

GEODUCK CLAM STOCK ASSESSMENT SURVEYS
AND FISHERY MANAGEMENT
FOR THE 2000/2001 SEASON



by

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and
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TABLE OF CONTENTS

| | <u>Page</u> |
|---|-------------|
| AUTHORS | 2 |
| ACKNOWLEDGMENTS | 2 |
| LIST OF TABLES..... | 4 |
| LIST OF FIGURES | 4 |
| LIST OF APPENDICES..... | 4 |
| ABSTRACT | 5 |
| INTRODUCTION | 6 |
| METHODS..... | 6 |
| Geoduck Weight Estimates | 8 |
| Geoduck Biomass Estimates | 9 |
| SHOW FACTOR SURVEYS | 10 |
| SURVEY RESULTS AND DISCUSSION..... | 11 |
| FISHERY MANAGEMENT AND SEASON SUMMARY | 13 |
| LITERATURE CITED..... | 16 |
| APPENDICES | 27 |

LIST OF TABLES

| | <u>Page</u> |
|--|-------------|
| Table 1. Biomass estimates of geoduck clams from seven areas surveyed in Southeast Alaska in 2000..... | 17 |
| Table 2. Southeast Alaska 1999–2000 season commercial geoduck clam harvest by area..... | 18 |

LIST OF FIGURES

| | <u>Page</u> |
|--|-------------|
| Figure 1. Geoduck clam survey and commercial harvest areas in Southeast Alaska..... | 19 |
| Figure 2. Vallenar Bay (in Subdistrict 101-23-815004) 2000 geoduck survey transect locations..... | 20 |
| Figure 3. Foggy Bay geoduck survey transect locations..... | 21 |
| Figure 4. South Vallenar Point (101-23-815003) 2000 geoduck survey transect locations..... | 22 |
| Figure 5. Cone Island area geoduck survey transect locations. Transects 1–9 were surveyed in 1999 (see RIR 1J00-34, Figure 5)..... | 23 |
| Figure 6. San Christoval 2000 geoduck survey transect locations..... | 24 |
| Figure 7. Ulitka Bay (Bed 103-70-815001) 2000 geoduck survey transect locations..... | 25 |
| Figure 8. Port Santa Cruz (Subdistrict 104-30) 2000 geoduck survey transect locations..... | 26 |

LIST OF APPENDICES

| | <u>Page</u> |
|---|-------------|
| Appendix A. Key to vegetative substrate types used for geoduck clam surveys..... | 28 |
| Appendix B. Key to bottom types used for geoduck clam surveys..... | 29 |
| Appendix C. Vallenar Bay (Bed 101-23-815004) geoduck clam assessment survey, 2000..... | 30 |
| Appendix D. Foggy Bay (Bed 101-23-001) geoduck clam assessment surveys (1998, 1999, & 2000)..... | 34 |
| Appendix E. South Vallenar Point (in Subdistrict 101-29) 2000 geoduck clam assessment surveys..... | 39 |
| Appendix F. Cone Island (in portions of Subdistricts 103-50, 104-35, and 104-40) geoduck clam assessment survey, 1999 and 2000..... | 43 |
| Appendix G. San Christoval (in Subdistrict 103-70) 2000 geoduck clam assessment survey..... | 49 |
| Appendix H. Ulitka Bay (Bed 103-70-815001) 2000 geoduck clam assessment survey..... | 53 |
| Appendix I. Port Santa Cruz (in Subdistrict 104-30) 2000 geoduck clam assessment survey..... | 65 |

ABSTRACT

Surveys were conducted in portions of commercial fishing Subdistricts 101-23, 101-29, 103-50, 103-90, 103-70, 104-30, 104-35, and 104-40 to estimate geoduck clam biomass. Surveys were conducted by Alaska Department of Fish and Game (ADF&G) divers during June, July, and August 2000 using the ADF&G *R/V Sundance*. The fishery was opened November 26, 2000 with a Guideline Harvest Level of 177,400 kg (391,100 lb). An estimated total of 198,825 kg (438,334 lb) of geoduck clams were harvested during the 2000-2001 fishery.

INTRODUCTION

Historically, geoduck clam assessment surveys have been limited in scope in Southeast Alaska. Stock assessment surveys were first completed in Southeast Alaska in 1982 at Noyes Island and in 1988 and 1989 at Biorka Island, Kah Shakes, and Gravina Island. Although commercial fisheries have been ongoing in these areas since 1985 no additional surveys were conducted until 1997. Beginning in 1997 established commercial harvest areas were resurveyed, as were several new areas. The principal goals of this project were to 1) conduct a biomass assessment survey prior to opening the commercial fishery in areas scheduled to open for the 2000-2001 season, and 2) continue improvement of assessment techniques for future surveys. Areas surveyed were Foggy Bay in Subdistrict 101-23-001, Vallenar Bay and South Vallenar Point both in Subdistrict 101-29, San Christoval Channel, Palisade Island, and northern Rosary Island in Subdistrict 103-70, Ulitka Bay in 103-70, Cone Island area in portions of Subdistricts 103-50, 104-35, and 104-40, and Port Santa Cruz in Subdistrict 104-30 (Figure 1). As of the 2000 survey season, all traditional commercial geoduck harvest areas have been resurveyed.

METHODS

Density estimates were made by scuba divers along two-meter-wide strip transects. There are two types of transects that may be used depending on the area, Type I and II; these transects serve as the primary sampling unit. Type I transects run perpendicular to shore and are used along straight shorelines (not coves or bays). Transects extend to a minimum target depth of 17 m (55 fsw) depth below mean lower low water (MLLW). Dives to the target depth include the majority of habitat in which commercial divers normally operate. Dives are limited to a maximum depth of 21 m (70 fsw) because deeper dives severely limit total bottom time for scuba divers and pose safety risks when conducted repetitively over several days. Transect length varies depending on the slope of the bottom. For Type I transects, two divers swam as a team along each transect, with one diver holding a two-meter rod (a 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. The diver carrying the rod counted the number of geoduck clams passing under one side of the rod (usually the left) while the second diver counted geoducks on the other side (usually the right). Alternatively, each diver may carry a one-meter rod, but under no circumstances would a diver count an area wider than one meter. Type I transects are used in areas such as Vallenar Bay and Cone Island.

Type II transects are used in coves and embayments where a reasonable estimate of seabed area can be made. A buoyed anchor is dropped on a transect location where divers descend and survey a predetermined measured distance. Beginning at the anchor, a 1-m² PVC frame is flipped along a compass heading (generally toward the mouth of a bay), and all geoducks within each frame are counted and recorded. This survey season Type II transects were used in Ulitka Bay.

A variation of both Type I and II transects involves using a 1-meter square that is placed at the beginning of the transect and flipped until either target depth (Type I) or target distance (Type II) is reached. Geoduck counts are made within each square. This method has the advantage of focusing the counts into a well-defined area and may achieve a higher within transect precision (though this has not been tested). The disadvantages are the cumbersome use of the square, particularly in dense kelp, and the longer dive time required to complete a transect.

In addition to recording the geoduck count for each transect, divers also recorded data for start and stop depths, substrate type, percent vegetative cover, vegetative type, and the presence of other species of interest including sea urchins, sea cucumbers, abalone, and *Sargassum muticum*. Vegetative type was recorded for the two most common types on each transect, with the most prevalent type listed first. Substrates were coded using a key that groups various algae and intertidal plant species into categories (Appendix A). Similarly, substrate type was recorded as "percent cover" for up to two types and was coded (Appendix B).

The beginning and ending time for each transect was recorded by a dive tender to allow for standardization to the mean lower low water (mllw) tide stage. Preferably, shoreline (type-one) transects were paired (sides A and B) so that a dive team would census one strip while descending, and then a second strip when returning to shore. The second transect in each pair is approximately 10-15 meters to the left (when facing shore) of the first transect. This is the preferred method but may not be practical when a gentle slope requires extended bottom times with multiple dives often necessary to complete one transect. It is left to the divers discretion as to whether a paired transect is appropriate for a particular transect site. The appendices list whether a transect was paired or not.

Density estimates for each linear shoreline (Type I) were calculated as the average number of geoducks per meter of shoreline length:

$$D_1 = \sum_{i=1}^n \frac{L_i}{kL_t} c_i , \quad (1)$$

where:

- D_1 = estimated number of geoducks per meter of shoreline,
- i = transect index,
- c_i = count of geoduck clams on each transect i ,
- L_i = shoreline segment length associated with each transect i ,
- L_t = total shoreline length,
- k = either 2 or 4.

The variable k in Equation 1 is equal to 2 when only side A is counted on a Type I transect, or equals 4 when both sides A and B are counted, and corrects for the 2-meter width of each transect side.

Where a reasonable estimate of seabed area could be made (Type II transects), the density per square meter of seabed was estimated:

$$D_2 = \frac{1}{Tn_D} \sum_{i=1}^n c_i , \quad (2)$$

where:

- D_2 = estimated number of geoducks per square meter,
- c_i = count of geoduck clams on each transect i from 1 to n ,
- n_D = number of transects,
- T = transect length.

Uncertainty in the density estimate is expressed as the percent precision. The index is equal to the lower bound of the one-sided 90% confidence interval expressed as a percent of the average density and calculated as:

$$P_D = 100 \left(1 - t_\alpha \frac{s}{D\sqrt{n}} \right), \quad (3)$$

where:

P_D = percent precision of the density estimate,

t_α = t-value from Student's distribution for a one-sided interval with significance, level $\alpha = 10\%$,

s = standard deviation of the mean,

D = estimated density of geoducks (D_1 or D_2).

In a perfectly precise estimate, P_D would equal 100%; decreasing numbers indicate increasing uncertainty.

Geoduck Weight Estimates

Geoduck weight estimates were made using data collected from previous commercial fisheries and assessment surveys. All data available from the surveyed areas were combined and applied to the biomass estimates. In new areas where no data have been collected (e.g. Cone Island), all data collected and available from Southeast Alaska were averaged and used to estimate the biomass. After the fishery has occurred, data collected for that area's commercial fishery will be averaged and used to recalculate the biomass estimate. If there are significant differences in an area's weight estimate, an adjustment may be made to the biomass estimate and applied to future GHGs for that area. This method of estimating geoduck weight for an area increases the efficiency of geoduck surveys.

Mean weight per geoduck within a given area is estimated as:

$$W = \frac{\sum w_i}{n_w}, \quad (4)$$

where:

W = estimated mean weight per geoduck,

w_i = weight of the i th geoduck from the available data,

n_w = sample n for weight.

Geoduck Biomass Estimates

The estimate of total geoduck biomass in an area was calculated as:

$$B_{\text{bed}} = (D_1)(W)(S) \quad \text{or,} \quad (5)$$

$$B_{\text{bed}} = (D_2)(W)(A) \quad (6)$$

where:

- B_{bed} = estimated total geoduck biomass per defined area,
- D_1 = estimated density of geoducks per linear meter of shoreline,
- D_2 = estimated density of geoducks (number per square meter),
- S = total estimated shoreline length (in meters, using NOAA charts),
- A = total estimated bed area (in square meters, using NOAA charts).

Confidence limits for the biomass estimates are based on an estimate of the variance of the biomass. A variance-of-products formula (Goodman 1960) was used to calculate a variance estimate for the product of mean density and mean weight per geoduck. Assuming that there is no correlation between density and weight then the variance of the biomass is:

$$\delta_B^2 = D^2 \frac{\delta_W^2}{n_W} + W^2 \frac{\delta_D^2}{n_D} - \frac{\delta_D^2 \delta_W^2}{n_D n_W}, \quad (7)$$

where:

- δ_B^2 = variance of biomass, B,
- δ_D^2 = variance of mean density,
- δ_W^2 = variance of mean weight.

Uncertainty in the biomass estimate is expressed as the percent of precision. The index is equal to the lower bound of the one-sided 90% confidence interval expressed as a percent of the biomass. This index, similar to P_D (Equation 3), was calculated as:

$$P_B = 100 \left(1 - t_{\alpha} \frac{s}{B_{\text{bed}} \sqrt{n_D}} \right), \quad (8)$$

where:

- P_B = percent precision of the density estimate,
- s = standard deviation of the mean biomass estimate (δ_B , from Equation 7).

The statistical objective for each area was for a precision level of 66.7% of the estimated biomass². The Guideline Harvest Level (GHL) for biomass estimates not achieving the precision objective was calculated using a precision adjusted biomass.

$$B_{\text{adj}} = \frac{P_B}{66.7\%} * B_{\text{bed}}, \quad (9)$$

where:

B_{adj} = precision adjusted biomass estimate (used to calculate GHL),
 P_B = from equation 8, above,
 B_{bed} = from Equations 5 or 6.

SHOW FACTOR SURVEYS

Geoduck clams can be difficult to count when they are hidden below the substrate. For this reason the true clam density may be underestimated. The method described below, used to estimate the true density of geoducks from visual counts, is patterned after that used by the Washington Department of Fish and Wildlife (Bradbury et al. 2000). This method was originally introduced by Goodwin (1977) who coined the term “show factor.” A “show” is either a siphon visible above the substrate or a depression in the substrate that can be identified as having been made by a clam siphon.

The show factor, F, is the ratio of geoduck clam shows visible during a single observation of any defined area and the true abundance of harvestable geoducks within that area:

$$F = n / N \quad (10)$$

where

n = the number of visible shows within a defined area (show plot),
 N = the absolute number of harvestable geoducks within the area.

Show plots are discretely marked subtidal areas in which the absolute number of harvestable geoduck clams (N) is estimated from repeated tagging studies. Divers make an initial survey of the plot prior to tagging and count all visible geoducks within the plot (n) as if making a standard survey. A survey prior to tagging is preferred as repeated diving during the tagging process potentially disrupts the substrate and normal showing (e.g. after removing the tags a significant length of time is required before surveying for n). This show factor ratio is probably a function of various environmental factors and is specific both temporally and spatially; that is, preferably show factors should be used to refine biomass estimates only when a show factor has been established for a specific area and during a similar time period as the biomass estimate.

Two show plot surveys were conducted simultaneous with surveying west Gravina Island. Show plot sites were selected within or adjacent to the areas being surveyed to represent as closely as possible the substrate, depth, and current conditions of the survey tract or area. To avoid destruction of the show plot boundary

² The statistical objective is that we are at least 90% certain that the harvest rate does not exceed the target harvest rate by more than 50%. This means that a 2% harvest rate could be a maximum of 3% due to uncertainty in counts and weights. The 3% maximum harvest rate translates into a precision level of 66.7%.

markers, show plots were not located in areas where boats frequently anchor or where tidal currents sweep large amounts of algae along the bottom. Show plots were not located in large areas of horse clams (*Tresus sp.*) or false geoducks (*Panomya sp.*) to avoid identification errors that could confuse the results.

After a suitable site was chosen, the show plot survey tract was defined using a light colored (visible) line configured in a 2 x 10 m (6.6 x 32.8 ft) rectangle, staked to the bottom with 0.6 m (2 ft) sections of 3/8" steel rebar (the rebar was bent in a "u" shape at the top to hold the line to the bottom). Three show plots were placed at each site. A small buoy was placed near the show plots to facilitate relocating the area. After the show plot boundaries had been defined, an initial count was made of geoducks within the plot to determine *n*. Divers then tagged all geoduck shows within the plot by placing a sturdy wire or PVC flagged stake next to the siphon with all fags similarly oriented, approximately 4 cm (1.6 inches) from the show. During tagging, divers situated themselves to the show plot so as to prevent dislodging tags that were already in place.

All geoduck shows were tagged throughout the show plot over a period of several days, recording the total number of tags placed each day. When, after several repeated tagging sessions no new tags were placed, it was assumed that the entire population within the plot had been counted. Tagging was continued as long as new shows were discovered. Multiple tagging sessions were sometimes conducted during a single day to accelerate the process, but this procedure may run the risk that at least some geoducks will not show because they have been disturbed by the divers, and therefore tagging spanned a minimum of three days. To avoid this type of bias, the final determination of complete tagging was made on a day when limited (e.g. 1) or no tagging had occurred that day.

Potentially, show factors may be estimated for successive weeks or months; estimates after a year risk bias due to changes in geoduck population due to recruitment and mortality. After the biomass survey was completed and a show factor established, the show plots were left intact for future use.

The GHLS for Southeast areas open during the 2000/2001 season were adjusted for a show factor as:

$$GHL_F = \frac{GHL_{bed}}{F}, \quad (11)$$

where:

GHL_F = show factor adjusted GHL estimate,

GHL_{bed} = geoduck GHL estimate,

F = show factor, from equation 10.

SURVEY RESULTS AND DISCUSSION

A total of 123 transects were completed during the 2000 survey season in seven areas of Southeast Alaska (Table 1, Figures 2–8). Previously harvested areas that were surveyed included Foggy Bay, Ulitka Bay, Vallenar Bay, and South Vallenar Point. The Southeast Alaska Regional Dive Fisheries Association (SARDFA) provided reconnaissance data for new areas within Southeast. From this reconnaissance, three new areas were surveyed by the department for possible commercial fisheries in the 2000/2001 season: San Christoval Channel, Cone Island, and Port Santa Cruz. The appendices list the GHL and raw data and biomass estimates for each area.

The most recent surveys in Foggy Bay began in 1998, with additional transects completed in 1999 and 2000 for a total of 26 transects. This survey included additional new open area from Very Inlet to Foggy Point. A biomass of 917,206 kg (2,022,094 lb) was estimated for the Foggy Bay area.

A total of 18 transects in Ulitka Bay resulted in a biomass estimate of 745,555 kg (1,643,669 lb). This survey occurred only in an area previously open to commercial harvest.

A total of 13 transects were completed in South Vallenar Point and resulted in an estimated biomass of 41,623 kg (91,764 lb). This area had been open to commercial harvest during the 1988/1989, 1992/1993, and 1996/1997 seasons for a GHL of 56,699 kg (125,000 lb) each season. These three seasons resulted in a cumulative commercial harvest of 165,453 (364,762 lb) of whole geoduck clams. The current biomass estimate plus the known commercial harvest results in an estimated B_0 of 207,077 kg (456,526 lb). This data indicates that approximately 80% of the non-fished biomass has been removed from this area. During the January 2000 Board of Fisheries meeting in Juneau, the Board adopted a geoduck management plan into regulation which requires that an area may not be open to the commercial harvest of geoducks if the estimated biomass of geoducks is less than 30% of the original biomass (5 AAC 38.142.(g)). Consequently, the South Vallenar Point fishery was not open to the harvest of geoduck clams for the 2000/2001 season.

On two occasions, severe weather prevented the scheduled survey of Vallenar Bay in 1999. This area had not been surveyed since 1988 and recent surveys along the west Gravina Island shore (i.e. Middle Gravina in 1997 and Nehenta Bay in 1998) indicated a decrease in GHL might be justified (Pritchett et al. 1999). Consequently, the original data was closely re-examined for this area, the original biomass estimate recalculated, and a new GHL developed for the 1999–2000 fishery using an estimated (e.g. recalculated) unfished biomass (B_0) of 309,806 kg (683,006 lb, Pritchett et al. 2000). During the 2000 survey season, 14 transects were completed in Vallenar Bay. Estimated B_0 from this survey was 306,567 kg (675,865 lb) which agrees favorably with the recalculated estimate using original data. Given sufficient resources, additional transects will be completed prior to the next scheduled opening in 2003/2004.

A total of 52 transects were completed in three new geoduck commercial areas which resulted in an estimated additional 3,189,861 kg (7,032,441 lb) of biomass added to Southeast Alaska's fisheries (Table 1). In the Cone Island area, 20 transects were completed which resulted in an estimated biomass of 1,851,326 kg (4,081,475 lb) of clams. In the San Christoval Channel area 18 transects were completed resulting in an estimated biomass of 592,980 kg (1,307,297 lb) of clams. In Port Santa Cruz 14 transects were completed producing an estimated biomass of 745,555 kg (1,643,669 lb) of clams.

Show factors are very labor intensive and require that divers be able to visit a site continuously for relatively lengthy periods (up to 5–7 days per site). The remoteness of most geoduck fisheries in Southeast prohibits establishing show factors specific for individual geoduck harvest areas. Show factor work was begun in Southeast in 1998 (Pritchett et al. 1999). Following the 2000 survey season, a total of six sets (three 2x10 m plots per set) of show plots had been completed throughout Southeast Alaska: one set each near Kolosh Island, Legma Island, Middle Gravina, Blank Inlet, Grant Island, and San Juan Bautista. Average value for these combined show plots indicated a show factor of 0.80 is appropriate to adjust the 2000/2001 season's GHLs. An additional show plot was established in Bobs Bay for future evaluation.

FISHERY MANAGEMENT AND SEASON SUMMARY

Geoduck clams are long-lived with low and sporadic recruitment. Therefore, the objective of geoduck fishery management is to allow low exploitation rates on beds open to commercial harvest. Commercial harvest is also restricted to beds for which biomass estimates are available. The GHL for each area is calculated as 2% of the estimated biomass per year (Larson and Minicucci 1997). Harvests are by permit only and historically have been allowed from October 1 through May 31 to avoid the summer spawning and recovery period and to minimize PSP toxin levels.

Open fishing areas were approved for harvesting geoduck clams for intrastate and interstate sale by ADEC. Geoducks were sold either fresh or frozen only after satisfactory testing for Paralytic Shellfish Poisoning (PSP) by the ADEC prior to sale and distribution. A certificate and permit from ADEC was required to possess, harvest, process, and distribute geoduck clams for sale for human consumption or bait.

The geoduck fishery in Southeast Alaska was under limited entry during this season with 104 divers eligible to participate. Each diver was required to have a current Miscellaneous Shellfish Species Registration Form during fishing operations. The ADF&G Ketchikan area office had responsibility for geoduck fisheries management within all open areas except the Goddard area that was managed through the Sitka office. The SARDFA geoduck committee requested the department open the 2000–01 season until further notice beginning 9:00 a.m. Sunday, November 26, 2000. A total of 74 divers participated in the Southeast Alaska geoduck fishery, landing a preliminary estimate of 198,825 kg (438,334 lb) of geoduck clams (Table 2).

The Foggy Bay area (in portions of Subdistrict 101-23) opened with a GHL of 33,860 kg (80,713 lb) of whole geoduck clams. This represents 4% of the estimated harvestable biomass. At this harvest rate, this area is scheduled to open again to the commercial harvest of geoduck clams during the 2003/2004 season. The open commercial fishing area was in those waters of Foggy Bay along the mainland shore and the Delong Islands shore, south of the latitude of Kirk Point located at 55°00'00" N. latitude and north of the latitude of Foggy Point light at 54°55'32" N. latitude. The area was open from 9:00 a.m. to 3:00 p.m. daily, beginning 9:00 a.m. Sunday, November 26, 2000 and was closed by emergency order effective 3:00 p.m. Thursday, November 30, 2000. The total harvest was 36,611 kg (80,713 lb) with a total of 31 divers making 124 landings.

Southern Sea Otter Sound (in Subdistrict 103-90) opened with a GHL of 19,347 kg (42,653 lb) of whole geoduck clams. This represents 4% of the estimated harvestable biomass. At this harvest rate, this area is scheduled to open again to the commercial harvest of geoduck clams during the 2003/2004 season. The open commercial fishing area was in those waters of Sea Otter Sound east and south of a line from the Cape Lynch light to the southernmost tip of Whale Head Island to the northernmost tip of Turn Point, with Karheen Passage closed south of the latitude of the northernmost tip of Cob Island. The area was initially open from 9:00 a.m. to 3:00 p.m. daily, beginning 9:00 a.m. Sunday, November 26, 2000. Effective 9:00 a.m. Tuesday, December 12, 2000 the area was open 9:00 a.m. to 3:00 p.m. daily Sunday through Wednesday each week until closed by emergency order effective 3:00 p.m. Wednesday, December 27, 2000. The total harvest was 19,252 kg (42,443 lb) with a total of 24 divers making 49 landings.

Little Steamboat Bay (in Subdistrict 103-70) opened with a GHL of 5,646 kg (12,447 lb) of whole geoduck clams. This represents 4% of the estimated harvestable biomass. At this harvest rate, this area is scheduled to open again to the commercial harvest of geoduck clams during the 2003/2004 season. The

open commercial fishing area was in those waters along the northern shoreline of Noyes Island east of 133°41'20" W. longitude and west of Steamboat Point located at 133°38'54" W. longitude. The opened area was slightly larger than previous openings. At SARDFAs request, the previously unopened area between Little Steamboat and Ulitka Bays was opened to commercial harvest with approximately half the area being opened with Little Steamboat Bay and half opened with Ulitka Bay (i.e. Ulitka and Little Steamboat Bays now share a common boundary). Little Steamboat Bay was open from 9:00 a.m. to 3:00 p.m. daily, beginning 9:00 a.m. Sunday, November 26, 2000 and was initially closed effective 3:00 p.m. Saturday, December 9, 2000. This area was reopened effective 9:00 a.m. to 3:00 p.m. daily, Sunday through Wednesday of each week effective 9:00 a.m. Tuesday, December 12, 2000 and was closed by emergency order effective 3:00 p.m., Tuesday, February 27, 2001. The total harvest was 5,397 kg (11,898 lb) with a total of 10 divers making 19 landings.

Ulitka Bay (in Subdistrict 103-70) opened with a GHL of 5,893 kg (12,992 lb) of whole geoduck clams. This represents 4% of the estimated harvestable biomass. At this harvest rate, this area is scheduled to open again to the commercial harvest of geoduck clams during the 2003/2004 season. The open commercial fishing area was in those waters along the northern shoreline of Noyes Island east of Cape Ulitka at 133°43'31" W. longitude and west of 133°41'20" W. longitude. The opened area was slightly larger than previous openings. At SARDFAs request, the previously unopened area between Little Steamboat and Ulitka Bays was opened to commercial harvest with approximately half the area being opened with Little Steamboat Bay and half opened with Ulitka Bay (i.e. Ulitka and Little Steamboat Bays now share a common boundary). The area was initially open from 9:00 a.m. to 3:00 p.m. daily, beginning 9:00 a.m. Sunday, November 26, 2000. Effective 9:00 a.m. Tuesday, December 12, 2000 the area was open 9:00 a.m. to 3:00 p.m. Sunday through Wednesday each week until closed by emergency order effective 7:00 p.m., Monday, May 14, 2001. The total harvest was 6,144 kg (13,545 lb) with a total of six divers making 23 landings.

San Christoval (in Subdistrict 103-70) opened with a GHL of 20,814 kg (45,887 lb) of whole geoduck clams. This represents 4% of the estimated harvestable biomass. At this harvest rate, this area is scheduled to open again to the commercial harvest of geoduck clams during the 2003/2004 season. The open commercial fishing area was in those waters of St. Nicholas Channel and the Gulf of Esquibel north and east of a line from Point Incarnation at 55°33'19" N. latitude, 133°37'19" W. longitude to the southwesternmost tip of St. Joseph Island located at 55°34'51" N. latitude, 133°42'54" W. longitude then due west to the District 4 boundary, and north and east of a line from the westernmost tip of Point St. Isidor to a point on southeast side of Noyes Island at 55°27'16" N. latitude, 133°38'23" W. longitude, and north of a line from the northeastern point of Lulu Island at 55°30'37" N. latitude, 133°28'05" W. longitude to the northwestern side of San Fernando Island at 55°31'32" N. latitude, 133°26'49" W. longitude, north and west of a line from Point Polocano at 55°32'24" N. latitude, 133°17'20" W. longitude to the southernmost tip of Point Ildefonso at 55°34'08" N. latitude, 133°15'47" W. longitude, south of a line from the eastern shore of Prince of Wales Island at 55°38'00" N. latitude, 133°23'48" W. longitude to the southernmost tip of St. Phillips Island located at 55°38'02" N. latitude, 133°24'51" W. longitude, through a point on Esquibel Island at 55°37'41" N. latitude, 133°35'29" W. longitude, and east of the District 4 boundary line. The area was open from 9:00 a.m. to 3:00 p.m. daily, beginning 9:00 a.m. Sunday, November 26, 2000 and was closed by emergency order effective 3:00 p.m., Wednesday, November 29, 2000. The total harvest was 22,990 kg (50,685 lb) with a total of 20 divers making 52 landings.

The Cone Island area (in portions of Subdistricts 103-50, 104-40, and 104-35) opened with a GHL of 63,684 kg (140,399 lb) of whole geoduck clams. This represents 4% of the estimated harvestable biomass. At this harvest rate, this area is scheduled to open again to the commercial harvest of geoduck clams during the 2003/2004 season. The open commercial fishing area was in those waters of St. Nicholas

Channel, Cone Island, and the eastern shore of Baker Island south of a line from the westernmost tip of Point St. Isidor to a point on Noyes Island at 55°27'16" N. latitude, 133°38'23" W. longitude and east of a line extending from the southernmost tip of St. Nicholas Point to northwesternmost tip of Granite Point, and north and west of a line through Paloma Passage at the latitude of the southernmost tip of Pigeon Island located at 55°25'50" N. latitude. The area was open from 9:00 a.m. to 3:00 p.m. daily, beginning 9:00 a.m. Sunday, November 26, 2000 and was closed by emergency order effective 2:00 p.m., Friday, December 8, 2000. The total harvest was 79,373 kg (174,988 lb) with a total of 42 divers making 181 landings.

The Port Santa Cruz area (in Subdistrict 104-30) was originally scheduled to be open for a GHL of 25,663 kg (56,578 lb) of whole geoduck clams. An area within Port Santa Cruz had been proposed for aquatic farming and though the applicant had been denied a lease by the Department of Natural Resources, that denial was under appeal. Since the use of this proposed farm site was the subject of pending litigation and the impact of proposed farming activities on geoduck resources in Port Santa Cruz remained uncertain, a portion of Port Santa Cruz that included the proposed farm site was closed to commercial fishing to ensure conservation of the resource. The biomass represented by that shoreline that overlapped the proposed farm site was removed from the total surveyed biomass, and the GHL was recalculated. The Port Santa Cruz area was opened for a GHL of 19,763 kg (43,571 lb) of whole geoduck clams. This represents 4% of the estimated harvestable biomass. At this harvest rate, this area is scheduled to open again to the commercial harvest of geoduck clams during the 2003/2004 season. The open commercial fishing area was in those waters of Bucareli Bay south of a line from the westernmost tip of Point Arboleda to the southernmost tip of Point San Roque (including all waters of Port San Antonio Bay), and north of a line from the southernmost tip of Cape Felix to Cape Bartolome light, except those waters of Aguada Cove enclosed south of 55°16'34" N. latitude, east of 133°26'24" W. longitude, and west of 133°25'35" W. longitude were closed to the commercial harvest of geoduck clams. The area was open from 9:00 a.m. to 3:00 p.m. daily, beginning 9:00 a.m. Sunday, November 26, 2000 and was closed by emergency order effective 3:00 p.m., Saturday, December 9, 2000. The total harvest was 20,639 kg (45,501 lb) with a total of 21 divers making 47 landings.

The Goddard area (in portions of Subdistricts 113-31 and 113-41) opened with a GHL of 8,393 kg (18,503 lb) of whole geoduck clams. This represents 2% of the estimated harvestable biomass. At this harvest rate, this area is scheduled to open to the commercial harvest of geoduck clams during the 2001/2002 season. The open commercial fishing area was in those waters along the western coast of Baranof Island south and west of a line beginning at the southern entrance to Kanga Bay at 56°53'33" N. latitude, 135°22'47" W. longitude to the northwesternmost tip of Kanga Island located at 56°54'04" N. latitude, 135°22'02" W. longitude, then extending north and west to the southernmost tip of Ulinoi Island located at 56°55'51" N. latitude, 135°23'45" W. longitude, to the northwest tip of Ulinoi Island located at 56°55'59" N. latitude, 135°24'01" W. longitude, then southwest to the northernmost tip of the unnamed island within the Taigud Islands at 56°55'45" N. latitude, 135°24'51" W. longitude, then continues southwest to the northeasternmost tip of Hanus Island located at 56°51'56" N. latitude, 135°30'25" W. longitude, then north and east of a line extending from a point on the southeast shore of Biorka Island at 56°50'33" N. latitude, 135°30'58" W. longitude to a point at 56°45'00" N. latitude, 135°22'26" W. longitude; and north of 56°45'00" N. latitude and west of 135°20'00" W. longitude and all waters within Big Bay were open, with the following exception: All waters of Kliuchevoi Bay were closed east of a line from 56°50'24" N. latitude, 135°22'31" W. longitude to 56°50'12" N. latitude, 135°22'41" W. longitude, and those waters within the unnamed bay located southeast of Frosty Reef east of a line from 56°52'49" N. latitude, 135°22'56" W. longitude to 56°52'42" N. latitude, 135°22'59" W. longitude to 56°52'38" N. latitude, 135°22'59" W. longitude. This area was open from 9:00 a.m. to 3:00 p.m. daily, beginning 9:00 a.m. Sunday, November 26, 2000 and was closed by emergency order effective 3:00 p.m., Wednesday, December 27, 2000. The total harvest was 8,419 kg (18,561 lb) with a total of 6 divers making 49 landings.

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Table 1. Biomass estimates of geoduck clams from seven areas surveyed in Southeast Alaska in 2000.

| | Cone Island | San Christoval | Foggy Bay | Ulitka Bay | Port Santa Cruz | Vallenar Bay | South Vallenar Point |
|--|-------------------------|---------------------|---------------------|----------------------|---------------------|------------------------|------------------------------|
| Subdistrict(s) — Bed | 103-50, 104-34 & 104-40 | 103-70 | 101-23 | 103-70-815001 | 104-30 | 101-29-815004 | 101-29-815003 |
| Number of Transects | 20 | 18 | 26 | 18 | 14 | 14 | 13 |
| Average per Linear Meter (Ulitka = m2) | 213.7 | 75.3 | 51.6 | 0.46 | 122.9 | 39.8 | 29.4 |
| Shoreline (m) or area for Ulitka(m2) | 8,000 | 7,272 | 17,112 | 268,370 | 5,600 | 2,822 | 1,267 |
| Est. Number of Geoducks | 1,709,400 | 547,521 | 883,572 | 123,003 | 688,400 | 112,189 | 37,230 |
| Precision of Estimate | 60.3% | 61.9% | 62.2% | 66.4% | 61.1% | 75.0% | 45.6% |
| Weight | | | | | | | |
| Number of Samples | 3,233 | 3,233 | 420 | 410 | 3,233 | 250 | 202 |
| Average Weight (g) | 1,083 | 1,083 | 1,038 | 1,156 | 1,083 | 1,022 | 1,118 |
| Average Weight (lb) | 2.39 | 2.39 | 2.29 | 2.55 | 2.39 | 2.25 | 2.46 |
| Data obtained from: | Southeast Com. Avg. | Southeast Com. Avg. | Foggy Bay Com. Avg. | Ulitka Bay Com. Avg. | Southeast Com. Avg. | Vallenar Bay Com. Avg. | South Vallenar Pt. Com. Avg. |
| Biomass (kg) | 1,851,326 | 592,980 | 917,206 | 142,187 | 745,555 | 114,666 | 41,623 |
| Biomass (lb) | 4,081,475 | 1,307,297 | 2,022,094 | 313,468 | 1,643,669 | 252,796 | 91,764 |
| Precision of Estimate | 45.9% | 46.8% | 49.2% | 55.3% | 45.9% | 56.4% | 36.7% |
| GHL Precision Adjustment | 68.8% | 70.2% | 73.8% | 82.9% | 68.8% | 84.6% | 55.0% |
| Show Factor Adjustment | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | N/A |
| Target Harvest Rate | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.08 | N/A |
| GHL (kg) | 63,684 | 20,814 | 33,860 | 5,893 | 25,663 | Not Open This Season | Not Open This Season |
| Announced GHL (lb) | 140,399 | 45,887 | 74,648 | 12,992 | 56,578 | | |

Table 2. Southeast Alaska 1999–2000 season commercial geoduck clam harvest by area.

| Area | Subdistrict-Bed | Number of Divers | Number of Landings | Guideline Harvest Level, kg (lb) | Hours Open ^a | Kilograms (lb) Harvested ^b |
|----------------------|--------------------|------------------|--------------------|----------------------------------|-------------------------|---------------------------------------|
| Foggy Bay | 101-23-815001 | 31 | 124 | 33,860 (74,648) | 30 | 36,611 (80,713) |
| Little Steamboat Bay | 103-70-815002 | 10 | 19 | 5,646 (12,447) | 360 | 5,397 (11,898) |
| Ulitka Bay | 103-70-805001 | 6 | 23 | 5,893 (12,992) | 888 | 6,144 (13,545) |
| San Christoval | 103-70 | 20 | 52 | 20,814 (45,887) | 24 | 22,990 (50,685) |
| Sea Otter Sound | 103-90 | 24 | 49 | 19,347 (42,653) | 156 | 19,252 (42,443) |
| Cone Island | 103-50, 104-30, 40 | 42 | 181 | 63,684 (140,399) | 78 | 79,373 (174,988) |
| Port Santa Cruz | 104-30 | 21 | 47 | 19,763 (43,571) | 84 | 20,639 (45,501) |
| Goddard | 113-31-815002, 41 | 6 | 49 | 8,393 (18,503) | 192 | 8,419 (18,561) |
| Totals | | 74 | 544 | 177,400 (391,100) | | 198,825 (438,334) |

^a Each area originally open for 6-hour days (0900 – 1500). Ulitka Bay daily open period adjusted as season progressed.

^b Harvest Estimates from IFDB January 12, 2001.

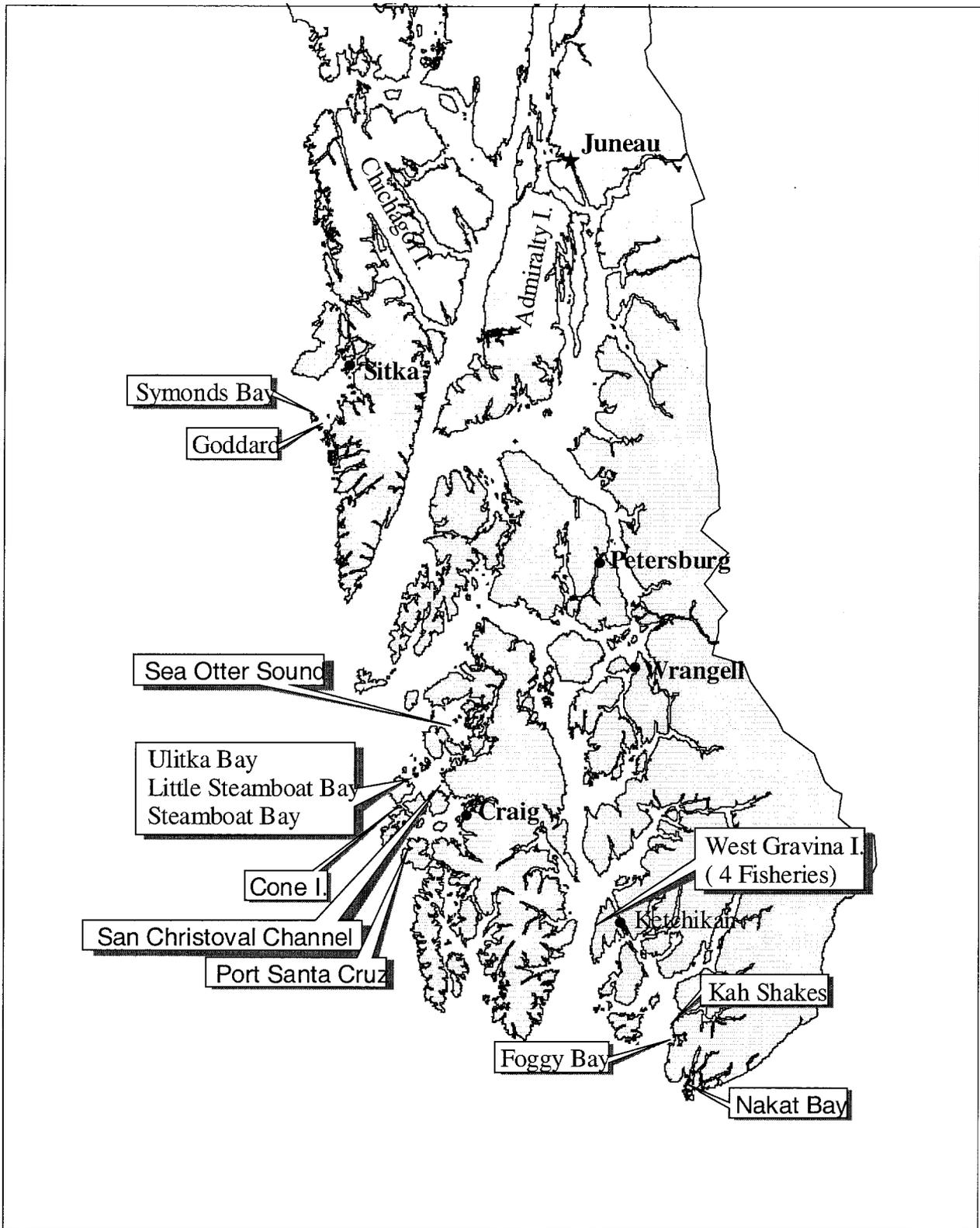


Figure 1. Geoduck clam survey and commercial harvest areas in Southeast Alaska.

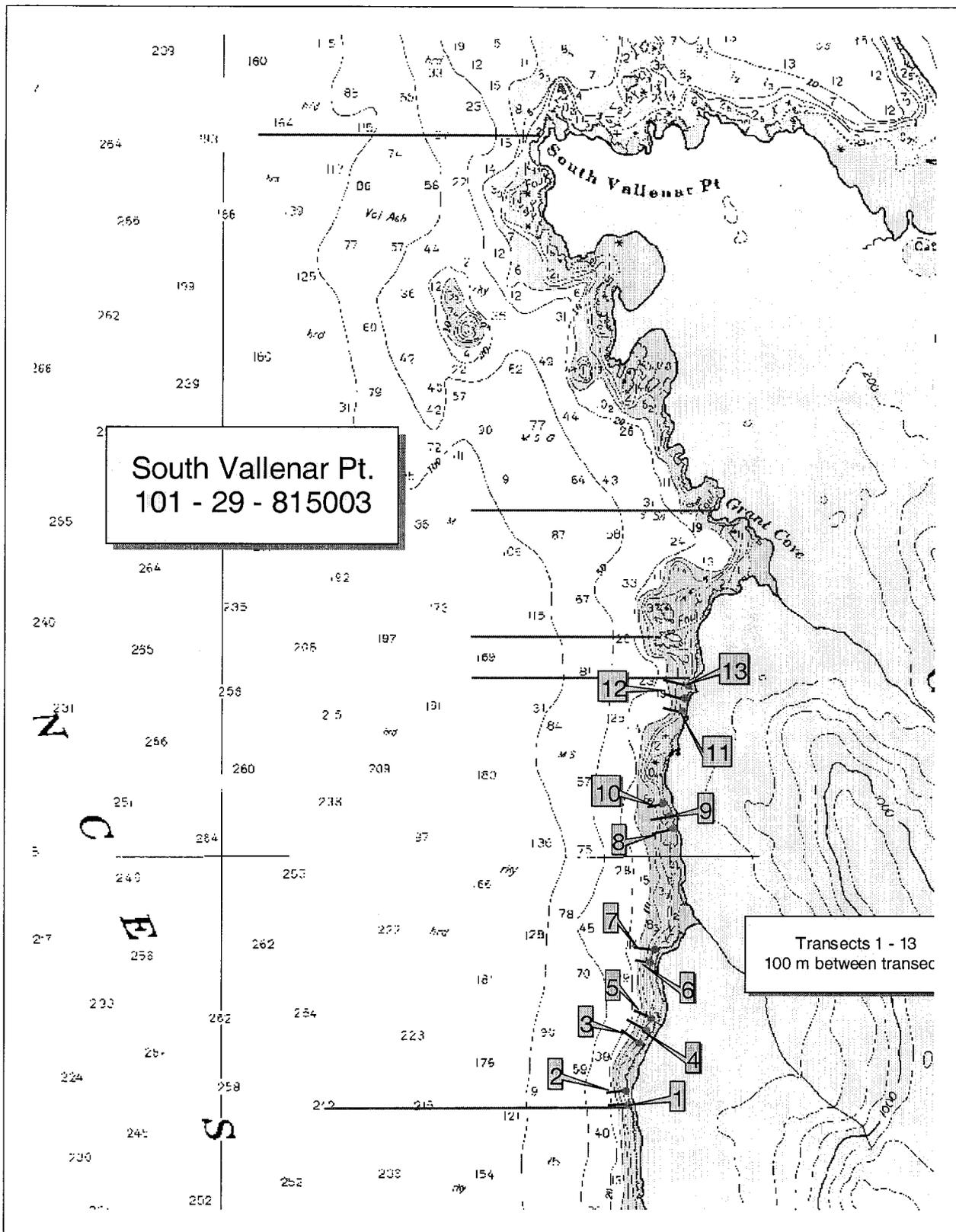


Figure 4. South Vallenar Point (101-23-815003) 2000 geoduck survey transect locations.

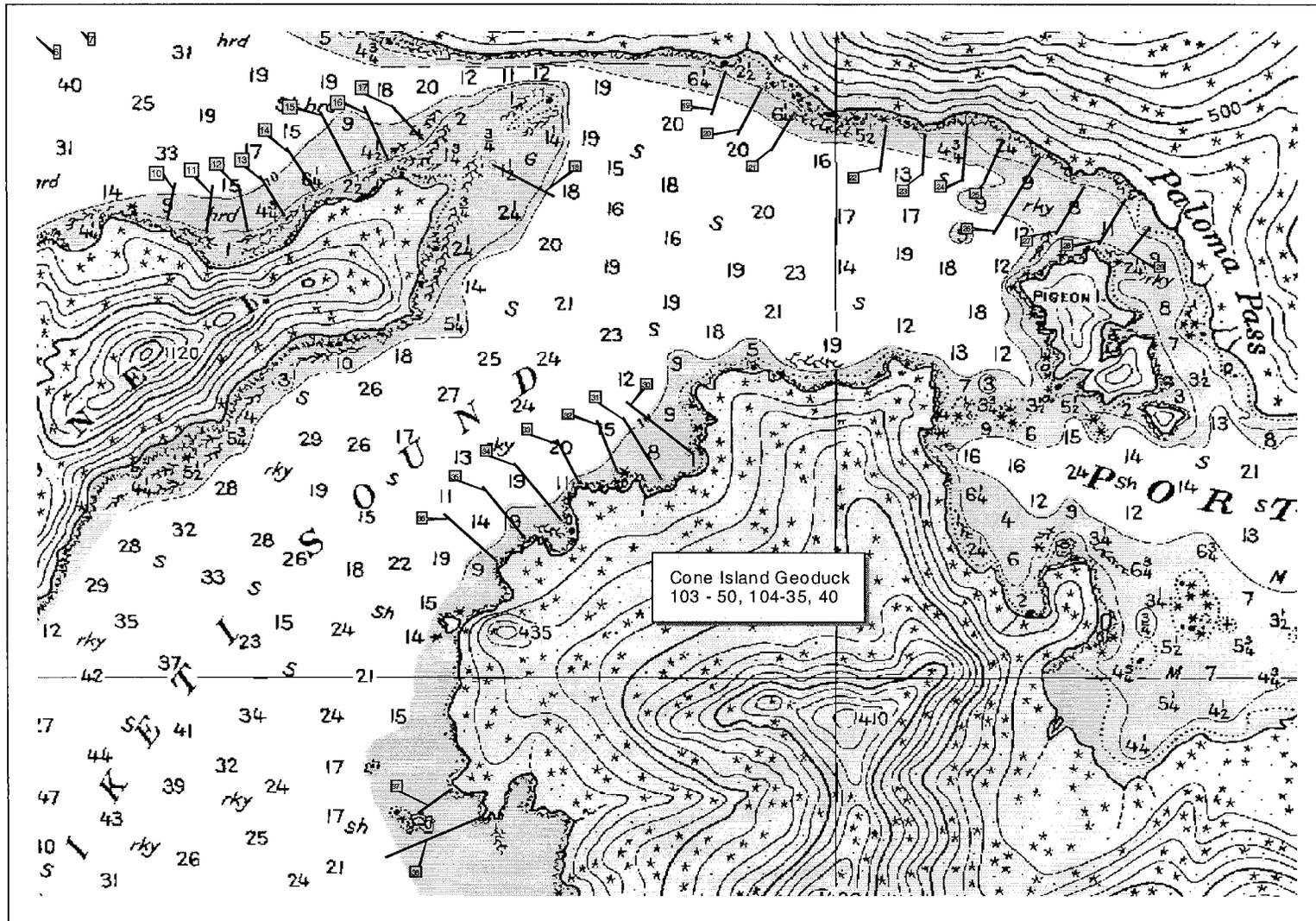


Figure 5. Cone Island area geoduck survey transect locations. Transects 1–9 were surveyed in 1999 (see RIR 1J00-34, Figure 5).

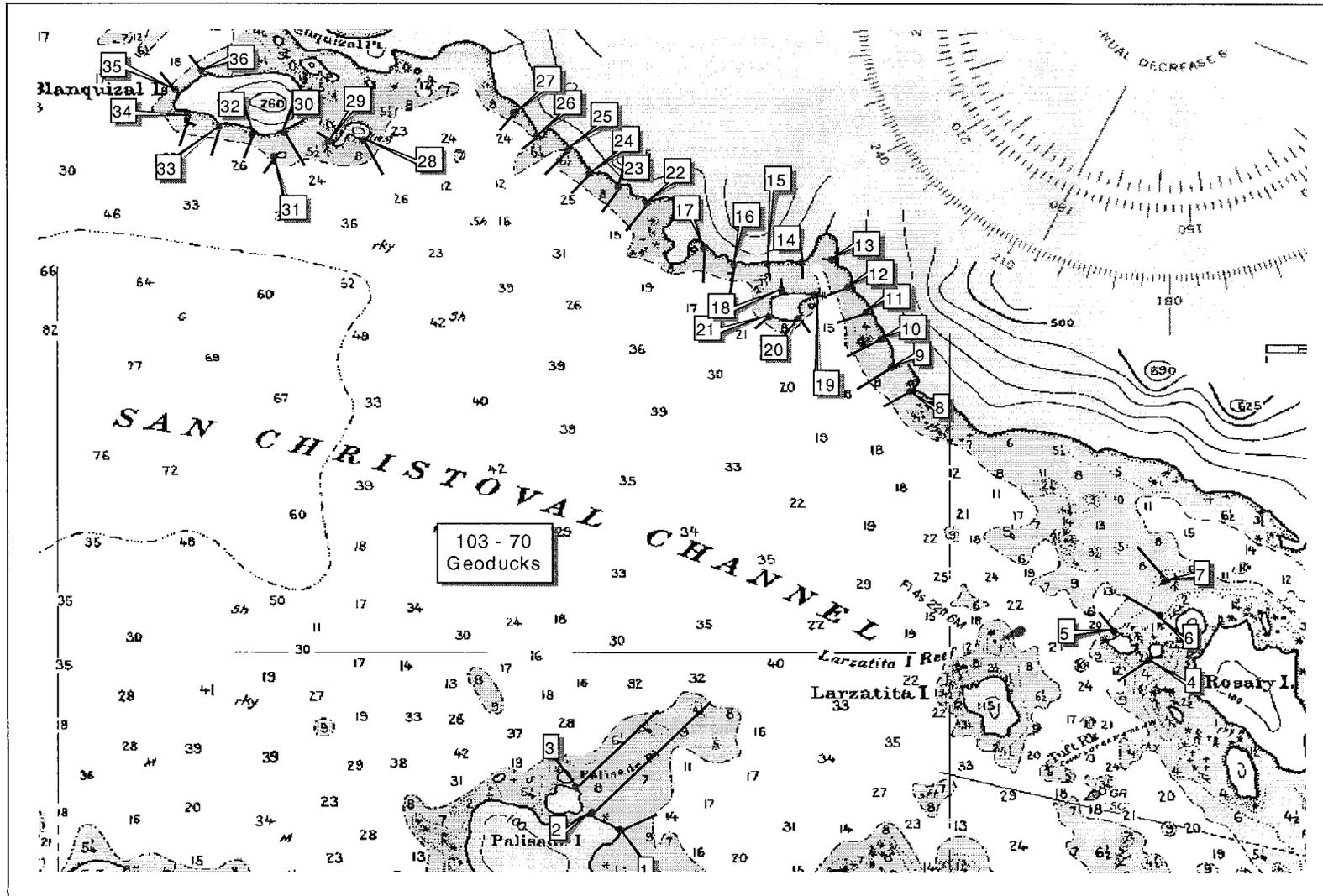


Figure 6. San Christoval 2000 geoduck survey transect locations.

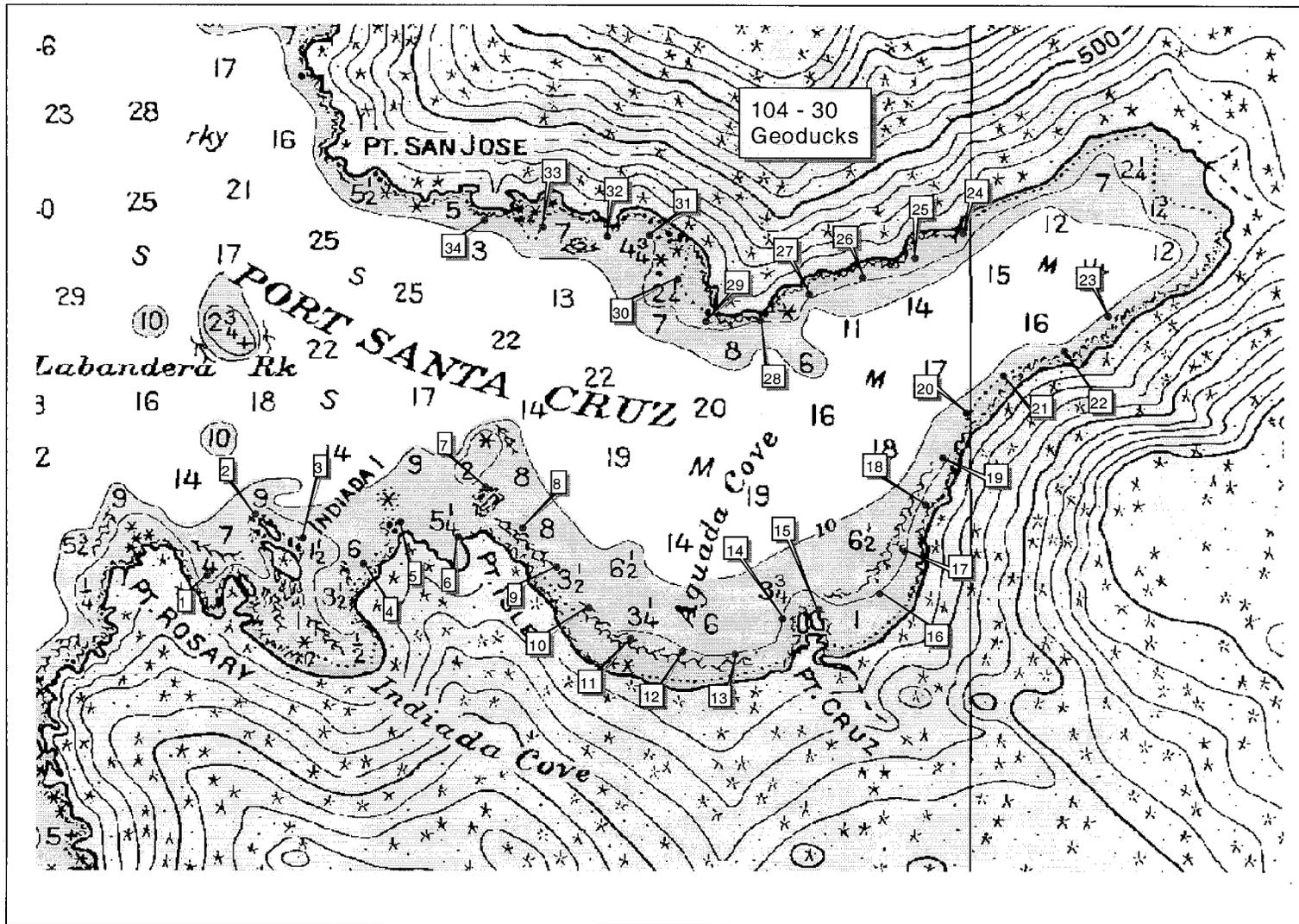


Figure 8. Port Santa Cruz (Subdistrict 104-30) 2000 geoduck survey transect locations.

APPENDICES

Appendix A. Key to vegetative substrate types used for geoduck clam surveys.

| Code | Expanded Code | Species Included | Latin Names |
|------|-----------------------|---|--|
| AGM | Agarum | Sieve kelp | <i>Agarum clathratum</i> |
| ALA | Alaria | Ribbon kelps | <i>Alaria marginata</i> , <i>A. nana</i> , <i>A. fistulosa</i> |
| ELG | Eel grass | Eel grass, surfgrasses | <i>Zostera marina</i> , <i>Phyllospadix serrulatus</i> , <i>P.</i> <i>scouleri</i> |
| FIL | Filamentous red algae | Sea brush, poly, black tassel | <i>Polysiphonia pacifica</i> , <i>P.</i> <i>hendryi</i> , <i>Pterosiphonia</i> <i>bipinnata</i> |
| FIR | Fir kelp | Black pine, Oregon pine (red algae) | <i>Neorhodomela larix</i> , <i>N. oregona</i> |
| FUC | Fucus | Rockweed or popweed | <i>Fucus gardneri</i> |
| HIR | Hair kelp | Witch's hair, stringy acid kelp | <i>Desmarestia aculeata</i> , <i>D.</i> <i>viridis</i> |
| LAM | Laminaria | split kelp, sugar kelp, suction-cup kelp | <i>Laminaria bongardiana</i> , <i>L.</i> <i>saccharina</i> , <i>L. yezoensis</i> (when isolated and identifiable) |
| LBK | Large Brown Kelps | Five-ribbed kelp, three-ribbed kelp, split kelp, sugar kelp, sea spatula, sieve kelp, ribbon kelp | <i>Costaria costata</i> , <i>Cymathere triplicata</i> , <i>Laminaria spp.</i> , <i>Pleurophycus gardneri</i> , <i>Agarum</i> , <i>Alaria spp.</i> |
| MAC | Macrocystis | macrocystis | <i>Macrocystis integrifolia</i> |
| NER | Nereocystis | Bull kelp | <i>Nereocystis leutkeana</i> |
| RED | Red algae | All red leafy algae (red ribbons, red blades, red sea cabbage, Turkish washcloth) | <i>Palmaria mollis</i> , <i>P.</i> <i>hecatensis</i> , <i>P.</i> <i>callophyloides</i> , <i>Dilsea</i> <i>californica</i> , <i>Neodilsea</i> <i>borealis</i> , <i>Mastocarpus</i> <i>papillatus</i> , <i>Turnerella</i> <i>mertensiana</i> |
| ULV | Ulva | Sea lettuce | <i>Ulva fenestrata</i> , <i>Ulvaria</i> <i>obscura</i> |
| COR | Coralline algae | Coral seaweeds (red algae) | <i>Bossiella</i> , <i>Corallina</i> , <i>Serraticardia</i> |

Appendix B. Key to bottom types used for geoduck clam surveys.

| Code | Expanded Code | Definition |
|------|---------------|--|
| RCK | Bedrock | Various rocky substrates > 1 meter in diameter. |
| BLD | Boulder | Substrate between 25 cm and 1 meter. |
| CBL | Cobble | Substrate between 6 cm and 25 cm. |
| GVL | Gravel | Substrate between 0.4 cm and 6 cm. |
| SND | Sand | Clearly separate grains of < 0.4 cm. |
| MUD | Mud | Soft, paste-like material. |
| SIL | Silt | Fine organic dusting (very rarely used). |
| BAR | Barnacle | Area primarily covered with barnacles. |
| SHL | Shell | Area primarily covered with whole or crushed shells. |
| MUS | Mussels | Area primarily covered with mussels. |
| WDY | Woody debris | Any submerged bark, logs, branches or root systems. |

Appendix C. Vallendar Bay (Bed 101-23-815004) geoduck clam assessment survey, 2000.

| Date | Transect # | Transect side | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start (fsw) | MLLW End (fsw) | No. geoducks | No. horseclams | Bottom Type 1 | Bottom Type 2 | % vegetation cover | Predominant Vegetation Type | Comments |
|-----------|------------|---------------|---------|----------|------------|----------|----------|-------|------------------|----------------|--------------|----------------|---------------|---------------|--------------------|-----------------------------|---|
| 28-Jun-00 | 2 | a | 11:09 | 11:19 | 0:10 | JR | RL | 2 | 35 | 55 | 63 | 0 | cbl | snd | 0 | | bld from 0-48 fsw, all geoducks >57 fsw |
| 28-Jun-00 | 4 | a | 11:29 | 11:42 | 0:13 | SW | JR | 2 | 23 | 55 | 88 | 6 | cbl | snd | 0 | | boulder 0-36 fsw |
| 28-Jun-00 | 6 | a | 11:56 | 12:23 | 0:27 | RL | SW | 2 | 8 | 55 | 95 | | gvl | | 0 | | |
| 28-Jun-00 | 8 | a | 14:29 | 14:45 | 0:16 | JR | RL | 2 | 10 | 55 | 140 | 2 | snd | cbl | 5 | lbc | 0-17 fsw = rock |
| 28-Jun-00 | 10 | a | 14:29 | 14:48 | 0:19 | TT | WB | 2 | -6 | 55 | 68 | | | | | | rock to 31 fsw, first geoduck at 38 fsw |
| 28-Jun-00 | 10 | b | 14:29 | 14:48 | 0:19 | TT | WB | 2 | -6 | 55 | 107 | | | | | | first geoduck at 20 fsw |
| 28-Jun-00 | 12 | a | 14:56 | 15:10 | 0:14 | SW | JR | 2 | 18 | 55 | 43 | 4 | snd | shl | 5 | lbc | false geoducks present |
| 28-Jun-00 | 14 | a | 15:00 | 15:27 | 0:27 | MP | WB | 2 | -5 | 55 | 108 | | | | | | first geoduck @ 3 fsw in sand |
| 28-Jun-00 | 14 | b | 15:00 | 15:27 | 0:27 | MP | WB | 2 | -5 | 55 | 37 | | | | | | |
| 28-Jun-00 | 16 | a | 15:20 | 15:37 | 0:17 | RL | SW | 2 | 8 | 55 | 50 | 1 | snd | cbl | 10 | lbc | many truncated softshell |
| 28-Jun-00 | 18 | a | 15:39 | 16:01 | 0:22 | TT | WB | 2 | 3 | 55 | 74 | | snd | | 30 | lam | 1st geoduck @ 9 fsw |
| 28-Jun-00 | 18 | b | 15:39 | 16:01 | 0:22 | TT | WB | 2 | 3 | 55 | 56 | | snd | | 25 | lam | many horseclams above 30 fsw |
| 28-Jun-00 | 20 | a | 15:55 | 16:09 | 0:14 | RL | JR | 2 | 12 | 55 | 156 | 3 | snd | shl | 10 | lbc | eelgrass @ 15 fsw, 4 false geoduck |
| 28-Jun-00 | 22 | a | 16:14 | 16:37 | 0:23 | TT | WB | 2 | 9 | 55 | 109 | | snd | | | | 1st geoduck @ 15 fsw |
| 28-Jun-00 | 22 | b | 16:14 | 16:37 | 0:23 | TT | WB | 2 | 11 | 55 | 292 | | | | | | |
| 28-Jun-00 | 24 | a | 16:22 | 16:37 | 0:15 | JR | SW | 2 | 12 | 55 | 11 | 110 | snd | cbl | 10 | lbc | false geoducks present, Odestomia on horseclam |
| 28-Jun-00 | 26 | a | 16:48 | 17:04 | 0:16 | TT | WB | 2 | -3 | 55 | 7 | | gvl | | | | boulder to 21 fsw |
| 28-Jun-00 | 26 | b | 16:48 | 17:04 | 0:16 | TT | WB | 2 | -3 | 55 | 4 | | gvl | | | | boulder to 17 fsw |
| 28-Jun-00 | 28 | a | 11:43 | 12:01 | 0:18 | MP | TT | 2 | 0 | 55 | 37 | 2 | snd | gvl | 0 | | boulder 12-37 fsw, first geoduck @ 49 fsw, many truncated softshell clams, false geoducks present |
| 28-Jun-00 | 28 | b | 11:43 | 12:01 | 0:18 | MP | TT | 2 | 8 | 55 | 35 | 1 | snd | gvl | 0 | | |

-continued-

Appendix C. (page 2 of 4)

Vallenar Bay Geoduck 2000 Transect Summary.

| Date Counted | Sum of No geoducks | Transect side | | Average per meter | Est. Number per Transect's Shoreline |
|--------------|-----------------------|---------------|-----|----------------------|---|
| | | Transect no | a | | |
| | 1 | | | | |
| 6/28/00 | 2 | 63 | | 31.5 | 6,350 |
| | 3 | | | | |
| 6/28/00 | 4 | 88 | | 44.0 | 8,870 |
| | 5 | | | | |
| 6/28/00 | 6 | 95 | | 47.5 | 9,576 |
| | 7 | | | | |
| 6/28/00 | 8 | 140 | | 70.0 | 14,112 |
| | 9 | | | | |
| 6/28/00 | 10 | 68 | 107 | 43.8 | 8,820 |
| | 11 | | | | |
| 6/28/00 | 12 | 43 | | 21.5 | 4,334 |
| | 13 | | | | |
| 6/28/00 | 14 | 108 | 37 | 36.3 | 7,308 |
| | 15 | | | | |
| 6/28/00 | 16 | 50 | | 25.0 | 5,040 |
| | 17 | | | | |
| 6/28/00 | 18 | 74 | 56 | 32.5 | 6,552 |
| | 19 | | | | |
| 6/28/00 | 20 | 156 | | 78.0 | 15,725 |
| | 21 | | | | |
| 6/28/00 | 22 | 109 | 292 | 100.3 | 20,210 |
| | 23 | | | | |
| 6/28/00 | 24 | 11 | | 5.5 | 1,109 |
| | 25 | | | | |
| 6/28/00 | 26 | 7 | 4 | 2.8 | 554 |
| | 27 | | | | |
| 6/28/00 | 28 | 37 | 35 | 18.0 | 3,629 |
| | 29 | | | | |

-continued-

Appendix C. (page 3 of 4)

Vallenar Bay 2000 geoduck survey biomass estimate and GHL.

| | |
|---|---------------|
| Number of Transects | 14 |
| Average per Square Meter | 39.75 |
| Variance of Counts | 756.240 |
| Std. Variance of Mean | 54.017 |
| Shoreline (m) | 2,822 |
| | |
| Total Number of Geoducks | 112,189 |
| Variance of Total Number | 430,286,351 |
| Precision of Estimate | 75.0% |
| | |
| 90% Coefficient of Variation | 32.7% |
| 90% two-tail Precision | 67.3% |
| | |
| Average Weight (lb) | 2.25 |
| Variance of Average Weight | 0.36809369 |
| | |
| Biomass Estimate | 252,796 |
| Variance of Biomass Est. | 6,659,299,313 |
| Precision of Estimate | 56.4153% |
| | |
| 90% Coefficient of Variation | 57.2% |
| 90% two-tail Precision | 42.8% |
| Lower Bounds Biomass Est. | 108,280 |
| Upper Bounds Biomass Est. | 397,312 |
| | |
| 90% of being within 66.7% Adjustment | 84.6% |
| | |
| Show Factor Adjustment | 0.80 |
| Target Harvest Rate | 8% |
| | |
| Quota WITHOUT Precision Adjustment | 25,280 |
| | |
| Quota WITH Precision Adjustment | 21,382 |

-continued-

Appendix C. (page 4 of 4)

Vallenar Bay latitudes and longitudes for survey transects.

| Transect No. | Latitude | Longitude |
|--------------|----------|------------|
| 1 | 55.40104 | -131.85094 |
| 2 | 55.40190 | -131.85114 |
| 3 | 55.40282 | -131.85127 |
| 4 | 55.40375 | -131.85127 |
| 5 | 55.40464 | -131.85140 |
| 6 | 55.40587 | -131.80128 |
| 7 | 55.40638 | -131.85133 |
| 8 | 55.43030 | -131.85153 |
| 9 | 55.40823 | -131.85179 |
| 10 | 55.40908 | -131.85179 |
| 11 | 55.40997 | -131.85485 |
| 12 | 55.41089 | -131.85159 |
| 13 | 55.41178 | -131.85166 |
| 14 | 55.41267 | -131.85153 |
| 15 | 55.41360 | -131.85172 |
| 16 | 55.41448 | -131.85172 |
| 17 | 55.41537 | -131.85198 |
| 18 | 55.41626 | -131.85224 |
| 19 | 55.41719 | -131.85270 |
| 20 | 55.41796 | -131.85348 |
| 21 | 55.41882 | -131.85400 |
| 22 | 55.41959 | -131.85478 |
| 23 | 55.42041 | -131.85511 |
| 24 | 55.42130 | -131.85530 |
| 25 | 55.42226 | -131.85576 |
| 26 | 55.42307 | -131.85511 |
| 27 | 55.42389 | -131.85452 |
| 28 | 55.42466 | -131.85361 |
| 29 | 55.42548 | -131.85296 |

Appendix D. Foggy Bay (Bed 101-23-001) geoduck clam assessment surveys (1998, 1999, & 2000).

| Date | Transect # | Transect side | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|------------|---------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|---|
| 09-Sep-98 | 1 | a | 12:15 | 15:46 | 3:31 | SW | KH | 2 | -4 | 41 | 0 | 0 | rck | cbl | 0 | | many urchins all sizes start at 22' |
| 09-Sep-98 | 1 | a | 12:15 | 15:46 | 3:31 | SW | KH | 2 | 41 | 42 | 6 | 0 | snd | | 0 | | |
| 09-Sep-98 | 1 | a | 12:15 | 15:46 | 3:31 | SW | KH | 2 | 42 | 46 | 8 | 0 | snd | | 0 | | |
| 09-Sep-98 | 1 | a | 12:15 | 15:46 | 3:31 | SW | KH | 2 | 46 | 46 | 0 | 0 | cbl | | 0 | | |
| 09-Sep-98 | 1 | a | 12:15 | 15:46 | 3:31 | SW | KH | 2 | 46 | 49 | 0 | 0 | snd | | 0 | | |
| 09-Sep-98 | 3 | a | 15:37 | 16:12 | 0:35 | PD | MP | 2 | -1 | 28 | 0 | | bld | | 0 | | some cucs, few urchins |
| 09-Sep-98 | 3 | a | 15:37 | 16:12 | 0:35 | PD | MP | 2 | 28 | 32 | 26 | 3 | snd | | 0 | | |
| 09-Sep-98 | 3 | a | 15:37 | 16:12 | 0:35 | PD | MP | 2 | 32 | 49 | 57 | 1 | snd | shl | 0 | | |
| 09-Sep-98 | 3 | a | 15:37 | 16:12 | 0:35 | PD | MP | 2 | 49 | 53 | 15 | 0 | snd | shl | 0 | | |
| 28-Jul-00 | 4 | a | 8:33 | 8:56 | 0:23 | MP | SW | 2 | -7 | 55 | 123 | | snd | | 20 | lam | 1st geoduck @ 27 fsw, HC present |
| 09-Sep-98 | 5 | a | 16:09 | 16:21 | 0:12 | BD | KH | 2 | -8 | 39 | 0 | 0 | rck | | 25 | lbk | not geoduck habitat |
| 09-Sep-98 | 5 | a | 16:09 | 16:21 | 0:12 | BD | KH | 2 | 39 | 53 | 0 | 0 | snd | | 0 | | |
| 09-Sep-98 | 5 | b | 16:09 | 16:21 | 0:12 | BD | KH | 2 | -7 | 53 | 0 | 0 | rck | | 10 | lbk | |
| 09-Sep-98 | 7 | a | 16:27 | 16:43 | 0:16 | PD | MP | 2 | 9 | 43 | 0 | 0 | bld | snd | 0 | | |
| 09-Sep-98 | 7 | a | 16:27 | 16:43 | 0:16 | PD | MP | 2 | 43 | 54 | 1 | 0 | shl | snd | 0 | | |
| 09-Sep-98 | 7 | b | 16:27 | 16:43 | 0:16 | PD | MP | 2 | 29 | 54 | 0 | 0 | cbl | bld | 0 | | not good geoduck habitat, rck at 45' |
| 09-Sep-98 | 9 | a | 16:30 | 16:56 | 0:26 | BD | KH | 2 | 4 | 15 | 0 | 0 | rck | | 20 | lbk | |
| 09-Sep-98 | 9 | a | 16:30 | 16:56 | 0:26 | BD | KH | 2 | 15 | 41 | 20 | 0 | snd | cbl | 0 | | |
| 09-Sep-98 | 9 | a | 16:30 | 16:56 | 0:26 | BD | KH | 2 | 41 | 54 | 4 | 0 | snd | | 0 | | |
| 09-Sep-98 | 9 | b | 16:30 | 16:56 | 0:26 | BD | KH | 2 | 19 | 24 | 96 | 8 | snd | | 0 | | rck at 35' |
| 09-Sep-98 | 9 | b | 16:30 | 16:56 | 0:26 | BD | KH | 2 | 24 | 54 | 185 | 12 | snd | | 0 | | |
| 28-Jul-00 | 10 | a | 10:59 | 11:20 | 0:21 | SW | KH | 2 | -13 | 55 | 26 | | cbl | shl | | | 1st geoduck @ 57 fsw |
| 09-Sep-98 | 11 | a | 16:55 | 17:27 | 0:32 | PD | MP | 2 | 1 | 23 | 0 | 0 | bld | cbl | 0 | | |
| 09-Sep-98 | 11 | a | 16:55 | 17:27 | 0:32 | PD | MP | 2 | 23 | 36 | 223 | 0 | snd | | 0 | | |
| 09-Sep-98 | 11 | a | 16:55 | 17:27 | 0:32 | PD | MP | 2 | 36 | 55 | 113 | 0 | snd | | 0 | | |
| 28-Jul-00 | 12 | a | 8:25 | 8:43 | 0:18 | RL | TT | 2 | 14 | 55 | 58 | | snd | | 5 | lbk | false geoducks present, cbl @ 22 fsw |
| 10-Sep-98 | 13 | a | 9:22 | 9:51 | 0:29 | SW | KH | 2 | 0 | 21 | 0 | 0 | bld | snd | 0 | | |
| 10-Sep-98 | 13 | a | 9:22 | 9:51 | 0:29 | SW | KH | 2 | 21 | 36 | 269 | 0 | snd | | 0 | | |
| 10-Sep-98 | 13 | a | 9:22 | 9:51 | 0:29 | SW | KH | 2 | 36 | 55 | 151 | 0 | snd | | 0 | | |
| 10-Sep-98 | 13 | a | 9:22 | 9:51 | 0:29 | SW | KH | 2 | 55 | 70 | 4 | 0 | snd | | 0 | | urchins @ 70' |
| 10-Sep-98 | 15 | a | 10:10 | 10:31 | 0:21 | KH | BD | 2 | 0 | 24 | 0 | 0 | snd | rck | 0 | | |
| 10-Sep-98 | 15 | a | 10:10 | 10:31 | 0:21 | KH | BD | 2 | 24 | 35 | 0 | 0 | snd | | 0 | | |
| 10-Sep-98 | 15 | a | 10:10 | 10:31 | 0:21 | KH | BD | 2 | 35 | 71 | 0 | 0 | rck | | 0 | | |
| 10-Sep-98 | 15 | b | 10:10 | 10:31 | 0:21 | KH | BD | 2 | 44 | 17 | 0 | 0 | snd | cbl | 0 | | not geoduck habitat |
| 10-Sep-98 | 15 | b | 10:10 | 10:31 | 0:21 | KH | BD | 2 | 71 | 44 | 0 | 0 | rck | | 0 | | |
| 28-Jul-00 | 16 | a | 10:41 | 11:07 | 0:26 | TT | RL | 2 | -13 | 44 | 8 | | rck | snd | 30 | lbk | |
| 10-Sep-98 | 17 | a | 11:41 | 11:54 | 0:13 | KH | SW | 2 | -3 | 55 | 0 | 0 | rck | | 0 | | rock to silty bottom |
| 28-Jul-00 | 18 | a | 9:19 | 9:37 | 0:18 | RL | TT | 2 | -10 | 55 | 10 | | rck | | 50 | lbk | good numbers of cucumbers, some urchins |
| 15-Aug-99 | 19 | a | 9:44 | 9:58 | 0:14 | JR | RL | 2 | 20 | 55 | 3 | 0 | gvl | rck | 5 | lbk | |
| 28-Jul-00 | 20 | a | 9:54 | 10:12 | 0:18 | RL | TT | 2 | 12 | 54 | 47 | | snd | | 10 | lbk | |

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Appendix D. (page 2 of 5)

| Date | Transect # | Transect side | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|------------|---------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|---|
| 15-Aug-99 | 21 | a | 10:19 | 10:41 | 0:22 | SW | DW | 2 | 19 | 55 | 159 | 2 | snd | cbl | 15 | lam | 1st GD @ 23 fsw |
| 28-Jul-00 | 22 | a | 10:01 | 10:32 | 0:31 | SW | KH | 2 | -11 | 55 | 118 | | rck | snd | 5 | mac | no need to go past 50 fsw |
| 15-Aug-99 | 23 | a | 10:14 | 10:41 | 0:27 | MP | JR | 2 | 11 | 55 | 154 | 7 | snd | mud | | | 1st GD @ 21 fsw |
| 10-Sep-98 | 25 | a | 9:39 | 9:54 | 0:15 | RL | PD | 2 | 9 | 21 | 0 | 0 | cbl | snd | 30 | fir | max depth = 24 fsw |
| 10-Sep-98 | 27 | a | 9:00 | 9:19 | 0:19 | MP | PD | 2 | 18 | 45 | 0 | 0 | bld | gvl | 0 | | |
| 10-Sep-98 | 27 | a | 9:00 | 9:19 | 0:19 | MP | PD | 2 | 45 | 55 | 0 | 0 | gvl | snd | 5 | lbc | not geoduck habitat |
| 10-Sep-98 | 29 | a | 8:45 | 9:00 | 0:15 | BD | SW | 2 | -2 | 42 | 0 | 0 | bld | | 0 | | urchins |
| 10-Sep-98 | 29 | a | 8:45 | 9:00 | 0:15 | BD | SW | 2 | 42 | 55 | 0 | 0 | cbl | | 0 | | urchins |
| 10-Sep-98 | 29 | b | 8:45 | 9:00 | 0:15 | BD | SW | 2 | -2 | 50 | 0 | 0 | bld | | 0 | | urchins |
| 10-Sep-98 | 29 | b | 8:45 | 9:00 | 0:15 | BD | SW | 2 | 50 | 55 | 0 | 0 | shl | cbl | 0 | | urchins |
| 28-Jul-00 | 30 | a | 9:17 | 9:43 | 0:26 | KH | MP | 2 | -10 | 55 | 184 | | snd | gvl | 0 | | 1st geoduck @ 32 fsw |
| 10-Sep-98 | 31 | a | 10:48 | 11:10 | 0:22 | SW | BD | 2 | 0 | 22 | 0 | 0 | bld | cbl | 0 | | cucs urchins |
| 10-Sep-98 | 31 | a | 10:48 | 11:10 | 0:22 | SW | BD | 2 | 22 | 26 | 112 | 0 | snd | | 0 | | |
| 10-Sep-98 | 31 | a | 10:48 | 11:10 | 0:22 | SW | BD | 2 | 26 | 27 | 24 | 0 | snd | | 0 | | |
| 10-Sep-98 | 31 | a | 10:48 | 11:10 | 0:22 | SW | BD | 2 | 27 | 55 | 0 | 0 | rck | snd | 0 | | |
| 15-Aug-99 | 33 | a | 8:11 | 9:23 | 1:12 | RL | MP | 2 | 15 | 26 | 621 | 10 | snd | gvl | 20 | elg | |
| 15-Aug-99 | 35 | a | 8:33 | 9:59 | 1:26 | DW | CB | 2 | 3 | 49 | 13 | | | | 65 | elg | started to get shallower at end of dive |

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Appendix D. (page 3 of 5)

Foggy Bay geoduck 1998, 1999, and 2000 transect summary.

| Transect No. | Transect Side | | Average per meter | Est. Number per Transect's Shoreline |
|--------------|---------------|-----|-------------------|--------------------------------------|
| | a | b | | |
| 1 | 14 | | 7 | 4,607 |
| 2 | | | | |
| 3 | 98 | | 49 | 32,250 |
| 4 | 123 | | 61.5 | 40,476 |
| 5 | 0 | 0 | 0 | 0 |
| 6 | | | | |
| 7 | 1 | 0 | 0.25 | 165 |
| 8 | | | | |
| 9 | 24 | 281 | 76.25 | 50,184 |
| 10 | 26 | | 13 | 8,556 |
| 11 | 336 | | 168 | 110,570 |
| 12 | 58 | | 29 | 19,086 |
| 13 | 424 | | 212 | 139,529 |
| 14 | | | | |
| 15 | 0 | 0 | 0 | 0 |
| 16 | 8 | | 4 | 2,633 |
| 17 | 0 | | 0 | 0 |
| 18 | 10 | | 5 | 3,291 |
| 19 | 3 | | 1.5 | 987 |
| 20 | 47 | | 23.5 | 15,467 |
| 21 | 159 | | 79.5 | 52,323 |
| 22 | 118 | | 59 | 38,831 |
| 23 | 154 | | 77 | 50,678 |
| 24 | | | | |
| 25 | 0 | | 0 | 0 |
| 26 | | | | |
| 27 | 0 | | 0 | 0 |
| 28 | | | | |
| 29 | 0 | 0 | 0 | 0 |
| 30 | 184 | | 92 | 60,550 |
| 31 | 136 | | 68 | 44,754 |
| 32 | | | | |
| 33 | 621 | | 310.5 | 204,357 |
| 34 | | | | |
| 35 | 13 | | 6.5 | 4,278 |
| 36 | | | | |

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Appendix D (page 4 of 5)

Foggy Bay geoduck survey biomass estimate and GHL.

| | |
|---|-----------------|
| Number of Transects | 26 |
| Average per Linear Meter | 51.63 |
| Variance of Counts | 5,711 |
| Std. Variance of Mean | 220 |
| Shoreline (meters) | 17,112 |
| | |
| Total Number of Geoducks | 883,572 |
| Variance of Total Number | 64,317,426,057 |
| Precision of Estimate | 62.2% |
| | |
| 90% Coefficient of Variation | 49.0% |
| 90% two-tail Precision | 51.0% |
| | |
| Average Weight (lb) | 2.29 |
| Variance of Average Weight | 0.37827728 |
| | |
| Biomass Estimate | 2,022,094 |
| Variance of Biomass Est. | 607,849,661,367 |
| Precision of Estimate | 49.2% |
| | |
| 90% Coefficient of Variation | 65.9% |
| 90% two-tail Precision | 34.1% |
| Lower Bounds Biomass Est. | 690,348 |
| Upper Bounds Biomass Est. | 3,353,841 |
| | |
| 90% of being within 66.7% Adjustment | 73.8% |
| | |
| Show Factor Adjustment | 0.80 |
| Target Harvest Rate | 4% |
| | |
| Quota WITHOUT Precision Adjustment | 101,105 |
| | |
| Quota WITH Precision Adjustment | 74,648 |

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Appendix D. (page 5 of 5)

Foggy Bay latitudes and longitudes for survey transects.

| Transect No. | Latitude | Longitude |
|--------------|-----------|-------------|
| 1 | 54.927550 | -130.974950 |
| 2 | 54.932580 | -130.974630 |
| 3 | 54.934717 | -130.966750 |
| 4 | 54.933166 | -130.959166 |
| 5 | 54.932967 | -130.952117 |
| 6 | 54.935030 | -130.947717 |
| 7 | 54.939217 | -130.948200 |
| 8 | 54.943467 | -130.946200 |
| 9 | 54.947633 | -130.948083 |
| 10 | 54.951700 | -130.950883 |
| 11 | 54.955133 | -130.951833 |
| 12 | 54.960383 | -130.949250 |
| 13 | 54.961667 | -130.962417 |
| 14 | 54.962867 | -130.968450 |
| 15 | 54.963550 | -130.973783 |
| 16 | 54.976110 | -130.986800 |
| 17 | 54.971133 | -130.979617 |
| 18 | 54.974450 | -130.980250 |
| 19 | 54.980033 | -130.981283 |
| 20 | 54.983783 | -130.982917 |
| 21 | 54.986967 | -130.987583 |
| 22 | 54.990083 | -130.990883 |
| 23 | 54.994633 | -130.995917 |
| 24 | 54.990700 | -131.000300 |
| 25 | 54.993117 | -131.006583 |
| 27 | 54.993333 | -131.013433 |
| 29 | 54.954217 | -130.988250 |
| 30 | 54.959617 | -130.984300 |
| 31 | 54.963217 | -130.982700 |
| 32 | 54.967283 | -130.985033 |
| 33 | 54.964050 | -130.996050 |
| 34 | 54.967967 | -130.999367 |
| 35 | 54.971950 | -131.000800 |
| 36 | 54.973750 | -131.006417 |

Appendix E. South Vallenar Point (in Subdistrict 101-29) 2000 geoduck clam assessment surveys.

| Date | Transect # | Transect side | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW Start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|------------|---------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|---|
| 25-Jun-00 | 1 | a | 15:59 | 16:10 | 0:11 | MP | TT | 2 | 10 | 55 | 0 | | rck | cbl | | | geoducks at 67 fsw |
| 25-Jun-00 | 1 | b | 15:59 | 16:10 | 0:11 | MP | TT | 2 | 14 | 55 | 0 | | rck | cbl | | | |
| 25-Jun-00 | 10 | a | 13:03 | 13:23 | 0:20 | MP | TT | 2 | 30 | 55 | 87 | | snd | rck | | | 0 to 33 fsw = rock & sand |
| 25-Jun-00 | 10 | b | 13:03 | 13:23 | 0:20 | MP | TT | 2 | 22 | 55 | 1 | 0 | rck | gvl | | | horse clams present |
| 25-Jun-00 | 11 | a | 12:51 | 13:08 | 0:17 | RL | JR | 2 | 12 | 55 | 94 | 2 | snd | | 5 | fil | large numbers of moon snails |
| 25-Jun-00 | 12 | a | 12:24 | 12:44 | 0:20 | RL | JR | 2 | 10 | 55 | 83 | 1 | snd | | 10 | lam | eelgrass bed @ 15 fsw, large numbers of moon snails |
| 25-Jun-00 | 13 | a | 12:19 | 12:49 | 0:30 | TT | WB | 2 | 8 | 50 | 3 | | | | | | 1st geoduck at 25 fsw |
| 25-Jun-00 | 13 | b | 12:19 | 12:49 | 0:30 | TT | WB | 2 | 15 | 50 | 65 | 1 | | | | | horse clams present |
| 25-Jun-00 | 2 | a | 15:46 | 15:56 | 0:10 | RL | JR | 2 | 9 | 55 | 0 | | rck | | 50 | lbk | |
| 25-Jun-00 | 3 | a | 15:00 | 15:28 | 0:28 | RL | JR | 2 | 21 | 55 | 314 | 45 | | | | | false geoducks present |
| 25-Jun-00 | 4 | a | 15:02 | 15:33 | 0:31 | MP | TT | 2 | 9 | 55 | 134 | | snd | | 75 | lbk | 1st geoduck @ 18 fsw, geoducks continue deeper |
| 25-Jun-00 | 4 | b | 15:02 | 15:33 | 0:31 | MP | TT | 2 | 10 | 55 | 84 | | snd | gvl | 50 | lbk | large horseclams shallow |
| 25-Jun-00 | 5 | a | 14:40 | 14:52 | 0:12 | RL | JR | 2 | 14 | 55 | 8 | 3 | cbl | gvl | 30 | lbk | cucs present, not geoducks habitat |
| 25-Jun-00 | 6 | a | 14:02 | 14:43 | 0:41 | WB | TT | 2 | 21 | 55 | 42 | | gvl | shl | | | 1st geoduck @ 32 fsw, False geoducks & horseclams present |
| 25-Jun-00 | 6 | b | 14:02 | 14:43 | 0:41 | WB | TT | 2 | 25 | 55 | 34 | | gvl | shl | | | abs @ 25 fsw |
| 25-Jun-00 | 7 | a | 13:51 | 14:08 | 0:17 | RL | JR | 2 | 18 | 55 | 13 | 0 | cbl | | 10 | lam | undiggable geoducks all below 40 fsw |
| 25-Jun-00 | 8 | a | 13:44 | 13:53 | 0:09 | MP | WB | 2 | 17 | 55 | 2 | | gvl | | | | |
| 25-Jun-00 | 8 | b | 13:44 | 13:53 | 0:09 | MP | WB | 2 | 18 | 55 | 0 | | | | | | |
| 25-Jun-00 | 9 | a | 13:21 | 13:40 | 0:19 | RL | JR | 2 | 20 | 55 | 26 | 13 | gvl | cbl | 15 | lbk | |

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South Vallenar Point geoduck 2000 transect summary.

| Transect No. | Transect side | | Average per meter | Est. Number per Transect's Shoreline |
|--------------|---------------|----|-------------------|--------------------------------------|
| | a | b | | |
| 1 | 0 | 0 | 0.0 | 0 |
| 2 | 0 | | 0.0 | 0 |
| 3 | 314 | | 157.0 | 15,301 |
| 4 | 134 | 84 | 54.5 | 5,312 |
| 5 | 8 | | 4.0 | 390 |
| 6 | 42 | 34 | 19.0 | 1,852 |
| 7 | 13 | | 6.5 | 634 |
| 8 | 2 | 0 | 0.5 | 49 |
| 9 | 26 | | 13.0 | 1,267 |
| 10 | 87 | 1 | 22.0 | 2,144 |
| 11 | 94 | | 47.0 | 4,581 |
| 12 | 83 | | 41.5 | 4,045 |
| 13 | 3 | 65 | 17.0 | 1,657 |

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Appendix E. (page 3 of 4)

South Vallenar Point geoduck survey biomass estimate and GHL.

| | |
|---|---------------|
| Number of Transects | 13 |
| Average per Square Meter | 29.38 |
| Variance of Counts | 1,807.256 |
| Std. Variance of Mean | 139.020 |
| Shoreline (m) | 1,267 |
| | |
| Total Number of Geoducks | 37,230 |
| Variance of Total Number | 223,166,834 |
| Precision of Estimate | 45.6% |
| | |
| 90% Coefficient of Variation | 71.5% |
| 90% two-tail Precision | 28.5% |
| | |
| Average Weight (lb) | 2.46 |
| Variance of Average Weight | 0.41354383 |
| | |
| Biomass Estimate | 91,764 |
| Variance of Biomass Est. | 1,836,667,438 |
| Precision of Estimate | 36.7% |
| | |
| 90% Coefficient of Variation | 83.2% |
| 90% two-tail Precision | 16.8% |
| Lower Bounds Biomass Est. | 15,381 |
| Upper Bounds Biomass Est. | 168,146 |
| | |
| 90% of being within 66.7% Adjustment | 55.0% |
| | |
| Show Factor Adjustment | 0.80 |
| Target Harvest Rate | 8% |
| | |
| Quota WITHOUT Precision Adjustment | 9,176 |
| | |
| Quota WITH Precision Adjustment | 5,044 |

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Appendix E. (page 4 of 4)

South Vallendar Point transect latitude and longitude.

| Transect No. | Latitude | Longitude |
|--------------|----------|------------|
| 1 | 55.31681 | -131.86971 |
| 2 | 55.31773 | -131.87001 |
| 3 | 55.32088 | -131.86853 |
| 4 | 55.32168 | -131.86772 |
| 5 | 55.32248 | -131.86713 |
| 6 | 55.32613 | -131.86721 |
| 7 | 55.32702 | -131.86676 |
| 8 | 55.33500 | -131.86470 |
| 9 | 55.33588 | -131.86500 |
| 10 | 55.33668 | -131.86573 |
| 11 | 55.34277 | -131.86360 |
| 12 | 55.34361 | -131.86338 |
| 13 | 55.34449 | -131.86293 |

Appendix F. Cone Island (in portions of Subdistricts 103-50, 104-35, and 104-40) geoduck clam assessment survey, 1999 and 2000.

| Date | Transect No. | Transect side | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|--------------|---------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|--|
| 17-Jul-99 | 1 | a | 14:34 | 14:46 | 0:12 | KH | JR | 2 | 49 | 55 | 74 | 1 | gvl | snd | | | rck ended at 55 fsw |
| 17-Jul-99 | 10 | a | 15:54 | 16:09 | 0:15 | RL | JR | 2 | 39 | 55 | 85 | 2 | gvl | cbl | 20 | lbk | geoducks 3/m ² @ 70 fsw |
| 17-Jul-99 | 11 | a | 15:40 | 16:13 | 0:33 | MP | JC | 2 | 22 | 55 | 279 | 79 | gvl | snd | 90 | lam | sea cucumber present |
| 17-Jul-99 | 2 | a | 14:10 | 14:21 | 0:11 | JR | RL | 2 | 42 | 60 | 149 | 6 | gvl | cbl | 0 | | |
| 17-Jul-99 | 3 | a | 13:45 | 13:55 | 0:10 | RL | KH | 2 | 52 | 60 | 31 | 3 | gvl | | | | very strong current, 1st geoduck at 57 fsw |
| 17-Jul-99 | 4 | a | 12:51 | 13:30 | 0:39 | JR | KH | 2 | 33 | 55 | 2185 | 0 | snd | | 10 | lbk | geoduck start at 51 fsw |
| 17-Jul-99 | 5 | a | 12:48 | 13:16 | 0:28 | JC | MP | 2 | 25 | 55 | 1346 | | snd | gvl | 0 | | geoducks begin at 41 fsw, 16/m ² @ 45', 26/m ² @ 57' |
| 17-Jul-99 | 6 | a | 13:42 | 14:00 | 0:18 | JC | DG | 2 | -5 | 59 | 274 | 7 | snd | | | | geoducks begin @ 41 fsw |
| 17-Jul-99 | 7 | a | 14:15 | 14:20 | 0:05 | MP | DG | 2 | 34 | 55 | 0 | 0 | cbl | gvl | | | "stiff" current |
| 17-Jul-99 | 8 | a | | | | MP | | | | | 0 | | | | | | not dove, stiff current, similar area/current to T#7 (indeed, current so strong on T#7 we probably touched on portions of T#8 !) |
| 17-Jul-99 | 9 | a | 14:34 | 14:46 | 0:12 | MP | DG | 2 | 15 | 55 | 52 | 8 | gvl | snd | 20 | lam | strong current, most geoducks tended to be more shallow than deep |
| 09-Aug-00 | 11 | a | 15:15 | 16:52 | 1:37 | BL | RL | 2 | -4 | 55 | 1912 | | snd | gvl | 95 | lbk | |
| 09-Aug-00 | 14 | a | 15:09 | 15:50 | 0:41 | MP | DB | 2 | 21 | 55 | 95 | | gvl | snd | 80 | lam | 1st geoduck @ 29 fsw |
| 09-Aug-00 | 15 | a | 16:25 | 17:17 | 0:52 | MP | TT | 2 | 13 | 54 | 492 | | snd | gvl | 80 | lam | geoducks continue deeper @ dense concentrations (>=10/m ² @ 60 fsw) |
| 10-Aug-00 | 17 | a | 9:27 | 9:43 | 0:16 | TT | KH | 2 | -6 | 55 | 47 | | gvl | snd | 50 | lbk | 1st geoduck @ 28 fsw |
| 10-Aug-00 | 19 | a | 9:57 | 10:35 | 0:38 | RL | MP | 2 | 22 | 55 | 1279 | | gvl | snd | 35 | lbk | see raw data for density estimates at several depths. Many horse clams at depth |
| 10-Aug-00 | 21 | a | 10:01 | 10:17 | 0:16 | TT | DB | 2 | 21 | 55 | 50 | | snd | shl | 10 | lbk | 1st geoduck @ 33 fsw |
| 10-Aug-00 | 23 | a | 10:31 | 10:49 | 0:18 | KH | DB | 2 | -7 | 56 | 5 | | snd | rck | | | |
| 10-Aug-00 | 25 | a | 11:06 | 11:44 | 0:38 | MP | BL | 2 | 4 | 55 | 708 | 121 | snd | | | | 1st geoduck @ 17 fsw, many broken geoduck shells @ depth, see raw data for density estimate |
| 10-Aug-00 | 27 | a | 11:17 | 11:40 | 0:23 | KH | TT | 2 | 7 | 55 | 187 | | snd | shl | 60 | lbk | horse clams present shallow, no geoducks seen below approx. 45 fsw |
| 10-Aug-00 | 29 | a | 14:24 | 14:30 | 0:06 | RL | BL | 2 | -5 | 55 | 1 | 3 | gvl | snd | 75 | lbk | |
| 10-Aug-00 | 31 | a | 9:00 | 9:37 | 0:37 | RL | BL | 2 | 6 | 55 | 314 | | gvl | snd | | | rck pile @ 59 fsw |
| 10-Aug-00 | 33 | a | 8:58 | 9:06 | 0:08 | KH | DB | 2 | 33 | 57 | 12 | | snd | gvl | 5 | | |
| 10-Aug-00 | 35 | a | 8:29 | 8:41 | 0:12 | MP | BL | 2 | 26 | 70 | 0 | | gvl | cbl | 10 | lam | not geoduck habitat |
| 10-Aug-00 | 37 | a | 8:27 | 8:42 | 0:15 | DB | TT | 2 | 41 | 55 | 0 | | bld | cbl | 0 | | not geoduck habitat |
| 10-Aug-00 | 37 | b | 8:27 | 8:42 | 0:15 | DB | TT | 2 | 39 | 55 | 0 | | cbl | rck | | | not geoduck habitat |
| 10-Aug-00 | 39 | a | 15:23 | 15:54 | 0:31 | MP | BL | 2 | 17 | 55 | 1329 | | snd | | 75 | lbk | 1st geoduck @ 28 fsw, see raw data for density |
| 10-Aug-00 | 41 | a | 15:45 | 16:00 | 0:15 | TT | KH | 2 | -5 | 55 | 4 | | cbl | gvl | | | 1st geoduck @ 40 fsw, tough digging |
| 10-Aug-00 | 43 | a | 15:14 | 15:35 | 0:21 | KH | DB | 2 | -5 | 55 | 3 | | gvl | snd | 20 | lbk | |

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Appendix F. (page 2 of 6)

| Date | Transect No. | Transect side | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|--------------|---------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|---|
| 10-Aug-00 | 51 | a | 14:52 | 15:06 | 0:14 | MP | RL | 2 | -5 | 55 | 32 | 2 | snd | | 20 | lbk | 1st geoduck @ 53 fsw (e.g. all geoducks deeper than 50 fsw) |
| 10-Aug-00 | 53 | a | 14:42 | 14:55 | 0:13 | TT | DB | 2 | 11 | 55 | 0 | | gvl | cbl | 45 | lbk | |
| 10-Aug-00 | 53 | b | 14:42 | 14:55 | 0:13 | TT | DB | 2 | 9 | 55 | 0 | | gvl | cbl | 50 | lbk | |

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Appendix F (3 of 6)

Cone Island transect summary.

| Transect No. | Side a | Side b | Associated Shoreline (m) | Average per meter | Est. Number per Transect's Shoreline |
|--------------|--------|--------|--------------------------|-------------------|--------------------------------------|
| 1 | 74 | | 400 | 46 | 18,300 |
| 2 | 109 | | | | |
| 3 | 31 | | 400 | 554 | 221,400 |
| 4 | 2183 | | | | |
| 5 | 1346 | | 400 | 405 | 162,000 |
| 6 | 274 | | | | |
| 7 | 0 | | 400 | 0 | 0 |
| 8 | 0 | | | | |
| 9 | 52 | | 400 | 34 | 13,700 |
| 10 | 85 | | | | |
| 11 | 1912 | | 400 | 956 | 382,400 |
| 12 | | | | | |
| 13 | | | | | |
| 14 | 95 | | 400 | 48 | 19,000 |
| 15 | 492 | | 400 | 246 | 98,400 |
| 16 | | | | | |
| 17 | 47 | | 400 | 24 | 9,400 |
| 18 | | | | | |
| 19 | 1279 | | 400 | 640 | 255,800 |
| 20 | | | | | |
| 21 | 50 | | 400 | 25 | 10,000 |
| 22 | | | | | |
| 23 | 5 | | 400 | 3 | 1,000 |
| 24 | | | | | |
| 25 | 708 | | 400 | 354 | 141,600 |
| 26 | | | | | |
| 27 | 187 | | 400 | 94 | 37,400 |
| 28 | | | | | |
| 29 | 1 | | 400 | 1 | 200 |
| 30 | | | | | |
| 31 | 314 | | 400 | 157 | 62,800 |
| 32 | | | | | |
| 33 | 12 | | 400 | 6 | 2,400 |
| 34 | | | | | |
| 35 | 0 | | 400 | 0 | 0 |
| 36 | | | | | |
| 37 | 0 | 0 | 400 | 0 | 0 |
| 38 | | | | | |
| 39 | 1329 | | 400 | 665 | 265,800 |
| 40 | | | | | |
| 41 | 4 | | 400 | 2 | 800 |

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Appendix F (page 4 of 6)

Cone Island Transect Summary (continued)

| Transect No. | Side a | Side b | Associated Shoreline (m) | Average per meter | Est. Number per Transect's Shoreline |
|--------------|--------|--------|--------------------------|-------------------|--------------------------------------|
| 42 | | | | | |
| 43 | 3 | | 400 | 2 | 600 |
| 44 | | | | | |
| 45 | | | | | |
| 46 | | | | | |
| 47 | | | | | |
| 48 | | | | | |
| 49 | | | | | |
| 50 | | | | | |
| 51 | 32 | | 400 | 16 | 6,400 |
| 52 | | | | | |
| 53 | 0 | 0 | 400 | 0 | 0 |

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Appendix F. (page 5 of 6)

Cone Island geoduck survey biomass estimate.

| | |
|---|-------------------|
| Number of Transects | 20 |
| Average per Linear Meter | 214 |
| Variance of Counts | 81,470 |
| Std. Variance of Mean | 4,074 |
| Shoreline (meters) | 8,000 |
| | |
| Total Number of Geoducks | 1,709,400 |
| Variance of Total Number | 260,704,212,632 |
| Precision of Estimate | 60.3% |
| | |
| 90% Coefficient of Variation | 51.6% |
| 90% two-tail Precision | 48.4% |
| | |
| Average Weight (lb) | 2.39 |
| Variance of Average Weight | 0.48120961 |
| | |
| Biomass Estimate | 4,081,475 |
| Variance of Biomass Est. | 2,766,924,782,815 |
| Precision of Estimate | 45.8884% |
| | |
| 90% Coefficient of Variation | 70.5% |
| 90% two-tail Precision | 29.5% |
| Lower Bounds Biomass Est. | 1,205,225 |
| Upper Bounds Biomass Est. | 6,957,725 |
| | |
| 90% of being within 66.7% Adjustment | 68.8% |
| | |
| Show Factor Adjustment | 0.80 |
| Target Harvest Rate | 4% |
| | |
| Quota WITHOUT Precision Adjustment | 204,074 |
| | |
| Quota WITH Precision Adjustment | 140,399 |

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Appendix F. (page 5 of 6)

Cone Island transect latitude and longitude.

| Transect No. | Latitude | Longitude |
|--------------|----------|------------|
| 1 | 55.44441 | -133.65800 |
| 2 | 55.44597 | -133.65652 |
| 3 | 55.44743 | -133.65474 |
| 4 | 55.44871 | -133.65323 |
| 5 | 55.44947 | -133.65036 |
| 6 | 55.44991 | -133.64743 |
| 7 | 55.45022 | -133.64434 |
| 8 | 55.45174 | -133.64240 |
| 9 | 55.45351 | -133.64118 |
| 10 | 55.43945 | -133.63622 |
| 11 | 55.43887 | -133.63314 |
| 13 | 55.43975 | -133.62704 |
| 14 | 55.44093 | -133.62462 |
| 15 | 55.44176 | -133.62167 |
| 16 | 55.44249 | -133.61877 |
| 17 | 55.44343 | -133.61603 |
| 18 | 55.44223 | -133.61047 |
| 19 | 55.44673 | -133.59212 |
| 20 | 55.44598 | -133.58915 |
| 21 | 55.44474 | -133.58661 |
| 22 | 55.44377 | -133.57949 |
| 23 | 55.44371 | -133.57638 |
| 24 | 55.44371 | -133.57297 |
| 25 | 55.44337 | -133.57027 |
| 26 | 55.44235 | -133.56746 |
| 27 | 55.44129 | -133.56364 |
| 28 | 55.44036 | -133.56074 |
| 29 | 55.43894 | -133.55874 |
| 30 | 55.42796 | -133.59493 |
| 31 | 55.42659 | -133.59723 |
| 32 | 55.42694 | -133.60074 |
| 33 | 55.42648 | -133.60385 |
| 34 | 55.42455 | -133.60515 |
| 35 | 55.42364 | -133.60816 |
| 36 | 55.42244 | -133.61027 |
| 37 | 55.41078 | -133.61428 |
| 38 | 55.40941 | -133.61187 |

Appendix G. San Christoval (in Subdistrict 103-70) 2000 geoduck clam assessment survey.

| Date | Transect # | Transect side | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|------------|---------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|--|
| 09-Aug-00 | 1 | a | 8:40 | 9:00 | 0:20 | RL | KH | 2 | -7 | 55 | 37 | | gvl | shl | 25 | lbk | |
| 09-Aug-00 | 3 | a | 8:33 | 9:00 | 0:27 | MP | TT | 2 | -7 | 55 | 387 | | snd | | 75 | lam | 1st geoduck @ 30 fsw, few geoducks deeper than 62 fsw |
| 09-Aug-00 | 5 | a | 9:21 | 9:52 | 0:31 | KH | BL | 2 | -7 | 55 | 603 | | shl | snd | 30 | lbk | vast flat bed, numbers fall off beyond 62 fsw (bed density=15-20gd/m ²); urchin tests at beginning of transect |
| 09-Aug-00 | 7 | a | 9:22 | 9:54 | 0:32 | TT | DB | 2 | 21 | 45 | 512 | | snd | shl | 35 | lbk | 1st geoduck @ 32 fsw |
| 08-Aug-00 | 9 | a | 14:10 | 14:37 | 0:27 | MP | TT | 2 | 32 | 55 | 157 | | cbl | snd | | | 1st geoduck @ 43 fsw |
| 08-Aug-00 | 9 | b | 14:10 | 14:37 | 0:27 | MP | TT | 2 | 22 | 55 | 295 | 25 | snd | gvl | 10 | lbk | |
| 08-Aug-00 | 11 | a | 14:55 | 15:22 | 0:27 | MP | BL | 2 | 17 | 55 | 163 | 8 | snd | shl | 10 | lam | 1st geoduck @ 23 fsw |
| 08-Aug-00 | 11 | b | 14:55 | 15:22 | 0:27 | MP | BL | 2 | 55 | 16 | 287 | 5 | snd | gvl | 20 | lam | few horseclams |
| 08-Aug-00 | 13 | a | 15:41 | 16:02 | 0:21 | BL | TT | 2 | 29 | 55 | 2 | 1 | snd | sil | 0 | | |
| 08-Aug-00 | 13 | b | 15:41 | 16:02 | 0:21 | BL | TT | 2 | 31 | 55 | 0 | | snd | | | | |
| 09-Aug-00 | 15 | a | 16:22 | 16:30 | 0:08 | TT | MP | 2 | 10 | 16 | 3 | | snd | gvl | 50 | lam | surveyed half way to island |
| 09-Aug-00 | 17 | a | 10:16 | 10:35 | 0:19 | DB | MP | 2 | -7 | 57 | 160 | | gvl | snd | 20 | lam | 1st geoduck @ 25 fsw, 10ft wide bed of red urchins @ 25 fsw(@ edge of kelp) |
| 09-Aug-00 | 17 | b | 10:16 | 10:35 | 0:19 | DB | MP | 2 | 18 | 57 | 47 | | gvl | snd | 20 | lam | |
| 09-Aug-00 | 19 | a | 16:38 | 16:53 | 0:15 | TT | MP | 2 | -6 | 55 | 68 | | snd | shl | 10 | lam | rck shallow, 1st geoduck @ 40 fsw |
| 09-Aug-00 | 19 | b | 16:38 | 16:53 | 0:15 | TT | MP | 2 | 24 | 55 | 87 | | snd | | | | rck/bld shallower than 30 fsw |
| 09-Aug-00 | 21 | a | 10:11 | 10:23 | 0:12 | RL | BL | 2 | -7 | 56 | 45 | 0 | gvl | shl | 5 | lam | |
| 09-Aug-00 | 23 | a | 10:39 | 10:58 | 0:19 | KH | RL | 2 | -7 | 55 | 64 | | snd | gvl | 25 | lbk | |
| 09-Aug-00 | 25 | a | 10:53 | 11:11 | 0:18 | TT | MP | 2 | 15 | 57 | 38 | | gvl | snd | 15 | lam | started at edge of kelp/bld, no red urchins, 1st geoduck @ 24 fsw |
| 09-Aug-00 | 25 | b | 10:53 | 11:11 | 0:18 | TT | MP | 2 | 14 | 57 | 12 | | gvl | snd | | | |
| 09-Aug-00 | 27 | a | 11:14 | 11:21 | 0:07 | BL | KH | 2 | -7 | 55 | 0 | | rck | | 0 | | rck to 75 fsw than snd w/ geoduck shells |
| 09-Aug-00 | 29 | a | 14:40 | 15:01 | 0:21 | DB | RL | 2 | -4 | 39 | 97 | | gvl | snd | 80 | lbk | |
| 09-Aug-00 | 31 | a | 11:25 | 11:42 | 0:17 | TT | DB | 2 | -7 | 55 | 40 | | | | | | 1st geoduck @ 47 fsw |
| 09-Aug-00 | 31 | b | 11:25 | 11:42 | 0:17 | TT | DB | 2 | 29 | 55 | 31 | | | | | | otter diggings |
| 09-Aug-00 | 33 | a | 16:01 | 16:25 | 0:24 | RL | KH | 2 | -5 | 55 | 246 | | snd | shl | 5 | lam | |
| 09-Aug-00 | 35 | a | 15:19 | 15:31 | 0:12 | KH | DB | 2 | -4 | 55 | 23 | | shl | snd | 0 | | red urchins shallow |

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Appendix G. (page 2 of 4)

San Christoval transect summary.

| Transect No. | Transect Side | | Average per Meter | Est. Number per Transect's Shoreline |
|--------------|---------------|-----|-------------------|--------------------------------------|
| | a | b | | |
| 1 | 37 | | 18.5 | 7,474 |
| 2 | | | | |
| 3 | 387 | | 193.5 | 78,174 |
| 4 | | | | |
| 5 | 603 | | 301.5 | 121,806 |
| 6 | | | | |
| 7 | 512 | | 256.0 | 103,424 |
| 8 | | | | |
| 9 | 157 | 295 | 113.0 | 45,652 |
| 10 | | | | |
| 11 | 163 | 287 | 112.5 | 45,450 |
| 12 | | | | |
| 13 | 2 | 0 | 0.5 | 202 |
| 14 | | | | |
| 15 | 3 | | 1.5 | 606 |
| 16 | | | | |
| 17 | 160 | 47 | 51.8 | 20,907 |
| 18 | | | | |
| 19 | 68 | 87 | 38.8 | 15,655 |
| 20 | | | | |
| 21 | 45 | | 22.5 | 9,090 |
| 22 | | | | |
| 23 | 64 | | 32.0 | 12,928 |
| 24 | | | | |
| 25 | 38 | 12 | 12.5 | 5,050 |
| 26 | | | | |
| 27 | 0 | | 0.0 | 0 |
| 28 | | | | |
| 29 | 97 | | 48.5 | 19,594 |
| 30 | | | | |
| 31 | 40 | 31 | 17.8 | 7,171 |
| 32 | | | | |
| 33 | 246 | | 123.0 | 49,692 |
| 34 | | | | |
| 35 | 23 | | 11.5 | 4,646 |

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Appendix G. (page 3 of 4)

San Christoval geoduck survey biomass estimate and GHL.

| | |
|---|-----------------|
| Number of Transects | 18 |
| Average per Linear Meter | 75.3 |
| Variance of Counts | 8,318.009 |
| Std. Variance of Mean | 462.112 |
| Shoreline (m) | 7,272 |
| | |
| Total Number of Geoducks | 547,521 |
| Variance of Total Number | 24,437,379,387 |
| Precision of Estimate | 61.9% |
| | |
| 90% Coefficient of Variation | 49.7% |
| 90% two-tail Precision | 50.3% |
| | |
| Average Weight (lb) | 2.39 |
| Variance of Average Weight | 0.48120961 |
| | |
| Biomass Estimate | 1,307,297 |
| Variance of Biomass Est. | 271,813,310,258 |
| Precision of Estimate | 46.8241% |
| | |
| 90% Coefficient of Variation | 69.4% |
| 90% two-tail Precision | 30.6% |
| Lower Bounds Biomass Est. | 400,341 |
| Upper Bounds Biomass Est. | 2,214,253 |
| | |
| 90% of being within 66.7% Adjustment | 70.2% |
| | |
| Show Factor Adjustment | 0.80 |
| Target Harvest Rate | 4% |
| | |
| Quota WITHOUT Precision Adjustment | 65,365 |
| | |
| Quota WITH Precision Adjustment | 45,887 |

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Appendix G. (page 4 of 4)

San Christoval transect latitude and longitude.

| Transect No. | Latitude | Longitude |
|--------------|----------|------------|
| 1 | 55.57254 | -133.36408 |
| 2 | 55.57357 | -133.36669 |
| 3 | 55.57511 | -133.36821 |
| 4 | 55.58288 | -133.31472 |
| 5 | 55.58459 | -133.31789 |
| 6 | 55.58557 | -133.31362 |
| 7 | 55.58772 | -133.31321 |
| 8 | 55.59918 | -133.33699 |
| 9 | 55.60062 | -133.33871 |
| 10 | 55.60237 | -133.33967 |
| 11 | 55.60397 | -133.34108 |
| 12 | 55.60549 | -133.34271 |
| 13 | 55.60643 | -133.34419 |
| 14 | 55.60695 | -133.34703 |
| 15 | 55.60690 | -133.35021 |
| 16 | 55.60685 | -133.35340 |
| 17 | 55.60785 | -133.35626 |
| 18 | 55.60528 | -133.34894 |
| 19 | 55.60505 | -133.34576 |
| 20 | 55.60353 | -133.34740 |
| 21 | 55.60368 | -133.35017 |
| 22 | 55.61053 | -133.36158 |
| 23 | 55.61153 | -133.36426 |
| 24 | 55.61233 | -133.36694 |
| 25 | 55.61377 | -133.36892 |
| 26 | 55.61455 | -133.37188 |
| 27 | 55.61598 | -133.37402 |
| 28 | 55.61436 | -133.38804 |
| 29 | 55.61431 | -133.39126 |
| 30 | 55.61480 | -133.39544 |
| 31 | 55.61333 | -133.39631 |
| 32 | 55.61467 | -133.39831 |
| 33 | 55.61516 | -133.40135 |
| 34 | 55.61578 | -133.40431 |
| 35 | 55.61740 | -133.40554 |
| 36 | 55.61852 | -133.40310 |

Appendix H. Ulitka Bay (Bed 103-70-815001) 2000 geoduck clam assessment survey.

| Date | Transect no | Transect Square (or "flap") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|--------------------|
| 06-Jun-00 | 1 | 1 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | 28 | 28 | 2 | | snd | | 0 | | 1 m^2 quadrants |
| 06-Jun-00 | 1 | 2 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 3 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 4 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 5 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 6 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 7 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 8 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 9 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 10 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 11 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 12 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 13 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 14 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 15 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 16 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 17 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 18 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 1 | 19 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 1 | 20 | 16:20 | 16:39 | 0:19 | MP | RL | 1 | | 30 | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 1 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 32 | 32 | 0 | | snd | | 0 | | use 1 m^2 quadrant |
| 06-Jun-00 | 2 | 2 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 32 | 32 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 3 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 32 | 32 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 4 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 33 | 33 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 5 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 33 | 33 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 6 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 34 | 34 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 7 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 35 | 35 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 8 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 35 | 35 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 9 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 35 | 35 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 10 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 36 | 36 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 2 | 11 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | 36 | 36 | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 12 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 13 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 14 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 15 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 16 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 17 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 18 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 19 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 2 | 20 | 16:14 | 16:24 | 0:10 | PD | BL | 1 | | | 0 | | rck | | 0 | | |
| 06-Jun-00 | 3 | 1 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | 28 | 28 | 2 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 2 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 1 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 3 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 4 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 2 | | snd | | 0 | | |

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Appendix H. (page 2 of 12)

| Date | Transect no | Transect Square (or "flip") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|---------------|
| 06-Jun-00 | 3 | 5 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 2 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 6 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 7 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 8 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 1 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 9 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 10 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 1 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 11 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 12 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 1 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 13 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 14 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 1 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 15 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 2 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 16 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 1 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 17 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 18 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 19 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 3 | 20 | 16:52 | 17:52 | 1:00 | RL | TT | 1 | | | 0 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 1 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 3 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 2 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 3 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 2 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 4 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 3 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 5 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 3 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 6 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 7 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 3 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 8 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 2 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 9 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 1 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 10 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 11 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 12 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 42 | 42 | 2 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 13 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 0 | | snd | | 0 | | 5 worm mounds |
| 06-Jun-00 | 4 | 14 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 1 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 15 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 1 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 16 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 0 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 17 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 1 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 18 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 2 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 19 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 2 | | snd | | 0 | | |
| 06-Jun-00 | 4 | 20 | 16:37 | 16:55 | 0:18 | PD | BL | 1 | 43 | 43 | 2 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 1 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | 36 | 36 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 2 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 3 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 4 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 5 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 6 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 7 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 8 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |

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Appendix H. (page 3 of 12)

| Date | Transect no | Transect Square (or "flip") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|----------|
| 07-Jun-00 | 5 | 9 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 10 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 11 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 12 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 13 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 14 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 15 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 16 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 17 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 18 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | 1 snd | | 0 | | |
| 07-Jun-00 | 5 | 19 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 5 | 20 | 8:29 | 8:41 | 0:12 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 1 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | 32 | 32 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 2 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 3 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 4 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 3 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 5 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 2 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 6 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 7 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 8 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 9 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 2 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 10 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 2 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 11 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 12 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 13 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 14 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 15 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 16 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 17 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 18 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 19 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 6 | 20 | 8:55 | 9:07 | 0:12 | PD | KH | 1 | 33 | 33 | 1 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 1 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 52 | 52 | 2 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 2 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 53 | 53 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 3 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 54 | 54 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 4 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 54 | 54 | 1 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 5 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 54 | 54 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 6 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 7 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 8 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 9 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 10 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 11 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 12 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 56 | 56 | 0 | | snd | | 0 | | |

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Appendix H. (page 4 of 12)

| Date | Transect no | Transect Square (or "flip") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|----------|
| 07-Jun-00 | 7 | 13 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | rck | | 0 | | |
| 07-Jun-00 | 7 | 14 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 15 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 16 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 56 | 56 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 17 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 56 | 56 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 18 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 56 | 56 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 19 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 1 | | snd | | 0 | | |
| 07-Jun-00 | 7 | 20 | 8:51 | 9:05 | 0:14 | MP | BL | 1 | 55 | 55 | 2 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 1 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | 49 | 49 | 1 | | gvl | | 0 | | |
| 07-Jun-00 | 8 | 2 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 0 | | gvl | | 0 | | |
| 07-Jun-00 | 8 | 3 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 4 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 5 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 6 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 7 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 8 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 9 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 10 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 11 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | 48 | 48 | 3 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 12 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 13 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 14 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 15 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 16 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 2 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 17 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 3 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 18 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 3 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 19 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 8 | 20 | 9:18 | 9:31 | 0:13 | PD | RL | 1 | 49 | 49 | 3 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 1 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | 41 | 41 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 2 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 3 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 4 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 5 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 6 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 7 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 8 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 9 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 3 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 10 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 2 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 11 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 3 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 12 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 13 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 14 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 2 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 15 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 9 | 16 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 2 | | snd | | 0 | | |

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Appendix H. (page 5 of 12)

| Date | Transect no | Transect Square (or "flip") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|--|
| 07-Jun-00 | 9 | 17 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 0 | 0 | snd | | 0 | | |
| 07-Jun-00 | 9 | 18 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 6 | 0 | snd | | 0 | | |
| 07-Jun-00 | 9 | 19 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | | | 4 | 0 | snd | | 0 | | |
| 07-Jun-00 | 9 | 20 | 9:16 | 9:25 | 0:09 | MP | TT | 1 | 43 | 43 | 2 | 0 | snd | | 0 | | recon'd to east of transect, similar densities w/otter diggings. no diggings on transect |
| 07-Jun-00 | 10 | 1 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | 53 | 53 | 0 | 0 | rck | | 0 | | |
| 07-Jun-00 | 10 | 2 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | rck | | 0 | | |
| 07-Jun-00 | 10 | 3 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | rck | | 0 | | |
| 07-Jun-00 | 10 | 4 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | rck | | 0 | | |
| 07-Jun-00 | 10 | 5 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 6 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 7 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 8 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 9 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 10 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 11 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | 60 | 60 | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 12 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 13 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 14 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 15 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 16 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | cbl | | 0 | | |
| 07-Jun-00 | 10 | 17 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | gvl | | 0 | | |
| 07-Jun-00 | 10 | 18 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | gvl | | 0 | | |
| 07-Jun-00 | 10 | 19 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | | | 0 | 0 | gvl | | 0 | | |
| 07-Jun-00 | 10 | 20 | 9:42 | 9:51 | 0:09 | RL | PD | 1 | 63 | 63 | 0 | 0 | gvl | | 0 | | |
| 07-Jun-00 | 11 | 1 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | rock & boulder for at least 75 m |
| 07-Jun-00 | 11 | 2 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 3 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 4 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 5 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 6 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 7 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 8 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 9 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 10 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 11 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 12 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 13 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 14 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 15 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |
| 07-Jun-00 | 11 | 16 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | 0 | rck | bld | | | |

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Appendix H. (page 6 of 12)

| Date | Transect no | Transect Square (or "flip") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|----------|
| 07-Jun-00 | 11 | 17 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | | rck | bld | | | |
| 07-Jun-00 | 11 | 18 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | | rck | bld | | | |
| 07-Jun-00 | 11 | 19 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | | rck | bld | | | |
| 07-Jun-00 | 11 | 20 | 9:44 | 9:52 | 0:08 | BL | TT | 1 | | | 0 | | rck | bld | | | |
| 07-Jun-00 | 12 | 1 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | 59 | 59 | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 2 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 3 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 4 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 5 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 6 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 7 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 8 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 9 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 10 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 11 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | 57 | 57 | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 12 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 13 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 14 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 15 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 16 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 17 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 18 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 19 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 12 | 20 | 10:06 | 10:18 | 0:12 | PD | RL | 1 | 63 | 63 | 0 | | bld | | | | |
| 07-Jun-00 | 13 | 1 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | 61 | 61 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 2 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 3 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 4 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 5 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 6 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 7 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 8 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 9 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 10 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 11 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 12 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 13 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 14 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 15 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 16 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 17 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 18 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 19 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 13 | 20 | 10:09 | 10:24 | 0:15 | BL | TT | 1 | | | 0 | | snd | | | | |

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Appendix H. (page 7 of 12)

| Date | Transect no | Transect Square (or "flip") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|----------|
| 07-Jun-00 | 14 | 1 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | 51 | 51 | 1 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 2 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 3 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 4 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 5 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 6 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 7 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 8 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 9 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 2 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 10 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | 54 | 54 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 11 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | 54 | 54 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 12 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 13 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 1 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 14 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 15 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | snd | | 0 | | |
| 07-Jun-00 | 14 | 16 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | shl | | 0 | | |
| 07-Jun-00 | 14 | 17 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | shl | | 0 | | |
| 07-Jun-00 | 14 | 18 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | shl | | 0 | | |
| 07-Jun-00 | 14 | 19 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | shl | | 0 | | |
| 07-Jun-00 | 14 | 20 | 10:31 | 10:44 | 0:13 | RL | PD | 1 | | | 0 | | shl | | 0 | | |
| 07-Jun-00 | 15 | 1 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 1 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 2 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 1 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 3 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 4 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 5 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 5 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 1 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 6 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 7 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 8 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 9 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 10 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | 40 | 40 | 0 | | snd | | 0 | | |
| 07-Jun-00 | 15 | 11 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 15 | 12 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 15 | 13 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | 0 | | |
| 07-Jun-00 | 15 | 14 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | 0 | | |
| 07-Jun-00 | 15 | 15 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | 0 | | |
| 07-Jun-00 | 15 | 16 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | 0 | | |
| 07-Jun-00 | 15 | 17 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | 0 | | |
| 07-Jun-00 | 15 | 18 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | 0 | | |
| 07-Jun-00 | 15 | 19 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | 0 | | |
| 07-Jun-00 | 15 | 20 | 10:37 | 10:50 | 0:13 | MP | BL | 1 | | | 0 | | rck | | 0 | | |
| 07-Jun-00 | 16 | 1 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 1 | | snd | | 0 | | |
| 07-Jun-00 | 16 | 2 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 1 | | snd | | | | |
| 07-Jun-00 | 16 | 3 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 0 | | cbl | | | | |
| 07-Jun-00 | 16 | 4 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 0 | | cbl | | | | |

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Appendix H. (page 8 of 12)

| Date | Transect no | Transect Square (or "flip") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|----------|
| 07-Jun-00 | 16 | 5 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 1 | | cbl | | | | |
| 07-Jun-00 | 16 | 6 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 1 | | cbl | | | | |
| 07-Jun-00 | 16 | 7 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 0 | | cbl | | | | |
| 07-Jun-00 | 16 | 8 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 0 | | cbl | | | | |
| 07-Jun-00 | 16 | 9 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 2 | | cbl | | | | |
| 07-Jun-00 | 16 | 10 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 55 | 55 | 0 | | cbl | | | | |
| 07-Jun-00 | 16 | 11 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 56 | 56 | 1 | | cbl | | | | |
| 07-Jun-00 | 16 | 12 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | | | 0 | | cbl | | | | |
| 07-Jun-00 | 16 | 13 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | | | 1 | | cbl | | | | |
| 07-Jun-00 | 16 | 14 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | | | 0 | | cbl | | | | |
| 07-Jun-00 | 16 | 15 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | | | 1 | | gvl | | | | |
| 07-Jun-00 | 16 | 16 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | | | 1 | | gvl | | | | |
| 07-Jun-00 | 16 | 17 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | | | 0 | | gvl | | | | |
| 07-Jun-00 | 16 | 18 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | | | 1 | | gvl | | | | |
| 07-Jun-00 | 16 | 19 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | | | 0 | | gvl | | | | |
| 07-Jun-00 | 16 | 20 | 11:03 | 11:19 | 0:16 | PD | RL | 1 | 58 | 58 | 0 | | gvl | | | | |
| 07-Jun-00 | 17 | 1 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | 60 | 60 | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 2 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 3 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 4 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 5 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 6 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 7 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 8 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 9 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 10 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 11 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 12 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 13 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 14 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 15 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 16 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 17 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 18 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 19 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | | | 0 | | rck | | | | |
| 07-Jun-00 | 17 | 20 | 11:01 | 11:17 | 0:16 | MP | TT | 1 | 61 | 61 | 0 | | rck | | | | |
| 07-Jun-00 | 18 | 1 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | 60 | 60 | 1 | | snd | | | | |
| 07-Jun-00 | 18 | 2 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 3 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 4 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 5 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 2 | | snd | | | | |
| 07-Jun-00 | 18 | 6 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 2 | | snd | | | | |
| 07-Jun-00 | 18 | 7 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 8 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 4 | | snd | | | | |

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Appendix H. (page 9 of 12)

| Date | Transect no | Transect Square (or "flip") | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|-------------|-----------------------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|----------|
| 07-Jun-00 | 18 | 9 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 4 | | snd | | | | |
| 07-Jun-00 | 18 | 10 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 1 | | snd | | | | |
| 07-Jun-00 | 18 | 11 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 12 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 13 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 1 | | snd | | | | |
| 07-Jun-00 | 18 | 14 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 15 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 16 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 17 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 18 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 19 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | | | 0 | | snd | | | | |
| 07-Jun-00 | 18 | 20 | 11:41 | 11:55 | 0:14 | BL | TT | 1 | 63 | 63 | 1 | | snd | | | | |

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Appendix H. (page 10 of 12)

Ulitka Bay Transect Summary (20, 1 m² counts were made for each transect)

| Transect No. | Transect Total | Average per m ² | No. GD represented per each transect |
|--------------|----------------|----------------------------|--------------------------------------|
| 1 | 2 | 0.10 | 1,491 |
| 2 | 0 | 0.00 | 0 |
| 3 | 14 | 0.70 | 10,437 |
| 4 | 28 | 1.40 | 20,873 |
| 5 | 0 | 0.00 | 0 |
| 6 | 15 | 0.75 | 11,182 |
| 7 | 6 | 0.30 | 4,473 |
| 8 | 23 | 1.15 | 17,146 |
| 9 | 29 | 1.45 | 21,619 |
| 10 | 0 | 0.00 | 0 |
| 11 | 0 | 0.00 | 0 |
| 12 | 0 | 0.00 | 0 |
| 13 | 5 | 0.25 | 3,727 |
| 14 | 8 | 0.40 | 5,964 |
| 15 | 8 | 0.40 | 5,964 |
| 16 | 11 | 0.55 | 8,200 |
| 17 | 0 | 0.00 | 0 |
| 18 | 16 | 0.80 | 11,928 |

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Appendix H. (page 11 of 12)

Ulitka Bay geoduck survey biomass estimate and GHL.

| | |
|---|----------------|
| Number of Transects | 18 |
| Average per Square Meter | 0.46 |
| Variance of Counts | 0.240 |
| Std. Variance of Mean | 0.013 |
| Area (m ²) | 268,370 |
| | |
| Total Number of Geoducks | 123,003 |
| Variance of Total Number | 960,593,635 |
| Precision of Estimate | 66.4% |
| | |
| 90% Coefficient of Variation | 43.8% |
| 90% two-tail Precision | 56.2% |
| | |
| Average Weight (lb) | 2.55 |
| Variance of Average Weight | 0.33942537 |
| | |
| Biomass Estimate | 313,468 |
| Variance of Biomass Est. | 11,048,068,970 |
| Precision of Estimate | 55.2901% |
| | |
| 90% Coefficient of Variation | 58.3% |
| 90% two-tail Precision | 41.7% |
| Lower Bounds Biomass Est. | 130,618 |
| Upper Bounds Biomass Est. | 496,317 |
| | |
| 90% of being within 66.7% Adjustment | 82.9% |
| | |
| Show Factor Adjustment | 0.80 |
| Target Harvest Rate | 4% |
| | |
| Quota WITHOUT Precision Adjustment | 15,673 |
| | |
| Quota WITH Precision Adjustment | 12,992 |

-continued-

Appendix H. (page 12 of 12)

Ulitka Bay transect latitude and longitude.

| Transect No. | Latitude | Longitude |
|--------------|----------|------------|
| 1 | 55.55463 | -133.71765 |
| 2 | 55.55463 | -133.71961 |
| 3 | 55.55462 | -133.72155 |
| 4 | 55.55556 | -133.71871 |
| 5 | 55.55556 | -133.72064 |
| 6 | 55.55556 | -133.72248 |
| 7 | 55.55649 | -133.71768 |
| 8 | 55.55649 | -133.71961 |
| 9 | 55.55649 | -133.72155 |
| 10 | 55.55743 | -133.71099 |
| 11 | 55.55743 | -133.71290 |
| 12 | 55.55743 | -133.71484 |
| 13 | 55.55743 | -133.71866 |
| 14 | 55.55743 | -133.72057 |
| 15 | 55.55743 | -133.72253 |
| 16 | 55.55838 | -133.72157 |
| 17 | 55.55838 | -133.72343 |
| 18 | 55.55930 | -133.72250 |

Appendix I. Port Santa Cruz (in Subdistrict 104-30) 2000 geoduck clam assessment survey.

| Date | Transect No. | Transect side | Time in | Time out | Total time | Diver #1 | Diver #2 | Width | MLLW start | MLLW End | No. of Geoducks | No. of Horseclams | Bottom Type 1 | Bottom Type 2 | % Vegetation Cover | Predominant Vegetation Type | Comments |
|-----------|--------------|---------------|---------|----------|------------|----------|----------|-------|------------|----------|-----------------|-------------------|---------------|---------------|--------------------|-----------------------------|---|
| 14-Aug-00 | 1 | a | 10:33 | 11:04 | 0:31 | MP | TT | 2 | -4 | 55 | 55 | 11 | snd | gvl | 20 | lbk | snd/cbl @ 40 fsw, bed starts @ 60 fsw w/good [] in good snd, lots of horse clams shallow, many olive shells |
| 14-Aug-00 | 3 | a | 10:13 | 10:29 | 0:16 | RL | BL | 2 | -3 | 55 | 0 | 0 | rck | | 0 | | a few scattered geoduck @ 67 fsw |
| 14-Aug-00 | 5 | a | 10:07 | 10:19 | 0:12 | DB | TT | 2 | 26 | 55 | 1 | 0 | rck | snd | 0 | | snd @ 55 fsw |
| 14-Aug-00 | 7 | a | 9:36 | 9:58 | 0:22 | RL | BL | 2 | -2 | 55 | 0 | 0 | rck | bld | 0 | | |
| 14-Aug-00 | 9 | a | 9:27 | 9:49 | 0:22 | MP | DB | 2 | 16 | 55 | 147 | | snd | | | | bld/cbl to 42 fsw; 1st geoduck @ 42 fsw; 6-10/m^2 @ 60-64 fsw |
| 14-Aug-00 | 11 | a | 8:39 | 9:00 | 0:21 | MP | TT | 2 | 26 | 55 | 218 | | snd | sil | 35 | lbk | 1st geoduck @ 29 fsw; |
| 14-Aug-00 | 13 | a | 8:36 | 9:17 | 0:41 | RL | BL | 2 | 0 | 55 | 628 | 11 | sil | | 2 | agm | |
| 13-Aug-00 | 15 | a | 15:36 | 16:26 | 0:50 | MP | BL | 2 | -7 | 55 | 803 | 33 | sil | snd | 10 | lbk | rck to 29 fsw, 1st geoduck @ 30 fsw |
| 14-Aug-00 | 17 | a | 10:46 | 11:30 | 0:44 | RL | BL | 2 | -5 | 55 | 390 | 27 | snd | | 35 | red | |
| 14-Aug-00 | 19 | a | 15:00 | 15:29 | 0:29 | RL | BL | 2 | -8 | 55 | 182 | 36 | snd | sil | 25 | lbk | jack knife clams; 1 male Dungeness crab |
| 14-Aug-00 | 21 | a | 15:44 | 16:31 | 0:47 | RL | OS | 2 | -7 | 55 | 93 | | snd | | 40 | lbk | many horseclams present |
| 14-Aug-00 | 23 | a | 16:14 | 16:24 | 0:10 | BL | OS | 2 | -6 | 55 | 16 | | snd | sil | 0 | | rck/cbl to 35 fsw |
| 14-Aug-00 | 25 | a | 16:40 | 17:02 | 0:22 | RL | BL | 2 | -6 | 55 | 3 | 11 | shl | gvl | 40 | lbk | |
| 14-Aug-00 | 27 | a | 17:01 | 17:26 | 0:25 | MP | DB | 2 | -5 | 55 | 248 | | sil | snd | 25 | lbk | fewer clams deeper |
| 14-Aug-00 | 29 | a | 16:03 | 16:33 | 0:30 | MP | TT | 2 | -7 | 55 | 621 | 11 | snd | | 30 | red | rck to 39 fsw; 1st geoduck @ 40 fsw; geoducks continue deeper @ same [] |
| 14-Aug-00 | 31 | a | 15:01 | 15:38 | 0:37 | TT | DB | 2 | -8 | 55 | 29 | 0 | rck | snd | | | rck to 36 fsw; band of snd @ 56-57 fsw w/geoducks, fine gravel deeper; first geoduck @ 57 fsw |
| 14-Aug-00 | 33 | a | 11:30 | 11:53 | 0:23 | MP | DB | 2 | -6 | 55 | 0 | | rck | rck | 0 | | rck to 58 fsw than bld/cbl deeper |

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Appendix I. (page 2 of 4)

Port Santa Cruz transect summary.

| Transect No. | Transect Side | | Average per Meter | Est. Number per Transect's Shoreline |
|--------------|---------------|---|-------------------|--------------------------------------|
| | a | b | | |
| 1 | 55 | | 27.5 | 11,000 |
| 2 | | | | |
| 3 | 0 | | 0.0 | 0 |
| 4 | | | | |
| 5 | 1 | | 0.5 | 200 |
| 6 | | | | |
| 7 | 0 | | 0.0 | 0 |
| 8 | | | | |
| 9 | 147 | | 73.5 | 29,400 |
| 10 | | | | |
| 11 | 218 | | 109.0 | 43,600 |
| 12 | | | | |
| 13 | 628 | | 314.0 | 125,600 |
| 14 | | | | |
| 15 | 803 | | 401.5 | 160,600 |
| 16 | | | | |
| 17 | 398 | | 199.0 | 79,600 |
| 18 | | | | |
| 19 | 182 | | 91.0 | 36,400 |
| 20 | | | | |
| 21 | 93 | | 46.5 | 18,600 |
| 22 | | | | |
| 23 | 16 | | 8.0 | 3,200 |
| 24 | | | | |
| 25 | 3 | | 1.5 | 600 |
| 26 | | | | |
| 27 | 248 | | 124.0 | 49,600 |
| 28 | | | | |
| 29 | 621 | | 310.5 | 124,200 |
| 30 | | | | |
| 31 | 29 | | 14.5 | 5,800 |
| 32 | | | | |
| 33 | 0 | | 0.0 | 0 |
| 34 | | | | |

-continued-

Appendix I. (page 3 of 4)

Port Santa Cruz geoduck survey biomass estimate and GHL.

| | |
|---|-----------------|
| Number of Transects | 14 |
| Average per Linear Meter | 123 |
| Variance of Counts | 17,568.071 |
| Std. Variance of Mean | 1,254.862 |
| Shoreline (m) | 5,600 |
| | |
| Total Number of Geoducks | 688,400 |
| Variance of Total Number | 39,352,480,000 |
| Precision of Estimate | 61.1% |
| | |
| 90% Coefficient of Variation | 51.0% |
| 90% two-tail Precision | 49.0% |
| | |
| Average Weight (lb) | 2.39 |
| | |
| Variance of Average Weight | 0.48120961 |
| | |
| Biomass Estimate | 1,643,669 |
| Variance of Biomass Est. | 433,452,152,883 |
| Precision of Estimate | 45.9% |
| | |
| 90% Coefficient of Variation | 70.9% |
| 90% two-tail Precision | 29.1% |
| Lower Bounds Biomass Est. | 477,739 |
| Upper Bounds Biomass Est. | 2,809,599 |
| | |
| 90% of being within 66.7% Adjustment | 68.8% |
| | |
| Show Factor Adjustment | 0.80 |
| Target Harvest Rate | 4% |
| | |
| Quota WITHOUT Precision Adjustment | 82,183 |
| | |
| Quota WITH Precision Adjustment | 56,578 |

-continued-

Appendix I. (page 4 of 4)

Port Santa Cruz transect latitude and longitude.

| Transect no | Latitude | Longitude |
|-------------|----------|------------|
| 1 | 55.27344 | -133.46111 |
| 2 | 55.27565 | -133.45835 |
| 3 | 55.27480 | -133.45559 |
| 4 | 55.27384 | -133.45202 |
| 5 | 55.27535 | -133.44991 |
| 6 | 55.27480 | -133.44653 |
| 7 | 55.27662 | -133.44494 |
| 8 | 55.27515 | -133.44275 |
| 9 | 55.27370 | -133.44080 |
| 10 | 55.27222 | -133.43890 |
| 11 | 55.27113 | -133.43646 |
| 12 | 55.27062 | -133.43344 |
| 13 | 55.27056 | -133.43036 |
| 14 | 55.27186 | -133.42764 |
| 15 | 55.27217 | -133.42554 |
| 16 | 55.27276 | -133.42199 |
| 17 | 55.27433 | -133.42057 |
| 18 | 55.27602 | -133.41935 |
| 19 | 55.27775 | -133.41832 |
| 20 | 55.27939 | -133.41697 |
| 21 | 55.28075 | -133.41480 |
| 22 | 55.28166 | -133.41125 |
| 23 | 55.28292 | -133.40873 |
| 24 | 55.28592 | -133.41714 |
| 25 | 55.28505 | -133.41999 |
| 26 | 55.28434 | -133.42297 |
| 27 | 55.28372 | -133.42609 |
| 28 | 55.28275 | -133.42891 |
| 29 | 55.28271 | -133.43206 |
| 30 | 55.28425 | -133.43374 |
| 31 | 55.28584 | -133.43542 |
| 32 | 55.28580 | -133.43783 |
| 33 | 55.28615 | -133.44163 |
| 34 | 55.28638 | -133.44500 |

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