9						
05-Jun-93	31b	1223	1251	28	10.5	RT	RL	2	5	55	50	44.5	39.5	4	rck		20	lbk		
									5	50	44	39.5	33.5	1	rck		50	lbk		
									5	44	31	33.5	20.5	5	rck		50	lbk		
									5	31	23	20.5	12.5	7	rck		50	lbk		
									5	23	14	12.5	3.5	5	rck		90	lbk		
									7	14	5	3.5	-5.5	0	rck		90	fuc		
								Total	32					22						
05-Jun-93	32a	1537	1543	6	13.0	SW	DI	2	4	0	8	-13	-5	0	rck		50	fuc		
									5	8	13	-5	0	0	rck		80	fil		
									5	13	23	0	10	1	rck		80	lbk		
									5	23	33	10	20	1	rck		80	lbk		
									5	33	46	20	33	2	mud		50	lbk		

									3	46	50	33	37	1	mud	rck	50	lbk		no abs, no urchins
								Total	27					5						
05-Jun-93	32b	1543	1548	5	13.0	SW	DI	2	5	55	50	42	37	1	rck		0			
									5	50	43	37	30	2	rck		50	lbk		
									5	43	41	30	28	6	mud	rck	50	lbk		
									5	41	34	28	21	7	mud	rck	50	lbk		
									5	34	21	21	8	4	rck		70	lbk		
									5	21	13	8	0	0	rck		90	fil	fuc	
									6	13	0	0	-13	0	rck		60	fuc		no abs, no urchins
								Total	36					20						
05-Jun-93	33a	1606	1619	13	12.0	DI	DW	2	5	0	8	-12	-4	0	rck		90	fuc		
									5	8	17	-4	5	3	rck		80	lbk		
									5	17	23	5	11	7	rck		70	lbk		
									5	23	27	11	15	12	rck		90	lbk		
									5	27	35	15	23	11	rck	snd	80	lbk		
									5	35	42	23	30	2	rck	snd	80	lbk		
									6	42	50	30	38	0	rck	snd	0			no abs, no urchins
								Total	36					35						
05-Jun-93	33b	1619	1631	12	11.0	DI	DW	2	5	55	47	44	36	5	rck		0			
									5	47	36	36	25	3	rck		70	lbk		
									5	36	27	25	16	5	rck		80	lbk		
									5	27	22	16	11	6	rck		80	lbk		
									5	22	21	11	10	11	rck		100	lbk		
									10	21	12	10	1	13	rck		90	lbk		
									5	12	0	1	-11	0	rck		80	fuc	fir	no abs, no urchins
								Total	40					43	rck					
05-Jun-93	34a	1645	1659	14	10.0	RL	RT	2	15	0	12	-10	2	0	rck		90	fuc	fil	
									13	12	12	2	2	0	rck		100	fil		
									5	12	26	2	16	6	rck		90	lbk		
									5	26	36	16	26	2	rck		40	lbk		
									5	36	40	26	30	3	cbl		10	lbk		+ 1 - 4" cuc
									5	40	50	30	40	3	rck					
								Total	48					14						
05-Jun-93	34b	1659	1712	13	9.0	RL	RT	2	3	53	49	44	40	0	rck					
									5	49	47	40	38	3	cbl					
									5	47	43	38	34	1	cbl					
									5	43	37	34	28	2	gvl		10	lbk		
									5	37	31	28	22	3	gvl		10	lbk		
									5	31	25	22	16	1	gvl	shl	20	lbk		
									5	25	17	16	8	7	gvl	shl	30	lbk		spawning cucs
									2	17	14	8	5	1	rck		70	lbk		
									11	14	0	5	-9	0	rck		80	fuc	fil	
								Total	46					18						
05-Jun-93	35a	1604	1611	7	12.0	RT	RL	2	8	0	9	-12	-3	0	rck		60	fuc		
									5	9	15	-3	3	7	rck		40	lbk		
									5	15	30	3	18	3	rck	shl	40	lbk		
									5	30	45	18	33	4	rck		20	lbk		
									4	45	53	33	41	0	rck					
								Total	27					14						
05-Jun-93	35b	1611	1618	7	11.5	RT	RL	2	5	53	47	41.5	35.5	1	cbl					
									5	47	36	35.5	24.5	4	rck		10	lbk		
									5	36	24	24.5	12.5	0	rck		60	lbk		
									5	24	14	12.5	2.5	8	rck					
									5	14	8	2.5	-3.5	1	rck		60	fuc		
									8	8	0	-3.5	-12	0	rck		80	fuc		
								Total	33					14						
05-Jun-93	36a	1106	1126	20	5.5	DW	SW	2	1	0	0	-5.5	-5.5	0	rck			fuc		
									3	0	7	-5.5	1.5	0	rck			fuc	fil	
									5	7	9	1.5	3.5	0	gvl		70	lbk		
									5	9	11	3.5	5.5	6	gvl		70	lbk		
									5	11	13	5.5	7.5	2	gvl		70	lbk		
									5	13	16	7.5	10.5	1	gvl		70	lbk		
									5	16	18	10.5	12.5	7	gvl			lbk		
									5	18	20	12.5	14.5	8	gvl			lbk		
									5	20	23	14.5	17.5	6	gvl			lbk		
									5	23	27	17.5	21.5	3	gvl			lbk		
									5	27	30	21.5	24.5	5	gvl			lbk		
									5	30	34	24.5	28.5	2	rck			lbk		
									5	34	44	28.5	38.5	2	rck			lbk		
									5	44	50	38.5	44.5	1	rck			lbk		out of air
								Total	64					43						
05-Jun-93	36b	1136	1159	23	7.5	DW	SW	2	3	0	6	-7.5	-1.5	0	rck			fuc		
									5	6	10	-1.5	2.5	0	gvl			fil		
									5	10	9	2.5	1.5	2	gvl	rck		lbk		

									5	9	12	1.5	4.5	3	gvl			lbk		
									5	12	12	4.5	4.5	3	gvl			lbk		
									5	12	18	4.5	10.5	3	gvl			lbk		
									5	18	21	10.5	13.5	5	gvl			lbk		
									5	21	23	13.5	15.5	7	gvl			lbk		
									5	23	25	15.5	17.5	7	gvl			lbk		
									5	25	27	17.5	19.5	8	gvl			lbk		
									5	27	33	19.5	25.5	3	gvl	rck		lbk		
									5	33	34	25.5	26.5	6	gvl	rck		lbk		
									5	34	36	26.5	28.5	1	rck			lbk		
									5	36	50	28.5	42.5	2	rck			lbk		cucs collected
								Total	68					50						
05-Jun-93	38a	1014	1023	9	1.5	DI	DW	2	5	0	12	-1.5	10.5	4	rck		80	lbk		
									5	12	23	10.5	21.5	1	cbl	snd	70	lbk		
									5	23	36	21.5	34.5	4	cbl	snd	20	lbk		
									5	36	47	34.5	45.5	2	gvl	snd	0			
									5	47	50	45.5	48.5	0	gvl	snd	0			no abs, no urchins
								Total	25					11						
05-Jun-93	38b	1023	1031	8	2.0	DI	DW	2	5	55	50	53	48	1	gvl	snd	0			
									5	50	43	48	41	2	bld	snd	0			
									5	43	32	41	30	1	rck	gvl	10	lbk		
									5	32	19	30	17	6	rck	bld	70	lbk		
									5	19	14	17	12	11	rck		80	lbk		
									2	14	0	12	-2	0	rck		80	fil	fuc	no abs, no urchins
								Total	27					21						
05-Jun-93	39a	1010	1024	14	1.5	RL	RT	2	4	0	3	-1.5	1.5	0	cbl		100	fil		
									5	3	6	1.5	4.5	7	gvl		100	lbk		
									4	6	7	4.5	5.5	2	gvl		80	lbk		
									5	7	14	5.5	12.5	9	rck		80	lbk		
									5	14	17	12.5	15.5	18	rck	shl	80	lbk		
									5	17	17	15.5	15.5	3	rck		90	lbk		
									5	17	22	15.5	20.5	4	rck	mud	80	lbk		
									5	22	26	20.5	24.5	4	cbl		80	lbk		
									5	26	34	24.5	32.5	5	cbl	mud	40	lbk		
									5	34	40	32.5	38.5	7	cbl	mud	30	lbk		
									5	40	51	38.5	49.5	7	cbl					
								Total	53					66						
05-Jun-93	39b	1024	1038	14	2.5	RL	RT	2	3	51	47	48.5	44.5	1	cbl					
									4	47	42	44.5	39.5	0	cbl					
									5	42	36	39.5	33.5	4	cbl					
									5	36	32	33.5	29.5	8	cbl	shl				
									4	32	28	29.5	25.5	2	cbl	shl				
									5	28	19	25.5	16.5	4	rck					
									5	19	10	16.5	7.5	7	cbl					
									5	10	4	7.5	1.5	7	cbl					
									3	4	0	1.5	-2.5	0	cbl					
								Total	39					33						
05-Jun-93	40a	905	917	12	-2.0	DI	SW	2	2	0	3	2	5	6	gvl	mud	10	elg	fuc	
									5	3	9	5	11	8	gvl	mud	10	lbk		
									5	9	11	11	13	9	gvl	mud	30	lbk		
									5	11	14	13	16	10	gvl	mud	50	lbk		
									5	14	17	16	19	2	gvl	mud	50	lbk		
									5	17	22	19	24	4	gvl	mud	50	lbk		
									5	22	27	24	29	2	gvl	mud	20	lbk		
									5	27	33	29	35	4	gvl	mud	20	lbk		
									10	33	43	35	45	1	gvl	mud	0			
									10	43	45	45	47	0	mud		0			
									10	45	48	47	50	0	mud		0			no abs, no urchins
								Total	67					46						
05-Jun-93	40b	917	928	11	-1.5	DI	SW	2	5	50	46	51.5	47.5	0	mud	mud	0			
									10	46	41	47.5	42.5	1	gvl	mud	0			
									5	41	37	42.5	38.5	3	gvl	mud	0			
									5	37	33	38.5	34.5	4	gvl	mud	30	red		
									5	33	31	34.5	32.5	6	gvl	mud	30	red		
									5	31	27	32.5	28.5	3	gvl	mud	30	lbk		
									5	27	24	28.5	25.5	9	gvl	mud	30	lbk		
									5	24	22	25.5	23.5	7	gvl	mud	30	lbk		
									5	22	19	23.5	20.5	7	gvl	mud	30	lbk		
									5	19	15	20.5	16.5	8	gvl	mud	80	lbk		
									5	15	12	16.5	13.5	5	gvl	mud	80	lbk		
									5	12	8	13.5	9.5	10	gvl	mud	80	lbk		
									5	8	5	9.5	6.5	5	gvl	mud	80	lbk		
									4	5	0	6.5	1.5	4	gvl	mud	50	elg	lbk	no abs, no urchins
								Total	74					72						

05-Jun-93	41a	907	917	10	-2.0	RL	RT	2	5	0	11	2	13	2	bld		100	lbk	
									5	11	21	13	23	3	bld		100	lbk	
									4	21	29	23	31	4	bld		80	lbk	
									5	29	35	31	37	5	gvl	shl	10	lbk	
									5	35	39	37	41	0	gvl	slt			
									5	39	44	41	46	0	gvl	slt			
									5	44	48	46	50	0	mud				
								Total	34					14					
05-Jun-93	41b	917	927	10	-1.5	RL	RT	2	15	48	45	49.5	46.5	0	mud				
									10	45	37	46.5	38.5	0	gvl	slt			
									7	37	32	38.5	33.5	0	gvl	slt			
									6	32	27	33.5	28.5	5	gvl	shl			
									7	27	21	28.5	22.5	4	gvl	shl			
									5	21	13	22.5	14.5	3	bld	shl	80	lbk	
									5	13	6	14.5	7.5	1	bld		100	lbk	
									5	6	0	7.5	1.5	2	bld		100	lbk	cucs collected
								Total	60					15					



Map of transect locations in subdistrict 102-70.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 102-70 Clarence Strait (not including Thorne Bay)
Cruise Dates: June 3-4, 1993

Divers: Don Ingledue (DI), Robert Larson (RL), Randy Timothy (RT), Doug Woodby (DW), Scott Walker (SW)

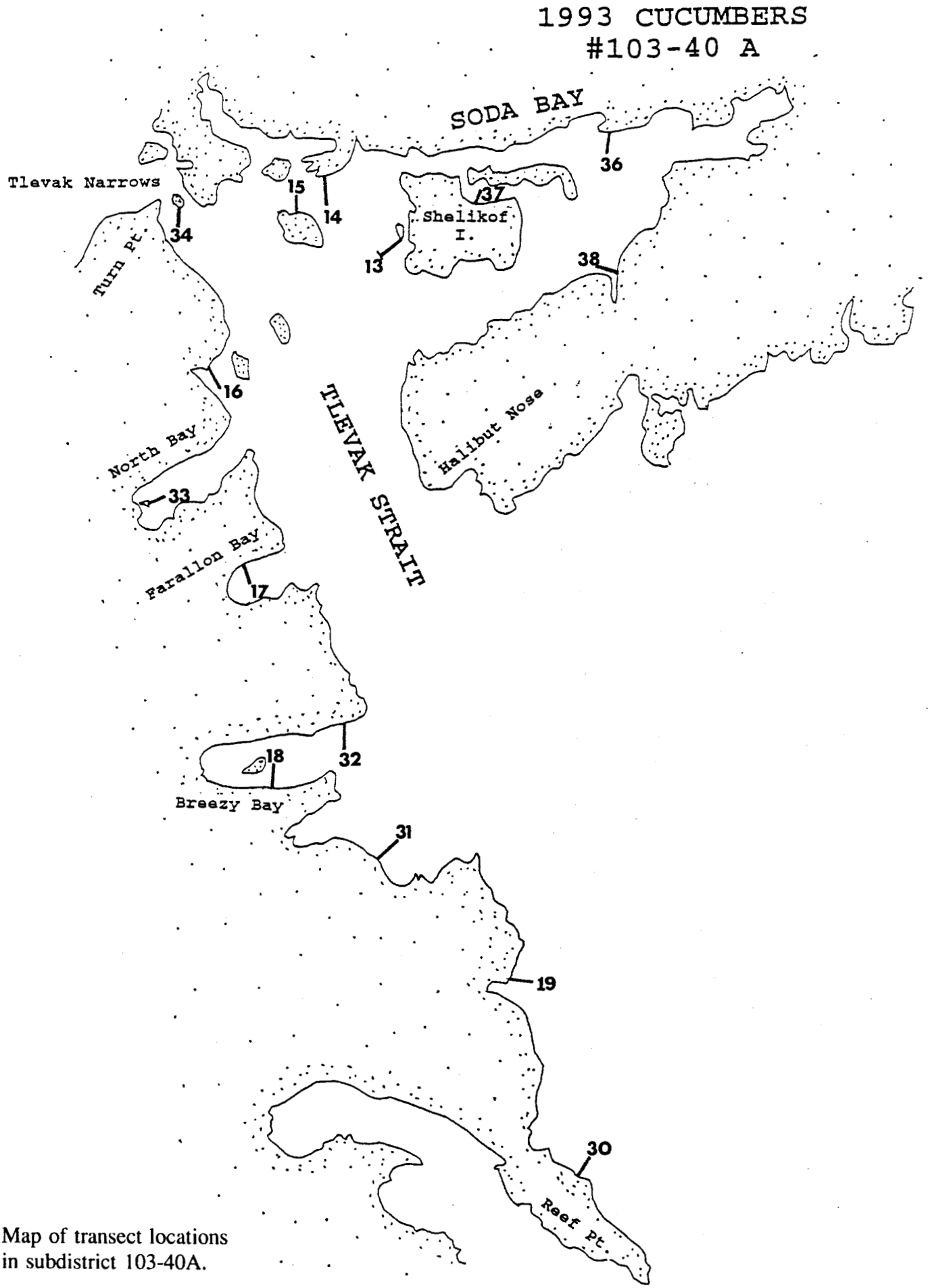
Tide Datum: Hadley, Anchorage/MHW -15'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
03-Jun-93	1a	1609	1618	9	7.5	RL	RT	2	5	0	6	-7.5	-1.5	0		rck		20	fuc		
									7	6	13	-1.5	5.5	0		rck		40	fuc		
									10	13	18	5.5	10.5	0		cbl		100	lbk		
									5	18	29	10.5	21.5	0		bld		80	agm		
									10	29	33	21.5	25.5	0	20	cbl	shl	20	agm		20 red urchins
									10	33	37	25.5	29.5	4		gvl	shl	10	agm		
									5	37	41	29.5	33.5	3		gvl	shl				
									5	41	46	33.5	38.5	0		gvl	shl				
									5	46	50	38.5	42.5	2		gvl	shl				
									5	50	56	42.5	48.5	1		gvl	shl				
								Total	67					10							
03-Jun-93	1b	1618	1627	9	7.0	RL	RT	2	5	55	48	48	41	1		gvl	shl				
									5	48	43	41	36	3		gvl	shl				
									5	43	38	36	31	1		gvl	shl				
									5	38	32	31	25	0		cbl		20	agm		urchins start
									5	32	25	25	18	1		bld		30	agm		
									8	25	16	18	9	0		bld		40	agm		
									10	16	0	9	-7	0		rck		80	lbk	fuc	
								Total	43					6							
03-Jun-93	2a	1652	1703	11	5.0	RT	RL	2	5	0	7	-5	2	0		bld		100	fuc	fil	
									5	7	13	2	8	3		cbl		100	lbk		
									5	13	18	8	13	2		cbl		100	lbk		
									6	18	27	13	22	12		cbl		100	lbk		
									6	27	33	22	28	4		cbl		100	lbk		
									5	33	39	28	34	4		gvl	shl	20	lbk		
									5	39	44	34	39	1		gvl	shl				
									8	44	50	39	45	2		gvl	shl				
									5	50	55	45	50	0		gvl					
								Total	50					28							
03-Jun-93	2b	1703	1714	11	4.5	RT	RL	2	5	50	46	45.5	41.5	0		gvl					
									5	46	40	41.5	35.5	1		cbl					
									5	40	33	35.5	28.5	6		rck		40	lbk		
									5	33	28	28.5	23.5	4		bld		80	lbk		
									5	28	20	23.5	15.5	4		rck		90	lbk		
									5	20	15	15.5	10.5	1		rck		100	lbk		
									5	15	13	10.5	8.5	3		gvl		90	lbk		
									5	13	12	8.5	7.5	3		gvl		80	lbk		
									5	12	9	7.5	4.5	0		gvl		80	lbk		
									5	9	6	4.5	1.5	0		rck		40	lbk		
									5	6	0	1.5	-4.5	0		cbl		90	fuc	fil	
								Total	55					22							
04-Jun-93	3a	905	913	8	-0.5	RL	RT	2	5	0	12	0.5	12.5	0		rck		100	agm	ner	
									5	12	19	12.5	19.5	0	15	rck		50	agm		15 red urchins
									10	19	24	19.5	24.5	2	20	cbl		40	agm		20 red urchins
									7	24	29	24.5	29.5	2	15	cbl		30	agm		15 red urchins
									5	29	36	29.5	36.5	2	5	cbl		10	agm		5 red urchins
									5	36	46	36.5	46.5	1		gvl					
									4	46	54	46.5	54.5	0		gvl					
								Total	41					7							
04-Jun-93	3b	913	920	7	0.5	RL	RT	2	5	53	44	52.5	43.5	0		gvl					
									5	44	37	43.5	36.5	0		gvl		10	agm		
									5	37	30	36.5	29.5	0		gvl		10	agm		
									5	30	20	29.5	19.5	0	10	gvl		10	agm		10 red urchins
									10	20	9	19.5	8.5	0	25	gvl					25 red urchins
								Total	30					0							

04-Jun-93	4a	956	1010	14	3.5	RT	RL	2	7	0	17	-3.5	13.5	0		rck		100	lbk		
									10	17	22	13.5	18.5	0		cbl		80	lbk		5 green urchins
									10	22	26	18.5	22.5	0		cbl		80	lbk		5 green urchins
									5	26	27	22.5	23.5	1		cbl	shl	40	agm		5 green urchins
									10	27	28	23.5	24.5	1		gvl		10	agm		40 green urchins
									15	28	30	24.5	26.5	2		gvl					
									20	30	35	26.5	31.5	1		gvl					
									10	35	39	31.5	35.5	4		gvl					
									8	39	54	35.5	50.5	1		rck					
								Total	95					10							
04-Jun-93	4b	1010	1025	15	4.5	RT	RL	2	10	54	47	49.5	42.5	0		snd					
									10	47	41	42.5	36.5	0		gvl					occasional small geoduck
									10	41	34	36.5	29.5	6	10	gvl		10	agm		10 red urchins
									10	34	28	29.5	23.5	3	6	gvl		20	agm		6 red urchins
									8	28	21	23.5	16.5	5	2	gvl		30	agm		2 red urchins
									10	21	17	16.5	12.5	4	9	cbl		50	lbk		9 red urchins
									15	17	13	12.5	8.5	0	1	cbl					1 red urchins
									14	13	2	8.5	-2.5	0		rck		100	fuc	fil	85 green urchins
								Total	87					18							
04-Jun-93	5a	1057	1107	10	8.0	RT	RL	2	5	0	3	-8	-5	0		rck		50	fuc		
									5	3	8	-5	0	0		rck		100	flr	fil	
									8	8	16	0	8	0		rck		100	lbk	ner	
									10	16	20	8	12	0	13	bld		90	agm		13 red urchins
									10	20	21	12	13	2	34	rck		90	agm		34 red urchins
									5	21	35	13	27	2	36	rck		10	agm		36 red urchins
									6	35	50	27	42	1		rck					
									3	50	54	42	46	0		gvl					
								Total	52					5							
04-Jun-93	5b	1108	1117	9	8.5	RT	RL	2	5	53	49	44.5	40.5	1		gvl					
									5	49	40	40.5	31.5	3	12	rck					12 red urchins
									5	40	34	31.5	25.5	3	26	rck					26 red urchins
									5	34	26	25.5	17.5	2	36	rck		30	agm		36 red urchins
									5	26	18	17.5	9.5	0	14	rck		60	agm		14 red urchins
									10	18	17	9.5	8.5	0	10	bld		90	agm		10 red urchins
									15	17	11	8.5	2.5	0		cbl		100	lbk	ner	
									8	11	8	2.5	-0.5	0		cbl		90	red		
									20	8	0	-0.5	-8.5	0		cbl					
								Total	78					9							
04-Jun-93	6a	1215	1235	20	13.0	RL	RT	2	5	0	11	-13	-2	0		rck		100	fuc	red	
									20	11	10	-2	-3	0		rck		100	fuc		
									20	10	21	-3	8	0		bld		100	lbk	ner	100 sm green urchins
									10	21	25	8	12	0	60	cbl		60	lbk		60 red urchins
									20	25	27	12	14	0		rck		100	lbk	ner	100 sm green urchins
									20	27	30	14	17	0	6	cbl		80	agm		6 red urchins
									15	30	33	17	20	1	4	rck		80	agm		4 red urchins
									15	33	43	20	30	1	6	cbl		80	agm		6 red urchins
									5	43	46	30	33	9	4	gvl		10	lbk		4 red urchins
									5	46	50	33	37	6	2	snd	shl	10	lbk		2 red urchins
								Total	135					17							
04-Jun-93	6b	1219	1249	30	13.5	DI	SW	2	5	60	60	46.5	46.5	3		cbl			hir		
									10	60	50	46.5	36.5	3		rck					
									20	50	47	36.5	33.5	8		snd			lbk		one box p.s. crab
									15	47	43	33.5	29.5	3		snd			hir	lbk	
									10	43	37	29.5	23.5	1		rck			agm		70 - 1" green urchins
									20	37	28	23.5	14.5	0		rck			agm		28 - 1" green urchins
									10	28	25	14.5	11.5	0		rck			lbk		8 - 1" green urchins
									10	25	26	11.5	12.5	0		snd			agm		200 - 1" green urchins
									15	26	27	12.5	13.5	0		snd			agm		
									10	27	24	13.5	10.5	0		snd			lbk		200 - 1" green urchins
									10	24	23	10.5	9.5	0		snd			lbk		
									10	23	17	9.5	3.5	0		rck			lbk		
									10	17	12	3.5	-1.5	0		rck			lbk	fuc	
									10	12	13	-1.5	-0.5	0		rck			lbk		
									10	13	16	-0.5	2.5	0		bld			lbk		
									4	16	14	2.5	0.5	0		bld			lbk	hir	
									10	14	11	0.5	-2.5	0		rck			fuc	hir	
									1	11	3	-2.5	-10.5	0		rck			fuc		
								Total	190					18							
03-Jun-93	7a	1613	1632	19	7.0	DI	SW	2	5	0	4	-7	-3	0		rck			fuc		
									5	4	6	-3	-1	0		rck			fuc		
									5	6	11	-1	4	0		rck			lbk		ribbon kelp
									5	11	12	4	5	0		bld		100	lbk		
									5	12	15	5	8	0		bld		100	lbk		
									5	15	18	8	11	0		bld		100	lbk		

									5	18	21	11	14	0	2	bld			lbk		2 red urchins
									5	21	20	14	13	0		bld			lbk		
									5	20	19	13	12	0		rck			lbk		1 green urchin
									5	19	22	12	15	0	2	bld		75	agm		2 red urchins
									5	22	25	15	18	0	15	rck			agm		15 red urchins
									5	25	33	18	26	0	8	rck			agm		8 red urchins
									1	33	39	26	32	1		rck					
									5	39	43	32	36	1		bld			agm		
									5	43	45	36	38	0	3	cbl		20	agm		3 red urchins
									5	45	48	38	41	1		cbl		20	agm		
									5	48	50	41	43	1		cbl		10	agm		
									5	50	50	43	43	1		cbl		10	agm		
								Total	86					5							
03-Jun-93	7b	1632	1651	19	6.0	DI	SW	2	5	55	50	49	44	2		cbl			agm		
									5	50	48	44	42	1		cbl		5	agm		
									5	48	45	42	39	0		cbl		20	agm		
									5	45	41	39	35	2		cbl		40	agm		tube wormworms
									5	41	37	35	31	0	6	rck		10	agm		6 red urchins
									10	37	29	31	23	0	12	bld			agm		12 red urchins
									5	29	15	23	9	0	9	rck			lbk		9 red urchins
									5	15	5	9	-1	0		rck			lbk	hir	
									10	5	5	-1	-1	0		rck			fuc	hir	
									5	5	0	-1	-6	0		rck			fuc		strong current
								Total	60					5		rck					
03-Jun-93	8a	1718	1757	39	3.0	DI	SW	2	5	0	5	-3	2	0		rck		100	fir	lbk	
	(new)								5	5	11	2	8	0		rck		100	lbk		
									5	11	20	8	17	0		bld		100	lbk		
									5	20	23	17	20	0		bld		80	agm		
									5	23	24	20	21	0		bld		80	agm		
									5	24	25	21	22	0		bld		80	lbk		
									5	25	26	22	23	1		bld		80	lbk		
									5	26	27	23	24	3		bld		80	lbk		
									5	27	25	24	22	2		bld		80	lbk		
									5	25	26	22	23	0		bld		100	lbk		
									10	26	26	23	23	0		bld		100	lbk		
									10	26	26	23	23	0		bld		100	lbk		
									10	26	22	23	19	0		bld		100	lbk		
									5	22	17	19	14	0		bld		100	lbk		
									5	17	18	14	15	0		bld		100	lbk		
									5	18	21	15	18	0		bld		100	lbk		
									5	21	27	18	24	0		bld		100	lbk		1 red urchin
									5	27	31	24	28	1	1	bld		50	agm		1 red urchin
									5	31	33	28	30	0	1	bld		50	agm		2 urchins
									5	33	43	30	40	0	2	bld		50	agm		1 urchin
									5	43	47	40	44	0	1	gvl	snd	10	agm		
									5	47	57	44	54	1		gvl	snd	10	agm		
									10	57	55	54	52	4		gvl	snd	10	agm		no return tran. out of time
								Total	135					12							
04-Jun-93	9a	859	905	6	-0.5	DW	SW	2	1	0	1	0.5	1.5	0		rck		100	lbk		
									3	1	7	1.5	7.5	0	10	rck					10 red urchins
									5	7	25	7.5	25.5	0	12	rck					12 red urchins
									5	25	33	25.5	33.5	0		rck					
									5	33	50	33.5	50.5	1		rck					lots of red urchins
								Total	19					1							
04-Jun-93	9b	905	911	6	0.0	DW	SW	2	5	50	42	50	42	3		rck					
									5	42	29	42	29	0	10	rck					10 red urchins
									5	29	15	29	15	0	8	rck					8 red urchins
									3	15	0	15	0	0		rck		90	lbk		steep cliff
								Total	18					3							
04-Jun-93	10a	940	948	8	2.0	SW	DI	2	5	0	5	-2	3	0		mud	gvl	90	fil	ulv	
	(new)								5	5	7	3	5	0		gvl		60	lbk		
									5	7	9	5	7	0		gvl		50	lbk		
									5	9	10	7	8	0		gvl		50	lbk		
									10	10	14	8	12	0		gvl		50	lbk		
									10	14	16	12	14	0		mud	gvl	20	lbk		
									10	16	21	14	19	0		mud		10	lbk		
									5	21	22	19	20	0		mud					
								Total	55					0							
04-Jun-93	10b	948	956	8	2.5	SW	DI	2	5	16	16	13.5	13.5	2		mud	rck	50	lbk		
	(new)								5	16	16	13.5	13.5	7		mud	rck	50	lbk		
									5	16	14	13.5	11.5	2		mud	rck	50	lbk		
									5	14	13	11.5	10.5	0		gvl	mud	50	lbk		
									10	13	10	10.5	7.5	0		gvl	mud	70	lbk		
									10	10	6	7.5	3.5	0		gvl	mud	90	lbk		

									5	6	6	3.5	3.5	0		gvl	mud	100	lbk		
									5	6	3	3.5	0.5	0		gvl		50	fuc		
									5	3	0	0.5	-2.5	0		gvl		50	fuc		sm red box crab
								Total	55					11							
04-Jun-93	11a	1028	1042	14	6.0	DW	DI	2	3	0	6	-6	0	0		rck		80	fuc	fir	
	(new)								5	6	7	0	1	0		rck		100	lbk		
									5	7	9	1	3	0		rck		90	lbk		
									5	9	12	3	6	0	100	rck		20	lbk		100+ red urchins
									5	12	10	6	4	0	200	rck		10	lbk		200+ red urchins
									10	10	7	4	1	0		rck		90	lbk	fir	
									15	7	38	1	32	2		rck		5	lbk		few urchins
									3	38	41	32	35	3		snd	rck				
									10	41	47	35	41	3		rck					
									5	47	50	41	44	0		rck					
								Total	66					8							
04-Jun-93	11b	1042	1056	14	7.0	DW	DI	2	10	50	38	43	31	3		snd	cbl	20	lbk		
	(new)								10	38	27	31	20	2	23	cbl	snd				23 red urchins
									20	27	17	20	10	0	40	rck		10	lbk		40 red urchins
									5	17	12	10	5	0		rck		40	lbk	fir	
									20	12	7	5	0	0		rck		80	lbk	fir	
									3	7	0	0	-7	0		rck		50	fuc	fir	
									15	0	3	-7	-4	0		rck	cbl	30	fuc	fir	
								Total	83					5							
03-Jun-93	12a	1131	1138	7	12.5	SW	DW	2	2	0	3	-13	-9.5	0		rck		20	fuc	fir	
									5	3	15	-9.5	2.5	0		rck		80	lbk		
									5	15	24	2.5	11.5	0		bld	cbl	40	lbk		
									5	24	30	11.5	17.5	2		bld		10	lbk		
									5	30	37	17.5	24.5	7		cbl		10	lbk		
									5	37	45	24.5	32.5	3		cbl		10	hir		
									4	45	50	32.5	37.5	1		snd	cbl	10	hir		3 cucs to 60 FSW
								Total	31					13							
03-Jun-93	12b	1138	144	6	13.0	SW	DW	2	5	50	43	37	30	4		snd	rck	10	hir		
									5	43	33	30	20	3		rck		10	lbk		
									5	33	28	20	15	3		rck		10	lbk		
									5	28	21	15	8	2		rck		20	lbk		
									5	21	9	8	-4	0		rck		40	lbk		
									7	9	0	-4	-13	0		rck		20	fuc	fir	
								Total	32					12							MLLW tide correction



Map of transect locations in subdistrict 103-40A.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 103-40a
Cruise Dates: Sept. 18-19, 1993

Divers: William Bergmann (WB), Phil Doherty (PD), Robert Larson (RL), Brian Lynch (BL), Tim Minicucci (TM), Scott Walker (SW)

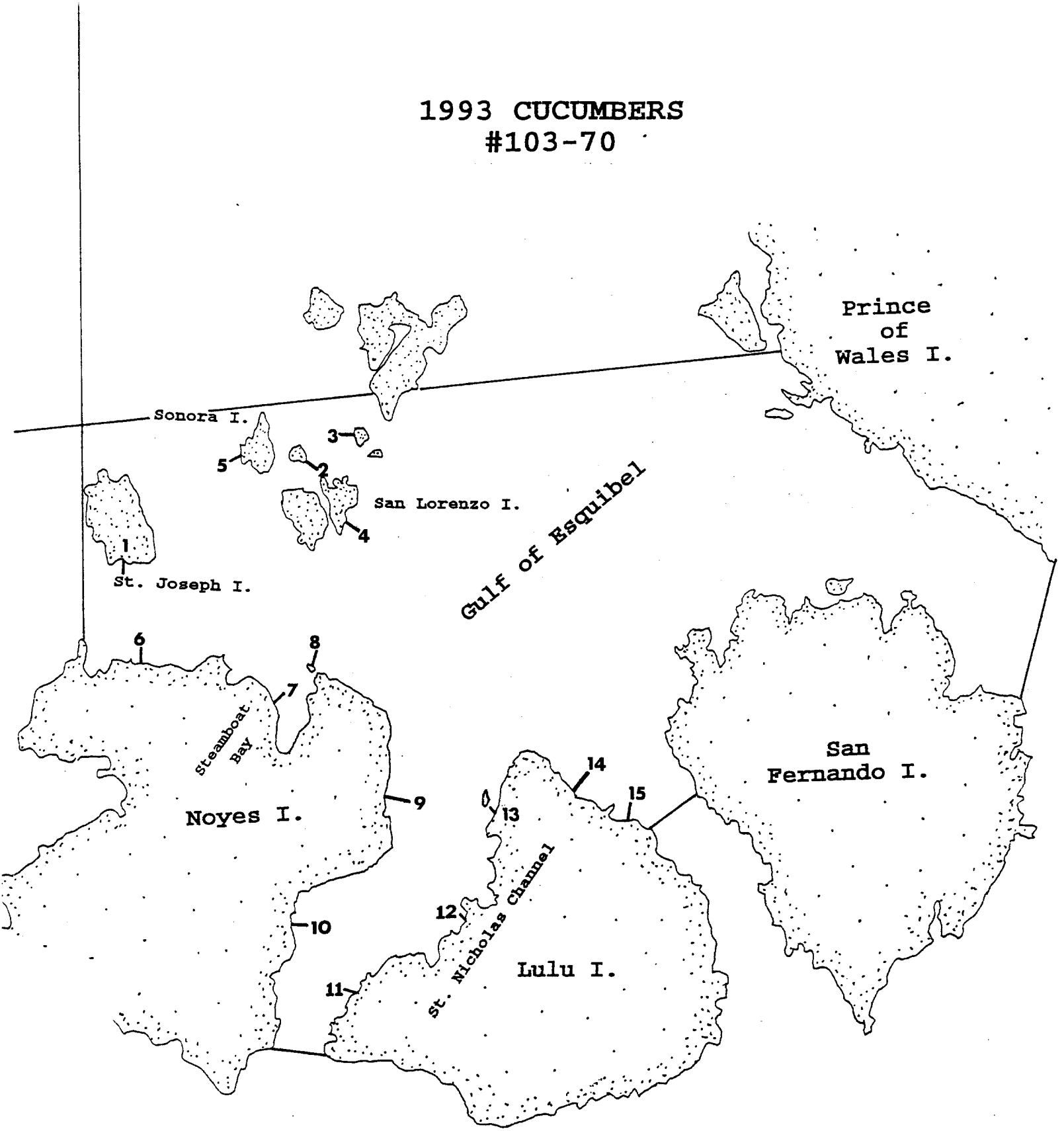
Tide Datum: Soda Bay/MHW Avg.-12'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
18-Sep-93	13a	1502	1525	23	14.5	WB	PD	2	5	2	10	-13	-5	0		rck	bar	20	fuc		
									5	10	14	-5	-1	0		rck		10	fuc	ulv	
									5	14	15	-1	0.5	0		rck		10	ulv	flr	
									5	15	16	0.5	1.5	0		rck		10	ulv		
									5	16	19	1.5	4.5	0		rck		100	mac	flr	
									5	19	27	4.5	13	0		rck	bld	100	mac	agm	
									5	27	29	13	15	0		snd	cbl	80	agm	lbk	
									5	29	31	15	17	0		snd		40	lbk		
									5	31	32	17	18	1		snd	gvl	40	lbk		
									5	32	34	18	20	0		snd	gvl	70	lbk	mac	
									5	34	35	20	21	0		snd	rck	70	lbk		
									5	35	36	21	22	0		rck	snd	50	lbk		
									5	36	36	22	22	0		rck	snd	70	lbk		
									5	36	42	22	28	1		rck		70	lbk		
									5	42	46	28	32	4		rck	snd	50	lbk		
									5	46	50	32	36	4		rck	snd	20	lbk		no abs, a few red urchins
								Total	80					10							
18-Sep-93	13b	1539	1616	37	13.5	WB	PD	2	5	50	50	37	37	7		rck	snd	70	lbk		
									5	50	45	37	32	5		rck	snd	70	lbk		
									5	45	42	32	29	7		rck	snd	60	lbk		
									5	42	42	29	29	2		snd	rck	60	lbk		
									5	42	38	29	25	2		snd	rck	60	lbk		
									5	38	36	25	23	1		snd	rck	60	agm	lbk	
									5	36	35	23	22	1		snd	rck	80	agm	lbk	
									5	35	32	22	19	1		snd	rck	80	agm	mac	
									5	32	30	19	17	0		snd	rck	80	agm	mac	
									5	30	27	17	14	1		snd	rck	80	agm	mac	
									5	27	27	14	14	1		snd	gvl	100	lbk		
									5	27	26	14	13	0		snd	gvl	80	lbk		
									5	26	29	13	16	0		snd	cbl	100	mac		
									5	29	20	16	6.5	0		cbl		100	mac	agm	
									5	20	18	6.5	4.5	0		cbl		40	mac	agm	
									5	18	14	4.5	0.5	0		rck	cbl	20	fuc	agm	
									5	14	10	0.5	-4	0		rck		10	fuc		
								Total	85					28							
19-Sep-93	14a	850	901	11	1.5	WB	SW	2	7	3	4	1.5	2.5	0		rck		40	lbk	mac	40m from shore
									7	4	10	2.5	8.5	0		rck		100	agm	mac	2 abs
									7	10	29	8.5	28	0		rck		10	mac	lbk	
									7	29	36	28	35	0		snd		10	lbk		
									6	36	40	35	39	7		snd	gvl	10	lbk		
									6	40	44	39	43	3		snd	gvl	10	lbk		
									6	44	49	43	48	1		snd	gvl				no urchins
								Total	46					11							
19-Sep-93	14b	901	911	10	1.5	WB	SW	2	6	48	43	47	42	4		snd	gvl	10	lbk		
									6	43	37	42	36	0		snd					
									6	37	18	36	17	18		rck		30	lbk	mac	

									6	18	11	17	9.5	9	rck		80	lbk		
									6	11	3	9.5	1.5	1	rck		100	mac		
								Total	30					32						
19-Sep-93	15a	822	829	7	2.0	SM	WB	2	8	0	16	-2	14	1	rck		50	lbk	agm	
									8	16	25	14	23	2	rck		50	lbk		
									8	25	33	23	31	8	rck		50	lbk		
									8	33	47	31	45	10	rck					
									2	47	50	45	48	3	rck	snd				
								Total	34					24						
19-Sep-93	15b	829	836	7	2.0	SM	WB	2	8	50	35	48	33	2	rck		20	lbk		
									8	35	16	33	14	10	rck		70	lbk		
									8	16	12	14	10	6	rck		70	lbk		
									8	12	3	10	1	8	rck		70	lbk		
									2	3	0	1	-2	0	rck		70	lbk		no abs, no urchins
								Total	34					26						
18-Sep-93	16a	1502	1513	11	14.5	TM	BD	2	5	0	11	-15	-4	0	bld		80	fuc	lbk	
									5	11	18	-4	3.5	0	bld		90	lbk		
									5	18	20	3.5	5.5	0	bld		90	lbk		
									5	20	20	5.5	5.5	0	bld		90	lbk		
									5	20	27	5.5	13	2	bld		100	lbk		
									5	27	34	13	20	8	bld	snd	80	lbk		
									5	34	39	20	25	9	bld	snd	60	lbk		
									5	39	42	25	28	10	cbl	snd	40	lbk		
									5	42	46	28	32	8	cbl	snd	40	lbk		
									4	46	48	32	34	3	cbl	snd	20	lbk		no abs, no urchins
								Total	49					40						
18-Sep-93	16b	1513	1523	10	14.5	TM	BD	2	5	48	43	34	29	1	cbl	snd	10	lbk		
									5	43	36	29	22	0	rck	bld	20	lbk		
									5	36	34	22	20	1	rck	snd	40	lbk		
									5	34	26	20	12	3	rck		80	lbk		
									5	26	21	12	6.5	0	rck		90	lbk		
									5	21	11	6.5	-4	0	rck		60	lbk	fuc	
									5	11	5	-4	-10	0	rck		30	fuc		
									5	5	0	-10	-15	0	rck		50	fuc		1 ab, no urchins
								Total	40					5						
18-Sep-93	17a	900	910	10	0.5	PD	WB	2	5	0	7	-1	6.5	0	rck	cbl	90	lbk	mac	
									5	7	10	6.5	9.5	0	rck	cbl	90	lbk		
									5	10	16	9.5	16	3	cbl	snd	60	lbk		
									5	16	25	16	25	0	snd	gvl	60	lbk		
									5	25	30	25	30	3	snd	gvl	60	lbk	mac	
									5	30	33	30	33	3	snd	gvl	30	lbk		
									5	33	39	33	39	4	snd	gvl	10	lbk		
									5	39	43	39	43	6	snd	gvl	10	lbk		
									3	43	49	43	49	6	snd	gvl				no abs, no urchins
								Total	43					25						
18-Sep-93	17b	910	919	9	0.5	PD	WB	2	5	49	45	49	45	4	snd	gvl				
									5	45	40	45	40	11	snd	gvl	20	lbk		
									5	40	33	40	33	5	snd	gvl	20	lbk		
									5	33	29	33	29	2	snd	gvl	50	lbk		
									5	29	25	29	25	7	snd	gvl	50	lbk		
									5	25	23	25	23	2	snd	gvl	60	lbk	mac	
									5	23	16	23	16	7	snd	gvl	30	lbk		
									5	16	8	16	7.5	1	cbl	bld	80	lbk	mac	
									7	8	2	7.5	1.5	0	cbl	bld	80	lbk		no abs, urchins or ducks
								Total	47					39						
18-Sep-93	18a	1013	1020	7	2.0	PD	WB	2	5	3	5	1	3	0	gvl	cbl	20	lbk		
									5	5	12	3	10	0	gvl	shl	20	lbk		
									5	12	17	10	15	0	gvl	shl	40	lbk	hir	
									5	17	23	15	21	0	snd	shl	40	lbk		
									5	23	29	21	27	1	snd	shl	40	lbk		
									5	29	37	27	35	0	snd	shl	30	lbk		
									5	37	47	35	45	0	gvl	shl	30	lbk		
									2	47	50	45	48	4	gvl	shl	30	lbk		
								Total	37					5						
18-Sep-93	18b	1020	1027	7	2.5	PD	WB	2	5	50	44	48	42	7	gvl	cbl	20	lbk		
									5	44	39	42	37	1	gvl	shl	20	lbk		
									5	39	32	37	30	0	snd	shl	20	lbk		
									5	32	25	30	23	0	snd	shl	20	lbk		
									5	25	19	23	17	1	snd	shl	40	lbk		
									5	19	15	17	13	7	snd	shl	70	lbk		
									5	15	10	13	7.5	0	snd	shl	60	lbk	elg	
									5	10	6	7.5	3.5	0	snd	shl	60	elg		
									5	6	3	3.5	0.5	0	cbl	snd	50	elg	lbk	
									5	3	0	0.5	-3	0	cbl	snd	30	fuc		no abs, urchins or ducks

								Total	50					16						
18-Sep-93	19a	929	941	12	1.0	TM	SM	2	5	0	7	-1	6	0	cbl	shl	70	lbk		
									10	7	16	6	15	0	cbl	shl	30	lbk	mac	
									5	16	22	15	21	3	cbl	shl	50	lbk		
									5	22	25	21	24	7	cbl	shl	70	lbk		
									5	25	25	24	24	4	cbl	shl	70	lbk		
									5	25	24	24	23	4	cbl	shl	30	lbk		
									5	24	26	23	25	1	cbl	shl	40	lbk		
									5	26	31	25	30	10	cbl	shl	70	lbk		
									5	31	37	30	36	4	cbl	shl	50	lbk		
									5	37	42	36	41	7	cbl	shl	50	lbk		
									5	42	47	41	46	3	cbl	shl	50	lbk		no abs, urchins or ducks
								Total	60					43						
18-Sep-93	19b	941	952	11	1.0	TM	SM	2	5	48	40	47	39	7	cbl	shl	70	lbk		
									5	40	37	39	36	3	cbl	shl	50	lbk		
									5	37	33	36	32	2	cbl	shl	50	lbk		
									5	33	29	32	28	2	cbl	shl	30	lbk		
									5	29	25	28	24	1	cbl	shl	20	lbk		
									5	25	22	24	21	3	cbl	shl	30	lbk		
									5	22	17	21	16	2	rck		50	lbk	mac	
									5	17	11	16	10	0	rck		70	mac	lbk	
									5	11	6	10	5	0	rck		90	cor		
									5	6	0	5	-1	0	rck		90	cor		no abs, urchins or ducks
								Total	50					20						
18-Sep-93	30a	856	901	5	0.5	SM	TM	2	5	0	3	-1	2.5	0	rck		100	lbk		
									10	3	16	2.5	16	0	rck		90	lbk		red urchins .5/m2
									5	16	26	16	26	0	rck		50	lbk		red urchins .5/m2
									5	26	36	26	36	3	snd	shl	30	lbk		
									5	36	46	36	46	4	snd		50	lbk		no abs
								Total	30					7						
18-Sep-93	30b	901	906	5	0.5	SM	TM	2	10	48	33	48	33	2	snd	wdy				
									10	33	23	33	23	0	snd	shl				red urchins .5/m2
									5	23	13	23	13	0	snd	shl				
									5	13	6	13	5.5	0	snd	shl	30	elg		
									5	6	0	5.5	-1	0	snd	shl	20	lbk		no abs
								Total	35					2						
18-Sep-93	31a	1055	1105	10	4.5	TM	BD	2	5	0	9	-5	4.5	0	bld	snd	100	lbk	mac	
									5	9	11	4.5	6.5	0	bld	snd	100	lbk	mac	
									5	11	14	6.5	9.5	2	cbl	snd	50	mac	lbk	
									5	14	19	9.5	15	4	cbl	shl	50	lbk	mac	
									5	19	25	15	21	0	cbl	shl	30	lbk		
									5	25	33	21	29	2	cbl	shl	30	lbk		
									5	33	38	29	34	16	cbl	shl	10	lbk		
									5	38	48	34	44	1	snd	shl	10	lbk		no abs, no urchins
								Total	40					25						
18-Sep-93	31b	1105	1115	10	5.0	TM	BD	2	5	48	43	43	38	1	snd	shl				
									5	43	35	38	30	0	cbl	shl				
									5	35	27	30	22	9	cbl	shl	30	lbk		
									5	27	23	22	18	8	cbl	shl	40	lbk		
									5	23	17	18	12	1	cbl	shl	50	lbk		
									5	17	14	12	9	0	cbl	shl	30	lbk	mac	
									5	14	8	9	3	0	cbl		30	lbk	mac	
									7	8	0	3	-5	0	rck		80	cor	fuc	no abs, no urchins
								Total	42					19						
18-Sep-93	32a	942	950	8	1.0	PD	WB	2	5	0	12	-1	11	1	bld		100	agm	mac	
									5	12	24	11	23	5	bld	snd	40	agm		
									5	24	34	23	33	4	gvl		20	agm	lbk	
									5	34	40	33	39	3	gvl	snd	20	lbk		
									5	40	50	39	49	3	gvl	snd	10	lbk		no abs, urchins or ducks
								Total	25					16						
18-Sep-93	32b	950	958	8	1.5	PD	WB	2	5	50	44	49	43	4	snd	gvl	10	lbk		
									5	44	36	43	35	3	gvl	rck	30	agm	lbk	a few red urchins at 45-50'
									5	36	33	35	32	2	gvl	snd	50	agm	lbk	
									5	33	28	32	27	1	gvl	snd	30	agm	mac	
									5	28	19	27	18	4	cbl	rck	80	mac	agm	
									5	19	7	18	5.5	1	cbl		100	agm	mac	
									8	7	0	5.5	-2	0	cbl		100	mac	agm	no abs, no ducks
								Total	38					15						
18-Sep-93	33a	1430	1438	8	14.5	TM	BD	2	5	0	9	-15	-6	0	rck		90	fuc	lbk	
									5	9	17	-6	2.5	0	rck		90	lbk	fuc	
									5	17	25	2.5	11	0	rck		70	lbk		
									5	25	32	11	18	0	snd	shl	30	lbk		
									5	32	39	18	25	0	snd	shl	10	lbk		
									5	39	41	25	27	0	snd	shl	10	lbk		

									5	41	46	27	32	0	snd	shl	5	lbk		no abs, no urchins
								Total	35					0						
18-Sep-93	33b	1438	1445	7	14.5	TM	BD	2	5	48	43	34	29	0	snd	shl	5	lbk		
									5	43	39	29	25	2	snd	cbl	50	lbk		
									5	39	35	25	21	1	rck	snd	80	lbk		
									5	35	32	21	18	2	rck	snd	80	lbk		
									5	32	24	18	9.5	0	rck		90	lbk		
									5	24	18	9.5	3.5	0	rck		90	lbk		
									5	18	9	3.5	-6	0	rck		70	lbk		
									6	9	0	-6	-15	0	rck		50	fuc	lbk	no abs, no urchins
								Total	41					5						
19-Sep-93	34a	929	933	4	1.0	TM	PD	2	5	7	14	6	13	0	rck	bld	60	lbk		
									20	14	20	13	19	0	bld	gvl	60	lbk		
									20	20	34	19	33	0	bld	rck	30	lbk		red urchins 1/m2
								Total	45					0						
19-Sep-93	34b	933	937	4	1.0	TM	PD	2	20	35	18	34	17	0	bld	rck	30	lbk		
									20	18	18	17	17	0	bld	rck	30	lbk		red urchins 1/m2
								Total	40					0						
18-Sep-93	36a	1426	1434	8	14.5	WB	PD	2	20	5	9	-10	-6	0	cbl	gvl	10	fuc		
									10	9	11	-6	-4	0	cbl	gvl				
									10	11	14	-4	-1	0	cbl	gvl	10	ala		
									5	14	16	-1	1.5	0	cbl	snd	20	elg		
									5	16	17	1.5	2.5	0	snd		80	elg		
									5	17	24	2.5	9.5	0	mud	snd	80	elg		
									5	24	32	9.5	18	0	mud					
									5	32	40	18	26	0	mud					
									5	40	50	26	36	0	mud					no abs, no urchins
								Total	70					0						
18-Sep-93	36b	1434	1442	8	14.5	WB	PD	2	5	50	41	36	27	0	mud					
									5	41	36	27	22	0	mud					
									5	36	28	22	14	0	mud	snd				
									5	28	18	14	3.5	0	mud	snd	80	elg		
									5	18	16	3.5	1.5	0	snd	rck	30	elg		
									20	16	12	1.5	-3	0	snd	gvl	10	elg	fuc	
									20	12	6	-3	-9	0	cbl	snd				
									10	6	2	-9	-13	0	cbl	snd				no abs, no urchins
								Total	75					0						
19-Sep-93	37a	841	850	9	1.5	TM	PD	2	20	0	15	-2	14	0	mud	rck	90	elg		
									5	15	17	14	16	0	mud		10	lbk		
									20	17	21	16	20	0	mud		5	lbk		
									20	21	23	20	22	0	mud					
									20	23	24	22	23	0	mud					
									20	24	27	23	26	0	mud					
									20	27	28	26	27	0	mud					half was across
									20	28	28	27	27	0	mud					no abs, no urchins
								Total	145					0						
19-Sep-93	37b	850	858	8	1.5	TM	PD	2	20	28	29	27	28	0	mud					
									20	29	28	28	27	0	mud					
									20	28	28	27	27	0	mud					
									20	28	27	27	26	0	mud					
									20	27	26	26	25	0	mud					
									20	26	23	25	22	0	mud		5	lb		
									20	23	15	22	14	0	mud		10	lbk		yuk....
									10	15	0	14	-2	0	mud	rck	70	elg		no abs, no urchins
								Total	150					0						
18-Sep-93	38a	1624	1632	8	12.5	TM	BD	2	10	0	8	-13	-5	0	cbl					
									20	8	10	-5	-3	0	cbl					high tide
									10	10	12	-3	-1	0	cbl					
									10	12	14	-1	1.5	0	rck	cbl				
									10	14	22	1.5	9.5	0	rck	cbl				
									10	22	33	9.5	21	0	rck	cbl				
									10	33	41	21	29	0	cbl					
									5	41	48	29	36	0	cbl					no abs, no urchins
								Total	85					0						
18-Sep-93	38b	1632	1640	8	12.0	TM	BD	2	5	48	41	36	29	3	cbl					
									5	41	34	29	22	0	cbl					
									5	34	28	22	16	1	cbl					
									5	28	23	16	11	0	cbl	shl				
									5	23	18	11	6	0	cbl	rck				
									5	18	14	6	2	0	cbl	rck				
									20	14	10	2	-2	0	cbl	rck	10	fuc		
									20	10	5	-2	-7	0	bld	cbl	20	fuc		
									20	5	0	-7	-12	0	bld	cbl	20	fuc		no abs, no urchins
								Total	90					4						



Map of transect locations in subdistrict 103-70.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 103-70 Noyes Island
Cruise Dates: September 14-15,1993

Divers: William Bergmann (WB), Bill Davidson (BD), Phil Doherty (PD), Tim Minicucci (TM), Scott Marshall (SM)

Tide Datum: Steamboat Bay, Noyes Is./MHW -9'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
15-Sep-93	1a	936	943	7	5.0	WB	BD	2	5	0	11	-5	6	0		rck		30	lbk		surge/wall,
									5	11	31	6	26	0		rck					stalk laminaria
									5	31	31	26	26	0		cbl		10	lbk		
									5	31	35	26	30	0		cbl	bld	30	lbk		nereocystis
									5	35	37	30	32	0		cbl		40	lbk		1 sm scallop,nereo
									5	37	41	32	36	0		gvl		10	lbk		
									5	41	44	36	39	0		gvl					
									5	44	47	39	42	0		gvl					urchin shells
									5	47	48	42	43	0		gvl	shl				ratfish/needlefish
								Total	45					0							
15-Sep-93	1b	943	951	8	5.5	WB	BD	2	5	49	45	44	40	0		shl	gvl	0			
									5	45	41	40	36	0		gvl		0			needlefish rising
									5	41	37	36	32	0		cbl		10	lbk		
									5	37	26	32	21	0		rck		60	lbk		nereocystis
									5	26	16	21	11	0		rck		40	lbk	lbk	nereocystis,laminaria
									5	16	7	11	1.5	0		rck		80	lbk		laminaria
									10	7	0	1.5	-6	0		rck		80	lbk		1abs, no urchins or ducks
								Total	40					0							
15-Sep-93	2a	1427	1437	10	8.5	WB	BD	2	5	2	8	-7	-1	0		rck		80	fuc	lbk	
									5	8	11	-1	2.5	0		rck		80	lbk	mac	
									5	11	14	2.5	5.5	0		rck	bld	80	lbk	mac	
									5	14	21	5.5	13	0		rck	bld	80	lbk	mac	
									5	21	28	13	20	0		rck	bld	50	lbk	mac	
									5	28	32	20	24	0		cbl	shl	30	lbk	mac	
									5	32	36	24	28	0		snd	shl	20	lbk		
									5	36	40	28	32	0		snd	shl	20	lbk		
									5	40	47	32	39	0		snd	shl	10	lbk		no abs, no urchins
								Total	45					0							
15-Sep-93	2b	1437	1446	9	8.0	WB	BD	2	5	47	43	39	35	0		snd	shl	10	lbk		
									5	43	41	35	33	0		snd	shl	10	lbk		scattered ducks
									5	41	34	33	26	0		snd	shl	20	lbk		
									5	34	27	26	19	0		rck		40	lbk	mac	
									5	27	21	19	13	0		rck		60	lbk	mac	
									5	21	14	13	6	0		rck		70	lbk	mac	
									8	14	3	6	-5	0		rck		80	lbk		no abs, no urchins
								Total	38					0							
15-Sep-93	3a	1512	1530	18	6.0	PD	WB	2	5	3	8	-3	2	0		rck	bld	80	fuc	ala	
									5	8	12	2	6	0		bld	gvl	40	lbk		
									5	12	15	6	9	0		bld	rck	100	lbk		
									5	15	15	9	9	0		rck	bld	80	lbk	mac	
									5	15	17	9	11	0		cbl	snd	70	lbk		
									5	17	18	11	12	0		fck	gvl	80	lbk	mac	
									5	18	20	12	14	0		rck	snd	20	lbk	mac	
									5	20	25	14	19	0		rck	snd	40	lbk	mac	
									5	25	26	19	20	0		cbl	snd	20	lbk		
									5	26	28	20	22	0		gvl	rck	10	lbk		
									5	28	31	22	25	0		gvl	rck	10	lbk		
									5	31	32	25	26	0		gvl	cbl	10	lbk		
									5	32	34	26	28	0		gvl	rck	30	lbk		
									5	34	36	28	30	0		gvl		20	lbk		
									5	36	37	30	31	0		snd	gvl	20	lbk		
									5	37	39	31	33	0		snd	gvl	10	lbk		loose kelp
									5	39	41	33	35	0		snd	gvl	5	lbk		loose kelp
									5	41	43	35	37	0		snd	shl	10	lbk		loose kelp
									5	43	45	37	39	0		snd	gvl	20	lbk		loose kelp

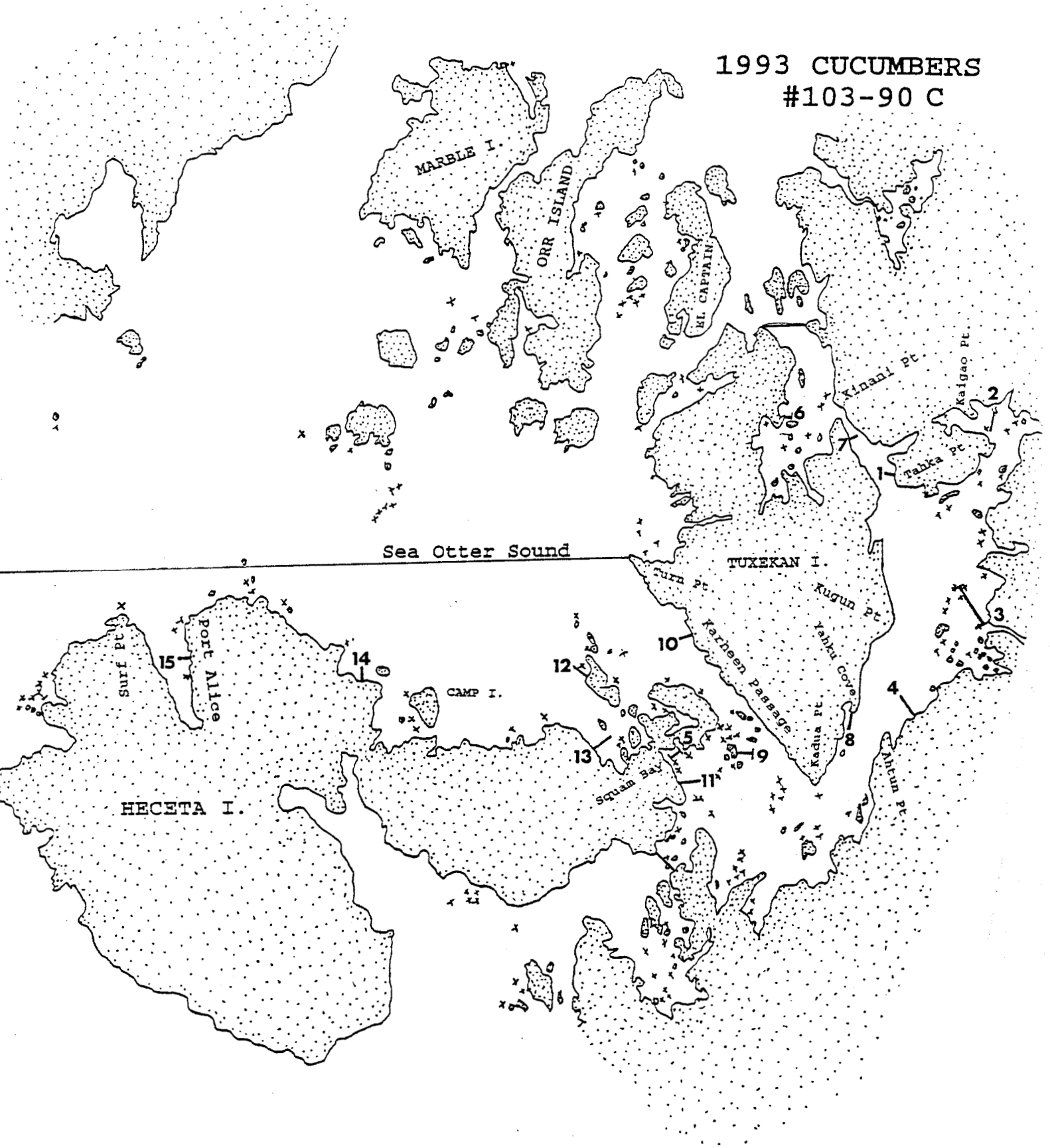
									5	45	46	39	40	0	snd	gvl	10	lbk		loose kelp
									5	46	47	40	41	0	snd	shl	10	lbk		loose kelp
									5	47	48	41	42	0	snd	shl	10	lbk		no urchins, abs, ducks
								Total	110					0						
15-Sep-93	3b	1530	1548	18	5.5	PD	WB	2	5	48	47	43	42	0	snd	shl	10	lbk		loose kelp
									5	47	46	42	41	0	snd	shl	10	lbk		loose kelp
									5	46	45	41	40	0	snd	shl	10	lbk		loose kelp
									5	45	43	40	38	0	snd	shl	10	lbk		loose kelp
									5	43	42	38	37	0	gvl	shl	10	lbk	fir	loose kelp
									5	42	40	37	35	0	gvl	gvl	10	lbk		loose kelp
									5	40	38	35	33	0	snd	shl	10	lbk		loose kelp
									5	38	36	33	31	0	gvl	snd	10	lbk		loose kelp
									5	36	35	31	30	0	gvl	snd	10	lbk		
									5	35	33	30	28	0	gvl	snd	10	lbk		
									5	33	31	28	26	0	gvl	snd	20	lbk		
									5	31	29	26	24	0	gvl		20	lbk		
									5	29	27	24	22	0	gvl	snd	20	lbk		
									5	27	25	22	20	0	gvl		30	lbk		
									5	25	23	20	18	0	gvl		20	lbk		
									5	23	21	18	16	0	gvl	snd	20	lbk		
									5	21	18	16	13	0	gvl	snd	20	lbk		
									5	18	13	13	7.5	0	snd	cbl	30	lbk	mac	
									5	13	10	7.5	4.5	0	rck	bld	60	lbk		
									5	10	4	4.5	-2	0	rck	bld	80	lbk		
									5	4	0	-2	-6	0	rck		80	lbk		no urchins, abs, ducks
								Total	105					0						
15-Sep-93	4a	1615	1622	7	3.5	PD	BD	2	5	3	10	-1	6.5	0	rck		50	lbk	mac	
									5	10	20	6.5	17	0	rck	cbl	50	lbk	mac	
									5	20	29	17	26	0	rck	cbl	50	lbk	mac	
									5	29	35	26	32	0	rck		60	lbk		
									5	35	48	32	45	0	rck	cbl	30	lbk		no abs, no urchins
								Total	25					0						
15-Sep-93	4b	1622	1629	7	3.5	PD	BD	2	5	46	39	43	36	0	rck		50	lbk	mac	
									5	39	28	36	25	0	rck		50	lbk	mac	
									5	28	19	25	16	0	rck		70	lbk	mac	
									5	19	16	16	13	0	rck	bld	70	lbk	mac	1 red urchin
									5	16	12	13	8.5	0	rck	bld	70	lbk	mac	1 - 2.5' cuc
									5	12	7	8.5	3.5	0	rck		70	lbk	mac	
									5	7	2	3.5	-2	0	rck		70	lbk		
								Total	35					0						
15-Sep-93	5a	849	859	10	3.0	WB	BD	2	5	0	15	-3	12	0	rck		40	lbk		
									5	15	25	12	22	0	rck	bld	40	lbk		
									5	25	37	22	34	0	bld	rck	20	lbk	fir	25 sea otters S. end
									5	37	41	34	38	0	bld		10	lbk	fir	Sanora Island
									5	41	43	38	40	0	bld	rck	10	lbk		
									5	43	35	40	32	0	rck		10	lbk		
									5	35	47	32	44	0	rck	bld	10	lbk		no urchins, abs, ducks
								Total	35					0						
15-Sep-93	5b	859	908	9	3.5	WB	BD	2	5	50	40	47	37	0	rck		20	lbk		
									5	40	45	37	42	0	rck		20	lbk		
									5	45	45	42	42	0	rck	gvl	10	lbk		
									5	45	39	42	36	0	gvl	bld	20	lbk		
									5	39	32	36	29	0	bld		40	lbk		
									5	32	27	29	24	0	rck	bld	60	lbk		
									5	27	16	24	13	0	rck		100	lbk		no urchins, abs, ducks
								Total	35					0						
15-Sep-93	6a	1011	1024	13	7.0	WB	BD	2	5	19	23	12	16	0	bld	rck	30	lbk		heavy surf
									5	23	26	16	19	0	bld	rck	30	lbk		2-4" red urchins in cracks
									5	26	27	19	20	0	rck		20	lbk		
									5	27	26	20	19	0	rck		16	lbk		3 cucs observed outside trans.
									5	26	33	19	26	0	rck		5	lbk		red urchins 3/m2
									5	33	37	26	30	0	rck	cbl				red urchins 2/m2
									5	37	40	30	33	0	cbl					red urchins 4/m2
									5	40	41	33	34	0	cbl					red urchins 1/m2
									5	41	43	34	36	0	cbl					red urchins 1/m2
									5	43	43	36	36	0	cbl					red urchins 2/m2
									5	43	46	36	39	0	cbl					red urchins 3/m2
									5	46	49	39	42	0	cbl					
								Total	60					0						
15-Sep-93	6b	1024	1036	12	7.5	WB	BD	2	5	49	44	42	37	0	rck					
									5	44	38	37	31	0	rck	cbl				red urchins 2/m2
									5	38	36	31	29	0	rck					red urchins 2/m2
									5	36	37	29	30	1	rck					red urchins 1/m2
									5	37	44	30	37	0	rck	cbl				red urchins 2/m2

									5	44	41	37	34	0	cbl					red urchins .25/m2
									5	41	38	34	31	0	cbl	gvl				red urchins .5/m2
									5	38	33	31	26	0	cbl	cbl				red urchins .5/m2
									5	33	32	26	25	0	rck	cbl	10	lbk		red urchins 1/m2, 2 sm abs
									5	32	30	25	23	0	rck		20	lbk		red urchins 1/m2
									5	30	27	23	20	0	rck		30	lbk		red urchins 1/m2
									5	27	26	20	19	0	rck		50	lbk		red urchins 1/m2
									5	26	19	19	12	0	rck		50	lbk		
								Total	65					0						
15-Sep-93	7a	1115	1133	18	9.5	TM	SM	2	5	0	6	-10	-4	0	bld	cbl	20	lbk		
									5	6	9	-4	-1	0	bld	cbl	40	lbk	ner	
									5	9	13	-1	3.5	0	bld		20	lbk		red urchins 1/m2
									5	13	22	3.5	13	0	bld	cbl	30	lbk		red urchins 1-2/m2
									5	22	30	13	21	0	cbl	snd	5	lbk		
									5	30	38	21	29	0	cbl	snd				
									5	38	46	29	37	0	cbl	snd				
								Total	35					0						
15-Sep-93	7b	1133	1151	18	10.0	TM	SM	2	5	46	37	36	27	3	cbl					
									5	37	33	27	23	0	cbl	snd				numerous red urchins
									5	33	23	23	13	0	cbl	snd				
									5	23	18	13	8	2	bld					few red urchins
									5	18	12	8	2	0	bld		20	lbk	ner	
									5	12	7	2	-3	1	bld		50	lbk	ner	
									10	7	0	-3	-10	0	bld		50	fuc	ner	
								Total	40					6						
15-Sep-93	8a	943	959	16	6.0	TM	SM	2	5	0	12	-6	6	0	bld	rck	90	ner	lbk	
									5	12	14	6	8	0	bld		90	ner		
									5	14	18	8	12	0	bld		50	ner		red urchins .5/m2
									5	18	25	12	19	0	bld		10	lbk		red urchins 1-2/m2
									5	25	27	19	21	0	rck	cbl	20	lbk		
									5	27	29	21	23	0	rck	cbl	40	lbk		
									5	29	32	23	26	0	rck	cbl	20	lbk		
									5	32	33	26	27	0	bld	cbl				
									5	33	35	27	29	0	rck					
									5	35	33	29	27	0	rck					red urchins 1-2/m2
									5	33	36	27	30	1	rck					red urchins .5-1/m2
									5	36	41	30	35	0	rck					red urchins .5-1/m2
									5	41	44	35	38	2	rck					red urchins 1-2/m2
								Total	65					3						
15-Sep-93	8b	959	1015	16	6.5	TM	SM	2	5	44	41	38	35	1	rck	cbl				red urchins 1-2/m2
									5	41	38	35	32	2	rck	cbl				red urchins 1-3/m2
									5	38	36	32	30	2	rck					
									5	36	36	30	30	1	rck					red urchins 1-3/m2
									5	36	35	30	29	0	rck					
									5	35	33	29	27	2	rck					red urchins .5-1m2
									5	33	30	27	24	2	rck					red urchins .5-1m2
									5	30	31	24	25	0	cbl	snd	20	lbk		
									5	31	29	25	23	1	rck		20	lbk		red urchins 1-3/m2
									5	29	27	23	21	0	rck	cbl				red urchins 1-3/m2
									5	27	25	21	19	0	rck	cbl	10	lbk		red urchins .5-1m2
									5	25	23	19	17	0	rck	cbl	30	lbk		
									5	23	20	17	14	0	rck	cbl	30	lbk		
									5	20	15	14	8.5	0	rck		10	ner		red urchins .5/m2
									5	15	15	8.5	8.5	1	rck	snd	10	ner		red urchins 3-6/m2
								Total	75					12						
15-Sep-93	9a	841	855	14	2.5	TM	SM	2	5	5	10	2.5	7.5	0	rck	cbl	70	lbk	fuc	
									5	10	11	7.5	8.5	0	rck	cbl	90	lbk		
									5	11	11	8.5	8.5	0	rck	cbl	70	lbk		
									5	11	11	8.5	8.5	6	cbl	shl	50	lbk	rib	
									5	11	12	8.5	9.5	5	cbl	shl	30	lbk	rib	
									5	12	14	9.5	12	3	gvl	shl	30	lbk	rib	
									5	14	16	12	14	3	gvl	shl	30	lbk	rib	
									5	16	21	14	19	2	gvl	shl	20	lbk	rib	
									5	21	27	19	25	1	gvl	shl	20	lbk		
									5	27	34	25	32	2	gvl	shl	50	lbk		
									5	34	39	32	37	6	gvl	shl	50	lbk		
									5	39	45	37	43	12	gvl	shl	70	lbk	rib	
									5	45	49	43	47	7	cbl	gvl	60	lbk	rib	no abs, no urchins
								Total	65					47						
15-Sep-93	9b	855	909	14	3.5	TM	SM	2	5	49	42	46	39	7	cbl	snd	50	lbk		
									5	42	38	39	35	6	cbl	gvl	30	lbk		
									5	38	34	35	31	5	cbl	gvl	30	lbk		
									5	34	27	31	24	3	gvl	snd	60	lbk		
									5	27	22	24	19	0	gvl	snd	80	lbk	rib	

									5	22	17	19	14	1	gvl	snd	50	lbk	rib	
									5	17	14	14	11	3	gvl	snd	20	lbk	rib	
									5	14	12	11	8.5	8	gvl	snd	50	lbk	rib	
									5	12	10	8.5	6.5	3	gvl	snd	70	lbk	rib	
									5	10	8	6.5	4.5	0	rck	gvl	90	lbk		
									10	8	3	4.5	-1	0	rck		100	lbk		
									4	3	0	-1	-4	0	bld	rck	90	elg	lbk	no abs, no urchins
								Total	64					36						
14-Sep-93	10a	1548	1606	18	3.5	PD	WB	2	5	3	6	-1	2.5	0	cbl	rck				
									5	6	8	2.5	4.5	0	cbl	rck				
									5	8	8	4.5	4.5	0	rck		30	lbk		
									5	8	8	4.5	4.5	0	rck		10	lbk		
									5	8	17	4.5	14	0	rck	snd	40	lbk		
									5	17	20	14	17	0	snd	shl	20	lbk	ner	
									5	20	23	17	20	2	snd	shl	20	lbk		ducks
									5	23	24	20	21	0	snd	shl				
									5	24	25	21	22	0	snd	shl				
									5	25	27	22	24	0	snd	mud	20	lbk		
									5	27	28	24	25	1	snd	shl	20	lbk		
									5	28	29	25	26	0	snd	shl	40	lbk		ducks
									5	29	30	26	27	1	snd	shl	20	lbk		
									5	30	30	27	27	2	snd	rck				
									5	30	32	27	29	0	snd	rck				
									5	32	32	29	29	1	snd	rck	20	lbk		
									5	32	28	29	25	1	rck					
									5	28	24	25	21	0	rck					
									5	24	19	21	16	0	rck					
									5	19	26	16	23	0	rck					
									5	26	40	23	37	3	rck					lots of red urchins
									5	40	47	37	44	4	rck					this transect
								Total	110					15						
14-Sep-93	10b	1606	1625	19	2.5	PD	WB	2	5	47	34	45	32	0	rck					
									5	34	36	32	34	3	rck	snd				
									5	36	35	34	33	2	snd	shl				
									5	35	36	33	34	1	snd	shl	40	lbk		
									5	36	35	34	33	1	snd	shl	60	lbk		ducks 1-2/m2
									5	35	34	33	32	4	snd	shl	60	lbk		ducks 1-2/m2
									5	34	34	32	32	12	snd	shl	60	lbk		ducks 1-2/m2
									5	34	33	32	31	1	snd	shl	30	lbk		
									5	33	32	31	30	1	snd	shl	30	lbk		
									5	32	30	30	28	2	snd	shl	10	lbk		
									5	30	29	28	27	3	snd	shl	10	lbk		
									5	29	27	27	25	0	shl	mud				
									5	27	24	25	22	0	shl	mud	20	lbk		
									5	24	21	22	19	0	snd	shl	30	lbk		
									5	21	17	19	15	0	snd	gvl	10	lbk		
									5	17	15	15	13	0	snd	gvl	40	lbk		
									5	15	12	13	9.5	0	snd	gvl	60	lbk		
									5	12	10	9.5	7.5	0	snd	gvl	70	lbk		
									5	10	8	7.5	5.5	0	cbl	rck	30	lbk	ner	lots of red urchins
									5	8	2	5.5	-1	0	cbl	rck	90	lbk		this transect
								Total	100					30						
14-Sep-93	11a	1450	1503	13	5.5	PD	WB	2	5	3	8	-3	2.5	0	cbl		50	lbk		
									5	8	11	2.5	5.5	0	cbl		10	ner		
									5	11	12	5.5	6.5	0	cbl		100	ulv		red urchins 5/m2
									5	12	16	6.5	11	0	cbl		50	ulv		red urchins 2/m2
									5	16	17	11	12	1	cbl	gvl				red urchins 1/m2
									5	17	19	12	14	5	cbl	gvl				red urchins 1/m2
									5	19	23	14	18	0	gvl	gvl				red urchins 1/m2, few ducks
									5	23	26	18	21	1	shl	gvl				red urchins 1/m2
									5	26	27	21	22	3	shl	gvl				red urchins 1/m2
									5	27	28	22	23	1	gvl	bld				red urchins 3/m2
									5	28	39	23	34	1	gvl					red urchins 4/m2
									5	39	43	34	38	6	gvl					red urchins 2/m2
									5	43	45	38	40	6	gvl					red urchins 1/m2
									5	45	48	40	43	8	gvl					red urchins 1/m2
								Total	70					32						
14-Sep-93	11b	1503	1517	14	5.0	PD	WB	2	5	48	46	43	41	14	gvl					
									5	46	44	41	39	5	gvl		10	lbk		
									5	44	42	39	37	7	gvl		20	lbk		red urchins 2/m2
									5	42	37	37	32	4	gvl		20	lbk		red urchins 3/m2
									5	37	34	32	29	2	gvl					red urchins 1/m2
									5	34	30	29	25	1	gvl					red urchins 1/m2
									5	30	29	25	24	2	gvl	shl				red urchins 8/m2

									5	29	27	24	22	0	shl	gvl				red urchins .5/m2
									5	27	22	22	17	0	gvl	shl				red urchins .5/m2
									5	22	18	17	13	1	gvl					red urchins .5/m2
									5	18	16	13	11	2	cbl					red urchins 2/m2
									5	16	12	11	7	0	cbl					
									5	12	9	7	4	0	cbl		70	lbk		red urchins 3/m2
									5	9	8	4	3	0	cbl		100	lbk		red urchins 3/m2
									5	8	4	3	-1	0	cbl		70	lbk		
								Total	75					38						
14-Sep-93	12a	1445	1502	17	5.5	TM	SM	2	5	0	4	-6	-2	0	cbl	rck	20	fuc	alg	
									5	4	8	-2	2.5	0	rck	cbl	40	lbk	fuc	
									5	8	9	2.5	3.5	0	bld	rck	70	lbk	alg	
									5	9	13	3.5	7.5	0	bld	rck	60	lbk	lam	
									5	13	16	7.5	11	0	rck	cbl	40	lbk	lam	
									5	16	19	11	14	0	cbl	snd	30	lbk	lam	
									5	19	23	14	18	1	cbl	snd	20	lbk	hir	
									5	23	26	18	21	0	cbl	snd	30	lbk	hir	
									5	26	29	21	24	1	cbl	snd	30	lbk		
									5	29	31	24	26	2	snd	shl	20	lbk		
									5	31	35	26	30	0	snd	shl	20	lbk		
									5	35	36	30	31	0	snd	shl	40	lbk		
									5	36	39	31	34	0	snd	shl	60	lbk		
									5	39	41	34	36	2	snd	shl	50	lbk		
									5	41	43	36	38	1	cbl	snd	30	lbk		
									5	43	45	38	40	0	cbl	snd	30	lbk		
									5	45	47	40	42	2	cbl	snd	60	lbk		
								Total	85					9						
14-Sep-93	12b	1502	1518	16	5.0	TM	SM	2	5	47	42	42	37	0	cbl	snd	70	lbk		
									5	42	42	37	37	2	rck	snd	50	lbk		
									5	42	39	37	34	1	bld	snd	50	lbk		
									5	39	37	34	32	0	bld	snd	60	lbk		
									5	37	36	32	31	0	rck	snd	50	lbk		
									5	36	33	31	28	0	cbl	snd	30	lbk		
									5	33	31	28	26	3	cbl	snd	70	lbk		
									5	31	29	26	24	2	cbl	shl	60	lbk		
									5	29	27	24	22	1	cbl	shl	80	lbk		
									5	27	24	22	19	2	snd	shl	50	lbk		
									5	24	21	19	16	0	snd	shl	30	lbk		
									5	21	20	16	15	0	snd	shl	70	lbk		
									5	20	17	15	12	0	snd	shl	50	lbk		
									5	17	14	12	9	0	snd	snd	50	lbk		
									5	14	13	9	8	2	clb	snd	50	lbk		
									5	13	10	8	5	0	cbl	cbl	50	lbk		
									5	10	9	5	4	0	rck		50	lbk		
									12	9	0	4	-5	0	rck		50	lbk		
								Total	97					13						
14-Sep-93	13a	1548	1556	8	3.5	TM	SM	2	5	0	6	-4	2.5	0	rck		70	alg	fuc	
									10	6	9	2.5	5.5	0	rck	snd	50	alg	fuc	
									5	9	14	5.5	11	0	snd	cbl	10	alg		
									5	14	18	11	15	0	snd	cbl	20	lbk		
									5	18	27	15	24	0	snd	shl	10	lbk		
									5	27	34	24	31	0	cbl	snd				red urchins .5/m2
									10	34	41	31	38	0	cbl	snd				red urchins .5/m2
									10	41	43	38	40	0	cbl	snd				red urchins <.5/m2
									15	43	42	40	39	4	cbl	snd				red urchins 1/m2
								Total	70					4						
14-Sep-93	13b	1556	1604	8	3.0	TM	SM	2	5	41	39	38	36	8	cbl	shl	0			ratfish
									5	39	38	36	35	1	cbl	snd	0			good red urchins in
									5	38	37	35	34	0	snd	shl	0			trench @ 40' 1-2/m2
									10	37	34	34	31	0	snd	shl	0			red urchins 1-2/m2
									5	34	26	31	23	0	snd	shl	5	lbk		red urchins 2-4/m2
									10	26	16	23	13	0	snd	shl	0			
									30	16	0	13	-3	0	rck	cbl	70	alg		
								Total	70					9						
15-Sep-93	14a	1620	1628	8	3.5	TM	SM	2	30	0	14	-4	11	0	shl	snd	50	mac	lbk	
									15	14	17	11	14	0	shl	snd	50	lbk	mac	
									20	17	26	14	23	0	shl	snd	70	lbk		
									20	26	33	23	30	0	shl	cbl	50	lbk		
									20	33	41	30	38	0	shl	cbl	30	lbk		
									20	41	47	38	44	0	shl	cbl	30	lbk		
								Total	125					0						
15-Sep-93	14b	1628	1637	9	3.0	TM	SM	2	10	43	40	40	37	0	shl	cbl	20	lbk		
									20	40	36	37	33	0	shl	cbl	50	lbk		
									20	36	28	33	25	0	shl	cbl	50	lbk		

									20	28	22	25	19	0	shl	cbl	50	lbk		
									30	22	15	19	12	0	shl	cbl	30	lbk	mac	
									30	15	0	12	-3	0	shl	cbl	50	mac	ulv	
								Total	130					0						
15-Sep-93	15a	1513	1533	20	6.0	TM	SM	2	5	3	6	-3	0	0	bld	cbl	30	lbk		
									5	6	10	0	4	0	bld	cbl	50	mac	lbk	
									5	10	14	4	8	0	snd	rck	30	mac	lbk	
									10	14	18	8	12	0	cbl	snd	40	mac	lbk	
									5	18	19	12	13	0	snd	shl	20	lbk	mac	
									5	19	21	13	15	0	snd	shl	20	lbk		
									5	21	22	15	16	0	snd	shl	50	lbk		
									5	22	23	16	17	0	snd	shl	80	lbk	hir	
									20	23	26	17	20	0	snd	shl	80	lbk	ulv	
									20	26	29	20	23	0	snd	shl	50	hir	lbk	
									15	29	29	23	23	3	snd	shl	50	lbk	ulv	
									10	29	31	23	25	0	snd	shl	30	lbk		few red urchins
									5	31	32	25	26	3	snd	shl	10	lbk		few red urchins
									5	32	33	26	27	6	snd	shl	10	lbk		few red urchins
									5	33	34	27	28	5	snd		10	lbk		few red urchins
									5	34	35	28	29	2	snd		10	lbk		
									5	35	37	29	31	5	snd		10	lbk		
									5	37	38	31	32	3	snd	shl	20	lbk		
									5	38	41	32	35	5	snd	shl	30	lbk		
									5	41	43	35	37	1	snd	shl	30	lbk		
									5	43	45	37	39	4	snd	shl	40	lbk		
									5	45	47	39	41	6	snd	shl	50	lbk		
								Total	160					43						
15-Sep-93	15b	1533	1554	19	5.5	TM	SM	2	5	44	42	39	37	2	snd	shl	30	lbk		
									5	42	39	37	34	3	snd	shl	40	lbk		
									5	39	36	34	31	4	snd	shl	30	lbk		
									5	36	34	31	29	8	snd	shl	50	lbk		
									5	34	33	29	28	3	snd	shl	20	lbk		
									5	33	33	28	28	3	snd	shl	40	lbk		
									5	33	32	28	27	7	snd	shl	50	lbk		
									5	32	31	27	26	7	snd	shl	20	lbk		
									5	31	30	26	25	5	snd	shl	20	lbk		
									5	30	29	25	24	7	snd	shl	50	lbk		
									5	29	28	24	23	2	snd	shl	20	lbk		
									20	28	24	23	19	0	snd	shl	50	lbk		
									20	24	22	19	17	0	snd	shl	50	hir		
									10	22	21	17	16	0	snd	shl	30	lbk		
									10	21	18	16	13	0	snd	shl	10	hir		
									75	18	0	13	-6	0	snd	shl	0			75m to 0' sand/shl 0 cucs
								Total	190					51						MLLW tide correction



Map of transect locations in subdistrict 103-90C.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 103-90c
Cruise Dates: September 16-17, 1993

Divers: William Bergmann (WB), Bill Davidson (BD), Phil Doherty (PD), Scott Marshall (SM), Tim Minicucci (TM)

Tide Datum: Kareen Passage, Sea Otter Sound/MHW -10'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
17-Sep-93	1a	849	857	8	0.5	TM	WB	2	5	0	8	-0.5	7.5	0		cbl	snd				
									5	8	19	7.5	19	0		cbl	snd				
									5	19	27	19	27	0		cbl	snd				
									5	27	40	27	40	0		cbl	mud				
									5	40	44	40	44	0		mud					
									5	44	45	44	45	0		mud					
									5	45	45	45	45	0		mud					
									5	45	45	45	45	0		mud					
									5	45	45	45	45	0		mud					
									5	45	45	45	45	0		mud					
								Total	50					0							
17-Sep-93	1b	857	804	7	-0.5	TM	WB	2	5	40	39	41	40	0		mud					
									5	39	39	40	40	0		mud					
									5	39	38	40	39	0		mud					
									5	38	32	39	33	0		mud					
									5	32	21	33	22	0		snd	shl				
									5	21	14	22	15	0		rck	snd	50	lbk		
									5	14	5	15	5.5	0		rck	snd	50	lbk		
									3	5	0	5.5	0.5	0		rck	snd	30	lbk		
								Total	38					0							
17-Sep-93	2a	858	930	32	1.0	PD	SM	2	20	0	6	-1	5	0		mud	rck				
									5	6	7	5	6	0		mud					
									5	7	7	6	6	0		mud					
									5	7	7	6	6	0		mud					
									5	7	8	6	7	0		mud					
									5	8	9	7	8	0		mud					
									5	9	9	8	8	0		mud					
									5	9	9	8	8	0		mud					
									5	9	9	8	8	0		mud	shl				
									5	9	9	8	8	0		mud	shl				
									5	9	10	8	9	0		mud	shl				
									40	10	11	9	10	0		mud	shl				
									40	11	12	10	11	0		mud	shl				
									40	12	14	11	13	0		mud	shl				
									20	14	16	13	15	0		mud	shl				
									30	16	20	15	19	0		mud					
									35	20	21	19	20	0		mud					
									30	21	20	20	19	0		mud					
									30	20	21	19	20	0		mud					half way across
									5	21	21	20	20	0		mud					there is no 2b
								Total	340					0							
17-Sep-93	3a	1015	1030	15	4.0	PD	BD	2	100	0	8	-4	4	0		mud		40	elg		
									5	8	18	4	14	0		mud					
									5	18	19	14	15	0		mud	wdy				
									5	19	19	15	15	0		mud					
									5	19	17	15	13	0		mud					
									5	17	21	13	17	0		mud					one small Dungeness
									5	21	26	17	22	0		mud					
									5	26	30	22	26	0		mud					
									5	30	34	26	30	0		mud					
									5	34	35	30	31	0		mud					one small dungeness
									5	35	35	31	31	0		mud					two small dungeness
									5	35	35	31	31	0		mud					
									5	35	33	31	29	0		mud					
									20	33	28	29	24	0		mud					

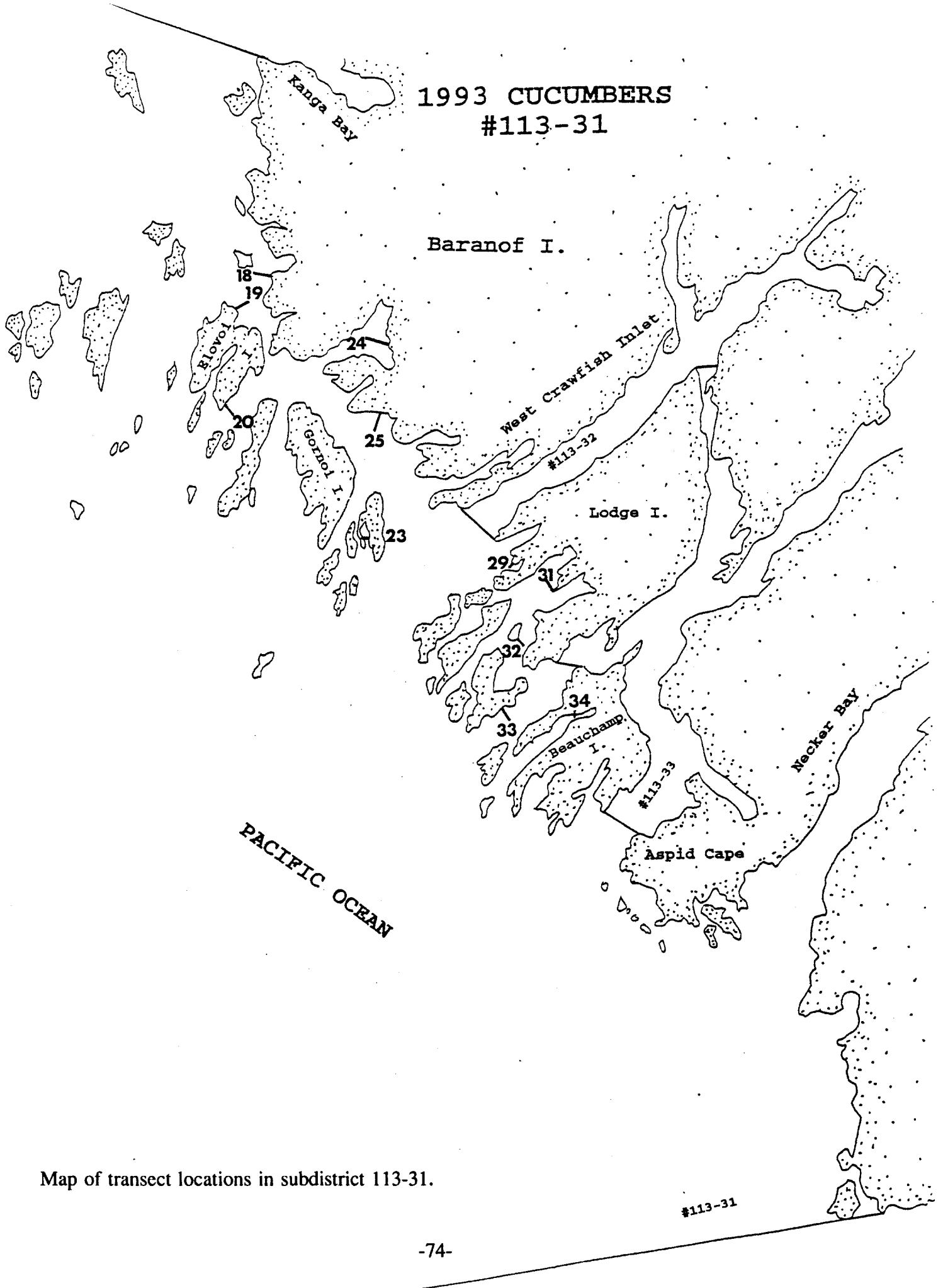
									20	28	32	24	28	1	mud	rck				+ 1 juvenile cuc 6"
									5	32	37	28	33	0	mud					
									5	37	43	33	39	0	mud					
									5	43	47	39	43	0	mud					there is no 3b
								Total	215					1						
17-Sep-93	4a	1257	1318	21	11.5	BD	SM	2	5	0	3	-12	-9	0	rck		10	fuc		
									5	3	12	-8.5	0.5	0	rck		20	fuc		
									5	12	14	0.5	2.5	0	snd	shl	70	elg		
									5	14	21	2.5	9.5	0	snd		70	elg		
									7	21	26	9.5	15	0	snd	shl				5 small dungeness
									5	26	29	15	18	15	mud	shl	10	lbk		
									5	29	29	18	18	0	snd	rck	10	lbk		
									5	29	29	18	18	5	snd	rck	10	lbk		2 small dungeness
									5	29	33	18	22	8	snd	rck	10	lbk		
									5	33	36	22	25	0	mud	shl				
									5	36	40	25	29	0	mud	shl				
									5	40	43	29	32	0	mud	shl				
									5	43	43	32	32	0	mud					
									5	43	42	32	31	0	mud	rck				
									5	42	41	31	30	1	snd	shl	10	lbk		
									5	41	39	30	28	0	snd	shl	10	lbk		
									5	39	34	28	23	1	rck		10	lbk		
									5	34	36	23	25	3	rck					
									5	36	45	25	34	3	rck	snd				
									5	45	48	34	37	0	snd	mud				
								Total	102					36						
17-Sep-93	4b	1318	1339	21	12.0	BD	SM	2	5	48	43	36	31	0	mud					
									5	43	36	31	24	0	mud	shl				
									5	36	31	24	19	9	shl		10	lbk		
									5	31	29	19	17	0	rck	snd	10	lbk		
									5	29	30	17	18	2	rck	snd	10	lbk		
									5	30	34	18	22	1	rck		10	lbk		
									5	34	37	22	25	4	rck	snd	10	lbk		
									5	37	41	25	29	0	mud	snd				
									5	41	44	29	32	0	mud					
									5	44	42	32	30	0	mud	gvl				
									5	42	39	30	27	0	mud	gvl				
									5	39	36	27	24	0	snd	mud				
									5	36	30	24	18	18	mud	rck	10	lbk		
									5	30	30	18	18	3	snd	rck	10	lbk		
									5	30	29	18	17	0	snd	mud	10	lbk		
									5	29	28	17	16	11	mud		30	lbk		
									5	28	25	16	13	0	snd					
									5	25	18	13	6	0	snd		40	elg		
									5	18	13	6	1	0	snd	shl	80	elg		
									5	13	10	1	-2	0	cbl	rck	10	fuc	elg	
									6	10	0	-2	-12	0	rck		40	fuc		
								Total	106					48						
17-Sep-93	5a	1253	1310	17	11.5	TM	WB	2	30	9	9	-2.5	-3	0	rck	cbl	5	fuc		
									5	9	12	-2.5	0.5	0	cbl					
									5	12	13	0.5	1.5	0	snd	shl	100	elg		
									20	13	33	1.5	22	0	mud		10	lbk		
									20	33	41	22	30	2	mud		10	lbk		
									20	41	44	30	33	1	mud					
									20	44	44	33	33	0	mud					
									20	44	44	33	33	0	mud					
									20	44	44	33	33	0	mud					
									20	44	44	33	33	0	mud					
									20	44	45	33	34	0	mud					
								Total	200					3						
17-Sep-93	5b	1310	1326	16	12.0	TM	WB	2	20	45	44	33	32	0	mud					
									20	44	45	32	33	0	mud					
									20	45	44	33	32	0	mud					
									20	44	45	32	33	0	mud					
									20	45	46	33	34	2	mud					
									20	46	44	34	32	0	mud	cbl				
									20	44	38	32	26	1	mud	cbl	30	lbk		
									20	38	22	26	10	0	mud	cbl	50	lbk		
									10	22	18	10	6	0	snd	shl	50	lbk		
									5	18	16	6	4	0	snd	shl	50	lbk		
									10	16	12	4	0	0	snd	shl	100	elg		
									5	12	7	0	-5	0	snd	shl	10	lbk		
									20	7	0	-5	-12	0	snd	cbl				
								Total	210					3						

17-Sep-93	6a	924	928	4	1.5	TM	WB	2	5	0	16	-1.5	15	0	rck		10	lbk		
									5	16	20	15	19	0	rck		10	lbk		
									5	20	29	19	28	0	rck	snd				
									5	29	39	28	38	0	snd	shl				
									5	39	49	38	48	0	shl	mud				stripe shrimp
								Total	25					0						
17-Sep-93	6b	928	932	4	1.5	TM	WB	2	5	49	43	48	42	0	mud	shl				
									5	43	37	42	36	0	mud	shl				
									5	37	30	36	29	0	snd	shl				
									5	30	25	29	24	0	snd					
									5	25	19	24	18	0	snd	rck	10	agm		
									6	19	0	18	-2	0	rck		10	lbk		no abs, urchins or ducks
								Total	31					0						
17-Sep-93	7a	829	833	4	0.0	WB	TM	2	5	0	12	0	12	0	rck	snd	30	agm	fuc	
									5	12	24	12	24	0	snd	rck	30	agm		
									5	24	33	24	33	0	snd	rck	10	agm		
									5	33	50	33	50	0	snd	rck				
								Total	20					0						
17-Sep-93	7b	833	836	3	0.0	WB	TM	2	5	50	37	50	37	0	rck	snd				
									5	37	25	37	25	0	rck	snd				strip shrimp
									5	25	17	25	17	0	rck	snd	20	agm		
									5	17	9	17	9	0	rck	snd	50	agm	lam	
									6	9	0	9	0	0	rck	snd	40	fuc	agm	no abs, urchins or ducks
								Total	26					0						
17-Sep-93	8a	1405	1423	18	12.0	PD	SM	2	5	7	10	-5	-2	0	cbl		10	fuc		
									5	10	13	-2	1	0	gvl	shl	30	fuc		
									5	13	16	1	4	0	mud		90	elg		
									5	16	18	4	6	0	mud		90	elg		
									5	18	23	6	11	0	mud		80	elg		
									5	23	27	11	15	0	mud	snd				
									5	27	30	15	18	0	mud					
									5	30	34	18	22	0	gvl	mud	10	lbk		
									5	34	35	22	23	3	gvl	mud	10	lbk		
									5	35	37	23	25	2	gvl	mud	10	lbk		
									5	37	33	25	21	5	bld	gvl	30	lbk		
									5	33	30	21	18	6	bld		30	lbk		
									5	30	32	18	20	0	bld	gvl	30	lbk		
									5	32	33	20	21	2	bld	gvl	50	lbk		
									5	33	41	21	29	3	bld	gvl	20	lbk		
									5	41	47	29	35	0	bld					
									5	47	50	35	38	0	bld					
								Total	85					21						
17-Sep-93	8b	1423	1441	18	12.0	PD	SM	2	5	50	50	38	38	0	mud	bld				
									5	50	49	38	37	0	mud					
									5	49	44	37	32	0	mud					
									5	44	42	32	30	0	mud					
									5	42	40	30	28	1	mud	bld	5	lbk		
									5	40	37	28	25	0	mud	gvl				
									5	37	36	25	24	0	gvl	gvl				
									5	36	33	24	21	0	gvl	shl	10	lbk		
									5	33	27	21	15	8	gvl	bld	10	lbk		
									5	27	26	15	14	0	mud	mud	10	lbk		
									5	26	24	14	12	0	mud		10	lbk		
									5	24	19	12	7	0	mud		90	elg		
									5	19	15	7	3	0	mud		90	elg		
									5	15	12	3	0	0	mud	gvl	80	elg		
									5	12	8	0	-4	0	cbl	gvl	20	lbk	fuc	
									5	8	3	-4	-9	0	cbl					
								Total	80					9						
16-Sep-93	9a	1208	1222	14	11.0	WB	SM	2	5	0	16	-11	5	0	rck		5	fuc	lbk	
									5	16	31	5	20	2	rck	snd	20	lbk		
									5	31	37	20	26	2	gvl	snd	10	agm		
									5	37	39	26	28	0	gvl	snd	5	agm		red urchins .5/m2
									5	39	41	28	30	14	gvl	snd	5	lbk		
									5	41	42	30	31	18	gvl	snd	5	lbk		
									5	42	42	31	31	10	gvl	snd	5	lbk		
									5	42	41	31	30	5	gvl	snd	5	lbk		red urchins .25/m2
									5	41	37	30	26	3	cbl	rck	10	lbk		red urchins .25/m2
									5	37	34	26	23	6	rck		10	lbk		red urchins .25/m2
									5	34	35	23	24	4	rck		10	lbk		red urchins .25/m2
									5	35	38	24	27	0	rck		10	lbk		red urchins .25/m2
									5	38	50	27	39	4	rck		10	lbk		metridium
								Total	65					68						
16-Sep-93	9b	1349	1408	19	11.5	WB	TM	2	5	50	49	39	38	4	snd	cbl				

								5	49	46	38	35	0	snd	cbl				red urchin 1/m2
								5	46	45	35	34	0	snd	shl				red urchin 1/m2
								5	45	44	34	33	0	snd	shl				red urchin 1/m2
								5	44	43	33	32	0	snd	shl				
								5	43	41	32	30	0	snd	shl	10	lbk		
								5	41	37	30	26	1	snd	shl	20	lbk		
								5	37	31	26	20	4	snd	bld	50	lbk		
								5	31	19	20	7.5	0	bld	rck	50	lbk		
								10	19	16	7.5	4.5	0	rck	bld	30	lbk	fuc	
							Total	55					9						
16-Sep-93	10a	1503	1513	10	9.5	WB	SM	2	5	3	9	-6.5	-1	0	rck	snd	80	fuc	elg	
									5	9	15	-0.5	5.5	0	rck	bld	80	lam		
									5	15	22	5.5	13	0	bld	snd	50	lam		
									5	22	27	13	18	0	snd	gvl	30	lbk		
									5	27	35	18	26	1	snd	gvl	10	lbk		
									5	35	40	26	31	4	snd	mud	10	lbk		
									5	40	44	31	35	0	mud	shl	5	lbk		
									5	44	49	35	40	8	mud	shl	5	lbk		no urchins, no ducks
							Total	40					13						
16-Sep-93	10b	1513	1522	9	9.0	WB	SM	2	5	50	42	41	33	2	mud	snd				
									5	42	36	33	27	1	gvl	snd	5	lbk		
									5	36	30	27	21	4	gvl	snd	20	lbk		2 rock scallops
									5	30	25	21	16	0	snd		20	lbk		1 abalone
									5	25	20	16	11	0	snd	gvl	20	lbk		
									5	20	17	11	8	0	gvl		40	lbk		
									5	17	12	8	3	0	cbl	hir	80	lbk		
									5	12	10	3	1	0	cbl	gvl	80	lbk	hir	
									5	10	8	1	-1	0	gvl		70	fuc	fir	
									5	8	0	-1	-9	0	gvl	rck	30	fuc		no urchins, no ducks
							Total	50					7						
16-Sep-93	11a	1058	1120	22	8.5	WB	SM	2	5	3	8	-5.5	-1	0	gvl	shl	10	fuc		
									5	8	13	-0.5	4.5	0	mud	shl	20	lbk		
									5	13	17	4.5	8.5	0	mud	shl	30	lbk		
									5	17	19	8.5	11	0	mud		40	lbk		
									5	19	21	11	13	0	mud	gvl	40	lbk		
									5	21	22	13	14	0	mud	gvl	60	lbk		
									5	22	23	14	15	2	mud	gvl	80	lbk		
									5	23	23	15	15	7	mud	gvl	80	lbk		
									5	23	23	15	15	1	mud	gvl	10	lbk		
									5	23	23	15	15	0	mud	gvl	50	lbk		
									5	23	24	15	16	2	mud		30	lbk		
									5	24	24	16	16	1	mud		50	lbk		
									5	24	25	16	17	0	mud	gvl	50	lbk		
									5	25	26	17	18	1	mud	gvl	50	lbk		
									5	26	25	18	17	0	mud	gvl	20	lbk		
									5	25	24	17	16	0	mud	gvl	40	lbk		
									5	24	24	16	16	0	mud	gvl	20	lbk		
									5	24	22	16	14	0	mud	snd	40	lbk		
									5	22	20	14	12	1	mud	bld	50	lbk		
									5	20	20	12	12	3	snd	bld	60	lbk		
									5	20	20	12	12	5	snd	bld	80	lbk		
									5	20	20	12	12	5	mud	bld	100	lbk		
									5	20	18	12	9.5	0	mud	rck	90	lbk		
									5	18	30	9.5	22	1	rck	mud	50	lbk		
									5	30	38	22	30	2	rck	mud	40	lbk		
									5	38	48	30	40	0	snd		10	lbk		
							Total	130					31						
16-Sep-93	11b	1120	1141	21	9.5	WB	SM	2	5	44	37	35	28	0	snd	rck	5	lbk		
									5	37	25	28	16	1	rck		20	lbk		
									5	25	15	16	5.5	1	rck		30	lbk		
									5	15	16	5.5	6.5	2	rck		60	lbk		
									5	16	16	6.5	6.5	1	rck	mud	60	lbk		
									5	16	16	6.5	6.5	2	gvl	mud	80	lbk		
									5	16	16	6.5	6.5	1	gvl	mud	50	lbk		
									5	16	20	6.5	11	1	gvl	rck	30	lbk		
									5	20	22	11	13	0	gvl		30	lbk		
									5	22	24	13	15	0	gvl	mud	20	lbk		
									5	24	26	15	17	0	mud	gvl	10	lbk		
									5	26	26	17	17	0	mud	gvl	10	lbk		
									5	26	25	17	16	0	mud	gvl	20	lbk		
									5	25	25	16	16	2	mud	gvl	20	lbk		
									5	25	26	16	17	2	mud	gvl	20	lbk		
									5	26	26	17	17	5	mud	gvl	80	lbk		
									5	26	24	17	15	0	mud		80	fir		

									5	24	24	15	15	0	mud		20	fir		
									5	24	24	15	15	0	mud		10	fir		
									5	24	23	15	14	0	mud		10	fir		
									5	23	22	14	13	0	mud		20	lbk		
									5	22	22	13	13	0	mud		80	lbk		
									5	22	20	13	11	0	gvl		80	lbk		
									5	20	19	11	9.5	0	gvl		70	lbk	fir	
									5	19	15	9.5	5.5	0	gvl		70	lbk	fir	
									5	15	11	5.5	1.5	0	gvl		70	lbk	fir	
									5	11	6	1.5	-4	0	bld		30	fuc		
								Total	135					18						
16-Sep-93	12a	1600	1629	29	6.0	TM	PD	2	5	6	21	0	15	0	rck	bld	10	fuc		4 red urchins
									5	21	31	15	25	3	rck	bld				
									5	31	39	25	33	4	bld	snd	20	lbk		
									10	39	48	33	42	1	snd					
								Total	25					8						
16-Sep-93	12b	1629	1658	29	4.5	TM	PD	2	5	47	42	43	38	2	snd	shl	10	lbk		
									5	42	36	38	32	2	snd	shl				
									5	36	30	32	26	2	snd	bld				3 red urchins
									5	30	19	26	15	0	bld					
									5	19	10	15	5.5	0	bld	rck				
									5	10	1	5.5	-4	0	bld	rck				
								Total	30					6						
16-Sep-93	13a	1723	1739	16	2.0	TM	BD	2	5	0	5	-2	3	0	cbl	gvl	50	lbk	hir	
									10	5	9	3	7	3	sbd	gvl	30	lbk		1 rock scallop
									10	9	12	7	10	0	gvl	snd	20	lbk	hir	
									10	12	15	10	13	0	gvl		40	lbk		
									20	15	20	13	18	0	snd	gvl	60	lbk		decaying lbk
									10	20	20	18	18	3	snd	shl	40	lbk		
									5	20	21	18	19	2	snd	shl	40	lbk		
									5	21	23	19	21	2	snd	shl	50	lbk		
									5	23	25	21	23	7	snd	cbl	60	lbk		
									5	25	27	23	25	1	snd	shl	30	lbk		
									5	27	31	25	29	0	snd	shl	20	lbk		
									5	31	35	29	33	4	snd		10	lbk		
									5	35	38	33	36	2	snd	shl	10	lbk		
									15	38	49	36	47	0	snd	gvl				
								Total	115					24						
16-Sep-93	13b	1739	1754	15	1.5	TM	BD	2	10	49	39	48	38	0	snd	gvl				
									10	39	32	38	31	7	snd	cbl	10	lbk		1 small Dungeness
									5	32	30	31	29	11	snd	gvl	10	lbk		juv. quillback rockfish
									5	30	25	29	24	7	snd	shl	20	lbk		decomposing lbk
									5	25	23	24	22	2	snd		40	lbk		
									5	23	21	22	20	1	snd	shl	60	lbk		
									5	21	19	20	18	2	snd	rck	50	lbk		
									10	19	16	18	15	0	snd	rck	60	lbk		
									10	16	14	15	13	0	gvl	snd	50	lbk		
									10	14	10	13	8.5	0	gvl	snd	20	lbk		
									20	10	5	8.5	3.5	1	cbl	gvl	40	lbk		
									5	5	2	3.5	0.5	0	cbl	gvl	30	fuc		
									35	2	0	0.5	-2	0	cbl	gvl	10	fuc		
								Total	135					31						
16-Sep-93	14a	1242	1257	15	11.5	BD	PD	2	30	0	12	-12	0.5	0	rck		70	fuc		
									5	12	12	0.5	0.5	0	rck	cbl	70	fuc		
									5	12	11	0.5	-1	0	cbl		30	fuc		
									5	11	13	-0.5	1.5	0	cbl		30	fuc	fir	
									5	13	13	1.5	1.5	0	cbl		50	hir	mac	
									5	13	16	1.5	4.5	1	cbl	gvl	50	hir	mac	
									5	16	17	4.5	5.5	0	cbl	gvl	50	lbk	mac	
									5	17	19	5.5	7.5	0	cbl	gvl	50	lbk	mac	
									5	19	20	7.5	8.5	1	cbl	gvl	70	lbk	mac	
									5	20	22	8.5	11	0	cbl	gvl	70	lbk	mac	
									5	22	24	11	13	1	cbl	gvl	70	lbk	mac	
									5	24	26	13	15	2	cbl	snd	30	lbk	mac	
									5	26	30	15	19	0	snd	cbl	10	lbk		
									5	30	33	19	22	1	snd		10	lbk		
									5	33	36	22	25	1	snd	gvl	30	lbk		
									5	36	39	25	28	16	snd		30	lbk		
									5	39	45	28	34	15	snd	shl	30	lbk		no urchins
								Total	110					38						
16-Sep-93	14b	1257	1312	15	12.0	BD	PD	2	5	48	44	36	32	11	snd	shl	30	lbk		
									5	44	41	32	29	18	snd	shl	10	lbk		
									5	41	36	29	24	5	snd	shl	30	lbk		
									5	36	33	24	21	4	snd	gvl	40	lbk		

									5	33	30	21	18	3	snd	gvl	60	lbk	mac	
									5	30	28	18	16	1	cbl	snd	70	lbk	mac	
									5	28	27	16	15	7	gvl	cbl	50	lbk	mac	
									5	27	24	15	12	1	gvl	cbl	80	lbk	mac	
									5	24	23	12	11	0	cbl	gvl	80	lbk	mac	
									5	23	20	11	8	3	cbl		80	lbk	mac	
									5	20	19	8	7	2	cbl		40	lbk	mac	
									5	19	17	7	5	1	cbl		60	mac	lbk	
									5	17	17	5	5	0	cbl		60	mac	lbk	
									5	17	15	5	3	0	cbl	rck	30	lbk	lbk	
									5	15	12	3	0	0	rck		30	fir		
									5	12	6	0	-6	0	rck		10	fuc		
									40	6	0	-6	-12	0	rck		10	fuc		
								Total	120					56						
16-Sep-93	15a	1137	1147	10	10.0	PD	BD	2	5	0	3	-10	-7	0	rck					
									5	3	9	-7	-1	0	rck					
									5	9	17	-1	7	0	mud	40	elg			
									5	17	24	7	14	0	mud	80	elg	lbk		
									5	24	32	14	22	11	mud	5	lbk			
									5	32	37	22	27	12	mud	5	lbk			
									5	37	44	27	34	1	mud					1 small dungeness
									5	44	49	34	39	4	mud	5	lbk			
								Total	40					28						
16-Sep-93	15b	1147	1156	9	10.0	PD	BD	2	5	49	44	39	34	1	mud	shl	5	lbk		
									5	44	38	34	28	6	mud	shl	10	lbk		1 small dungeness
									5	38	36	28	26	2	mud	snd	30	lbk		
									5	36	33	26	23	4	mud	shl	40	lbk		
									5	33	25	23	15	12	bld		40	lbk		1 abalone
									5	25	21	15	11	14	bld	mud	60	lbk		1 abalone
									5	21	16	11	6	5	bld	cbl	40	lbk		
									5	16	16	6	6	0	bld	cbl	20	lbk	elg	
									5	16	10	6	0	0	mud		100	elg		
									5	10	7	0	-3	0	rck		50	elg		
									5	7	6	-3	-4	0	rck		20	fuc		
									10	6	0	-4	-10	0	rck		20	fuc		
								Total	65					44						MLLW tide correction



Map of transect locations in subdistrict 113-31.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 113-31
Cruise Dates: June 17, 1993

Divers: Bob DeJong (BDJ), Tim.Minicucci (TM), Tory O'Connell (TO), Scott Walker (SW)

Tide Datum: Sitka/MHW -9'

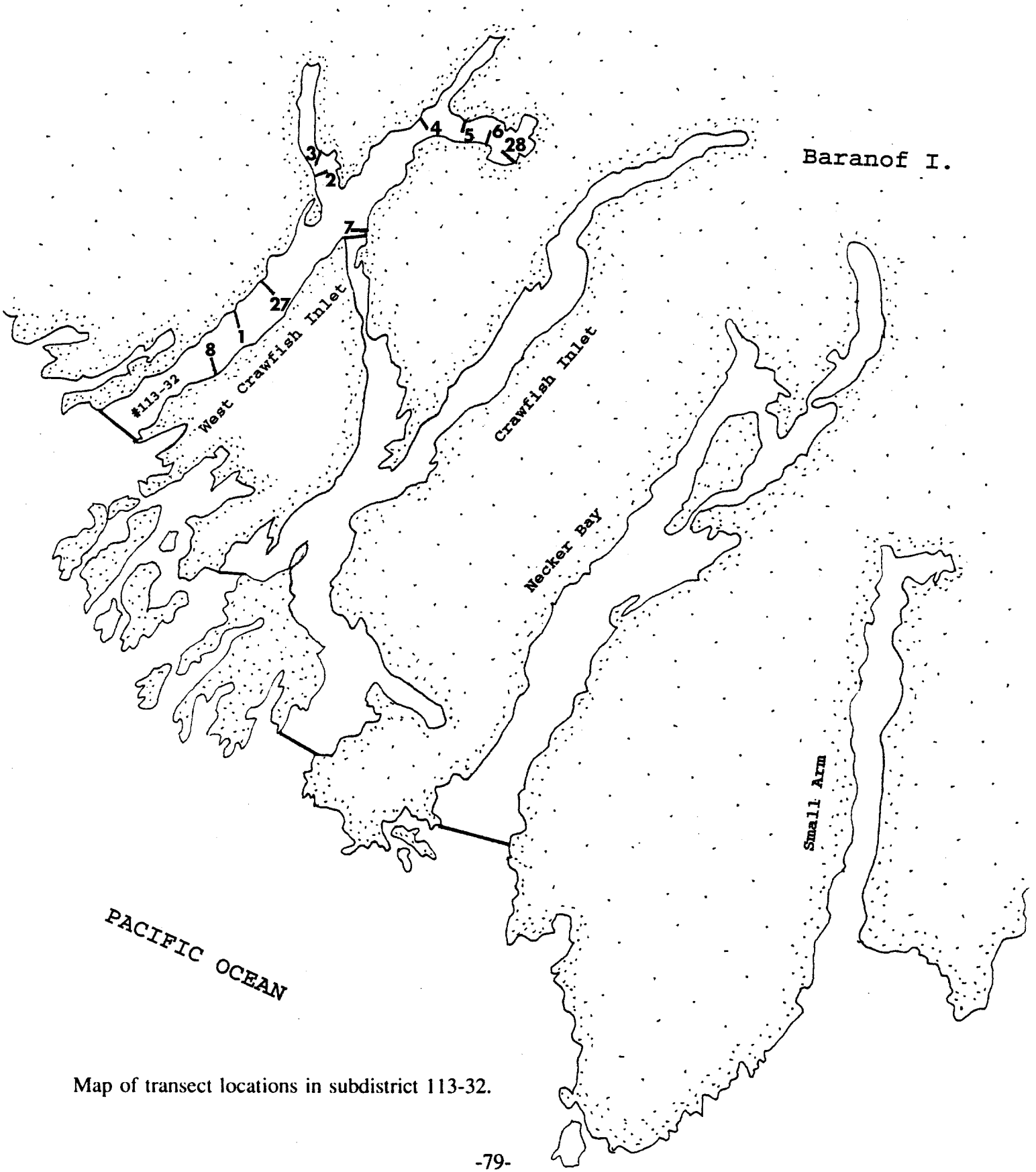
Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
17-Jun-93	18a	1300	1319	19	7.0	TO	SW	2	2	0	4	-7	-3	0		cbl		20	fuc		
									10	4	8	-3	1	1		cbl		40	ulv	fil	
									6	8	10	1	3	3		cbl		100	lbk		
									5	10	11	3	4	5		mud		100	lbk		
									4	11	12	4	5	9		snd		100	lbk		
									4	12	14	5	7	6		snd					
									5	14	15	7	8	7		snd	cbl	100	lbk		
									5	15	17	8	10	7		snd	bld	100	lbk		
									5	17	18	10	11	7		snd	bld	75	lbk		
									4	18	20	11	13	5		snd	bld	100	lbk		
									4	20	20	13	13	4		snd	bld	100	lbk		
									5	20	23	13	16	8		snd		100	lbk		
									5	23	23	16	16	6		snd		100	lbk		geoducks
									10	23	26	16	19	1		snd		90	lbk		
								Total	74					69							
17-Jun-93	18b	1319	1338	19	7.0	TO	SW	2	15	28	24	21	17	0		snd		50	lbk		half way across
									10	24	22	17	15	0		snd		75	lbk		
									5	22	19	15	12	5		snd		75	lbk		
									5	19	18	12	11	7		snd		75	lbk		
									3	18	15	11	8	7		snd		75	lbk		
									5	15	14	8	7	8		snd		75	lbk		
									6	14	13	7	6	9		snd		75	lbk		geoducks
									8	13	12	6	5	7							
								Total	57					43							
17-Jun-93	19a	1152	1213	21	7.0	TO	SW	2	3	0	4	-7	-3	0		bld		75	fuc	lbk	
									5	4	13	-3	6	1		bld		100	lbk		
									5	13	16	6	9	2		bld		100	lbk		
									5	16	19	9	12	0		snd	bld	100	lbk		
									5	19	24	12	17	4		snd		50	lbk		
									10	24	26	17	19	0		snd		50	lbk		many geoducks
									10	26	31	19	24	0		snd		75	lbk		many geoducks
									10	31	35	24	28	0		snd		75	lbk		many geoducks
									15	35	37	28	30	3		snd		75	lbk		many geoducks
									10	37	35	30	28	0		snd	cbl	75	lbk		
									5	35	33	28	26	1		rck	snd	75	lbk		
									10	33	33	26	26	0		rck	snd	75	lbk		
									10	33	27	26	20	0		rck	snd	75	lbk		
								Total	103					11							
17-Jun-93	19b	1230	1242	12	7.0	TO	SW	2	4	0	4	-7	-3	0		rck		20	fuc		
									5	4	9	-3	2	0		bld		100	lbk		
									4	9	18	2	11	0		bld		100	lbk		
									6	18	27	11	20	0		snd		75	lbk		
									10	27	33	20	26	0		snd		75	lbk		
									10	33	39	26	32	1		snd		75	lbk		geoducks
									3	39	46	32	39	1		snd		75	lbk		
									4	46	50	39	43	0		snd		75	lbk		
								Total	46					2							
17-Jun-93	20a	1119	1127	8	6.5	TO	SW	2	2	0	4	-6.5	-2.5	0		rck		50	fuc		
									5	4	16	-2.5	9.5	0		rck		100	lbk		
									6	16	21	9.5	14.5	0		rck		20	lbk		many small abs.
									10	21	29	15	22.5	1		rck		50	lbk		
									10	29	36	23	29.5	0		bld		70	lbk		
									13	36	36	30	29.5	0		snd	cbl	70	lbk		no urchins
								Total	46					1							
17-Jun-93	20b	1127	1135	8	7.0	TO	SW	2	10	36	41	29	34	0		rck	cbl	50	lbk		

									15	41	31	34	24	0	cbl	snd	75	lbk		many small abs.
									10	31	25	24	18	0	bld		80	lbk		
									7	25	17	18	10	0	bld		80	lbk		
									15	17	7	10	0	3	bld		80	lbk		
									11	7	0	0	-7	0	rck		100	lbk	fuc	
								Total	68					3						
17-Jun-93	23a	1217	1223	6	7.0	TM	BD	2	1	0	3	-7	-4	0	rck		10	fuc		
									5	3	11	-4	4	0	rck		90	lbk		
									5	11	20	4	13	0	rck		90	lbk		
									5	20	29	13	22	3	rck		90	lbk		
									5	29	35	22	28	1	rck		50	lbk		
									5	35	42	28	35	0	rck		20	lbk		
									4	42	49	35	42	1	rck		5	lbk		no urchins or abs
								Total	30					5						
17-Jun-93	23b	1223	1229	6	7.0	TM	BD	2	5	50	41	43	34	1	rck		0			
									5	41	35	34	28	1	bld		10	lbk		
									5	35	27	28	20	1	bld		30	lbk		
									5	27	15	20	8	0	bld		40	lbk		
									5	15	10	8	3	0	bld		70	lbk		
									5	10	6	3	-1	0	bld		80	lbk		
									3	6	0	-1	-7	0	bld		90	lbk		no urchins or abs
								Total	33					3						
17-Jun-93	24a	919	933	14	4.0	TO	SW	2	5	0	3	-4	-1	0	mud	snd	20	elg	fuc	
									10	3	5	-1	1	1	mud		100	elg		
									5	5	13	1	9	4	mud		20	lbk		
									10	13	19	9	15	0	mud		50	lbk		
									5	19	19	15	15	0	mud		100	lbk		dung. crab
									10	19	21	15	17	0	mud		100	lbk		
									10	21	23	17	19	3	mud		100	lbk		
									12	23	26	19	22	0	mud		50	lbk		
									10	26	31	22	27	0	mud		10	lbk		
									10	31	35	27	31	0	mud					
									7	35	37	31	33	3	mud					
									15	37	40	33	36	0	mud					
									15	40	46	36	42	0	mud					
								Total	124					11						
17-Jun-93	24b	933	946	13	4.5	TO	SW	2	20	45	39	41	34.5	0	mud					
									10	39	37	35	32.5	3	mud					
									5	37	35	33	30.5	5	mud					
									10	35	30	31	25.5	5	mud					
									5	30	28	26	23.5	4	mud					
									5	28	27	24	22.5	4	mud		30	lbk		
									5	27	23	23	18.5	4	mud		30	lbk		
									5	23	18	19	13.5	3	mud		100	lbk		
									10	18	14	14	9.5	4	mud		100	lbk		
									4	14	10	9.5	5.5	0	mud		60	lbk		
									7	10	0	5.5	-4.5	0	mud		80	elg	fuc	muck dive
								Total	86					32						
17-Jun-93	25a	830	843	13	2.5	TOC	SW	2	4	0	3	-2.5	0.5	0	bld	snd	100	elg	fuc	
									5	3	6	0.5	3.5	0	snd		100	elg		sample taken
									5	6	7	3.5	4.5	0	cbl		100	lbk		
									5	7	9	4.5	6.5	0	snd		100	lbk		
									5	9	13	6.5	10.5	0	snd		100	lbk		
									5	13	16	11	13.5	0	snd		100	lbk		
									5	16	19	14	16.5	0	snd		90	lbk		
									5	19	23	17	20.5	0	snd		80	lbk		
									5	23	26	21	23.5	0	cbl		80	lbk		
									5	26	31	24	28.5	0	snd		80	lbk		
									5	31	37	29	34.5	0	bld	snd	20	lbk		
									5	37	50	35	47.5	0	bld	snd	10	lbk		
								Total	59					0						
17-Jun-93	25b	843	855	12	2.5	TOC	SW	2	7	50	41	48	38.5	2	cbl		10	lbk		
									5	41	37	39	34.5	2	cbl		10	lbk		
									5	37	33	35	30.5	2	cbl		20	lbk		
									5	33	27	31	24.5	2	cbl		20	lbk		
									5	27	21	25	18.5	0	rck		10	lbk		
									5	21	14	19	11.5	0	rck	snd	20	lbk		
									5	14	8	12	5.5	0	bld		100	lbk		
									5	8	6	5.5	3.5	0	snd		100	lbk		
									6	6	0	3.5	-2.5	0	bld		100	lbk		
								Total	48					8						
17-Jun-93	29a	1140	1145	5	7.0	TM	BD	2	1	0	2	-7	-5	0	rck		50	fuc	lbk	
									5	2	12	-5	5	0	rck		90	lbk		many urchins
									5	12	21	5	14	0	rck					many urchins

									5	21	31	14	24	0	rck					many urchins
									5	31	45	24	38	2	rck					few urchins
									3	45	49	38	42	2	rck					
								Total	24					4						
17-Jun-93	29b	1145	1149	4	7.0	TM	BD	2	5	50	42	43	35	2	rck					
									5	42	37	35	30	2	rck					some urchins
									3	37	28	30	21	0	rck					some urchins
									3	28	24	21	17	0	rck					some urchins
									5	24	15	17	8	2	rck					many urchins
									5	15	8	8	1	0	rck		50	lbk	fuc	
									3	8	0	1	-7	0	rck		30	fuc	lbk	
								Total	29					6						
17-Jun-93	31a	1105	1114	9	6.5	TM	BD	2	2	0	5	-6.5	-1.5	0	rck		50	fuc		
									5	5	10	-1.5	3.5	7	rck	snd	50	elg	lbk	
									5	10	20	3.5	13.5	25	cbl	snd	50	elg	lbk	
									5	20	27	14	20.5	19	snd	snd	50	lbk		few urchins
									5	27	36	21	29.5	14	snd	cbl	30	lbk		few urchins
									5	36	43	30	36.5	2	snd	cbl	10	lbk		
									5	43	49	37	42.5	5	snd	cbl	5	lbk		
								Total	32					72						
17-Jun-93	31b	1114	1123	9	6.5	TM	BD	2	5	50	42	44	35.5	4	snd	cbl	5	lbk		
									5	42	38	36	31.5	4	snd	cbl	15	lbk		
									5	38	32	32	25.5	9	snd	cbl	30	lbk		
									5	32	26	26	19.5	14	snd	cbl	50	lbk		
									5	26	21	20	14.5	11	snd	cbl	70	lbk		
									5	21	12	15	5.5	16	rck	slt	70	lbk		
									3	12	6	5.5	-0.5	2	rck	slt	50	lbk		
									3	6	0	-0.5	-6.5	0	rck		30	fuc		no urchins or abs
								Total	36					60						
17-Jun-93	32a	1008	1020	12	5.5	TM	BD	2	1	0	2	-5.5	-3.5	0	bld		30	fuc		
									5	2	11	-3.5	5.5	17	bld	slt	70	lbk		
									5	11	21	5.5	15.5	25	bld	slt	50	lbk		
									5	21	28	16	22.5	14	cbl	snd	50	lbk		
									5	28	34	23	28.5	12	cbl	snd	30	lbk		
									5	34	38	29	32.5	4	slt	mud	10	lbk		
									5	38	41	33	35.5	2	slt	mud	5	lbk		
									5	41	42	36	36.5	3	slt	mud				
									5	42	43	37	37.5	3	slt	mud				
									5	43	44	38	38.5	3	slt	mud				
									10	44	47	39	41.5	0	slt	rck	5	lbk		no urchins or abs
								Total	56					83						
17-Jun-93	32b	1020	1032	12	5.5	TM	BD	2	10	50	47	45	41.5	8	slt	mud				
									10	47	43	42	37.5	4	rck	slt				
									10	43	39	38	33.5	3	cbl	slt	5	lbk		
									10	39	31	34	25.5	9	cbl	slt	20	lbk		
									7	31	25	26	19.5	13	cbl	slt	20	lbk		
									5	25	16	20	10.5	20	cbl	slt	50	lbk		
									5	16	6	11	0.5	4	rck	slt	51	lbk	alg	
									5	6	0	0.5	-5.5	0	rck		50	lbk	fuc	no urchins or abs.
								Total	62					61						
17-Jun-93	33a	935	942	7	4.0	TM	BD	2	3	0	3	-4	-1	0	rck		50	lbk		
									5	3	11	-1	7	0	bld		30	lbk		many urchins
									5	11	16	7	12	0	bld		10	lbk		red urchins 10-12m2
									5	16	25	12	21	0	bld					red urchins 8-10 m2
									5	25	34	21	30	7	bld					red urchins 8-10 m2
									5	34	41	30	37	2	bld	snd				red urchins 2-5m2
									5	41	49	37	45	1	bld	snd				
								Total	33					10						
17-Jun-93	33b	942	949	7	4.5	TM	BD	2	10	50	45	46	40.5	4	bld	snd				few red urchins
									5	45	38	41	33.5	0	bld					
									5	38	31	34	26.5	1	bld					
									5	31	21	27	16.5	0	bld					few red urchins
									5	21	12	17	7.5	1	bld		30	lbk		
									5	12	8	7.5	3.5	0	bld		70	lbk		few red urchins
									7	8	0	3.5	-4.5	0	bld		70	lbk		
								Total	42					6						
17-Jun-93	34a	847	904	17	3.0	TM	BD	2	2	0	7	-3	4	0	rck		30	fuc		
									5	7	14	4	11	4	rck		10	lbk		
									5	14	23	11	20	7	rck		10	lbk		
									5	23	27	20	24	9	mud	shl	5	lbk		
									5	27	29	24	26	7	mud	shl	10	lbk		
									5	29	31	26	28	6	mud	shl	10	lbk		survey half way acros
									5	31	33	28	30	8	mud	shl	5	lbk		
									5	33	32	30	29	4	mud	shl	5	lbk		

									5	32	31	29	28	4	mud	shl	5	lbk	no urchins or abs.
								Total	42					49					
17-Jun-93	34b	904	921	17	3.5	TM	BD	2	5	31	22	28	18.5	12	mud	cbl	70	lbk	
									5	22	21	19	17.5	12	mud	cbl	90	lbk	
									5	21	19	18	15.5	14	rck	snd	90	lbk	
									5	19	20	16	16.5	14	rck	snd	80	lbk	
									5	20	21	17	17.5	24	rck	mud	60	lbk	
									5	21	13	18	9.5	18	rck		50	lbk	
									5	13	6	9.5	2.5	3	rck		30	lbk	sample taken
									6	6	0	2.5	-3.5	0	rck		30	fuc	no urchins or abs.
								Total	41					97					MLLW tide correction

1993 CUCUMBERS
#113-32



Map of transect locations in subdistrict 113-32.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 113-32 West Crawfish
Cruise Dates: June 16, 1993

Divers: Bob DeJong (BDJ), Brian Lynch (BL), Tim Minicucci (TM), Scott Walker (SW)

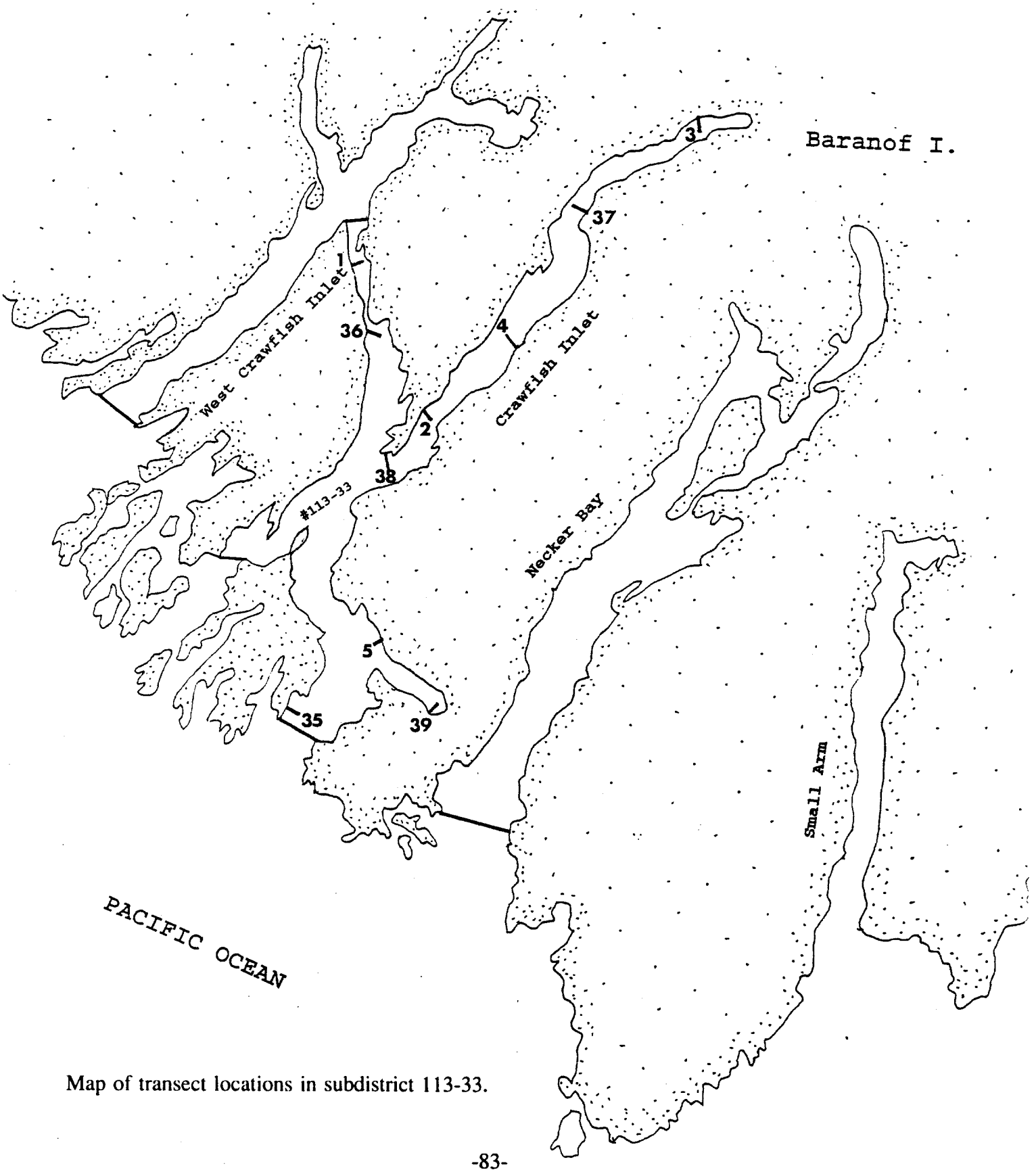
Tide Datum: Sitka/MHW -9'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
16-Jun-93	1a	1542	1546	4	4.0	BL	SW	2	1	0	4	-4	0	0		rck		50	fuc		
									4	4	7	0	3	0		rck					
									3	7	15	3	11	1		rck					
									3	15	26	11	22	3		rck					
									4	26	38	22	34	3		rck					
									4	38	50	34	46	0		rck					lots of urchins, no abs
								Total	19					7							
16-Jun-93	1b	1546	1550	4	4.0	BL	SW	2	4	50	43	46	39	3		rck					
									4	43	35	39	31	1		rck					
									3	35	25	31	21	0		rck		40	fil		small abs at 30 FSW
									5	25	14	21	10	0		rck		50	fil		
									3	14	0	10	-4	0		rck		70	fuc	fil	
								Total	19					4							
16-Jun-93	2a	1556	1603	7	3.5	TM	BDJ	2	2	0	4	-4	0.5	0		rck		70	lbk		
									3	4	10	0.5	6.5	0		rck		30	lbk		
									5	10	20	6.5	17	1		rck		50	lbk		
									5	20	26	17	23	1		rck		30	lbk		
									3	26	32	23	29	1		rck		20	lbk		
									5	32	41	29	38	5		rck		10	lbk		no abs, no urchins
									3	41	48	38	45	1		rck	snd				
								Total	26					9							
16-Jun-93	2b	1603	1610	7	3.5	TM	BDJ	2	5	50	42	47	39	2		rck	snd	20	lbk		
									3	42	37	39	34	0		rck	snd	20	lbk		
									5	37	29	34	26	4		rck		50	lbk		
									5	29	20	26	17	7		rck		70	lbk		
									5	20	12	17	8.5	0		rck		70	lbk	alg	
									5	12	6	8.5	2.5	0		rck		80	lbk	alg	
									7	6	0	2.5	-4	1		rck		50	lbk	alg	no abs, no urchins
								Total	35					14							
16-Jun-93	3a	1544	1607	23	3.5	BDJ	TM	2	2	0	4	-4	0.5	0		rck		30	fuc		
									5	4	10	0.5	6.5	0		rck		50	alg		
									5	10	18	6.5	15	0		bld		50	lbk	alg	
									5	18	27	15	24	1		rck		30	lbk		
									5	27	36	24	33	2		rck	snd	30	lbk		
									5	36	44	33	41	2		rck	snd	20	lbk		
									2	44	47	41	44	1		rck	snd	10	lbk		no abs, no urchins
								Total	29					6							
16-Jun-93	3b	1607	1630	23	3.5	BDJ	TM	2	3	50	40	47	37	0		rck					
									4	40	32	37	29	0		rck					
									3	32	23	29	20	2		rck		20	lbk		
									5	23	14	20	11	1		rck		50	lbk	alg	
									5	14	5	11	1.5	1		rck		50	alg	lbk	
									8	5	0	1.5	-4	0		rck		70	alg		no abs, no urchins
								Total	28					4							
16-Jun-93	4a	1035	1043	8	6.5	SW	BL	2	5	0	12	-7	5.5	0		rck		50	fuc	lbk	
									5	12	29	5.5	23	2		rck	bld	90	lbk		
									4	29	39	23	33	0		bld	snd	60	lbk		
									3	39	47	33	41	0		rck		40	lbk		
								Total	17					2							
16-Jun-93	4b	1043	1050	7	6.5	SW	BL	2	3	50	47	44	41	1		rck		0			
									3	47	37	41	31	0		rck		5	lbk		
									3	37	28	31	22	1		rck		75	lbk	fil	
									4	28	17	22	11	0		rck		60	lbk	fil	
									3	17	10	11	3.5	0		rck	bld	50	lbk	fil	
									3	10	0	3.5	-7	0		rck		40	fuc	lbk	

								Total	19					2						
16-Jun-93	5a	1101	1109	8	6.5	SW	BL	2	2	0	4	-7	-3	0	rck		50	fuc		
									5	4	16	-3	9.5	0	rck		25	lbk		
									5	16	32	9.5	26	0	rck		25	lbk		numerous cucs below 50 FSW
									5	32	39	26	33	0	rck		10	lbk		
									4	39	50	33	44	2	rck		5	lbk		no urchins
								Total	21					2						
16-Jun-93	5b	1109	1116	7	6.5	SW	BL	2	2	50	47	44	41	1	rck					
									3	47	43	41	37	2	rck		2	lbk		
									3	43	30	37	24	0	rck		10	lbk		
									5	30	17	24	11	0	rck		30	lbk		
									5	17	9	11	2.5	0	rck		50	lbk	fil	
									4	9	5	2.5	-2	0	rck		50	fuc	fil	
									2	5	0	-2	-7	0	rck		50	fuc		
								Total	24					3						
16-Jun-93	6a	1048	1055	7	6.5	TM	BDJ	2	1	0	4	-7	-3	0	rck		30	fuc		
									5	4	14	-3	7.5	1	rck		10	lbk		
									5	14	24	7.5	18	3	rck		30	lbk		
									5	24	33	18	27	1	rck		30	lbk		
									5	33	43	27	37	2	rck		10	lbk		no abs, no urchins
									3	43	48	37	42	1	rck					
								Total	24					8						
16-Jun-93	6b	1055	1102	7	6.5	TM	BDJ	2	5	50	40	44	34	1	rck	shl	5	lbk		
									5	40	36	34	30	2	rck	snd	30	lbk		
									5	36	31	30	25	6	cbl	snd	30	lbk		
									5	31	22	25	16	7	cbl	snd	30	lbk		
									5	22	15	16	8.5	5	snd	shl	10	lbk		
									5	15	6	8.5	-1	0	bld	snd				
									5	6	0	-1	-7	0	bld	snd	10	alg		no abs, no urchins
								Total	35					21						
16-Jun-93	7a	1627	1634	7	3.5	TM	BDJ	2	2	0	6	-4	2.5	0	rck		50	fuc	alg	
									3	6	12	2.5	8.5	0	rck		30	lbk	alg	
									5	12	21	8.5	18	0	rck		20	lbk		
									5	21	30	18	27	2	rck	snd	20	lbk		
									3	30	36	27	33	6	rck	snd	10	lbk		
									5	36	42	33	39	4	snd					
									3	42	48	39	45	2	snd					no abs, no urchins
								Total	26					14						
16-Jun-93	7b	1634	1640	6	3.5	TM	BDJ	2	5	50	43	47	40	4	snd					
									5	43	38	40	35	6	snd					
									5	38	30	35	27	2	snd					
									5	30	22	27	19	0	rck	snd	50	lbk		
									5	22	15	19	12	1	rck		80	lbk		
									5	15	10	12	6.5	0	rck		70	lbk		
									5	10	0	6.5	-4	0	rck		30	fuc	lbk	no abs, no urchins
								Total	35					13						
16-Jun-93	8a	1520	1526	6	4.0	BL	SW	2	2	0	4	-4	0	0	rck		50	lbk		
									3	4	7	0	3	6	bld					
									4	7	17	3	13	1	bld					
									4	17	30	13	26	0	bld					
									5	30	42	26	38	7	bld	snd				
									2	42	50	38	46	3	bld	snd				lots of urchins, no abs
								Total	20					17						
16-Jun-93	8b	1526	1531	5	4.0	BL	SW	2	5	50	45	46	41	1	snd					
									5	45	41	41	37	5	snd					
									5	41	35	37	31	6	snd	bld				
									5	35	26	31	22	11	bld					
									4	26	18	22	14	4	bld					
									5	18	6	14	2	1	bld					
									2	6	0	2	-4	0	bld		40	lbk		lots of urchins, no abs
								Total	31					28						
16-Jun-93	27a	1603	1609	6	3.5	BL	SW	2	1	0	4	-4	0.5	0	rck		40	fuc		
									4	4	8	0.5	4.5	0	rck		40	lbk	fil	
									4	8	17	4.5	14	0	rck		60	fil		
									3	17	27	14	24	0	rck					
									4	27	40	24	37	0	rck					
									4	40	50	37	47	3	rck					no abs, no urchins
								Total	20					3						
16-Jun-93	27b	1609	1615	6	3.5	BL	SW	2	5	50	43	47	40	1	snd	bld				
									5	43	33	40	30	0	snd	bld				
									5	33	24	30	21	4	bld		10	lbk		
									5	24	15	21	12	3	bld		60	fir		
									7	15	0	12	-4	1	rck		70	fuc		no abs, no urchins
								Total	27					9						

16-Jun-93	28a	1120	1139	19	6.5	TM	BDJ	2	3	0	3	-7	-4	0	rck	snd	20	fuc		
									5	3	9	-4	2.5	0	cbl		90	alg	fuc	
									5	9	18	2.5	12	0	cbl	snd	70	lbk		
									5	18	26	12	20	2	cbl	snd	50	lbk		
									5	26	35	20	29	3	cbl	snd	50	lbk		
									5	35	42	29	36	0	cbl	snd	10	lbk		
									4	42	48	36	42	1	cbl	snd				no abs, no urchins.
								Total	32					6						
16-Jun-93	28b	1139	1157	18	7.0	TM	BDJ	2	5	50	41	43	34	0	cbl	snd				
									5	41	34	34	27	1	cbl	snd	30	lbk		
									5	34	28	27	21	5	cbl	snd	50	lbk		
									5	28	19	21	12	10	cbl	snd	70	lbk		sample taken
									5	19	9	12	2	0	bld	snd	20	lbk		
									10	9	0	2	-7	0	cbl		50	lbk		no abs, no urchins
								Total	35					16						MLLW tide correction

1993 CUCUMBERS
#113-33



Map of transect locations in subdistrict 113-33.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 113-33 Crawfish Inlet
Cruise Dates: June 15 & 16, 1993

Divers: Bob DeJong (BDJ), Brian Lynch (BL), Tim Minicucci (TM), Tory O'Connell (TO), Scott Walker (SW)

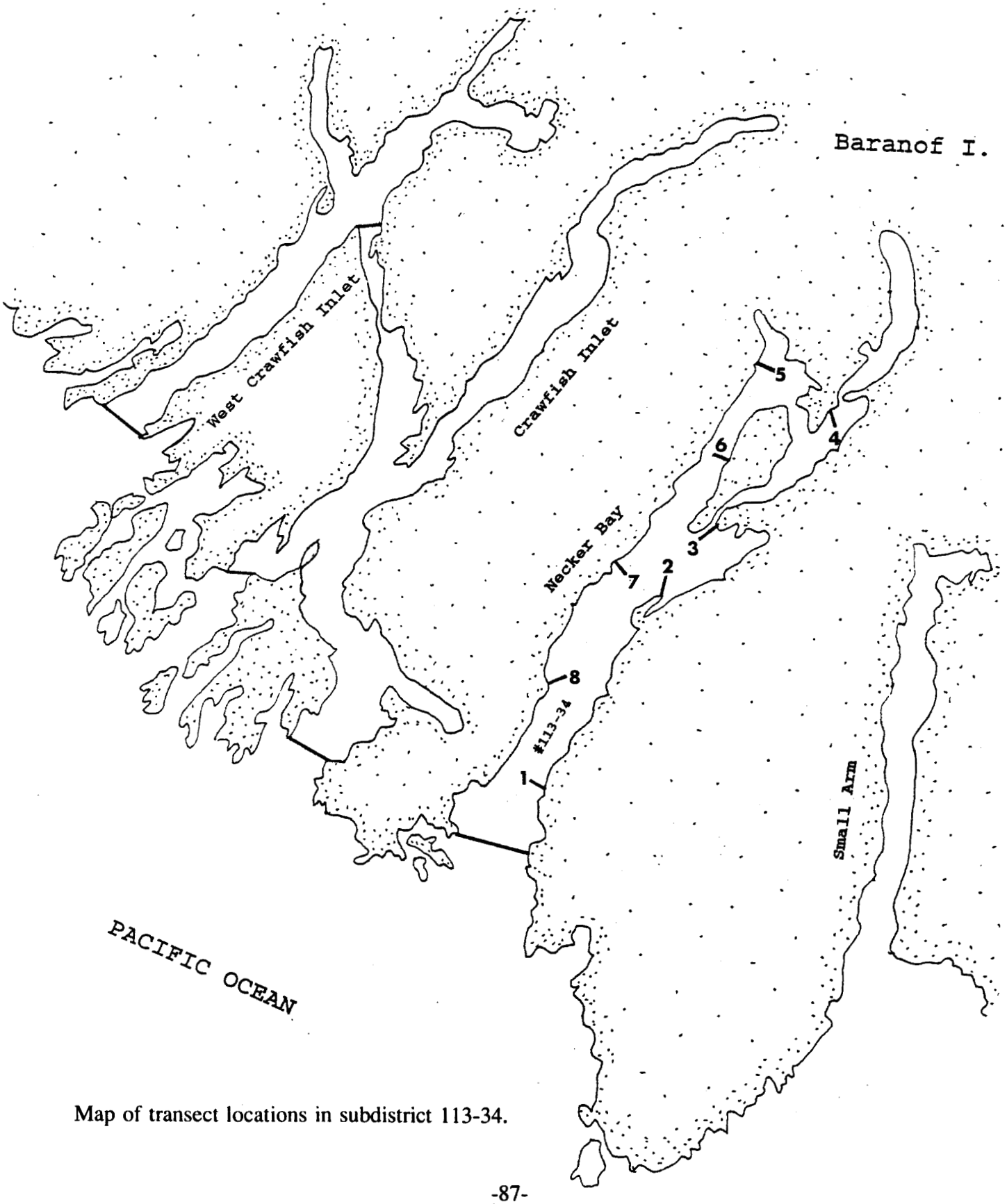
Tide Datum: Sitka/MHW -9'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
15-Jun-93	1a	1535	1541	16	3.5	TO	TM	2	5	0	10	-4	6.5	0		rck		50	alg		
									5	10	18	6.5	15	8		rck		80	lbk	fir	
									5	18	26	15	23	7		rck		80	lbk		
									5	26	32	23	29	4		rck		60	lbk		
									5	32	34	29	31	3		rck		40	lbk		
									5	34	30	31	27	5		rck	cbl	40	lbk		
									5	30	29	27	26	7		rck	cbl	20	lbk		
									5	29	29	26	26	12		rck	cbl	50	lbk		
									5	29	31	26	28	8		rck		70	lbk		
									5	31	38	28	35	8		cbl		30	lbk		
									5	38	47	35	44	2		cbl		10	lbk		no abs, no urchins
								Total	55					64							
15-Jun-93	1b	1541	1607	16	3.5	TO	TM	2	5	50	40	47	37	3		cbl		20	lbk		
									5	40	35	37	32	6		cbl		30	lbk		
									5	35	32	32	29	1		cbl		40	lbk		
									5	32	30	29	27	11		cbl		50	lbk		
									5	30	29	27	26	4		cbl		50	lbk		
									5	29	33	26	30	11		cbl		30	lbk		
									5	33	38	30	35	6		cbl		20	lbk		
									5	38	26	35	23	7		rck		50	lbk		
									5	26	19	23	16	5		bld		50	lbk		
									5	19	13	16	9.5	4		rck		10	lbk		
									5	13	8	9.5	4.5	3		rck		40	fuc		
									5	8	0	4.5	-4	0		rck		70	fuc		no abs, no urchins
								Total	60					61							
16-Jun-93	2a	836	846	10	4.0	BDJ	TM	2	2	0	2	-4	-2	0		rck		30	fuc		
									3	2	9	-2	5	0		rck		10	lbk		
									3	9	14	5	10	1		rck		10	lbk		
									3	14	20	10	16	4		rck		30	lbk		
									3	20	30	16	26	4		rck		10	lbk		
									3	30	36	26	32	2		rck		20	lbk		
									3	36	44	32	40	0		rck		10	lbk		
									2	44	46	40	42	0		rck		10	lbk		no abs, no urchins
								Total	22					11							
16-Jun-93	2b	846	856	10	4.0	BDJ	TM	2	3	50	42	46	38	3		rck	cbl				
									5	42	35	38	31	2		rck					
									3	35	29	31	25	0		rck	cbl				
									5	29	21	25	17	0		rck	cbl	10	lbk		few red urchins
									5	21	12	17	8	3		rck		40	lbk		sample taken
									3	12	6	8	2	0		rck		20	lbk		
									2	6	0	2	-4	0		rck		20	fuc		
								Total	26					8							
16-Jun-93	3a	818	828	10	3.5	BL	SW	2	1	0	4	-4	0.5	0		bld	snd	50	fuc		
									5	4	4	0.5	0.5	5		bld		50	lbk		
									5	4	20	0.5	17	8		bld	snd	20	lbk		some urchins
									5	20	32	17	29	1		bld	snd	20	lbk		
									5	32	50	29	47	2		snd	bld	10	lbk		
								Total	21					16							
16-Jun-93	3b	828	838	10	3.5	BL	SW	2	5	50	43	47	40	5		bld		50	lbk		
									5	43	35	40	32	1		bld	snd	40	lbk		
									5	35	31	32	28	2		bld	snd	40	lbk		
									5	31	28	28	25	7		bld		50	lbk		some urchins
									5	28	22	25	19	5		snd		70	lbk		
									5	22	18	19	15	5		snd		70	lbk		
									5	18	12	15	8.5	0		snd		70	lbk		

									5	12	0	8.5	-4	0	bld		50	lbk	fuc	
								Total	40					25						
16-Jun-93	4a	1035	1043	8	6.5	BL	SW	2	4	0	3	-7	-4	0	bld		50	fuc		
									5	3	6	-4	-1	0	cbl	snd	10	elg		geoducks
									5	6	14	-1	7.5	0	cbl		40	elg		geoducks
									5	14	18	7.5	12	0	mud		20	lbk		
									5	18	24	12	18	1	mud		10	lbk		
									5	24	34	18	28	2	mud		50	wdy	lbk	
									7	34	50	28	44	2	mud		50	wdy		no abs, no urchins
								Total	36					5						
16-Jun-93	4b	1043	1050	7	6.5	BL	SW	2	10	50	37	44	31	0	snd		10	lbk		
									10	37	25	31	19	0	mud	wdy	10	lbk		
									5	25	12	19	5.5	0	snd		50	lbk		
									5	12	6	5.5	-1	0	gvl		100	lbk		
									10	6	5	-1	-2	0	bld	snd	50	fuc		
									10	5	0	-2	-7	0	bld	snd	50	fuc		no abs, no urchins
								Total	50					0						
15-Jun-93	5a	1607	1619	12	3.5	SW	BL	2	2	0	6	-4	2.5	0	rck		100	elg	fuc	
									5	6	7	2.5	3.5	0	rck		100	elg		
									4	7	7	3.5	3.5	0	rck		100	elg		many urchins
									5	7	10	3.5	6.5	0	bld					many urchins, two abs
									5	10	10	6.5	6.5	0	bld					many urchins, lots of abs
									6	10	19	6.5	16	0	bld					
									5	19	23	16	20	1	snd					many urchins
									10	23	25	20	22	0	snd					
									20	25	30	22	27	0	snd					some urchins
									20	30	38	27	35	0	cbl					some urchins
									10	38	41	35	38	1	snd					some urchins
									10	41	44	38	41	2	snd					some urchins
									10	44	50	41	47	3	snd					
								Total	112					7						
15-Jun-93	5b	1619	1630	11	3.5	SW	BL	2	10	50	47	47	44	1	snd					
									10	47	44	44	41	3	cbl					one box crab
									10	44	41	41	38	1	cbl					
									20	41	34	38	31	0	cbl					many urchins
									20	34	27	31	24	0	cbl					many urchins
									20	27	22	24	19	0	rck					many abs. small
									10	22	18	19	15	0	rck					
									10	18	12	15	8.5	0	rck					many urchins
									10	12	10	8.5	6.5	0	bld					many urchins
									10	10	7	6.5	3.5	0	rck		100	elg		many small abs
									5	7	6	3.5	2.5	0	rck		100	elg		
									6	6	0	2.5	-4	0	rck		75	fuc		
								Total	141					5						
15-Jun-93	35a	1537	1543	6	3.5	SW	BL	2	1	0	4	-4	0.5	0	rck		50	lbk		
									3	4	12	0.5	8.5	0	rck		50	lbk		
									3	12	20	8.5	17	0	rck		50	lbk		many urchins
									3	20	27	17	24	0	rck					
									5	27	37	24	34	0	rck					many urchins
									5	37	36	34	33	0	rck					many urchins
									5	36	50	33	47	0	rck					
								Total	25					0						
15-Jun-93	35b	1543	1548	5	3.5	SW	BL	2	5	50	46	47	43	1	rck					
									5	46	39	43	36	0	rck					many urchins
									5	39	27	36	24	0	rck		70	lbk		many urchins
									5	27	17	24	14	0	rck		100	lbk		many urchins
									6	17	4	14	0.5	0	rck		100	lbk		
									2	4	0	0.5	-4	0	rck		50	fuc		
								Total	28					1						
15-Jun-93	36a	1620	1634	14	3.5	TO	TM	2	5	0	10	-4	6.5	1	rck		80	lbk	elg	
									5	10	14	6.5	11	3	cbl	snd	70	elg	lbk	sample taken
									5	14	24	11	21	2	rck		40	lbk		
									5	24	31	21	28	7	rck		10	lbk		
									5	31	40	28	37	2	rck	cbl	10	lbk		no abs, no urchins
									5	40	48	37	45	2	cbl		0			
								Total	30					17						
15-Jun-93	36b	1634	1648	14	3.5	TO	TM	2	5	50	41	47	38	0	cbl		10	lbk		
									5	41	36	38	33	3	cbl	snd	30	lbk		
									5	36	27	33	24	2	rck		70	lbk		
									5	27	21	24	18	6	rck		70	lbk		
									5	21	13	18	9.5	6	rck		50	lbk	elg	
									5	13	7	9.5	3.5	3	rck	snd	30	lbk	elg	no abs, no urchins
								Total	30					20						
16-Jun-93	37a	921	927	6	5.0	BDJ	TM	2	1	0	2	-5	-3	0	rck		10	fuc		

									3	2	10	-3	5	0	rck		30	lbk		
									3	10	15	5	10	4	rck		20	lbk		
									3	15	20	10	15	3	rck		10	lbk		
									3	20	30	15	25	3	rck		20	lbk		
									3	30	38	25	33	2	rck		10	lbk		
									4	38	48	33	43	2	rck		10	lbk		no abs, no urchins
								Total	20					14						
16-Jun-93	37b	927	933	6	5.0	BDJ	TM	2	5	50	42	45	37	10	snd	shl				
									5	42	32	37	27	2	snd	shl	10	lbk		few red urchins
									5	32	28	27	23	4	snd	cbl	20	lbk		
									5	28	18	23	13	13	rck		20	lbk		
									5	18	10	13	5	2	rck		30	lbk		
									5	10	2	5	-3	5	rck		40	lbk		
									2	2	0	-3	-5	1	rck		20	fuc		
								Total	32					37						
16-Jun-93	38a	806	815	9	3.0	BDJ	TM	2	2	0	3	-3	0	0	rck		30	fuc		
									3	3	9	0	6	0	rck		20	hir	lbk	
									3	9	17	6	14	0	rck		10	hir	lbk	
									3	17	22	14	19	0	rck		20	lbk		
									3	22	28	19	25	0	rck		20	lbk		
									3	28	37	25	34	4	rck		10	lbk		
									5	37	47	34	44	2	rck		10	lbk		no abs, no urchins
								Total	22					6						
16-Jun-93	38b	815	823	8	3.5	BDJ	TM	2	3	50	40	47	37	3	rck					
									3	40	30	37	27	0	rck					few urchins
									3	30	21	27	18	0	rck		90	lbk		
									5	21	12	18	8.5	0	rck		100	lbk		
									5	12	10	8.5	6.5	4	rck		80	lbk		
									5	10	5	6.5	1.5	2	rck		50	lbk		
									4	5	0	1.5	-4	0	rck		50	fuc		
								Total	28					9						
15-Jun-93	39a	1603	1617	14	3.5	SW	BL	2	3	0	4	-4	0.5	0	bld		90	fil	fuc	
									5	4	9	0.5	5.5	0	shl	snd	90	lbk		
									5	9	11	5.5	7.5	3	shl	snd	90	lbk		
									5	11	14	7.5	11	2	shl	snd	90	lbk		
									5	14	18	11	15	2	shl	snd	80	lbk		
									5	18	22	15	19	1	shl	snd	70	lbk		
									5	22	25	19	22	0	shl	snd	50	lbk		
									10	25	29	22	26	0	shl	snd	5	lbk		
									5	29	29	26	26	7	shl	snd	10	lbk		
									5	29	28	26	25	9	bld		50	lbk		
									5	28	31	25	28	4	bld		50	lbk		
									5	31	39	28	36	0	shl	snd	5	lbk		
									10	39	43	36	40	0	shl	slt	0			
									10	43	43	40	40	4	shl		0			no abs, no urchins
								Total	83					32						
15-Jun-93	39b	1617	1630	13	3.5	SW	BL	2	5	50	42	47	39	2	shl	slt	0			
									10	42	35	39	32	7	shl	slt				
									10	35	27	32	24	11	snd	bld	20	lbk		
									10	27	23	24	20	7	snd	bld	20	lbk		
									5	23	22	20	19	0	bld		50	lbk		
									5	22	19	19	16	6	bld	snd	50	lbk		
									5	19	17	16	14	4	bld	snd	50	lbk		
									5	17	7	14	3.5	0	bld		90	lbk		
									6	7	6	3.5	2.5	0	bld		20	lbk		
									5	6	4	2.5	0.5	0	bld					
									10	4	0	0.5	-4	0	bld		70	fuc		no abs, no urchins
								Total	76					37						

1993 CUCUMBERS
#113-34



Map of transect locations in subdistrict 113-34.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 113-34 Necker Bay
Cruise Dates: June 15, 1993

Divers: Brian Lynch (BL), Tim Minicucci (TM), Tory O'Connell (TO), Scott Walker (SW)

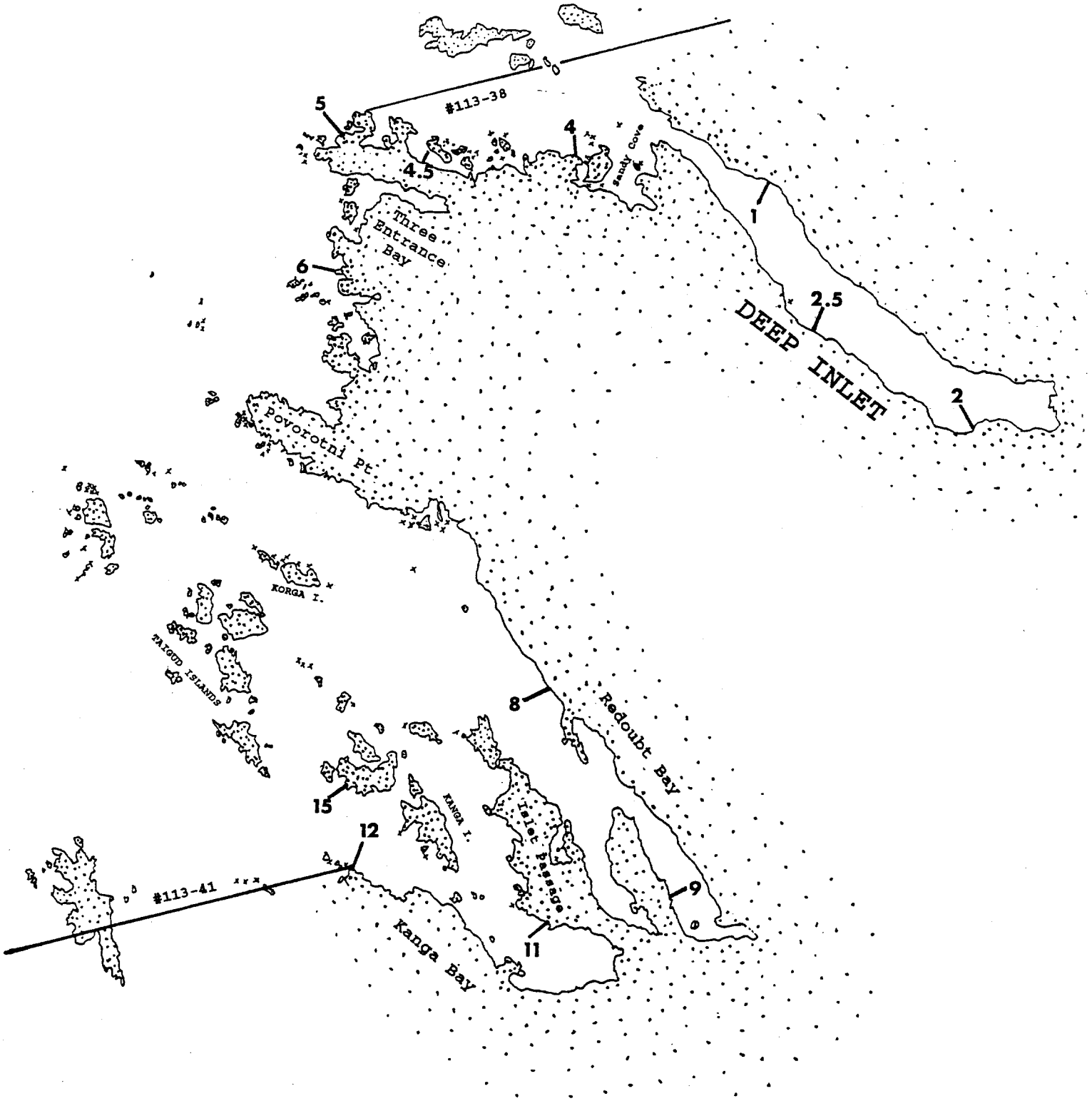
Tide Datum: Sitka/MHW -9'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
15-Jun-93	1a	940	948	8	6.0	TO	TM	2	5	0	7	-6	1	0		rck		70	lbk		
									5	7	14	1	8	0		rck		50	lbk		red urchins 4-6/m2
									5	14	22	8	16	0		rck		30	lbk		
									5	22	30	16	24	0		rck		10	lbk		
									4	30	40	24	34	2		rck		0			
									3	40	48	34	42	2		rck		0			
								Total	27					4							
15-Jun-93	1b	948	956	8	6.0	TO	TM	2	3	50	48	44	42	0		rck		0			
									4	48	40	42	34	0		rck		0			red urchins 5-7/m2
									4	40	32	34	26	0		rck		0			
									5	32	26	26	20	0		rck		0			few small green urchins
									4	26	17	20	11	0		rck		0			
									3	17	0	11	-6	0		rck		60	lbk		
								Total	20					0							
15-Jun-93	2a	1110	1117	7	6.5	TO	TM	2	4	0	10	-7	3.5	0		rck		40	fuc		
									5	10	14	3.5	7.5	0		rck		20	lbk		red urchins 3-5/m2
									5	14	19	7.5	13	0		rck		0			few 2 inch abs
									5	19	27	13	21	1		rck		0			
									5	27	36	21	30	2		rck		0			
									3	36	45	30	39	0		rck		0			
									1	45	48	39	42	0		rck		0			
								Total	24					3							
15-Jun-93	2b	1117	1123	6	6.5	TO	TM	2	5	50	44	44	38	1		snd					
									5	44	37	38	31	3		rck					
									5	37	33	31	27	1		rck					
									5	33	29	27	23	4		rck					
									5	29	20	23	14	3		rck					red urchins 2-3/m2
									5	20	12	14	5.5	1		rck		40	lbk		red urchins 7-10/m2
									5	12	3	5.5	-4	1		rck		50	fuc		
									2	3	0	-4	-7	0		rck		50	fuc		
								Total	27					14							
15-Jun-93	3a	1145	1157	12	6.0	BL	SW	2	2	0	3	-6	-3	0		rck		60	fuc		
									5	3	10	-3	4	0		rck		20	fuc	lbk	several red urchins
									5	10	23	4	17	0		bdl	snd	10	lbk		several red urchins
									5	23	28	17	22	1		bdl	snd	10	lbk		several red urchins
									5	28	32	22	26	7		bdl	shl	5	lbk		several red urchins
									5	32	36	26	30	1		bdl	shl	11	lbk		few urchins
									5	36	44	30	38	6		shl	snd	2	lbk		few urchins
									5	44	45	38	39	0		shl	snd	2	lbk		few urchins
									4	45	46	39	40	0		shl	snd	2	lbk		many scallops
								Total	41					15							
15-Jun-93	3b	1157	1208	11	6.0	BL	SW	2	5	50	45	44	39	3		rck		1	lbk		
									5	45	38	39	32	0		rck					
									5	38	36	32	30	1		rck					
									5	36	39	30	33	0		rck					
									5	39	41	33	35	1		rck	shl				
									5	41	35	35	29	0		rck					many small green urchins
									4	35	26	29	20	0		rck		20	lbk		many small green urchins
									3	26	20	20	14	2		rck		5	lbk		many small green urchins
									6	20	9	14	3	1		rck					
									5	9	4	3	-2	0		rck					
									3	4	0	-2	-6	0		rck					
								Total	51					8							
15-Jun-93	4a	1045	1059	14	6.5	BL	SW	2	3	0	1	-7	-6	0		cbl		90	fuc		
									5	1	5	-6	-2	0		cbl	snd	50	fuc		

									5	5	8	-2	1.5	0	snd		30	elg		
									5	8	14	1.5	7.5	0	snd		10	elg		
									5	14	16	7.5	9.5	0	snd		5	fil		
									10	16	21	9.5	15	0	snd					
									10	21	25	15	19	1	snd					
									5	25	27	19	21	1	slt					
									10	27	33	21	27	0	slt					
									10	33	37	27	31	0	slt					
									10	37	41	31	35	0	slt					many shrimp
									10	41	43	35	37	0	slt					
									10	43	43	37	37	0	slt		2	lbk		
									5	43	43	37	37	1	gvl	cbl	5	lbk		
									5	43	45	37	39	0	gvl	cbl	10	lbk		
									5	45	46	39	40	1	gvl	cbl	50	lbk		
									3	46	48	40	42	0	cbl	gvl	40	lbk		
								Total	116					4						
15-Jun-93	4b	1059	1113	14	6.5	BL	SW	2	10	50	46	44	40	0	slt	snd				
									10	46	44	40	38	0	slt	snd				
									15	44	38	38	32	0	slt	snd				
									15	38	35	32	29	0	slt	snd				
									10	35	29	29	23	1	slt	snd				
									10	29	25	23	19	0	snd	slt				
									10	25	19	19	13	0	snd	slt	5	lbk		
									5	19	16	13	9.5	0	snd	slt	5	lbk		
									10	16	9	9.5	2.5	0	snd	slt	90	elg		
									5	9	6	2.5	-1	0	cbl	snd	90	fil		
									4	6	0	-1	-7	0	cbl		90	fuc		
								Total	104					1						
15-Jun-93	5a	1015	1021	6	6.5	BL	SW	2	4	0	2	-7	-5	0	rck			fuc		
									4	2	7	-5	0.5	0	rck			fil		percent cover not recorded
									4	7	15	0.5	8.5	1	bld			fil		
									5	15	29	8.5	23	1	bld			lbk		few urchins
									5	29	44	23	38	1	bld			lbk		
									3	44	50	38	44	0	snd	bld		lbk		
								Total	25					3						
15-Jun-93	5b	1021	1027	6	6.5	BL	SW	2	3	50	47	44	41	0	snd					
									5	47	42	41	36	0	snd					percent cover not recorded
									5	42	35	36	29	1	snd	bld		lbk		
									4	35	25	29	19	1	bld			lbk		
									5	25	14	19	7.5	2	bld			lbk	fil	few urchins
									5	14	0	7.5	-7	0	rck			lbk	fuc	few urchins
								Total	27					4						
15-Jun-93	6a	945	952	7	6.0	BL	SW	2	1	0	4	-6	-2	0	rck			lbk	fuc	
									5	4	15	-2	9	1	bld					percent cover not recorded
									3	15	25	9	19	0	bld					
									5	25	42	19	36	0	snd					lots of urchins
									2	42	50	36	44	0	snd					
								Total	16					1						
15-Jun-93	6b	952	958	6	6.0	BL	SW	2	5	50	50	44	44	1	snd					
									5	50	43	44	37	1	snd	bld				percent cover not recorded
									5	43	39	37	33	2	snd	bld				lots of urchins
									5	39	27	33	21	4	bld					lots of urchins
									5	27	17	21	11	6	bld					several small abs
									4	17	13	11	7	2	bld					
									4	13	4	7	-2	0	rck			lbk	fil	few urchins
									2	4	0	-2	-6	0	rck			fuc		
								Total	35					16						
15-Jun-93	7a	1037	1046	9	6.5	TM	TO	2	5	0	3	-7	-4	0	bld		40	fuc		
									5	3	3	-4	-4	0	bld		70	fuc	hir	
									5	3	4	-4	-3	0	bld		60	lbk	fuc	
									5	4	12	-3	5.5	0	bld		60	lbk	hir	
									5	12	15	5.5	8.5	0	bld		50	lbk	hir	red urchins 5-7/m2
									5	15	24	8.5	18	4	cbl		10	lbk		
									4	24	34	18	28	4	cbl					
									3	34	43	28	37	1	cbl					
									2	43	48	37	42	0	cbl					
								Total	39					9						
15-Jun-93	7b	1046	1054	8	6.5	TM	TO	2	5	50	40	44	34	5	cbl					
									5	40	34	34	28	2	cbl					red urchins 3-5/m2
									5	34	26	28	20	1	cbl					
									5	26	19	20	13	0	cbl					red urchins 7-10/m2
									5	19	12	13	5.5	0	cbl					
									5	12	10	5.5	3.5	0	cbl		70	lbk	hir	
									5	10	8	3.5	1.5	0	cbl		80	lbk	hir	

									5	8	0	1.5	-7	0	cbl	80	lbk	fuc
								Total	40					8				
15-Jun-93	8a	1010	1017	7	6.0	TM	TO	2	5	0	9	-6	3	0	rck	70	lbk	
									5	9	14	3	8	0	bld	40	lbk	red urchins 7-10/m2
									5	14	19	8	13	0	bld			red urchins 7-10/m2
									5	19	28	13	22	0	bld			red urchins 7-10/m2
									3	28	37	22	31	0	bld			few small abs
									3	37	44	31	38	3	bld			
									2	44	48	38	42	1	bld			
								Total	28					4				
15-Jun-93	8b	1017	1023	6	6.5	TM	TO	2	5	50	44	44	38	4	rck			
									5	44	34	38	28	5	rck			
									5	34	25	28	19	3	rck			red urchins 7-10/m2
									5	25	16	19	9.5	4	rck			few small abs
									5	16	10	9.5	3.5	1	rck	20	lbk	
									5	10	0	3.5	-7	1	rck	50	lbk	
								Total	30					18				

1993 CUCUMBERS
#113-41, 38 B



Map of transect locations in subdistrict 113-41 and 38B.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 113-41,38
Cruise Dates: June 17 & 18, 1993

Divers: Bob DeJong (BDJ), Brian Lynch (BL), Tim Minicucci (TM), Tory O'Connell (TO), Scott Walker (SW)

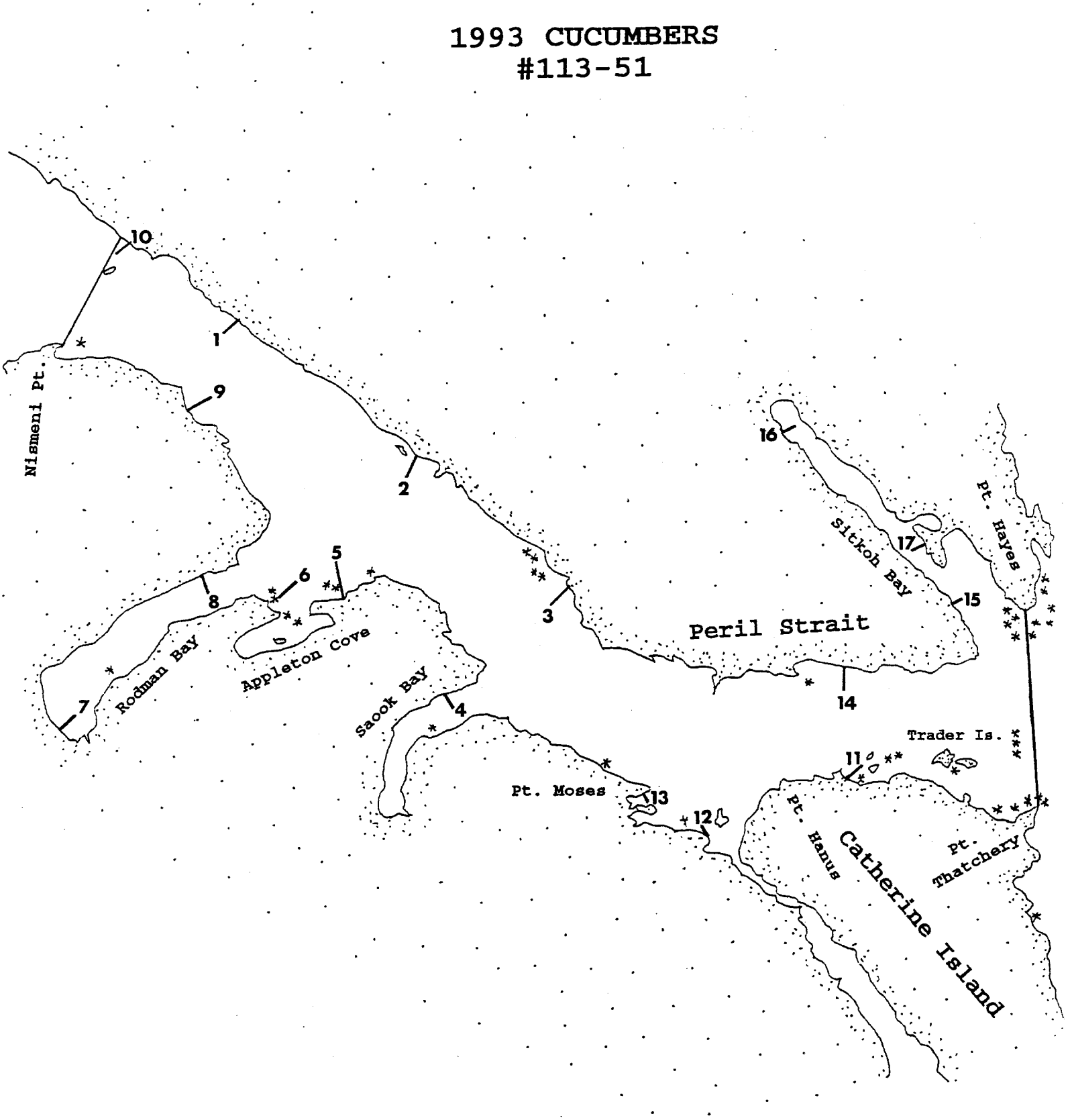
Tide Datum: Sitka/MHW -9'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
18-Jun-93	1a	1016	1024	8	4.5	TO	BD	2	3	0	8	-5	3.5	0		rck		20	lbk	fuc	
									5	8	19	3.5	15	3		rck		50	lbk		
									3	19	24	15	20	3		bld		50	lbk		
									5	24	37	20	33	7		cbl	snd	30	lbk		
									3	37	50	33	46	12		cbl	snd	20	lbk		no abs, no urchins
								Total	19					25							
18-Jun-93	1b	1024	1032	8	4.5	TO	BD	2	5	50	41	46	37	1		cbl	snd	20	lbk		
									4	41	33	37	29	5		bld	snd	40	lbk		
									4	33	25	29	21	2		bld		60	lbk		
									5	25	17	21	13	4		bld		80	lbk		
									7	17	0	13	-5	10		rck		70	lbk	fuc	no abs, no urchins
								Total	25					22							
18-Jun-93	2a	852	900	8	1.5	TO	BD	2	5	0	3	-2	1.5	0		gvl		20	alg		
									6	3	7	1.5	5.5	0		slt	gvl	70	elg		
									5	7	22	5.5	21	2		slt	gvl				
									5	22	31	21	30	1		slt	gvl				
									4	31	39	30	38	1		slt					
									5	39	51	38	50	0		slt					no abs, no urchins
								Total	30					4							
18-Jun-93	2b	900	908	8	1.5	TO	BD	2	5	50	45	49	44	0		slt					
									5	45	40	44	39	0		slt					
									4	40	34	39	33	0		slt					
									5	34	26	33	25	0		slt		10	lbk		
									5	26	19	25	18	0		gvl	slt	10	lbk		
									5	19	11	18	9.5	0		gvl	slt	5	lbk		
									8	11	3	9.5	1.5	0		gvl	snd	5	alg	lbk	
									5	3	0	1.5	-2	0		gvl		5	fuc		no abs, no urchins
								Total	42					0							
18-Jun-93	2.5a	925	943	18	2.5	TO	BD	2	3	0	3	-3	0.5	0		bld		30	fuc	alg	
									5	3	7	0.5	4.5	0		bld		90	lbk		
									5	7	17	4.5	15	2		bld	snd	100	lbk		
									5	17	24	15	22	12		gvl		80	lbk		
									5	24	20	22	18	9		gvl		50	lbk		
									5	20	35	18	33	9		cbl	snd	20	lbk		
									10	35	45	33	43	3		snd					
									4	45	54	43	52	0		snd					no abs, no urchins
								Total	42					35							
18-Jun-93	2.5b	943	1000	17	3.5	TO	BD	2	10	50	43	47	40	6		gvl	snd	0			
									10	43	34	40	31	5		gvl	snd	5	lbk		
									5	34	28	31	25	10		snd	gvl	20	lbk		
									5	28	25	25	22	10		snd	gvl	50	lbk		
									5	25	19	22	16	8		cbl		90	lbk		
									5	19	12	16	8.5	5		cbl		100	lbk		
									8	12	4	8.5	0.5	0		cbl		100	lbk		
									3	4	0	0.5	-4	0		bld		30	fuc	alg	few red urchins
								Total	51					44							
18-Jun-93	4a	1155	1203	8	7.0	SW	BL	2	4	0	9	-7	2	0		rck		50	lbk		
									5	9	22	2	15	0		rck					
									5	22	26	15	19	3		rck					few urchins
									5	26	32	19	25	3		snd	cbl				few urchins
									5	32	35	25	28	6		snd	cbl				
									5	35	39	28	32	6		snd	cbl				
									5	39	46	32	39	3		snd	gvl				
									2	46	49	39	42	1		snd	gvl				small abs, many urchins
								Total	36					22							

18-Jun-93	4b	1203	1210	7	7.0	SW	BL	2	5	47	39	40	32	8	snd	gvl				
									5	39	35	32	28	7	snd	cbl				
									5	35	31	28	24	2	snd	cbl		cor		few urchins
									5	31	23	24	16	2	snd					few urchins
									5	23	17	16	10	0	bld					
									3	17	13	10	6	0	bld					
									5	13	2	6	-5	0	rck		50	lbk		
								Total	33					19						
18-Jun-93	4.5a	1105	1118	13	6.0	SW	BL	2	4	0	3	-6	-3	0	cbl		10	fuc		
									5	3	10	-3	4	0	cbl		90	lbk		
									5	10	13	4	7	7	cbl		95	lbk		
									5	13	13	7	7	2	cbl	snd	95	lbk		
									5	13	19	7	13	3	snd		95	lbk		
									5	19	23	13	17	3	snd		75	lbk		
									5	23	26	17	20	4	snd		75	lbk		
									5	26	29	20	23	2	snd		80	lbk		
									5	29	34	23	28	3	snd		40	lbk		
									5	34	37	28	31	0	shl		5	lbk		
									10	37	43	31	37	0	mud	shl	5	lbk	alg	
									10	43	46	37	40	0	mud	shl	5	lbk	alg	
									10	46	45	40	39	0	mud					
									3	45	45	39	39	0	mud					no abs, no red urchins
								Total	82					24						
18-Jun-93	4.5b	1118	1130	12	6.0	SW	BL	2	10	48	44	42	38	0	mud					
									15	44	41	38	35	0	mud	snd	75	lbk		
									10	41	37	35	31	0	mud	snd	75	lbk		
									12	37	33	31	27	2	mud	shl	50	lbk		
									5	33	29	27	23	3	snd	shl	50	lbk		
									5	29	24	23	18	4	snd	shl	95	lbk		
									5	24	18	18	12	3	cbl	snd	100	lbk		
									5	18	14	12	8	3	cbl		95	lbk	alg	
									5	14	9	8	3	2	cbl		100	fir	alg	
									7	9	0	3	-6	0	cbl					no abs, no urchins
								Total	79					17						
18-Jun-93	5a	935	948	13	3.0	BL	SW	2	5	0	15	-3	12	0	rck		90	lbk		
									5	15	20	12	17	0	rck		40	lbk		
									5	20	23	17	20	0	bld					
									5	23	24	20	21	0	bld					
									5	24	29	21	26	0	bld					
									5	29	30	26	27	0	bld					
									5	30	42	27	39	0	bld					
									7	42	50	39	47	0	cbl					
								Total	42					0	cbl					
18-Jun-93	5b	948	1000	12	3.5	BL	SW	2	5	46	43	43	40	0	rck	cbl				
									5	43	37	40	34	0	rck	cbl				
									3	37	26	34	23	0	rck					urchins
									4	26	20	23	17	0	rck		50	lbk		urchins
									5	20	11	17	7.5	0	rck		90	lbk		urchins
									6	11	0	7.5	-4	0	rck		90	lbk		urchins
								Total	28					0						
18-Jun-93	6a	838	852	14	1.0	BL	SW	2	5	0	8	-1	7	0	rck		100	lbk		
									3	8	13	7	12	1	rck		100	lbk		many urchins
									5	13	18	12	17	0	rck					many urchins
									5	18	24	17	23	0	rck					
									5	24	26	23	25	0	rck					
									5	26	27	25	26	1	bld		5	lbk		
									5	27	27	26	26	1	bld		5	lbk		
									10	27	27	26	26	0	bld					
									7	27	37	26	36	3	rck					some urchins
									10	37	45	36	44	1	snd					
									10	45	46	44	45	0	snd		40	lbk		
									10	46	46	45	45	0	snd		100	lbk		
									10	46	47	45	46	0	snd		100	lbk		
									10	47	47	46	46	0	snd		100	lbk		
									10	47	48	46	47	0	snd	cbl				
									10	48	47	47	46	2	snd	cbl				
									10	47	45	46	44	1	snd					
									15	45	40	44	39	1	bld					
									20	40	46	39	45	0	cbl					
									10	46	49	45	48	0	cbl					
								Total	175					11						
18-Jun-93	6b	852	905	13	1.5	BL	SW	2	7	47	46	46	45	0	cbl					
									10	46	36	45	35	2	bld					
									10	36	35	35	34	0	bld					

									10	35	38	34	37	0	bld							
									10	38	37	37	36	0	bld							
									10	37	40	36	39	0	bld							
									5	40	43	39	42	0	cbl							
									20	43	47	42	46	0	cbl							
									15	47	45	46	44	0	cbl							
									10	45	43	44	42	0	cbl							many urchins
									10	43	41	42	40	3	cbl							
									5	41	39	40	38	1	cbl							
									20	39	32	38	31	0	cbl							many urchins
									5	32	25	31	24	0	cbl							
									10	25	18	24	17	0	cbl							lots of urchins
									5	18	16	17	15	0	cbl							
									5	16	13	15	12	0	rck			100	lbk			
									10	13	13	12	12	0	rck			100	lbk			
									8	13	0	12	-2	0	rck			100	lbk			
								Total	185					6								
17-Jun-93	8a	1750	1805	15	3.5	TM	BD	2	5	0	5	-4	1.5	0	gvl			30	fuc			
									10	5	10	1.5	6.5	1	gvl			30	lbk			
									5	10	14	6.5	11	3	gvl	slt		20	lbk			
									5	14	18	11	15	3	slt	gvl		20	lbk			
									5	18	21	15	18	4	slt			20	lbk			
									5	21	24	18	21	9	slt			10	lbk			
									5	24	27	21	24	6	slt			10	lbk			
									5	27	29	24	26	6	slt			20	lbk			
									5	29	31	26	28	10	slt			20	lbk			
									5	31	34	28	31	5	slt			10	lbk			
									5	34	39	31	36	3	slt			10	lbk			
									6	39	48	36	45	7	snd	bld		10	lbk			no abs, no urchins
								Total	66					57								
17-Jun-93	8b	1805	1819	14	3.5	TM	BD	2	5	50	45	47	42	5	slt			10	lbk			
									5	45	39	42	36	5	slt			10	lbk			
									5	39	36	36	33	6	slt			20	lbk			
									5	36	31	33	28	5	bld	slt		40	lbk			
									5	31	28	28	25	12	bld	slt		40	lbk			
									5	28	26	25	23	9	bld	slt		30	lbk			
									5	26	25	23	22	6	gvl	slt		20	lbk			
									5	25	20	22	17	9	gvl			60	lbk			
									5	20	14	17	11	5	gvl			90	lbk			
									5	14	7	11	3.5	4	cbl			60	lbk			
									10	7	0	3.5	-4	0	cbl			20	lbk	fuc		no abs, no urchins
								Total	60					66								
17-Jun-93	9a	1713	1725	12	3.5	TM	BD	2	2	0	4	-4	0.5	0	bld			50	fuc	alg		
									5	4	10	0.5	6.5	8	cbl	snd		30	lbk	alg		
									5	10	15	6.5	12	19	cbl	snd		30	lbk	alg		
									5	15	22	12	19	8	cbl	snd		20	lbk			
									5	22	28	19	25	4	cbl	snd		10	lbk			
									5	28	3	25	-1	3	cbl	snd		5	lbk			
									10	3	39	-1	36	1	cbl	snd		5	lbk			
									10	39	43	36	40	2	cbl	snd		5	lbk			
									10	43	46	40	43	2	cbl	snd						
									5	46	49	43	46	1	cbl	snd						no abs, no urchins
								Total	62					48								
17-Jun-93	9b	1725	1736	11	3.5	TM	BD	2	5	50	47	47	44	0	cbl	slt						
									10	47	39	44	36	3	cbl	slt						
									10	39	33	36	30	3	cbl	slt						
									5	33	28	30	25	1	cbl	slt		20	lbk			
									5	28	24	25	21	2	cbl	slt		30	lbk			
									5	24	16	21	13	10	cbl	slt		60	lbk			
									5	16	9	13	5.5	5	bld	snd		100	lbk	fil		
									7	9	3	5.5	-1	0	bld	snd		20	alg			
									5	3	0	-1	-4	0	bld	snd		60	fuc			no abs, no urchins
								Total	57					24								
17-Jun-93	11a	1843	1853	10	4.0	SW	BD	2	2	0	3	-4	-1	0	bld			90	fuc	fil		
									5	3	9	-1	5	10	rck			100	lbk			
									5	9	13	5	9	15	snd			100	lbk			
									5	13	20	9	16	11	cbl			100	lbk			
									5	20	30	16	26	15	cbl			70	lbk			
									5	30	38	26	34	3	cbl			60	lbk			
									5	38	47	34	43	9	cbl	snd		60	lbk			
									2	47	50	43	46	1	cbl	snd		20	lbk			no abs, no urchins
								Total	34					64								
17-Jun-93	11b	1853	1902	9	4.0	SW	BD	2	5	50	41	46	37	3	rck			50	lbk			
									5	41	31	37	27	5	rck			70	lbk			

									5	31	26	27	22	8	bld	90	lbk		
									5	26	10	22	6	8	rck	90	lbk	fil	
									4	10	0	6	-4	3	rck	90	fil	fuc	no abs, no urchins
								Total	24					27					
17-Jun-93	12a	1710	1719	9	3.5	TO	SW	2	1	0	4	-4	0.5	0	rck	100	lbk		
									2	4	13	0.5	9.5	0	rck	100	lbk		
									3	13	12	9.5	8.5	0	rck	100	lbk		
									5	12	14	8.5	11	0	rck	100	lbk		
									6	14	16	11	13	0	bld	100	lbk		
									5	16	22	13	19	0	rck				many urchins
									6	22	30	19	27	0	rck				
									7	30	50	27	47	4	bld				
								Total	35					4					
17-Jun-93	12b	1719	1727	8	3.5	TO	SW	2	5	50	42	47	39	0	rck				
									3	42	37	39	34	4	rck				
									10	37	27	34	24	2	rck				1 abalone
									4	27	20	24	17	3	rck				
									4	20	16	17	13	0	rck	100	lbk		
									4	16	12	13	8.5	0	rck	100	lbk		
									7	12	12	8.5	8.5	0	rck	100	lbk		
									6	12	0	8.5	-4	0	rck	100	lbk		many urchins
								Total	43					9					
17-Jun-93	15a	1738	1744	6	3.5	TO	SW	2	4	0	15	-4	12	0	rck	100	lbk		
									3	15	20	12	17	0	rck				
									3	20	30	17	27	0	rck				
									5	30	36	27	33	1	bld				
									6	36	49	33	46	0	cbl				no abs, no urchins
								Total	21					1					
17-Jun-93	15b	1744	1750	6	3.5	TO	SW	2	3	49	40	46	37	0	rck	70	fil		
									6	40	32	37	29	1	rck				
									10	32	40	29	37	0	bld	10	lbk		
									10	40	28	37	25	0	bld	10	lbk		
									5	28	25	25	22	0	rck	20	lbk		
									6	25	0	22	-4	0	rck	100	lbk		no abs, no urchins
								Total	40					1					



Map of transect locations in subdistrict 113-51.

SEA CUCUMBER SURVEY TRANSECT DETAILS:

Survey Area: 113-51 original and new areas
Cruise Dates: June 19 & 20, 1993

Divers: Bob DeJong (BDJ), Brian Lynch (BL), Dave Gordon (DG), Tim Minicucci (TM), Scott Walker (SW)

Tide Datum: Pt. Elizabeth/MHW Avg. -14'

Date	Transect #	Time In	Time Out	Total Time	MLLW Tide Correction	Diver #1	Diver #2	Width (Meters)	Length Interval	Start Depth (Feet)	Ending Depth (feet)	MLLW Start (Feet)	MLLW End (feet)	No. of Cucumbers	No. of Red Urchins	Bottom Type #1	Bottom Type #2	% Vegetation Cover	Vegetation Type #1	Vegetation Type #2	Comments
19-Jun-93	1a	1350	1400	10	13.0	TM	DG	2	10	0	10	-13	-3	0		bld		10	fuc		
									10	10	14	-3	1	0		bld		20	fuc	alg	
									6	14	19	1	6	0		bld		100	lbk		
									5	19	28	6	15	0		cbl		100	lbk		
									5	28	35	15	22	3		cbl		70	lbk		no abs or urchins
									5	35	46	22	33	9		cbl	snd	30	lbk		many cucs>50 FSW
								Total	41					12							
19-Jun-93	1b	1400	1410	10	13.0	TM	DG	2	5	50	42	37	29	6		cbl	snd	30	lbk		
									5	42	36	29	23	8		cbl	snd	50	lbk		
									5	36	29	23	16	6		cbl	snd	70	lbk		
									5	29	20	16	7	1		bld		80	lbk		
									9	20	14	7	1	0		bld	cbl	100	lbk		
									5	14	6	1	-7	0		bld	cbl	50	alg		
									3	6	0	-7	-13	0		cbl		30	alg	fuc	no abs - few green urchins
								Total	37					21							
19-Jun-93	2a	1538	1548	10	10.5	TM	DG	2	3	0	5	-11	-5.5	0		rck		70	fuc		
									5	5	10	-6	-0.5	0		rck		50	lbk	alg	
									5	10	19	-1	8.5	0		rck		100	lbk		
									5	19	26	8.5	16	3		rck	snd	50	lbk		
									5	26	29	16	19	3		cbl	snd	70	lbk		
									5	29	36	19	26	8		snd	shl	50	lbk		many cucs 50 FSW
									5	36	47	26	37	7		snd	shl	10	lbk		no urchins or abs
								Total	33					21							
19-Jun-93	2b	1548	1559	10	10.0	TM	DG	2	5	50	40	40	30	8		snd	shl	10	lbk		
									5	40	31	30	21	19		snd	shl	30	lbk		
									5	31	22	21	12	4		rck		70	lbk		
									5	22	16	12	6	6		rck		90	lbk		
									5	16	9	6	-1	3		rck		100	lbk		
									3	9	0	-1	-10	0		rck		50	lbk		no urchins or abs
								Total	28					40							
20-Jun-93	3a	815	849	34	-2.5	TM	BDJ	2	2	0	4	2.5	6.5	0		cbl		50	lbk		
									10	4	9	6.5	12	3		cbl		70	lbk		
									10	9	13	12	16	6		cbl	snd	50	lbk		
									10	13	16	16	19	24		cbl	snd	50	lbk		
									10	16	17	19	20	22		cbl	snd	50	lbk		
									10	17	19	20	22	30		cbl	snd	30	lbk		
									10	19	20	22	23	26		cbl	snd	50	lbk		
									8	20	12	23	15	7		rck		30	lbk		
									5	12	5	15	7.5	5		rck		70	lbk		
									5	5	2	7.5	4.5	0		rck		90	lbk		
									5	2	10	4.5	13	7		rck		80	lbk		
									5	10	11	13	14	12		rck		50	lbk		
									5	11	9	14	12	5		rck		70	lbk		
									5	9	12	12	15	4		rck		70	lbk		
									5	12	12	15	15	6		rck		50	lbk		
									5	12	15	15	18	5		rck		50	lbk		
									5	15	15	18	18	10		rck		50	lbk		
									5	15	16	18	19	8		rck		50	lbk		
									5	16	19	19	22	12		rck		80	lbk		
									5	19	23	22	26	22		rck		30	lbk		
									5	23	27	26	30	22		rck		20	lbk		
									5	27	33	30	36	11		rck	snd	10	lbk		
									5	33	38	36	41	14		rck	snd	10	lbk		
									5	38	42	41	45	4		rck	snd	5	lbk		
									2	42	49	45	52	3		rck	snd				no abs or urchins

								Total	152					268						
20-Jun-93	3b	849	923	34	-2.0	TM	BDJ	2	3	50	42	52	44	3	rck		0			
									5	42	36	44	38	3	rck		0			
									5	36	28	38	30	9	rck		30	lbk		
									5	28	27	30	29	7	rck		50	lbk		
									5	27	32	29	34	10	rck		30	lbk		
									5	32	35	34	37	16	cbl		20	lbk		
									5	35	33	37	35	14	cbl		5	lbk		
									5	33	28	35	30	9	rck		50	lbk		
									5	28	25	30	27	14	rck		30	lbk		
									5	25	25	27	27	15	snd		30	lbk		
									5	25	18	27	20	14	rck		70	lbk		
									5	18	24	20	26	11	rck		90	lbk		
									5	24	28	26	30	12	rck		90	lbk		
									5	28	33	30	35	19	snd		10	lbk		
									5	33	34	35	36	8	snd		10	lbk		
									5	34	33	36	35	6	snd		10	lbk		
									10	33	26	35	28	15	cbl		20	lbk		
									10	26	18	28	20	10	cbl		30	lbk		
									10	18	16	20	18	13	cbl		20	lbk		
									10	16	12	18	14	11	cbl		20	lbk		
									10	12	10	14	12	14	cbl		20	lbk		
									10	10	14	12	16	3	cbl		50	lbk		
									10	14	10	16	12	5	cbl		70	lbk		
									10	10	8	12	10	3	rck		70	lbk		
									12	8	0	10	2	0	rck		90	lbk		no abs or urchins
								Total	170					244						
20-Jun-93	4a	1112	1122	10	6.0	BDJ	TM	2	3	0	6	-6	0	0	bld		30	lbk	alg	
									5	6	10	0	4	3	bld		80	lbk		
									5	10	17	4	11	12	bld		70	lbk		
									5	17	23	11	17	11	bld		70	lbk		
									5	23	27	17	21	10	bld	snd	50	lbk		
									5	27	32	21	26	13	snd	gvl	30	lbk		
									5	32	36	26	30	15	snd	gvl	20	lbk		
									5	36	41	30	35	11	snd	gvl	10	lbk		
									5	41	49	35	43	7	snd	gvl	5	lbk		no urchins or abs
								Total	43					82						
20-Jun-93	4b	1122	1133	11	2.5	BDJ	TM	2	5	50	42	48	40	3	snd	gvl	5	lbk		
									5	42	36	40	34	6	snd	gvl	5	lbk		
									5	36	32	34	30	9	snd	gvl	10	lbk		
									5	32	27	30	25	12	bld		30	lbk		
									5	27	22	25	20	7	bld		50	lbk		
									5	22	14	20	12	5	bld		80	lbk		
									5	14	9	12	6.5	0	bld		100	lbk		
									5	9	6	6.5	3.5	0	bld		100	lbk		
									10	6	0	3.5	-2.5	0	bld		50	fuc	lbk	no urchins or abs
								Total	50					42						
20-Jun-93	5a	809	855	46	-2.5	SW	DG	2	20	0	3	2.5	5.5	0	mud		50	lbk		
									20	3	4	5.5	6.5	0	mud		100	lbk		
									20	4	6	6.5	8.5	6	mud		100	lbk		
									20	6	7	8.5	9.5	0	mud	cbl	90	lbk		
									26	7	6	9.5	8.5	0	mud		90	lbk		
									30	6	7	8.5	9.5	0	mud		100	lbk		
									40	7	8	9.5	11	0	mud		90	lbk		
									32	8	11	11	14	2	mud		90	lbk		
									30	11	17	14	20	6	mud		100	lbk		
									30	17	19	20	22	5	mud		100	lbk		
									25	19	19	22	22	12	mud		100	lbk		
									28	19	18	22	21	8	mud		90	lbk		
									40	18	19	21	22	6	mud		90	lbk		
									40	19	24	22	27	9	mud		50	lbk		
									35	24	34	27	37	20	mud		10	lbk		
									25	34	44	37	47	4	mud					
									7	44	50	47	53	0	snd					no urchins or abs
								Total	468					78						
20-Jun-93	5b	855	942	47	-1.5	SW	DG	2	10	0	4	1.5	5.5	0	mud		100	lbk		
									30	4	10	5.5	12	1	snd		100	lbk		
									27	10	15	12	17	1	snd		95	lbk		
									32	15	18	17	20	0	snd		50	lbk		
									40	18	20	20	22	7	snd		90	lbk		
									25	20	27	22	29	9	snd		40	lbk		
									16	27	34	29	36	14	snd		20	lbk		
									25	34	45	36	47	11	snd					
									10	45	50	47	52	0	snd					no urchins or abs
								Total	215					43						

19-Jun-93	6a	1458	1521	23	11.5	BDJ	BL	2	10	0	13	-12	1.5	0	gvl	bld	70	alg	fuc	
									5	13	17	1.5	5.5	0	cbl	snd	100	lbk		
									5	17	21	5.5	9.5	0	snd	cbl	100	lbk		
									10	21	24	9.5	13	0	snd	shl	95	lbk		
									5	24	25	13	14	1	snd	shl	100	lbk		
									5	25	27	14	16	6	snd	shl	100	lbk		
									5	27	28	16	17	6	gvl	snd	90	lbk		
									10	28	28	17	17	10	cbl	cbl	90	lbk		
									5	28	33	17	22	4	rck	snd	90	lbk		
									3	33	36	22	25	6	snd	rck	80	lbk		
									10	36	40	25	29	9	snd	shl	10	lbk		
									10	40	44	29	33	6	snd	shl				
									5	44	45	33	34	6	snd	shl				
									10	45	43	34	32	9	snd	shl	5	lbk		
									5	43	42	32	31	4	snd	rck				
									10	42	43	31	32	8	rck	snd				
									5	43	47	32	36	11	snd	rck	10	lbk		
									5	47	50	36	39	3	snd	rck	5	lbk		no urchins or abs
								Total	123					89						
19-Jun-93	6b	1521	1544	23	11.0	BDJ	BL	2	10	50	47	39	36	1	snd	shl				
									10	47	42	36	31	5	snd	shl	5	lbk		
									5	42	41	31	30	6	snd	shl	5	lbk		
									5	41	39	30	28	6	snd	shl	5	lbk		
									5	39	39	28	28	7	snd	shl	5	lbk		
									5	39	37	28	26	7	snd	shl	10	lbk		
									5	37	35	26	24	7	snd	rck				
									10	35	27	24	16	4	snd	rck	50	lbk		
									5	27	22	16	11	2	snd	snd	100	lbk		
									10	22	25	11	14	5	rck	snd	95	lbk		
									10	25	23	14	12	6	gvl	shl	100	lbk		
									10	23	14	12	3	4	snd	rck	100	lbk		
									10	14	11	3	0	0	rck					
									5	11	0	0	-11	0	bld	rck	100	alg	fuc	no urchins or abs
								Total	105					60						
19-Jun-93	7a	1349	1357	8	13.0	BDJ	BL	2	30	0	10	-13	-3	0	gvl		10	fuc		
									30	10	10	-3	-3	0	snd	gvl	10	elg		
									30	10	13	-3	0	0	snd		15	elg		few Dungeness
									20	13	15	0	2	0	snd		15	elg		
									15	15	19	2	6	0	snd					
									10	19	30	6	17	0	mud					
									10	30	38	17	25	0	mud					
									10	38	46	25	33	0	mud					
									7	46	50	33	37	0	mud					
								Total	162					0						
19-Jun-93	7b	1357	1406	9	13.0	BDJ	BL	2	10	50	42	37	29	0	mud					
									10	42	35	29	22	0	mud					
									10	35	24	22	11	0	mud					
									5	24	18	11	5	0	mud					
									30	18	13	5	0	0	snd		10	elg		no urchins or abs
									80	13	0	0	-13	0	snd		10	elg		estimated distance
								Total	145					0						
19-Jun-93	8a	1424	1432	8	13.0	BDJ	BL	2	100	0	10	-13	-3	0	gvl		5	fuc		
									20	10	11	-3	-2	0	gvl		10	alg	fir	
									8	11	11	-2	-2	0	snd	shl	10	fir	alg	
									5	11	11	-2	-2	0	snd		10	fir	alg	many horse clams
									15	11	13	-2	0	0	snd		30	elg		
									5	13	14	0	1	0	snd		20	elg		
									5	14	16	1	3	0	slt		50	lbk		5m band of horse clams
									10	16	29	3	16	0	slt		10	lbk		
									5	29	33	16	20	3	slt		10	lbk		
									5	33	36	20	23	3	slt		5	lbk		
									5	36	39	23	26	2	slt		5	lbk		
									10	39	46	26	33	0	slt					no urchins or abs
								Total	193					8						
19-Jun-93	8b	1432	1441	8	12.5	BDJ	BL	2	10	50	41	38	29	0	slt		5	lbk		
									10	41	34	29	22	2	slt		5	lbk		
									5	34	29	22	17	1	slt					
									5	29	22	17	9.5	0	slt					many horse clams
									5	22	15	9.5	2.5	0	snd		5	lbk		
									10	15	13	2.5	0.5	0	snd		10	elg	lbk	
									10	13	11	0.5	-1.5	0	snd	gvl	10	alg		
									120	11	0	-2	-13	0	gvl		10	alg	fuc	no urchins or abs
								Total	175					3						
19-Jun-93	9a	1430	1439	9	12.5	TM	DG	2	10	0	8	-13	-4.5	0	bld		10	fuc		

									20	8	16	-5	3.5	0	cbl	snd	20	lbk		
									10	16	19	3.5	6.5	0	cbl	snd	70	lbk		
									11	19	27	6.5	15	0	cbl	snd	70	lbk		
									10	27	35	15	23	3	cbl	snd	30	lbk		
									5	35	40	23	28	4	snd	shl	10	lbk		
									8	40	47	28	35	4	cbl		5	lbk		no abs and no urchins
								Total	74					11						
19-Jun-93	9b	1439	1449	10	12.5	TM	DG	2	5	50	44	38	32	7	snd	shl	70	lbk		
									5	44	39	32	27	3	snd		30	lbk		
									5	39	32	27	20	1	snd		30	lbk		
									5	32	26	20	14	2	snd		30	lbk		
									10	26	19	14	6.5	0	snd		50	lbk	hrk	
									10	19	16	6.5	3.5	0	snd		70	lbk	hrk	
									10	16	13	3.5	0.5	0	cbl		50	lbk	hrk	
									5	13	9	0.5	-3.5	0	cbl	snd	30	fuc		
									7	9	0	-4	-13	0	cbl	snd	30	fuc		no abs or urchins
								Total	62					13						
19-Jun-93	10a	1317	1325	8	13.0	TM	DG	2	15	0	10	-13	-3	0	cbl					
									10	10	11	-3	-2	0	cbl		30	fuc		
									20	11	16	-2	3	0	snd		50	alg		
									20	16	22	3	9	0	snd		70	elg		
									5	22	30	9	17	0	snd					
									5	30	37	17	24	0	snd					
									5	37	42	24	29	0	snd					
									5	42	48	29	35	0	snd					no urchins or abs
								Total	85					0						
19-Jun-93	10b	1325	1334	9	13.0	TM	DG	2	5	50	41	37	28	0	snd					
									5	41	32	28	19	0	snd					
									5	32	24	19	11	0	snd					
									5	24	16	11	3	0	snd		80	lbk		
									5	16	14	3	1	0	snd		50	lbk		
									5	14	13	1	0	0	bld		20	fuc		few green urchins
									10	13	10	0	-3	0	cbl		50	fuc		
									5	10	8	-3	-5	0	bld		50	fuc		
									15	8	0	-5	-13	0	bld		30	fuc		
								Total	60					0						
20-Jun-93	11a	1540	1550	10	12.5	BL	BDJ	2	10	0	5	-13	-7.5	0	cbl	gvl				
									12	5	8	-8	-4.5	0	bld	cbl	10	fuc		
									5	8	12	-5	-0.5	0	cbl		20	fuc	alg	
									5	12	16	-1	3.5	0	bld	cbl	95	lbk		
									5	16	20	3.5	7.5	0	gvl	snd	95	lbk		
									5	20	24	7.5	12	3	gvl	snd	90	lbk		
									5	24	29	12	17	0	cbl	snd	80	lbk		
									5	29	31	17	19	0	snd	cbl	70	lbk		
									5	31	34	19	22	1	snd		60	lbk		
									10	34	39	22	27	2	snd	shl	30	lbk		
									10	39	47	27	35	2	snd	shl	5	lbk		
									5	47	50	35	38	3	snd	shl				no urchins or abs.
								Total	82					11						
20-Jun-93	11b	1550	1600	10	12.0	BL	BDJ	2	5	50	44	38	32	0	snd	shl				
									5	44	39	32	27	1	snd	shl				
									5	39	36	27	24	1	snd	shl				
									5	36	32	24	20	2	snd	shl	5	lbk		
									5	32	30	20	18	2	snd	shl	80	lbk		
									5	30	28	18	16	6	snd	gvl	75	lbk		
									5	28	25	16	13	6	gvl		90	lbk		
									5	25	21	13	9	0	snd	gvl	90	lbk		
									5	21	15	9	3	1	cbl	gvl	100	lbk		
									3	15	13	3	1	0	cbl		100	lbk		
									5	13	9	1	-3	0	bld		10	alg		
									5	9	6	-3	-6	0	bld		20	fuc	fil	
									5	6	5	-6	-7	0	bld		10	fuc		
									5	5	0	-7	-12	0	bld		5	fuc		no urchins or abs.
								Total	68					19						
20-Jun-93	12a	1515	1531	16	13.0	SW	DG	2	2	0	4	-13	-9	0	rck		40	fuc		
									40	4	12	-9	-1	0	rck		90	fuc	fil	
									25	12	26	-1	13	1	snd		100	lbk		
									15	26	34	13	21	7	snd		95	lbk		
									20	34	45	21	32	10	snd		20	lbk		
									10	45	50	32	37	8	snd		10	lbk		no urchins or abs.
								Total	112					26						
20-Jun-93	12b	1531	1548	17	12.5	SW	DG	2	15	50	41	38	29	7	snd		20	lbk		
									20	41	28	29	16	5	rck		100	lbk		
									20	28	24	16	12	6	rck		100	lbk		

									15	24	17	12	4.5	5	rck		100	lbk		
									20	17	16	4.5	3.5	3	rck		100	lbk		
									20	16	14	3.5	1.5	2	rck		100	lbk		
									30	14	10	1.5	-2.5	0	rck	cbl	40	fuc	fil	
									20	10	0	-3	-13	0	rck	cbl	40	fuc		no urchins or abs.
								Total	160					28						
20-Jun-93	13a	1155	1201	6	9.0	TM	BDJ	2	3	0	3	-9	-6	0	rck		60	fuc	hir	
									5	3	8	-6	-1	0	rck		90	lbk		
									5	8	17	-1	8	0	rck		90	lbk		
									5	17	25	8	16	2	rck		60	lbk		
									5	25	31	16	22	4	rck	snd	20	lbk		
									5	31	37	22	28	5	cbl	snd	20	lbk		
									5	37	43	28	34	13	cbl	snd	10	lbk		
									5	43	49	34	40	8	cbl	snd	10	lbk		no urchins or abs.
								Total	38					32						
20-Jun-93	13b	1201	1207	6	9.5	TM	BDJ	2	5	50	44	41	35	11	cbl	snd	5	lbk		
									5	44	36	35	27	17	cbl	snd	10	lbk		
									5	36	29	27	20	4	cbl	snd	20	lbk		
									5	29	18	20	8.5	6	bld		60	lbk		
									5	18	11	8.5	1.5	1	bld		90	lbk		
									5	11	7	1.5	-2.5	0	bld		90	lbk		
									7	7	0	-3	-9.5	0	rck		50	lbk	fuc	no urchins or abs.
								Total	37					39						
20-Jun-93	14a	1620	1628	8	11.0	SW	DG	2	3	0	3	-11	-8	0	bld					
									5	3	11	-8	0	0	bld		100	lbk		
									5	11	20	0	9	2	bld		75	lbk		
									5	20	29	9	18	4	bld		75	lbk		
									5	29	38	18	27	3	cbl		90	lbk		
									5	38	46	27	35	5	cbl		70	lbk		
									3	46	50	35	39	3	cbl		60	lbk		no urchins or abs.
								Total	31					17						
20-Jun-93	14b	1628	1636	8	10.5	SW	DG	2	5	50	42	40	32	2	bld					
									5	42	33	32	23	0	bld					
									5	33	24	23	14	0	bld		100	lbk		
									5	24	17	14	6.5	0	bld		100	lbk		
									5	17	10	6.5	-0.5	0	cbl		100	lbk	fil	
									5	10	8	-1	-2.5	0	cbl		20	fil		
									8	8	0	-3	-11	0	cbl		10	fuc		no urchins or abs.
								Total	38					2						
20-Jun-93	15a	1648	1656	8	9.5	BL	BDJ	2	1	0	3	-10	-6.5	0	bld		30	fuc		
									5	3	7	-7	-2.5	0	bld	gvl	30	fuc		
									5	7	9	-3	-0.5	0	bld	gvl	50	fuc	alg	
									2	9	10	-1	0.5	1	bld	gvl	60	lbk	alg	
									5	10	13	0.5	3.5	8	bld	snd	100	lbk		
									5	13	19	3.5	9.5	9	gvl		100	lbk		
									5	19	30	9.5	21	7	gvl		100	lbk		
									5	30	39	21	30	7	gvl		50	lbk		
									5	39	48	30	39	1	snd	gvl	20	lbk		no urchins or abs.
								Total	38					33						
20-Jun-93	15b	1656	1705	9	9.0	BL	BDJ	2	5	50	42	41	33	3	gvl		10	lbk		
									5	42	35	33	26	5	gvl		5	lbk		
									5	35	29	26	20	4	gvl		10	lbk		
									5	29	21	20	12	7	cbl		100	lbk		
									5	21	14	12	5	6	gvl		100	lbk		
									5	14	11	5	2	4	gvl		100	lbk		
									5	11	9	2	0	3	bld	gvl	100	lbk		
									8	9	0	0	-9	0	bld		50	lbk	fuc	no urchins or abs.
								Total	43					32						
20-Jun-93	16a	1725	1730	5	8.0	BL	BDJ	2	5	0	5	-8	-3	0	gvl		30	fuc	alg	
									4	5	10	-3	2	0	gvl		25	fuc	alg	
									5	10	17	2	9	0	snd	gvl	10	lbk		
									5	17	26	9	18	1	snd	gvl	10	lbk		
									5	26	36	18	28	2	gvl	snd	5	lbk		
									5	36	46	28	38	1	gvl	snd				
									2	46	50	38	42	0	gvl	slt				no urchins or abs.
								Total	31					4						
20-Jun-93	16b	1730	1735	5	7.5	BL	BDJ	2	5	50	42	43	35	1	gvl	slt				
									5	42	33	35	26	1	gvl	slt				
									5	33	21	26	14	2	gvl	slt	20	lbk		
									5	21	11	14	3.5	1	gvl	snd	20	lbk	alg	
									5	11	7	3.5	-0.5	0	gvl	snd	90	alg		
									5	7	0	-1	-7.5	0	gvl	snd	90	alg		no urchins or a'
								Total	30					5						
20-Jun-93	17a	1702	1712	10	9.0	SW	DG	2	10	0	4	-9	-5	0	cbl					

									8	4	10	-5	1	1	cbl	50	lbk	fil	
									5	10	17	1	8	9	cbl	100	lbk		
									5	17	24	8	15	9	cbl	100	lbk		
									32	24	31	15	22	12	cbl	90	lbk		sample taken
									10	31	45	22	36	3	snd	40	lbk		
									4	45	50	36	41	4	snd				no urchins or abs
								Total	74					38					
20-Jun-93	17b	1712	1722	10	8.5	SW	DG	2	5	50	44	42	36	2	snd	10	lbk		
									5	44	37	36	29	8	sbd	10	lbk		
									5	37	30	29	22	11	cbl	100	lbk		
									5	30	23	22	15	7	cbl	100	lbk		
									5	23	17	15	8.5	11	cbl	100	lbk		
									8	17	10	8.5	1.5	4	cbl	100	lbk		
									10	10	6	1.5	-2.5	0	cbl	100	lbk		
									10	6	0	-3	-8.5	0	cbl	75	lbk		no urchins, no abs
								Total	53					43			fuc	alg	

APPENDIX B: Sea cucumber weights by subdistrict from commercial fisheries, 1993

Appendix B. Sea Cucumber weights by subdistrict from commercial fishery surveys, 1993.

INDIVIDUAL SEA CUCUMBER WEIGHTS FROM COMMERCIAL FISHERY

	101-43, Thorne Arm 10/4/93				
N	200				
Mean	117.8				
Std dev.	39.4				
	29	42	30	50	61
	42	45	39	72	65
	54	58	52	74	95
	61	64	74	79	106
	69	77	79	80	167
	69	78	80	95	174
	69	81	83	96	176
	70	83	85	97	179
	79	83	85	102	192
	81	83	86	103	206
	85	92	87	104	219
	86	93	88	105	221
	88	99	88	107	229
	88	99	89	107	248
	88	100	91	108	266
	93	101	91	110	276
	96	102	93	112	
	100	103	94	113	
	105	103	95	113	
	105	106	96	113	
	105	108	99	114	
	105	109	101	115	
	106	110	102	117	
	108	114	103	118	
	114	116	113	118	
	115	118	114	120	
	116	122	116	123	
	118	123	117	125	
	118	127	121	125	
	119	130	121	125	
	124	131	122	129	
	125	136	124	129	
	129	138	124	136	
	131	139	126	136	
	132	140	134	136	
	138	144	134	137	
	139	145	135	137	
	140	152	139	138	
	145	153	143	141	
	145	154	145	142	
	153	155	145	143	
	153	157	148	149	
	153	158	156	160	
	155	168	159	161	
	159	169	165	169	
	159	170	168	182	

	102-30, Moira Sound 10/4/93					
N	299					
Mean	202.1					
Std dev.	55.3					
	64	126	70	125	75	86	90
	118	132	109	127	78	88	98
	120	134	133	132	113	88	138
	150	142	134	134	124	95	145
	156	145	141	145	128	120	158
	157	147	143	145	129	123	163
	159	155	146	150	133	142	167
	159	161	156	150	137	161	169
	169	166	157	153	145	163	175
	171	166	160	157	147	167	175
	174	168	162	165	147	169	176
	179	169	165	170	155	172	179
	181	170	166	170	158	177	180
	184	176	170	174	162	178	187
	186	183	175	177	165	180	195
	187	185	178	178	169	186	201
	191	188	181	179	169	187	210
	191	189	181	179	180	189	220
	192	197	183	180	181	191	225
	193	199	183	181	184	196	230
	195	199	185	190	191	198	258
	195	201	187	191	193	199	272
	197	207	189	193	193	203	277
	200	208	192	196	199	208	
	200	210	193	198	203	209	
	200	212	195	199	206	224	
	201	213	195	213	213	231	
	201	213	195	218	214	234	
	210	219	201	219	217	235	
	213	224	203	224	220	238	
	214	229	203	227	221	244	
	215	237	204	227	223	244	
	221	237	205	227	227	247	
	224	238	206	228	237	254	
	226	243	206	230	243	257	
	227	244	210	235	248	265	
	236	252	211	254	255	267	
	239	253	217	256	256	270	
	243	264	224	257	259	284	
	248	272	226	262	263	287	
	248	283	235	263	288	302	
	258	306	237	264	301	305	
	260	320	239	266	312	314	
	278	326	243	267	313	332	
	312	327	248	311	328	337	
	362	362	260	361	332	404	

Appendix B. Sea Cucumber weights by subdistrict from commercial fishery surveys, 1993 (cont.).

	113-31, West Baranof 10/11-15/93					113-32, West Crawfish 10/11/93			113-38, Deep Inlet 10/14/93		
N	202					113			119		
Mean	210.6					246.0			213.1		
Std dev.	49.9					59.0			52.3		
	82	178	205	228	265	119	231	291	124	189	238
	84	178	205	228	266	137	232	294	124	190	242
	104	178	207	228	267	139	235	299	135	191	245
	105	180	208	229	267	146	236	300	135	191	249
	108	181	208	229	268	149	237	300	138	192	252
	115	181	209	231	269	149	237	300	139	193	255
	116	181	210	231	273	151	237	302	140	193	257
	116	182	210	231	273	157	237	306	143	194	258
	122	183	211	232	273	175	240	309	148	196	259
	125	184	211	232	274	178	240	310	157	196	264
	126	184	211	232	278	180	242	310	157	196	265
	136	184	212	233	281	182	242	311	158	197	267
	139	184	212	234	288	185	242	312	158	198	267
	141	185	212	235	290	186	243	313	160	198	269
	142	185	213	236	291	187	243	325	160	199	273
	142	185	213	237	301	187	243	330	161	199	274
	146	185	213	238	301	188	247	334	162	199	277
	146	186	214	238	306	188	248	340	163	201	278
	147	188	214	241	307	189	252	349	164	204	278
	147	188	216	241	308	189	254	365	164	205	279
	149	189	216	242	333	192	255	375	169	206	280
	149	189	217	242	335	193	255	379	172	208	286
	153	190	218	242	337	194	256	383	173	208	287
	154	191	218	242	378	195	257	399	173	209	288
	156	191	218	242	391	195	257	406	173	211	301
	157	191	218	244		198	257		174	212	310
	159	191	219	244		199	258		174	217	338
	159	192	219	246		199	258		176	217	353
	160	194	219	246		200	258		177	219	370
	160	194	220	247		201	260		178	221	371
	161	195	220	248		202	260		179	221	378
	161	196	221	249		202	261		183	222	
	163	196	222	249		204	263		183	222	
	164	198	222	250		206	268		184	225	
	166	198	222	250		209	271		185	225	
	166	199	222	252		210	271		185	226	
	167	199	223	253		211	275		185	226	
	168	201	225	254		214	276		185	228	
	171	201	225	255		215	276		186	228	
	171	201	225	257		218	277		186	231	
	171	203	227	257		223	277		186	233	
	174	204	227	257		225	286		186	234	
	174	204	227	258		229	287		187	234	
	175	204	228	263		230	289		187	235	
	177										

Appendix B. Sea Cucumber weights by subdistrict from commercial fishery surveys, 1993 (cont.)

	113-51,52, Peril, Hanus 10/8/93			113-59, Sitkoh Bay 10/8/93			Peril Strait Total
N	104			113			217
Mean	230.2			179.3			203.7
Std dev.	72.5			39.4			62.9
	85	214	316	68	168	204	
	114	216	318	93	168	208	
	115	217	319	94	169	213	
	117	218	328	107	172	213	
	121	220	328	113	173	214	
	121	222	328	123	173	217	
	122	223	328	124	174	220	
	130	223	336	126	175	223	
	133	224	344	130	175	223	
	140	228	345	132	176	223	
	141	229	353	132	176	225	
	142	232	354	134	178	226	
	143	233	364	134	178	228	
	146	233	386	135	179	230	
	146	234	392	136	180	232	
	147	234	393	137	181	235	
	153	235		139	182	236	
	154	236		145	182	239	
	158	245		146	183	241	
	159	246		147	184	246	
	165	250		149	185	250	
	166	253		149	185	262	
	166	253		150	185	268	
	166	259		150	186	288	
	172	265		150	188	291	
	174	267		151	189		
	175	268		151	189		
	175	269		152	189		
	177	270		153	191		
	180	271		154	192		
	182	275		154	193		
	183	277		155	194		
	184	285		155	194		
	185	285		156	194		
	188	291		157	195		
	189	291		158	196		
	193	295		161	196		
	195	296		163	197		
	195	299		164	198		
	195	300		164	198		
	200	300		165	198		
	202	304		165	199		
	202	310		165	199		
	209	312		165	202		

APPENDIX C: Sea cucumber weights by subdistrict from assessment surveys, 1993

Appendix C. Sea cucumber weights by subdistrict from assessment surveys, 1993.

INDIVIDUAL SEA CUCUMBER WEIGHTS FROM ASSESSMENT SURVEYS

101-43, Thorne Arm

Transect:	2	4	44	45	Total
N	34	14	36	35	119
Mean	175.5	295.2	171.4	155.1	182.3
Std dev.	52.8	93.9	40.5	34.2	66.0
	79	125	76	93	
	93	211	87	103	
	106	230	105	113	
	110	254	108	117	
	119	255	125	119	
	125	275	132	124	
	134	281	140	124	
	136	301	143	126	
	137	307	155	126	
	143	310	159	127	
	149	327	161	131	
	159	355	162	131	
	165	359	162	134	
	165	543	166	139	
	165		166	145	
	166		167	146	
	167		167	150	
	175		169	157	
	180		171	158	
	181		173	159	
	182		174	164	
	183		178	164	
	192		179	165	
	196		184	169	
	200		188	170	
	201		188	171	
	206		189	171	
	212		198	179	
	217		204	191	
	218		205	194	
	222		216	202	
	266		220	204	
	307		228	215	
	310		235	223	
			243	224	
			247		

101-53, East Behm Canal

Transect:	1	1	5	48	49	Total
N	90		60	34	35	219
Mean	79.9		112.5	86.7	78.7	89.7
Std dev.	30.4		34.5	25.2	41.5	35.6
	20	96	45	13	10	
	26	96	54	47	20	
	26	97	59	51	25	
	27	97	62	54	25	
	30	101	62	57	27	
	31	102	64	64	32	
	35	102	65	65	36	
	35	103	67	65	42	
	36	105	71	66	42	
	37	107	72	66	47	
	40	107	74	67	49	
	42	108	80	69	50	
	45	108	82	84	54	
	45	108	84	85	55	
	47	108	86	88	71	
	47	110	91	93	72	
	48	113	92	95	73	
	49	114	92	98	76	
	51	114	96	99	84	
	52	115	97	100	93	
	54	115	102	100	94	
	55	117	102	101	94	
	56	124	103	105	99	
	56	124	104	106	100	
	59	125	106	107	103	
	59	133	108	108	104	
	62	133	109	108	104	
	63	136	109	109	111	
	64	143	112	109	115	
	64	147	112	109	121	
	64		112	113	126	
	67		112	114	132	
	67		116	115	138	
	68		116	117	150	
	69		118		179	
	72		120			
	74		123			
	75		127			
	75		129			
	77		130			
	78		130			
	78		131			
	80		132			
	81		133			
	82		134			
	82		134			
	83		136			
	84		139			
	85		142			
	85		142			
	86		143			
	86		143			
	88		151			
	89		152			
	89		156			
	89		157			
	89		164			
	92		167			
	93		181			
	93		219			

101-85, West Behm Canal

Transect :	15	19	21	24	Total
N	49	52	50	20	171
Mean	166.0	156.0	216.8	115.7	171.9
Std dev.	30.2	50.5	66.1	40.2	59.3
	103	9	76	18	
	112	89	95	42	
	120	96	105	67	
	123	96	110	92	
	125	107	136	94	
	133	108	155	98	
	133	111	157	113	
	134	118	158	116	
	137	120	163	118	
	137	121	167	120	
	138	124	171	120	
	140	124	177	122	
	144	125	178	122	
	144	125	179	124	
	144	128	186	133	
	144	129	186	151	
	153	130	187	161	
	155	131	188	161	
	157	131	189	164	
	158	132	189	178	
	159	139	193		
	161	140	195		
	162	140	197		
	164	143	199		
	166	146	202		
	167	146	211		
	173	147	215		
	173	148	218		
	174	148	220		
	174	150	221		
	177	158	224		
	180	159	226		
	180	164	227		
	181	165	227		
	181	173	235		
	182	176	238		
	182	176	247		
	185	180	264		
	189	184	271		
	191	187	278		
	192	189	278		
	198	197	296		
	208	199	298		
	210	200	308		
	210	206	309		
	211	208	311		
	217	212	334		
	225	217	343		
	227	220	350		
		238	352		
		280			
		324			

Appendix C. Sea cucumber weights by subdistrict from assessment surveys, 1993 (cont.).

102-30, Moira Sound

Transect: 31	33	36	40	41	Total
32	31	48	43	28	182
134.2	150.3	149.9	239.0	199.9	175.9
34.2	41.9	41.2	51.4	60.7	61.1
34	59	45	123	68	
89	77	73	136	125	
90	81	81	139	128	
94	100	86	154	144	
97	111	86	157	144	
110	114	91	169	148	
112	121	98	184	161	
114	124	105	184	168	
118	126	114	189	170	
119	133	118	210	186	
122	134	120	212	188	
125	134	122	214	188	
125	136	123	218	191	
127	139	127	221	193	
135	142	132	224	196	
135	152	133	225	198	
137	155	134	231	202	
138	157	141	234	204	
142	164	146	237	206	
151	170	147	237	207	
152	171	148	241	209	
153	174	151	246	227	
153	179	152	250	254	
154	182	153	251	256	
154	184	157	255	279	
158	188	161	256	296	
159	190	162	258	305	
160	196	163	265	357	
161	208	165	265		
168	217	165	271		
180	240	165	275		
229		168	276		
		169	281		
		170	282		
		171	288		
		172	289		
		172	291		
		175	292		
		179	292		
		182	297		
		189	304		
		195	321		
		196	331		
		210			
		210			
		216			
		218			
		237			

102-70, Clarence Strait

Transect: 1	2	4	5	8	10	11	Total
12	40	6	31	7	4	18	118
306.7	233.3	285.2	238.1	185.9	149.8	194.6	233.1
44.8	43.4	16.4	37.2	49.4	56.7	87.4	61.6
252	150	267	167	118	94	24	
265	155	271	187	119	108	26	
268	168	278	188	192	194	34	
274	176	288	197	195	203	150	
283	178	297	201	208		170	
304	184	310	209	224		173	
305	185		209	245		179	
319	190		214			207	
319	195		216			209	
320	197		216			224	
360	201		217			231	
411	202		224			238	
	202		225			244	
	207		227			263	
	212		227			265	
	222		236			280	
	225		239			284	
	230		240			301	
	232		240				
	236		242				
	239		242				
	239		249				
	240		263				
	241		269				
	249		269				
	253		269				
	254		279				
	261		295				
	261		296				
	265		302				
	265		327				
	275						
	276						
	280						
	286						
	289						
	290						
	299						
	301						
	320						

103-40a

Transect: 38	16	13	19	31	Total
18	35	60	24	43	180
377.9	213.0	196.6	249.6	227.8	232.4
51.5	38.5	33.4	69.1	55.2	70.1
250	137	122	149	119	
331	137	144	169	145	
339	149	150	169	152	
343	159	158	187	153	
350	162	158	191	158	
353	175	160	194	160	
360	179	162	214	178	
372	181	163	217	193	
373	190	164	222	194	
379	197	164	228	196	
381	200	165	231	200	
385	200	166	233	200	
395	200	167	235	201	
409	200	172	236	202	
413	202	175	250	203	
432	204	178	252	204	
467	211	179	273	208	
471	213	180	279	209	
	214	180	280	214	
	218	180	291	218	
	223	180	301	225	
	231	182	387	227	
	231	184	393	234	
	231	185	409	234	
	236	185		235	
	237	185		236	
	239	186		236	
	246	188		237	
	247	188		238	
	254	189		241	
	256	189		241	
	261	189		245	
	269	191		250	
	279	192		250	
	287	193		252	
		196		270	
		197		282	
		201		287	
		201		297	
		203		300	
		206		319	
		207		331	
		207		422	
		217			
		222			
		222			
		223			
		226			
		227			
		227			
		228			
		233			
		233			
		244			
		250			
		252			
		256			
		257			
		280			
		288			

Appendix C. Sea cucumber weights by subdistrict from assessment surveys, 1993 (cont.).

103-90c Karheen Pass

Transect: 9b	4	Total
44	61	105
322.4	338.2	331.6
65.2	74.9	71.1
170	161	
205	182	
231	212	
232	226	
242	247	
250	259	
257	263	
258	266	
262	271	
280	274	
282	275	
282	277	
285	281	
288	287	
303	290	
303	290	
304	296	
307	296	
310	296	
312	300	
313	314	
313	316	
316	316	
322	317	
326	318	
327	322	
328	322	
330	330	
350	331	
350	331	
352	332	
354	332	
355	343	
360	344	
370	345	
372	346	
386	350	
393	350	
410	353	
416	357	
433	360	
443	363	
451	367	
452	369	
	379	
	379	
	380	
	381	
	396	
	397	
	400	
	404	
	416	
	417	
	428	
	432	
	432	
	436	
	441	
	551	
	585	

113-31, Sitka-Goddard to Aspid Cape

Transect: 18	25	34	34	Total
56	20	70		146
274.6	312.2	153.4		221.7
70.3	48.9	40.5		86.2
84	243	43	169	
101	249	53	170	
174	255	58	173	
180	256	76	174	
190	259	82	177	
192	269	85	177	
201	279	90	177	
204	294	114	178	
205	296	115	181	
210	315	115	181	
212	320	119	183	
223	320	120	185	
224	333	122	185	
227	342	123	192	
227	346	126	193	
235	349	128	200	
240	364	129	203	
245	367	132	204	
250	374	135	210	
254	414	139	211	
259		139	211	
260		142	219	
263		143	227	
265		144	257	
267		144		
267		144		
271		144		
272		148		
278		149		
278		150		
281		151		
283		151		
285		152		
287		153		
289		154		
294		158		
295		158		
297		158		
300		159		
302		161		
303		163		
304		163		
305		165		
324		166		
341		168		
350		169		
352				
352				
356				
361				
372				
373				
374				
381				
426				
435				

113-32, West Crawfish

Transect: 4/5	6	1	27	7	3	Total
17.0	54.0	16.0	15.0	27.0	17.0	146.0
173.5	248.7	141.3	163.5	254.8	248.5	220.5
58.37	84.17	37.79	63.21	59.89	89.77	83.22
69	33	59	52	126	79	
95	72	81	71	177	152	
96	76	102	104	180	153	
97	91	104	110	189	175	
114	100	134	129	205	188	
155	129	140	138	207	196	
164	147	141	144	219	218	
177	149	143	168	228	221	
199	152	144	177	228	225	
202	159	149	204	237	247	
207	185	167	207	237	270	
214	206	177	220	241	307	
219	215	177	223	245	332	
231	215	179	250	246	334	
233	216	180	255	255	355	
238	222	184		260	372	
239	224			266	400	
	228			268		
	228			290		
	234			293		
	236			293		
	244			295		
	245			302		
	246			313		
	250			317		
	253			334		
	254			429		
	260					
	265					
	270					
	277					
	278					
	279					
	284					
	287					
	287					
	288					
	290					
	292					
	294					
	296					
	299					
	301					
	303					
	304					
	324					
	329					
	335					
	349					
	349					
	350					
	394					
	414					
	423					

Appendix C. Sea cucumber weights by subdistrict from assessment surveys, 1993 (cont.).

113-33, Crawfish Inlet

Transect: 36	39	2	3	Total
16	27	53	36	132
239.9	225.5	272.2	204.3	240.2
52.8	53.9	60.1	46.2	60.9
96	127	145	75	
180	145	184	88	
204	149	191	150	
214	156	191	157	
217	170	197	158	
227	177	199	163	
242	189	206	173	
243	190	215	177	
252	200	216	181	
255	201	217	182	
262	205	220	182	
266	221	220	185	
278	225	221	191	
285	226	224	193	
295	226	224	197	
322	227	235	197	
	230	240	200	
	239	245	202	
	264	245	212	
	265	248	213	
	266	248	216	
	272	256	217	
	285	258	220	
	292	260	221	
	304	265	221	
	305	272	229	
	333	276	234	
		277	235	
		277	239	
		278	242	
		279	248	
		280	257	
		281	262	
		282	271	
		284	283	
		289	284	
		290		
		303		
		305		
		305		
		306		
		307		
		314		
		321		
		327		
		328		
		345		
		351		
		361		
		396		
		403		
		403		
		419		

113-34, Necker

Transect: 3
45
234.8
75.8
72
88
103
110
118
126
136
155
156
173
186
190
191
192
195
203
207
221
235
239
243
245
248
265
265
266
276
278
281
282
284
285
285
285
286
286
288
295
296
306
307
311
345
356
406

113-41,38 SitkaSound

Transect: 2.5	4.5	4	Total
47	29	34	110
198.4	261.2	231.2	225.1
36.8	38.4	51.4	49.1
138	151	130	
143	170	151	
151	218	153	
154	224	156	
156	245	165	
163	248	167	
164	248	178	
165	248	184	
172	255	185	
173	257	192	
174	259	207	
176	260	210	
177	260	217	
179	261	220	
183	264	230	
184	266	231	
185	268	241	
186	273	244	
186	274	249	
187	275	254	
188	275	255	
190	275	255	
191	277	256	
191	282	259	
191	286	262	
197	292	269	
199	299	270	
200	302	272	
201	363	272	
206		274	
208		304	
209		307	
211		310	
212		333	
214			
215			
216			
217			
227			
230			
231			
236			
237			
249			
252			
256			
356			

113-51, Peril Strait

Transect: 2	2	6	4	4	8	Total
107		38	74		32	251
186.2		146.1	144.0		157.3	164.0
36.8		65.1	34.7		58.8	48.7
88	181	49	55	150	28	
98	183	51	77	150	44	
119	183	64	85	153	53	
120	184	65	86	155	56	
124	185	65	91	161	73	
125	185	66	104	162	112	
125	188	69	106	163	124	
133	189	76	108	164	134	
134	190	76	110	166	135	
136	191	88	113	166	137	
138	192	104	114	167	146	
138	193	115	115	167	147	
139	195	124	118	169	154	
141	196	126	118	171	158	
146	196	129	120	171	158	
147	197	139	121	171	159	
148	197	143	124	172	164	
149	198	144	124	174	166	
153	199	146	126	178	170	
153	199	148	127	185	176	
154	199	150	127	189	179	
155	200	157	128	197	179	
157	200	157	128	199	192	
158	201	161	129	227	192	
159	201	168	129	250	204	
159	203	172	130	265	208	
159	205	174	131		208	
159	205	175	131		211	
162	205	176	132		223	
166	207	185	136		225	
167	207	200	137		238	
167	210	202	138		279	
168	214	204	138			
170	215	216	138			
172	215	232	139			
172	218	237	141			
172	220	239	141			
173	221	358	142			
174	221		142			
175	221		142			
175	224		144			
175	226		145			
176	227		146			
177	229		146			
177	230		147			
177	230		148			
177	231		148			
180	235		148			
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