Bathymetric Relationships of Principal Groundfish Shelf Cohabitants off West Vancouver Island and in Queen Charlotte Sound, Based on Demersal-trawl Landing Records

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BATHYMETRIC RELATIONSHIPS OF PRINCIPAL GROUNDFISH SHELF COHABITANTS OFF WEST VANCOUVER ISLAND AND IN QUEEN CHARLOTTE SOUND, BASED ON DEMERSAL-TRAWL LANDING RECORDS

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The bathymetric relationships of lingcod (*Ophiodon elongatus*), Pacific cod (*Gadus macrocephalus*) and rock sole (*Lepidopsetta bilineata*) were investigated using data for 1960-95 from the B.C. groundfish trawl fishery in Queen Charlotte Sound (QCS) and the west coast of Vancouver Island (WCVI). Analysis was initially based on 5-fm depth intervals which were selected on the basis of the quantity and consistency of the landings of the principal species.

We found that mean-depth differences among principal species groups were significant for virtually all areas. However, when we used data for individual species within principal species groups, mean depths were generally not significantly different. Species combinations were predominant, and within the combinations, mean-depth differences among species were generally small, and usually not significant. The bathymetric ranking was generally Pacific cod > lingcod > rock sole.

The predominance of multiple-species combinations over single-species combinations in the catches, and the relatively small depth differences between species in general, and within multiple-species combinations, suggests that multiple-species stock assessments would be worth exploring.

RÉSUMÉ

Westrheim, S. J., and Fargo J. 2005. Bathymetric relationships of principal groundfish shelf cohabitants off West Vancouver Island and in Queen Charlotte Sound, based on demersal-trawl landing records. Can. Tech. Rep. Fish. Aquat. Sci. 2504: xiii + 139 p.

La répartition en fonction de la profondeur de la morue-lingue (*Ophiodon elongates*), de la morue du Pacifique (*Gadus macrocephalus*)et de la fausse limande (*Lepidopsetta bilineata*) a été déterminée à partir des données de pêches du poisson de fond au chalut effectuées dans le bassin de la Reine-Charlotte et au large de la côte ouest de l'île de Vancouver (en C.-B.) entre 1960 et 1995. L'analyse a d'abord été fondée sur des intervalles de profondeur de 5 brasses qui ont été choisis d'après la quantité et la régularité des débarquements des principales espèces.

Cependant, lorsque nous utilisons des données pour chaque espèce, les profondeurs moyennes ne sont généralement pas significativement différentes. Les combinaisons d'espèces sont prédominantes, et les différences de profondeur moyenne entre les espèces d'un même groupe sont généralement petites et non significatives. La répartition en fonction de la profondeur est généralement la suivante : morue du Pacifique > morue-lingue > fausse limande.

La prédominance des combinaisons d'espèces par rapport aux espèces individuelles dans les prises ainsi que les différences de profondeur relativement petites entre les espèces en général et à l'intérieur des combinaisons, suggèrent que les évaluations simultanées de stocks de plusieurs espèces méritent d'être étudiées

INTRODUCTION

Potential interactions of demersal groundfish species, on the continental shelf, off western Canada were first noted by Westrheim and Foucher (1985). They reported the phenomena of intermittent, reciprocal relationships between trawl landings of Pacific cod (*Gadus macrocephalus*) and some of its principal shelf co-habitants, on major trawling grounds off southwest Vancouver Island (Area 3Cn[1]), and in Queen Charlotte Sound (Areas 5A and 5B) and northern Hecate Strait (Area 5D) (Fig. 1). To date, Area 5D has not been investigated.

The initial study (unpublished[2]), completed in 1998, dealt with the 1969-72 demersal-trawl landings of individual vessels operating off the west coast of Vancouver Island (Areas 3Cn and 3D). Its purpose was to determine the spatial, temporal, and bathymetric distributions of Pacific cod and lingcod (*Ophiodon elongatus*). This yielded the surprising result that Pacific cod and lingcod were being caught by the same vessels, generally at the same time, depth, and ground. The report suggested further studies should be undertaken into the time, depth, and location of catches for these two species in Area 3Cn, and similar shelf, multiple-species groups elsewhere. It also noted that perhaps, the traditional independent, single-species stock assessments might not be appropriate where two or more species are caught in the same ground-time-depth cells. Subsequently, the effort to explain the reciprocal relationships of landings shifted to examining in more detail the phenomenon of multiple-species trawl catches.

In 1999, a second, more extensive, investigation (also unpublished) was completed which dealt with similar, principal shelf co-habitants, in Areas 3Cn, 3D, 5A, and 5B, for the years 1970, 1975, 1980, 1985, 1990, and 1995, and additionally, 1960 and 1965 for Area 3Cn. Areas 5A and 5B were treated separately, because Pacific cod in Area 5A differed from those in Area 5B, by delayed maturity, lower growth rate, and higher mortality rate. These differences were attributed to a substantially higher incidence of X-cell parabranchial lesions in Pacific cod from Area 5A (Westrheim 1987). Records identifiable to individual trawlers were not used, to ensure confidentiality.

The 1999 report noted that: (1) interviewed landings (providing detailed records of trawling activities) comprised a substantial proportion of the total landings; (2) April-September was the appropriate study period; (3) Area 3D lacked sufficient data for analysis; (4) principal species were lingcod and Pacific cod in Area 3Cn, and lingcod, Pacific cod, and rock sole (*Lepidopsetta bilineata*) in Areas 5A and 5B; (5) the principal grounds for all principal species, in each of the remaining major areas, were Big Bank (3Cn, Fig. 2); Cape Scott Spit (5A, Fig. 3); and Goose Island Bank (5B, Fig 3); (6) multiple-species combinations represented a substantial portion of the interviewed landings; (7) the general bathymetric array of species was the same on all banks. That is, lingcod depths were generally shallower than those of Pacific cod, and rock sole

[1] Approximately one third of Area 3C lies in U.S. waters, and is labeled 3Cs (see Fig 2).

[2] Results were not published because these catch records were volunteered by the trawl captains on the condition that they remain confidential.

depths (in Areas 5A and 5B) were shallower than those of lingcod; (8) mean depths of multiple-species combinations were affected by the species present; and (9) mean depths of individual species within multiple-species combinations were similar in most cases.

The purpose of the present study is to extend the investigation using the years 1960-95 for Area 3Cn, and 1966-95 for Areas 5A and 5B. For Areas 5A and 5B, few records of landings by locality (ground) were reported prior to 1966.

MATERIALS AND METHODS

MATERIALS

The basic data were extracted from the Groundfish Data Base at the Pacific Biological Station (PBS), for Major Areas 3Cn, 3D, 5A, and 5B. The extracted data consist of four, 14-column spreadsheets—one for each major area. In each spreadsheet, column headings are year, month, depth (fms; midpoint of range reported), major area, minor area, locality (ground), all-species landings (lbs; containing at least one of the principal species), lingcod landings (lbs), Pacific cod landings (lbs), rock sole landings (lbs; Areas 5A and 5B only), proportion of lingcod in all-species landings, proportion of Pacific cod in all-species landings, proportion of rock sole in all-species landings, and nominal trawling effort (min). Each row (hereafter referred to as a record) represents, with some exceptions, the activities of one or more vessels (unidentified in this array) at the same depth. Records for 1991-95 represent individual trawl hauls in Areas 5A and 5B, based on the mean hours per record (Fig. 4).

These analyses were conducted prior to metrification of echo sounders, fishing charts, and landing records, and involved fathoms and pounds. Equivalent values in meters and tonnes have been included where feasible.

Groundfish catch statistics are of two types—total and interviewed. Total catch (actually, landing) records are collected from fish processors who purchase the fish from the fishing vessels. These are referred to as sales-slip records. They contain only general information, such as date landed, vessel name, and weight landed of each species.

Interviewed catch statistics supplement sales-slip data, and provide detailed records of each trawling trip. They are provided, on a volunteer basis, by the trawler captain, at the time of landing, to a DFO[3] Port Liaison Officer. The PLO forwards the interviewed records to PBS for storage, and integration with sales-slip records, in the Station's mainline computer. Information collected during the interview includes vessel name, date landed, and for each ground fished, number of sets, time trawled, depth range, and estimated weight of the marketable catch by species.

[3] Fisheries and Oceans Canada.

For groundfish catch statistics, the British Columbia coast is divided into major areas, minor areas (MSAs), and localities (grounds). The boundaries of most localities are neither well defined, nor constant.

METHODS

The analysis, for each major area, has six steps: (1) determine the proportions of interviewed landings in total landings, for each principal species, (2) select the appropriate time period(s); (3) select the appropriate grounds; (4) for appropriate grounds, tabulate all-species effort and total interviewed landings of each species, by 5-fathom depth interval; (5) select "principal" 5-fm depth intervals for each species; and (6) compare mean depths among species, and combinations thereof.

Compilation of data has three stages, for each of the abovementioned steps: (1) work tables were assembled for each year; (2) work table data were then combined, for the years involved, into appendix tables; (3) figures and tables were based on data from appendix tables. Work tables were not included in this report, but are filed with the Groundfish Investigation at the Pacific Biological Station.

Proportions of Interviewed Landings

This step provides a measure of the representativeness of the data analyzed.

Principal Time Period

Basis for selection is the presence of all principal species in the time period, and the proportions they represented of the total landings from the major area. April-September was selected, based on the results of the 1999 study (Fig. 5).

Principal Ground(s)

Selection was based on the contribution each ground made to the total interviewed landings from that major area (Fig 6). The principal grounds were Big Bank (Area 3Cn), Cape Scott Spit (Area 5A), and Goose Island Bank (Area 5B), based on the 1999 study (Figs 2 and 3). No grounds in Area 3D warranted analysis.

Principal 5-fm Depth Intervals

Principal depth intervals were selected based on their contribution to the total interviewed landings from each principal ground.

Species-depth Relationships

Annual mean depths of species, or species combinations, were calculated by weighting with the appropriate landings (lbs) in each record. Summary mean depths were not based on weighting. Significant temporal trends in mean depth were

investigated with regression analysis. Significance of differences in mean depths between species, and combinations thereof, were investigated with the conventional "t" or ANOVA tests. The software for these statistical analyses was included in the authors' PCs. A second type of "t" test was found in Dixon and Massey (1969, p. 116) as follows:

$$t = (X_1 - X_2)/Sp\sqrt{((1/N_1)+(1/N_2))},$$
$$Df = 2$$

where, X_1 = mean depth of the first species,
X_2 = mean depth of the second species,
N_1 = landings (000s lbs) of the first species,
N_2 = landings (000s lbs) of the second species,
$Sp^2 = ((N_1 -1)(s_1^2)+ (N_2 -1)(s_2^2))/(N_1+ N_2 -2)$,
s_1^2 = variance of the mean depth of the first species,
s_2^2 = variance of the mean depth of the second species,
$N > 1$,
and $s > 0$.

Four types of comparisons of mean depths were undertaken:: (1) among species, disregarding combinations; (2) among combinations (single-species and multiple-species); (3) among species within multiple-species combinations; and (4) individual species among combinations. Item (4) required a complete "set" of each species.

RESULTS

AREA 3Cn

General

Interviewed landings. There are three MSAs in Area 3Cn--21, 23, and 24. Mean proportions of interviewed landings from MSA 23, which contains Big Bank, were 72% for lingcod and 67% for Pacific cod (Fig. 3Cn-1). However, values were less than 65% in 12 years, of the 36-yr period, for lingcod (32-62%) and 13 years for Pacific cod (29-61%) (Appendix table 3Cn-2). Ten of the low lingcod values occurred after 1979, while eleven of the low Pacific cod values occurred after 1980.

Big Bank

Combinations. For the two principal species, three combinations were possible—LC, PC, and LC/PC. During April-September 1960-95, landings of the two species totaled 17,484 t, which consisted of 8% LC, 3% PC, and 89% LC/PC (Fig. 3Cn-2; Appendix table 3Cn-3). Within LC/PC, proportions were 57% LC, and 32% PC.

Depth distribution. Seventeen 5-fm depth intervals contained lingcod or Pacific cod whose midpoints were 32-92, 112, 132, 157, and 197 (59-168, 205, 242, 287, and 361 m) (Table 3Cn-1). Principal depth intervals were 37 fm (68 m), 42fms (77 m), and 47 fms (86m), which together accounted for 84% of the all-species effort, 87% of lingcod landings, and 84% of Pacific cod landings. Modal depth interval was 42 fms (77 m) for all-species effort, and landings of lingcod and Pacific cod (Fig. 3Cn-3). The secondary interval was 37 fms (68 m) for all-species effort and lingcod, and 47 fms (86 m) for Pacific cod.

In 17 of the 36 years, depths >64 fms (>117 m) were reported, but were deemed to be inaccurate with respect to fishing ground (Appendix tables 3Cn-4,5,6). The first such inaccuracy occurred in 1963, and then intermittently through 1994 (Table 3Cn-2). First "new" deepwater ground reported was Deep Big Bank/Barkley Canyon (MSA 23-10), in 1970. Subsequently, seven additional grounds, other than Big Bank, were reported to yield landings of lingcod or Pacific cod from depths >64 fms.

Subsequent analyses will be limited to the principal 5-fm depth intervals (37-47 fms; 68-86 m) as a group, and individually.

Mean depths and landings among species. Disregarding combinations, the 36-yr, mean depth for lingcod was 41.0 fms (75 m) (S.D. = 1.5), and for Pacific cod, 42.3 fms (78 m) (1.5) (Fig. 3Cn-4). Corresponding total landings were 9,814 and 5,194 t (Appendix table 3Cn-7). Mean depths of the two species were significantly different ($P < 0.01$), based on a "t" test (Table 3Cn-3). Among years, mean depths fluctuated moderately, without significant temporal trend. Regression analysis yielded small, negative slopes of -0.013 and –0.002, respectively for lingcod and Pacific cod. Neither differed significantly from zero ($P = 0.60$ and 0.92). Estimated mean depths in 1995 differed from those in 1960 by -0.4 and -0.1 fms, respectively for lingcod and Pacific cod.

Tests of mean depths among individual 5-fm depth intervals, involved the four years (1992, 1964, 1960, and 1990) which yielded the largest absolute differences in mean depths between species-- 4.6, 4.2, 3.6, and 3.2 fms, respectively (Appendix table 3Cn-8). Mean depths among species were not significantly different ($P > 0.05$ to > 0.50), except at 47 fms in 1960 and 1990 ($P < 0.01$) (Table 3Cn-4). However, these results were deemed anomalous since mean-depth differences were 0.6 and -0.3 fms, respectively . Presumably the test was hypersensitive to small standard deviations--0.1/0.2 and 0.3/0.5. Mean difference among the 12 tests was -0.2 fm (S.D. = 0.6), and the range, -1.3 to +0.6 fms. No explanation was found for the non-significance of the only difference greater than ± 1.0.

Mean depths and landings among combinations. The 36-yr mean depths were 41.0 fms (75 m) (S.D. = 2.6) for lingcod, 43.5 fms (80) (2.1) for Pacific cod, and 41.6 fms (76 m) (1.5) for LC/PC (Fig. 3Cn-5). Corresponding total landings were 1,174, 404, and 13,481 t (Appendix table 3Cn-9). An ANOVA test indicated significant differences among the three combinations ($P < 0.01$), for the 23 years of comparable data (Tables

3Cn-3,6). Single-species' mean depths were significantly different (P <0.01) for both unpaired and paired values, based on a "t" test. Mean depth of LC/PC was significantly different from that of PC (P <0.01), but not from LC (P = 0.25). For all combinations, among-year mean depths fluctuated moderately, despite the substantial fluctuations in landings (Fig. 3Cn-5). Regression analysis yielded small, slopes of -0.075, +0.025, and -0.030, respectively, for LC, PC, and LC/PC. None differed significantly from zero (P = 0.08, 0.62, and 0.27). Estimated mean depths in 1995 differed from those in 1960 by -2.6, +0.9, and -1.1 fms, respectively, for LC, PC, and LC/PC.

Mean depths and landings within the LC/PC combination. The 36-yr mean depths were 41.1 fms (75 m) (S.D. = 1.7) for lingcod and 42.4 fms (78) (1.6) for Pacific cod (Fig. 3Cn-6). Corresponding total landings were 8,681 and 4,800 t (Appendix table 3Cn-9). Mean depths were significantly different (P <0.01), based on a "t" test (Table 3Cn-3). Among-year mean depths fluctuated moderately, despite the substantial fluctuations in landings. Regression slopes were small, negative, and not significantly different from zero –0.024 (P = 0.42) for lingcod, and –0.004 (P = 0.89) for Pacific cod.. Estimated depths in 1995 differed from those in 1960 by -0.8 and -0.1 fms, respectively, for LC and PC.

The "significant" difference between depths seemed anomalous, since both species were included in each "catch". Further analysis, by 5-fm depth interval, within the 37-47 depth interval, was undertaken which involved: (a) the 13 years in which landings for each species exceeded 100 t (Table 3Cn-7); and (b) the four years with the largest absolute difference between mean depths. In the former case, mean depths were 37.8/37.7, 41.7/41.7, and 46..8/47.1, respectively for the 37, 42, and 47 fm depth intervals. All comparisons yielded non-significant results (P = 0.44, 0.46, and 0.17), based on the "t" test (Table 3Cn-4). In the latter case, two of the 12 "t" tests produced significant results, both at 47 fms—47.4/47.1 in 1960 (P <0.01), and 45.1/45.4 in 1990 (P < 0.01) (Table 3Cn-5).

Mean depths of individual species among combinations. Twenty-three complete sets were available—1961-62, 1964-67, 1970-82, and 1986-90 (Table 3Cn-6). Statistical analyis yielded mixed results. Based on ANOVA, mean depths were significantly different between PC and PC in LC/PC (43.5 *vs* 42.4 fms; P = 0.04), but not so between LC and LC in LC/.PC (41.1 *vs* 41.0) (Table 3Cn-3). However, the mean depths were not significantly different (P >0.04 and >0.10), based on the Dixon-Massey "t" test.

Summary

During April-September 1960-95, principal shelf species in Area 3Cn were lingcod and Pacific cod. Principal MSA was 23 (which contains Big Bank), and in it, mean proportions of interviewed landings were 72% for lingcod and 68% for Pacific cod, but values were less than 65% in 12 years, for lingcod (32-62%) and Pacific cod (29-61%), primarily after 1978. Subsequent analyses dealt with Big Bank (MSA 23-3,4,5,7), the major, and most consistent, source of lingcod and Pacific cod.

Three combinations of the two species were possible—LC, PC, and LC/PC.

During 1960-95, landings of the two species totaled 17,484 t. Landings of multiple-species combinations predominated over those of single-species combinations (89% *vs* 11%).

Seventeen 5-fm depth intervals (32-197; 59-361 m) contained lingcod or Pacific cod.

Principal 5-fm depth intervals selected for analysis were 37, 42, and 47 fms (68, 77, and 86 m), which included 84% of all- species effort, 87% of the lingcod landings, and 83% of the Pacific cod landings.

Disregarding combinations, among-year mean depths of lingcod and Pacific cod exhibited no significant temporal trend, despite substantial fluctuations of landings. Among species, mean depth of lingcod was significantly shallower than that of Pacific cod within the 37-47 group. Further analyses involved comparisons, within individual 5-fm depth intervals, of: (a) the four years with maximum differences in mean depth; and (b) the 13 years with "large" landings. In both cases results indicated few significant differences in mean depths between species.

Among combinations, mean depths exhibited no significant temporal trend for any combination, despite substantial fluctuations in landings. Combination mean depths were significantly different in all comparisons, except LC vs LC/PC. Mean depth rankings were PC > LC/PC > LC.

Within LC/PC, no significant temporal trend in mean depth was evident for either species. Lingcod mean depth was significantly shallower than that of Pacific cod, within the 37-47 depth interval. Further analyses involved comparisons, among individual 5-fm depth intervals, of: (a) the four years with maximum differences in mean depth and (b) the 13 years with "large" landings;. In both cases results indicated no significant difference in mean depths between species

Mean depths of individual species among combinations were significantly different between PC and PC in LC/PC (in one of two tests), but not so between LC and LC in LC/PC (in both tests). Mean depths of single-species combinations were greater than those in LC/PC, although only marginally so for LC.

AREA 5A

General

Interviewed landings. Area 5A contains two MSAs-9 and 11. MSA 9 is geographically small, and not productive. Total landings during 1966-95 were 6 t of lingcod, 4 t of Pacific cod, and 14 t of rock sole (Appendix table 5A-2). Comparable landings from MSA 11 were in the thousands of tonnes, 9.5, 12.4, and 4.5. Mean

proportions of interviewed landings from MSA 11, which contains Cape Scott Spit, were 93, 92, and 91%, respectively, for lingcod, Pacific cod, and rock sole. However, proportions fell below 65% during 1990-92 for lingcod (59-64%), Pacific cod (52-61%), and rock sole (46-55%) (Fig. 5A-1).

For the three principal species, seven combinations were possible—LC, PC, RS, LC/PC, LC/RS, PC/RS, and LC/PC/RS.

Cape Scott Spit

Combinations. During 1966-95, combined interviewed landings of the three species totaled 16,917 t (Table 5A-1). Multiple-species landings comprised 86% (14,578 t), and single-species, 14 % (2,340 t) (Fig. 5A-2). Individual proportions of the seven combinations were 5, 7, 3, 20, 12, 5, and 50 %, respectively, for LC, PC, RS, LC/PC, LC/RS, PC/RS, and LC/PC/RS (Appendix table 5A-3). However, the multiple-species proportions were not uniform throughout the time series. Following 1990, values decreased substantially, from an average of 90% during 1966-90 to 70% during 1991-95. This change coincides with the decrease in records per hour of effort (Appendix table 5A-1). The latter phenomenon suggests that the 1991-95 data originated from logbooks, which provided results of individual hauls. If so, then the 1966-90 data overestimated the relative importance of multiple-species combinations.

Depth distributions. Twenty-one 5-fm depth intervals (22-122; 40-223 m) contained lingcod, Pacific cod, or rock sole (Table 5A-2). Distributions were bi-modal for all-species effort, lingcod, and Pacific cod, but uni-modal for rock sole. Principal modes were at 104 m (57 fms) for effort (13.5%) and lingcod (19.3%), 113 m (62 fms) for Pacific cod (17.3%), and 68 m (37 fms) for rock sole (36.7%) (Figure 5A-3). Secondary modes were at 68 m (37 fms) for effort (12.0%), lingcod (11.3%), and Pacific cod (7.3%), and 95 m (52 fms) (11.1%) for rock sole.

Principal 5-fm depth intervals selected for analysis were 37 (68 m) and 42 (77 m) for all three species, and 52-72 (95-132 m), primarily for lingcod and Pacific cod. Together, the seven depth intervals accounted for 77% of the effort, 86% of the lingcod landings, 80% of the Pacific cod landings, and 84% of the rock sole landings (Table 5A-2).

Mean depths and landings among species (37-42 fms; 68-77 m). Disregarding combinations, the 30-yr mean depths were 39.4 fms (72 m) (S.D. = 1.6), 39.8 fms (73 m) (2.3), and 39.1 fms (72 m) (1.2), respectively, for lingcod, Pacific cod, and rock sole (Fig. 5A-4) Corresponding total interviewed landings were 1,095, 1,017, and 1,805 t (Appendix table 5A-8). No significant temporal trend in mean depths was evident for any of the species, despite the substantial variations in the corresponding annual landings. Regression slopes were small for each species (–0.092 to 0.033), and none differed significantly from zero (P >0.10 to >0.40) (Table 5A-3). Over the data range (1966-95), estimated mean depths rose 1.0 fm for lingcod, and declined 2.7 fms for

Pacific cod and 0.9 fms for rock sole. ANOVA tests indicated no significant differences in mean depths between species (P = 0.25-0.65) (Table 5A-4).

Mean depths and landings among species (52-72 fms; 95-132 m). Disregarding combinations, the 30-yr mean depths were 59.8 fms (110 m) (S.D. = 2.9) for lingcod, 61.3 fms (112 m) (3.4) for Pacific cod, and 57.6 fms (105 m) (2.5) for rock sole (Fig. 5A-5). Corresponding total interviewed landings were 4,337, 5,421, and 784 t (Appendix table 5A-8).. No significant temporal trend in mean depths was evident in any of the three species, despite the substantial variations in their annual landings. Regression slopes were all positive (0.058-0.251), but only the slope for Pacific cod (0.251) was significantly different from zero (P <0.05) (Table 5A-3). Over the data range, estimated mean depths increased 2.9, 7.2, and 1.7 fms, respectively, for lingcod, Pacific cod, and rock sole. ANOVA tests indicated mean depths were significantly different (P <0.01) in all comparisons, except LC *vs* PC (P = 0.08) (Table 5A-4).

The heterogeneity within the 52-72 depth interval led to re-arranging the data into 5-fm depth intervals for selected years, which were chosen based on the absolute differences in mean weights of species among years. These differences ranged from 1.0 to 11.9 fms (Appendix table 5A-9). The top four years were selected for analysis of differences in mean depth within 5-fm depth intervals, *viz.*, 1978 (11.9 fms), 1993 (9.1 fms), 1994 (8.5 fms), and 1990 (8.4 fms). Only three of the 56 tests yielded significant differences, all in 1993—at 67 fms for LC *vs* RS, and at 72 fms for LC *vs* RS and PC *vs* RS (Table 5A-5). Mean absolute difference among species was 1.0 fm (S.D. = 0.5), with a range of 0.3 to 1.8 fms, a substantial reduction from 8.5-11.9 fms for the 52-72 group (Table 5A-6) Among species, in the 5-fm groups, mean differences (and standard deviations) were -0.2 (0.7), -0.1 (0.8), and +0.1 (0.9) fms, respectively, for LC-PC, LC-RS, and PC-RS. Range of differences was -1.7 to +1.8 fms. Ten differences exceeded $\pm$1.0 fm, but only three were significant. No explanation was found for the non-significance of the seven tests—two each at LC-PC and LC-RS, and three at PC-RS. Reducing depth-interval size to 5-fm substantially reduced the mean-depth differences among species. Presumably, mean-depth differences would be further reduced in the remaining years of the series, where the absolute differences, at 52-72 fms, were smaller.

Mean depths and landings among combinations (37-42 fms; 68-77 m). Single-species mean depths were 40.0 fms (73 m) (S.D. = 2.3), 39.9 fms (73 m) (2.8); and 39.3 fms (72 m) (1.7), respectively, for lingcod, Pacific cod, and rock sole (Figure 5A-6). Corresponding total interviewed landings were 18, 19, and 105 t (Appendix table 5A-10). Mean depths exhibited no evident temporal trend. Regression slopes were all negative (-0.011 to –0.173), but not significantly different from zero (P >0.50) (Table 5A-3). Over the data range, estimated mean depths decreased 0.3, 5.0, and 0.5 fms, respectively, for lingcod, Pacific cod, and rock sole. Among-year mean depths were not significantly different, based on an ANOVA test, for either all data (P = 0.46), or for the three years in which all species were represented (P = 0.38) (Table 5A-4). Intermittent, and generally small, landings precluded other comparisons.

Multiple-species mean depths were 40.5 fms (74 m) (S.D. = 2.9), 39.5 fms (72 m) (1.9), 39.6 fms (72 m) (2.6), and 39.2 fms (72 m) (1.6), respectively, for LC/PC, LC/RS, PC/RS, and LC/PC/RS (Figure 5A-7). Corresponding total interviewed landings were 60, 930, 298, and 2,138 t (Appendix table 5A-10). Among-year records for LC/PC were limited, but for the other three combinations, mean depths exhibited no evident temporal trend, despite the substantial fluctuations in landings. Regression slopes were all negative (-0.014 to –0.047), but not significantly different from zero (P >0.50) (Table 5A-3). Over the data range, mean depths declined 3.2, 0.4, 1.4, and 1.0 fms, respectively, for LC/PC, LC/RS, PC/RS, and LC/PC/RS. ANOVA tests indicated no significant differences between combinations for all years (P = 0.45), or for the eight years when all combinations were present (P = 0.72) (Table 5A-4).

Ranking for mean depths of combinations, at 37-42 fms, was LC/PC > LC > PC >LC/RS > PC/RS > LC/PC/RS > RS.

Mean depths, and landings, among combinations (52-72 fms; 95-132 m). Single-species mean depths were 59.5 fms (109 m) (S.D. = 3.9), 62.3 fms (115 m) (5.9), and 56.4 fms (103 m) (5.2), respectively, for lingcod, Pacific cod, and rock sole (Fig. 5A-8). Corresponding total interviewed landings were 533, 694, and 37 t (Appendix table 5A-11). Among-year mean depths of lingcod and rock sole, but not Pacific cod, exhibited no evident significant temporal trend, despite substantial fluctuations in landings. Regression slopes were variable—0.158 for lingcod, 0.545 for Pacific cod, and –0.079 for rock sole (Table 5A-3). Only the slope for Pacific cod was significantly different from zero (P <0.05). Over the data range, estimated mean depths increased for lingcod (4.6 fms) and Pacific cod (15.8 fms), and decreased for rock sole (2.3 fms). All mean-depth comparisons among species were significantly different (P <0.04), except for LC vs RS (P = 0.12), based on ANOVA tests (Table 5A-4). For the 15 years during which all three species were represented, ANOVA tests indicated significant differences in mean depths for all combinations (P < 0.01), except for LC vs PC (P = 0.12).

Multiple-species mean depths were more variable--62.3 fms (114 m) (S.D.= 4.2), 56.6 fms (103 m) (4.0), 58.9 fms (109 m) (6.1), and 59.5 fms (109 m) (3.1), respectively, for LC/PC, LC/RS, PC/RS, and LC/PC/RS (Fig. 5A-9). Corresponding total interviewed landings were 2,509, 617, 412, and 5,034 t (Appendix table 5A-11) Among years, mean depths exhibited no temporal trend for any of the combinations. Regression slopes were positive for LC/PC (0.221), LC/RS (0.035), and LC/PC/RS (0.145), but negative for PC/RS (-0.094) (Table 5A-3). None differed significantly from zero (P >0.30 and 0.50). Over the data range, increases in estimated mean depths were 6.4 (LC/PC), 1.0 (LC/RS), and 4.2 (LC/PC/RS) fms, and the decrease for PC/RS was 2.7 fms. ANOVA tests indicated that all comparisons yielded significant differences in mean depths (P <0.01), except LC/RS vs PC/RS (P = 0.05) (Table 5A-4). For the 21 years during which all four combinations were represented, ANOVA tests indicated mean depths, were significantly different (P <0.05) for all comparisons, except LC/PC vs PC/RS (P = 0.06).

Ranking for mean depths of combinations, at 52-72 fms, was PC > LC/> LC > PC/RS and LC/PC/RS > LC/RS > RS.

Mean depths and landings among species within combinations (37-42 fms; 68-77 m). Mean depths were similar within each combination--40.4/40.5 fms (74/74 m) (S.D. = 2.8/2.8); 39.5/39.6 (72/73) (2.1/1.9); 39.9/39.6 (73/72) (2.5/2.76); and 39.4/39.5/39.2 (72/72/72) (1.8/1.8/1.7), respectively, for LC/PC, LC/RS, PC/RS, and LC/PC/RS (Figs. 5A-10 and11). Corresponding total interviewed landings were: 16/44, 405/595, 182/118, and 586/772/782 t (Appendix table 5A-12). Regression slopes were variable, but small, within combinations (-0.123 to 0.079), and none differed significantly from zero (P >0.50) (Table 5A-3). ANOVA tests indicated mean depths were not significantly different in any comparison (P >0.72) (Table 5A-4).

Mean depths and landings among species within combinations (52-72 fms; 95-132 m). Mean depths were similar within each combination--61.7/62.8 fms. (113/115 m) (S.D.= 4.9/4.1), 56.7/56.3 (103/103) (4.1/4.1), 59.2/58.3 (109/108) (5.8/7.0), and 59.6/60.0/57.3 (109/110/105) (3.2/3.6/2.8), respectively, in LC/PC, LC/RS, PC/RS, and LC/PC/RS (Figs. 5A-12 and13). Corresponding total interviewed landings were: 915/1,592, 481/134, 342/70, and 1,896/2,624/1,182 t (Appendix table 5A-13). Regression slopes ranged from –0.116 to +0.235, and none differed significantly from zero (P >0.10 to >0.50) (Table 5A-3). Over the data range, estimated mean depths increased by 0.5 to 6.8 fms for LC/PC, LC/RS, and LC/PC/RS, and decreased for PC/RS by 0.5 and 3.3 fms. ANOVA tests indicated no significant differences between mean depths within any combination (P >0.41), except for LC/PC/RS (P <0.01) (Table 5A-4).

Mean depths of individual species among combinations (37-42 fms; 68-77 m). Among single-species combinations, lingcod had the deepest mean depth (40.0 fms; 73 m), and rock sole had the shallowest (39.3 fms; 72 m) (Table 5A-7). Among combinations, lingcod had a positive effect on mean depths, and rock sole had a negative effect. Lingcod was involved in all three depth maxima, and rock sole was involved in all three depth minima. Maximum depths occurred in LC/PC for lingcod (40.4 fms; 74 m) and Pacific cod (40.5 fms; 74 m), and in LC/RS and PC/RS for rock sole (39.6 fms; 73 m). Minimum depths occurred in LC/PC/RS for lingcod (39.3 fms; 72 m), Pacific cod (39.5 fms; 72 m), and rock sole (39.2 fms; 72 m). There was no significant difference between mean depths, because the range of standard deviations (1.7-2.8) exceeded greatest differences between the mean depths (0.4-1.0) compared.

Mean depths of individual species among combinations (52-72 fms; 95-132 m). Among single species, Pacific cod had the deepest mean depth (62.5 fms; 115 m), and rock sole had the shallowest (56.4 fms; 103 m) (Table 5A-7). Among multiple-species combinations, Pacific cod had a positive effect on mean depth, and rock sole had a negative effect. Pacific cod was involved in all three maxima, and rock sole was involved in three of the four minima. Maximum depth occurred in LC/PC for lingcod (61.7 fms; 113 m) and Pacific cod (62.8 fms; 115 m), and in PC/RS for rock sole (58.3 fms; 108 m). Minimum depths occurred in LC and LC/PC/RS for lingcod (59.5 fms; 109 m), in PC/RS for Pacific cod (59.2 fms; 105 m), and in LC/RS for rock sole (56.3 fms; 103 m). There was no significant difference between mean depths, because the range of standard deviations (2.7-7.4) exceeded the greatest differences between the mean depths (2.6-5.4) compared..

Summary

During 1966-95, principal shelf species, in Area 5A, were lingcod, Pacific cod, and rock sole. Principal MSA was 11, and there, mean proportions of interviewed landings were 93, 92, and 91%, respectively, for lingcod, Pacific cod, and rock sole. Annual proportions fell below 65% during 1990-92 for lingcod (59-64%), Pacific cod (52-61%), and rock sole (46-55%). Subsequent analyses dealt with Cape Scott Spit (MSA 11-2), the major, and most consistent, source of lingcod, Pacific cod, and rock sole, based on the 1999 report.

Seven combinations of the three species were possible LC, PC, RS, LC/PC, LC/RS, PC/RS, and LC/PC/RS.

Landings of multiple-species combinations predominated over landings of single-species combinations 86% vs 14% overall, but 70% vs 30% for 1991-95, when data were apparently reported by individual trawl hauls.

Twenty-one 5-fm depth intervals (22-122; 40-223 m) contained landings of lingcod, Pacific cod or rock sole. Depth-frequency distributions were bi-modal for all-species effort, lingcod landings, and Pacific cod landings, and uni-modal for rock sole Landings. Principal 5-fm depth intervals selected for analysis, as a group, were 37-42 (68-86 m) (all three species) and 52-72 (95-132 m) (primarily lingcod and Pacific cod). Together, they accounted for 77% of the all-species effort, 86% of the lingcod landings, 80% of the Pacific cod landings, and 84% of the rock sole landings.

Disregarding combinations, mean depths at both 37-42 fms (68-86 m) and 52-72 fms (95-132 m) exhibited no significant temporal trend, despite substantial fluctuations in landings. At 37-42 fms, mean depths of the three species were not significantly different, while at 52-72 fms, mean depths of the three species were significantly different in all comparisons, except LC vs PC. Ranking of mean depths, for both depth intervals, was PC > LC > RS. A second analysis, based on 5-fm depth intervals, within the 52-72 depth interval, involved the four years with the largest absolute differences in mean depth between species. Only three of the 56 tests yielded significant differences. Since significant differences in mean depth occurred so infrequently in the selected years, it seems likely that the situation is similar in the remaining years in the series, where absolute differences were smaller.

Among combinations at 37-42 fms (68-86 m), single- and multiple-species mean depths exhibited no significant temporal trends, despite substantial fluctuations in landings. Mean depths were not significantly difference among combinations. Overall ranking was LC/PC > LC > PC > LC/RS > PC/RS > LC/PC/RS > RS.

Among combinations at 52-72 fms (95-132 m), single- and multiple-species mean depths exhibited no significant temporal trends, except for a significant, positive trend for Pacific cod. Mean depths were significantly different for all comparisons, except LC vs

RS, LC/RS vs PC/RS (all years), and LC/PC vs PC/RS (paired years). Overall ranking of mean depths was PC > LC/PC > LC > PC/RS and LC/PC/RS > LC/RS > RS.

Within single- and multiple-species combinations, at both 37-42 and 52-72 fms, species' mean depths exhibited no significant temporal trends. Mean depths did not differ significantly in any comparison, except in LC/PC/RS.

For individual species among combinations at 37-42 fms, lingcod had a positive effect on mean depths, and rock sole had a negative effect. Lingcod was involved in three depth maxima, and rock sole was involved in three depth minima. At 52-72 fms, Pacific cod had a positive effect on mean depth, and rock sole had a negative effect. Pacific cod was involved in all three maxima, and rock sole was involved in three of the four minima. There was no significant difference between mean depths, at 37-42 or 52-72 fms. The standard deviations exceeded the differences between mean depths.

AREA 5B

General

Interviewed landings. Area 5B contains only one MSA--8 (Fig. 1). Mean annual proportions of interviewed records for MSA 8 were 94, 93, and 92%, respectively, for landings of lingcod, Pacific cod, and rock sole (Appendix table 5B-2). Annual values were greater than 80%, except during 1988-91 for lingcod (58-64%) and rock sole (41-54%), and during 1988-92 for Pacific cod (48-74%) (Fig. 5B-1).

As with Area 5A, there are seven combinations of the three principal species—LC, PC, RS, LC/PC, LC/RS, PC/RS, and LC/PC/RS.

Goose Island Bank

Combinations. During 1966-95, landings of the three species totaled 25,308 t, of which 81% (20,543 t) consisted of multiple-species combinations (Fig. 5B-2; Table 5B-1). Individual proportions of the seven combinations were 7, 8, 3, 16, 12, 5, and 48%. However, the multiple-species proportions were not uniform throughout the time series. Following 1990, values decreased substantially, from an average of 86% during 1966-90 to 63% during 1991-95. This change coincided with the decrease in records per hour of effort (Appendix 5B-1). The latter phenomenon suggests that the 1991-95 data originated from logbooks, containing results of individual hauls. If so, then the 1966-90 data overestimated the relative importance of multiple-species combinations.

Depth Distribution. Twenty-nine 5-fm depth intervals (22-162; 40-296 m) contained at least one of the three principal species. (Fig. 5B-3; Table 5B-2). All distributions were uni-modal—113 m (62 fms) for all-species effort and lingcod;123 m (67 fms) for Pacific cod; and 104 m (57 fms) for rock sole. Principal depth intervals were 52-67 fms (95-123 m) (75%) for lingcod, 52-72 fms (95-132 m) (69%) for Pacific cod, and 47-62 fms (86-113 m) (75%) for rock sole. The common range selected for

analysis was 47-72 fms , which included 77% of the all-species effort, 90% of the lingcod landings, and 81% of the Pacific cod and rock sole landings.

Subsequent analyses will be limited to the selected six 5-fm depth intervals (47-72; 86-132 m) as a group, and individually.

Mean depths and landings, among species. Disregarding combinations, mean depths were 57.9 fms (106 m) (S.D. = 3.9), 61.0 fms (112 m) (4.7), and 55.0 fms (101 m) (3.0), respectively, for lingcod, Pacific cod, and rock sole (Fig. 5B-4). Corresponding total interviewed landings were 8,593, 8,553, and 4,240 t (Appendix table 5B-8). Regression analysis yielded mean-depth slopes of 0.305, 0.373, and 0.187, respectively, for lingcod, Pacific cod, and rock sole. All differed significantly from zero (Table 5B-3). Landings fluctuated substantially throughout the period. For all three species, mean depths increased from 1966 to the late 1970s, but no significant temporal trend was evident thereafter. The early increase in mean depths may have reflected the fleet learning the true extent of the fishable grounds. ANOVA tests indicated that mean depths were significantly different in all comparisons ($P < 0.02$) (Table 5B-4).

The heterogeneity of mean depths within the 47-72 depth interval led to re-arranging the data into 5-fm depth intervals for selected years, which were chosen based on the absolute differences in mean weights of species among years. These differences ranged from 1.1 to 11.6 fms (Appendix table 5B-9). The top four years selected were 1991 (11.6 fms), 1992 (11.0 fms), 1993 (9.9 fms), and 1989 (8.8 fms). Five of the 69 tests yielded significant differences, three for LC-PC (1989 and 1991), and one each for LC-RS (1989) and PC-RS (1989) (Table 5B-5). Mean differences (and S.D.) were -0.2 (0.6), +0.2 (0.5), and +0.4 (0.7) fms, respectively, for LC-PC, LC-RS, and PC-RS (Table 5B-6). Range of differences was -1.4 to +1.6 fms. Ten differences were greater than $\pm$1.0 fm. No explanation was found for the significance of the two "small" differences (<1.0 fms), in 1989 (-0.8) and 1992 (+0.7), or for the non-significance of the seven "large" differences (>1.0 fms), in 1989 (-1.1, 1.5, 1.6), 1991 (+1.3), 1992 (+1.1, +1.1), and 1993 (+1.1). Reducing depth-interval size to 5 fm substantially reduced the mean-depth differences among species. Presumably, mean-depth differences would be similarly reduced in the remaining years of the series, where the absolute differences are smaller.

Mean depths and landings, among single-species combinations. Mean depths were 59.5 fms (109 m) (S.D. = 5.0), 64.7 fms (118 m) (6.4), and 54.4 fms (100 m) (5.0), respectively, for lingcod, Pacific cod, and rock sole (Fig. 5B-5). Corresponding total interviewed landings were 1,496, 1,401, and 503 t (Appendix table 5B-10). Among years, mean depths exhibited no evident temporal trend. Regression analysis indicated that slopes for lingcod (0.164) and rock sole (0.158) did not differ significantly from zero ($P = 0.13$ and 0.14), but that for Pacific cod (0.453) differed significantly from zero ($P < 0.01$) (Table 5B-3). ANOVA tests indicated the mean depths were significantly different ($P < 0.01$) in all comparisons (Table 5B-4).

Mean depths and landings, among multiple-species combinations. Mean depths were 62.4 fms (114 m) (S.D. = 4.5), 54.6 fms (100 m) (3.8), 57.4 fms (105 m) (7.1), and 57.6 (105) (4.1), respectively, for LC/PC, LC/RS, PC/RS, and LC/PC/RS (Fig. 5B-6). Corresponding total interviewed landings were 3,199, 2,626, 942, and 11,230 t (Appendix table 5B-10). Among years, mean depths of all four combinations exhibited little significant temporal trend, but all slopes (-0.006 to 0.271) were significantly different from zero ($P < 0,.05$), except for PC/RS ($P < 0.05$) (Table 5B-3). ANOVA tests indicated that mean-depths were significantly different ($P < 0.01$) in all comparisons, except LC/RS vs PC/RS ($P = 0.05$) and PC/RS vs LC/PC/RS ($P = 0.86$) (Table 5B-4).

Mean depths of species, within multiple-species combinations. Mean depths (meters; S.D.) were similar within each combination--61.6/63.5 (113/116; 4.1/4.1), 55.7/53.7 (102/98; 3.9/3.4), 58.3/56.0 (107/102; 7.7/5.9); and 57.8/59.0/55.8 (106/108/102; 3.8/4.5/3.2) fms, respectively, in LC/PC, LC/RS, PC/RS, and LC/PC/RS (Figs. 5B-7 and 8). Corresponding total interviewed landings were: 1,173/2,027, 1,558/1,069, 702/248, and 4,369/4,439/2,425 t (Appendix table 5B-11). Among years, mean depths of individual species within each combination exhibited different patterns. Regression analysis indicated all slopes were positive (0.020-0.335), and most were significantly different from zero (Table 5B-3). The exceptions were LC in LC/PC ($P = 0.07$), and both in PC/RS ($P = 0.16$ and 0.88). ANOVA tests indicated significant differences in mean depths between species in LC/RS ($P = 0.04$) and LC/PC/RS ($P = 0.01$), but not in LC/PC ($P = 0.07$) or PC/RS ($P = 0.20$) (Table 5B-4).

Mean depths and landings of individual species, among multiple-species combinations. For 1966-95, Pacific cod exerted a positive influence on mean depth, and rock sole exerted a negative influence. Maximum depths occurred in LC/PC for lingcod (61.6 fms), in PC for Pacific cod (64.7 fms), and in PC/RS for rock sole (56.0 fms) (Table 5B-7). Minimum depths occurred in LC/RS for lingcod (55.7 fms), in PC/RS for Pacific cod (58.3 fms), and in LC/RS for rock sole (53.7 fms).

Summary

In Area 5B, during 1966-95, principal shelf species, were lingcod, Pacific cod, and rock sole. The only MSA was 8, and in it, annual mean proportions of interviewed landings were 94% lingcod, 93% Pacific cod, and 92% rock sole. Annual proportions fell below 80% during 1988-91 for lingcod (58-64%) and rock sole (41-54%), and during 1988-92 for Pacific cod (48-74%). Subsequent analyses dealt with Goose Island Bank (MSA 8-1,2,3,4), the principal ground.

Seven combinations of the three species were possible—LC, PC, RS, LC/PC, LC/RS, PC/RS, and LC/PC/RS.

The 1966-95 landings of the three species totaled 25,308 t, of which 81% (20,543 t) consisted of multiple-species combinations. Individual proportions of the seven combinations were 7, 8, 3, 16, 12, 5, and 48%. However, records prior to 1991 overestimated the importance of combinations, based on the 1991-95 records, probably

based on individual trawl hauls. Percentage of landings dropped from 86% for 1966-90 to 63% for 1991-95.

Twenty-nine 5-fm depth intervals (22-162; 40-296 m) contained landings of lingcod, Pacific cod, or rock sole. Principal 5-fm depth intervals selected for analysis were 47-72 (86-132 m), which included 77% of the all-species effort, 90% of the lingcod landings, 81% of the Pacific cod landings, and 82% of the rock sole landings.

Disregarding combinations, mean depths at 47-72 fms (86-132 were 57.9 fms (106 m), 61.0 (112), and 55.0 (101), respectively, for lingcod, Pacific cod, and rock sole. Corresponding total interviewed landings were 8,593, 8,553, and 4,240 t. Regression analysis of among-year mean depths indicated all slopes were positive, and significantly different from zero. For all species, mean depths increased from 1966 to the late 1970s, then leveled off. The early increase was attributed to the fleet learning the true extent of the ground. ANOVA tests indicated mean depths were significantly different in all comparisons. Mean-depth ranking was PC > LC > RS.

A second analysis was undertaken which compared species' mean depths at 5-fm depth intervals, within the original 47-72 fm interval. Four years were selected which exhibited the maximum absolute difference in mean depths among species. Mean differences were small (-0.2 to +0.4 fm), and their range was -1.4 to +1.2 fms, with four differences $< \pm 1.0$ fm. Five of the 69 tests yielded significantly different mean depths between species. Non-significant differences ranged from -1.1 to +1.3 fms.

Among combinations, at 47-72 fms, single-species mean depths exhibited no significant temporal trend, despite substantial fluctuations in landings. Among species, mean depths were significantly different. Mean depths of multiple-species combinations exhibited significant temporal trends—one negative and three positive. Mean depths were significantly different among these combinations. Overall rankings were PC > LC/PC > LC > LC/PC/RS > PC/RS > LC/RS > RS.

Within multiple-species combinations, species mean depths exhibited significant temporal trends. All were positive, except for LC in LC/PC, and both species in PC/RS. Species mean depths were significantly different in LC/RS and LC/PC/RS, but not in LC/PC and PC/RS.

For individual species among multiple-species combinations, Pacific cod exerted a positive influence on mean depth, and rock sole exerted a negative influence. Maximum depths occurred in LC/PC for lingcod, in PC for Pacific cod, and in PC/RS for rock sole. Corresponding minimum depths occurred in LC/RS, PC/RS, and LC/RS.

SUMMARY AND DISCUSSION

A 1985 report first noted the potential interactions of demersal groundfish species on the continental shelf off western Canada, based on the intermittent reciprocal relationships between trawl landings of Pacific cod and its principal shelf co-habitants. Subsequently, three reports have been prepared dealing with interactions—two unpublished (1998 and 1999), and the current one.

The 1998 report dealt with the 1969-72 demersal-trawl landings of Pacific cod and lingcod by individual vessels fishing off West Vancouver Island (Areas 3Cn and 3D). Results revealed that: (1) Big Bank (Area 3Cn) was the principal ground; (2) April-September was the principal time; and (3) the two principal species were caught by the same vessels, on the same grounds at similar times and depths. Results were not published due to the confidentiality of the trawl records. In the two subsequent reports, emphasis shifted from the reciprocal relationships to those of spatial, temporal, and bathymetric.

The 1999 report dealt with species in areas off West Vancouver Island (3Cn and 3D), and in Queen Charlotte Sound (5A and 5B), during 1970, 1975, 1980, 1985, 1990, and 1995, and 1960 and 1965 for Areas 3Cn and 3D. Principal areas were 3Cn, 5A, and 5B, and within these, the principal grounds were Big Bank (3Cn), Cape Scott Spit (5A), and Goose Island Bank (5B). Principal species on Big Bank were lingcod and Pacific Cod, and their combinations were LC, PC, and LC/PC. Principal species on Cape Scott Spit and Goose Island Bank were lingcod, Pacific cod, and rock sole, and their combinations were LC, PC, RS, LC/PC, LC/RS, and LC/PC/RS. April-September was the principal time in all areas. The general bathymetric ranking was Pacific cod > lingcod > rock sole (if present), on all banks. Multiple-species combinations comprised a substantial proportion of the interviewed landings, and the mean depths of individual species within these combinations were similar in most cases. However, mean depths of individual species were affected by the presence of co-habitant species. For example, lingcod mean depths in an LC/PC combination were deeper than its mean depth as a single-species combination, but shallower than in the LC/RS and LC/PC/RS combinations. The 1999 report was considered exploratory, and was not published.

The current, study involves the years 1960-95 for Area 3Cn, and 1966-95 for Areas 5A and 5B. Areas, species, grounds, and time, were adopted from the 1999 study. Analysis was initially based on "principal groups" of 5-fm depth intervals which were selected on the basis of the quantity and consistency of the landings of the principal species—37-47 for Big Bank (3Cn), 37-42 and 47-72 for Cape Scott Spit (5A), and 47-72 for Goose Island Bank (5B). Conventional statistical tests ("t" or ANOVA) indicated virtually all mean-depth differences were significant, except for Big Bank (3Cn) and the 37-42 depth interval for Cape Scott Spit (5A). Despite the significant differences in mean depths in most of the "principal groups", the bathymetric arrays of effort and landings provided an interesting view of the fishery. Possibly, insight into stock assessments might be improved by first arraying all-species effort, and then observing the resulting landings of the various species, the reverse of common practice.

A second analysis involved 5-fm depth intervals within the "principal groups". For each area, four years were selected which exhibited the largest difference in mean depth between species, disregarding combinations. Mean depths were generally not significantly different, and it was assumed that incidence of significant differences would be less for those years when the mean-depth differences were smaller. Combinations were predominant, and within the multiple-species combinations, mean-depth differences among species were generally small, and usually not significant. The bathymetric ranking was generally PC > LC > RS.

In summary, the current investigation has demonstrated the predominance of multiple-species combinations over single-species combinations in the catches, and the relatively small depth differences between species in general, and within multiple-species combinations. The evidence suggests that multiple-species stock assessments would be worth exploring.

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LITERATURE CITED

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Table 1. Interviewed landings (%), by major area, species, and quarter-year, of lingcod (LC), Pacific cod (PC), and rock sole (RS), for selected years[a], January-December 1960-95. (Source: Unpublished 1999 report)

Area	Species	Quarter-year				N[b]	% II+III
		I	II	III	IV		
3Cn	LC	0.8	37.3	58.0	3.8	5757	95.3
	PC	30.1	38.8	21.8	9.3	5310	60.6
3D	LC	1.8	61.1	36.2	0.9	1755	97.3
	PC	19.3	59.0	20.2	1.5	724	79.2
5A	LC	1.8	40.7	44.5	13.0	2246	85.2
	PC	6.4	52.9	31.4	9.3	2041	84.3
	RS	3.8	63.5	29.7	3.1	1175	93.2
5B	LC	2.1	36.3	57.4	4.2	2422	93.7
	PC	7.1	39.9	45.3	7.7	2607	85.2
	RS	0.4	33.4	61.5	4.6	1843	94.9

a. Selected years: 1970, 1975, 1980, 1985, 1990, and 1995, for all areas. 1960 and 1965 for Area 3Cn..
b. N = landings (t)

Table 2. Interviewed landings (% of area total), by major area, principal grounds, species, and selected years[a], for lingcod (LC), Pacific cod (PC), and rock sole (RS), April-September 1960-95. (Source: Unpublished 1999 report)

Area	Ground	Spp	1960-95
3Cn	Big Bank	LC	69.6
	(23-3,4,5,7)	PC	32.4
	Swiftsure	LC	6.5
	(21-1)	PC	24.0
	Amphitrite Bank	LC	3.3
	(23-1,2)	PC	21.2
	Fingers	LC	6.0
	(23-6)	PC	4.8
	Other	LC	14.6
	(6-18)[b]	PC	17.6
	N[c]	LC	5479
		PC	3218
3D	Kains Island	LC	26.2
	(27-1)	PC	66.5
	Nootka	LC	35.2
	(25-2)	PC	13.2
	N. Estevan	LC	7.5
	(25-1)	PC	19.5
	Other	LC	31.1
	(4-18)[b]	PC	0.8
	N[c]	LC	1159
		PC	361

Area	Ground	Spp	1966-95
5A	C. Scott Spit	LC	59.5
	(11-2)	PC	74.0
		RS	75.5
	Topknot	LC	27.5
	(11-4)	PC	10.8
		RS	12.0
	Mexicana	LC	5.5
	(11-3)	PC	11.0
		RS	7.0
	Other	LC	7.5
	(0-13)[b]	PC	4.1
		RS	5.6
	N[c]	LC	1774
		PC	1407
		RS	714
5B	SW Goose	LC	31.7
	(8-4)	PC	49.5
		RS	75.0
	SE Goose	LC	42.8
	(8-2)	PC	22.8
		RS	13.7
	NE Goose	LC	11.0
	(8-1)	PC	21.3
		RS	9.2
	NW Goose	LC	7.3
	(8-3)	PC	5.8
		RS	1.4
	Other	LC	7.3
	(0-7)[b]	PC	0.6
		RS	0.7
	N[c]	LC	1651
		PC	1133
		RS	2153

a. Selected years: 1970, 1975, 1980, 1985, 1990, and 1995 for all areas; 1960 and 1965 for Area 3Cn. b Numbers of localities among years. c. Landings (t).

Table 3Cn-1. Interviewed all-species effort (%), and interviewed landings (%), by 5-fm depth interval, for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: Appendix tables 3Cn-4 to 6)

Depth[a]		Effort	Landings		
(m)	(fms)		LC	PC	Total
59	32	1.7	2.8	1.1	
68	37	25.1	32.4	18.7	
77	42	39.4	39.7	37.5	
86	47	19.1	15.0	27.4	
95	52	7.3	6.0	7.4	
104	57	2.9	1.5	2.0	
113	62	1.7	2.0	1.4	
123	67	0.4	0.1	0.7	
132	72	0.6	0.2	1.0	
141	77	0.5	0.1	0.4	
150	82	0.1	<0.1	0.2	
159	87	0.7	0.1	1.7	
168	92	0.5	0.1	0.5	
205	112	<0.1	0	<0.1	
242	132	<0.1	<0.1	<0.1	
287	157	<0.1	<0.1	<0.1	
361	197	<0.1	<0.1	0	
	N[b]	39383	11270	6215	17485
	%		64.5	35.5	100.0
68-86	37-47	83.6	87.1	83.6	

a. Mid-points of 5-fm depth intervals (32 = 30-34, *etc*.). Equivalent values in meters.
b. N = effort in hours; landings in tonnes.

Table 3Cn-2. Years and localities in which landings of lingcod or Pacific cod were reported from depths greater than 64 fms (117 m), from Big Bank (MSA 23-3,4,5,7), and other localities in MSA 23, April-September 1960-95. (Source: PBS Groundfish Data Base) .

Year	Locality	
	Big Bank	Other[a]
1963	5	nil
1964	7	nil
1970	3	10
1971	3	nil
1976	3,5	nil
1977	3,5,7	nil
1978	3,5,7	nil
1979	3	10
1980	3	10
1981	3,7	10
1982	3	10
1983	3	1,10
1989	3,5	8,10,12
1990	3,5	10,12
1992	3,5	6,10,12,13,17
1994	4,5	6,10,12,13,16

a. Localities:

1. Firing Range (Amphitrite Bank)
6. Fingers Bank
8. Cape Beale
10. Deep Big Bank/Barkley Canyon
12. Ucluelet/Loudon Canyons
13. Nitinat Canyon
16. Barkley Hake
17. Nitinat Hake

Table 3Cn-3. Statistical analyses of mean depths, by species and combination, at selected 5-fm depth intervals (37-47), for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7; 3Cn), April-September 1960-95. (Source: Appendix tables 3Cn-7,9)

Combination	Comparison	N[a]	Depth *vs* Depth							Depth on Year					
			LC	PC	LC/PC	"t"	P_t	F	P_F	Slope	P_S	Interc.	Est. depth at:		
													1960	1995	Diff.[b]
All[c]	LC vs PC	36	41.0	42.3	nil	-3.832	<0.01								
	LC on Year									-0.013	0.60	66.4	40.9	40.5	-0.4
	PC on Year									-0.002	0.92	47.1	43.2	43.1	-0.1
Single-species[d]	LC vs PC	36,23	41.0	43.5	nil	-3.872	<0.01								
	LC vs PC [e]	23	41.5	43.5	nil	-3.121	<0.01								
	LC on Year	36			nil					-0.075	0.08	190.4	43.4	40.8	-2.6
	PC on Year	23			nil					+0.025	0.62	-5.1	43.9	44.8	0.9
Among[d]	LC vs PC vs LC/PC	23	41.5	43.5	41.7			6.914	<0.01						
	LC vs LC/PC	36	41.0		41.6	-0.679	0.25								
	PC vs LC/PC [e]	23		43.5	41.7	+3.404	<0.01								
	LC/PC on Year	36								-0.030	0.27	100.0	41.2	40.2	-1.1
Within (LC/PC)[d]	LC vs PC	36	41.0	42.4		-3.347	<0.01								
	LC on Year									-0.024	0.42	88.8	41.8	40.9	-0.8
	PC on Year									-0.004	0.89	50.0	42.4	42.2	-0.1
Among species[e]	LC vs LC in LC/PC	23	41.5	41.0		0.997[f]	>0.40	0.687	0.41						
	PC vs PC in LC/PC	23	43.5	42.4		2.664[f]	>0.10	4.588	0.04						

a. Number of years.
b. Difference = 1995 - 1960
c. Appendix table 7
d. Appendix table 9
e. Table 3Cn-6
f. Dixon & Massey (1969, p. 116)

Table 3Cn-4. "t" tests[a] of weighted mean depths (fms) between species (all combinations), numbers of records, and interviewed landings (000s lbs), by individual 5-fm depth intervals (37-47), for lingcod (LC) and Pacific cod (PC), from Big Bank (MSA 23-3,4,5,7), April-September 1960, 1964, 1990, and 1992. (Source: Appendix table 3Cn-8; PBS Groundfish Data Base)

Year	Interv.	Rec.	Depth			S.D.		Landings		t	P
(diff)[b]	(fms)	(nos.)	LC	PC	LC-PC	LC	PC	LC	PC		
1960	37	8	36.4	37.2	-0.8	1.6	1.7	119	2	-0.445	>0.50
(3.6)	42	13	42.4	41.8	+0.6	2.5	2.8	159	32	+0.415	>0.50
	47	4	47.7	47.1	+0.6	0.3	0.6	31	30	+16.101	<0.01
1964	37	8	37.9	37.8	+0.1	1.0	0.7	54	39	+0.310	>0.50
(4.2)	42	8	41.0	42.3	-1.3	2.1	1.5	5	78	-1.720	>0.20
	47	2	47.7	48.5	-0.8	0.9	0.7	3	38	-1.841	>0.20
1990	37	9	37.1	37.2	-0.1	1.0	0.5	97	8	-0.302	>0.50
(3.2)	42	15	42.4	42.5	-0.1	1.2	0.6	158	58	-0.167	>0.50
	47	6	45.1	45.4	-0.3	0.1	0.2	53	83	-45.791	<0.01
1992	37	7	37.3	37.4	-0.1	1.3	1.4	46	5	-0.323	>0.50
(4.6)	42	5	41.0	41.4	-0.4	0.9	0.6	15	6	-2.964	>0.05
	47	4	45.7	45.9	-0.2	1.4	1.4	15	21	-0.477	>0.50
	N				12						
	Mean				-0.2						
	S.D.				0.6						
	Max				+0.6						
	Min				-1.3						
	Ns[c]				2						
	N>±1.0				1						
	%>±1.0				8.3						

a. Dixon and Massey (1969, p. 116).
b. Absolute difference (Appendix table 3Cn-8).
c. Ns = numbers of significant differences.

Table 3Cn-5. Differences in mean depths (fms) among species (all combinations), by year and 5-fm depth intervals within selected 5-fm depth intervals (37-47), for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September, 1960, 1964, 1990, and 1992. Note: underlined values indicate significant differences. (Source: Table 3Cn-4).

Year (diff)[a]	Interv.	Mean depths LC	PC	Diff[b]
1960	37	36.4	37.2	-0.8
(3.6)	42	42.4	41.8	0.6
	47	47.7	47.1	0.6
1964	37	37.9	37.8	0.1
(4.2)	42	41.0	42.3	-1.3
	47	47.7	48.5	-0.8
1990	37	37.1	37.2	-0.1
(3.2)	42	42.4	42.5	-0.1
	47	45.1	45.4	-0.3
1992	37	37.3	37.4	-0.1
(4.6)	42	41.0	41.4	-0.4
	47	45.7	45.9	-0.2
	N			12
	Mean			-0.2
	S.D.			0.6
	Max			0.6
	Min			-1.3
	Ns[c]			2
	N > ±1.0			1
	% > ±1.0			8.3

a. diff = absolute difference (max-min), Appendix table 3Cn-8
b. Diff = difference, LC-PC
c. Ns = numbers of significant differences.

Table 3Cn-6. Weighted mean depths (fms) of interviewed landings, by selected years[a], combination, and species, within selected 5-fm depth intervals (37-47), for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95.(Source: Appendix table 3Cn-8)

Year	Single-spp		LC/PC		
	LC	PC	LC	PC	Total
1961	45.9	42.0	46.3	45.5	46.2
1962	42.4	42.0	42.6	43.3	43.0
1964	37.3	42.0	37.9	42.9	40.8
1965	46.9	42.2	40.7	42.4	41.6
1966	41.5	47.0	40.4	41.5	41.0
1967	41.3	43.0	38.6	39.5	38.8
1970	42.7	42.0	40.1	42.2	40.7
1971	39.7	43.0	39.5	41.5	41.1
1972	42.7	45.0	41.9	43.7	43.4
1973	41.2	44.7	39.6	42.1	40.5
1975	40.7	42.9	41.0	42.1	41.3
1976	41.1	42.6	42.0	43.6	42.7
1977	42.2	42.8	40.9	41.7	41.1
1978	43.2	42.4	42.1	42.2	42.1
1979	41.4	46.7	41.0	42.2	41.6
1980	38.9	42.2	41.5	43.0	42.1
1981	42.0	47.0	40.9	41.0	41.0
1982	39.5	47.0	39.0	41.2	39.1
1986	41.3	47.0	39.8	39.4	39.8
1987	45.2	42.0	41.6	42.2	41.8
1988	39.5	42.1	44.0	45.1	44.5
1989	40.7	42.1	43.5	45.2	44.1
1990	37.3	41.5	37.3	41.6	38.8
Mean	41.5	43.5	41.0	42.4	41.6
S.D.	2.4	2.0	2.0	1.6	1.8

a. The 23 years in which all values were present among and within combinations..

Table 3Cn-7. "t" tests of weighted mean depths (fms) between species in the LC/PC combination and interviewed landings (000s lbs), for selected years[a] and 5-fm depth interval (37-47), for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September. (Source: PBS Groundfish Data Base)

Year	Mean depths at:						Landings at:					
	37 fms		42 fms		47 fms		37 fms		42 fms		47 fms	
	LC	PC	LC	PC	LC	PC	LC	PC	LC	PC	LC	PC
1965	38.7	38.7	42.6	42.1	46.0	45.8	52	53	66	32	24	64
1966	37.0	37.0	41.0	41.4	47.4	46.7	123	78	49	107	53	78
1970	37.8	37.5	40.6	41.0	47.8	47.3	176	29	131	70	49	34
1971	37.1	37.4	41.3	41.0	46.8	46.9	120	270	35	21	28	235
1972	39.0	39.0	44.0	44.0	46.5	49.0	51	91	117	52	45	49
1973	36.9	36.8	41.3	41.5	47.6	46.8	206	61	100	113	34	64
1974	37.7	37.8	41.1	41.1	46.9	47.0	258	162	211	184	72	48
1975	37.8	37.9	42.2	41.6	46.8	47.0	266	68	434	153	95	73
1976	37.8	37.2	41.2	41.1	46.3	47.1	88	22	204	127	81	101
1977	37.4	37.1	42.3	42.0	47.5	47.2	87	27	182	66	30	22
1979	37.4	37.6	41.2	41.5	47.0	47.4	106	56	164	155	41	87
1980	38.6	38.7	41.1	42.3	45.9	47.1	85	29	136	63	47	59
1988	38.0	38.0	41.9	41.6	46.5	46.9	44	4	74	77	25	54
Total							1661	950	1903	1221	623	969
N	13		13		13							
Mean	37.8	37.7	41.7	41.7	46.8	47.1						
S.D.	0.7	0.7	0.9	0.8	0.6	0.7						
"t"	0.145		-0.091		-0.964							
P	0.44		0.46		0.17							

a. Years in which landings of each species exceeded 100 t. See Appendix table 3Cn-8.

Table 5A-1. Interviewed landings (t;%), by combination and species within combinations, for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September, 1966-90 and 1991-95. (Source: Appendix table 5A-3)

Combination	Species	1966-90		1991-95		1966-95	
		(t)	(%)	(t)	(%)	(t)	(%)
LC		407	2.9	364	12.4	771	4.6
PC		804	5.7	289	9.9	1093	6.5
RS		255	1.8	220	7.5	475	2.8
Single-spp total		1466	10.5	873	29.8	2339	13.8
LC/PC	LC	911	6.5	273	9.3	1184	7.0
	PC	1778	12.7	373	6.4	2151	12.7
	Total	2689	19.2	646	11.1	3335	19.7
LC/RS	LC	707	5.1	363	6.3	1070	6.3
	RS	663	4.7	228	3.9	891	5.3
	Total	1370	9.8	591	10.2	1961	11.6
PC/RS	PC	527	3.8	116	4.0	643	3.8
	RS	154	1.1	63	1.1	217	1.3
	Total	681	4.9	179	3.1	860	5.1
LC/PC/RS	LC	2490	17.8	240	8.2	2730	16.1
	PC	3814	27.3	261	8.9	4075	24.1
	RS	1475	10.5	142	4.8	1617	9.6
	Total	7779	55.6	643	21.9	8422	49.8
Multiple-spp total		12519	89.5	2059	70.2	14578	86.2
Grand total		13985	100.0	2932	100.0	16917	100.0

Table 5A-2. All-species effort (%), and interviewed landings (%), by 5-fm depth interval, for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix tables 5A-4 to 7)

Depth[a]		Effort	Landings			
(m)	(fms)		LC	PC	RS	Total
40	22	<0.1	<0.1	0	<0.1	
49	27	0.1	<0.1	<0.1	0.3	
59	32	1.1	0.8	0.6	4.1	
68	37	12.0	11.3	7.3	36.7	
77	42	9.1	7.9	5.6	22.1	
86	47	6.3	6.7	5.5	10.6	
95	52	11.2	15.6	10.8	11.1	
104	57	13.5	19.3	16.4	6.1	
113	62	13.3	16.5	17.3	4.5	
123	67	9.5	8.4	11.6	2.1	
132	72	8.2	7.4	11.1	1.0	
141	77	4.9	2.2	5.6	0.5	
150	82	3.3	1.3	3.7	0.1	
159	87	3.6	1.4	2.9	0.5	
168	92	1.8	0.9	0.8	0.1	
178	97	1.1	0.1	0.6	<0.1	
187	102	0.5	0.1	0.2	0.1	
196	107	0.5	0.1	0.1	0.2	
205	112	<0.1	<0.1	<0.1	0	
214	117	0.1	<0.1	<0.1	0	
223	122	<0.1	<0.1	<0.1	0	
	N[b]	52202	5755	7958	3202	16915
	%		34.0	47.0	18.9	100.0
68-77	37-42	21.1	19.2	12.9	58.8	
95-132	52-72	55.7	67.2	67.2	25.3	
Total		76.8	86.4	80.1	84.1	

a. Mid-points of 5-fm depth intervals (22 = 20-24, *etc*.) Equivalent values in meters.
b. N = effort in hours; landings in tonnes

Table 5A-3. Regression analysis of weighted mean depths (fms) of interviewed landings on year, by combination and species, at selected 5-fathom depth intervals (37-42; 52-72), for lingcod (LC), Pacific cod l(PC), and rock sole RS) from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Sources: Appendix tables 5A-8, 10-13)

Combination	N[a]	Parameters			Est. Depth at:			Mean depth
		Slope	P, B=0	Intercept	1966	1995	Diff.	1966-95
All (37-42)								
LC	30	0.033	>0.40	36.7	38.8	39.8	1.0	39.4
PC	30	-0.092	>0.10	47.1	41/1	38.4	-2.7	39.8
RS	30	-0.029	>0.30	41.5	39.6	38.7	-0.9	39.1
All (52-72)								
LC	30	0.102	>0.20	51.6	58.3	61.2	2.9	59.8
PC	30	0.251	<0.05	41.0	57.6	64.8	7.2	61.3
RS	30	0.058	>0.30	52.8	56.7	58.4	1.7	57.6
Single-species (37-42)								
LC	11	-0.011	>0.50	41.0	40.3	40.0	-0.3	40.0
PC	7	-0.173	>0.50	53.2	41.8	36.8	-5.0	39.9
RS	25	-0.112	>0.50	40.1	39.1	38.6	-0.5	39.3
Single-species (52-72)								
LC	27	0.158	>0.40	46.6	57.1	61.7	4.6	59.5
PC	27	0.545	<0.05	18.5	54.5	70.3	15.8	62.5
RS	18	-0.079	>0.50	63.6	58.4	56.1	-2.3	56.4
Multiple-species (37-42)								
LC/PC	10	-0.112	>0.50	50.7	43.3	40.1	-3.2	40.5
LC/RS	30	-0.014	>0.50	40.7	39.7	39.3	-0.4	39.5
PC/RS	23	-0.047	>0.50	43.1	40.0	38.6	-1.4	39.6
LC/PC/RS	28	-0.032	>0.50	41.6	39.5	38.5	-1.0	39.2
Multiple-species (52-72)								
LC/PC	30	0.221	>0.30	44.6	59.1	65.5	6.4	62.3
LC/RS	30	0.035	>0.50	53.7	56.0	57.0	1.0	56.6
PC/RS	21	-0.094	>0.50	67.1	60.9	58.2	-2.7	58.8
LC/PC/RS	30	0.145	>0.50	47.7	57.3	61.5	4.2	59.5

Table 5A-3 (cont.)

Combination		Parameters			Est. Depth at:			Mean depth
		Slope	P, B=0	Intercept	1966	1995	Diff.	1966-95
Within multiple-species (37-42)								
LC/PC								
LC	10	-0.104	>0.50	48.3	41.5	38.5	-3.0	40.4
PC	10	-0.123	>0.50	50.0	41.9	38.4	-3.5	40.5
LC/RS								
LC	30	0.027	>0.50	37.4	39.2	40.0	0.8	39.5
RS	30	-0.011	>0.50	40.6	39.9	39.6	-0.3	39.6
PC/RS								
PC	23	-0.060	>0.50	44.4	40.5	38.7	-1.8	39.7
RS	23	-0.064	>0.50	44.6	40.3	38.4	-1.9	39.4
LC/PC/RS								
LC	28	0.0003	>0.50	39.2	39.3	39.3	0.0	39.4
PC	28	0.079	>0.50	46.0	40.7	38.4	-2.3	39.5
RS	28	-0.008	>0.50	39.9	39.4	39.2	-0.2	39.2
Within multiple-species (52-72)								
LC/PC								
LC		0.200	>0.10	45.8	59.0	64.8	5.8	61.9
PC		0.235	>0.05	43.9	59.4	66.2	6.8	62.8
LC/RS								
LC		0.018	>0.50	55.1	56.3	56.8	0.5	56.5
RS		0.063	>0.50	51.2	55.4	57.2	1.8	56.3
PC/RS								
PC		-0.116	>0.50	69.0	61.3	58.0	-3.3	59.5
RS		-0.016	>0.50	60.3	59.2	58.7	-0.5	58.9
LC/PC/RS								
LC		0.122	>0.50	49.7	57.8	61.3	3.5	59.5
PC		0.194	>0.10	44.3	57.1	62.7	5.6	59.9
RS		0.051	>0.50	53.1	56.5	58.0	1.5	57.2

Table 5A-4. ANOVA (single-factor) tests of mean depths, by combination and comparisons within selected 5-fm depth intervals (37-42; 52-72), for interviewed landings of lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix tables 5A-8 to 12)

Combination	N[a]	Mean depth (fms)	F	P
All (37-42 fms):				
LC vs PC vs RS	30	39.3/39.7/39.2	0.799	0.45
LC vs PC	30	39.3/39.7	0.605	0.44
LC vs RS	30	39.3/39.2	0.205	0.65
PC vs RS	30	39.7/39.2	1.336	0.25
All (52-72 fms):				
LC vs PC vs RS	30	59.8/61.2/57.5	11.865	<0.01
LC vs PC	30	59.8/61.2	3.174	0.08
LC vs RS	30	59.8/57.5	10.259	<0.01
PC vs RS	30	61.2/57.5	23.006	<0.01
Single species (37-42 fms):				
LC vs PC vs RS	11,7,25	40.1/39.9/39.2	0.796	0.46
	3[b]	40.1/38.8/38.5	1.127	0.38
Multiple species (37-42 fms):				
All[c]	10,30,23,28	40.5/39.6/39.4/39.3	0.896	0.45
All[c]	8[b]	40.4/39.3/39.5;39.5	0.445	0.72
Single species (52-72 fms):				
LC vs PC vs RS	27,27,18	59.5/62.6/57.2	6.041	<0.01
LC vs PC			5.071	0.03
LC vs RS			2.588	0.12
PC vs RS			9.164	<0.01
LC vs PC vs RS	16[b]	60.2/62.5/56.1	7.380	<0.01
LC vs PC			2.061	0.16
LC vs RS			7.086	0.01
PC vs RS			11.591	<0.01

Table 5A-4 (cont.)

Multiple species (52-72 fms):				
All[c]	30,30,21,30	62.3/56.5/59.4/59.4	8.944	<0.01
LC/RS vs PC/RS	30,21		4.032	0.05
All[c]	21[b]	62.4/56.0/59.4/59.1	7.741	<0.01
LC/PC vs LC/RS	21[b]		33.476	<0.01
LC/PC vs PC/RS	21[b]		3.714	0.06
PC/RS vs LC/RS	21[b]		4.343	0.04
Among species within combinations (37-42) fms):				
LC/PC/RS	28[b]	39.4/39.5/39.2	0.235	0.79
LC/PC	10[b]	40.4/40.5	0.012	0.91
LC/RS	30[b]	39.5/39.6	0.041	0.84
PC/RS	23[b]	39.7/39.4	0.122	0.73
Among species within combinations (52-72) fms):				
LC/PC/RS	30[b]	59.5/59.9/57.2	6.156	<0.01
LC/PC	30[b]	61.9/62.8	0.650	0.42
LC/RS	30[b]	56.5/56.3	0.052	0.82
PC/RS	21[b]	59.5/58.9	0.064	0.80

a. Numbers of values compared.
b. Paired values only.
c. All = LCPC + LC/RS + PC/RS + LC/PC/RS.

Table 5A-5. "t" tests of weighted mean depths between species (all combinations), by year and 5-fm depth interval within selected 5-fm depth intervals (52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1978-81. (Source: PBS Groundfish Data Base)

Year	Interv. (fms)	Comp.	Depth (fms)	S.D. (fms)	Land.[a]	t[b]	P	Year	Interv. (fms)	Comp.	Depth (fms)	S.D. (fms)	Land.[a]	t[b]	P
1978	52	LC vs PC	51.0/52.7	1.1/1.0	5/169	-2.781	>0.10	1993	52	LC vs PC	52.3/51.5	1.0/1.6	62/14	2.328	>0.10
		LC vs RS	51.0/51.9	1.1/0.7	5/22	-1.608	>0.20			LC vs RS	52.3/52.8	1.0/2.3	62/25	-1.491	>0.20
		PC vs RS	52.7/51.9	1.0/0.7	169/22	3.910	>0.05			PC vs RS	51.5/52.8	1.6/2.3	14/25	-2.597	>0.10
	57	LC vs PC	55.2/56.8	0.7/1.2	2/47	-1.452	>0.20		57	LC vs PC	57.1/57.5	1.2/1.5	37/15	-1.027	>0.40
		LC vs RS	55.2/56.8	0.7/0.8	2/2	-2.286	>0.10			LC vs RS	57.1/57.0	1.2/1.6	37/10	0.342	>0.50
		PC vs RS	56.8/56.8	1.2/0.8	47/2	-0.054	>0.50			PC vs RS	57.5/57.0	1.5/1.6	15/10	1.100	>0.30
	62	LC vs PC	62.9/63.2	1.5/1.2	4/61	-0.382	>0.50		62	LC vs PC	61.8/62.0	1.5/2.0	47/78	-0.580	>0.50
		LC vs RS	62.9/62.9	1.5/0.9	4/2	-0.087	>0.50			LC vs RS	61.8/61.1	1.5/1.7	47/15	2.403	>0.10
		PC vs RS	63.2/62.9	1.2/0.9	61/2	0.248	>0.50			PC vs RS	62.0/61.1	2.0/1.7	78/15	2.421	>0.10
	67	LC vs PC	67.6/66.6	1.0/1.6	33/316	3.213	>0.05		67	LC vs PC	67.5/67.4	1.3/2.1	38/81	0.140	>0.50
		LC vs RS	67.6/67.0	1.0/1.6	33/6	1.211	>0.30			LC vs RS	67.5/66.0	1.3/1.1	38/4	6.602	<0.05
		PC vs RS	66.6/67.0	1.6/1.6	316/6	-0.633	>0.50			PC vs RS	67.4/66.0	2.1/1.1	81/4	3.939	>0.05
	72	LC vs PC	72.5/71.8	1.2/1.6	39/244	2.246	>0.10		72	LC vs PC	70.8/70.9	1.1/1.5	59/150	-0.573	>0.50
		LC vs RS	72.5/71.3	1.2/1.1	39/1	NS[c]				LC vs RS	70.8/72.2	1.1/2.5	59/6	-6.716	<0.05
		PC vs RS	71.8/71.3	1.6/1.1	244/1	NS[c]				PC vs RS	70.9/72.2	1.5/2.5	150/6	-5.597	<0.05

Table 5A-5 (cont.)

Year	Interv. (fms)	Comp.	Depth (fms)	S.D. (fms)	Land.[a]	t[b]	P	Year	Interv. (fms)	Comp.	Depth (fms)	S.D. (fms)	Land.[a]	t[b]	P
1990	52	LC vs PC	51.3/51.6	1.5/1.1	58/9	-0.451	>0.50	1994	52	LC vs PC	52.2/51.3	1.6/1.4	185/17	2.116	>0.10
		LC vs RS	51.3/50.7	1.5/1.0	58/45	0.050	>0.50			LC vs RS	52.2/52.0	1.6/1.7	185/47	0.899	>0.40
		PC vs RS	51.6/50.7	1.1/1.0	9/45	0.285	>0.50			PC vs RS	51.3/52.0	1.4/1.7	17/47	-1.325	>0.30
	57	LC vs PC	57.8/57.5	1.2/1.1	189/54	1.449	>0.20		57	LC vs PC	56.7/56.7	1.5/1.1	131/7	0.001	>0.50
		LC vs RS	57.8/57.5	1.2/1.1	189/4	0.004	>0.50			LC vs RS	56.7/57.5	1.5/1.5	131/15	-2.040	>0.10
		PC vs RS	57.5/57.5	1.1/1.1	54/4	0.003	>0.50			PC vs RS	56.7/57.5	1.1/1.5	7/15	-1.283	>0.30
	62	LC vs PC	62.3/62.0	1.5/1.3	282/115	1.447	>0.20		62	LC vs PC	61.9/61.9	1.4/1.3	117/37	-0.082	>0.50
		LC vs RS	62.3/62.6	1.5/1.2	282/7	-0.003	>0.50			LC vs RS	61.9/61.5	1.4/1.3	117/6	0.617	>0.50
		PC vs RS	62.0/62.6	1.3/1.2	115/7	-0.015	>0.50			PC vs RS	61.9/61.5	1.3/1.3	37/6	0.677	>0.50
	67	LC vs PC	66.8/67.1	1.4/1.4	33/53	-0.691	>0.50		67	LC vs PC	66.3/67.3	1.3/1.1	24/27	-3.219	>0.05
		LC vs RS	66.8/69.0	1.4/0.0	33/0.1	NS[d]				LC vs RS	66.3/65.5	1.3/0.8	24/2	0.790	>0.50
		PC vs RS	67.1/69.0	1.4/0.0	53/0.1	NS[d]				PC vs RS	67.3/65.5	1.1/0.8	27/2	2.275	>0.10
	72	LC vs PC	70.7/71.0	0.6/1.0	41/42	-2.151	>0.10		72	LC vs PC	70.6/71.2	1.1/0.9	34/24	-2.142	>0.10
		LC vs RS	70.7/72.0	0.6/0.4	41/4	-0.060	>0.50			LC vs RS	70.6/70.7	1.1/1.0	34/2	-0.058	>0.50
		PC vs RS	71.0/72.0	1.0/0.4	42/4	-0.043	>0.50			PC vs RS	71.2/70.7	0.9/1.0	24/2	0.808	>0.50

a. Thousands of pounds.
b. Dixon and Massey (1969, p. 116)
c. NS = no solution. N = 1
d. NS = no solution. s = 0.

Table 5A-6. Differences in mean depths (fms) among species, by year and 5-fm depth interval, within selected 5-fm depth intervals (52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April September 1978, 1990, 1993, and 1994. Note underlined values indicate significant differences. (Source: Table 5A-5)

Year	Interv.	Mean depths				Difference		
(diff)[a]	(fms)	LC	PC	RS	Diff[b]	LC-PC	LC-RS	PC-RS
1978	52	51.0	52.7	5.7	0.1	-1.7	-0.9	0.8
(11.9)	57	55.2	56.8	56.8	1.6	-1.6	-1.6	0.0
	62	62.9	63.2	62.9	0.3	-0.3	0.0	0.3
	67	67.6	66.6	67.0	1.0	1.0	0.6	-0.4
	72	72.5	NR[c]	NR[c]	NR[c]	NR[c]	NR[c]	NR[c]
1990	52	51.3	51.6	50.7	0.9	-0.3	0.6	0.9
(8.4)	57	57.8	57.5	57.5	0.3	0.3	0.3	0.0
	62	62.3	62.0	62.6	0.6	0.3	-0.3	-0.6
	67	66.8	NR[c]	NR[c]	NR[c]	NR[c]	NR[c]	NR[c]
	72	70.7	71.0	72.0	1.3	-0.3	-1.3	-1.0
1993	52	52.3	51.5	52.8	1.3	0.8	-0.5	-1.3
(9.1)	57	57.1	57.5	57.0	0.5	0.4	0.1	0.5
	62	61.8	62.0	61.1	0.9	-0.2	0.7	0.9
	67	67.5	67.4	66.0	1.5	..1	1.5	1.4
	72	70.6	70.9	72.2	1.4	-0.1	-1.4	-1.3
1994	52	52.2	51.3	52.0	0.9	0.9	0.2	-0.7
(8.5)	57	56.7	56.7	57.5	0.8	0.0	-0.8	-0.8
	62	6.8	6.8	61.5	0.4	0.0	0.4	0.4
	67	66.3	67.3	65.5	1.8	-1.0	0.8	1.8
	72	70.6	71.2	70.7	0.6	-0.6	-0.1	0.5
N					18	18	18	18
Mean					1.0	-0.2	-0.1	0.1
S.D.					0.5	0.7	0.8	0.9
Max					1.8	1.0	1.5	1.8
Min					0.3	-1.7	-1.6	-1.3
Ns[d]						0	2	1
N>±1.0					7	2	4	4
%>±1.0					38.9	11.1	22.2	22.2

a. diff = absolute difference (max-min), Appendix table 5A-9
b. Diff = absolute difference (max-min), this this table.
c. NR = not relevant. See Table 5A-5.
d. Nx = numbers of significant differences.

Table 5A-7. Mean depths (fms), and inteviewed landings (t), by species within combinations, at selected 5-fm depth intervals (37-42; 52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September, 1966-95. (Sources: Appendix tables 5A-10 to 13)

Combination	37-42 fms			52-72 fms		
	Mean	S.D.	Land.	Mean	S.D.	Land.
LC in:						
LC	40	2.3	38	59.5	3.9	533
LC/PC	40.4	2.8	16	61.7	4.9	915
LC/RS	39.5	2.1	405	56.7	4.1	481
LC/PC/RS	39.4	1.8	595	59.6	3.2	1896
PC in:						
PC	39.9	2.8	24	62.5	5.9	694
LC/PC	40.5	2.8	44	62.8	4.1	1692
PC/RS	39.6	2.7	182	59.2	5.6	342
LC/PC/RS	39.5	1.8	772	60.0	3.6	2624
RS in:						
RS	39.3	1.7	306	56.4	5.2	37
LC/RS	39.6	1.9	612	56.3	4.1	134
PC/RS	39.6	2.7	119	58.3	7.0	70
LC/PC/RS	39.2	1.7	824	57.3	2.8	1182

Table 5B-1. Interviewed landings (t;%), by combination and species within combinations, for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September, 1966-90 and 1991-95. (Source: Appendix table 5B-3)

Combination	Species	1966-90		1991-95		1966-95	
		(t)	(%)	(t)	(%)	(t)	(%)
Single species							
LC		948	4.9	838	14.4	1786	7.1
PC		1299	6.7	810	14.0	2109	8.3
RS		397	2.0	473	8.2	870	3.4
Total		2644	13.6	2121	36.6	4765	18.8
Multiple species							
LC/PC	LC	995	5.1	426	7.3	1421	5.6
	PC	2009	10.3	676	11.6	2685	10.6
	Total	3004	15.4	1102	18.9	4106	16.2
LC/RS	LC	1199	6.1	525	9.0	1724	6.8
	RS	870	4.5	429	7.4	1299	5.1
	Total	2069	10.6	954	16.4	3023	11.9
PC/RS	PC	621	3.2	252	4.3	873	3.4
	RS	253	1.3	100	1.7	353	1.4
	Total	874	4.5	352	6.0	1226	4.8
LC/PC/RS	LC	4113	21.1	534	9.2	4647	18.4
	PC	4396	22.5	452	7.8	4848	19.2
	RS	2403	12.3	290	5.0	2693	10.6
	Total	10912	55.9	1276	22.0	12188	48.2
Total		16859	86.4	3684	63.3	20543	81.2
Grand total		19503	100.0	5805	99.9	25308	100.0

Table 5B-2. All-species interviewed effort (%), and interviewed landings (%) of lingcod (LC), Pacific cod (PC), and rock sole (RS), by mid-points of 5-fm depth intervals, from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix tables 5B-4 to 7)

Depth[a]		Effort	Landings		
(m)	(fms)		LC	PC	RS
40-49	22-27	0.2	0.1	<0.1	0.6
59	32	0.7	0.2	0.2	1.9
68	37	1.6	0.5	0.3	7.0
77	42	2.2	2.0	0.7	7.4
86	47	7.5	7.7	3.2	17.6
95	52	12.3	15.8	9.5	22.3
104	57	16.8	23.5	14.4	22.9
113	62	18.4	24.1	18.1	12.5
123	67	11.7	11.7	18.6	4.2
132	72	10.2	6.9	17.6	1.9
141	77	5.9	2.9	8.5	0.7
150	82	3.6	1.7	4.8	0.3
159	87	2.0	0.8	2.9	0.1
168	92	1.1	0.9	0.4	0.3
178	97	0.6	0.4	0.2	0.1
187	102	1.2	0.3	0.2	0.1
196	107	1.0	0.2	0.1	0.0
205	112	0.6	0.1	0.1	0.0
214	117	0.7	0.1	0.1	0.0
223	122	0.5	0.1	0.0	0.0
232-296	127-162	1.4	0.1	0.1	<0.1
	N[b]	73588	9582	10510	5217
86-132	47-72	76.9	89.7	81.4	81.4

a. 22 = 20-24, *etc*. Equivalent values in meters.
b. N = effort in hours, and landings in tonnes.

Table 5B-3. Regression analysis of weighted mean depths (fms) of interviewed landings on year, by combination and species, at selected 5-fathom depth intervals (42-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS) from Cape Scott Spit (MSA 11-2; 5A), April-September 1966-95. (Sources: Appendix tables 5B-8 to 10)

Combination	N[a]	Parameters			Est. depth at:			Mean depth
		Slope	P, B=0	Intercept	1966	1995	95 - 66	1966-95
None								
LC	30	0.305	<0.01	-545	54.6	63.5	8.8	57.9
PC	30	0.373	<0.01	-677	56.3	67.1	10.8	61.0
RS	30	0.187	<0.01	-315	52.6	58.1	5.4	55.0
Single-species								
LC	29	0.164	0.13	-266	56.4	61.2	4.8	59.5
PC	29	0.453	<0.01	-833	57.6	70.7	13.1	64.7
RS	29	0.158	0.14	-258	52.6	57.2	4.6	54.4
Multiple-species								
LC/PC	30	0.192	0.04	-318	59.5	65.0	5.6	62.4
LC/RS	30	0.232	<0.01	-405	51.1	57.8	6.7	54/6
PC/RS	28	-0.006	0.05	68	56.2	56.0	-0.2	57.4
LC/PC/RS	30	0.271	<0.01	-480	52.8	60.6	7.9	57.6
Within Multiple-species								
LC/PC								
LC	30	0.157	0.07	-249	59.7	64.2	4.6	61.6
PC	30	0.236	0.01	-403	61.0	67.8	6.8	63.5
LC/RS								
LC	30	0.253	<0.01	-445	52.4	59.7	7.3	55.7
RS	30	0.239	<0.01	-420	49.9	56.8	6.9	53.7
PC/RS								
PC	28	0.242	0.16	-420	55.8	62.8	7.0	58.3
RS	28	0.020	0.88	16.9	56.2	56.8	0.6	56.0

Table 5B-3 (cont.)

Combination	N[a]	Parameters			Est. depth at:			Mean depth
		Slope	P, B=0	Intercept	1966	1995	95 - 66	1966-95
LC/PC/RS								
LC	30	0.310	<0.01	-557	52.5	61.5	9.0	57.8
PC	30	0.335	<0.01	-604	54.6	64.3	9.7	59.0
RS	30	0.187	<0.01	-314	53.6	59.1	5.4	55.8

Table 5B-4. ANOVA (single factor) tests of mean depths for combinations and species within combinations, within selected 5-fm depth intervals (47-72), for interviewed landings of lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix tables 5B-8 to 10)

Combination	N[a]	Mean depth (fms)	F	P
All:				
LC vs PC vs RS	30	57.9/61.0/55.0	17.408	<0.01
LC vs PC			7.511	0.01
LC vs RS			10.202	<0.01
PC vs RS			33.69	<0.01
Single species:				
LC vs PC vs RS	27	59.0/64.7/54.5	23.797	<0.01
LC vs PC			13.320	<0.01
LC vs RS			12.147	<0.01
PC vs RS				
Multiple species:				
All[b]	28	62.4/54.4/57.4/57.7	12.037	<0.01
LC/PC vs LC/RS			53.043	<0.01
LC/PC vs PC/RS			9.758	<0.01
LC/PC vs LC/PC/RS			16.549	<0.01
LC/RS vs PC/RS			4.033	0.05
LC/RS vs LC/PC/RS			9.134	<0.01
PC/RS vs LC/PC/RS			0.031	0.86
Species within multiple species:				
LC/PC/RS	30	57.8/59.0/55.8	5.534	0.01
LC/PC	30	61.6/63.5	3.403	0.07
LC/RS	30	55.7/53.7	4.654	0.04
PC/RS	28	58.3/56.0	1.657	0.20

a. N = numbers of years compared.
b. All = LC/PC vs LC/RS vs PC/RS vs LC/PC/RS.

Table 5B-5. "t" tests of weighted mean depths (all combinations), by 5-fm depth interval within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September, 1988 and 1991-93. (Source: PBS Groundfish Data Base)

Year	Interv. (fms)	Comp.	Depth (fms)	S.D. (fms)	Land.[a]	t	P	Year	Interv.	Comp.	Depth	S.D.	Land.[a]	t	P
1989	47	nil[b]	nil	nil	nil	nil	nil	1992	47	LC/PC	47.3/46.9	1.1/0.7	39/16	1.374	>0.30
										LC/RS	47.3/46.7	1.1/1.4	39/85	-0.760	>0.50
										PC/RS	46.9/46.7	0.7/1.4	16/85	0.556	>0.50
	52	LC/PC	52.6/51.1	1.4/1.6	35/24	3.726	>0.05		52	LC/PC	51.5/51.7	1.0/1.5	175/38	-0.985	>0.40
		LC/RS	52.6/52.5	1.4/1.3	35/68	0.094	>0.50			LC/RS	51.5/50.9	1.0/1.3	175/192	-1.189	>0.30
		PC/RS	51.1/52.5	1.6/1.3	24/68	-5.447	<0.05			PC/RS	51.7/50.9	1.5/1.3	38/192	3.304	>0.05
	57	LC/PC	56.3/57.1	0.9/0.9	239/35	-4.483	<0.05		57	LC/PC	57.0/57.2	1.5/1.5	121/86	-1.014	>0.40
		LC/RS	56.3/56.4	0.9/1.1	239/49	-0.243	>0.50			LC/RS	57.0/56.8	1.4/1.5	121/166	-0.529	>0.50
		PC/RS	57.1/56.4	0.9/1.1	35/49	3.754	>0.05			PC/RS	57.2/56.8	1.5/1.5	86/166	2.149	.>0.10
	62	LC/PC	62.0/61.4	1.6/1.7	331/63	2.370	>0.10		62	LC/PC	62.4/61.7	1.4/1.5	250/120	4.350	<0.05
		LC/RS	62.0/60.8	1.6/1.2	331/52	4.994	<0.05			LC/RS	62.4/61.3	1.4/1.4	250/70	0.159	>0.50
		PC/RS	61.4/60.8	1.7/1.2	63/52	1.983	>0.10			PC/RS	61.7/61.3	1.5/1.4	120/70	1.822	>0.20
	67	LC/PC	66.1/66.8	1.1/1.6	118/46	-3.289	>0.05		67	LC/PC	65.6/67.0	1.2/1.5	224/169	-10.278	<0.01
		LC/RS	66.1/65.2	1.1/0.8	118/6	2.097	>0.10			LC/RS	65.6/65.9	1.2/1.3	224/37	-0.713	>0.50
		PC/RS	66.8/65.2	1.6/0.8	46/6	1.737	>0.20			PC/RS	67.0/65.9	1.5/1.3	169/37	4.065	>0.05
	72	LC/PC	70.8/70.9	1.2/1.2	111/131	-0.569	>0.50		72	LC/PC	71.4/71.5	1.2/1.1	141/428	-0.765	>0.50
		LC/RS	70.8/71.9	1.2/0.5	111/0.3	-0.500	>0.50			LC/RS	71.4/71.2	1.2/1.4	141/28	-1.800	>0.20
		PC/RS	70.9/71.9	1.2/0.5	131/0.3	-0.336	>0.50			PC/RS	71.5/71.2	1.1/1.4	428/28	1.047	>0.40

Table 5B-5 (cont.)

Year	Interv. (fms)	Comp.	Depth (fms)	S.D. (fms)	Land.[a]	t	P	Year	Interv. (fms)	Comp.	Depth (fms)	S.D. (fms)	Land.[a]	t	P
1991	47	LC/PC	47.9/47.6	1.3/1.6	185/17	1.138	>0.30	1993	47	LC/PC	48.6/48.2	1.0/0.7	20/28	0.116	>0.50
		LC/RS	47.9/48.0	1.3/1.5	185/50	1.449	>0.20			LC/RS	48.6/48.0	1.0/1.1	20/57	0.142	>0.50
		PC/RS	47.6/48.0	1.6/1.5	17/50	-1.377	>0.30			PC/RS	48.2/48.0	0.7/1.1	28/57	0.057	>0.50
	52	LC/PC	51.1/51.3	1.2/1.7	336/41	-0.676	>0.50		52	LC/PC	52.2/52.0	1.4/1.1	48/37	0.037	>0.50
		LC/RS	51.1/50.8	1.2/1.4	336/78	-0.577	>0.50			LC/RS	52.2/51.7	1.4/1.4	48/144	0.060	>0.50
		PC/RS	51.3/50.8	1.7/1.4	41/78	1.479	>0.20			PC/RS	52.0/51.7	1.1/1.4	37/144	0.039	>0.50
	57	LC/PC	56.6/57.6	2.4/2.0	194/85	-3.433	>0.05		57	LC/PC	56.6/57.6	1.5/1.3	63/55	-0.134	>0.50
		LC/RS	56.6/56.3	2.4/1.9	194/120	-2.450	>0.10			LC/RS	56.6/56.5	1.5/1.4	63/104	0.018	>0.50
		PC/RS	57.6/56.3	2.0/1.9	85/120	3.716	>0.05			PC/RS	57.6/56.5	1.3/1.4	55/104	0.143	>0.50
	62	LC/PC	61.6/61.7	1.5/1.5	240/254	-0.834	>0.50		62	LC/PC	61.5/61.8	1.6/1.3	281/148	-0.017	>0.50
		LC/RS	61.6/61.3	1.5/1.2	240/34	-0.857	>0.40			LC/RS	61.5/60.8	1.6/1.3	281/72	0.062	>0.50
		PC/RS	61.7/61.3	1.5/1.2	254/34	1.268	>0.30			PC/RS	61.8/60.8	1.3/1.3	148/72	0.105	>0.50
	67	LC/PC	66.7/67.0	2.3/1.4	61/190	-1.438	>0.20		67	LC/PC	66.4/66.4	1.1/1.5	141/131	-0.003	>0.50
		LC/RS	66.7/66.7	2.3/1.9	61/6	-1.049	>0.40			LC/RS	66.4/66.6	1.1/1.5	141/11	-0.044	>0.50
		PC/RS	67.0/66.7	1.4/1.9	190/6	0.463	>0.50			PC/RS	66.4/66.6	1.5/1.5	131/11	-0.029	>0.50
	72	LC/PC	70.9/71.3	1.1/1.6	99/590	-2.160	>0.10		72	LC/PC	70.7/71.5	1.2/1.4	125/299	-0.067	>0.50
		LC/RS	70.9/71.1	1.1/1.6	99/10	-2.970	>0.05			LC/RS	70.7/71.0	1.2/1.3	125/21	-0.072	>0.50
		PC/RS	71.3/71.1	1.6/1.6	590/10	0.252	>0.50			PC/RS	71.5/71.0	1.4/1.3	299/21	0.077	>0.50

a. Thousands of pounds
b. Only one record.

Table 5B-6. Differences in mean depths (fms) among species (all combinations), by 5-fm depth interval within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September, 1988 and 1991-93. Note. Significant differences underlined. (Source:Table 5A-5)

Year (diff)[a]	Interv. (fms)	Mean depths LC	PC	RS	Diff[b]	Differences LC-PC	LC-RS	PC-RS
1989	47	nil	nil	nil	nil	nil	nil	nil
(8.8)	52	52.6	51.1	52.5	1.5	1.5	0.1	-1.4
	57	56.3	57.1	56.4	0.8	-0.8	-0.1	0.7
	62	62.0	61.4	60.8	1.2	0.6	1.2	0.6
	67	66.1	66.8	65.2	1.6	-0.7	0.9	1.6
	72	70.8	70.9	71.9	1.1	-0.1	-1.1	-1.0
1991	47	47.9	47.6	48.0	0.4	0.3	-0.1	-0.4
(11.6)	52	51.1	51.3	50.8	0.5	-0.2	0.3	0.5
	57	56.6	57.6	56.3	1.3	-1.0	0.3	1.3
	62	61.6	61.7	61.3	0.4	-0.1	0.3	0.4
	67	66.7	67.0	66.7	0.3	-0.3	0.0	0.3
	72	70.9	71.3	71.1	0.4	-0.4	-0.2	0.2
1992	47	47.3	46.9	46.7	0.6	0.4	0.6	0.2
(11.0)	52	51.5	51.7	50.9	0.8	-0.2	0.6	0.8
	57	57.0	57.2	56.8	0.4	-0.2	0.2	0.4
	62	62.4	61.7	61.3	1.1	0.7	1.1	0.4
	67	65.6	67.0	65.9	1.4	-1.4	-0.3	1.1
	72	71.4	71.5	71.2	0.3	-0.1	0.2	0.3
1993	47	48.6	48.2	48.0	0.6	0.4	0.6	0.2
(9.9)	52	52.2	52.0	51.7	0.5	0.2	0.5	0.3
	57	56.6	57.6	56.5	1.1	-1.0	0.1	1.1
	62	61.5	61.8	60.8	1.0	-0.3	0.7	1.0
	67	66.4	66.4	66.6	0.2	0.0	-0.2	-0.2
	72	70.7	71.5	71.0	0.8	-0.8	-0.3	0.5
	N				23	23	23	23
	Mean				0.8	-0.2	0.2	0.4
	S.D.				0.4	0.6	0.5	0.7
	Max				1.6	+1.5	+1.2	+1.6
	Min				0.2	-1.4	-1.1	-1.4
	Ns[c]					3	1	1
	N > ±1.0				8	2	3	5
	% > ±1.0				34.8	8.7	13.0	21.7

a. diff = absolute difference (Appendix table 5B-9).
b. Diff = absolute difference.
c. Ns = numbers of significant.differences.

Table 5B-7. Mean depths (fms), and interviewed landings (t), by species within combinations, at selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Sources: Appendix tables 5B-9,10)

Combination		47-72 fms		
		Mean	S.D.	Land
LC in:				
LC		59.5	5.0	1496
LC/PC	+	61.6	4.1	1173
LC/RS	-	55.7	3.9	1558
LC/PC/RS		57.8	3.9	4369
PC in:				
PC	+	64.7	6.4	1401
LC/PC		63.5	4.1	2027
PC/RS	-	58.3	7.7	702
LC/PC/RS		59.0	4.5	4439
RS in:				
RS		54.4	5.0	503
LC/RS	-	53.7	3.4	1069
PC/RS	+	56.0	5.9	248
LC/PC/RS		55.8	3.2	2425

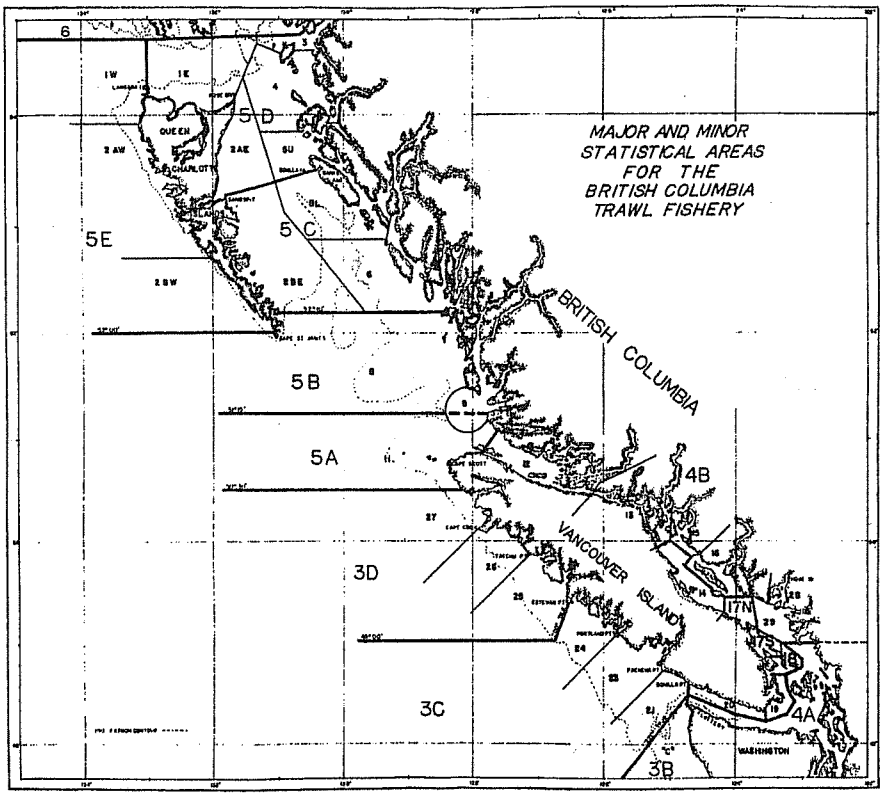


Figure 1. Statistical areas for the Groundfish trawl fishery off the west coast of Canada.

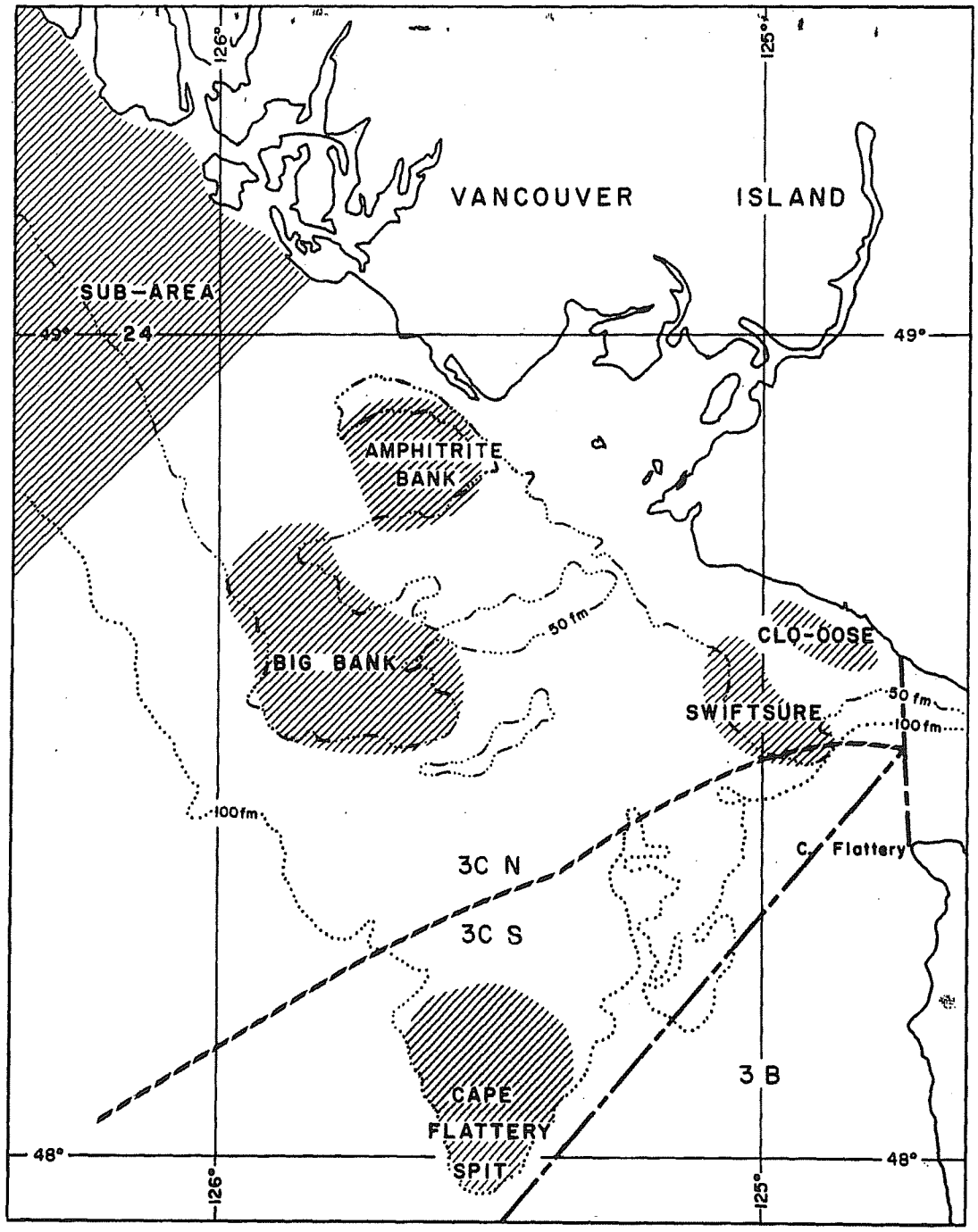


Figure 2. Important trawling grounds off southwest Vancouver Island

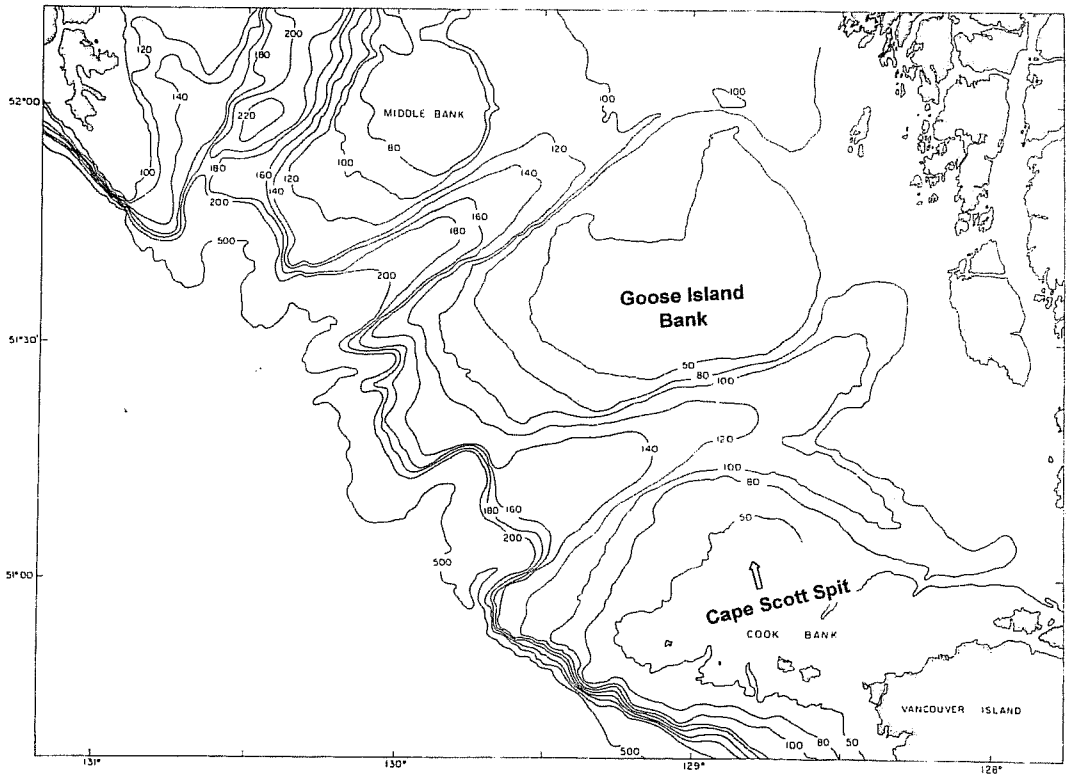


Figure 3. Important trawling grounds in Queen Charlotte Sound.

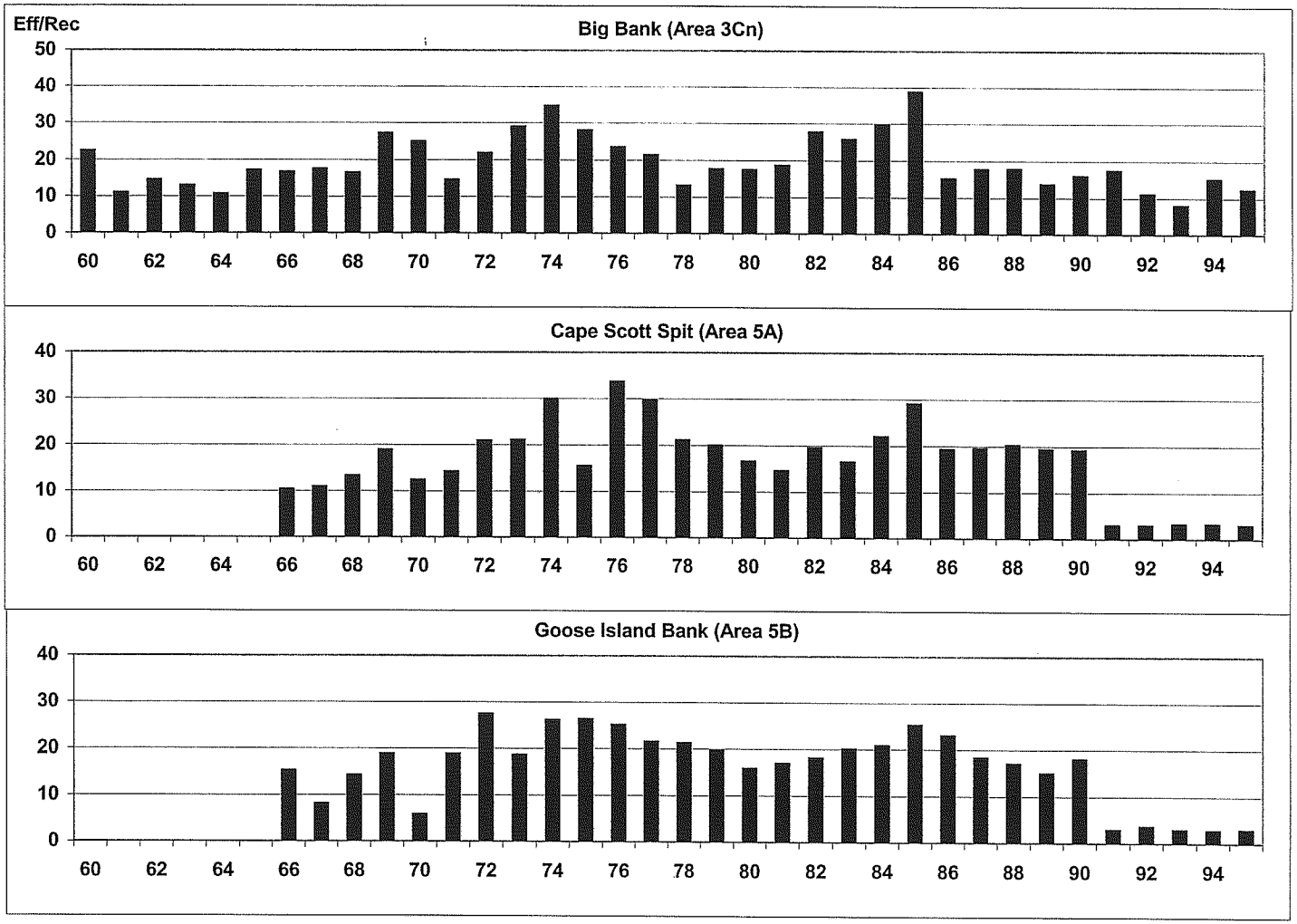


Figure 4. Interviewed effort (hrs) per record, by year and principal ground, for all-species landings from Major Areas 3Cn, 5A, and 5B, containing lingcod, Pacific cod, or rock sole, April-September 1960-95. (Source: Appendix tables 3Cn-1, 5A-1, 5B-1)

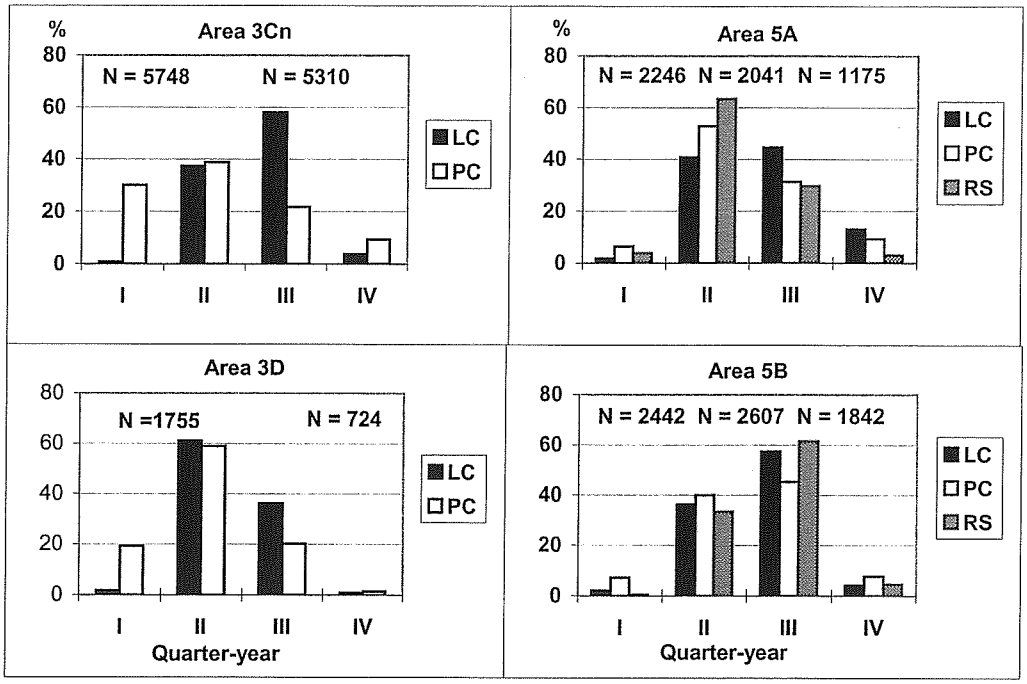


Figure 5. Cumulative interviewed landings (%), by major area and quarter-year, of lingcod (LC), Pacific cod (PC), and rock sole (RS), from Major Areas 3Cn, 3D, 5A, and 5B, for selected years, 1960-95. (N = interviewed landings (t)--LC on the left; RS on the right, if present.) (Source: unpublished 1999 report)

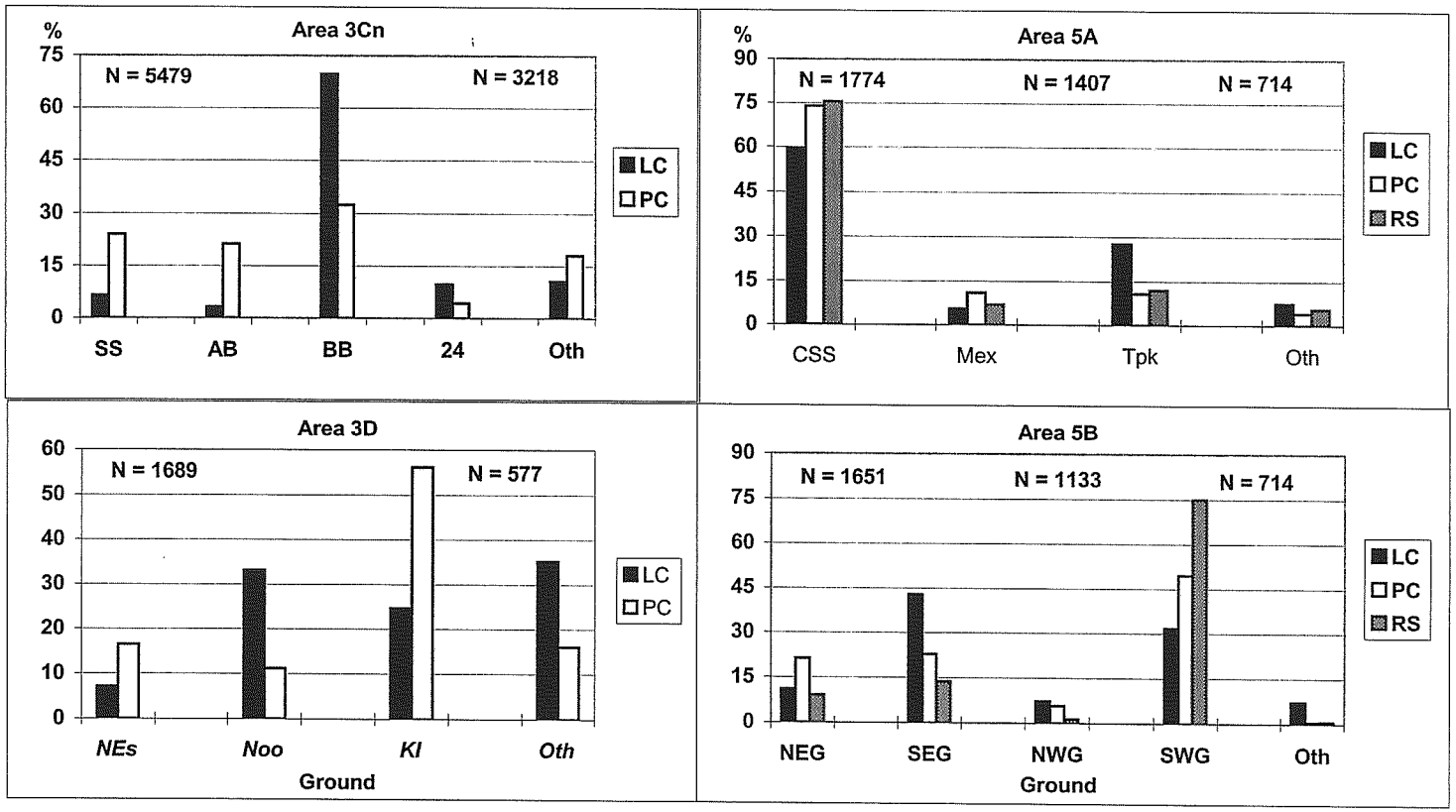


Figure 6. Cumulative interviewed landings (%), by ground, of lingcod (LC), Pacific cod (PC), and rock sole (RS), from Major Areas 3Cn, 3D, 5A, and 5B, for selected years, April-September 1960-95. (N = interviewed landings (t)--LC on the left; RS on the right, if present.) (Source: unpublished 1999 report)

Grounds:

Area 3Cn: AB = Amphitrite Bank; BB = Big Bank; Oth = other grounds; SS = Swiftsure Bank.

Area 3D: KI = Kains Is., NEs = N. Estevan; Noo = Nootka; Oth = other grounds..

Area 5A: CSS = Cape Scott Spit; Mex = Mexicana; Tpk = Topknot; Oth = other grounds.

Area 5B: NEG = NE Goose; NWG = NW Goose; SEG = SE Goose; SWG = SW Goose; Oth = other grounds.

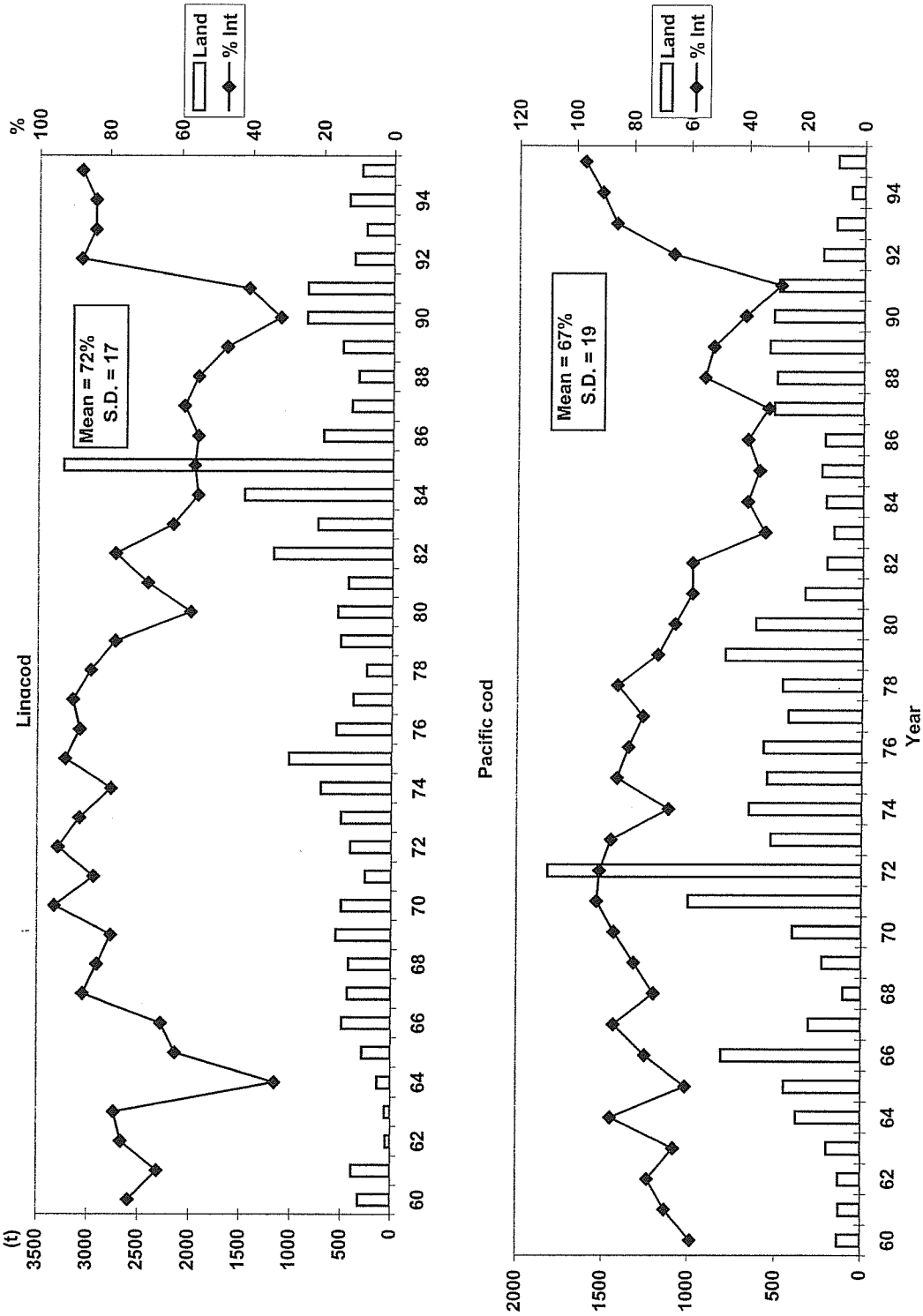


Figure 3Cn-1. Total landings (t) and percent interviewed, by year, for lingcod and Pacific cod from MSA 23, April-September 1960-95. (Source: Appendix table 3Cn-2)

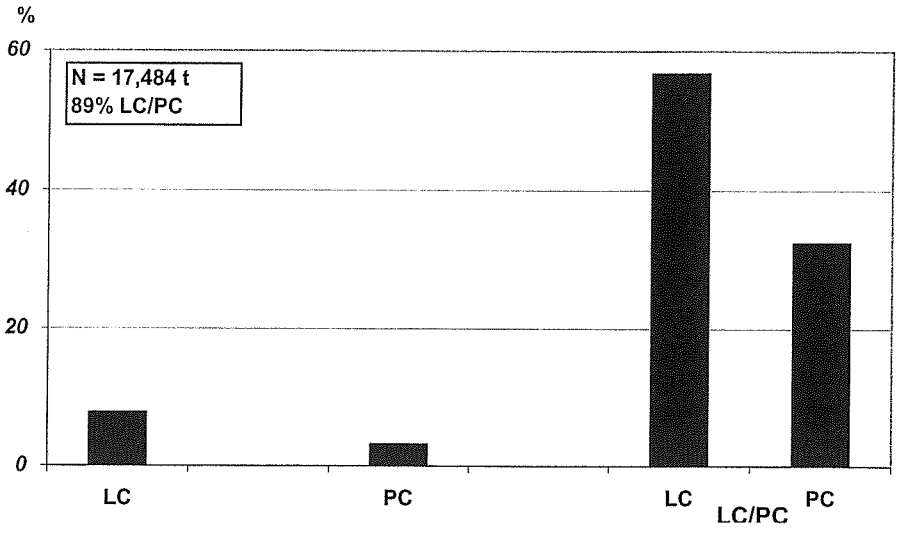


Figure 3Cn-2. Interviewed landings (%), by species in combinations (all depths), of lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: Appendix table 3Cn-3)

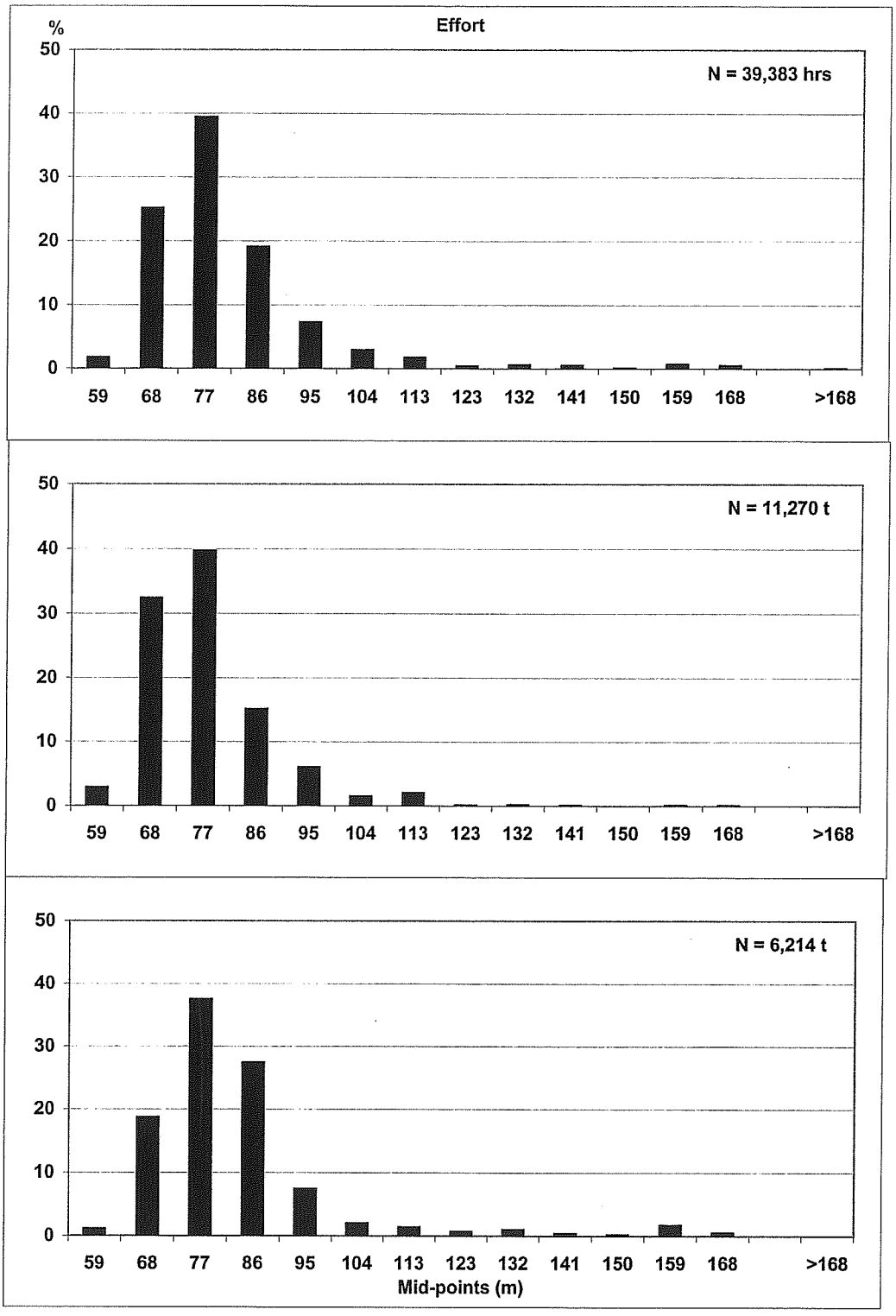


Figure 3Cn-3. Interviewed all-species effort (%) and interviewed landings (%), by mid-points (m) of 5-fm depth intervals, for lingcod and Pacific cod from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: Table 3Cn-1)

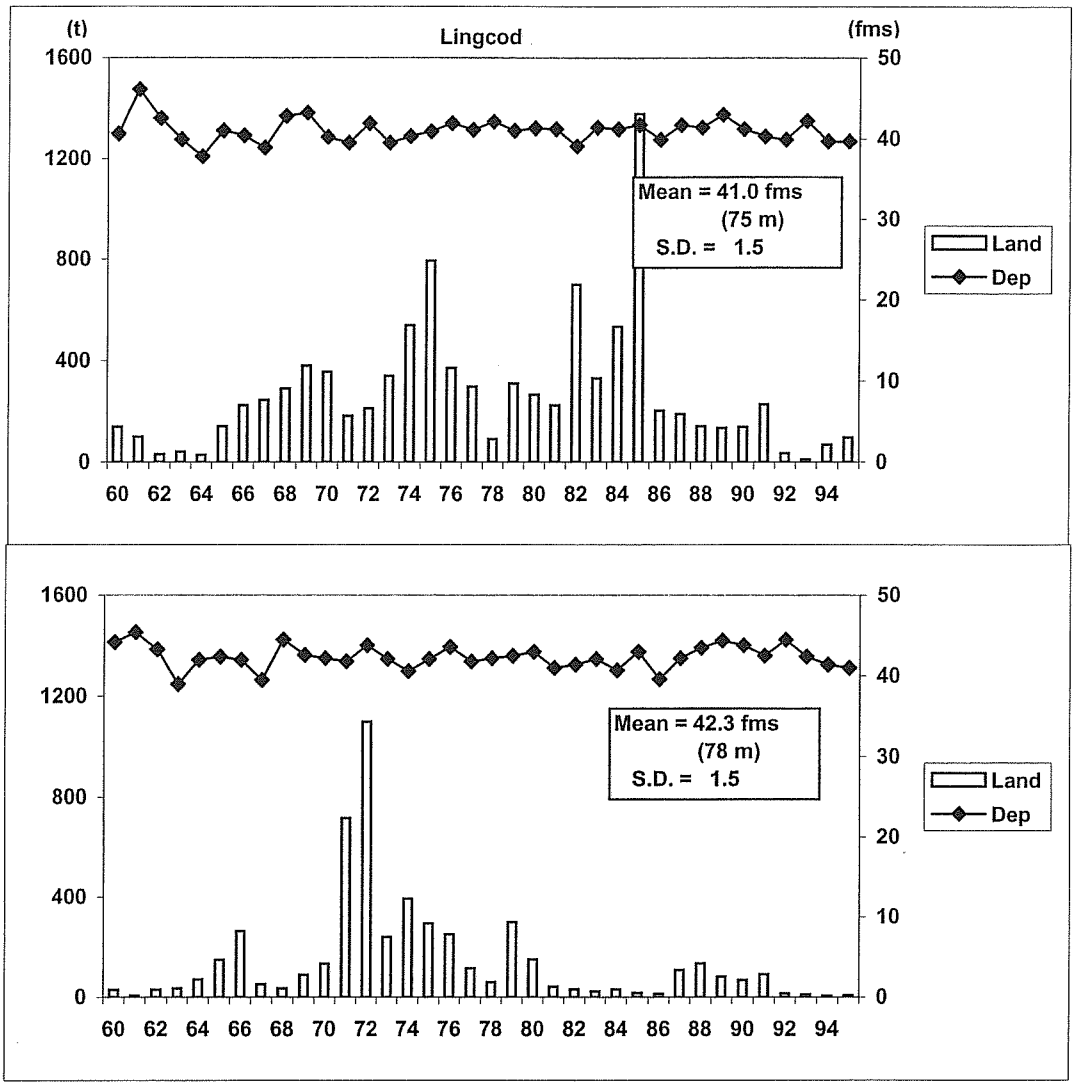


Figure 3Cn-4. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year, within selected 5-fm depth intervals (37-47), for lingcod and Pacific cod from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: Appendix table 3Cn-7)

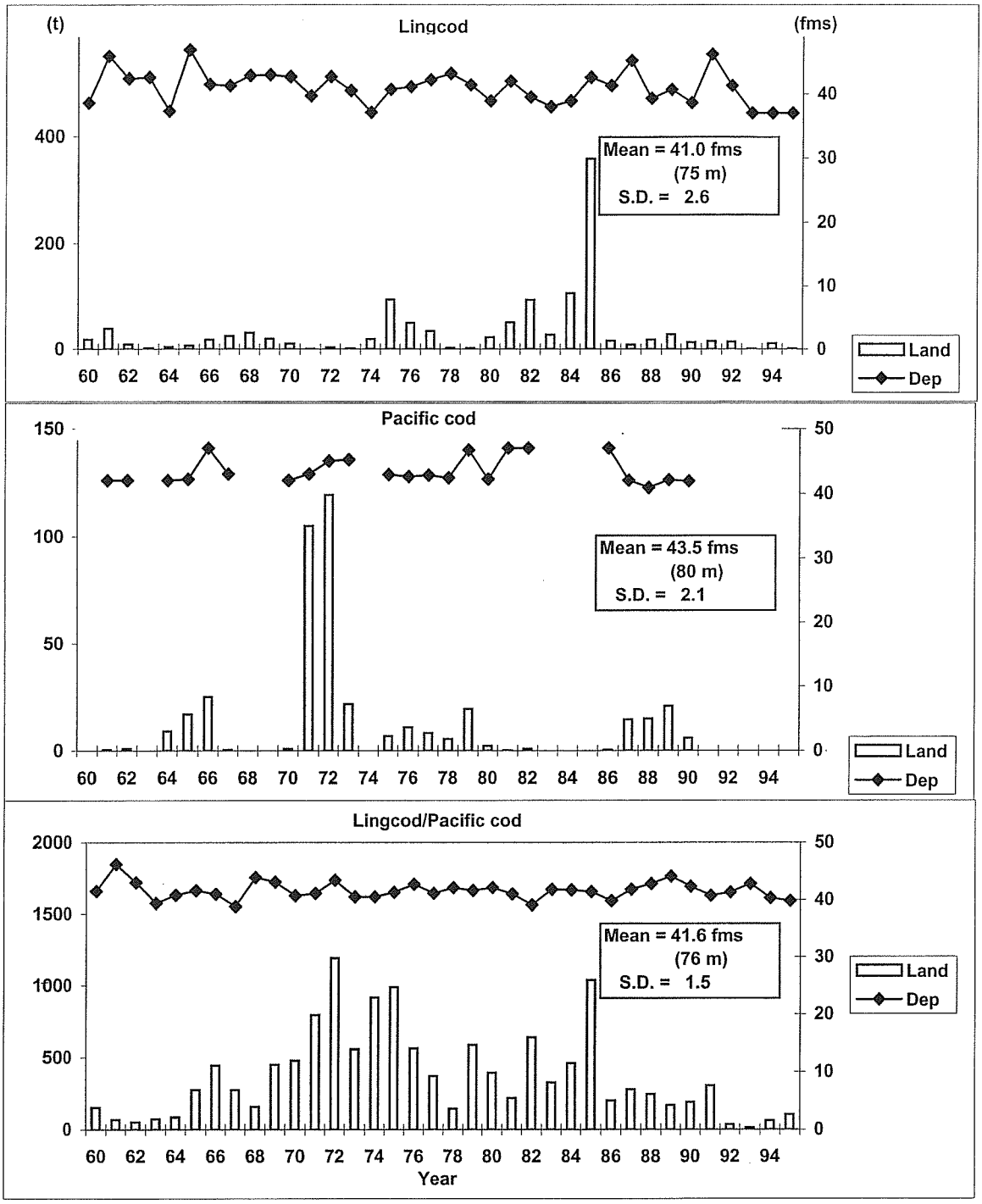


Figure 3Cn-5. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and combination, within selected 5-fm depth intervals (37-47), for lingcod and Pacific cod from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: Appendix table 3Cn-9)

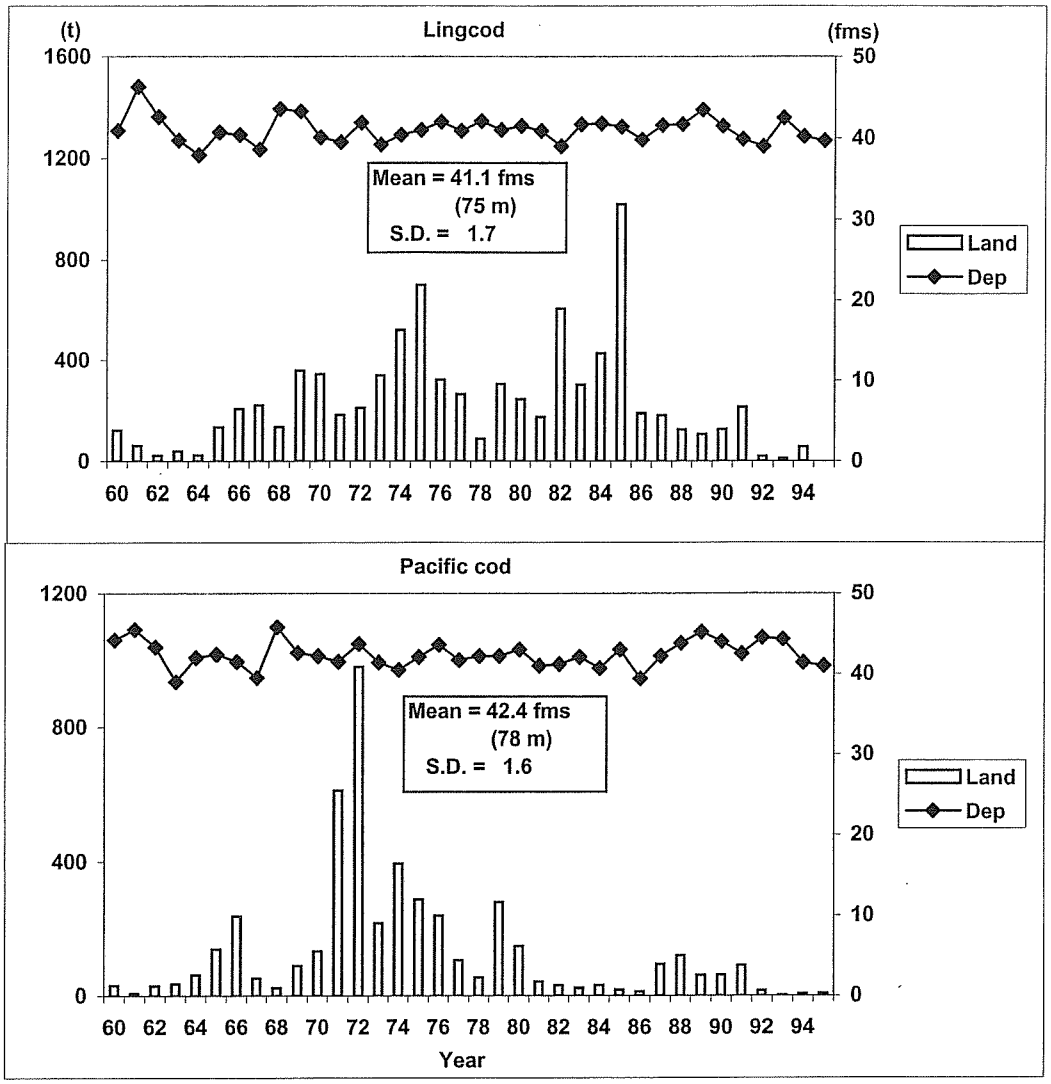


Figure 3Cn-6.Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year, and species in the LC/PC combination, within selected 5-fm depth intervals (37-47), for lingcod and Pacific cod from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: Appendix table 3Cn-9)

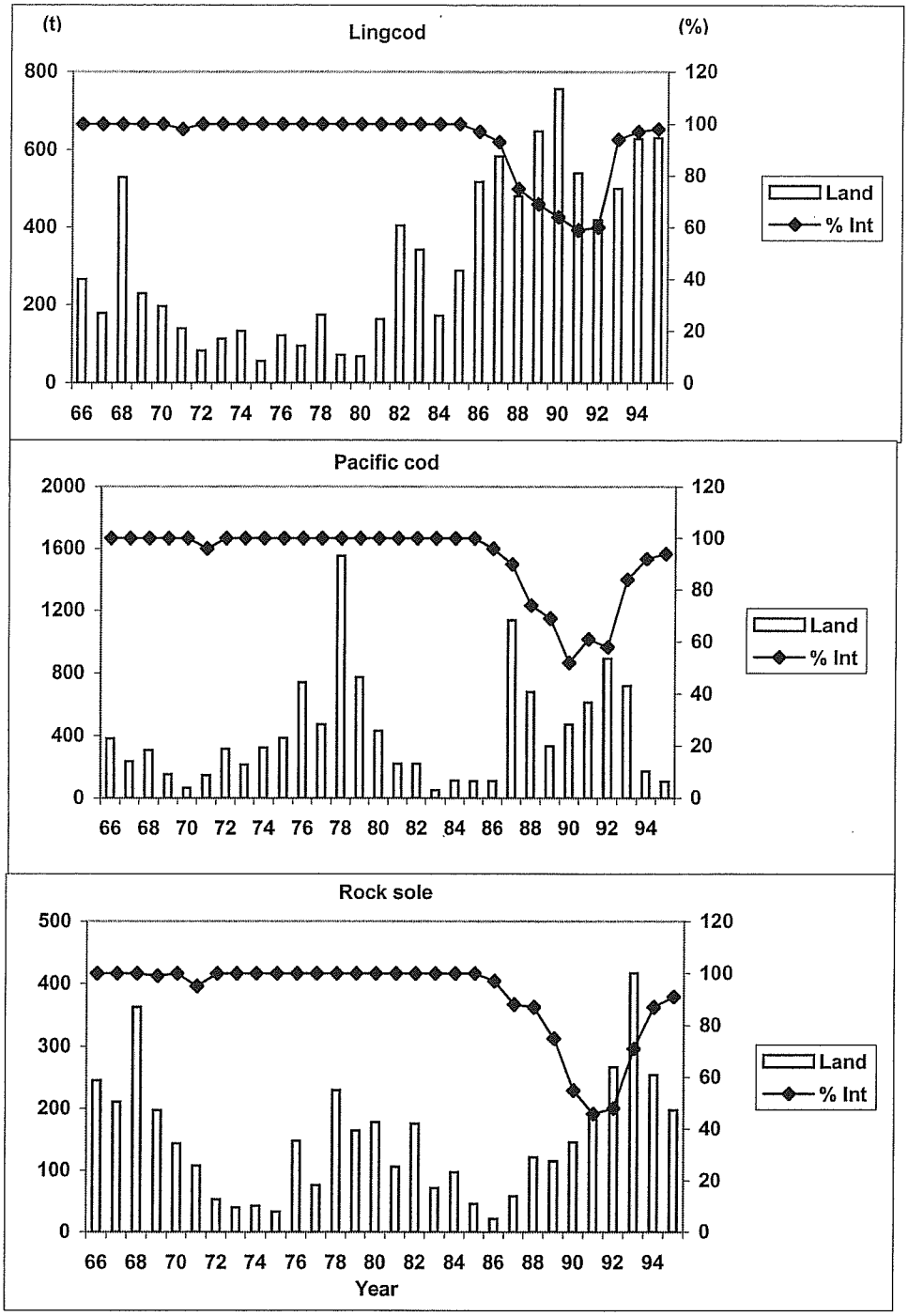


Figure 5A-1. Total landings (t), and percent interviewed, by year, for lingcod (LC), Pacific cod (PC), and rock sole (RS), from MSA 11, April-September 1966-95. (Source: Appendix table 5A-2).

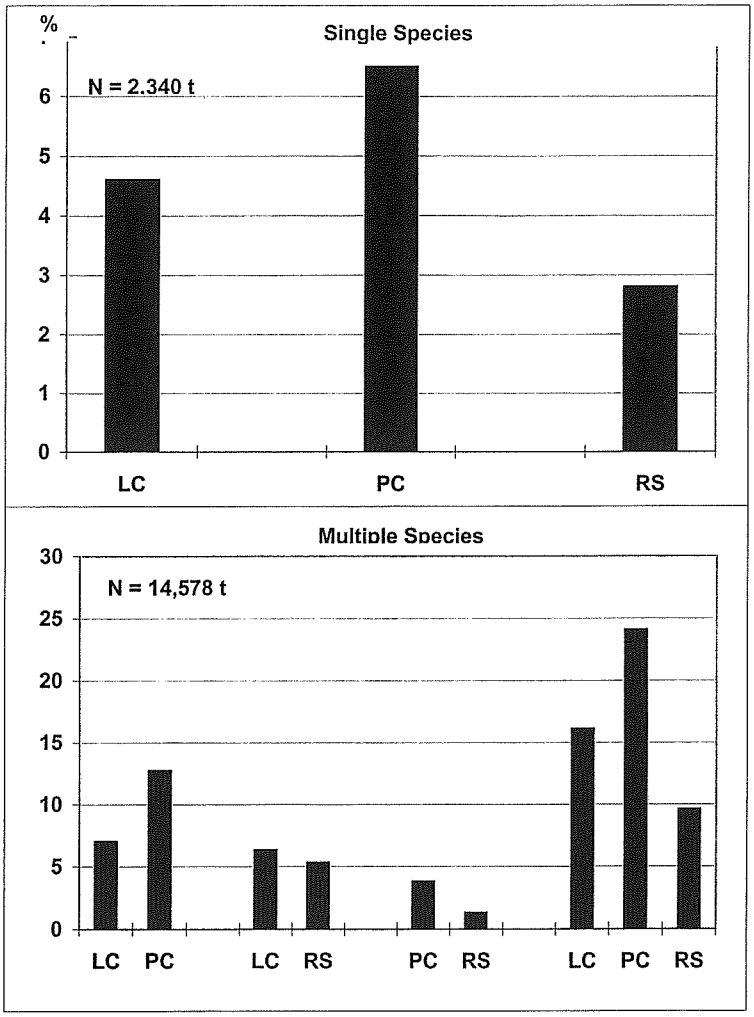


Figure 5A-2. Interviewed landings (%), by species in combinations (all depths), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-3).

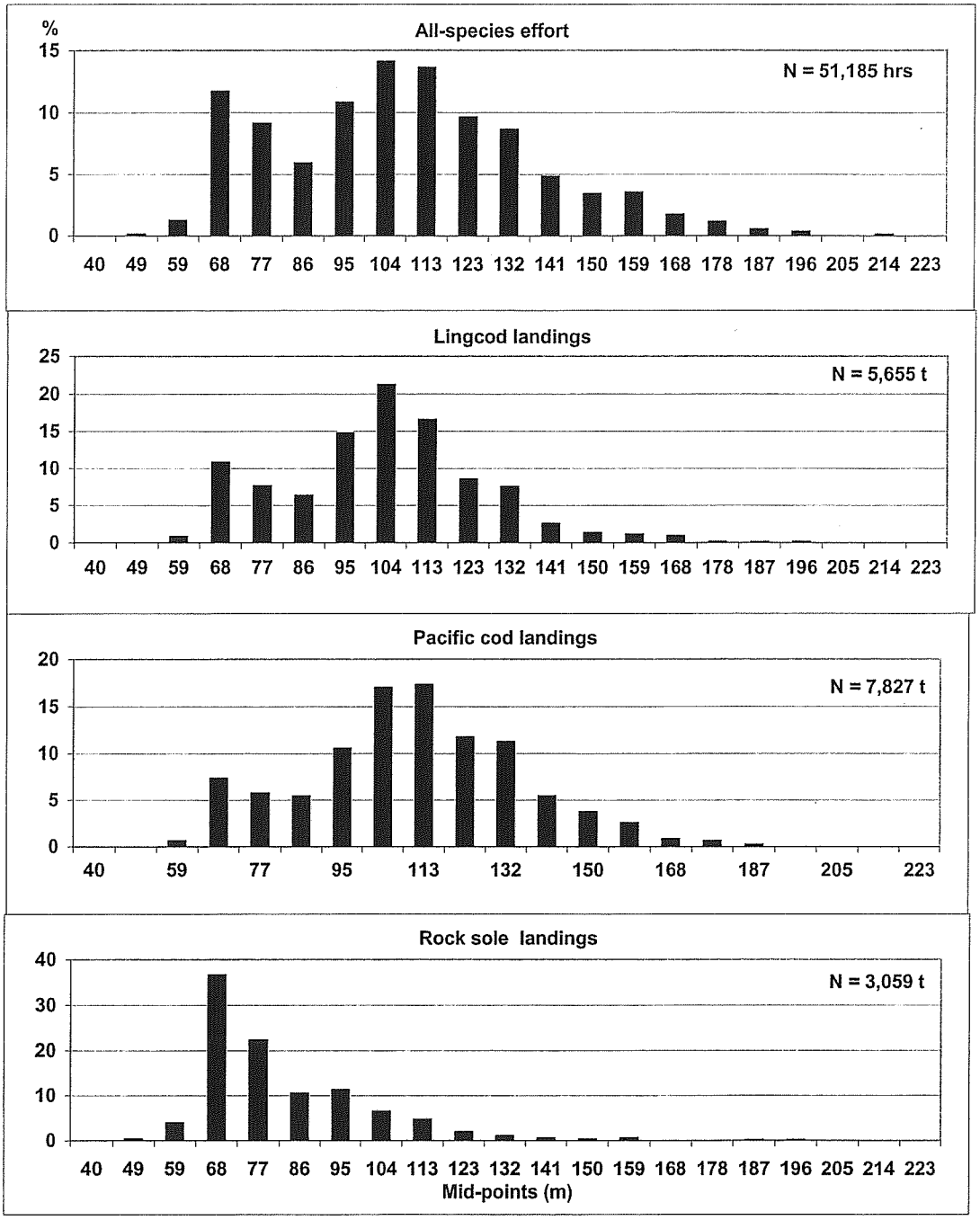


Figure 5A-3. All-species interviewed effort (%), and interviewed landings (%) of lingcod, Pacific cod, and rock sole, by mid-points (m) of 5-fm depth intervals, from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix tables 5A-4,5,6,7)

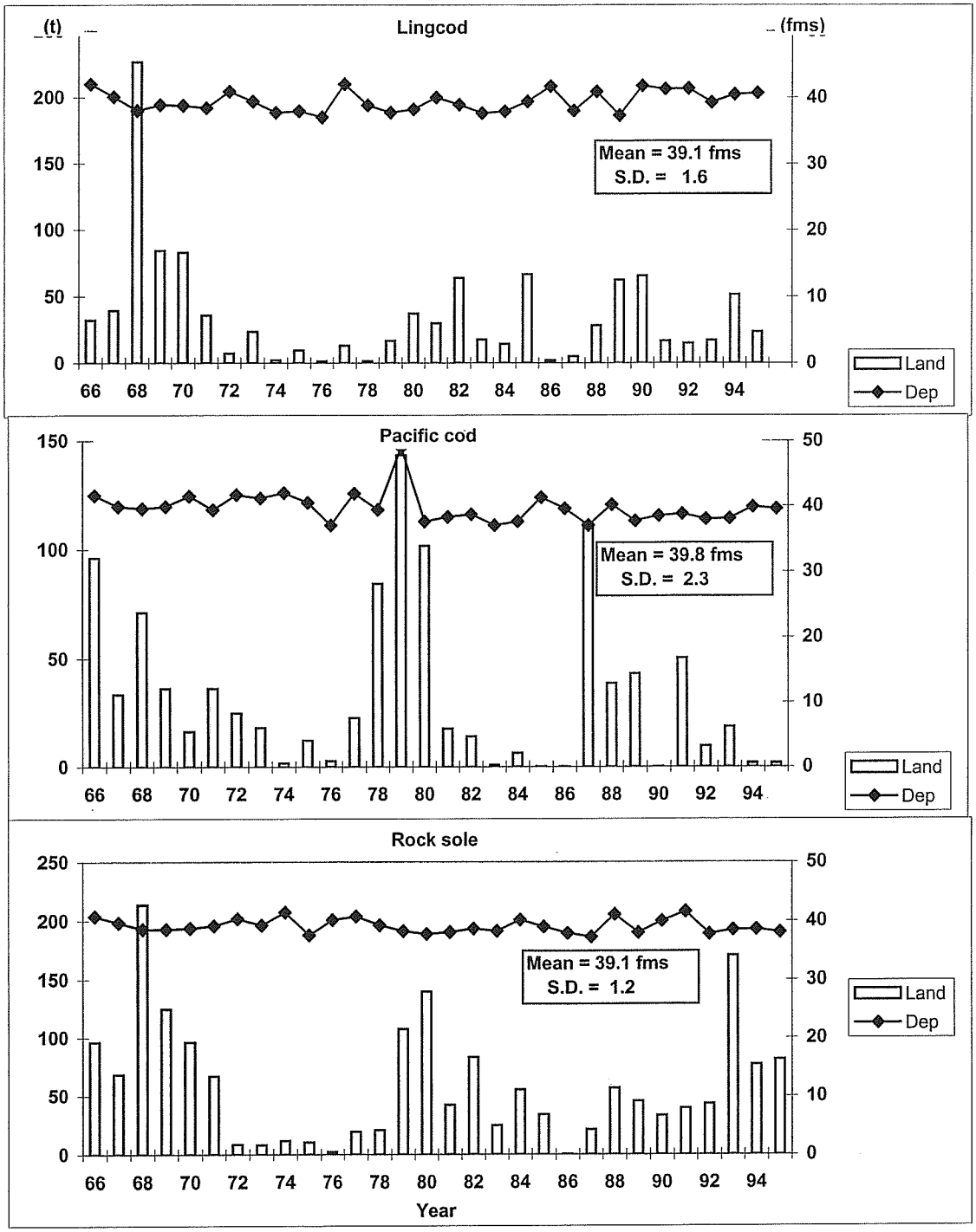


Figure 5A-4. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year, within selected 5-fm depth intervals (37-42), for lingcod, Pacific cod, and rock sole, from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-8)

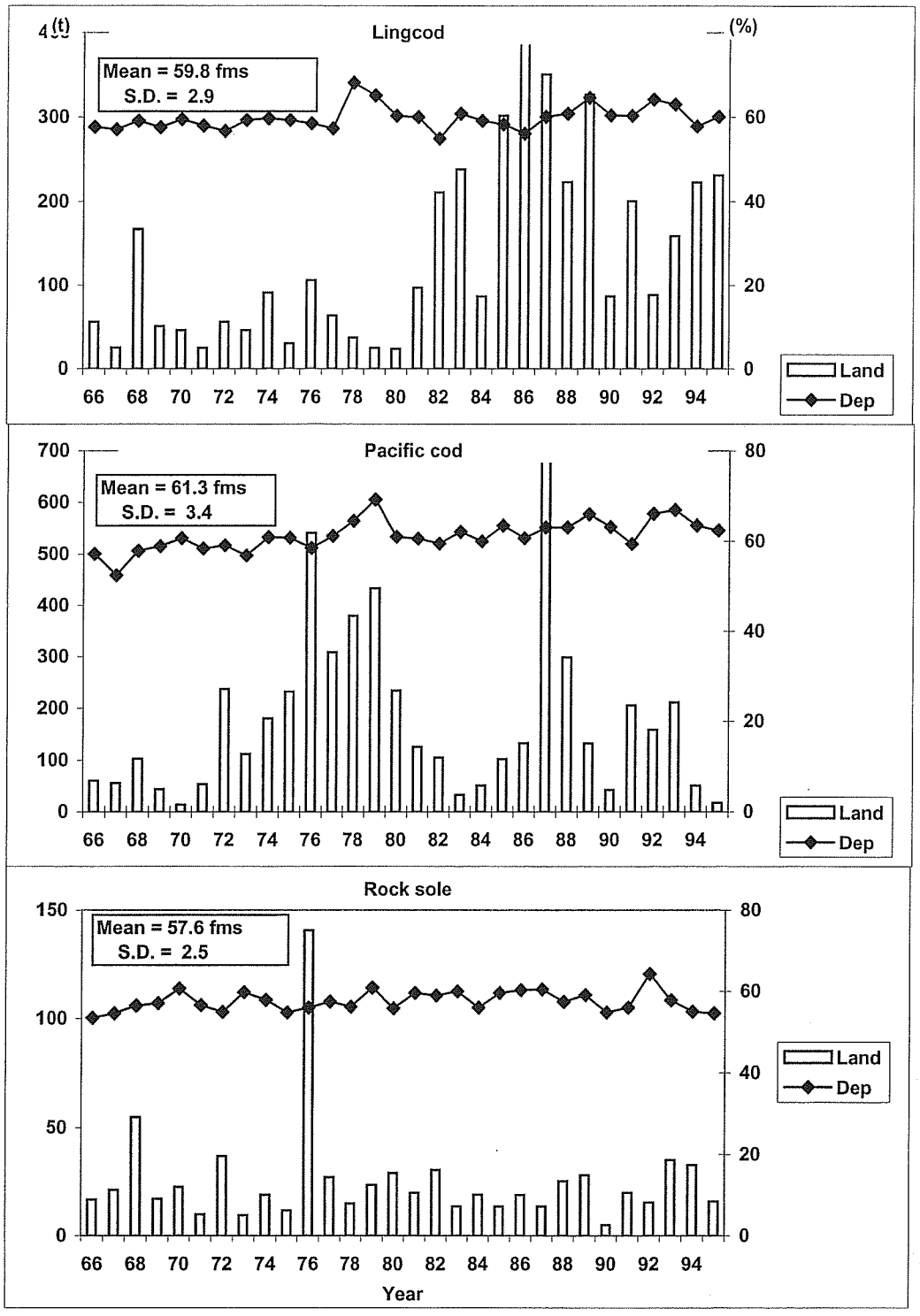


Figure 5A-5. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year, within selected 5-fm depth intervals (52-72), for lingcod, Pacific cod, and rock sole, from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-8)

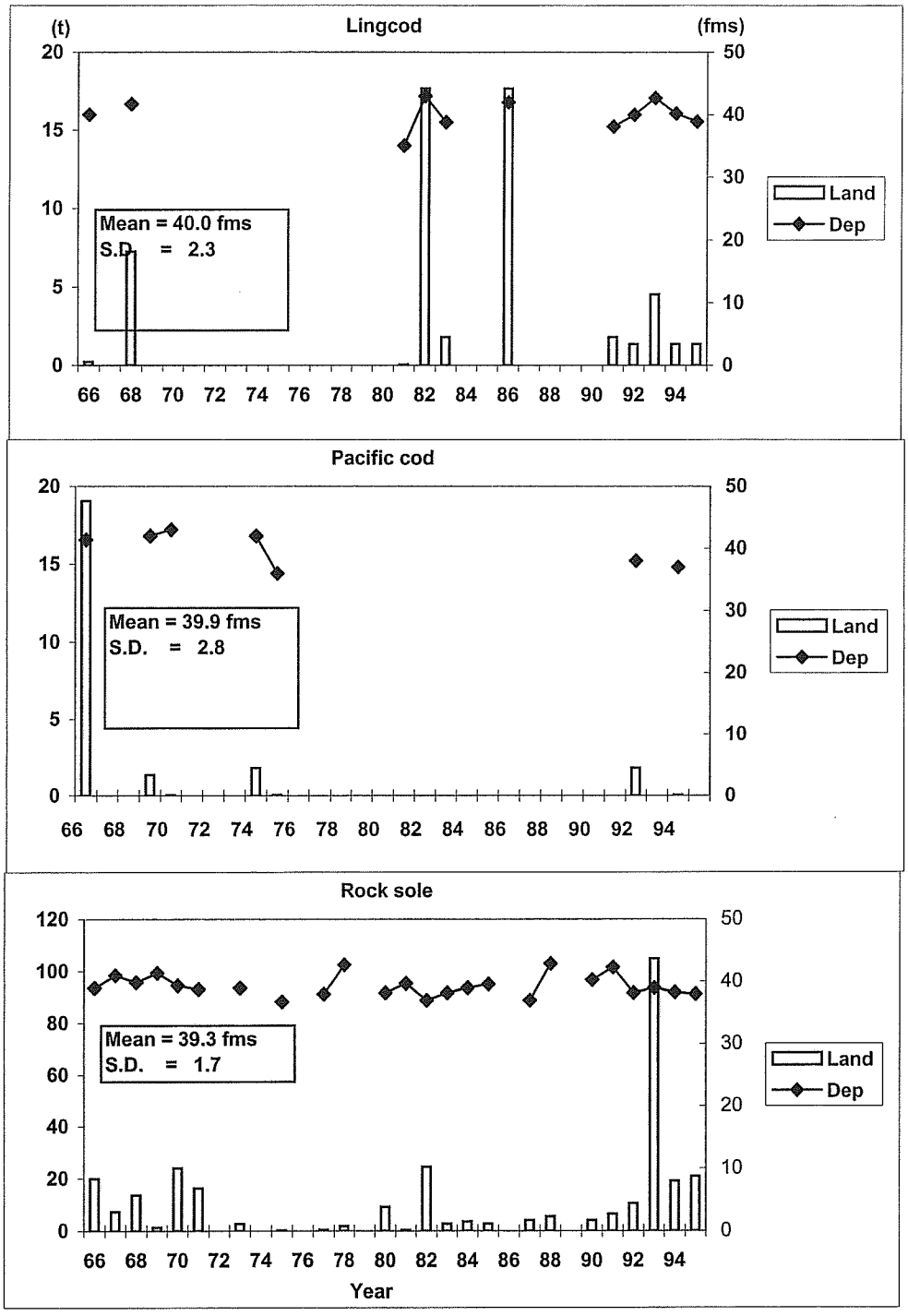


Figure 5A-6. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and single-species combination, within selected 5-fm depth intervals (37-42), for lingcod, Pacific cod, and rock sole, from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-10)

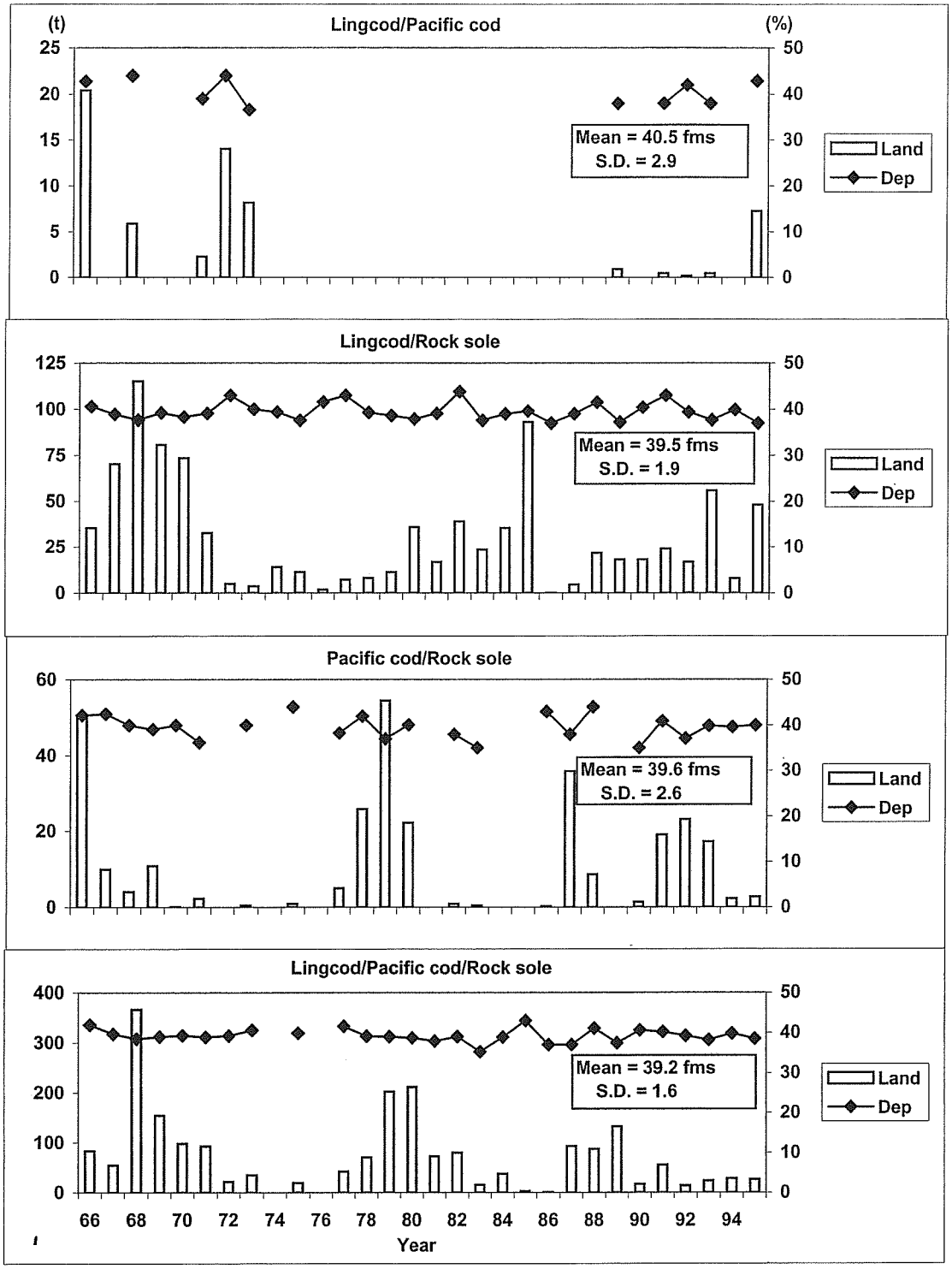


Figure 5A-7. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and multiple-species combination, within selected 5-fm depth intervals (37-42), for lingcod, Pacific cod, and rock sole, from Cape Flattery Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-10)

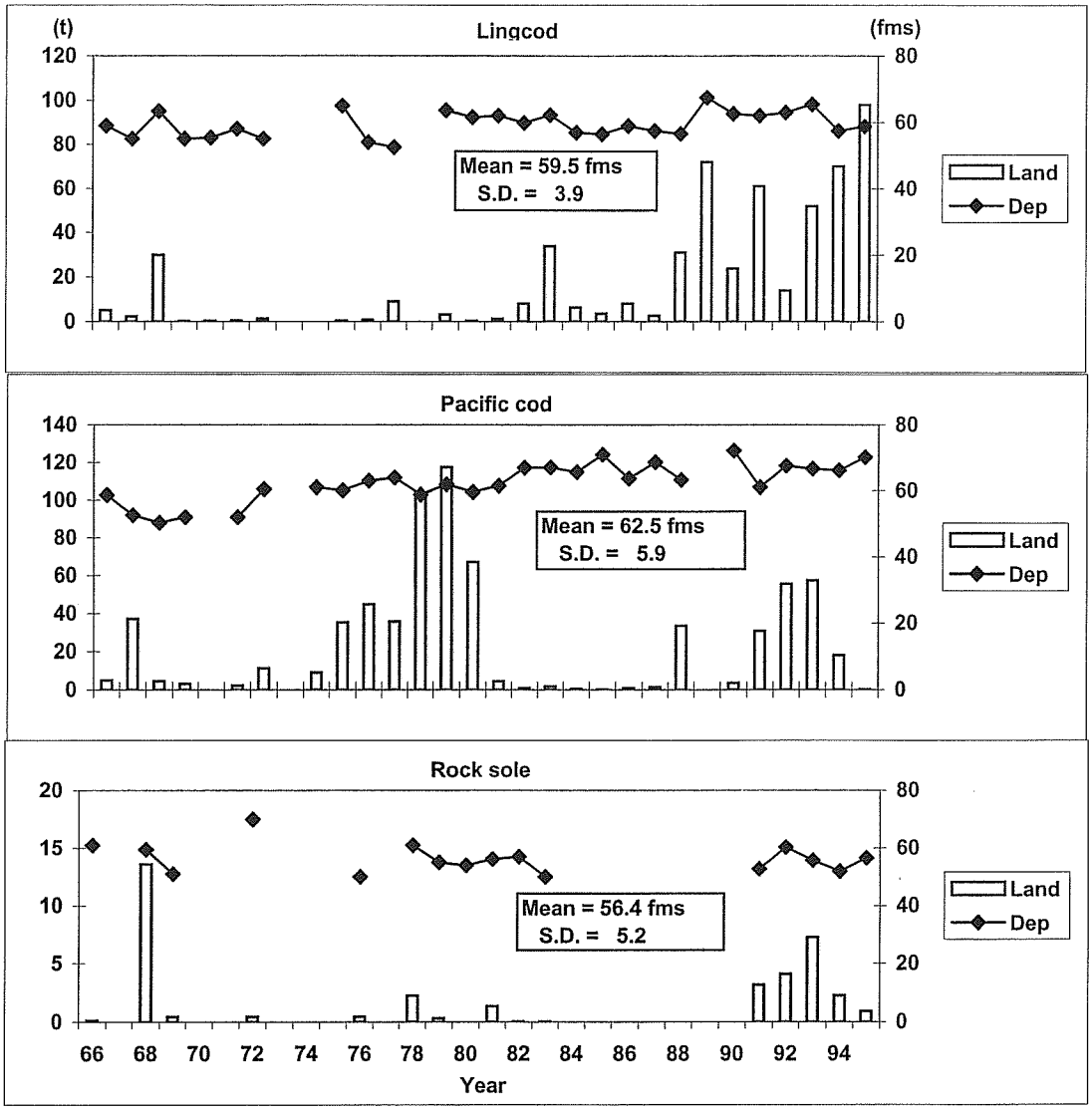


Figure 5A-8. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and single-species combination, within selected 5-fm depth intervals (52-72), for lingcod, Pacific cod, and rock sole, from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-11)

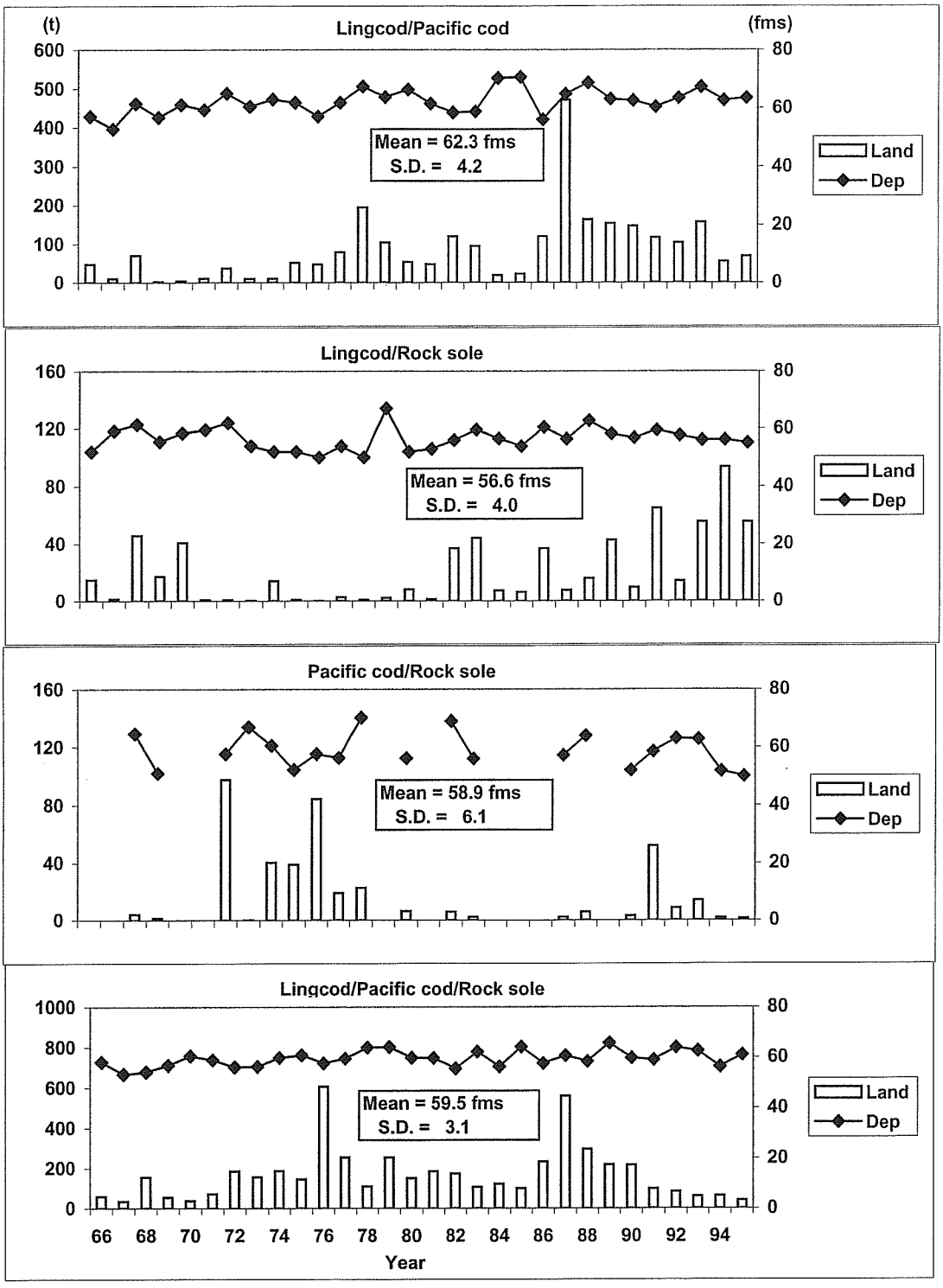


Figure 5A-9. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and multiple-species combination, within selected 5-fm depth intervals (52-72), for lingcod, Pacific cod, and rock sole, from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-11)

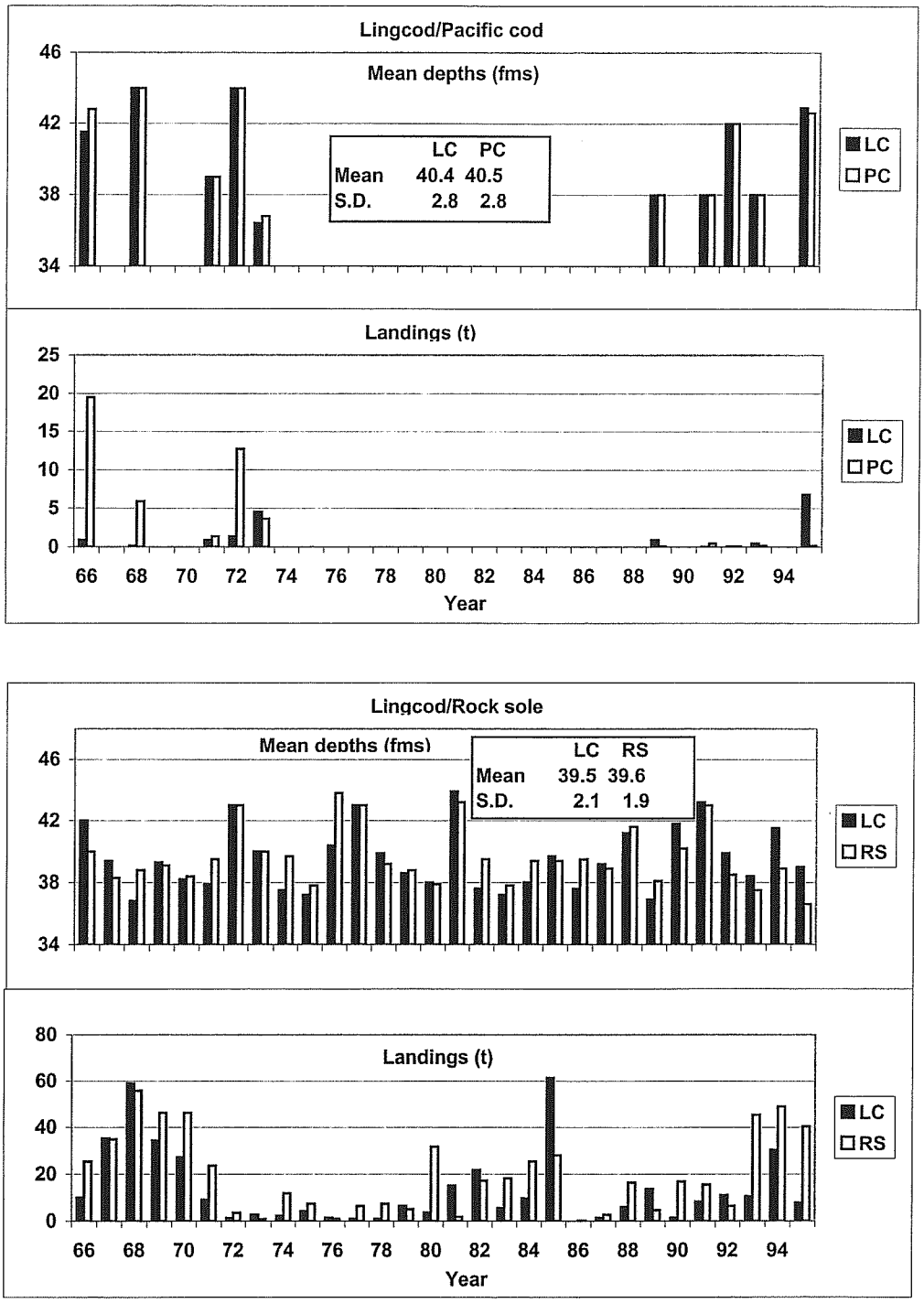
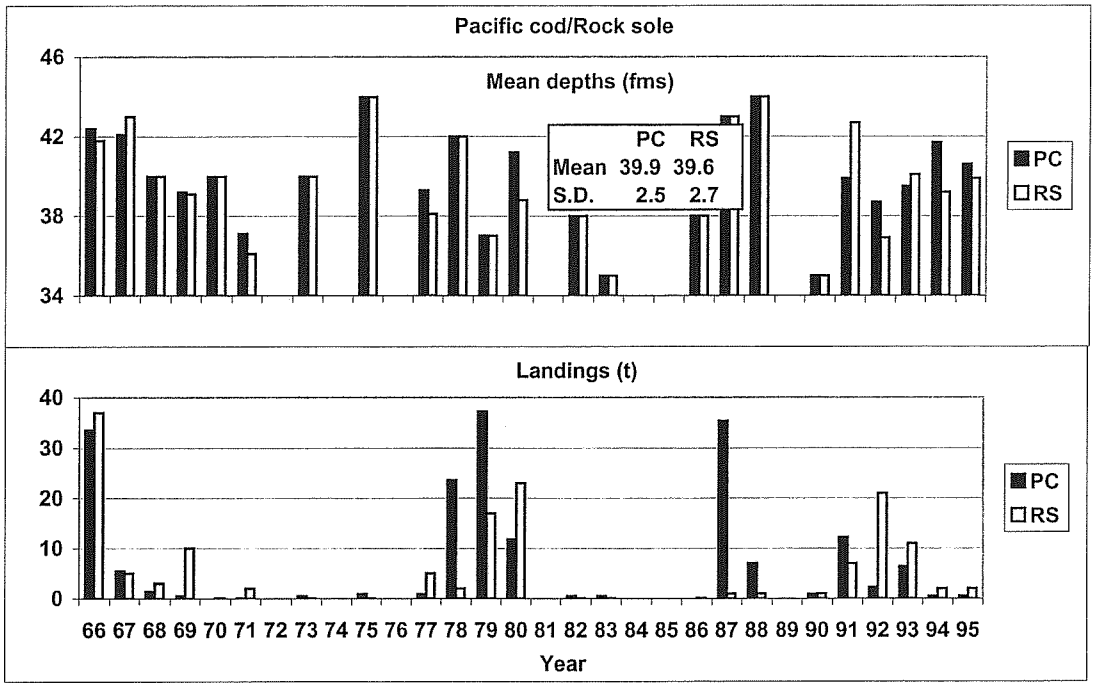


Figure 5A-10. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and species in the LC/PC and LC/RS combinations, within selected 5-fm depth intervals (37-42), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Flattery Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-12)



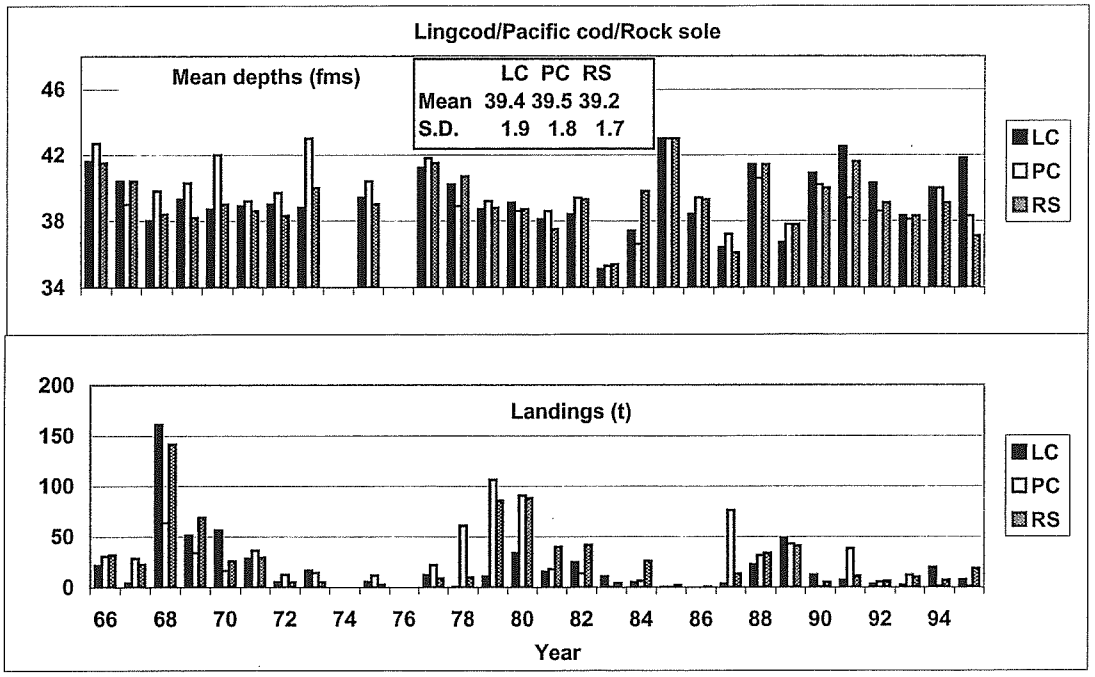


Figure 5A-11.Weighted mean depths (fms), and interviewed landings (t), by year and species in the PC/RS and LC/PC/RS combinations, within selected 5-fm depth intervals (37-42), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-12)

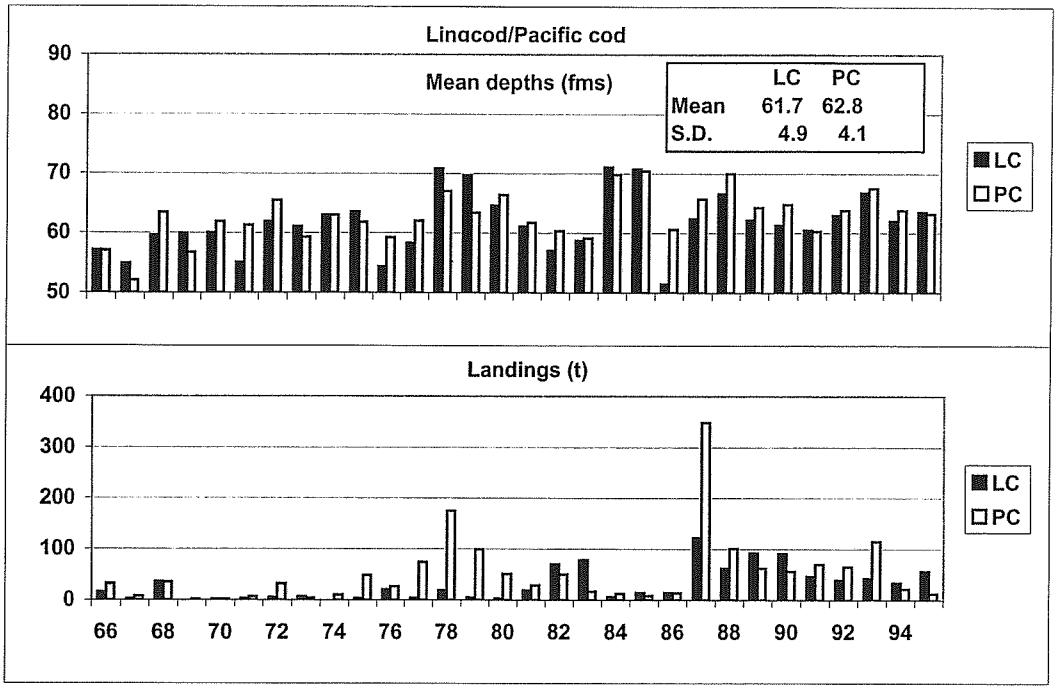
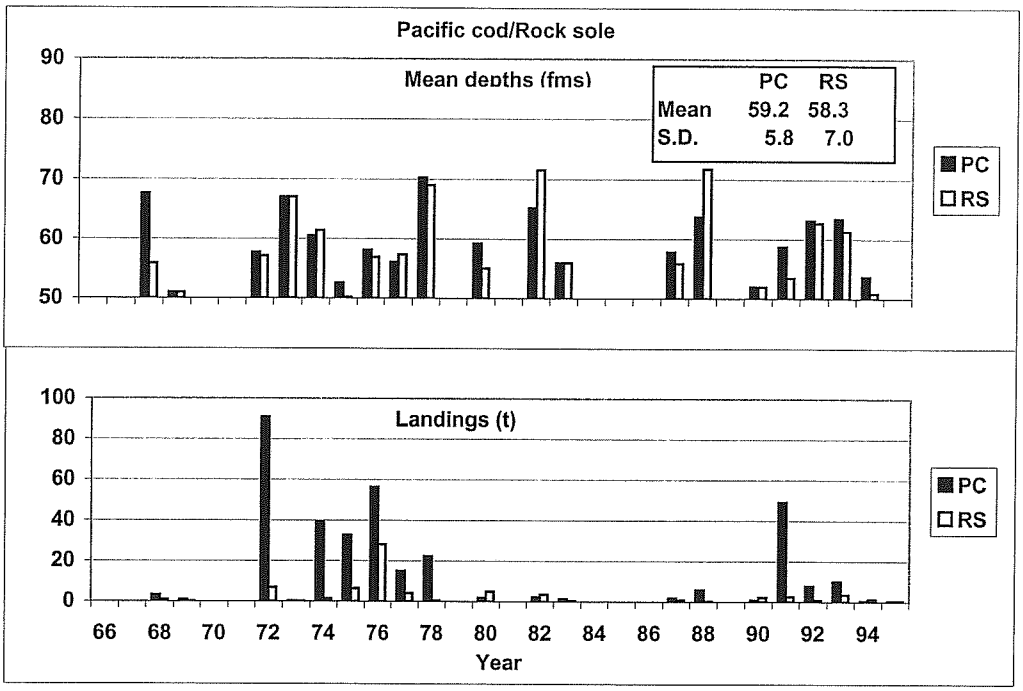


Figure 5A-12.Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and species in the LC/PC and LC/RS combinations, within selected 5-fm depth intervals (52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2; Area 5A), April-September 1966-95. (Source: Appendix table 5A-13)



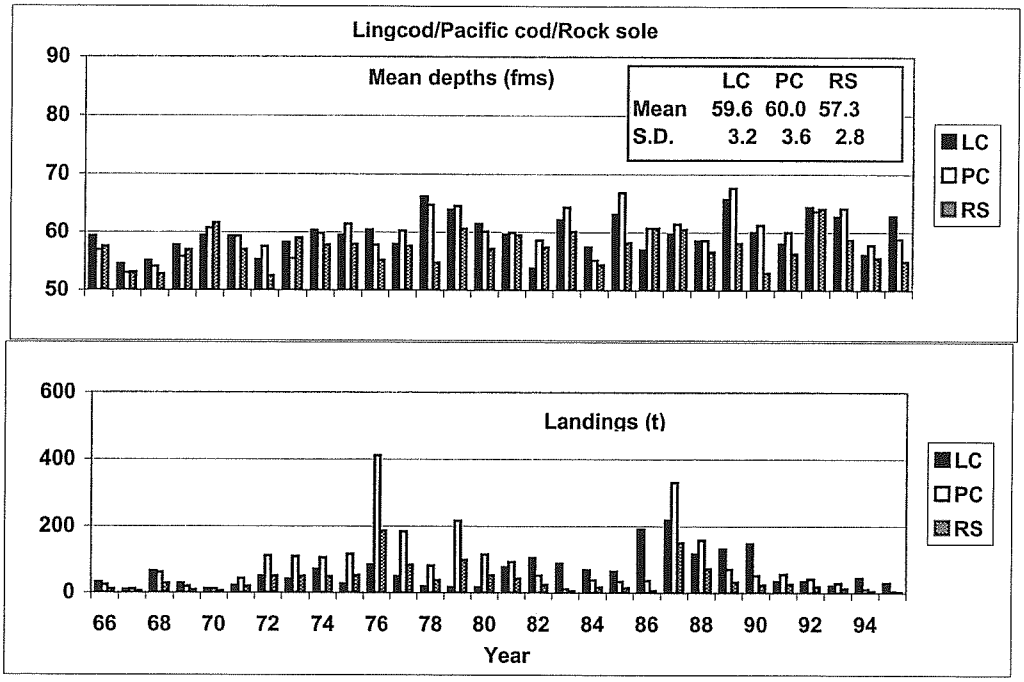


Figure 5A-13. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and species in the PC/RS and LC/PC/RS combinations, within selected 5-fm depth intervals (52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-13)

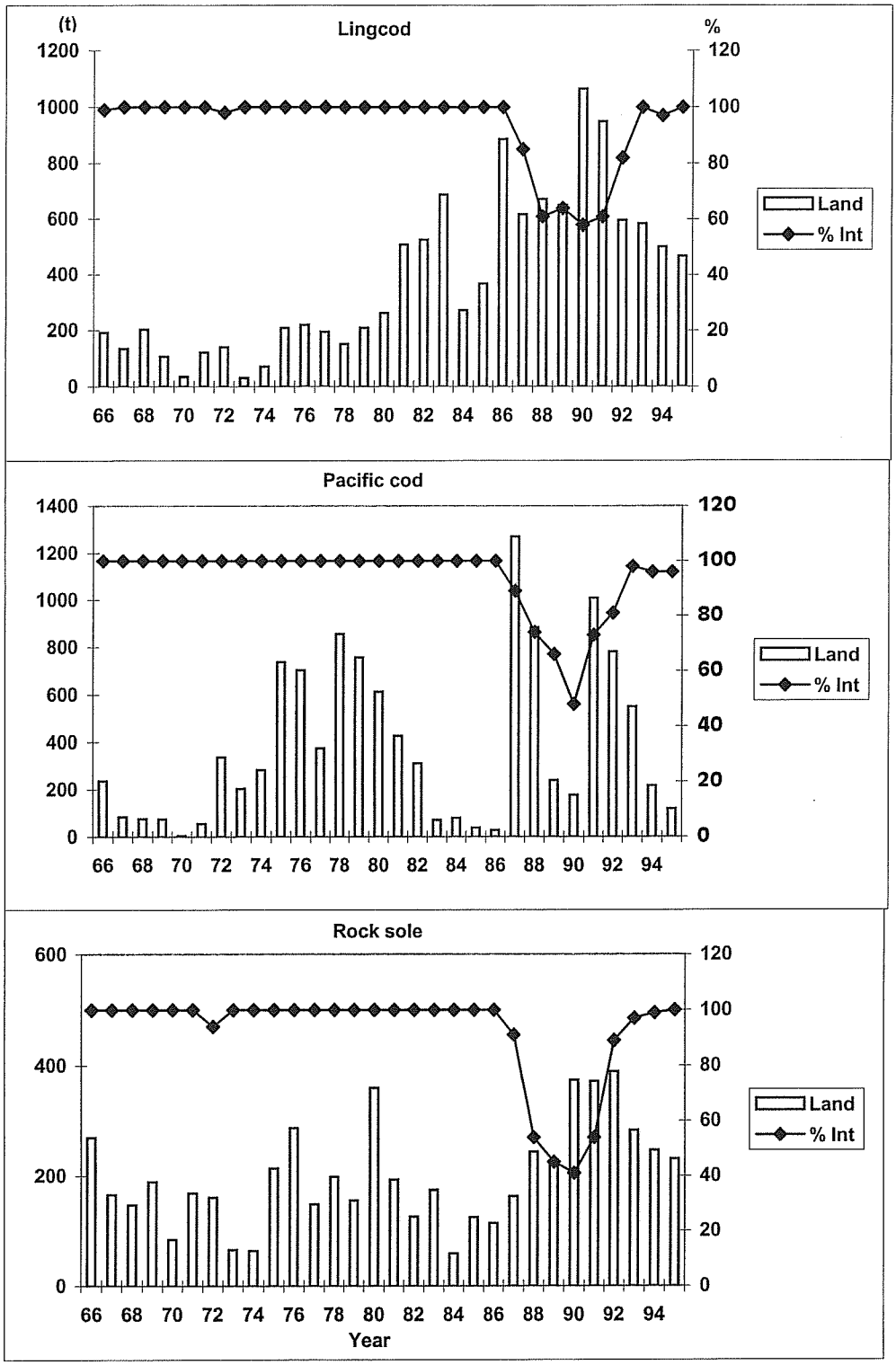


Figure 5B-1. Total landings (t) and percent interviewed, by year, for lingcod, Pacific cod, and rock sole, from Area 5B (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix table 5B-2)

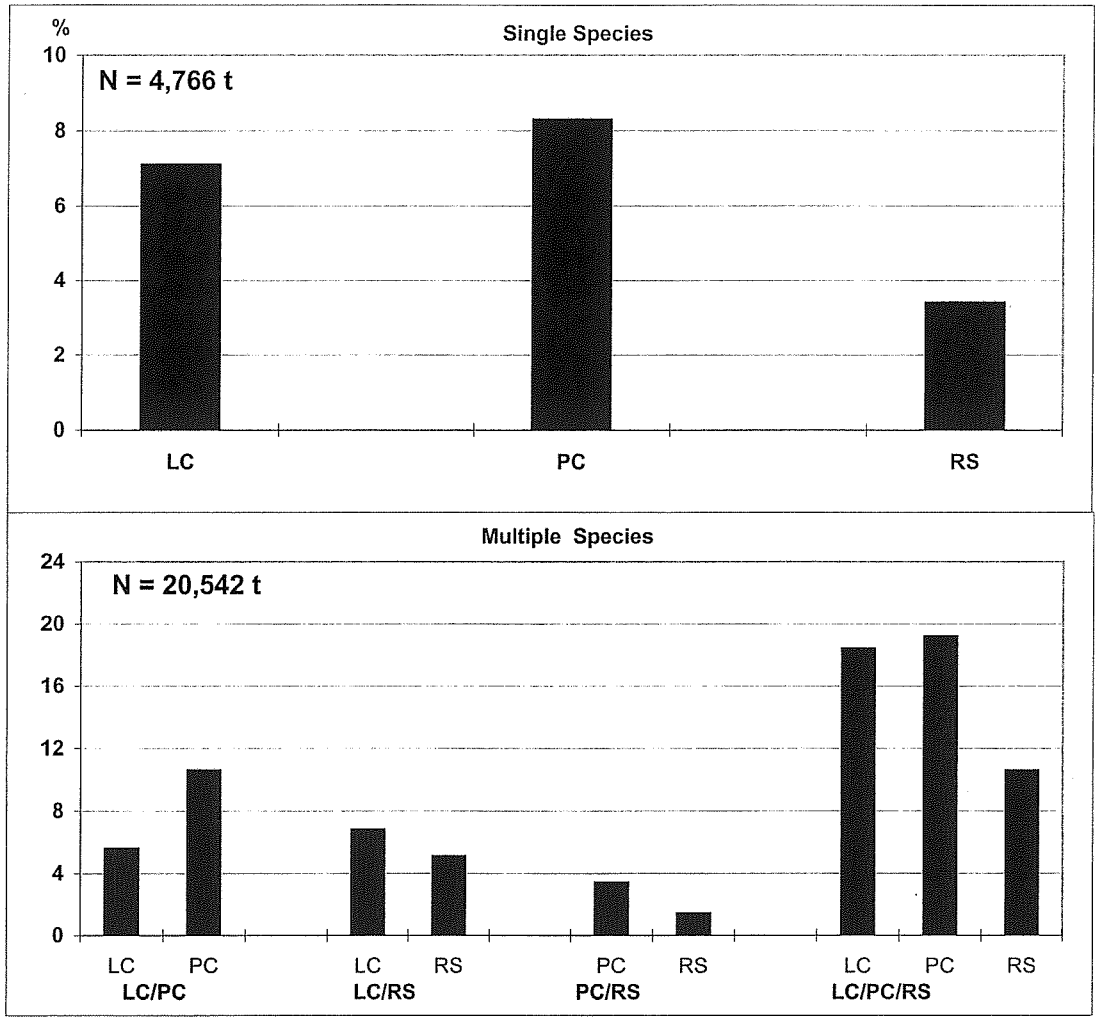


Figure 5B-2. Interviewed landings (%), by species in combinations (all depths), of lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix table 5B-3)

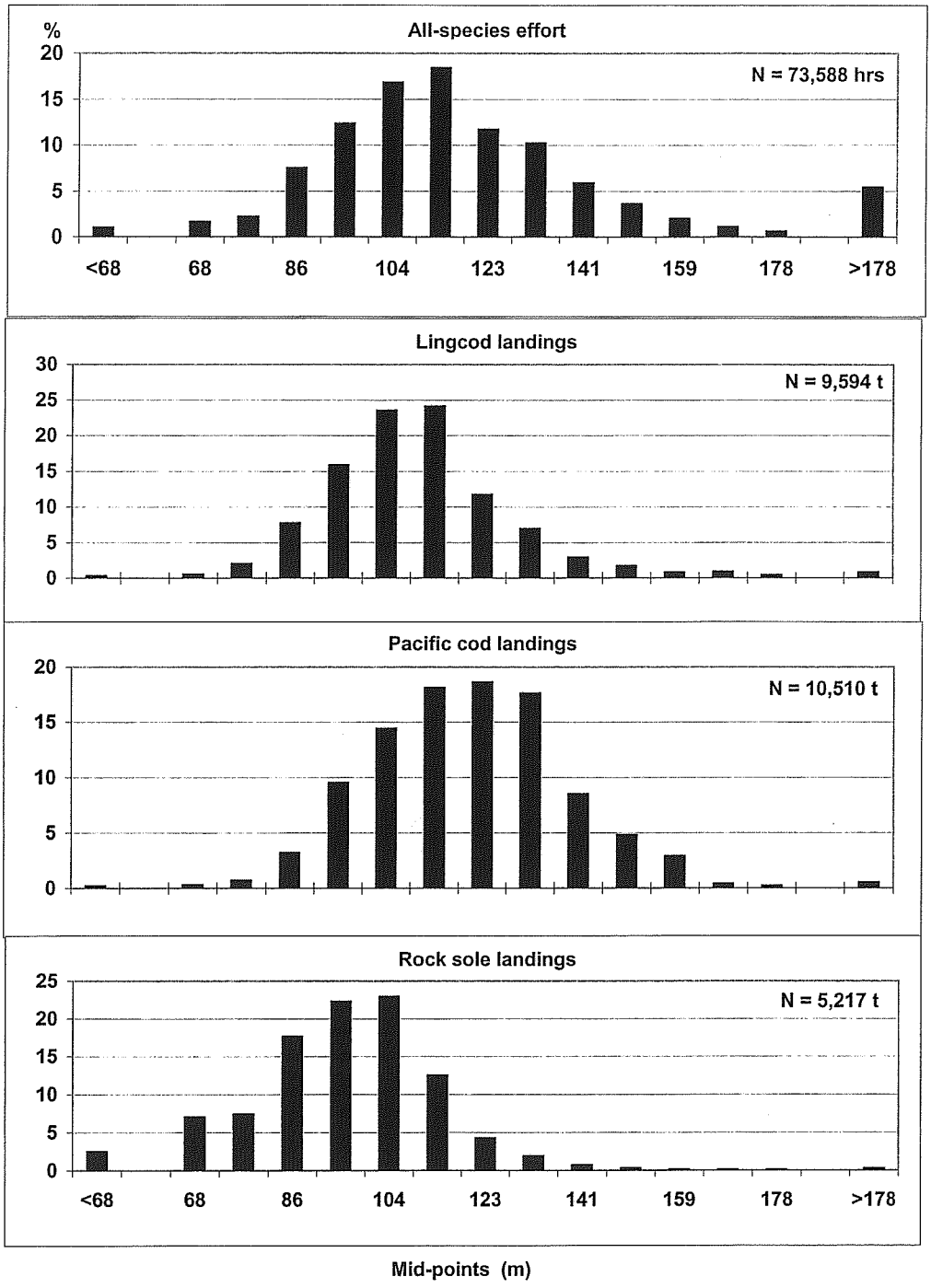


Figure 5B-3. Interviewed all-species effort (%), and interviewed landings (%), of lingcod, Pacific cod, and rock sole, by mid-points (m) of 5-fm depth intervals, from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix tables 5B-4 to 7)

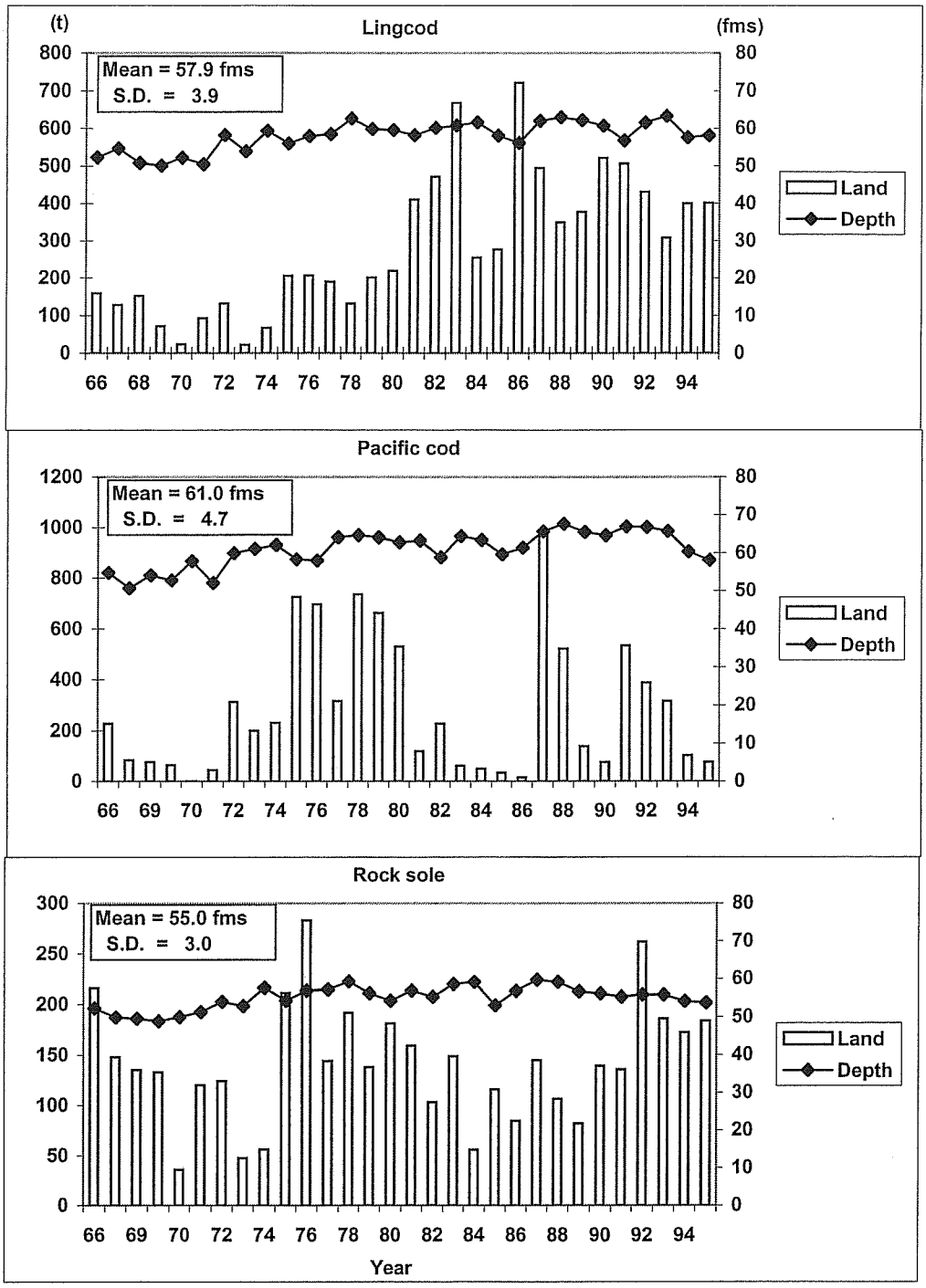


Figure 5B-4. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and species, within selected 5-fm depth intervals (47-72), for lingcod, Pacific cod, and rock sole, from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix table 5B-8)

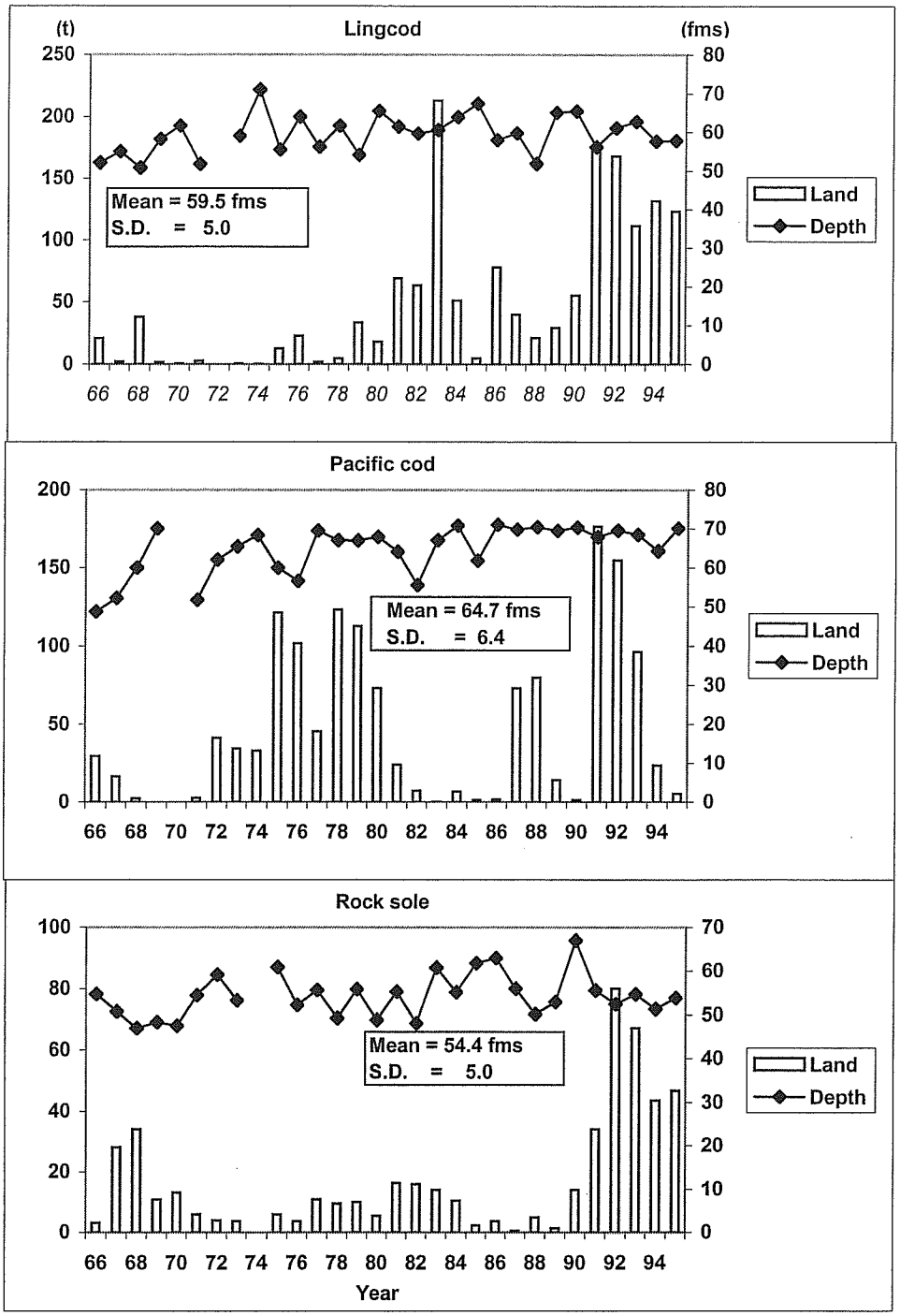


Figure 5B-5. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and single-species combination, within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix table 5B-9)

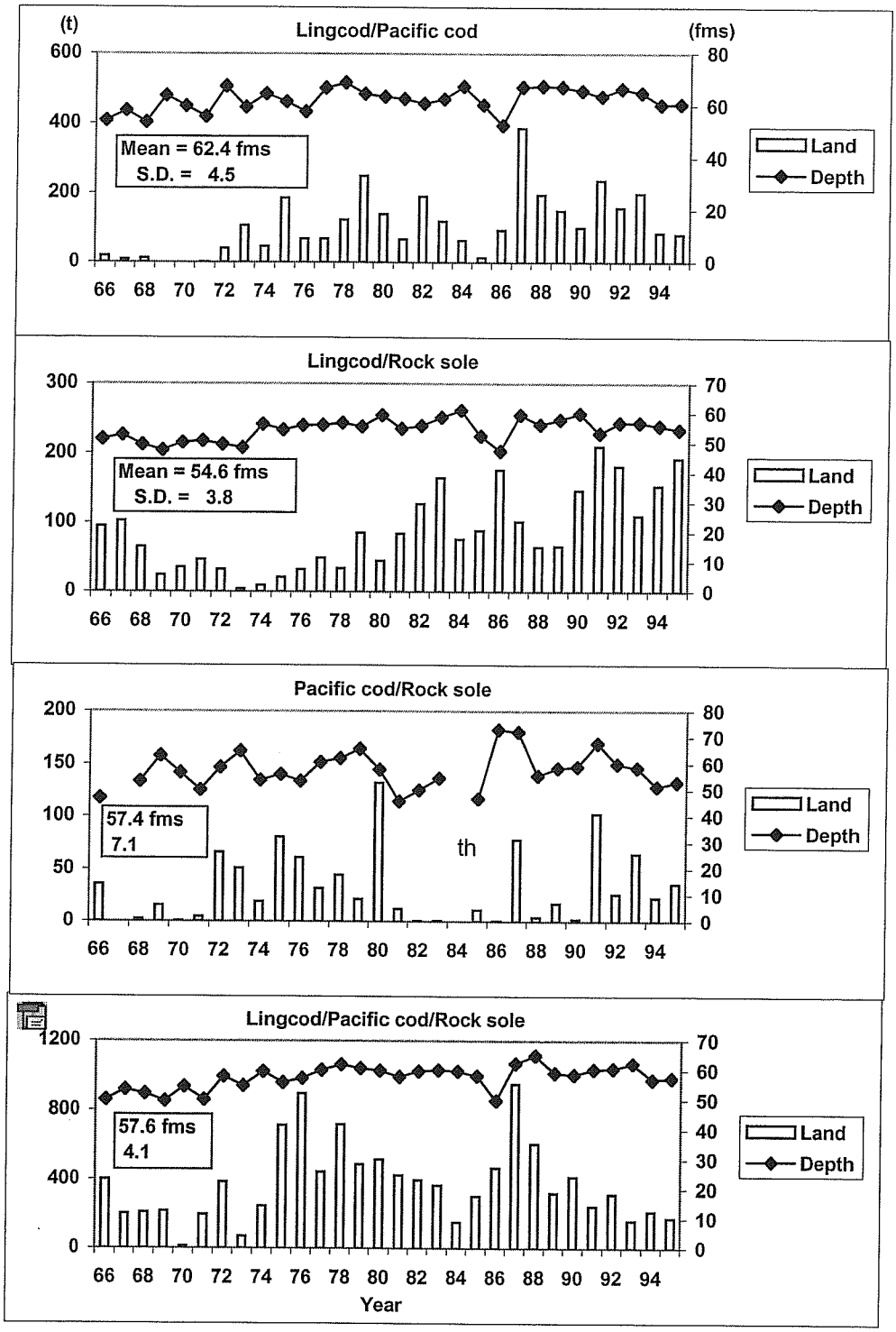


Figure 5B-6. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and multiple-species combination, within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (8-1,2,3,4), April-September 1966-95. (Source: Appendix table 5B-9)

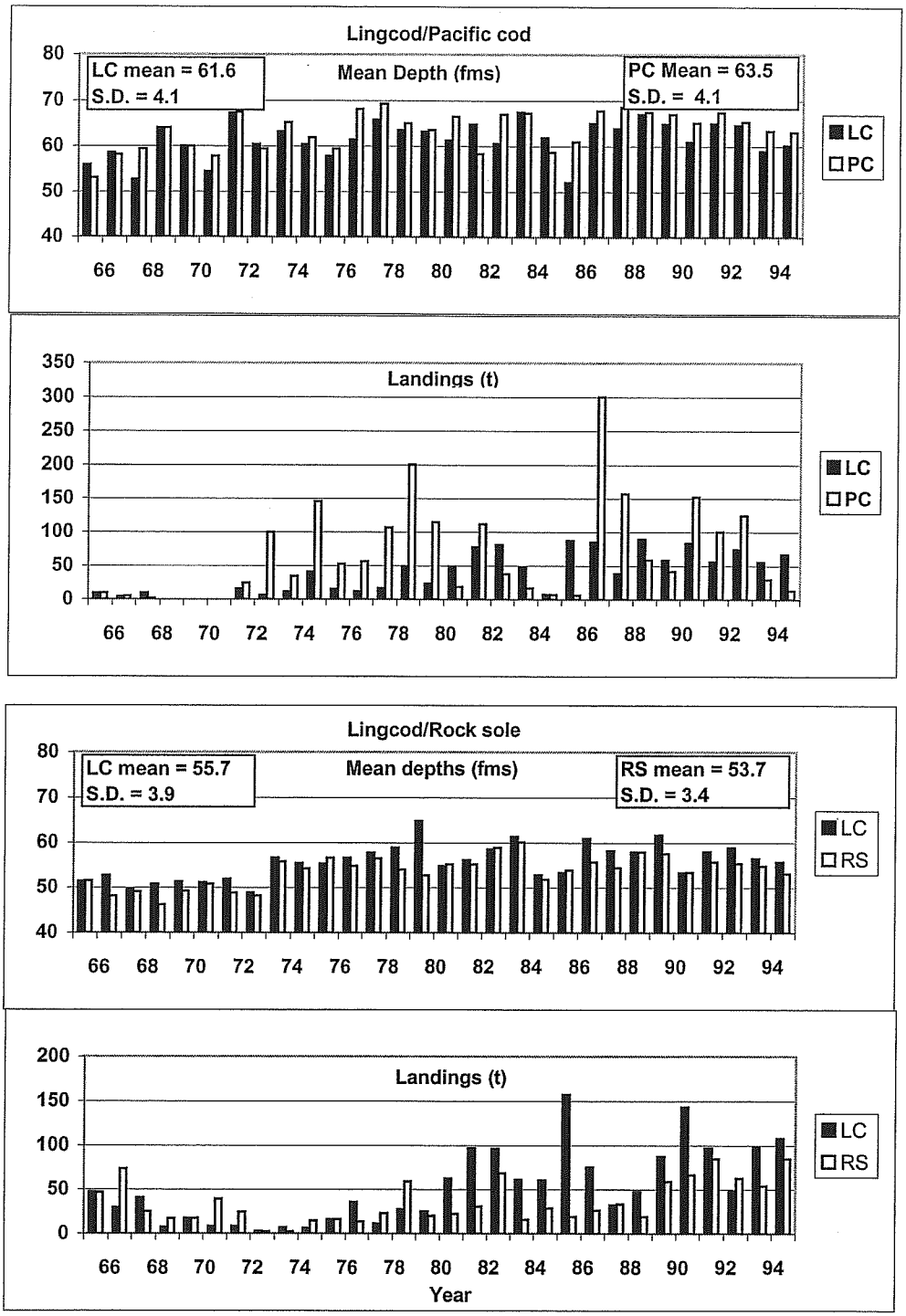


Figure 5B-7. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and species in the LC/PC and LC/RS combinations, within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix table 5B-10)

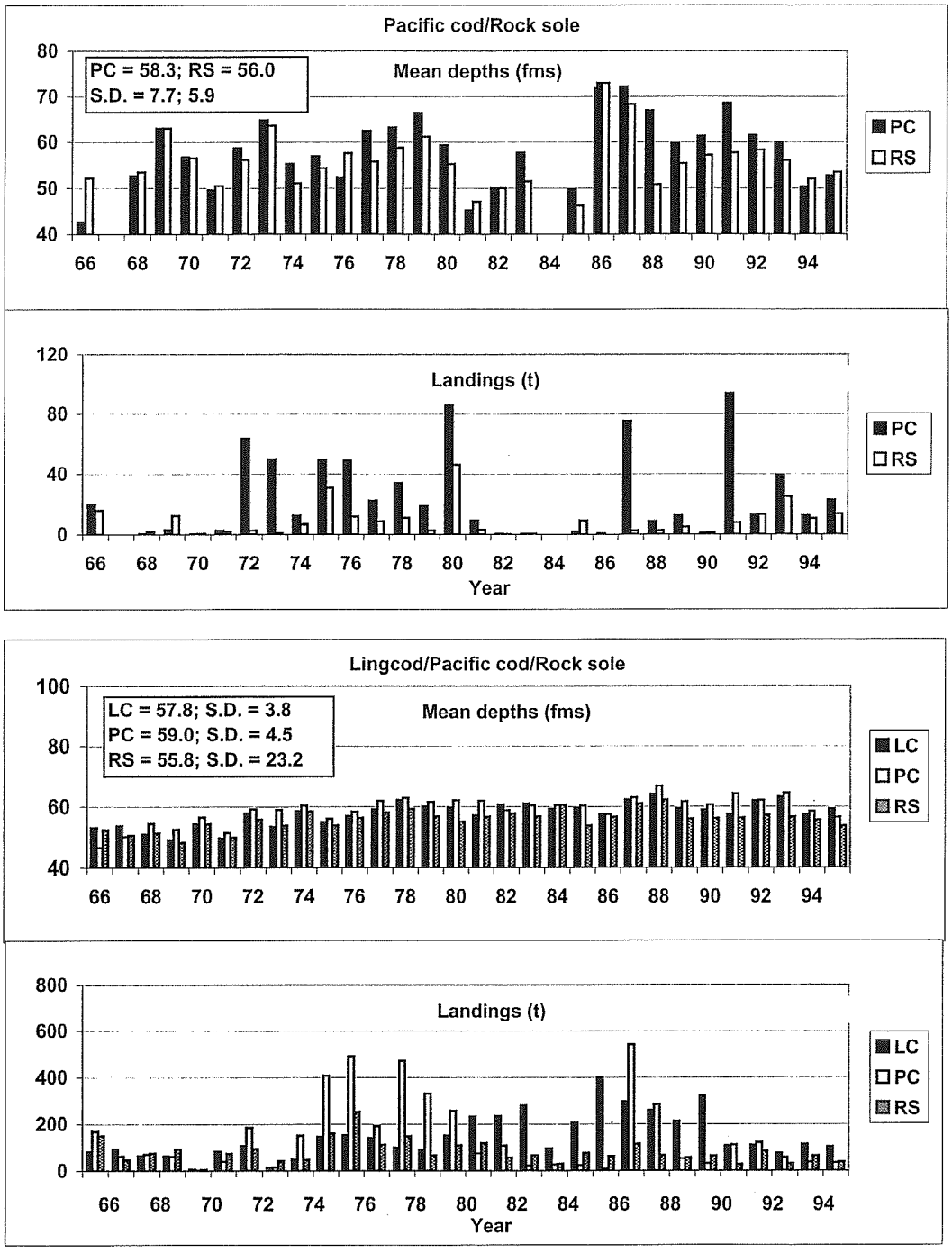


Figure 5B-8. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and species in the PC/RS and LC/PC/RS combinations, within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix table 5B-10)

Appendix table 3Cn-1. Interviewed effort per record, by year, for all-species landings containing lingcod (LC) of Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: PBS Groundfish Data Base)

Year	Effort (hrs)	Records (nos.)	Eff/Rec
1960	712	32	22.3
1961	645	59	10.9
1962	488	34	14.4
1963	370	33	11.2
1964	233	22	10.6
1965	731	39	18.7
1966	980	59	16.6
1967	757	43	17.6
1968	477	29	16.4
1969	1391	53	26.2
1970	1247	50	24.9
1971	1406	97	14.5
1972	2314	106	21.8
1973	1244	43	28.9
1974	1839	53	34.7
1975	2374	85	27.9
1976	1919	82	23.4
1977	1699	90	18.9
1978	817	63	13.0
1979	1654	93	17.8
1980	1171	71	16.5
1981	1022	55	18.6
1982	1846	67	27.6
1983	972	38	25.6
1984	1249	42	29.7
1985	3018	78	38.7
1986	651	43	15.1
1987	1062	60	17.7
1988	1016	57	17.8
1989	969	71	13.6
1990	815	55	14.8
1991	923	53	17.4
1992	318	29	11.0
1993	126	16	7.9
1994	528	35	15.1
1995	378	31	12.2

Appendix table 3Cn-2. Total landings (t), and percent interviewed[a], by year and MSA, for lingcod (LC) and Pacific cod (PC), from Area 3Cn, April-September 1960-95. (Source: PBS Groundfish Data Base)

Year	MSA 21				MSA 23				MSA 24			
	Total		% Int		Total		% Int		Total		% Int	
	LC	PC	LC	PC	LC	PC	LC	PC	LC	PC	LC	PC
1960	60	78	54	73	327	136	74	59	34	3	92	87
1961	221	90	73	66	393	127	66	68	69	1	85	40
1962	103	117	88	61	49	130	76	74	68	7	73	11
1963	132	367	92	81	58	197	78	65	3	9	85	22
1964	265	293	93	93	137	377	33	87	22	15	77	11
1965	357	320	76	71	292	448	61	61	93	29	45	26
1966	144	376	96	83	491	807	65	75	44	52	74	51
1967	78	168	97	92	437	302	87	86	437	302	55	7
1968	66	54	64	57	427	106	83	72	70	1	96	70
1969	9	30	39	59	551	227	79	79	40	14	40	14
1970	18	49	97	80	500	401	95	86	5	3	100	100
1971	74	432	87	80	266	1002	84	92	347	108	100	100
1972	37	693	59	77	413	1818	94	91	44	246	99	97
1973	54	392	63	73	504	527	88	87	91	15	5	93
1974	72	494	77	92	704	652	79	67	38	74	34	61
1975	88	451	63	72	1021	549	92	85	25	93	97	89
1976	63	314	63	66	551	569	88	81	36	97	81	45
1977	49	407	91	94	389	429	90	76	54	103	95	94
1978	15	152	73	77	258	463	85	85	15	81	54	64
1979	8	363	96	98	515	793	78	71	39	115	17	24
1980	20	277	97	98	544	618	57	65	53	22	48	37
1981	34	475	59	83	443	334	69	59	64	19	67	36
1982	52	204	74	78	1180	208	78	59	210	7	84	61
1983	100	280	21	15	745	169	62	34	83	27	58	74
1984	29	107	43	32	1470	214	55	40	139	14	62	47
1985	13	36	53	72	3249	240	56	36	7	5	75	41
1986	26	97	39	60	693	222	55	40	83	6	30	16
1987	22	158	52	46	416	519	59	33	20	4	12	7
1988	14	340	81	80	351	504	55	55	113	157	23	34
1989	20	86	96	83	508	547	47	52	14	60	14	13
1990	31	273	62	72	863	525	32	41	182	81	15	12
1991	19	51	56	42	858	494	41	29	324	141	37	13
1992	12	211	82	96	396	239	88	66	351	132	75	51
1993	5	152	73	90	278	163	84	86	704	143	91	67
1994	3	32	100	100	447	76	84	91	166	19	93	79
1995	2	0	100	100	328	155	88	97	452	30	82	74
Total	2313	8420			21050	15286			4538	2236		

Appendix table 3Cn-2 (cont.)

Year	MSA 21				MSA 23				MSA 24			
	Total		%Int		Total		% Int		Total		% Int	
	LC	PC	LC	PC	LC	PC	LC	PC	LC	PC	LC	PC
Mean			73	75			72	68			63	49
S.D.			21	19			17	19			30	31
Min	2	0	21	15	49	76	32	29	3	1	5	7
Max	357	693	100	100	3249	1818	95	97	704	302	100	100

a. Percentages calculated before landings rounded to nearest thousands of lbs, and converted to tonnes..

Appendix table 3Cn-3. Interviewed landings (000s lbs/tonnes; all depths), by year, species, and combination, for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: PBS Groundfish Data Base)

Year	Effort (hrs)	Species		Combinations						
		LC (lbs)	PC (lbs)	LC (lbs)	PC (lbs)	LC/PC LC (lbs)	LC/PC PC (lbs)	LC/PC Total (lbs)	Total (lbs)	% LC/PC
1960	712	385	95	40	0	345	95	440	480	91.7
1961	645	385	23	128	3	256	21	277	408	67.9
1962	488	70	69	19	2	51	67	118	139	84.9
1963	370	93	78	5	1	88	77	165	171	96.5
1964	233	65	185	10	20	56	165	221	251	88.0
1965	731	322	367	15	24	307	343	650	689	94.3
1966	980	556	622	47	55	509	567	1076	1178	91.3
1967	757	727	156	55	2	672	155	827	884	93.6
1968	477	726	85	69	0	657	85	742	811	91.5
1969	1391	885	203	43	0	842	203	1045	1088	96.0
1970	1247	890	363	25	2	865	360	1225	1252	97.8
1971	1406	410	1646	1	246	408	1400	1808	2055	88.0
1972	2314	573	2631	7	266	566	2365	2931	3204	91.5
1973	1244	771	591	2	51	769	540	1309	1362	96.1
1974	1839	1191	868	42	0	1148	868	2016	2058	98.0
1975	2374	1893	782	208	15	1685	767	2452	2675	91.7
1976	1919	884	685	113	83	771	602	1373	1569	87.5
1977	1699	706	511	80	52	626	459	1085	1217	89.2
1978	817	233	324	6	42	227	282	509	557	91.4
1979	1654	755	940	36	116	719	825	1544	1696	91.0
1980	1171	611	374	53	11	558	363	921	985	93.5
1981	1022	580	157	117	1	463	156	619	737	84.0
1982	1846	1719	127	261	8	1458	119	1577	1846	85.4
1983	972	867	64	82	0	785	64	849	931	91.2
1984	1249	1418	80	261	0	1157	80	1237	1498	82.6
1985	3018	3674	61	897	0.4	2777	60	2837	3734	76.0

Appendix table 3Cn-3 (cont.)

Year	Effort (hrs)	Species		Combinations						
		LC (lbs)	PC (lbs)	LC (lbs)	PC (lbs)	LC/PC LC (lbs)	LC/PC PC (lbs)	LC/PC Total (lbs)	Total (lbs)	% LC/PC
1986	651	575	48	41	3	535	45	580	624	92.9
1987	1062	446	257	24	32	423	225	648	704	92.0
1988	1016	372	376	49	41	323	335	658	748	88.0
1989	969	421	292	78	89	344	202	546	713	76.6
1990	815	377	231	33	24	343	207	550	607	90.6
1991	923	603	230	35	0	568	230	798	833	95.8
1992	318	123	79	31	0	92	79	171	202	84.7
1993	126	39	39	0	0	39	39	78	78	100.0
1994	528	245	28	47	0	198	28	226	273	82.8
1995	378	254	23	13	0	242	23	265	278	95.3
Total	39361	24844	13690	2973	1189	21872	12501	34373	38535	89.2
(t)		11272	6211	1349	540	9924	5672	15596	17484	
%		64.5	35.5	7.7	3.1	56.8	32.4	89.2	100.0	

Appendix table 3Cn-4. Interviewed effort (hrs), by year and mid-points of 5-fm depth intervals, for all-species landings containing lingcod or Pacific cod from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: PBS Groundfish Data Base)

Year	Mid-points (fms)[a]																	
	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	112 (205)	132 (242)	157 (287)	197 (361)	Total
1960	32	177	341	79	71	12												712
1961		7	127	293	170	48												645
1962		31	274	162	16	5												488
1963		171	136	45	8	0	0	0	0	0	0	0	10					370
1964		75	78	40	35	0	4	0	0	0	0	0	0	1				233
1965	54	214	198	209	56													731
1966	78	364	269	250	9	10												980
1967	80	348	136	89	13	14	78											758
1968	6	46	242	157	0	0	26											477
1969		118	718	510	8	5	33											1392
1970	4	374	525	163	132	36	0	0	14									1248
1971	1	644	314	383	22	15	23	0	4									1406
1972	19	266	1020	677	284	48												2314
1973	28	449	531	194	42													1244
1974		739	793	308														1840
1975		678	1186	358	133	0	20											2375
1976		314	1015	379	143	0	37	0	0	0	22	9						1919
1977	7	279	627	286	114	20	0	8	14	111	12	124	100					1702
1978		64	364	102	87	35	0	0	1	11	12	114	29					819
1979	30	384	730	161	149	117	3	52	28									1654
1980	22	257	426	327	31	48	5	0	55									1171
1981		143	531	57	112	59	77	1	25	0	0	0	0	0	0	13	5	1023
1982		795	468	271	187	61	15	0	0	5	0	4	42					1848
1983		222	462	157	102	8	10	0	0	11								972
1984	91	391	361	264	18	125												1250
1985	80	474	1490	447	405	87	34											3017
1986	54	286	163	61	37	15	34											650
1987		387	363	205	60	29	12	4	4									1064

Appendix table 3Cn-4 (cont.)

Year	Mid-points (fms)[a]																	
	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	112 (205)	132 (242)	157 (287)	197 (361)	Total
1988	3	186	431	188	130	46	22	9	1									1016
1989	6	71	320	256	54	114	68	48	0	0	2	17	7	0	6			969
1990	26	112	295	129	42	59	44	41	64	3	1							816
1991		384	221	209	23	38	50											925
1992		56	36	21	147	44	0	8	0	0	3	0	5					320
1993		32	41	18	13	22	0	2										128
1994	26	200	94	27	13	30	86	0	14	39								529
1995	19	151	176	22	10													378
Total	666	9889	15502	7504	2876	1150	681	173	224	180	52	268	193	1	6	13	5	39383
%	1.7	25.1	39.4	19.1	7.3	2.9	1.7	0.4	0.6	0.5	0.1	0.7	0.5	<0.1	<0.1	<0.1	<0.1	100.0

a. 32 = 30-34, *etc*. In parentheses, equivalent values in meters.

Appendix table 3Cn-5. Interviewed landings (000s lbs/tonnes), by year and mid-points of 5-fm depth intervals, for lingcod from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: PBS Groundfish Data Base)

Year	Mid-points (fms)[a]																	Total	
	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	112 (205)	132 (242)	157 (287)	197 (361)	(lbs)	(t)
1960	32	119	159	31	44	1												386	175
1961		4	32	185	143	20												384	174
1962		3	55	10	2	0.1												70	32
1963		41	47	3	2													93	42
1964		54	5	3	3	0	0.4											65	30
1965	3	114	145	52	7													321	146
1966	57	270	108	117	2	3												557	253
1967	111	378	123	42	1	0	71											726	329
1968	14	50	435	156	0	0	70											725	329
1969		66	496	275	0.3	10	38											885	402
1970	2	389	288	107	87	16	0	0	1									890	404
1971	0.03	265	77	62	2	2	2	0	0.1									410	186
1972	5	113	257	100	94	4												573	260
1973	13	454	221	74	8													770	349
1974		568	466	158														1192	541
1975		587	957	209	118	0	22											1893	859
1976		193	449	178	64	0	0	0	0	0	0.1							884	401
1977	17	191	402	66	16	3	0	1	1	4	0	2	3					706	320
1978		19	159	23	22	2	0	0	0	1	0	3	3					232	105
1979	8	233	362	91	39	20	0.3	0	2									755	343
1980	1	187	300	103	2	9	0.3	0	8									610	277
1981		150	279	69	70	3	8	0.1	1	0	0	0	0	0	0	0.4	0.4	581	264
1982		1031	380	132	109	29	13	0	0	1		10	14					1719	780
1983		217	378	133	118	7	5	0	0	9								867	393
1984	158	494	382	302	11	71												1418	643
1985	135	729	1770	540	374	39	86											3673	1667
1986	60	218	199	31	8	2	56											574	260
1987		143	157	121	13	9	3	0.2	0.3									447	203
1988		96	162	56	41	7	10	0.5										373	169

Appendix table 3Cn-5 (cont.)

Year	Mid-points (fms)[a]																		
	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	112 (205)	132 (242)	157 (287)	197 (361)	Total (lbs)	Total (t)
1989	3	36	169	93	49	30	22	7	0	0	0.04	1	10	0	0.5			421	191
1990	11	97	158	53	9	5	10	8	24	2								377	171
1991		271	129	103	5	61	32											601	273
1992		46	15	15	30	10	0	2	0	0	2	0	3					123	56
1993		8	6	9	3	4	0	8										38	17
1994	22	96	30	25	3	11	38	0	6	13								244	111
1995	38	110	94	10	3													255	116
Total	690	8040	9851	3737	1502	378	487	27	43	30	2	16	33	0	0.5	0.4	0.4	24838	11270
(t)	313	3648	4470	1696	682	172	221	12	20	14	1	7	15	0	0.2	0.2	0.2	11270	
%	2.8	32.4	39.7	15.0	6.0	1.5	2.0	0.1	0.2	0.1	<0.1	0.1	0.1	0	<0.1	<0.1	<0.1	100.0	

a. 32 = 30-34, *etc*. In parentheses, equivalent values in meters.

Appendix table 3Cn-6. Interviewed landings (000s lbs/tonnes), by year and mid-points of 5-fm depth intervals[a], for Pacific cod from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: PBS Groundfish Data Base)

Year	Mid-points (fms)[a]																	Total	
	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	112 (205)	132 (242)	157 (287)	197 (361)	(lbs)	(t)
1960	2	2	32	30	28	1												95	43
1961			5	11	5	2												23	10
1962		10	29	28	2													69	31
1963		54	15	8	0.2	0	0	0	0	0	0	0	1					78	35
1964		39	78	38	29	0	0	0	0	0	0	0	0	0.4				184	84
1965	17	117	70	141	22													367	167
1966	29	172	236	172	13	0.1												622	282
1967	10	68	38	10	5	1	26											158	72
1968	8	4	30	43	0	0	1											86	39
1969		20	132	45	1	2	4											204	93
1970		65	154	76	29	34	0	0	4									362	164
1971		594	466	518	17	12	36	0	2									1645	746
1972	7	201	1137	1088	186	12												2631	1194
1973	41	135	250	141	25													592	269
1974		357	405	106														868	394
1975		149	338	161	126	0	8											782	355
1976		48	281	223	104	0	18	0	0	0	9	2						685	311
1977	0.3	59	145	48	91	0.3	0	1	0	30	10	80	46					511	232
1978		18	91	23	7	6	0	0	0.03	19	3	149	9					325	147
1979	15	124	342	192	94	67	2	40	65									941	427
1980		63	138	131	5	9	0.1	0	28									374	170
1981		20	70	3	15	2	37	0	10	0	0	0	0	0	0	1		158	72
1982		30	18	22	33	14	1	0	0	2	0	0	8					128	58
1983		10	30	11	14													65	29
1984	3	30	26	12	0	8												79	36
1985	1	5	20	13	17	3	2											61	28
1986	2	17	9	3	1	2	15											49	22
1987		55	120	65	6	7	2	2	1									258	117
1988	0.3	9	170	118	64	9	2	4	0.5									377	171

Appendix table 3Cn-6 (cont.)

Year	Mid-points (fms)[a]																	Total	
	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	112 (205)	132 (242)	157 (287)	197 (361)	(lbs)	(t)
1989	3	5	83	92	12	47	18	28	0	0	0.2	2	1	0	0.1			291	132
1990	11	8	58	83	14	6	5	16	29	0	0.3							230	104
1991		56	69	75	12	9	9											230	104
1992		5	6	21	28	13	0	2	0	0	4	0	0.3					79	36
1993		1	22	3	5	5	0	4										40	18
1994		4	7	2	1	2	5	0	2	4								27	12
1995	2	4	11	1	5													23	10
																			0
Total	152	2558	5131	3757	1016	273	191	97	142	55	27	233	65	0.4	0.1	1	0	13698	6215
(t)	69	1161	2328	1705	461	124	87	44	64	25	12	106	30	0.2	0.05	0.5	0	6215	
(%)	1.1	18.7	37.5	27.4	7.4	2.0	1.4	0.7	1.0	0.4	0.2	1.7	0.5	<0.1	<0.1	<0.1	0	100.0	

a. 32 = 30-34, *etc*. In parentheses, equivalent values in meters.

Appendix table 3Cn-7. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and species (all combinations), within selected 5-fm depth intervals (37-47), for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: PBS Groundfish Data Base)

Year	Mean depths		Landings	
	LC	PC	LC	PC
1960	40.6	44.2	140	29
1961	46.1	45.4	100	7
1962	42.5	43.3	31	30
1963	39.9	39.0	41	35
1964	37.8	42.0	28	71
1965	41.0	42.4	142	149
1966	40.4	42.0	225	263
1967	38.9	39.5	246	52
1968	42.8	44.5	291	35
1969	43.2	42.6	380	89
1970	40.2	42.2	356	134
1971	39.5	41.8	183	716
1972	41.9	43.8	213	1100
1973	39.5	42.1	340	239
1974	40.3	40.6	540	394
1975	40.9	42.1	795	294
1976	41.9	43.6	372	250
1977	41.1	41.8	299	115
1978	42.1	42.2	91	60
1979	41.0	42.5	311	299
1980	41.3	43.0	268	151
1981	41.2	41.0	225	42
1982	39.1	41.4	700	32
1983	41.4	42.1	330	23
1984	41.2	40.7	534	31
1985	41.7	43.0	1379	17
1986	39.9	39.6	204	13
1987	41.7	42.2	191	109
1988	41.4	43.8	142	135
1989	43.0	44.4	136	82
1990	41.3	44.5	140	68
1991	40.3	42.5	229	91
1992	39.9	44.5	34	15
1993	42.2	42.4	10	11
1994	39.7	41.4	69	6
1995	39.7	41.0	97	7
Total			9814	5194
Mean	41.0	42.4		
S.D.	1.5	1.5		

Appendix table 3Cn-7 (cont.)

	Mean depths		Landings	
	LC	PC	LC	PC
Min	37.8	39.0	10	6
Max	46.1	45.4	1379	1100

a. Annual values weighted by landings (lbs) of individual species. Summary values not weighted.

Appendix table 3Cn-8. Absolute differences between weighted mean depths (fms) of interviewed landings (all combinations), by year and species, within selected 5-fm depth intervals (37-47), for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: Appendix table 3Cn-7)

Year	Mean depths				
	LC	PC	Max	Min	Diff
1992	39.9	44.5	44.5	39.9	4.6
1964	37.8	42.0	42.0	37.8	4.2
1960	40.6	44.2	44.2	40.6	3.6
1990	41.3	44.5	44.5	41.3	3.2
1973	39.5	42.1	42.1	39.5	2.6
1988	41.4	43.8	43.8	41.4	2.4
1971	39.5	41.8	41.8	39.5	2.3
1982	39.1	41.4	41.4	39.1	2.3
1991	40.3	42.5	42.5	40.3	2.2
1970	40.2	42.2	42.2	40.2	2.0
1972	41.9	43.8	43.8	41.9	1.9
1968	42.8	44.5	44.5	42.8	1.7
1976	41.9	43.6	43.6	41.9	1.7
1980	41.3	43.0	43.0	41.3	1.7
1994	39.7	41.4	41.4	39.7	1.7
1966	40.4	42.0	42.0	40.4	1.6
1979	41.0	42.5	42.5	41.0	1.5
1965	41.0	42.4	42.4	41.0	1.4
1989	43.0	44.4	44.4	43.0	1.4
1985	41.7	43.0	43.0	41.7	1.3
1995	39.7	41.0	41.0	39.7	1.3
1975	40.9	42.1	42.1	40.9	1.2
1963	39.9	39.0	39.9	39.0	0.9
1962	42.5	43.3	43.3	42.5	0.8
1961	46.1	45.4	46.1	45.4	0.7
1983	41.4	42.1	42.1	41.4	0.7
1977	41.1	41.8	41.8	41.1	0.7
1967	38.9	39.5	39.5	38.9	0.6
1969	43.2	42.6	43.2	42.6	0.6
1984	41.2	40.7	41.2	40.7	0.5
1987	41.7	42.2	42.2	41.7	0.5
1974	40.3	40.6	40.6	40.3	0.3
1986	39.9	39.6	39.9	39.6	0.3
1981	41.2	41.0	41.2	41.0	0.2
1993	42.2	42.4	42.4	42.2	0.2
1978	42.1	42.2	42.2	42.1	0.1

Appendix table 3Cn-9. Weighted mean depths (fms) of interviewed landings, and interviewed landings (t), by year and combination, within selected 5-fm depth intervals (37-47), for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: PBS Groundfish Data Base)

Year	Mean depths					Landings				
	LC	PC	LC/PC			LC	PC	LC/PC		
			LC	PC	Total			LC	PC	Total
1960	39.5		40.9	44.2	41.5	25	0	122	29	151
1961	45.9	42.0	46.3	45.5	46.2	39	0.45	61	7	69
1962	42.4	42.0	42.6	43.3	43.0	9	1	22	29	52
1963	42.6		39.7	39.0	39.4	2	0	39	35	74
1964	37.3	42.0	37.9	42.0	40.8	4	9	24	62	85
1965	46.9	42.2	40.7	42.4	41.6	7	17	135	139	274
1966	41.5	47.0	40.4	41.5	41.0	18	25	206	238	445
1967	41.3	43.0	38.6	39.5	38.8	25	0.45	221	52	274
1968	42.9		43.6	45.8	43.9	31	0	136	23	158
1969	43.0		43.3	42.6	43.1	20	0	360	89	449
1970	42.7	42.0	40.1	42.2	40.7	10	1	345	133	478
1971	39.7	43.0	39.5	41.5	41.1	0.45	105	183	611	794
1972	42.7	45.0	41.9	43.7	43.4	3	119	210	981	1191
1973	41.2	44.7	39.6	42.1	40.5	1	22	325	202	527
1974	37.1		40.4	40.6	40.5	19	0	521	394	915
1975	40.7	42.9	41.0	42.1	41.3	94	7	701	287	988
1976	41.1	42.6	42.0	43.6	42.7	50	11	323	240	562
1977	42.2	42.8	40.9	41.7	41.1	34	8	265	106	371
1978	43.2	42.4	42.1	42.2	42.1	2	5	89	54	143
1979	41.4	46.7	41.0	42.2	41.6	2	20	306	279	585
1980	38.9	42.2	41.5	43.0	42.1	23	2	245	148	393
1981	42.0	47.0	40.9	41.0	41.0	51	0.1	175	42	217
1982	39.5	47.0	39.0	41.2	39.1	94	1	606	31	637
1983	38.0		41.7	42.1	41.8	28	0	303	23	325
1984	38.9		41.8	40.7	41.7	106	0	428	31	459
1985	42.6		41.4	43.0	41.4	358	0	1020	17	1038
1986	41.3	47.0	39.8	39.4	39.8	16	0.45	188	13	201
1987	45.2	42.0	41.6	42.2	41.8	9	15	182	94	277
1988	39.5	42.1	44.0	45.1	44.5	14	15	223	186	409
1989	40.7	42.1	43.5	45.2	44.1	28	21	107	61	168
1990	37.3	41.5	37.3	41.6	38.7	13	6	13	6	19
1991	46.2		39.9	42.5	40.7	15	0	214	91	304
1992	44.5		38.2	43.6	40.0	8	0	33	17	50
1993	37.0		42.5	44.3	42.8	0.45	0	11	2	13
1994	37.0		40.2	41.4	40.3	11	0	57	6	63
1995	37.0		39.7	41.0	39.8	0.45	0	96	7	103

Appendix table 3Cn-9 (cont.)

Param.	Mean depths					Landings				
	LC	PC	LC	PC	Total	LC	PC	LC	PC	Total
N[b]	36	23	36	36	36					
Total						1171	411	8494	4768	13262
Mean (m) (76)	41.1 (75)	43.5 (80)	41.0 (75)	42.4 (78)	41.5 (76)					
S.D.	2.7	2.0	1.8	1.6	1.7					
Min (m)	37.0 (68)	41.5 (76)	37.3 (68)	39.0 (71)	38.7 (71)+	0.45	0	11	2	13
Max (m)	46.9 (86)	47.0 (86)	46.3 (85)	45.8 (84)	46.2 (85)	358	119	1020	981	1191

a. Annual values weighted by landings (lbs) of individual species. Summary values not weighted. Equivalent values in meters
b. N = number of years.

Appendix table 3Cn-10. Absolute differences in weighted mean depths (fms) of interviewed landings (LC/PC combination), by year and species, within selected 5-fm depth intervals (37-47), for lingcod (LC) and Pacific cod (PC) from Big Bank (MSA 23-3,4,5,7), April-September 1960-95. (Source: Appendix table 3Cn-9)

Year	LC	PC	Max	Min	Diff
1992	38.2	43.6	43.6	38.2	5.4
1990	37.3	41.6	41.6	37.3	4.3
1964	37.9	42.0	42.0	37.9	4.1
1960	40.9	44.2	44.2	40.9	3.3
1991	39.9	42.5	42.5	39.9	2.6
1973	39.6	42.1	42.1	39.6	2.5
1982	39.0	41.2	41.2	39.0	2.2
1968	43.6	45.8	45.8	43.6	2.2
1970	40.1	42.2	42.2	40.1	2.1
1971	39.5	41.5	41.5	39.5	2.0
1972	41.9	43.7	43.7	41.9	1.8
1993	42.5	44.3	44.3	42.5	1.8
1989	43.5	45.2	45.2	43.5	1.7
1965	40.7	42.4	42.4	40.7	1.7
1976	42.0	43.6	43.6	42.0	1.6
1985	41.4	43.0	43.0	41.4	1.6
1980	41.5	43.0	43.0	41.5	1.5
1995	39.7	41.0	41.0	39.7	1.3
1979	41.0	42.2	42.2	41.0	1.2
1994	40.2	41.4	41.4	40.2	1.2
1966	40.4	41.5	41.5	40.4	1.1
1975	41.0	42.1	42.1	41.0	1.1
1988	44.0	45.1	45.1	44.0	1.1
1984	41.8	40.7	41.8	40.7	1.1
1967	38.6	39.5	39.5	38.6	0.9
1977	40.9	41.7	41.7	40.9	0.8
1961	46.3	45.5	46.3	45.5	0.8
1963	39.7	39.0	39.7	39.0	0.7
1962	42.6	43.3	43.3	42.6	0.7
1969	43.3	42.6	43.3	42.6	0.7
1987	41.6	42.2	42.2	41.6	0.6
1983	41.7	42.1	42.1	41.7	0.4
1986	39.8	39.4	39.8	39.4	0.4
1974	40.4	40.6	40.6	40.4	0.2
1978	42.1	42.2	42.2	42.1	0.1
1981	40.9	41.0	41.0	40.9	0.1

Appendix table 5A-1. Interviewed effort per record, by year, for all-species landings containing lingcod, Pacific cod, or rock sole, from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Effort (hrs)	Records (nos)	Rec/Eff
1966	1157	112	10.3
1967	830	75	11.1
1968	2061	156	13.2
1969	1692	91	18.6
1970	1146	91	12.6
1971	1016	72	14.1
1972	836	40	20.9
1973	839	39	21.5
1974	956	32	29.9
1975	782	51	15.3
1976	2388	70	34.1
1977	2046	69	29.7
1978	1943	91	21.4
1979	1674	84	19.9
1980	1897	114	16.6
1981	1221	84	14.5
1982	2183	112	19.5
1983	1359	83	16.4
1984	1541	71	21.7
1985	1567	54	29.0
1986	2225	115	19.3
1987	2931	150	19.5
1988	2522	125	20.2
1989	1987	103	19.3
1990	1965	112	17.5
1991	1723	582	3.0
1992	1834	623	2.9
1993	2995	929	3.2
1994	2086	643	3.2
1995	2926	933	3.1

Appendix table 5A-2. Total landings (t), and percent interviewed, by year and MSA, of lingcod (LC), Pacific cod (PC), and rock sole (RS), from Major Area 5A, April-September 1966-95. (Source: PBS Groundfish Data Base).

Year	MSA 9						MSA 11					
	Total Landings			% Interviewed			Total Landings			% Interviewed		
	LC	PC	RS	LC	PC	RS	LC	PC	RS	LC	PC	RS
1966	1.0	0.1	4.1	100	100	100	266	382	245	100	100	100
1967	0.45	7.4	3.6	100	100	100	179	235	211	100	100	100
1968	5	0.2	11.8	100	100	100	530	307	363	100	100	100
1969	0.45	<0.1	1.4	100	100	100	229	152	197	100	100	99
1970	0.2	<0.1	0.9	100	100	100	196	66	143	100	100	100
1971	0.45	<0.1	0.9	100	100	100	140	146	108	98	96	95
1972	0	0	0				83	315	53	100	100	100
1973	0	0	0				113	213	40	100	100	100
1974	0	0	0				133	322	42	100	100	100
1975	0	0	0				56	384	33	100	100	100
1976	0	0	0				122	740	148	100	100	100
1977	0	0	0.1			100	95	472	76	100	100	100
1978	0.1	<0.1	0.1	100	100	100	175	1553	230	100	100	100
1979	<0.1	<0.1	0.00	100	100	100	72	772	164	100	100	100
1980	0	0	0				68	432	178	100	100	100
1981	0	0	0				164	220	106	100	100	100
1982	0	0	0				405	219	176	100	100	100
1983	0	0	0				343	51	71	100	100	100
1984	0	0	0				173	112	97	100	100	100
1985	0	0	0				289	109	46	100	100	100
1986	1.0	0.1	0.45	100	100	100	518	110	21	97	96	97
1987	0	0	0				584	1138	58	93	90	88
1988	<0.1	0.8	0.45	100	100	100	481	679	121	75	74	87
1989	0	0	0				647	332	115	69	69	75
1990	0.9	<0.1	1	100	100	100	757	472	145	64	52	55
1991	0	0	0				540	614	186	59	61	46
1992	2	0.2	5	100	100	100	419	892	266	60	58	48
1993	0	0	0				500	718	417	94	84	71
1994	0	0	0				628	172	253	97	92	87
1995	0	0	0				630	107	198	98	94	91
Total	6	4	14				9538	12435	4509			
Mean				100	100	100				93	92	91
S.D.				0	0	0				13	14	16
Min				100	100	100				59	52	46
Max				100	100	100				100	100	100

Appendix table 5A-3. Interviewed landings (000s lbs/tonnes), by year, and species in combinations (all depths), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	LC	PC	RS	LC/PC		LC/RS		PC/RS		LC/PC/RS			Total		% comb.[a]
				LC	PC	LC	RS	PC	RS	LC	PC	RS	(lbs)	(t)	
1966	12	121	82	37	117	76	150	76	40	151	150	113	1125	510	80.9
1967	5	82	58	7	18	114	134	30	12	30	114	109	713	324	79.7
1968	90	14	62	79	90	227	147	10	8	528	322	425	2002	908	91.7
1969	1	11	4	6	8	111	118	6	24	206	172	183	850	386	98.1
1970	1	0.1	53	4	6	137	123	1	1	149	62	89	626	284	91.4
1971	2	24	36	10	28	26	75	1	4	120	187	89	602	273	89.7
1972	4	46	1	12	71	3	10	200	15	125	287	83	857	389	94.0
1973	0.1	0	17	25	17	40	18	6	0.3	139	312	40	614	279	97.2
1974	0	23	0	0.2	23	31	31	87	3	225	469	58	950	431	97.6
1975	1	85	1	10	117	10	17	93	15	74	291	21	735	333	88.2
1976	3	125	5	47	97	3	2	136	62	185	906	248	1819	825	92.7
1977	20	82	1	12	178	7	16	80	24	134	523	73	1150	522	91.0
1978	30	347	9	49	453	2	18	106	10	43	329	58	1454	660	73.5
1979	23	290	5	11	219	16	14	105	40	63	806	263	1855	842	82.9
1980	1	207	21	8	154	17	80	55	36	125	535	254	1493	677	84.7
1981	5	25	6	58	99	34	5	9	10	239	275	182	947	430	96.2
1982	141	18	56	175	201	112	83	6	9	363	197	185	1546	701	86.1
1983	85	25	31	184	40	111	72	4	1	227	29	29	838	380	83.2
1984	15	24	8	21	64	39	61	2	0.2	179	125	124	662	300	92.9
1985	17	8	6	124	125	153	66	0	0	142	73	12	726	329	95.7
1986	141	18	56	178	204	112	83	6	9	379	214	186	1586	720	86.4
1987	10	84	18	299	912	21	8	110	4	523	989	57	3035	1377	96.3
1988	69	83	18	206	274	46	42	29	4	322	617	145	1855	842	90.8
1989	161	12	0.03	220	194	99	38	0	0	426	277	147	1574	714	89.0
1990	60	18	9	226	210	12	50	4	7	390	145	78	1209	549	92.8
1991	163	76	26	117	165	151	50	141	24	94	248	57	1312	595	79.8
1992	61	211	49	98	186	36	40	37	64	84	133	51	1050	476	69.4
1993	152	255	274	138	357	136	110	71	36	61	141	100	1831	831	62.8

Appendix table 5A-3 (cont.)

Year	LC	PC	RS	LC/PC		LC/RS		PC/RS		LC/PC/RS			Total		% comb.[a]
				LC	PC	LC	RS	PC	RS	LC	PC	RS	(lbs)	(t)	
1994	167	57	74	82	66	330	188	4	7	197	40	43	1255	569	76.3
1995	259	38	62	167	49	147	115	3	7	92	14	63	1016	461	64.7
Total	1699	2409	1048	2610	4742	2359	1964	1418	477	6015	8982	3565	37288	16918	86.2
(t)	771	1093	476	1184	2152	1070	891	643	216	2729	4075	1618	16918		
%	4.6	6.5	2.8	7.0	12.7	6.3	5.3	3.8	1.3	16.1	24.1	9.6	100.0		
				19.7		11.6		5.1			49.8		86.2		

a. Comb. = combinations involving two or three species.

Appendix table 5A-4. All-species interviewed effort (hrs), by year and mid-points (m) of 5-fm depth intervals, for landings containing lingcod, Pacific cod, or rock sole, from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mid-points (fms)[a]																					
	22 (40)	27 (49)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (205)	Total
1966	0	0	12	39	390	341	94	186	10	34	4	0	0	0	45							1155
1967	0	12	38	107	237	234	114	61	12	0	4											819
1968	0	0	24	750	386	138	235	208	189	84	48											2062
1969	0	0	28	448	606	141	142	185	66	66	4	8										1694
1970	0	0	14	385	279	30	70	46	82	140	0	0	0	0	0	56	0	0	0	46		1148
1971	0	0	22	247	239	124	92	71	41	74	4	12	17	24	2	45	6					1020
1972	0	0	0	7	58	41	191	181	212	26	69	52										837
1973	0	5	112	103	128	30	105	99	22	134	29	8	16	47	0	3						841
1974	0	0	0	24	31	163	164	50	425	0	100											957
1975	0	0	0	114	28	42	87	143	186	135	0	38	10									783
1976	0	0	0	14	6	29	503	903	452	364	105	12										2388
1977	0	0	40	26	202	22	499	303	317	459	24	78	15	44	17							2046
1978	0	0	10	104	136	41	183	99	83	301	545	242	116	0	16							1876
1979	0	0	6	355	73	34	134	81	314	227	220	162	26	0	42	0	0	2				1676
1980	0	4	37	559	148	22	104	266	122	194	119	119	109	63	33							1899
1981	0	0	0	190	81	178	54	170	331	26	46	59	27	16	30	8	6					1222
1982	0	0	19	277	116	255	422	142	140	73	65	254	92	119	72	48	0	90				2184
1983	0	0	62	103	20	63	36	472	254	96	180	11	15	40	7							1359
1984	0	0	3	101	141	96	177	122	40	233	134	112	173	123	14	64	0	9				1542
1985	0	0	0	175	106	4	17	92	0	159	187	108	156	495	70							1569
1986	0	0	21	277	116	255	422	142	140	73	65	254	109	142	72	48	0	90				2226
1987	2	0	0	158	10	65	254	813	528	215	357	125	96	134	90	37	36	0	0	12		2932
1988	0	0	0	103	259	49	236	452	164	486	327	258	68	66	8	28	8	11				2523
1989	0	0	0	342	55	44	48	208	407	89	420	93	120	55	20	54	30	2				1987
1990	0	0	3	59	93	125	172	315	520	147	194	154	64	56	47	0	15	3				1967
1991	3	7	0	50	172	89	177	406	317	167	127	30	54	42	42	19	19	0	0	3		1724
1992	0	0	62	130	81	90	75	138	381	255	236	79	133	39	45	24	58	6	0	0	5	1837
1993	0	6	25	492	168	52	123	234	511	367	388	173	143	196	83	10	17	6	0	2		2996
1994	0	6	50	241	225	226	378	230	286	117	126	50	48	40	26	19	15	4				2087

Appendix table 5A-4 (cont.)

Year	Mid-points (fms)[a]																					
	22 (40)	27 (49)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (205)	Total
1995	0	0	11	290	161	242	517	213	383	214	136	82	125	115	153	106	75	12	2	8	1	2846
Total	5	40	599	6270	4751	3265	5825	7031	6935	4955	4263	2573	1732	1856	934	569	285	235	2	71	6	52202
%	0.0	0.1	1.1	12.0	9.1	6.3	11.2	13.5	13.3	9.5	8.2	4.9	3.3	3.6	1.8	1.1	0.5	0.5	0.0	0.1	0.0	100.0

a. 22 = 20-24 fms, *etc*. In parentheses, equivalent values in meters.

Appendix table 5A-5. Interviewed landings (000s lbs/tonnes), by year and 5-fm depth interval, of lingcod from Cape Scott Spit (MSA 11-2; Area 5A), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Depth intervals (fms)[a]																					Total	
	22 (40)	27 (49)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (205)	(lbs)	(t)
1966	0	0	0.4	0.1	71	80	22	74	18	9	1	0	0	0	0.1							276	125
1967	0	0.1	1	33	54	12	15	29	9	0	2											155	70
1968	0	0	15	397	103	41	92	109	97	60	11											925	420
1969	0	0	3	114	72	21	22	65	12	14	0.2	1										324	147
1970	0	0	4	116	67	1	38	15	9	40	0	0	0	0	0	0.1	0	0	0	0.3		290	132
1971	0	0	5	57	22	17	18	22	2	13	0.3	1	0.5	1	0.04	2						161	73
1972	0	0	0	4	12	3	74	8	29	1	12	1										144	65
1973	0	0	49	27	25	0.5	13	58	8	16	7	0.05	0.2	1	0	0.02						205	93
1974	0	0	0	4	1	50	40	21	136	0	4											256	116
1975	0	0	0	17	4	8	7	34	13	13												96	44
1976	0	0	0	3	0	1	87	58	22	66	2	1										240	109
1977	0	0	1	0	29	0.3	57	40	25	19	0.2	0	2	0.1								174	79
1978	0	0	0	2	1	1	5	2	4	33	39	5	2	0	29							123	56
1979	0	0	0	32	5	2	6	1	15	22	12	3	0	0	16							114	52
1980	0	0	5	62	20	0	10	15	14	11	3	3	6	0.2	1							150	68
1981	0	0	0	27	39	35	19	76	103	6	10	16	1	0.2	4							336	153
1982	0	0	0.4	87	53	105	321	58	63	7	15	47	4	22	3	1	0	1				787	357
1983	0	0	4	35	5	31	24	260	129	43	69	0.2	6									606	275
1984	0	0	0.3	27	6	7	77	40	4	58	13	5	12	4	1	2	0	0.04				256	116
1985	0	0	0	75	69	1	7	72	0	71	42	2	38	52	8							437	198
1986	0	0	0.4	87	53	105	321	58	63	7	15	47	7	38	3	1	0	1				806	366
1987	0	0	0	9	2	43	82	371	170	51	98	16	5	2	3	0	0	0	0	0.1		852	387
1988	0	0	0	14	48	10	72	201	42	127	49	63	7	0.2	0.3	3	0.3	6				643	292
1989	0	0	0	129	9	1	14	140	267	51	248	27	11	2	2	3	1	0.2				905	411
1990	0	0	0	1	28	21	58	189	282	33	41	10	9	9	8	0	2	1				692	314
1991	0.1	0.3	0	5	32	10	42	175	153	36	36	6	12	6	3	2	5	0	0	0.03		523	237
1992	0	0	3	4	30	3	14	26	76	74	19	5	12	3	9	1	1	0	0	0	0.1	280	127
1993	0	0	2	21	18	18	62	50	80	73	87	12	15	31	11	1	2	0.3	0	1		484	220
1994	0	1	4	35	79	158	185	131	117	24	34	3	3	3	0.5	0.3	0.1	1	0	0	0.01	779	353

Appendix table 5A-5 (cont.)

Year	Depth intervals (fms)[a]																						
	22 (40)	27 (49)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (205)	Total (lbs)	(t)
1995	0	0	2	13	38	62	176	53	131	83	67	8	11	5	8	2	3	0.2	0.1	0.1	0.1	663	301
Total	0.1	1	100	1437	995	848	1980	2451	2093	1061	937	282	164	180	110	18	14	11	0.1	1	0.2	12684	5755
(t)	0.0	0.6	45	652	451	385	898	1112	950	481	425	128	74	82	50	8	7	5	0.0	0.7	0.1	5755	
%	0.0	0.0	0.8	11.3	7.8	6.7	15.6	19.3	16.5	8.4	7.4	2.2	1.3	1.4	0.9	0.1	0.1	0.1	0.0	0.0	0.0	100.0	

a. 22 = 20-24, *etc*. In parentheses, equivalent values in meters.

Appendix table 5A-6. Interviewed landings (000s lbs/tonnes), by year and 5-fm depth interval, of Pacific cod from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Depth interval (fms)[a]																					Total	
	22 (40)	27 (49)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (205)	(lbs)	(t)
1966	0	0	0.4	17	195	115	12	111	3	7	0	0	0	0	4							464	211
1967	0	0	2	32	42	45	113	10														244	111
1968	0	0	1	75	81	52	110	33	52	0.1	32											436	198
1969	0	0	0	34	46	20	29	26	4	38	0.2											197	89
1970	0	0	0	3	33	1	4	6	14	6	0	0	0	0	0	1						68	31
1971	0	0	4	42	38	26	45	27	16	30	0.4	1	2	9	0	0	2					242	110
1972	0	0	0	3	52	23	89	216	166	23	31	3										606	275
1973	0	0	2	6	33	24	139	29	31	45	3	0	8	15	0	0.02						335	152
1974	0	0	0	0	4	201	91	38	206	0	64											604	274
1975	0	0	0	8	19	22	87	92	194	140	0	18	8									588	267
1976	0	0	0	6	0	54	256	519	244	148	26	10	0									1263	573
1977	0	0	70	1	49	24	135	101	185	252	8	21	15	2	1							864	392
1978	0	0	0.3	98	88	1	169	47	61	316	244	147	50	0	0							1221	554
1979	0	0	0	191	124	19	32	254	234	218	216	105	19	0	7	0	0	0.04				1419	644
1980	0	0.1	16	199	25	3	25	266	68	99	59	53	102	23	12							950	431
1981	0	0	0	29	10	50	28	60	168	3	19	15	3	10	9	1	4					409	186
1982	0	0	0	21	11	29	85	23	73	22	27	44	18	59	4	4	0	3				423	192
1983	0	0	0	2	0	16	0	30	23	5	14	1	0	6	1							98	44
1984	0	0	0	13	2	8	51	9	7	22	23	13	24	30	2	12						216	98
1985	0	0	0	0	0.3	2	0	24	0	13	56	16	33	60	2							206	94
1986	0	0	0	21	11	29	85	23	73	22	27	44	20	76	4	4	0	3				442	201
1987	0	0	0	246	0	60	45	452	488	160	358	108	69	84	11	12	0.5	0	0	0.1		2094	950
1988	0	0	0	30	55	60	134	142	53	99	231	166	24	2	0.4	3	0.1	2				1002	454
1989	0	0	0	82	13	7	4	24	117	25	121	23	37	5	5	16	2	0.2				481	218
1990	0	0	0	2	1	4	9	54	115	53	42	36	23	30	8	0	0.4					377	171
1991	0	0.2	0	72	39	39	47	209	146	39	12	1	5	4	6	1	9					629	285
1992	0	0	13	17	4	21	24	19	132	92	105	46	73	8	7	3	1	1	0	0	0.4	566	257
1993	0	0.2	0.2	32	8	3	14	26	107	122	196	85	99	67	31	22	11	1				824	374
1994	0	2	0	2	3	5	17	7	37	27	24	16	13	6	4	0	2					165	75

Appendix table 5A-6 (cont.)

Year	Depth interval (fms)[a]																						
	22 (40)	27 (49)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (205)	Total (lbs)	(t)
1995	0	0	0	2	2	3	8	6	10	7	8	5	7	4	20	18	4	0.1	0.04	0.1	0.04	104	47
Total	0	3	109	1286	988	966	1887	2883	3027	2033	1947	977	652	500	138	97	36	10	0.04	0.2	0.4	17540	7958
(t)	0	1	49	583	448	438	856	1308	1373	922	883	443	296	227	63	44	16	5	0.02	0.1	0.2		
%	0	0.0	0.6	7.3	5.6	5.5	10.8	16.5	17.3	11.6	11.1	5.6	3.7	2.9	0.8	0.6	0.2	0.1	0.0	0.0	0.0	100.2	

a. 22 = 20-24, *etc*. In parentheses, equivalent values in meters.

Appendix table 5A-7. Interviewed landings (000s lbs/tonnes), by year and 5-fm depth interval, for rock sole from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Depth intervals (fms)[a]																					Total	
	22 (40)	27 (49)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (205)	(lbs)	(t)
1966	0	0	31	50	162	106	27	9	1	0.2												386	175
1967	0	2	12	69	82	102	25	20	2	0	0.5											315	143
1968	0	0	5	324	147	45	60	18	39	1	2											641	291
1969	0	0	4	189	87	11	11	15	10	1	0	1										329	149
1970	0	0	2	137	75	2	15	5	7	22												265	120
1971	0	0	7	84	64	25	11	7	0.2	4	1	0.2	0.1									204	92
1972	0	0	0	6	13	3	56	10	10	1	3	7										109	49
1973	0	11	22	10	8	2	3	10	3	5	1	0	1	1								77	35
1974	0	0	0	3	23	23	16	5	20	0	1											91	41
1975	0	0	0	20	3	4	16	6	4	0.5	0	1										55	25
1976	0	0	0	2	3	1	139	112	45	11	4											317	144
1977	0	0	6	11	33	0.4	24	12	16	7	0.3	5										115	52
1978	0	0	3	25	21	12	22	2	2	6	1	1	0.3									95	43
1979	0	0	3	177	61	26	16	1	20	11	5	3										323	147
1980	0	0.4	13	258	50	2	24	34	3	3	0	3	2									392	178
1981	0	0	0	73	20	65	3	16	25	1	0.07	0	0.2	2	0.4							206	93
1982	0	0	27	121	63	46	30	10	6	14	8	2	0.05	2	0	0	0	4				333	151
1983	0	0	35	41	15	6	1	19	3	3	3											126	57
1984	0	0	1	43	78	20	27	5	0	9	0	7	1	0.2	0	0.07						191	87
1985	0	0	0	44	29	0	1	8	0	1	0.3											83	38
1986	0	0	27	121	63	46	30	10	6	14	8	2	0.05	3	0	0	0	4				334	152
1987	1	0	0	43	3	7	3	9	14	1	2	1	0.4	0	0	0	0.5					85	39
1988	0	0	0	23	102	26	23	16	10	3	4	2	1	0.06	0	0	0	0.4				210	95
1989	0	0	0	81	20	22	13	22	19	1	6	0.4	0.3									185	84
1990	0	0	0.5	24	34	25	45	2	6	0.1	4	0.4	0	0	0.07							141	64
1991	0	0.08	0	7	80	25	25	10	6	2	2	0	0.07	0.4	0.5	0	0.5					159	72
1992	0	0	30	80	15	24	12	6	9	14	4	1	0.4	2	0.06	0.01	4	0.1				202	91
1993	0	3	23	265	112	16	35	12	19	5	6	0.4	2	22	0.02	1	1					522	237
1994	0	2	33	116	53	31	47	15	6	2	2	0.1	0.06	0.3	0.2	0	0	3				311	141

Appendix table 5A-7 (cont.)

Year	Depth intervals (fms)[a]																						
	22 (40)	27 (49)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (205)	Total (lbs)	(t)
1995	0	0	4	140	40	26	26	3	3	2	1	0.1	0.3	0.4	0.1	0	2					248	112
Total	1	18	289	2587	1559	749	786	429	314	145	69	38	9	33	1	1	8	12	0	0	0	7049	3198
(t)	0.5	8	131	1174	707	340	357	195	143	66	31	17	4	15	1	0	4	5	0	0	0	3198	
%	0.0	0.3	4.1	36.7	22.1	10.6	11.1	6.1	4.5	2.1	1.0	0.5	0.1	0.5	0.0	0.0	0.1	0.2	0.0	0.0	0.0	99.9	

a. 22 = 20-24, *etc*. In parentheses, equivalent values in meters.

Appendix table 5A-8. Weighted mean depths[a] of interviewed landings, and interviewed landings (t), by year and species, within two sets of selected 5-fm depth intervals (37-42; 52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	37-42 fms (68-77 m)						52-72 fms (95-132 m)					
	Depth (fms)			Landings (t)			Depth (fms)			Landings (t)		
	LC	PC	RS	LC	PC	RS	LC	PC	RS	LC	PC	RS
1966	42.0	41.6	40.8	32	96	96	57.7	57.2	53.5	56	60	17
1967	40.1	39.9	39.7	39	34	69	57.1	52.4	54.6	25	56	21
1968	38.0	39.6	38.6	227	71	214	59.1	57.9	56.5	167	103	55
1969	38.9	39.9	38.6	84	36	125	57.6	58.9	57.1	51	44	17
1970	38.8	41.5	38.8	83	16	96	59.5	60.7	60.7	46	14	23
1971	38.4	39.4	39.2	36	36	67	58.0	58.4	56.6	25	54	10
1972	40.9	41.7	40.4	7	25	9	56.7	59.1	54.9	56	238	37
1973	39.4	41.2	39.3	24	18	8	59.3	56.8	59.8	46	112	10
1974	37.7	42.0	41.5	2	2	12	59.7	60.9	57.9	91	181	19
1975	37.9	40.5	37.6	10	12	10	59.3	60.8	54.8	30	232	12
1976	37.0	37.0	40.2	1	3	2	58.5	58.5	56.0	106	541	141
1977	42.0	41.9	40.8	13	23	20	57.3	61.2	57.5	64	309	27
1978	38.8	39.4	39.3	1	84	21	68.1	64.5	56.2	37	380	15
1979	37.7	49.0	38.3	17	143	108	65.1	69.2	60.9	25	433	24
1980	38.2	37.6	37.8	37	102	140	60.3	61.0	55.8	24	235	29
1981	40.0	38.3	38.1	30	18	42	60.0	60.6	59.6	97	126	20
1982	38.9	38.7	38.7	64	14	83	54.9	59.5	59.0	211	105	30
1983	37.6	37.0	38.3	18	1	25	60.8	62.1	60.0	239	33	14
1984	37.9	37.6	40.2	15	6	55	59.1	60.0	56.0	87	51	19
1985	39.4	41.3	39.0	67	0.2	34	58.3	63.5	59.6	302	102	14
1986	38.9	38.7	38.7	64	14	83	54.9	59.5	59.0	211	105	30
1987	38.0	37.0	37.3	5	112	21	60.1	63.1	60.5	350	682	14
1988	40.9	40.2	41.1	28	39	57	60.8	63.1	57.4	223	299	25
1989	37.3	37.7	38.0	63	43	45	64.6	66.0	59.1	327	132	28
1990	41.8	38.5	40.0	66	0.1	33	60.4	63.2	54.8	273	124	27
1991	41.3	38.8	41.6	17	50	39	60.3	59.4	56.0	201	206	20
1992	41.4	38.0	37.8	15	10	43	64.2	66.1	64.3	88	158	15
1993	39.3	38.1	38.5	17	19	171	63.0	66.9	57.8	159	211	35
1994	40.5	39.9	38.6	52	2	77	57.8	63.5	55.0	223	51	33
1995	40.7	39.6	38.1	24	2	82	60.1	62.4	54.6	231	17	16
Total				1157	1031	1887				4074	5393	796
Mean[b] (m)	39.3 (72)	39.7 (73)	39.2 (72)				59.8 (110)	61.2 (112)	57.5 (105)			
S.D.	1.5	2.3	1.2				2.9	3.4	2.5			

Appendix table 5A-8 (cont.)

Year	37-42 fms (68-77 m)						52-72 fms (95-132 m)					
	Depth (fms)			Landings (t)			Depth (fms)			Lsndings (t)		
	LC	PC	RS	LC	PC	RS	LC	PC	RS	LC	PC	RS
Min[b] (m)	37.0 (68)	37.0 (68)	37.3 (68)	1	0	2	54.9 (100)	52.4 (96)	53.5 (98)	24	14	10
Max[b] (m)	42.0 (77)	49.0 (90)	41.6 (76)	227	143	214	68.1 (125)	69.2 (127)	64.3 (118)	350	682	141

a. Annual values weighted to landings of individual species. Summary values are not weighted

b. In parentheses, equivalent values in meters.

Appendix table 5A-9. Absolute differences between weighted mean depths[a] of interviewed landings (all combinations), by year and species, within selected 5-fm depth intervals (52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: Appendix table 5A-8)

Year	Depth (fms)					
	LC	PC	RS	Max	Min	Diff
1978	68.1	64.5	56.2	68.1	56.2	11.9
1993	63.0	66.9	57.8	66.9	57.8	9.1
1994	57.8	63.5	55.0	63.5	55.0	8.5
1990	60.4	63.2	54.8	63.2	54.8	8.4
1979	65.1	69.2	60.9	69.2	60.9	8.3
1995	60.1	62.4	54.6	62.4	54.6	7.8
1989	64.6	66.0	59.1	66.0	59.1	6.9
1975	59.3	60.8	54.8	60.8	54.8	6.0
1988	60.8	63.1	57.4	63.1	57.4	5.7
1980	60.3	61.0	55.8	61.0	55.8	5.2
1985	58.3	63.5	59.6	63.5	58.3	5.2
1967	57.1	52.4	54.6	57.1	52.4	4.7
1982	54.9	59.5	59.0	59.5	54.9	4.6
1986	54.9	59.5	59.0	59.5	54.9	4.6
1991	60.3	59.4	56.0	60.3	56.0	4.3
1966	57.7	57.2	53.5	57.7	53.5	4.2
1972	56.7	59.1	54.9	59.1	54.9	4.2
1984	59.1	60.0	56.0	60.0	56.0	4.0
1977	57.3	61.2	57.5	61.2	57.3	3.9
1973	59.3	56.8	59.8	59.8	56.8	3.0
1974	59.7	60.9	57.9	60.9	57.9	3.0
1987	60.1	63.1	60.5	63.1	60.1	3.0
1968	59.1	57.9	56.5	59.1	56.5	2.6
1976	58.5	58.5	56.0	58.5	56.0	2.5
1983	60.8	62.1	60.0	62.1	60.0	2.1
1992	64.2	66.1	64.3	66.1	64.2	1.9
1969	57.6	58.9	57.1	58.9	57.1	1.8
1971	58.0	58.4	56.6	58.4	56.6	1.8
1970	59.5	60.7	60.7	60.7	59.5	1.2
1981	60.0	60.6	59.6	60.6	59.6	1.0

Appendix table 5A-10. Weighted mean depths[a] of interviewed landings, and interviewed landings, by year and combination, within selected 5-fm depth intervals (37-42), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mean depths (fms)							Landings (t)						
	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC RS	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC RS
1966	40.0	41.4	39.0	42.8	40.6	42.2	42.0	0.2	19	20	20	35	50	83
1967	nil	nil	41.1	nil	38.9	42.5	39.7	0	0	7	0	70	10	54
1968	41.7	nil	39.9	44.0	37.7	40.0	38.5	7	0	14	6	115	4	367
1969	nil	42.0	41.4	nil	39.2	39.1	39.0	0	1	1	0	81	11	154
1970	nil	43.0	39.4	nil	38.3	40.0	39.3	0	0.05	24	0	74	0.1	98
1971	nil	nil	38.8	39.0	39.1	36.2	38.9	0	0	16	2	33	2	93
1972	nil	nil	nil	44.0	43.0	nil	39.2	0	0	0	14	5	0	22
1973	nil	nil	39.0	36.6	40.0	40.0	40.6	0	0	3	8	4	0.45	35
1974	nil	42.0	nil	nil	39.4	nil	nil	0	2	0	0	14	0	0
1975	nil	36.0	36.8	nil	37.6	44.0	39.9	0	0.05	0.2	0	11	1	20
1976	nil	nil	nil	nil	41.6	nil	nil	0	0	0	0	2	0	0
1977	nil	nil	38.0	nil	43.0	38.3	41.6	0	0	0.45	0	7	5	42
1978	nil	nil	42.7	nil	39.3	42.0	39.1	0	0	2	0	8	26	71
1979	nil	nil	nil	nil	38.6	37.0	39.0	0	0	0	0	11	54	202
1980	nil	nil	38.2	nil	37.9	40.1	38.7	0	0	9	0	36	22	211
1981	35.0	nil	39.7	nil	43.8	nil	37.9	0.05	0	0.4	0	17	0	73
1982	43.0	nil	37.0	nil	38.4	38.0	39.0	18	0	25	0	39	1	80
1983	38.8	nil	38.2	nil	37.6	35.0	35.2	2	0	3	0	24	0.45	15
1984	nil	nil	39.0	nil	39.0	nil	38.9	0	0	4	0	35	0	38
1985	nil	nil	39.6	nil	39.6	nil	43.0	0	0	3	0	93	0	3
1986	43.0	nil	37.0	nil	38.4	38.0	39.0	18	0	25	0	39	1	80
1987	nil	nil	37.0	nil	39.0	38.0	37.0	0	0	4	0	5	36	93
1988	nil	nil	42.9	nil	41.5	44.0	41.1	0	0	5	0	22	9	87
1989	nil	nil	nil	38.0	37.2	nil	37.4	0	0	0	1	18	0	132
1990	nil	nil	40.3	nil	40.4	35.0	40.6	0	0	4	0	18	1	17
1991	38.1	nil	42.3	38.0	43.0	40.9	40.2	2	0	6	0.4	24	19	55
1992	40.0	38.0	38.2	42.0	39.4	37.1	39.2	1	2	10	0.2	17	23	14
1993	42.7	nil	39.0	38.0	37.7	39.9	38.2	5	0	105	0.45	56	17	24

Appendix table 5A-10 (cont.)

Year	Mean depths (fms)							Landings (t)						
							LC/PC							LC/PC
	LC	PC	RS	LC/PC	LC/RS	PC/RS	RS	LC	PC	RS	LC/PC	LC/RS	PC/RS	RS
1994	40.2	37.0	38.3	nil	39.9	39.6	39.8	1	0	19	0	8	2	28
1995	38.9	nil	38.0	42.9	37.0	40.0	38.5	1	0	21	7	48	3	26
Total								54	24	331	60	968	299	2217
Mean[b] (m)	40.1 (73)	39.9 (73)	39.2 (72)	40.5 (74)	39.5 (72)	39.4 (72)	39.3 (72)							
S.D.	2.4	2.8	1.7	2.9	1.9	2.5	1.6							
Min[b] (m)	35.0 (64)	36.0 (66)	36.8 (67)	36.6 (67)	37.0 (68)	35.0 (64)	35.2 (64)	0	0	0	0	2	0	0
Max[b] (m)	43.0 (79)	43.0 (70)	42.9 (79)	44.0 (81)	43.8 (80)	44.0 (81)	43.0 (79)	18	19	105	20	115	54	367

a. Annual values weighted to landings of individual species. Summary values are not weighted
b. In parentheses, equivalent values in meters.

Appendix table 5A-11. Weighted mean depths[a] of interviewed landings, and interviewed landings, by year and combination, within selected 5-fm depth intervals (52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mean depths (fms)							Landings (t)						
	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC/RS	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC/RS
1966	59.0	58.7	61.0	57.1	52.0	nil	58.2	5	5	0.1	48	15	0	59
1967	55.0	52.6	nil	52.8	59.2	nil	53.4	2	37	0	10	1	0	35
1968	63.4	50.3	59.5	61.5	61.4	64.7	54.3	30	5	14	71	46	4	156
1969	55.0	52.0	51.0	56.8	55.5	51.0	56.9	0.1	3	0.45	2	17	1	55
1970	55.3	nil	nil	61.1	58.4	nil	60.6	0.3	0	0	4	41	0	38
1971	58.0	52.0	nil	59.4	59.6	nil	59.0	0.45	2	0	11	1	0	73
1972	55.0	60.5	70.0	65.0	62.0	57.7	56.2	1	11	0.45	38	1	98	186
1973	nil	nil	nil	60.5	54.0	67.0	56.4	0	0	0	10	0.2	0.2	157
1974	nil	61.1	nil	63.0	52.0	60.6	59.9	0	9	0	10	14	40	188
1975	65.0	60.1	nil	61.9	52.0	52.2	60.9	0.45	35	0	52	1	39	146
1976	54.0	63.0	50.0	57.1	50.0	57.7	57.7	1	45	0.45	48	0.1	84	607
1977	52.5	64.0	nil	61.8	53.9	56.3	59.5	9	36	0	79	3	19	255
1978	nil	58.8	61.0	67.4	50.0	70.2	63.9	0	102	2	195	1	23	110
1979	63.7	61.9	55.0	63.7	67.0	nil	64.1	3	118	<0.1	104	2	0	255
1980	61.6	59.6	54.0	66.3	52.0	56.2	59.8	0.4	67	0.02	54	8	6	151
1981	62.1	61.5	56.2	61.5	53.0	nil	59.7	1	5	1	48	1	0	186
1982	59.9	67.0	57.0	58.4	56.0	69.0	55.6	8	1	0.05	120	37	6	174
1983	62.3	67.1	50.0	58.8	59.6	56.0	62.2	34	2	0.05	95	44	2	107
1984	57.0	65.7	nil	70.2	56.5	nil	56.3	6	0.5	0	20	7	0	123
1985	56.5	71.0	nil	70.6	53.9	nil	64.2	4	0.2	0	23	6	0	100
1986	59.9	67.0	57.0	58.4	56.0	69.0	55.6	8	1	0.05	120	37	6	174
1987	57.5	68.7	nil	64.9	56.4	57.2	60.7	3	1	0	471	8	2	559
1988	56.6	63.3	nil	68.7	62.8	64.0	58.4	31	34	0	164	16	6	297
1989	67.6	nil	nil	63.1	58.2	nil	65.7	72	0	0	154	43	0	219
1990	62.7	72.2	nil	62.6	56.8	52.0	59.7	24	4	0	147	10	3	217
1991	62.1	61.1	52.7	60.4	59.5	58.5	59.0	61	31	3	117	65	52	98
1992	63.0	67.6	60.3	63.5	57.7	63.1	63.9	14	56	4	104	14	9	84
1993	65.5	66.7	55.7	67.3	56.1	62.8	62.6	52	58	7	157	55	14	61

Appendix table 5A-11 (cont.)

Year	Mean depths (fms)							Landings (t)						
	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC/RS	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC/RS
1994	57.5	66.2	51.9	62.7	56.2	51.8	56.3	70	18	2	55	93	2	63
1995	58.8	70.2	56.5	63.5	55.1	50.0	61.0	98	0.3	1	69	55	1	40
Total								541	685	37	2600	643	418	4973
N	27	27	17	30	30	21	30							
Mean[b] (m)	59.5 (109)	62.6 (115)	56.4 (103)	62.3 (114)	56.4 (103)	59.4 (109)	59.4 (109)							
S.D.	3.9	5.9	5.0	4.1	3.9	6.3	3.2							
Min (m)	52.5 (96)	50.3 (92)	50.0 (92)	52.8 (97)	50.0 (92)	50.0 (92)	53.4 (98)	0	0	0	2	0	0	35
Max (m)	67.6 (124)	72.2 (132)	70.0 (128)	70.6 (129)	67.0 (123)	70.2 (128)	65.7 (120)	98	118	14	471	93	98	607

a. Annual values weighted to landings of individual species. Summary values are not weighted
b. In parentheses, equivalent values in meters.

Appendix table 5A-12. Weighted mean depths[a] of interviewed landings, and interviewed landings, by year and species in multiple-species combinations[b], within selected 5-fm depth intervals (37-42), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mean depths (fms)									Landings (t)								
	LC/PC		LC/RS		PC/RS		LC/PC/RS			LC/PC		LC/RS		PC/RS		LC/PC/RS		
	LC	PC	LC	RS	PC	RS	LC	PC	RS	LC	PC	LC	RS	PC	RS	LC	PC	RS
1966	41.5	42.8	42.0	40.0	42.4	41.8	41.6	42.7	41.5	1	20	10	25	34	17	21	30	32
1967	nil	nil	39.4	38.3	42.1	43.0	40.4	39.0	40.4	0	0	35	35	5	5	4	28	22
1968	44.0	44.0	36.8	38.8	40.0	40.0	38.0	39.8	38.4	0.1	6	59	56	1	3	161	64	142
1969	nil	nil	39.3	39.1	39.2	39.1	39.3	40.3	38.2	0	0	34	46	0.5	10	51	34	69
1970	nil	nil	38.2	38.4	40.0	40.0	38.7	42.0	39.0	0	0	27	46	0.01	0.1	56	16	25
1971	39.0	39.0	37.9	39.5	37.1	36.1	38.9	39.2	38.6	1	1	9	24	0.5	2	28	36	29
1972	44.0	44.0	43.0	43.0	nil	nil	39.0	39.7	38.3	1	13	1	4	0	0	5	12	5
1973	36.4	36.8	40.0	40.0	40.0	40.0	38.8	43.0	40.0	5	4	3	1	0.5	0.05	16	14	5
1974	nil	nil	37.5	39.7	nil	nil	nil	nil	nil	0	0	2	12	0	0	0	0	0
1975	nil	nil	37.2	37.8	44.0	44.0	39.4	40.4	39.0	0	0	4	7	1	0.02	5	11	3
1976	nil	nil	40.4	43.8	nil	nil	nil	nil	nil	0	0	1	1	0	0	0	0	0
1977	nil	nil	43.0	43.0	39.3	38.1	41.2	41.8	41.5	0	0	1	6	1	5	12	22	9
1978	nil	nil	39.9	39.2	42.0	42.0	40.2	38.9	40.7	0	0	1	7	24	2	0.5	61	10
1979	nil	nil	38.6	38.8	37.0	37.0	38.7	39.2	38.8	0	0	6	5	37	17	10	106	86
1980	nil	nil	38.0	37.9	41.2	38.8	39.1	38.6	38.7	0	0	4	32	12	10	34	90	88
1981	nil	nil	43.9	43.2	nil	nil	38.1	38.6	37.5	0	0	15	2	0	0	15	18	40
1982	nil	nil	37.6	39.5	38.0	38.0	38.4	39.4	39.3	0	0	22	17	0.5	0.5	25	14	42
1983	nil	nil	37.2	37.8	35.0	35.0	35.1	35.3	35.4	0	0	5	18	0.5	0.1	10	0.5	4
1984	nil	nil	38.0	39.4	nil	nil	37.4	36.6	39.8	0	0	10	25	0	0	5	6	26
1985	nil	nil	39.7	39.4	nil	nil	43.0	43.0	43.0	0	0	65	28	0	0	0.5	0.1	2
1986	nil	nil	37.6	39.5	38.0	38.0	38.4	39.4	39.3	0	0	22	17	0.5	0.5	25	14	42
1987	nil	nil	39.2	38.9	38.0	38.0	36.4	37.2	36.1	0	0	1	3	35	1	4	76	13
1988	nil	nil	41.2	41.6	44.0	44.0	41.4	40.6	41.4	0	0	6	16	7	1	22	31	34
1989	38.0	38.0	36.9	38.1	nil	nil	36.7	37.8	37.8	1	0.1	14	5	0	0	49	43	41
1990	nil	nil	41.8	40.2	35.0	35.0	40.9	40.2	40.0	0	0	1	17	1	1	12	0.5	5
1991	38.0	38.0	43.2	43.0	39.9	42.7	42.5	39.4	41.6	0.05	0.5	8	15	12	7	7	38	11
1992	42.0	42.0	39.9	38.5	38.7	36.9	40.3	38.6	39.1	0.1	0.1	11	6	2	21	3	5	6
1993	38.0	38.0	38.4	37.5	39.5	40.1	38.3	38.1	38.3	0.5	0.2	10	45	6	11	2	12	10

Appendix table 5A-12 (cont.)

Year	Mean depths (fms)									Landings (t)								
	LC/PC		LC/RS		PC/RS		LC/PC/RS			LC/PC		LC/RS		PC/RS		LC/PC/RS		
	LC	PC	LC	RS	PC	RS	LC	PC	RS	LC	PC	LC	RS	PC	RS	LC	PC	RS
1994	nil	nil	41.5	38.9	41.7	39.2	40.0	40.0	39.1	0	0	30	49	0.5	2	20	1	7
1995	42.9	42.6	39.0	36.6	40.6	39.9	41.8	38.3	37.1	7	0.2	8	40	0.5	2	7	1	18
Total										16	44	427	612	183	119	610	786	824
N	10	10	30	30	23	23	28	28	28									
Mean (m)	40.4 (74)	40.5 (74)	39.5 (72)	39.6 (73)	39.7 (73)	39.4 (72)	39.4 (72)	39.5 (72)	39.2 (72)									
S.D.	2.8	2.8	2.1	1.9	2.4	2.6	1.9	1.8	1.7									
Min (m)	36.4 (67)	36.8 (67)	36.8 (67)	36.6 (67)	35.0 (64)	35.0 (64)	35.1 (64)	35.3 (65)	35.4 (65)	0	0	1	1	0	0	0	0	0
Max (m)	44.0 (81)	44.0 (81)	43.9 (80)	43.8 (80)	44.0 (81)	44.0 (81)	43.0 (79)	43.0 (79	43.0 (79)	7	20	65	56	37	21	161	106	142

a. Annual values weighted to landings of individual combinations. Summary values are not weighted.
b. Data for single-species combinations in Appendix table 5A-9.

Appendix table 5A-13. Weighted mean depths[a] of interviewed landings, and interviewed landings, by year and species in multiple-species combinations[b], within selected 5-fm depth intervals (52-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Cape Scott Spit (MSA 11-2), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mean depths (fms)									Landings (t)								
	LC/PC		LC/RS		PC/RS		LC/PC/RS			LC/PC		LC/RS		PC/RS		LC/PC/RS		
	LC	PC	LC	RS	PC	RS	LC	PC	RS	LC	PC	LC	RS	PC	RS	LC	PC	RS
1966	57.1	57.0	52.0	52.0	nil	nil	59.3	56.9	57.5	16	32	3	12	0	0	31	24	11
1967	54.9	52.1	59.7	57.0	nil	nil	54.5	53.0	53.1	3	8	1	0.2	0	0	9	11	5
1968	59.6	63.4	61.5	61.2	67.6	55.9	55.1	54.1	52.8	36	35	37	9	3	1	64	60	27
1969	59.9	56.7	55.5	55.5	51.0	51.0	57.7	55.8	56.9	0.1	2	14	3	1	0.05	27	19	8
1970	60.0	61.9	58.9	56.2	nil	nil	59.4	60.7	61.6	2	2	33	8	0	0	12	12	5
1971	55.1	61.3	61.6	57.8	nil	nil	59.3	59.3	57.0	3	7	0.5	0.5	0	0	21	42	19
1972	61.9	65.5	62.0	62.0	57.7	57.1	55.3	57.5	52.5	5	32	0.1	1	91	7	49	111	50
1973	61.1	59.3	54.0	54.0	67.0	67.0	58.2	55.5	59.0	7	4	0.1	0.1	0.1	0.05	39	108	49
1974	63.0	63.0	52.2	50.8	60.5	61.4	60.3	59.8	57.8	0.1	10	12	2	39	1	70	105	48
1975	63.5	61.8	52.0	52.0	52.6	50.2	59.5	61.4	57.9	4	48	0.5	0.5	33	6	26	116	52
1976	54.4	59.2	50.0	50.0	58.1	56.9	60.4	57.8	55.2	21	27	0.05	0.1	56	28	84	411	186
1977	58.3	62.0	53.9	53.9	56.1	57.3	57.9	60.2	57.6	5	74	2	1	15	4	49	184	83
1978	70.8	67.0	50.0	50.0	70.2	69.0	66.1	64.7	54.8	19	175	0.1	1	22	0.5	18	81	37
1979	69.7	63.4	67.0	67.0	nil	nil	63.9	64.5	60.6	5	99	0.5	1	0	0	16	216	98
1980	64.6	66.4	52.0	52.0	59.2	55.1	61.4	60.1	57.1	3	51	4	5	2	5	16	115	52
1981	61.1	61.7	53.0	53.0	nil	nil	59.6	59.9	59.5	19	29	1	0.5	0	0	76	92	42
1982	57.0	60.3	55.4	58.0	65.2	71.5	53.8	58.6	57.4	70	50	29	8	2	4	104	51	23
1983	58.7	59.1	59.6	60.0	56.0	56.0	62.1	64.3	60.1	78	17	39	5	1	0.5	87	11	5
1984	71.0	69.8	56.4	56.8	nil	nil	57.4	55.2	54.4	6	13	6	1	0	0	68	37	17
1985	70.7	70.4	53.9	53.8	nil	nil	63.1	66.8	58.2	15	9	5	2	0	0	64	33	15
1986	57.0	60.3	55.4	58.0	65.2	71.5	53.8	58.6	57.4	70	50	29	8	2	4	104	51	23
1987	62.4	65.7	56.6	54.9	57.8	55.9	59.7	61.4	60.5	122	349	7	0.5	2	1	218	330	150
1988	66.6	70.0	62.9	62.7	63.7	71.7	58.5	58.6	56.6	62	101	13	3	6	0.2	117	158	72
1989	62.2	64.3	57.0	61.4	nil	nil	65.7	67.6	58.1	92	62	31	11	0	0	132	70	32
1990	61.3	64.8	57.9	56.2	52.0	52.0	60.0	61.2	53.0	91	56	4	6	1	2	147	51	23
1991	60.5	60.3	59.5	58.8	58.7	53.5	58.0	60.0	56.3	46	70	59	6	49	3	34	55	25
1992	63.0	63.8	58.3	56.8	63.1	62.7	64.3	63.6	64.0	39	65	8	6	8	1	34	41	19
1993	66.8	67.5	55.7	57.2	63.4	61.3	62.7	64.1	58.7	42	115	43	13	10	4	21	29	13

Appendix table 5A-13 (cont.)

Year	Mean depths (fms)									Landings (t)								
	LC/PC		LC/RS		PC/RS		LC/PC/RS			LC/PC		LC/RS		PC/RS		LC/PC/RS		
	LC	PC	LC	RS	PC	RS	LC	PC	RS	LC	PC	LC	RS	PC	RS	LC	PC	RS
1994	62.0	63.8	56.4	55.1	53.7	50.9	56.1	57.8	55.6	34	22	73	20	0.5	1	44	11	5
1995	63.5	63.2	55.3	54.2	50.0	50.0	62.8	58.8	55.0	56	13	49	7	0.5	0.5	29	4	2
Total										970	1627	500	141	345	73	1809	2639	1198
N	30	30	30	30	21	21	30	30	30									
Mean (m)	61.9 (113)	62.8 (115)	56.5 (103)	56.3 (103)	59.5 (109)	58.9 (108)	59.5 (109)	59.9 (110)	57.2 (105									
S.D.	4.6	4.1	4.0	4.0	5.8	7.4	3.3	3.6	2.7									
Min (m)	54.4 (100)	52.1 (95)	50.0 (92)	50.0 (92)	50.0 (92)	50.0 (92)	53.8 (98)	53.0 (97)	52.5 (96)	0.1	2	0.05	0.1	0	0	9	4	2
Max (m)	71.0 (130)	70.4 (129)	67.0 (123)	67.0 (123)	70.2 (128)	71.7 (131)	66.1 (121)	67.6 (124)	64.0 (117)	122	349	73	20	91	28	218	411	186

a. Annual values weighted to landings of individual combinations. Summary values are not weighted.
b. Data for single-species combinations in Appendix table 5A-9.

Appendix table 5B-1. Interviewed effort per record, by year, for all-species landings containing lingcod, Pacific cod, or rock sole, from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Effort (hrs)	Records (nos)	Eff/Rec (nos/hr)
1966	1561	103	15.2
1967	807	100	8.2
1968	1096	77	14.2
1969	1280	68	18.8
1970	665	56	5.8
1971	1355	74	18.8
1972	2137	78	27.4
1973	1019	55	18.6
1974	1147	44	26.1
1975	3028	115	26.3
1976	2883	115	25.1
1977	2835	132	21.5
1978	3194	151	21.2
1979	3485	177	19.8
1980	3341	210	15.8
1981	3032	179	16.9
1982	2772	153	18.1
1983	2655	133	20.0
1984	1704	82	20.8
1985	1838	73	25.2
1986	2299	100	23.0
1987	3050	167	18.3
1988	2591	152	17.0
1989	2121	142	14.9
1990	2744	160	18.0
1991	3319	1153	2.9
1992	4971	1393	3.6
1993	3815	1333	2.9
1994	3008	1081	2.8
1995	3700	1285	2.9

Appendix table 5B-2. Total landings (t), and percent interviewed, by year, of lingcod (LC), Pacific cod (PC), and rock sole (RS), from Area 5B (MSA 8), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Landings (t)			% Interviewed		
	LC	PC	RS	LC	PC	RS
1966	192	237	270	99	100	99+
1967	134	84	166	100	100	100
1968	203	76	147	100	100	100
1969	106	75	189	100	100	100
1970	35	5	84	100	100	100
1971	121	56	169	100	100	100
1972	141	337	161	98	100	100
1973	31	204	65	100	100	100
1974	71	284	64	100	100	100
1975	209	737	214	100	100	100
1976	221	702	287	100	100	100
1977	195	375	148	100	100	100
1978	151	856	198	100	100	100
1979	210	756	155	100	100	100
1980	262	613	359	100	100	100
1981	510	426	193	100	100	100
1982	527	311	126	100	100	100
1983	689	71	174	100	100	100
1984	274	79	59	100	100	100
1985	369	39	125	100	100	100
1986	886	29	114	100	100	100
1987	618	1271	163	85	89	91
1988	673	883	244	61	74	54
1989	652	239	228	64	66	45
1990	10549	176	374	58	48	41
1991	949	1008	372	61	73	54
1992	597	780	389	82	61	89
1993	584	550	283	100	98	97
1994	501	216	247	97	96	99
1995	468	118	231	100	96	100
Total	21127	11595	5997			
Mean				94	93	92
S.D.				14	14	18
Min	31	5	59	58	48	41
Max	10549	1271	389	100	100	100

Appendix table 5B-3. Interviewed landings (000s lbs/tonnes), by year and species in combinations (all depths), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	LC	PC	RS	LC/PC		LC/RS		PC/RS		LC/PC/RS			Total		% comb.[a]
				LC	PC	LC	RS	PC	RS	LC	PC	RS	(lbs)	(t)	
1966	53	65	24	20	21	130	177	52	40	213	380	339	1514	687	90.6
1967	12	36	85	8	10	71	175	0.3	2	204	139	104	846	384	84.3
1968	112	5	78	24	5	112	76	1	4	200	156	166	939	426	79.2
1969	5	0.2	34	38	14	33	93	7	27	158	144	262	815	370	95.2
1970	4	1	47	1	2	51	52	1	19	19	7	62	266	121	80.5
1971	13	9	20	2	2	33	135	8	6	215	103	183	729	331	94.2
1972	2	102	13	37	60	20	54	153	45	244	424	222	1376	624	91.5
1973	1	78	8	14	223	16	6	110	2	37	36	128	659	299	86.8
1974	0.4	77	2	27	90	16	7	27	15	112	431	117	921	418	91.4
1975	28	281	17	90	321	14	32	109	68	323	901	354	2538	1152	87.2
1976	50	228	10	35	118	40	38	109	29	339	1084	556	2636	1196	89.1
1977	5	151	29	27	127	81	30	50	20	317	499	247	1583	718	88.3
1978	21	302	21	49	389	25	51	86	32	234	1108	332	2650	1202	87.0
1979	76	307	32	118	547	60	130	64	21	205	740	158	2458	1115	83.1
1980	59	218	164	76	311	92	59	201	153	347	616	398	2694	1222	83.6
1981	190	372	50	153	252	166	68	20	7	574	274	263	2389	1084	74.4
1982	162	40	71	196	375	214	67	25	1	588	245	135	2119	961	87.1
1983	497	15	60	183	87	212	151	4	14	613	51	144	2031	922	71.8
1984	133	66	24	120	37	135	36	10	3	210	62	64	900	408	75.2
1985	24	9	5	37	20	133	63	4	20	463	54	170	1002	455	96.2
1986	228	7	22	218	31	438	85	3	0.4	882	17	136	2067	938	87.6
1987	105	225	3	213	749	169	63	206	6	657	1274	254	3924	1780	91.5
1988	76	219	11	105	399	73	74	89	9	645	728	196	2624	1191	88.3
1989	84	45	14	226	145	111	44	27	11	497	131	154	1489	676	90.4
1990	150	5	31	177	93	197	152	2	3	768	84	153	1815	824	89.8
1991	410	553	128	207	435	333	170	332	51	250	313	92	3274	1485	66.7
1992	422	627	331	156	354	222	200	34	36	252	349	197	3180	1443	56.6
1993	377	388	241	227	532	117	207	97	64	179	165	92	2686	1219	62.5

Appendix table 5B-3 (cont.)

Year	LC	PC	RS	LC/PC		LC/RS		PC/RS		LC/PC/RS			Total		% comb.[a]
				LC	PC	LC	RS	PC	RS	LC	PC	RS	(lbs)	(t)	
1994	324	171	203	139	112	234	141	30	36	258	89	157	1894	859	63.1
1995	314	47	140	209	57	251	228	62	33	237	79	102	1759	798	71.5
Total	3937	4649	1918	3132	5918	3799	2864	1923	777	10240	10683	5937	55778	25308	81.2
(t)	1786	2109	870	1421	2685	1724	1299	873	353	4646	4847	2694	25308		
%	7.1	8.3	3.4	5.6	10.6	6.8	5.1	3.4	1.4	18.4	19.2	10.6	100.0		
				16.2		11.9		4.8		48.2			81.1		
Min	0.4	0.2	2	1	2	14	6	0.3	0.4	19	7	62	266		
Max	497	627	331	227	749	438	228	332	153	882	1274	556	3924		

a. comb. = multiple-species combinations = LC/PC + LC/RS + PC/RS + LC/PC/RS.

Appendix table 5B-4. Interviewed effort (hrs), by year and mid-points of 5-fm depth intervals, for all-species landings containing lingcod, Pacific cod, or rock sole, from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mid-points (fms)[a]																					
	22-27 (<59)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (223)	127-162 (>223)	Total
1966	14	0	54	65	356	281	334	13	0	61	0	0	64	90	31	45	39	56	40	0	18	1561
1967	0	6	24	32	316	189	136	33	2	0	8	0	14	0	0	4	19	0	0	23	4	810
1968	0	8	8	55	466	225	178	42	3	0	0	0	0	0	0	30	75	0	0	7		1097
1969	0	12	112	170	504	180	97	15	20	8	0	0	0	0	0	0	0	69	0	93		1280
1970	6	47	64	98	163	26	45	31	7	0	0	1	0	0	26	0	34	47	72			667
1971	0	73	24	138	284	348	96	21	17	15	45	6	0	36	173	195	57\	0	2			1473
1972	0	0	0	46	209	285	369	381	157	210	65	132	0	54	65	55	77	0	0	0	33	2138
1973	0	0	0	20	46	171	188	150	181	104	28	0	44	0	0	0	0	0	90			1022
1974	0	0	0	4	0	165	131	222	231	105	50	31	0	0	0	85	89	0	0	0	35	1148
1975	0	6	0	0	300	809	411	760	160	181	0	0	0	0	12	0	0	74	115	56	145	3029
1976	0	0	0	11	116	795	779	528	448	59	10	0	0	0	16	0	0	0	0	0	121	2883
1977	8	0	2	12	28	302	619	757	402	301	171	33	0	0	0	0	20	15	0	44	124	2838
1978	24	10	0	0	26	56	570	724	782	415	348	135	85	20								3195
1979	0	0	10	57	179	124	740	731	517	693	212	91	72	0	0	10	4	0	26	0	19	3485
1980	20	0	192	124	385	286	241	609	510	459	187	182	18	8	0	5	0	0	49	42	25	3342
1981	0	2	0	38	67	410	456	578	201	160	420	188	113	2	39	171	0	36	0	59	92	3032
1982	0	0	17	23	169	220	661	530	436	107	151	226	118	19	18	0	0	0	0	8	69	2772
1983	0	0	16	23	134	128	710	993	199	169	94	25	30	55	0	0	8	0	0	0	71	2655
1984	0	0	7	2	10	152	277	524	258	229	109	64	35	4	0	0	0	0	0	0	33	1704
1985	0	0	0	0	248	184	464	307	164	244	134	62	18	0	14							1839
1986	0	0	73	20	167	250	705	210	162	268	323	50	17	54								2299
1987	0	0	6	2	20	210	407	679	773	400	230	118	64	47	31	21	34	8				3050
1988	0	0	12	30	46	113	295	593	421	583	265	83	29	31	28	13	15	0	17	5	12	2591
1989	0	12	25	11	4	149	239	409	227	360	220	230	138	51	21	0	18	0	0	7		2121
1990	0	0	0	20	87	354	380	737	590	207	98	128	48	46	6	29	14					2744
1991	12	140	34	69	159	354	547	615	301	506	255	155	58	40	15	29	20	5	5			3319
1992	3	50	137	199	236	601	576	693	605	801	399	226	205	47	35	60	38	36	21	0	3	4971
1993	12	30	167	104	152	386	352	627	486	501	301	215	165	143	65	30	39	9	22	6	3	3815

Appendix table 5B-4 (cont.)

Year	Mid-points (fms)[a]																					
	22-27 (<59)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (223)	127-162 (>223)	Total
1994	14	39	113	127	217	502	630	490	190	150	110	109	28	8	12	30	4	42	29	15	149	3008
1995	47	60	83	98	284	765	713	538	129	206	118	143	120	58	43	57	23	41	58	10	106	3700
Total	160	495	1180	1598	5536	9023	12346	13540	8610	7502	4351	2633	1483	813	477	869	727	438	546	375	1062	73588
%	0.2	0.7	1.6	2.2	7.5	12.3	16.8	18.4	11.7	10.2	5.9	3.6	2.0	1.1	0.6	1.2	1.0	0.6	0.7	0.5	1.4	100.0

a. 5-fm intervals: 22 = 20-24, *etc*. In parentheses, equivalent values in meters.

Appendix table 5B-5. Interviewed landings (000s lbs/tonnes), by year and 5-fm depth interval, of lingcod from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mid-points (fms)[a]																					Total	
	22-27 (<59)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (223)	127-157 (>223)	(lbs)	(t)
1966	9	0	3	10	102	149	89	2	0	8	0	0	26	5	0.3	0.3	1	10	2	0	0.3	417	189
1967	0	1	3	4	48	50	168	15	0	0	0	0	0.1	0	0	1	5	0	0	2	0.1	297	135
1968	0	0.1	9	83	172	86	61	15	0.2	0	0	0	0	0	0	2	1	0	0	19		448	203
1969	0	1	5	69	85	52	19	0.4	2	0	0	0	0	0	0	0	0	0.2				234	106
1970	6	5	2	8	27	7	8	11	0	0	0	0	0	0	1	0	1	0.4	0.5			77	35
1971	0	10	1	39	92	88	23	2	0.1	1	1	0	0	5	1	1	0.4					265	120
1972	0	0	0	1	31	84	69	37	23	45	4	2	0	0	7							303	137
1973	0	0	0	8	12	17	11	5	1	2	11											67	30
1974	0	0	0	0	0	39	32	44	32	1	1	3	0	0	0	1	3					156	71
1975	0	1	0	0	43	211	66	89	18	26	0	0	0	0	0	0	0	0	0	0	0.1	454	206
1976	0	0	0	8	6	143	153	91	32	32	0	0	0	0	0	0	0	0	0	0	1	466	211
1977	3	0	0.2	0	5	56	199	130	23	5	8	1	0	0	0	0	0.2	1				431	196
1978	7	0	0	0	0	14	68	85	106	16	21	7	4									328	149
1979	0	0	0	3	6	69	157	123	43	44	6	4	2									457	207
1980	0	0	8	37	93	85	39	71	124	68	29	7	2	0.1	0	2	0	0	7	0	0.01	572	260
1981	0	0	0	3	18	241	272	288	62	25	75	46	6	0	16	31	0	0.1	0	0	0.1	1083	491
1982	0	0	0	1	74	55	346	304	213	48	35	54	16	7	2	0	0	0	0	0	5	1160	526
1983	0	0	0	0	49	35	440	728	150	72	24	3	2	1	0	0	2					1506	683
1984	0	0	12	0	10	62	104	194	163	29	15	0.1	5	3	0	0	0	0	0	0	1	598	271
1985	0	0	0	0	74	108	226	85	44	73	34	8	0	0	4							656	298
1986	0	0	24	1	209	295	799	143	99	44	86	26	0.1	40								1766	801
1987	0	0	0.1	0.02	11	160	178	319	309	117	24	16	3	2	3	3	0.1					1145	520
1988	0	0	0.5	71	37	15	145	272	164	137	20	17	1	5	7	0.2	4	0	1	3	1	901	409
1989	0	1	6	0	0	35	239	331	118	111	24	21	27	4	1	0	1					919	417
1990	0	0	0	8	13	265	108	479	199	86	59	53	12	3	2	2	3					1292	586
1991	0	7	8	21	185	336	194	240	61	99	15	11	7	3	1	3	8	0	1			1200	544
1992	0	2	0	16	39	175	121	250	224	141	25	18	16	2	10	4	1	4	0.01	0	4	1052	477
1993	0	1	5	4	20	48	63	281	141	125	55	23	25	83	15	6	1	0	5	0	0.4	901	409

Appendix table 5B-5 (cont.)

Year	Mid-points (fms)[a]																						
	22-**27** (<59)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (223)	127-157 (>223)	Total	
1994	0.03	0.4	17	16	96	169	299	206	75	35	16	14	3	1	1	1	0.1	1	1	1	1	954	433
1995	0.2	3	5	10	69	197	263	244	40	71	30	27	16	17	10	2	2	1	1	1	4	1013	460
Total	25	33	109	421	1626	3346	4959	5084	2466	1461	618	361	173	181	81	60	34	18	19	26	18	21118	9582
(t)	11	15	49	191	738	1518	2250	2307	1119	663	280	164	79	82	37	27	15	8	8	12	8	9582	
%	0.1	0.2	0.5	2.0	7.7	15.8	23.5	24.1	11.7	6.9	2.9	1.7	0.8	0.9	0.4	0.3	0.2	0.1	0.1	0.1	0.1	100.0	

a. 5-fm intervals: 22 = 20-24, *etc*. In parentheses, equivalent values in meters.

Appendix table 5B-6. Interviewed landings (000s lbs/tonnes), by year and 5-fm depth interval, of Pacific cod from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mid-points (fms)[a]																					Total	
	22-27 (<59)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (223)	127-162 (>223)	(lbs)	(t)
1966	0	0	0	9	93	82	311	4	0	12	0	0	2	2	0	0.1	0	5	0	0	0.03	520	236
1967	0	0	0	1	125	12	27	12	7	0	0.3	0	0.1									184	84
1968	0	0.03	0	1	30	50	74	12	0	0	0	0	0	0	0	1	0.1					168	76
1969	0	1	0.3	22	44	36	60	0.4	1	0.1	0	0	0	0	0	0	0	0	0	0.01		165	75
1970	0	0.1	4	3	0	1	1	1	0.1	0	0	1	0	0	0	0	0.1	0.1	0.2			12	5
1971	0	0	0	17	46	32	12	3	1	6	1	0.5	0	0	3	1	0	0.01				123	56
1972	0	0	0	15	45	104	214	134	118	75	5	9	0	8	7	1	4	0	0	0	0.2	739	335
1973	0	0	0	3	4	19	205	66	116	30	3	0	2	0	0	0	0	0	1			449	204
1974	0	0	0	1	0	31	142	155	151	30	14	84	0	0	0	1	13	0	0	0	3	625	284
1975	0	2	0	0	119	422	247	598	160	51	0	0	0	0	2	0	0	2	5	2	4	1614	732
1976	0	0	0	0.1	64	568	265	291	316	29	0	0	0	0	2	0	0	0	0	0	5	1540	699
1977	0	0	0	0	1	29	119	186	248	113	89	13	0	0	0	0	0.1	0	0	0.4	4	803	364
1978	0.5	8	0	0	0.1	36	223	457	656	248	163	59	35	0.1								1886	856
1979	0	0	0	5	11	97	411	192	258	490	110	36	37	0	0	1	0.1	0	3	0	7	1658	752
1980	0	0	10	41	21	174	76	426	273	197	40	82	4	1	0	0	0	0	1	1	1	1348	612
1981	0	1	0	0	3	10	50	96	62	41	323	136	175	0.1	2	10	0	4	0	1	4	918	417
1982	0	0	0	0	25	157	89	78	144	8	18	92	74	0	0	0	0	0	0	0.1		685	311
1983	0	0	1	0	3	1	29	44	11	47	8	6	6	0	0	0	0	0	0	0	0.04	156	71
1984	0	0	0.3	0	1	11	19	35	10	34	15	48	1									174	79
1985	0	0	0	0	8	11	18	26	2	12	9	1	1									88	40
1986	0	0	0	0	8	0.4	3	9	4	10	13	11	1	0	0.03							59	27
1987	0	0	0	0	6	34	365	396	749	634	224	25	1	11	5	2	1	1				2454	1113
1988	0	0	14	27	1	9	25	262	369	484	241	3	0.5	0.3	0.4	1	0	0	0.1			1437	652
1989	0	0.1	1	0	5	24	35	63	46	131	19	6	16	2	0	0	1	0	0	0.01		349	158
1990	0	0	0	0.3	3	15	9	41	64	35	7	8	1	0.2	0	0.4	1					185	84
1991	2	30	20	6	17	41	85	254	190	590	234	118	28	9	0.5	5	1	0.4	2			1633	741
1992	0	1	0.4	3	16	38	86	120	169	428	222	103	123	22	15	7	0.4	5	4	0	0.1	1363	618
1993	0	0.1	7	3	28	37	55	148	131	299	140	156	126	31	11	6	3	0.4	0.1	0.04	0.04	1182	536

Appendix table 5B-6 (cont.)

Year	Mid-points (fms)[a]																						
	22-27 (<59)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 (123)	72 (132)	77 (141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (223)	127-162 (>223)	Total (lbs)	(t)
1994	0.03	0.1	1	4	16	43	45	46	47	29	66	87	9	0.1	1	2	0.3	1	1	1	2	402	182
1995	0.04	1	1	3	4	72	26	33	14	19	8	33	19	6	1	2	0.2	1	1	0.3	1	246	111
Total	3	44	60	164	747	2196	3326	4188	4317	4082	1972	1118	662	93	50	41	25	20	18	6	31	23164	10510
(t)	1	20	27	75	339	997	1509	1900	1959	1852	895	507	300	42	23	18	11	9	8	3	14	10510	
%	0.01	0.2	0.3	0.7	3.2	9.5	14.4	18.1	18.6	17.6	8.5	4.8	2.9	0.4	0.2	0.2	0.1	0.1	0.1	0.03	0.1	100.0	

a. 5-fm intervals: 22 = 20-24, *etc*. In parentheses, equivalent values in meters..

Appendix table 5B-7. Interviewed landings (000s lbs/tonnes), by year and 5-fm depth interval, of rock sole from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mid-points (fms)[a]																						
	22-27 (<59)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 123)	72 132)	77 141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (223)	127-162 (>223)	Total (lbs)	(t)
1966	4	0	54	34	187	133	135	2	0	19	0	0	7	0.4	0	1	1	3	0	0	0.1	581	263
1967	0	3	20	15	198	78	37	12	0	0	2	0	0.3									365	166
1968	0	1	0	25	190	65	39	4	0.5	0	0	0	0	0	0	0	0.4	0	0	1		326	148
1969	0	5	56	63	212	60	15	5	2	0	0	0	0	0	0	0	0	0.3				418	190
1970	0	34	25	42	55	6	12	6	0.1	0	0	0	0	0	0	0	0.1					180	82
1971	0	14	11	51	91	131	31	11	0.5	0.3	0	0	0	0	0	0	0	0	2			343	156
1972	0	0	0	44	89	77	55	33	5	15	9	0.4	0	4	3							334	152
1973	0	0	0	37	18	70	5	5	7	0.1	2											144	65
1974	0	0	0	0	0	44	37	26	18	0	0	12	0	0	0	4	0.4					141	64
1975	0	1	0	0	127	155	91	60	3	31	0	0	0	0	0	0	0	0	0	3		471	214
1976	0	0	0	4	10	213	223	138	37	2	2	0	0	0	0	0	0	0	0	0	3	632	287
1977	1	0	0	5	3	80	156	61	13	4	4	0	0	0	0	0	0.02					327	148
1978	2	7	0	0	16	15	206	134	43	8	4	1	0	0.01								436	198
1979	0	0	10	23	69	11	155	47	16	6	3	0.4	0.01	0	0	0.1	0.02					341	155
1980	31	0	247	95	109	123	90	36	37	4	0.3	3										775	352
1981	0	2	0	31	7	117	111	112	1	3	2	0.1	0.1	0	1	2						389	177
1982	0	0	23	13	76	8	91	23	26	2	9	2										273	124
1983	0	0	18	24	37	29	88	140	29	3	0.3	0										368	167
1984	0	0	0	1	3	17	35	63	2	3	2	1	0	0	0	0	0	0	0	0	0.1	127	58
1985	0	0	0	0	111	24	91	22	1	6	3											258	117
1986	0	0	26	9	10	24	124	21	6	1	8	0.3	0	14								243	110
1987	0	0	2	3	9	93	55	60	84	18	1	1	0.3	0	1							327	149
1988	0	0	21	28	29	32	61	53	34	25	7	0.3										290	132
1989	0	10	16	4	5	68	49	52	6	0.3	2	0.03	2	10								224	102
1990	0	0	0	22	44	107	68	37	46	3	3	6	0.02	1								337	153
1991	1	77	12	43	50	78	120	34	6	10	5	2	0.2	0.4	0.4	0	0.4	0	0.01			439	199
1992	1	21	70	72	85	192	166	70	37	28	7	6	1	0	1	5	1	1	0.3			764	347
1993	9	12	110	53	57	144	104	72	11	21	6	0.1	1	1	2	1	0.4	0	0	0.4		605	274

Appendix table 5B-7 (cont.)

Year	Mid-points (fms)[a]																						
	22-27 (<59)	32 (59)	37 (68)	42 (77)	47 (86)	52 (95)	57 (104)	62 (113)	67 123)	72 132)	77 141)	82 (150)	87 (159)	92 (168)	97 (178)	102 (187)	107 (196)	112 (205)	117 (214)	122 (223)	127-162 (>223)	Total (lbs)	(t)
1994	9	12	57	76	65	152	109	44	9	1	0.4	1	0.2	0	0.03	0.2						536	243
1995	13	20	24	38	58	218	70	51	4	1	1	1	1	1	0.2	0.04	0	0	0.4			502	228
Total	71	219	802	855	2020	2564	2629	1434	484	215	83	38	13	32	9	13	4	4	3	4	3	11499	5217
(t)	32	99	364	388	917	1163	1193	651	220	97	38	17	6	14	4	6	2	2	1	2	1	5217	
%	0.6	1.9	7.0	7.4	17.6	22.3	22.9	12.5	4.2	1.9	0.7	0.3	0.1	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	100.0	

a. 5-fm intervals: 22 = 20-24, *etc*. In parentheses, equivalent values in meters..

Appendix table 5B-8. Weighted mean depths[a] of interviewed landings, and interviewed landings, by year and species, within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groudnfish Data Base)

Year	Mean depths (fms)			Landings (t)		
	LC	PC	RS	LC	PC	RS
1966	52.3	54.7	52.3	159	227	216
1967	54.7	50.6	49.9	127	83	148
1968	50.8	54.0	49.6	152	75	135
1969	50.1	52.7	48.9	72	64	133
1970	52.2	57.8	50.0	24	1	36
1971	50.5	52.0	51.3	93	45	120
1972	58.2	59.9	54.0	131	314	124
1973	53.9	61.1	52.9	22	199	48
1974	59.4	62.1	57.7	67	231	56
1975	56.0	58.3	54.3	206	725	211
1976	58.0	58.0	56.9	206	696	283
1977	58.5	64.1	57.2	190	316	144
1978	62.7	64.6	59.3	131	735	191
1979	59.9	64.1	56.2	201	662	138
1980	59.6	62.8	54.3	219	529	181
1981	58.2	63.2	56.9	411	118	159
1982	60.2	58.8	55.3	472	227	103
1983	60.8	64.4	58.6	669	61	148
1984	61.7	63.4	59.2	255	50	56
1985	58.1	59.6	53.0	277	34	116
1986	56.2	61.4	56.8	721	15	84
1987	62.1	65.6	59.7	496	990	144
1988	63.0	67.6	59.2	349	521	106
1989	62.2	65.5	56.7	378	138	82
1990	60.7	64.6	56.1	522	76	139
1991	56.8	66.9	55.3	506	534	136
1992	61.6	66.8	55.8	431	389	262
1993	63.3	65.7	55.8	308	317	186
1994	57.6	60.4	54.1	399	103	172
1995	58.1	58.1	53.7	401	76	183
Total				8593	8553	4240
Mean (fms)	57.9	61.0	55.0			
(m)	106	112	101			
S.D. (fms)	3.9	4.7	3.0			

Appendix table 5B-8 (cont.)

		Mean depths		
		LC	PC	RS
Min	(fms)	50.1	50.6	48.9
	(m)	92	93	89
Max	(fms)	63.3	67.6	59.7
	(m)	116	124	109

a. Annual values weighted to landings of individual species. Summary values are unweighted.

Appendix table 5B-9. Absolute differences in weighted mean depths of interviewed landings (all combinations), by year, among species within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: Appendix table 5B-8)

Year	Mean depths (fms)					
	LC	PC	RS	Max	Min	Diff
1991	56.8	66.9	55.3	66.9	55.3	11.6
1992	61.6	66.8	55.8	66.8	55.8	11.0
1993	63.3	65.7	55.8	65.7	55.8	9.9
1989	62.2	65.5	56.7	65.5	56.7	8.8
1980	59.6	62.8	54.3	62.8	54.3	8.5
1990	60.7	64.6	56.1	64.6	56.1	8.5
1988	63.0	67.6	59.2	67.6	59.2	8.4
1973	53.9	61.1	52.9	61.1	52.9	8.2
1979	59.9	64.1	56.2	64.1	56.2	7.9
1970	52.2	57.8	50.0	57.8	50.0	7.8
1977	58.5	64.1	57.2	64.1	57.2	6.9
1985	58.1	59.6	53.0	59.6	53.0	6.6
1981	58.2	63.2	56.9	63.2	56.9	6.3
1994	57.6	60.4	54.1	60.4	54.1	6.3
1972	58.2	59.9	54.0	59.9	54.0	5.9
1987	62.1	65.6	59.7	65.6	59.7	5.9
1983	60.8	64.4	58.6	64.4	58.6	5.8
1978	62.7	64.6	59.3	64.6	59.3	5.3
1986	56.2	61.4	56.8	61.4	56.2	5.2
1982	60.2	58.8	55.3	60.2	55.3	4.9
1967	54.7	50.6	49.9	54.7	49.9	4.8
1968	50.8	54.0	49.6	54.0	49.6	4.4
1974	59.4	62.1	57.7	62.1	57.7	4.4
1995	58.1	58.1	53.7	58.1	53.7	4.4
1984	61.7	63.4	59.2	63.4	59.2	4.2
1975	56.0	58.3	54.3	58.3	54.3	4.0
1969	50.1	52.7	48.9	52.7	48.9	3.8
1966	52.3	54.7	52.3	54.7	52.3	2.4
1971	50.5	52.0	51.3	52.0	50.5	1.5
1976	58.0	58.0	56.9	58.0	56.9	1.1

Appendix table 5B-10. Weighted mean depths of interviewed landings, and interviewed landings, by year and combination, within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mean depths (fms)							Landings (t)						
	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC/RS	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC/RS
1966	52.1	48.7	54.8	54.5	51.4	46.9	50.2	21	29	3	19	94	35	400
1967	55.0	52.2	50.8	58.6	52.7		53.6	2	16	28	8	103	0	201
1968	50.8	60.0	47.0	53.8	49.5	53.3	52.3	38	2	34	12	65	2	208
1969	58.2	70.0	48.4	64.0	47.6	63.0	49.8	2	0.045	11	0.2	25	15	216
1970	61.7		47.6	60.0	50.2	56.6	54.6	0.45	0	13	0.045	35	0.45	12
1971	51.7	51.7	54.5	55.9	50.8	50.0	50.2	3	3	6	0.45	47	5	196
1972		62.1	59.2	67.4	49.6	58.6	58.0	0	41	4	40	32	66	385
1973	59.0	65.4	53.3	59.5	48.5	64.8	54.9	0.45	34	4	106	4	51	70
1974	71.0	68.3		64.7	56.4	53.8	59.7	0.2	33	0	46	9	19	247
1975	55.5	60.0	60.9	61.6	54.5	56.0	56.0	13	121	6	186	21	80	715
1976	64.0	56.6	52.3	57.8	56.0	53.4	57.5	23	102	4	68	32	61	896
1977	56.2	69.5	55.7	66.9	56.1	60.6	60.2	2	45	11	68	49	31	443
1978	61.7	66.4	49.3	68.9	56.9	62.2	62.1	5	123	10	123	34	44	719
1979	54.1	66.9	55.9	64.7	55.6	65.7	60.8	34	113	10	250	86	21	487
1980	65.5	67.9	48.9	63.5	59.4	57.8	60.0	18	73	5	139	45	132	516
1981	61.4	64.1	55.3	62.7	54.9	45.7	57.9	69	24	16	67	84	12	425
1982	59.6	55.5	48.1	61.0	55.9	50.0	59.8	64	7	16	190	127	0.45	397
1983	60.6	67.0	60.8	62.6	58.7	54.5	60.2	213	0.1	14	119	165	1	367
1984	63.9	70.8	55.2	67.4	61.1		59.8	51	7	10	64	77	0	152
1985	67.5	61.8	61.8	60.4	52.5	46.7	58.2	5	1	2	14	89	11	304
1986	58.0	71.0	63.0	52.6	47.5	73.0	49.9	78	2	4	93	176	0.45	467
1987	59.8	69.8	56.0	67.2	59.5	72.1	62.5	40	73	0	386	102	78	951
1988	51.9	70.4	50.2	67.6	56.3	55.5	65.1	21	80	5	195	65	4	607
1989	65.1	69.5	53.0	67.2	57.9	58.4	59.2	29	14	1	148	66	17	321
1990	65.5	70.3	67.0	65.8	60.0	59.0	58.6	55	1	14	100	147	2	416
1991	56.2	67.9	55.6	63.6	53.3	67.8	60.4	173	176	34	236	210	103	245

Appendix table 5B-9 (cont.)

Appendix table 5B-10 (cont.)

Year	Mean depths (fms)							Landings (t)						
	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC/RS	LC	PC	RS	LC/PC	LC/RS	PC/RS	LC/PC/RS
1992	61.1	69.6	52.5	66.6	56.9	59.9	60.7	168	155	80	157	181	26	314
1993	62.8	68.5	54.7	65.0	56.9	58.5	62.4	112	96	67	199	110	64	162
1994	57.7	64.3	51.4	60.4	55.8	51.3	57.0	132	24	44	85	153	23	215
1995	57.8	70.1	53.9	60.6	54.5	53.0	57.5	123	5	47	80	192	36	176
Total								1496	1401	503	3199	2626	942	11230
Mean (fms)	59.5	64.7	54.4	62.4	54.6	57.4	57.6							
(m)	109	118	100	114	100	105	105							
S.D. (fms)	5.0	6.4	5.0	4.5	3.8	7.1	4.1							
Min (fms)	50.8	48.7	47.0	52.6	47.5	45.7	49.8							
(m)	93	89	86	96	87	84	91							
Max (fms)	71.0	71.0	67.0	68.9	61.1	73.0	65.1							
(m)	130	130	123	126	112	134	119							

a. Annual values weighted to landings (lbs) of individual combinations. Summary values are unweighted.

Appendix table 5B-11. Weighted mean depths of interviewed landings, and interviewed landings, by year and species in multiple-species combinations, within selected 5-fm depth intervals (47-72), for lingcod (LC), Pacific cod (PC), and rock sole (RS), from Goose Island Bank (MSA 8-1,2,3,4), April-September 1966-95. (Source: PBS Groundfish Data Base)

Year	Mean depths (fms)									Landings (t)								
	LC/PC		LC/RS		PC/RS		LC/PC/RS			LC/PC		LC/RS		PC/RS		LC/PC/RS		
	LC	PC	LC	RS	PC	RS	LC	PC	RS	LC	PC	LC	RS	PC	RS	LC	PC	RS
1966	55.9	53.1	51.4	51.5	42.7	52.2	53.2	46.7	52.5	9	10	47	47	20	16	82	169	150
1967	58.6	58.2	52.7	48.1			53.6	50.3	50.7	4	5	29	74	0	0	93	63	47
1968	52.7	59.4	49.7	49.1	52.7	53.5	51.0	54.5	51.4	10	2	40	25	0	2	64	70	74
1969	64.0	64.0	50.8	46.2	63.0	63.0	49.2	52.6	48.3	0	0	7	17	3	12	63	61	93
1970	60.0	60.0	51.3	49.2	56.8	56.6	54.4	56.5	54.4	0	0	18	18	0	0	5	1	5
1971	54.5	57.8	51.1	50.8	49.6	50.5	49.7	51.5	50.0	0	0	8	39	3	2	82	40	74
1972	67.3	67.5	51.9	48.8	58.7	56.2	57.8	59.2	55.8	16	25	8	24	64	3	107	184	94
1973	60.4	59.4	48.8	48.2	64.8	63.6	53.5	59.0	53.9	6	100	2	2	50	1	14	15	42
1974	63.2	65.2	56.6	55.8	55.3	51.1	58.6	60.4	58.5	11	34	7	2	12	7	49	152	47
1975	60.4	61.9	55.4	54.2	57.0	54.4	55.0	56.1	54.0	41	146	6	15	49	31	146	408	160
1976	57.8	59.4	55.3	56.6	52.4	57.6	56.9	58.4	56.4	15	53	16	16	49	12	152	492	251
1977	61.4	68.1	56.6	54.8	62.5	55.8	59.2	62.0	58.1	12	57	35	14	22	9	141	192	111
1978	65.8	69.3	57.7	56.5	63.2	58.8	62.2	62.9	59.3	16	107	11	23	34	11	99	471	148
1979	63.5	65.0	58.9	54.0	66.4	61.2	60.1	61.6	56.8	49	200	27	59	19	3	90	330	66
1980	63.2	63.6	64.8	52.7	59.3	55.3	59.8	62.1	55.1	24	115	25	20	86	46	152	256	109
1981	61.3	66.5	54.8	55.2	45.2	47.1	57.1	62.0	56.7	49	19	62	22	9	3	231	75	118
1982	64.8	58.3	56.1	55.2	50.0	50.0	60.7	58.8	57.8	78	112	97	30	0	0	233	108	57
1983	60.6	67.0	58.6	58.9	57.7	51.5	61.0	60.4	56.8	81	38	96	69	0	0	278	23	65
1984	67.5	67.3	61.3	60.1			59.3	60.5	60.6	48	16	61	16	0	0	95	27	29
1985	61.9	58.7	52.8	51.8	49.6	46.2	59.6	60.3	53.9	7	7	60	29	2	9	205	25	76
1986	52.1	61.0	53.3	53.9	73.0	73.0	57.5	57.5	56.6	88	6	157	19	0	0	398	7	62
1987	65.0	67.8	60.9	55.7	72.2	68.3	62.2	63.0	61.0	85	300	75	26	75	3	295	542	115
1988	63.9	68.6	58.2	54.4	66.9	50.8	64.1	66.8	62.2	38	157	32	33	9	3	258	283	66
1989	67.0	67.5	57.9	57.9	59.7	55.4	59.4	61.7	56.0	89	59	47	19	12	5	212	52	57
1990	64.9	67.0	61.6	57.6	61.3	57.2	58.9	60.6	56.2	59	42	88	59	1	1	320	32	64
1991	60.9	65.1	53.3	53.4	68.6	57.7	57.4	64.3	56.3	84	152	143	67	95	8	106	111	27
1992	65.0	67.4	58.0	55.7	61.5	58.3	62.0	62.1	57.2	56	101	97	85	13	13	110	121	84
1993	64.6	65.3	58.9	55.4	60.0	56.1	63.2	64.5	56.6	74	124	48	63	39	25	74	57	31

Appendix table 5B-11 (cont.)

Year	Mean depths (fms)									Landings								
	LC/PC		LC/RS		PC/RS		LC/PC/RS			LC/PC		LC/RS		PC/RS		LC/PC/RS		
	LC	PC	LC	RS	PC	RS	LC	PC	RS	LC	PC	LC	RS	PC	RS	LC	PC	RS
1994	58.9	63.4	56.5	54.8	50.3	52.0	57.4	58.5	55.6	56	29	98	54	12	10	113	37	64
1995	60.2	63.1	55.7	53.1	52.7	53.5	59.3	56.5	53.8	67	13	108	85	23	14	103	35	38
Total (t)										1173	2027	1558	1069	702	248	4369	4439	2425
Mean (fms)	61.6	63.5	55.7	53.7	58.3	56.0	57.8	59.0	55.8									
(m)	113	116	102	98	107	102	106	108	102									
S.D. (fms)	4.1	4.1	3.9	3.4	7.7	5.9	3.9	4.5	3.2									
Min (fms)	52.1	53.1	48.8	46.2	42.7	46.2	49.2	46.7	48.3									
(m)	95	97	89	85	78	85	90	85	88									
Max (fms)	67.5	69.3	64.8	60.1	73.0	73.0	64.1	66.8	62.2									
(m)	124	127	119	110	134	134	117	122	114									

a. Annual values weighted to landings (lbs) of individual species. Summary values are unweighted.