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BOTTOM FISH FISHERIES OF AMERICAN SAMOA, GUAM, AND THE COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

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AMERICAN SAMOA

INTRODUCTION

This report summarizes recent information and updates previously published data on the bottom fish fisheries of American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI). Most of the information was drawn from Hamm and Quach (1988) as part of the Western Pacific Fishery Information Network (WPACFIN) Program of the Southwest Fisheries Center Honolulu Laboratory, National Marine Fisheries Service (NMFS), NOAA. Information from the present report has been included in the 1987 annual report (Western Pacific Regional Fishery Management Council (Council) in prep.) of the bottom fish fisheries, as mandated by the Fishery Management Plan (FMP) for the bottom fish and seamount groundfish. The FMP was implemented by the NMFS in August 1986 and was designed to manage and optimally utilize the bottom fish stocks in American Samoa, Guam, and the CNMI, as well as in Hawaii.

AMERICAN SAMOA

The 1986 annual report (Council 1988), by the Council's Plan Monitoring Team on the bottom fish fishery of American Samoa, pointed out that the data collecting system used by the American Samoa Department of Marine and Wildlife Resources (DMWR) to obtain information had been significantly modified in October 1985, and that a new processing system was needed to standardize the data bases as much as possible to facilitate analysis and comparisons. The new processing system was recently completed by the WPACFIN. Therefore, new data summaries, adjusted to account for percent coverage of the sampling programs, are presented in this section for all years. Caution is still advised in making interpretations of the data and comparisons among years, because differences still exist between the data sets for which adjustments cannot be made. Additionally, because of these differences and inadequacies and inaccuracies of some of the data, identical procedures could not be used for all years for all analyses summarized in this report. Some mixing of apples with oranges is still necessary, and detailed specific numbers may be affected, but the overall trends in the fishery should not be affected. For instance, some calculations or analyses use data only from trips that exclusively bottom fished, whereas some analyses and summaries also include trips that mixed bottom fishing and trolling activities, and still other summaries are based on species, irrespective of method of capture. Therefore, results presented herein are considered preliminary and subject to change. For a more complete description of the data collecting and processing systems and for additional detailed data, refer to Hamm and Quach (1988).

Landings and Revenue

The bottom fish fishery of American Samoa has been an important fishery historically, making up as much as 50% of the total commercial catch. However, landings of the bottom fish management unit species (BMUS) are declining (Fig. 1), both in total landings and in percent of the total commercial fishery. The 1987 landings of BMUS were the lowest on record.

Figure 2 shows the mix of the various American Samoa fisheries for pelagic, bottom, reef, and other fishes for 1982-87. The estimated total commercial landings for 1987 were the smallest recorded since 1982.

As defined in the Bottomfish FMP, American Samoa is an "area" for reporting purposes. The annual estimated commercial bottom fish landings (pounds, value, and average price per pound) by species for 1982-87 are summarized in Tables 1-6. Similar statistics on a monthly basis for 1985-87 are in Tables 7-9. Figures 3 and 4 graph the annual estimates of total commercial landings and total bottom fish landings (pounds and value) for 1982-87.

Tables 1-9 provide the estimated ex-vessel value of American Samoa bottom fish by species for 1982-87 and by species by month for the three most recent years. The declining values of bottom fish landings are shown in Figure 4.

Fishing Effort

Number of Vessels and Trips

The commercial fishing fleet steadily increased from 1982 to a peak of 46 vessels in 1985, then drastically declined in 1986 and 1987 to only 18 vessels (Table 10, Fig. 5). A portion of the 1987 decline is a direct result of a hurricane eliminating all of the Manu'a Islands' fleet. The 61% reduction in the active fishing fleet between 1985 and 1987 is positively correlated with the 70% reduction in bottom fish landings and the 21% reduction in total commercial landings. Additionally, the number of bottom fish fishing trips made during a year is positively correlated with the number of vessels in the fleet (Fig. 5). The calculations made to estimate the number of bottom fish fishing trips per year are based on two premises: All landings made by a vessel on a given day are the result of a single trip, and all trips using the bottom fish fishing method are included, even if trolling was also conducted during the trip. On the other hand, the data used to calculate the average trip length and catch per hour (Table 10, Fig. 6) included exclusively bottom fish fishing trips.

Figure 6 seems to show a somewhat different picture of the bottom fish fishery than earlier figures showing a severely declining fishery. The recorded catch per hour has been increasing since 1985, which would seem to indicate a healthy bottom fish resource. Therefore, the overwhelming decrease in the total bottom fish landings may be primarily a result of many vessels leaving the fishery and a decline in fishing effort for those remaining active, as opposed to a serious decline in the fishery resource. Additional information and analyses are needed to further define and interpret these relationships.

Species Composition, Areas Fished, and Catch by Area

Capabilities to perform analyses of species composition on the bottom fish complex continue to be reduced by the inadequacy of the data base. The DMWR data collectors obtain individual species identifications on only a small portion of the total bottom fish catch. This unidentified portion of the bottom fish catch has grown from 61% in 1983, the best year on record, to 96% in 1987, the worst year on record (Table 11). Because of the low level of specific identification, extra caution is advised in interpreting the results of any species composition comparisons. Serious efforts should be made to increase the level of specific identification of bottom fish catches.

If the assumption is made that identified catches are a representative sample of the true percent species composition in the fishery, the unidentified catch can be allocated appropriately to individual species (Table 12). Cursory analysis of these data and plotting of percent species composition of six of the major species, blue lined snapper (taape), gray jobfish (uku), lehi (Fig. 7), onaga, ehu, and emperorfish (Fig. 8)--show no obvious trends or changes in species composition.

Area fished has been recorded for the majority of the bottom fish fishing trips taken since 1982 (Fig. 9). Table 13 reports the percent of the total bottom fish catch by area fished and includes only those fishing trips exclusively using the bottom fish fishing method, (that is, excluding trips that also involved trolling). As expected, the areas closest to Tutuila have been the most heavily fished, making up almost 90% of the total catch. Over the 6-yr period, area 33 was the most productive, followed by area 36 and then area 31.

Biological Characteristics of the Landings

Using a market-sampling program, the DMWR staff began collecting size-frequency data for selected bottom fish species in 1987. These data were not available for analysis in Honolulu when this report was written. Analysis of these data will be conducted when available.

The relative importance of the bottom fish fishery compared to the tuna and pelagic management unit species (PMUS) fisheries is shown in Figure 10, and the seasonalities of these three fisheries are shown in Figure 11. Additionally, the seasonalities of the bottom fish fishery and two important species, onaga and ehu, are summarized in Figure 12. The fishery generally is more active from March through October than from November through February. The apparent trimodal peak periods during the most active months are unexplained as yet.

Table 1

AMERICAN SAMOA 1982 ANNUAL ESTIMATED COMMERCIAL
BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
JACKS	139.00	244.00	1.76
BLACK JACK	20.00	35.00	1.75
BOTTOM FISH	50294.00	87870.00	1.75
GROUPERS	141.00	247.00	1.75
FLAGTAIL GROUPER	10.00	17.00	1.70
GIANT GROUPER	282.00	282.00	1.00
LUNARTAIL GROUPER	504.00	881.00	1.75
BLUE LINED SNAPPER	1209.00	2115.00	1.75
ONESPOT SNAPPER	7.00	9.00	1.29
HUMPBACK SNAPPER	561.00	981.00	1.75
GRAY JOBFISH	230.00	433.00	1.88
DEEPWATER BOTTOMFISH	2349.00	6977.00	2.97
YELLOW OPAKAPAKA	40.00	60.00	1.50
HAWAIIAN OPAKAPAKA	68.00	118.00	1.74
OPAKAPAKA	406.00	811.00	2.00
BLUE LINED GINDAI	13.00	22.00	1.69
GINDAI (FLOWER SNAP)	82.00	139.00	1.70
LEHI (SILVERJAW)	216.00	370.00	1.71
ONAGA (RED SNAPPER)	1002.00	3796.00	3.79
EHU (RED SNAPPER)	1345.00	2851.00	2.12
EMPERORS (MISC)	2910.00	5090.00	1.75
LONGNOSE EMPEROR	150.00	263.00	1.75
BLUELINE BREAM	21.00	37.00	1.76
SNAKE MACKEREL	17.00	30.00	1.76
** Total Bottom Fish**	62016.00	113678.00	
** TOTAL ALL SPECIES**	155949.00	256455.00	

Table 2

AMERICAN SAMOA 1983 ANNUAL ESTIMATED COMMERCIAL
BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
JACKS	1962.00	3344.00	1.70
BLACK JACK	151.00	193.00	1.28
BIGEYE TREVALLY	19.00	11.00	0.57
BLUEFIN TREVALLY	6.00	6.00	1.00
AMBERJACK	111.00	194.00	1.75
BOTTOM FISH	77359.00	135296.00	1.75
GROUPERS	1705.00	2978.00	1.75
FLAGTAIL GROUPER	4.00	6.00	1.50
TOMATO GROUPER	167.00	253.00	1.51
BLACKTIP GROUPER	6.00	10.00	1.67
STRIPED GROUPER	22.00	52.00	2.36
GIANT GROUPER	348.00	359.00	1.03
LUNARTAIL GROUPER	198.00	347.00	1.75
SNAPPERS	52.00	65.00	1.25
BLUE LINED SNAPPER	2973.00	4872.00	1.64
BLACKTAIL SNAPPER	111.00	158.00	1.42
ONESPOT SNAPPER	342.00	543.00	1.59
TWINSPOT/RED SNAPPER	259.00	372.00	1.44
HUMPBACK SNAPPER	1174.00	2053.00	1.75
BROWN JOBFISH	52.00	90.00	1.73
GRAY JOBFISH	5943.00	14598.00	2.46
YELLOW OPAKAPAKA	1618.00	6575.00	4.06
HAWAIIAN OPAKAPAKA	173.00	454.00	2.62
GINDAI (FLOWER SNAP)	918.00	2018.00	2.20
YELLOWTAIL SNAPPER	13.00	14.00	1.08
LEHI (SILVERJAW)	4512.00	10246.00	2.27
ONAGA (RED SNAPPER)	13738.00	60254.00	4.39
EHU (RED SNAPPER)	5808.00	14450.00	2.49
STONE'S SNAPPER	2039.00	3396.00	1.67
KUSAKAR'S SNAPPER	25.00	45.00	1.80
EMPERORS (MISC)	3253.00	5679.00	1.75
LONGNOSE EMPEROR	65.00	81.00	1.25
SNAKE MACKEREL	41.00	71.00	1.73
** Total Bottom Fish**	125167.00	269083.00	
** TOTAL ALL SPECIES**	245937.00	389077.00	

Table 3

AMERICAN SAMOA 1984 ANNUAL ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
JACKS	1909.00	3171.00	1.66
BLACK JACK	15.00	24.00	1.60
TREVALLY	14.00	24.00	1.71
BOTTOM FISH	61063.00	97425.00	1.60
GROUPERS	1510.00	2621.00	1.74
BLACKTIP GROUPER	10.00	17.00	1.70
GIANT GROUPER	243.00	302.00	1.24
LUNARTAIL GROUPER	564.00	986.00	1.75
SNAPPERS	128.00	200.00	1.56
BLUE LINED SNAPPER	3713.00	5991.00	1.61
RUFOUS SNAPPER	122.00	190.00	1.56
BLACKTAIL SNAPPER	546.00	797.00	1.46
ONESPOT SNAPPER	381.00	591.00	1.55
TWINSPOT/RED SNAPPER	585.00	1020.00	1.74
HUMPBACK SNAPPER	1698.00	2952.00	1.74
GRAY JOBFISH	1521.00	2494.00	1.64
DEEPWATER BOTTOMFISH	163.00	369.00	2.26
YELLOW OPAKAPAKA	1193.00	2838.00	2.38
HAWAIIAN OPAKAPAKA	1043.00	3552.00	3.41
OPAKAPAKA	40.00	69.00	1.73
GINDAI (FLOWER SNAP)	1729.00	2923.00	1.69
YELLOWTAIL SNAPPER	3.00	2.00	0.67
LEHI (SILVERJAW)	1227.00	3232.00	2.63
ONAGA (RED SNAPPER)	4282.00	17026.00	3.98
EHU (RED SNAPPER)	4291.00	9764.00	2.28
BLACK SNAPPER	40.00	69.00	1.73
STONE'S SNAPPER	834.00	1454.00	1.74
KUSAKAR'S SNAPPER	108.00	189.00	1.75
BIGEYE EMPEROR	7.00	12.00	1.71
EMPERORS (MISC)	3740.00	6460.00	1.73
LONGNOSE EMPEROR	111.00	139.00	1.25
SNAKE MACKEREL	8.00	14.00	1.75
** Total Bottom Fish**	92841.00	166917.00	
** TOTAL ALL SPECIES**	334746.00	330424.00	

Table 4

AMERICAN SAMOA 1985 ANNUAL ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
JACKS	467.00	671.91	1.44
BLACK JACK	80.00	166.73	2.08
BIGEYE TREVALLY	95.00	118.75	1.25
BOTTOM FISH	85230.00	109570.77	1.29
GROUPERS	173.00	295.50	1.71
TOMATO GROUPER	196.00	245.00	1.25
BLACKTIP GROUPER	13.00	16.25	1.25
LUNARTAIL GROUPER	397.00	578.21	1.46
SNAPPERS	43.00	65.26	1.52
BLUE LINED SNAPPER	553.00	769.31	1.39
BLACKTAIL SNAPPER	51.00	63.74	1.25
ONESPOT SNAPPER	57.00	88.54	1.55
TWINSPOT/RED SNAPPER	7.00	12.24	1.75
HUMPBACK SNAPPER	269.00	429.61	1.60
GRAY JOBFISH	534.00	838.29	1.57
DEEPWATER BOTTOMFISH	649.00	957.05	1.47
YELLOW OPAKAPAKA	522.00	889.83	1.70
HAWAIIAN OPAKAPAKA	456.00	1656.54	3.63
OPAKAPAKA	168.00	209.75	1.25
BLUE LINED GINDAI	125.00	187.50	1.50
GINDAI (FLOWER SNAP)	1211.50	1853.88	1.53
YELLOWTAIL SNAPPER	5.00	9.00	1.80
LEHI (SILVERJAW)	396.00	1554.47	3.93
ONAGA (RED SNAPPER)	2139.50	7331.14	3.43
EHU (RED SNAPPER)	4382.00	6719.41	1.53
BLACK SNAPPER	27.00	33.75	1.25
STONE'S SNAPPER	143.00	200.00	1.40
KUSAKAR'S SNAPPER	18.00	22.50	1.25
EMPERORS (MISC)	730.00	1126.35	1.54
LONGNOSE EMPEROR	80.00	100.00	1.25
** Total Bottom Fish**	99217.00	136781.28	
** TOTAL ALL SPECIES**	259267.00	304864.62	

Table 5

AMERICAN SAMOA 1986 ANNUAL ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
JACKS	615.00	803.36	1.31
BLACK JACK	388.00	582.00	1.50
BOTTOM FISH	84384.00	107122.50	1.27
GROUPERS	128.00	192.00	1.50
TOMATO GROUPER	157.00	235.49	1.50
LUNARTAIL GROUPER	232.00	335.76	1.45
SNAPPERS	126.00	252.00	2.00
BLUE LINED SNAPPER	340.00	497.70	1.46
ONESPOT SNAPPER	98.25	147.19	1.50
TWINSPOT/RED SNAPPER	47.00	70.50	1.50
HUMPBACK SNAPPER	167.00	227.25	1.36
GRAY JOBFISH	315.00	882.50	2.80
DEEPWATER BOTTOMFISH	1157.00	1773.25	1.53
YELLOW OPAKAPAKA	490.00	847.00	1.73
HAWAIIAN OPAKAPAKA	342.00	1402.00	4.10
GINDAI (FLOWER SNAP)	568.00	1169.00	2.06
LEHI (SILVERJAW)	666.00	2152.00	3.23
ONAGA (RED SNAPPER)	3921.00	17863.00	4.56
EHU (RED SNAPPER)	4177.00	10084.17	2.41
EMPERORS (MISC)	118.50	177.75	1.50
** Total Bottom Fish**	98436.75	146816.42	
** TOTAL ALL SPECIES**	322296.70	357515.31	

Table 6

AMERICAN SAMOA 1987 ANNUAL ESTIMATED COMMERCIAL
BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
JACKS	94.00	131.00	1.39
BLACK JACK	33.00	52.00	1.58
BOTTOM FISH	28425.00	42217.00	1.49
GROUPERS	14.00	21.00	1.50
TOMATO GROUPER	27.00	40.50	1.50
LUNARTAIL GROUPER	34.00	51.00	1.50
BLUE LINED SNAPPER	150.00	233.50	1.56
ONESPOT SNAPPER	7.00	10.50	1.50
HUMPBACK SNAPPER	34.00	44.50	1.31
GRAY JOBFISH	25.00	37.50	1.50
YELLOW OPAKAPAKA	52.00	208.00	4.00
GINDAI (FLOWER SNAP)	38.00	144.00	3.79
LEHI (SILVERJAW)	81.00	175.00	2.16
ONAGA (RED SNAPPER)	232.00	881.00	3.80
EHU (RED SNAPPER)	298.00	581.50	1.95
EMPERORS (MISC)	16.00	24.00	1.50
AMBON EMPEROR	65.00	104.00	1.60
** Total Bottom Fish**	29625.00	44956.00	
** TOTAL ALL SPECIES**	204921.00	219522.50	

Table 7

AMERICAN SAMOA 1985 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** January **			
JACKS	44.00	55.00	1.25
BOTTOM FISH	2862.00	4583.65	1.60
GINDAI (FLOWER SNAP)	39.00	48.75	1.25
** Total Bottom Fish**	2945.00	4687.40	
** TOTAL ALL SPECIES**	10460.00	11065.50	
** February **			
BOTTOM FISH	4037.00	6070.25	1.50
GINDAI (FLOWER SNAP)	92.50	133.47	1.44
ONAGA (RED SNAPPER)	53.50	185.95	3.48
EHU (RED SNAPPER)	140.00	245.00	1.75
EMPERORS (MISC)	40.00	50.00	1.25
** Total Bottom Fish**	4363.00	6684.67	
** TOTAL ALL SPECIES**	11165.00	12855.03	
** March **			
BLACK JACK	55.00	135.48	2.46
BOTTOM FISH	3096.00	4140.25	1.34
GRAY JOBFISH	117.00	146.25	1.25
YELLOW OPAKAPAKA	8.00	51.15	6.39
HAWAIIAN OPAKAPAKA	164.00	1276.04	7.78
GINDAI (FLOWER SNAP)	19.00	85.76	4.51
YELLOWTAIL SNAPPER	5.00	9.00	1.80
LEHI (SILVERJAW)	247.00	1162.96	4.71
ONAGA (RED SNAPPER)	361.00	2646.45	7.33
EHU (RED SNAPPER)	11.00	56.17	5.11
** Total Bottom Fish**	4083.00	9709.51	
** TOTAL ALL SPECIES**	19691.00	23389.30	

Table 7 (Cont.)

AMERICAN SAMOA 1985 MONTHLY ESTIMATED COMMERCIAL
BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** April **			
JACKS	14.00	24.36	1.74
BOTTOM FISH	8446.00	10570.06	1.25
GROUPERS	27.00	46.98	1.74
BLUE LINED SNAPPER	44.00	61.86	1.41
ONESPOT SNAPPER	7.00	12.18	1.74
HUMPBACK SNAPPER	66.00	82.50	1.25
GRAY JOBFISH	23.00	28.75	1.25
YELLOW OPAKAPAKA	55.00	124.44	2.26
HAWAIIAN OPAKAPAKA	3.00	16.04	5.35
OPAKAPAKA	27.00	33.75	1.25
GINDAI (FLOWER SNAP)	54.00	107.86	2.00
LEHI (SILVERJAW)	57.00	203.28	3.57
ONAGA (RED SNAPPER)	222.00	1038.15	4.68
EHU (RED SNAPPER)	436.00	1191.71	2.73
** Total Bottom Fish**	9481.00	13541.92	
** TOTAL ALL SPECIES**	19364.00	22825.25	
** May **			
BOTTOM FISH	4176.00	5199.18	1.25
ONAGA (RED SNAPPER)	67.00	439.07	6.55
** Total Bottom Fish**	4243.00	5638.25	
** TOTAL ALL SPECIES**	12469.00	12613.31	
** June **			
JACKS	15.00	18.45	1.23
BOTTOM FISH	3127.00	3797.47	1.21
GROUPERS	12.00	15.00	1.25
TOMATO GROUPER	48.00	60.00	1.25
LUNARTAIL GROUPER	48.00	60.00	1.25
GRAY JOBFISH	23.00	17.25	0.75
EHU (RED SNAPPER)	26.00	32.50	1.25
EMPERORS (MISC)	51.00	54.75	1.07
** Total Bottom Fish**	3350.00	4055.42	
** TOTAL ALL SPECIES**	18938.00	19971.39	

Table 7 (Cont.)

AMERICAN SAMOA 1985 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** July **			
BLACK JACK	25.00	31.25	1.25
BOTTOM FISH	5678.00	7386.62	1.30
GROUPERS	63.00	109.63	1.74
BLUE LINED SNAPPER	37.00	64.75	1.75
ONESPOT SNAPPER	6.00	10.44	1.74
TWINSPOT/RED SNAPPER	7.00	12.24	1.75
HUMPBACK SNAPPER	69.00	120.76	1.75
GRAY JOBFISH	6.00	10.50	1.75
YELLOW OPAKAPAKA	4.00	10.99	2.75
GINDAI (FLOWER SNAP)	11.00	19.80	1.80
LEHI (SILVERJAW)	67.00	142.23	2.12
ONAGA (RED SNAPPER)	152.00	442.64	2.91
EHU (RED SNAPPER)	21.00	37.94	1.81
STONE'S SNAPPER	11.00	16.50	1.50
EMPERORS (MISC)	38.00	66.50	1.75
** Total Bottom Fish**	6195.00	8482.79	
** TOTAL ALL SPECIES**	26077.00	31946.78	
** August **			
JACKS	82.00	124.64	1.52
BOTTOM FISH	13129.00	16958.00	1.29
GROUPERS	37.00	64.40	1.74
LUNARTAIL GROUPER	11.00	19.24	1.75
BLUE LINED SNAPPER	111.00	164.06	1.48
BLACKTAIL SNAPPER	11.00	13.74	1.25
ONESPOT SNAPPER	14.00	24.42	1.74
HUMPBACK SNAPPER	32.00	55.86	1.75
GRAY JOBFISH	11.00	19.25	1.75
DEEPWATER BOTTOMFISH	54.00	81.54	1.51
GINDAI (FLOWER SNAP)	125.00	192.03	1.54
ONAGA (RED SNAPPER)	49.00	303.38	6.19
EHU (RED SNAPPER)	271.00	417.70	1.54
EMPERORS (MISC)	102.00	159.53	1.56
** Total Bottom Fish**	14039.00	18597.79	
** TOTAL ALL SPECIES**	33107.00	38610.14	

Table 7 (Cont.)

AMERICAN SAMOA 1985 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** September **			
JACKS	90.00	140.05	1.56
BOTTOM FISH	5132.00	6545.79	1.28
GROUPERS	34.00	59.49	1.75
LUNARTAIL GROUPER	7.00	12.24	1.75
SNAPPERS	43.00	65.26	1.52
BLUE LINED SNAPPER	104.00	144.39	1.39
BLACKTAIL SNAPPER	40.00	50.00	1.25
ONESPOT SNAPPER	26.00	35.50	1.37
HUMPBACK SNAPPER	76.00	132.49	1.74
GRAY JOBFISH	43.00	75.25	1.75
DEEPWATER BOTTOMFISH	27.00	47.26	1.75
GINDAI (FLOWER SNAP)	358.00	596.11	1.67
EHU (RED SNAPPER)	248.00	431.55	1.74
EMPERORS (MISC)	141.00	246.07	1.75
** Total Bottom Fish**	6369.00	8581.45	
** TOTAL ALL SPECIES**	12310.00	15795.48	
** October **			
JACKS	61.00	91.50	1.50
BIGEYE TREVALLY	95.00	118.75	1.25
BOTTOM FISH	17082.00	21182.50	1.24
TOMATO GROUPER	32.00	40.00	1.25
LUNARTAIL GROUPER	86.00	129.00	1.50
BLUE LINED SNAPPER	51.00	63.75	1.25
OPAKAPAKA	82.00	102.50	1.25
ONAGA (RED SNAPPER)	98.00	147.00	1.50
EHU (RED SNAPPER)	424.00	532.75	1.26
EMPERORS (MISC)	44.00	55.00	1.25
** Total Bottom Fish**	18055.00	22462.75	
** TOTAL ALL SPECIES**	35173.00	44453.49	

Table 7 (Cont.)

AMERICAN SAMOA 1985 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** November **			
JACKS	161.00	217.91	1.35
BOTTOM FISH	11184.00	13980.00	1.25
TOMATO GROUPER	116.00	145.00	1.25
BLACKTIP GROUPER	13.00	16.25	1.25
LUNARTAIL GROUPER	186.00	255.73	1.37
BLUE LINED SNAPPER	206.00	270.50	1.31
ONESPOT SNAPPER	4.00	6.00	1.50
HUMPBACK SNAPPER	9.00	9.00	1.00
GRAY JOBFISH	119.00	256.54	2.16
DEEPWATER BOTTOMFISH	568.00	828.25	1.46
YELLOW OPAKAPAKA	274.00	472.50	1.72
HAWAIIAN OPAKAPAKA	289.00	364.46	1.26
OPAKAPAKA	22.00	27.50	1.25
GINDAI (FLOWER SNAP)	433.00	531.10	1.23
LEHI (SILVERJAW)	25.00	46.00	1.84
ONAGA (RED SNAPPER)	924.00	1809.50	1.96
EHU (RED SNAPPER)	1149.00	1403.50	1.22
BLACK SNAPPER	27.00	33.75	1.25
STONE'S SNAPPER	58.00	72.50	1.25
KUSAKAR'S SNAPPER	18.00	22.50	1.25
EMPERORS (MISC)	163.00	245.50	1.51
LONGNOSE EMPEROR	80.00	100.00	1.25
** Total Bottom Fish**	16028.00	21113.99	
** TOTAL ALL SPECIES**	25951.00	31893.61	
** December **			
BOTTOM FISH	7281.00	9157.00	1.26
LUNARTAIL GROUPER	59.00	102.00	1.73
HUMPBACK SNAPPER	17.00	29.00	1.71
GRAY JOBFISH	192.00	284.50	1.48
YELLOW OPAKAPAKA	181.00	230.75	1.27
OPAKAPAKA	37.00	46.00	1.24
BLUE LINED GINDAI	125.00	187.50	1.50
GINDAI (FLOWER SNAP)	80.00	139.00	1.74
ONAGA (RED SNAPPER)	213.00	319.00	1.50
EHU (RED SNAPPER)	1656.00	2370.59	1.43
STONE'S SNAPPER	74.00	111.00	1.50
EMPERORS (MISC)	151.00	249.00	1.65
** Total Bottom Fish**	10066.00	13225.34	
** TOTAL ALL SPECIES**	34562.00	39445.34	

Table 8

AMERICAN SAMOA 1986 MONTHLY ESTIMATED COMMERCIAL
BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** January **			
BOTTOM FISH	8969.00	11560.25	1.29
GRAY JOBFISH	102.00	464.00	4.55
HAWAIIAN OPAKAPAKA	281.00	1062.00	3.78
GINDAI (FLOWER SNAP)	20.00	61.00	3.05
ONAGA (RED SNAPPER)	51.00	222.00	4.35
EHU (RED SNAPPER)	375.00	742.00	1.98
** Total Bottom Fish**	9798.00	14111.25	
** TOTAL ALL SPECIES**	24946.00	28536.25	
** February **			
BOTTOM FISH	9928.00	12316.25	1.24
GROUPERS	38.00	57.00	1.50
TOMATO GROUPER	54.00	80.99	1.50
BLUE LINED SNAPPER	34.00	51.00	1.50
ONESPOT SNAPPER	16.00	23.99	1.50
HUMPBACK SNAPPER	66.00	99.00	1.50
GRAY JOBFISH	69.00	165.00	2.39
YELLOW OPAKAPAKA	94.00	238.00	2.53
GINDAI (FLOWER SNAP)	7.00	18.00	2.57
ONAGA (RED SNAPPER)	155.00	483.00	3.12
EHU (RED SNAPPER)	71.00	180.00	2.54
** Total Bottom Fish **	10532.00	13712.23	
** TOTAL ALL SPECIES**	31987.00	34920.82	

Table 8 (Cont.)

AMERICAN SAMOA 1986 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** March **			
JACKS	60.00	90.00	1.50
BOTTOM FISH	15593.00	19490.50	1.25
LUNARTAIL GROUPER	72.00	108.00	1.50
BLUE LINED SNAPPER	58.00	86.70	1.49
ONESPOT SNAPPER	29.25	43.70	1.49
HUMPBACK SNAPPER	93.00	116.25	1.25
GRAY JOBFISH	39.00	118.00	3.03
DEEPWATER BOTTOMFISH	587.00	829.50	1.41
YELLOW OPAKAPAKA	317.00	336.00	1.06
HAWAIIAN OPAKAPAKA	54.00	307.00	5.69
GINDAI (FLOWER SNAP)	52.00	200.00	3.85
LEHI (SILVERJAW)	149.00	598.00	4.01
ONAGA (RED SNAPPER)	1131.00	6446.00	5.70
EHU (RED SNAPPER)	755.00	2733.00	3.62
EMPERORS (MISC)	76.50	114.75	1.50
** Total Bottom Fish**	19065.75	31617.40	
** TOTAL ALL SPECIES**	39834.50	53907.52	
** April **			
BOTTOM FISH	10580.00	13538.75	1.28
YELLOW OPAKAPAKA	23.00	106.00	4.61
GINDAI (FLOWER SNAP)	30.00	146.00	4.87
LEHI (SILVERJAW)	262.00	903.00	3.45
ONAGA (RED SNAPPER)	777.00	3752.00	4.83
EHU (RED SNAPPER)	487.00	1767.00	3.63
** Total Bottom Fish**	12159.00	20212.75	
** TOTAL ALL SPECIES**	37034.00	43313.75	

Table 8 (Cont.)

AMERICAN SAMOA 1986 MONTHLY ESTIMATED COMMERCIAL
BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** May **			
JACKS	60.00	75.00	1.25
BOTTOM FISH	5426.00	6782.00	1.25
GROUPERS	90.00	135.00	1.50
TOMATO GROUPER	103.00	154.50	1.50
LUNARTAIL GROUPER	83.00	124.50	1.50
BLUE LINED SNAPPER	200.00	300.00	1.50
ONESPOT SNAPPER	26.00	39.00	1.50
YELLOW OPAKAPAKA	7.00	23.00	3.29
LEHI (SILVERJAW)	153.00	359.00	2.35
ONAGA (RED SNAPPER)	552.00	2036.00	3.69
EHU (RED SNAPPER)	106.00	217.00	2.05
EMPERORS (MISC)	42.00	63.00	1.50
** Total Bottom Fish**	6848.00	10308.00	
** TOTAL ALL SPECIES**	19662.10	22636.60	
** June **			
BOTTOM FISH	6355.00	7943.50	1.25
SNAPPERS	126.00	252.00	2.00
TWINSPOT/RED SNAPPER	47.00	70.50	1.50
HUMPBACK SNAPPER	8.00	12.00	1.50
GRAY JOBFISH	23.00	34.50	1.50
DEEPWATER BOTTOMFISH	310.00	465.00	1.50
YELLOW OPAKAPAKA	18.00	67.00	3.72
HAWAIIAN OPAKAPAKA	7.00	33.00	4.71
GINDAI (FLOWER SNAP)	416.00	669.00	1.61
LEHI (SILVERJAW)	48.00	160.00	3.33
ONAGA (RED SNAPPER)	383.00	1715.00	4.48
EHU (RED SNAPPER)	211.00	776.00	3.68
** Total Bottom Fish**	7952.00	12197.50	
** TOTAL ALL SPECIES**	16413.10	20944.10	

Table 8 (Cont.)

AMERICAN SAMOA 1986 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** July **			
JACKS	310.00	387.00	1.25
BLACK JACK	388.00	582.00	1.50
BOTTOM FISH	9509.00	11791.00	1.24
DEEPWATER BOTTOMFISH	205.00	410.00	2.00
YELLOW OPAKAPAKA	31.00	77.00	2.48
GINDAI (FLOWER SNAP)	43.00	75.00	1.74
LEHI (SILVERJAW)	54.00	132.00	2.44
ONAGA (RED SNAPPER)	570.00	1784.00	3.13
EHU (RED SNAPPER)	599.00	1054.00	1.76
** Total Bottom Fish**	11709.00	16292.00	
** TOTAL ALL SPECIES**	25444.00	32949.00	
** August **			
JACKS	37.00	46.25	1.25
BOTTOM FISH	4894.00	6166.00	1.26
LUNARTAIL GROUPER	16.00	20.00	1.25
BLUE LINED SNAPPER	48.00	60.00	1.25
DEEPWATER BOTTOMFISH	55.00	68.75	1.25
ONAGA (RED SNAPPER)	302.00	1425.00	4.72
EHU (RED SNAPPER)	65.00	165.00	2.54
** Total Bottom Fish**	5417.00	7951.00	
** TOTAL ALL SPECIES**	33973.00	33263.50	
** September **			
BOTTOM FISH	4782.00	6244.75	1.31
** Total Bottom Fish**	4782.00	6244.75	
** TOTAL ALL SPECIES**	18438.00	20383.75	
** October **			
JACKS	148.00	205.11	1.39
BOTTOM FISH	3121.00	4680.50	1.50
LUNARTAIL GROUPER	61.00	83.26	1.36
ONESPOT SNAPPER	27.00	40.50	1.50
GRAY JOBFISH	37.00	55.50	1.50
EHU (RED SNAPPER)	1085.00	1840.17	1.70
** Total Bottom Fish**	4479.00	6905.04	
** TOTAL ALL SPECIES**	27439.00	24266.64	

Table 8 (Cont.)

AMERICAN SAMOA 1986 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** November **			
BOTTOM FISH	2709.00	3386.00	1.25
GRAY JOBFISH	9.00	13.50	1.50
EHU (RED SNAPPER)	97.00	121.00	1.25
** Total Bottom Fish**	2815.00	3520.50	
** TOTAL ALL SPECIES**	20270.00	20248.38	
** December **			
BOTTOM FISH	2518.00	3223.00	1.28
GRAY JOBFISH	36.00	32.00	0.89
EHU (RED SNAPPER)	326.00	489.00	1.50
** Total Bottom Fish**	2880.00	3744.00	
** TOTAL ALL SPECIES**	26856.00	22145.00	

Table 9

AMERICAN SAMOA 1987 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** January **			
BOTTOM FISH	7023.00	9200.00	1.31
HUMPBACK SNAPPER	25.00	31.00	1.24
LEHI (SILVERJAW)	31.00	54.00	1.74
EHU (RED SNAPPER)	223.00	390.00	1.75
** Total Bottom Fish**	7302.00	9675.00	
** TOTAL ALL SPECIES**	30250.00	30478.00	
** February **			
BOTTOM FISH	3195.00	4568.00	1.43
** Total Bottom Fish**	3195.00	4568.00	
** TOTAL ALL SPECIES**	13963.00	14332.00	
** March **			
BOTTOM FISH	4879.00	6781.00	1.39
YELLOW OPAKAPAKA	39.00	156.00	4.00
GINDAI (FLOWER SNAP)	28.00	112.00	4.00
LEHI (SILVERJAW)	31.00	91.00	2.94
ONAGA (RED SNAPPER)	128.00	704.00	5.50
EHU (RED SNAPPER)	19.00	95.00	5.00
** Total Bottom Fish**	5124.00	7939.00	
** TOTAL ALL SPECIES**	14972.00	17390.00	
** April **			
BOTTOM FISH	2648.00	4342.00	1.64
YELLOW OPAKAPAKA	13.00	52.00	4.00
GINDAI (FLOWER SNAP)	10.00	32.00	3.20
EHU (RED SNAPPER)	13.00	32.00	2.46
** Total Bottom Fish**	2684.00	4458.00	
** TOTAL ALL SPECIES**	8047.00	10645.00	

Table 9 (Cont.)

AMERICAN SAMOA 1987 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/lb
** May **			
BOTTOM FISH	997.00	1455.00	1.46
GROUPERS	14.00	21.00	1.50
TOMATO GROUPER	27.00	40.50	1.50
LUNARTAIL GROUPER	34.00	51.00	1.50
BLUE LINED SNAPPER	57.00	85.50	1.50
ONESPOT SNAPPER	7.00	10.50	1.50
HUMPBACK SNAPPER	9.00	13.50	1.50
GRAY JOBFISH	25.00	37.50	1.50
ONAGA (RED SNAPPER)	12.00	18.00	1.50
EHU (RED SNAPPER)	43.00	64.50	1.50
EMPERORS (MISC)	16.00	24.00	1.50
** Total Bottom Fish**	1241.00	1821.00	
** TOTAL ALL SPECIES**	11013.00	12997.50	
** June **			
BOTTOM FISH	3271.00	4971.00	1.52
** Total Bottom Fish**	3271.00	4971.00	
** TOTAL ALL SPECIES**	23641.00	28198.00	
** July **			
BOTTOM FISH	1784.00	2693.00	1.51
** Total Bottom Fish**	1784.00	2693.00	
** TOTAL ALL SPECIES**	11438.00	15158.00	
** August **			
BOTTOM FISH	200.00	320.00	1.60
** Total Bottom Fish**	200.00	320.00	
** TOTAL ALL SPECIES**	12085.00	12787.00	
** September **			
BOTTOM FISH	487.00	779.00	1.60
** Total Bottom Fish**	487.00	779.00	
** TOTAL ALL SPECIES**	20542.00	19571.00	

Table 9 (Cont.)

AMERICAN SAMOA 1987 MONTHLY ESTIMATED COMMERCIAL BOTTOM FISH LANDINGS

SPECIES	POUNDS	VALUE	$/LB
** October **			
BLACK JACK	33.00	52.00	1.58
BLUE LINED SNAPPER	93.00	148.00	1.59
LEHI (SILVERJAW)	19.00	30.00	1.58
ONAGA (RED SNAPPER)	61.00	97.00	1.59
AMBON EMPEROR	65.00	104.00	1.60
** Total Bottom Fish**	271.00	431.00	
** TOTAL ALL SPECIES**	15947.00	20949.00	
** November **			
BOTTOM FISH	2222.00	4444.00	2.00
** Total Bottom Fish**	2222.00	4444.00	
** TOTAL ALL SPECIES**	20697.00	19679.00	
** December **			
JACKS	94.00	131.00	1.39
BOTTOM FISH	1719.00	2664.00	1.55
ONAGA (RED SNAPPER)	31.00	62.00	2.00
* Total Bottom Fish**	1844.00	2857.00	
** TOTAL ALL SPECIES**	22326.00	17338.00	

Table 10

AMERICAN SAMOA BOTTOM FISH CATCH AND EFFORT

	1982	1983	1984	1985	1986	1987
ESTIMATED NUMBER OF BOTTOM FISH TRIPS	594	652	662	834	738	233
NUMBER OF VESSELS LANDING BOTTOM FISH	21	26	35	46	33	18
AVERAGE BOTTOM FISH TRIP LENGTH (H)	13.5	17.6	14.7	14.6	15.3	11.3
AVERAGE CATCH PER HOUR	8.2	11.1	9.9	8.0	9.2	12.4

Table 11

AMERICAN SAMOA BOTTOM FISH LANDINGS
(UNALLOCATED MISCELLANEOUS BOTTOM FISH)

SPECIES %	1982	1983	1984	1985	1986	1987
Jacks	139	1962	1909	467	615	94
	0.22%	1.57%	2.06%	0.47%	0.62%	0.32%
Black Jack	20	151	15	80	388	33
	0.03%	0.12%	0.02%	0.08%	0.39%	0.11%
Trevally	0	0	14	0	0	0
	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
Bigeye Trevally	0	19	0	95	0	0
	0.00%	0.02%	0.00%	0.10%	0.00%	0.00%
Bluefin Trevally	0	6	0	0	0	0
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Amberjack	0	111	0	0	0	0
	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%
Groupers	141	1705	1510	173	128	14
	0.23%	1.36%	1.63%	0.17%	0.13%	0.05%
Flagtail Grouper	10	4	0	0	0	0
	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%
Tomato Grouper	0	167	0	196	157	27
	0.00%	0.13%	0.00%	0.20%	0.16%	0.09%
Blacktip Grouper	0	6	10	13	0	0
	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%
Striped Grouper	0	22	0	0	0	0
	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%
Giant Grouper	282	348	243	0	0	0
	0.45%	0.28%	0.26%	0.00%	0.00%	0.00%
Lunartail Grouper	504	198	564	397	232	34
	0.81%	0.16%	0.61%	0.40%	0.24%	0.11%
Snappers	0	52	128	43	126	0
	0.00%	0.04%	0.14%	0.04%	0.13%	0.00%
Blue Lined Snapper	1209	2973	3713	553	340	150
	1.95%	2.38%	4.00%	0.56%	0.35%	0.51%
Rufous Snapper	0	0	122	0	0	0
	0.00%	0.00%	0.13%	0.00%	0.00%	0.00%
Blacktail Snapper	0	111	546	51	0	0
	0.00%	0.09%	0.59%	0.05%	0.00%	0.00%
Onespot Snapper	7	342	381	57	98	7
	0.01%	0.27%	0.41%	0.06%	0.10%	0.02%
Twinspot/Red Snapper	0	259	585	7	47	0
	0.00%	0.21%	0.63%	0.01%	0.05%	0.00%
Humpback Snapper	561	1174	1698	269	167	34
	0.90%	0.94%	1.83%	0.27%	0.17%	0.11%
Brown Jobfish	0	52	0	0	0	0
	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%

Table 11 (Cont.)

AMERICAN SAMOA BOTTOM FISH LANDINGS
(UNALLOCATED MISCELLANEOUS BOTTOM FISH)

SPECIES %	1982	1983	1984	1985	1986	1987
Gray Jobfish	230	5943	1521	534	315	25
	0.37%	4.75%	1.64%	0.54%	0.32%	0.08%
Yellow Opakapaka	40	1618	1193	522	490	52
	0.06%	1.29%	1.28%	0.53%	0.50%	0.18%
Hawaiian Opakapaka	68	173	1043	456	342	0
	0.11%	0.14%	1.12%	0.46%	0.35%	0.00%
Opakapaka	406	0	40	168	0	0
	0.65%	0.00%	0.04%	0.17%	0.00%	0.00%
Blue Lined Gindai	13	0	0	125	0	0
	0.02%	0.00%	0.00%	0.13%	0.00%	0.00%
Gindai	82	918	1729	1211	568	38
	0.13%	0.73%	1.86%	1.22%	0.58%	0.13%
Yellowtail Snapper	0	13	3	5	0	0
	0.00%	0.01%	0.00%	0.01%	0.00%	0.00%
Lehi	216	4512	1227	396	666	81
	0.35%	3.60%	1.32%	0.40%	0.68%	0.27%
Onaga	1002	13738	4282	2139	3921	232
	1.62%	10.98%	4.61%	2.16%	3.98%	0.78%
Ehu	1345	5808	4291	4382	4177	298
	2.17%	4.64%	4.62%	4.42%	4.24%	1.01%
Black Snapper	0	0	40	27	0	0
	0.00%	0.00%	0.04%	0.03%	0.00%	0.00%
Stone's Snapper	0	2039	834	143	0	0
	0.00%	1.63%	0.90%	0.14%	0.00%	0.00%
Kusakar's Snapper	0	25	108	18	0	0
	0.00%	0.02%	0.12%	0.02%	0.00%	0.00%
Emperors	2910	3253	3747	730	119	16
	4.69%	2.60%	4.04%	0.74%	0.12%	0.05%
Ambon Emperor	0	0	0	0	0	65
	0.00%	0.00%	0.00%	0.00%	0.00%	0.22%
Longnose Emperor	150	65	111	80	0	0
	0.24%	0.05%	0.12%	0.08%	0.00%	0.00%
Bluelined Bream	21	0	0	0	0	0
	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%
Snake Mackerel	17	41	8	0	0	0
	0.03%	0.03%	0.01%	0.00%	0.00%	0.00%
Deepwater Bottomfish	2349	0	163	649	1157	0
	3.79%	0.00%	0.18%	0.65%	1.18%	0.00%
Bottomfish	50294	77359	61063	85230	84384	28425
	81.10%	61.80%	65.77%	85.90%	85.72%	95.95%
TOTAL:	62016	125167	92841	99216	98437	29625

Table 12

AMERICAN SAMOA BOTTOM FISH LANDINGS
(ALLOCATED MISCELLANEOUS BOTTOM FISH)

SPECIES %	1982	1983	1984	1985	1986	1987
Jacks	885	5137	5596	3451	4639	2321
	1.43%	4.10%	6.03%	3.48%	4.71%	7.83%
Black Jack	127	395	44	591	2927	815
	0.21%	0.32%	0.05%	0.60%	2.97%	2.75%
Trevally	0	0	41	0	0	0
	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%
Bigeye Trevally	0	50	0	702	0	0
	0.00%	0.04%	0.00%	0.71%	0.00%	0.00%
Bluefin Trevally	0	16	0	0	0	0
	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Amberjack	0	291	0	0	0	0
	0.00%	0.23%	0.00%	0.00%	0.00%	0.00%
Groupers	898	4464	4426	1279	966	346
	1.45%	3.57%	4.77%	1.29%	0.98%	1.17%
Flagtail Grouper	64	10	0	0	0	0
	0.10%	0.01%	0.00%	0.00%	0.00%	0.00%
Tomato Grouper	0	437	0	1449	1184	667
	0.00%	0.35%	0.00%	1.46%	1.20%	2.25%
Blacktip Grouper	0	16	29	96	0	0
	0.00%	0.01%	0.03%	0.10%	0.00%	0.00%
Striped Grouper	0	58	0	0	0	0
	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%
Giant Grouper	1795	911	712	0	0	0
	2.89%	0.73%	0.77%	0.00%	0.00%	0.00%
Lunartail Grouper	3208	518	1653	2934	1750	839
	5.17%	0.41%	1.78%	2.96%	1.78%	2.83%
Snappers	0	136	375	318	950	0
	0.00%	0.11%	0.40%	0.32%	0.97%	0.00%
Blue Lined Snapper	7696	7784	10884	4087	2565	3703
	12.41%	6.22%	11.72%	4.12%	2.61%	12.50%
Rufous Snapper	0	0	358	0	0	0
	0.00%	0.00%	0.39%	0.00%	0.00%	0.00%
Blacktail Snapper	0	291	1601	377	0	0
	0.00%	0.23%	1.72%	0.38%	0.00%	0.00%
Onespot Snapper	45	895	1117	421	739	173
	0.07%	0.72%	1.20%	0.42%	0.75%	0.58%
Twinspot/Red Snapper	0	678	1715	52	355	0
	0.00%	0.54%	1.85%	0.05%	0.36%	0.00%
Humpback Snapper	3571	3074	4978	1988	1260	839
	5.76%	2.46%	5.36%	2.00%	1.28%	2.83%
Brown Jobfish	0	136	0	0	0	0
	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%

Table 12 (Cont.)

AMERICAN SAMOA BOTTOM FISH LANDINGS
(ALLOCATED MISCELLANEOUS BOTTOM FISH)

SPECIES %	1982	1983	1984	1985	1986	1987
Gray Jobfish	1464	15559	4459	3947	2376	617
	2.36%	12.43%	4.80%	3.98%	2.41%	2.08%
Yellow Opakapaka	284	4236	3511	3894	3752	1284
	0.46%	3.38%	3.78%	3.92%	3.81%	4.33%
Hawaiian Opakapaka	483	453	3070	3402	2619	0
	0.78%	0.36%	3.31%	3.43%	2.66%	0.00%
Opakapaka	2885	0	118	1253	0	0
	4.65%	0.00%	0.13%	1.26%	0.00%	0.00%
Blue Lined Gindai	92	0	0	932	0	0
	0.15%	0.00%	0.00%	0.94%	0.00%	0.00%
Gindai	583	2403	5089	9033	4349	938
	0.94%	1.92%	5.48%	9.10%	4.42%	3.17%
Yellowtail Snapper	0	34	9	37	0	0
	0.00%	0.03%	0.01%	0.04%	0.00%	0.00%
Lehi	1535	11813	3611	2954	5100	2000
	2.48%	9.44%	3.89%	2.98%	5.18%	6.75%
Onaga	7121	35968	12603	15956	30024	5728
	11.48%	28.74%	13.57%	16.08%	30.50%	19.33%
Ehu	9558	15206	12630	32688	31984	7357
	15.41%	12.15%	13.60%	32.95%	32.49%	24.83%
Black Snapper	0	0	117	200	0	0
	0.00%	0.00%	0.13%	0.20%	0.00%	0.00%
Stone's Snapper	0	5338	2445	1057	0	0
	0.00%	4.26%	2.63%	1.07%	0.00%	0.00%
Kusakar's Snapper	0	65	317	133	0	0
	0.00%	0.05%	0.34%	0.13%	0.00%	0.00%
Emperors	18525	8517	10984	5395	898	395
	29.87%	6.80%	11.83%	5.44%	0.91%	1.33%
Ambon Emperor	0	0	0	0	0	1605
	0.00%	0.00%	0.00%	0.00%	0.00%	5.42%
Longnose Emperor	955	170	325	591	0	0
	1.54%	0.14%	0.35%	0.60%	0.00%	0.00%
Bluelined Bream	134	0	0	0	0	0
	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%
Snake Mackerel	108	107	23	0	0	0
	0.17%	0.09%	0.03%	0.00%	0.00%	0.00%
TOTAL:	62016	125167	92841	99216	98437	29625

Table 13

PERCENT OF BOTTOM FISH CATCH BY AREA

Area	1982	1983	1984	1985	1986	1987
2	0	2.3	1.4	3.1	0.5	0
3	1.3	1.3	8.9	8.4	6.5	4.2
4	0	0	0.4	0	5.6	0
9	0	5.7	15.5	11.8	14.2	3.9
10	0	0.1	3.7	2.2	8.0	10.8
11	0	0	0.9	0	0	0
12	0	10.7	2.4	0.2	6.9	3.6
20	0	0	0	0.3	0	0
31	3.4	15.9	25.6	23.0	7.4	11.1
32	2.6	7.9	4.6	16.2	5.5	3.6
33	49.2	15.7	3.1	8.8	15.1	40.3
34	3.1	4.7	6.5	2.3	2.6	12.6
35	31.8	9.8	1.6	1.3	6.2	0
36	8.6	22.8	25.1	18.6	17.4	9.9
41	0	0.7	0	0	0	0
42	0	2.0	0.3	0.3	0	0
43	0	0.2	0	3.4	2.4	0
44	0	0	0	0	1.2	0
45	0	0	0	0	0.6	0

Figure 1

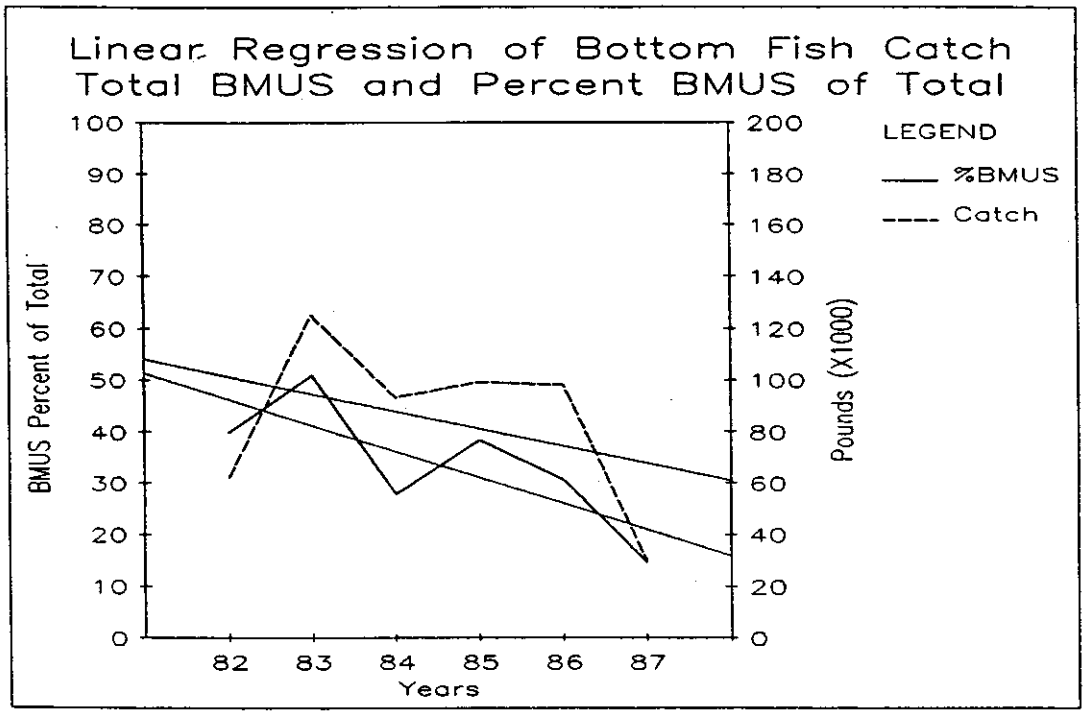


Figure 2

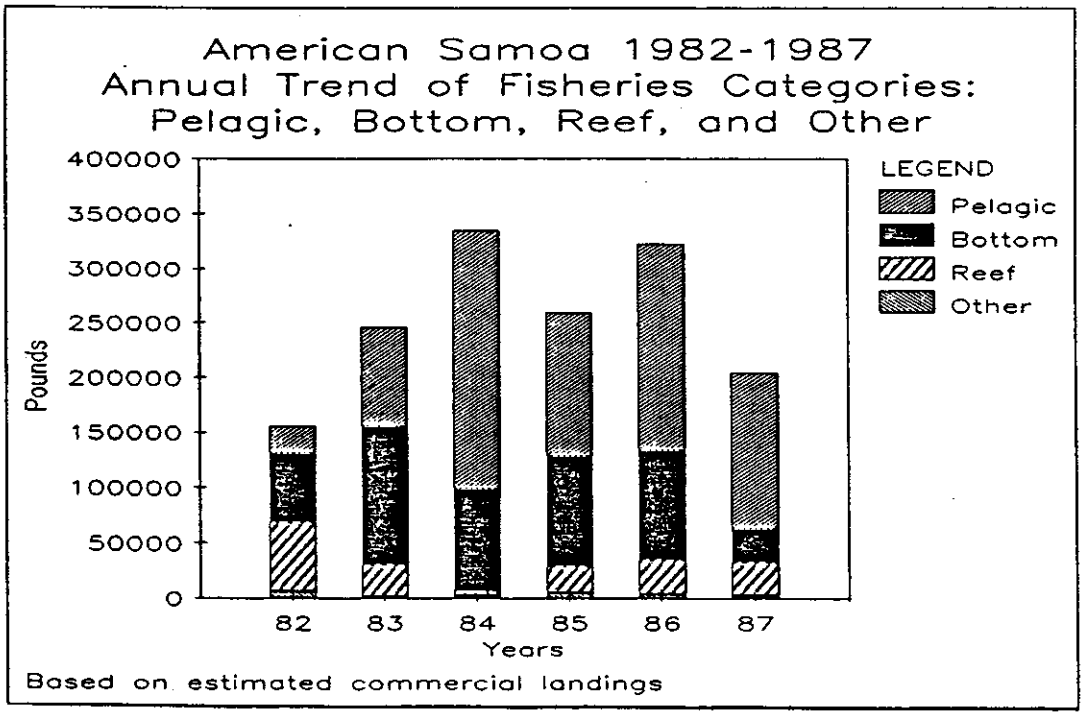


Figure 3

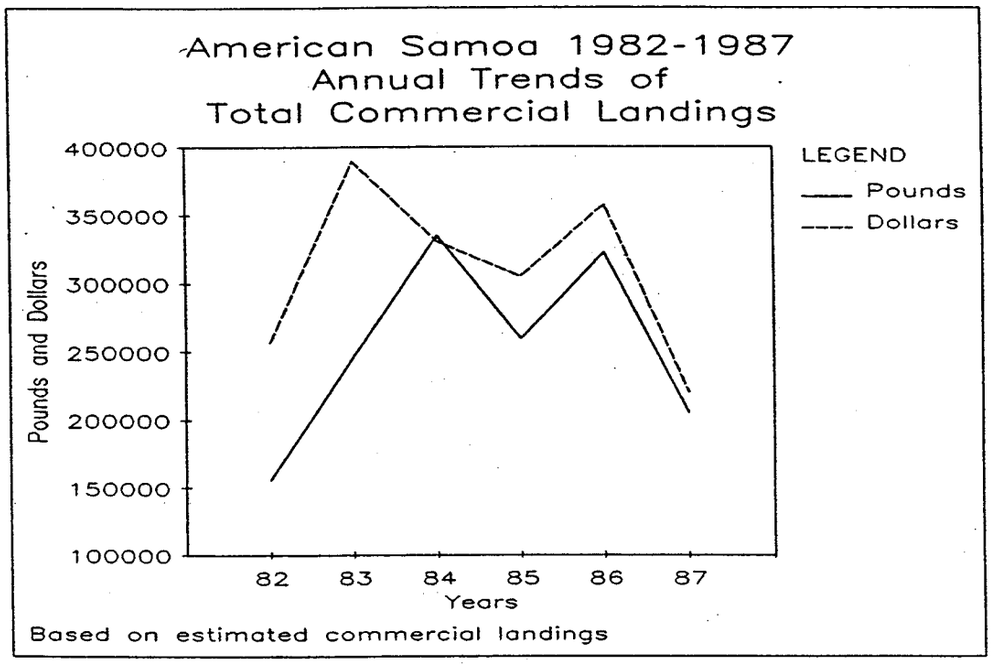


Figure 4

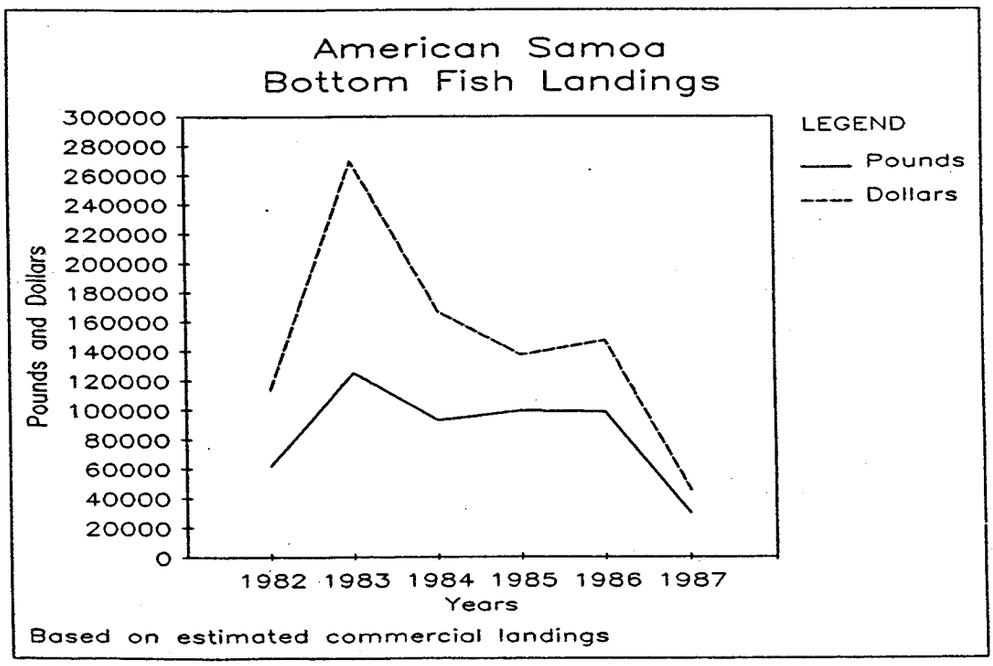


Figure 5

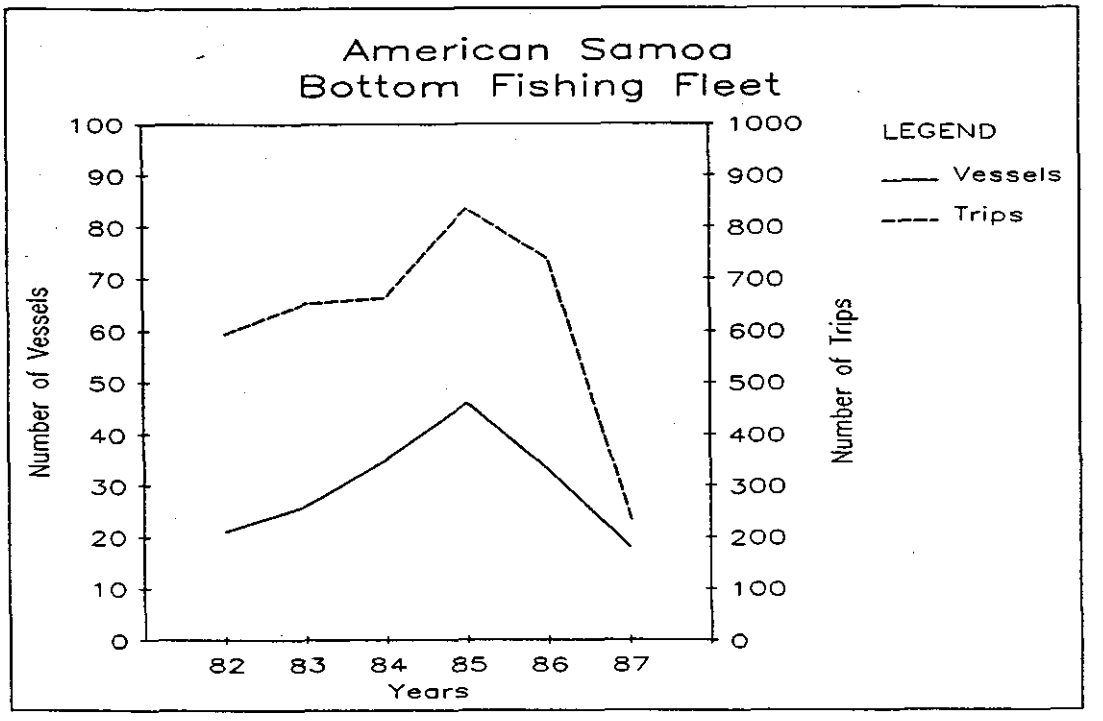


Figure 6

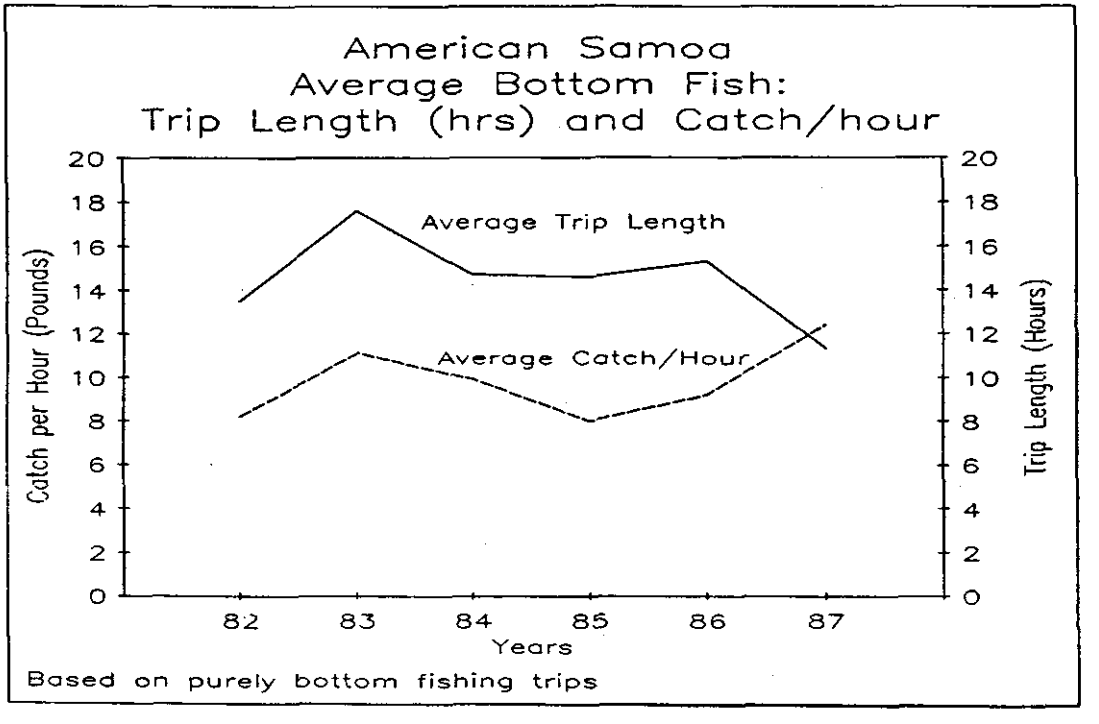


Figure 7

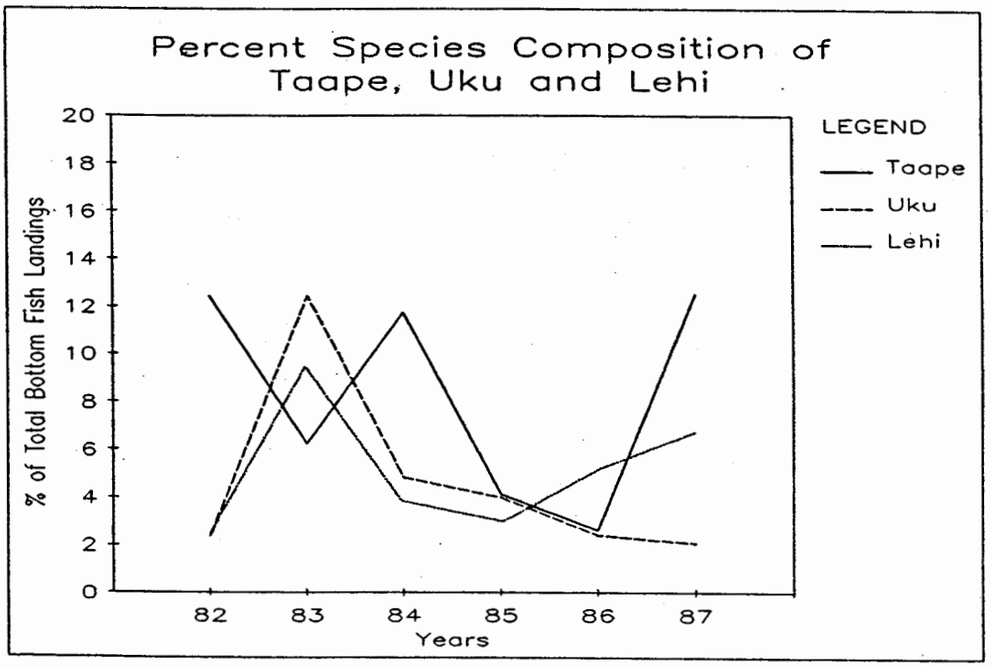


Figure 8

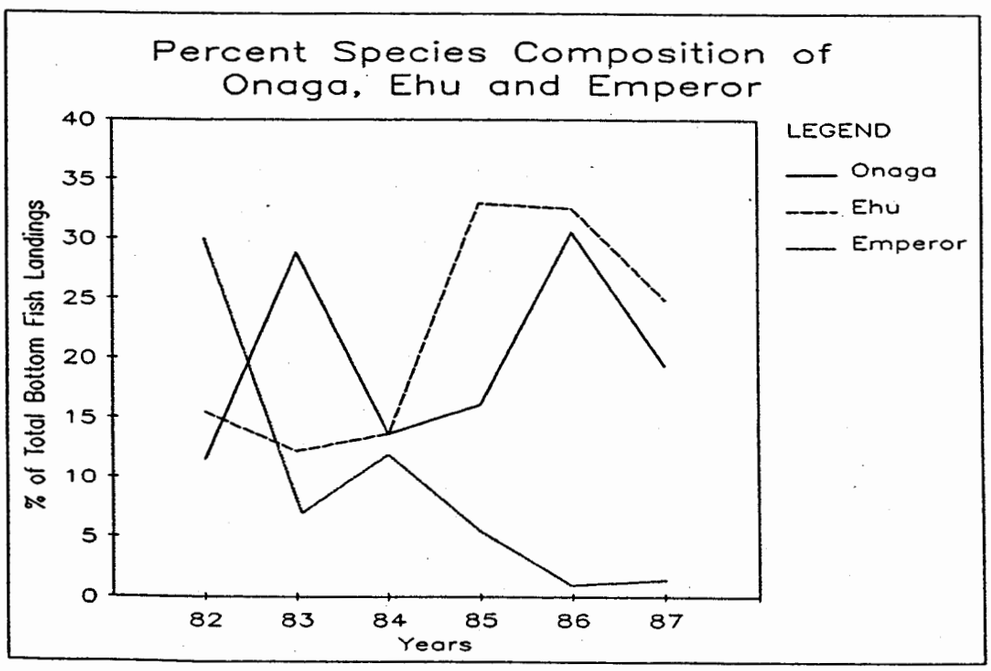
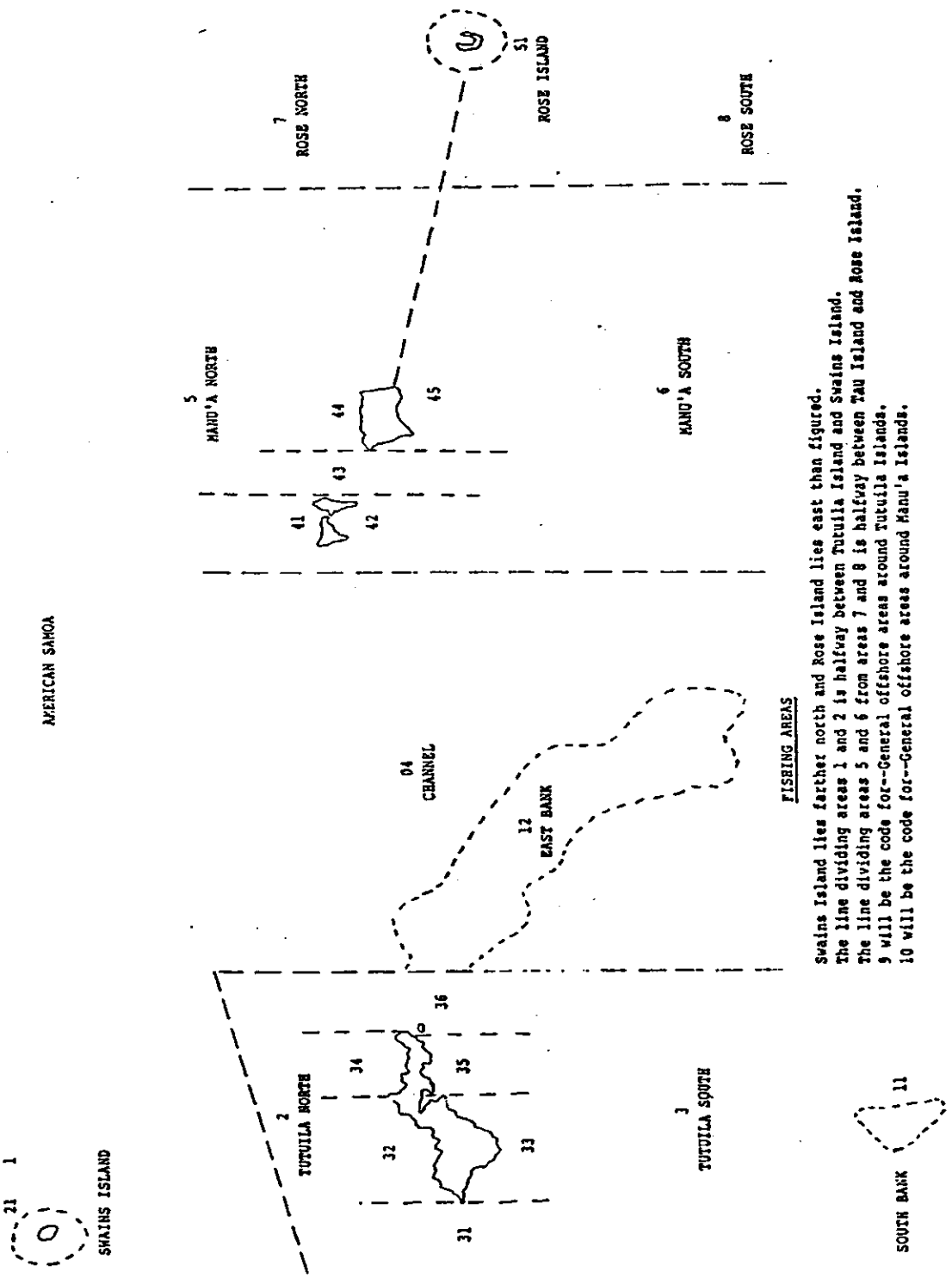


Figure 9



Swains Island lies farther north and Rose Island lies east than figured.
The line dividing areas 1 and 2 is halfway between Tutuila Island and Swains Island.
The line dividing areas 5 and 6 from areas 7 and 8 is halfway between TAU Island and Rose Island.
9 will be the code for--General offshore areas around Tutuila Islands.
10 will be the code for--General offshore areas around Manu'a Islands.

Figure 10

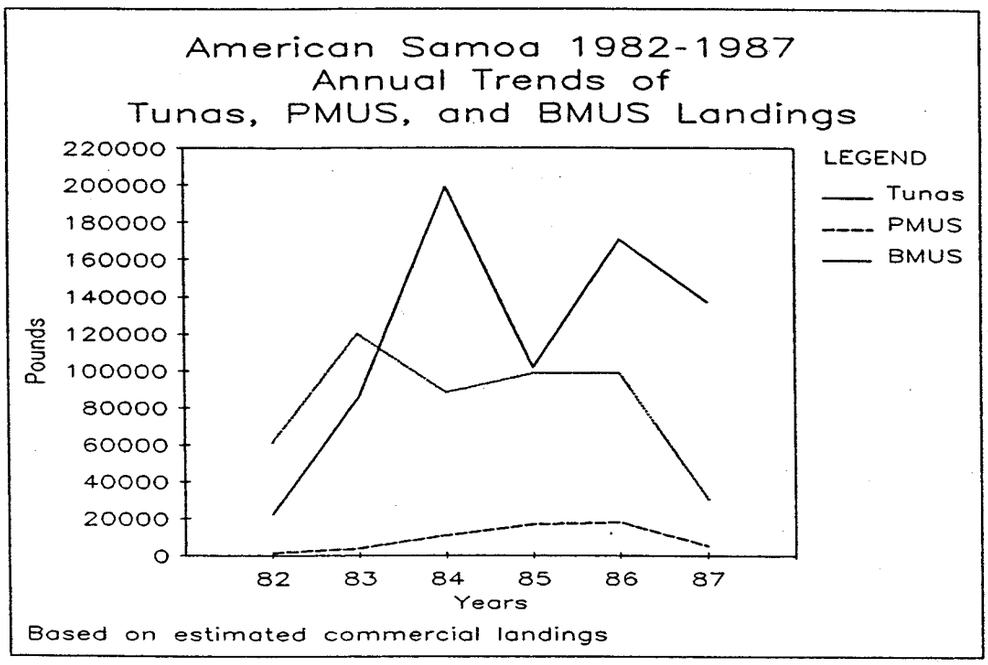

American Samoa 1982-1987
Annual Trends of
Tunas, PMUS, and BMUS Landings
220000
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
Pounds
82
83
84
85
86
87
Years
LEGEND
Tunas
PMUS
BMUS
Based on estimated commercial landings

Figure 11

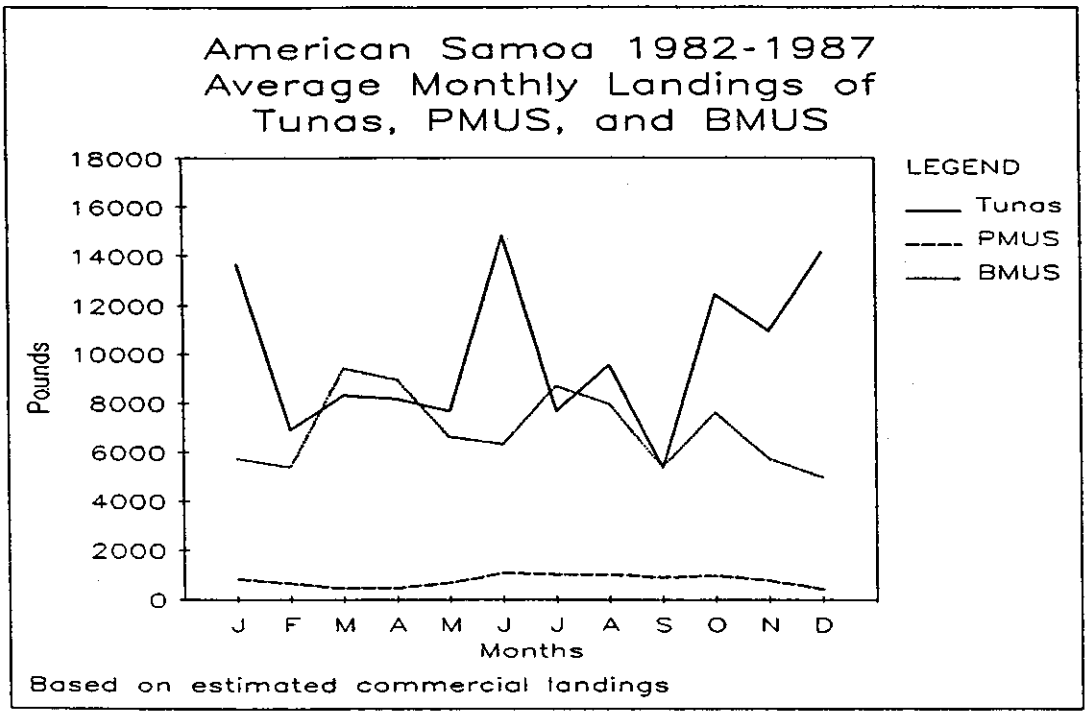
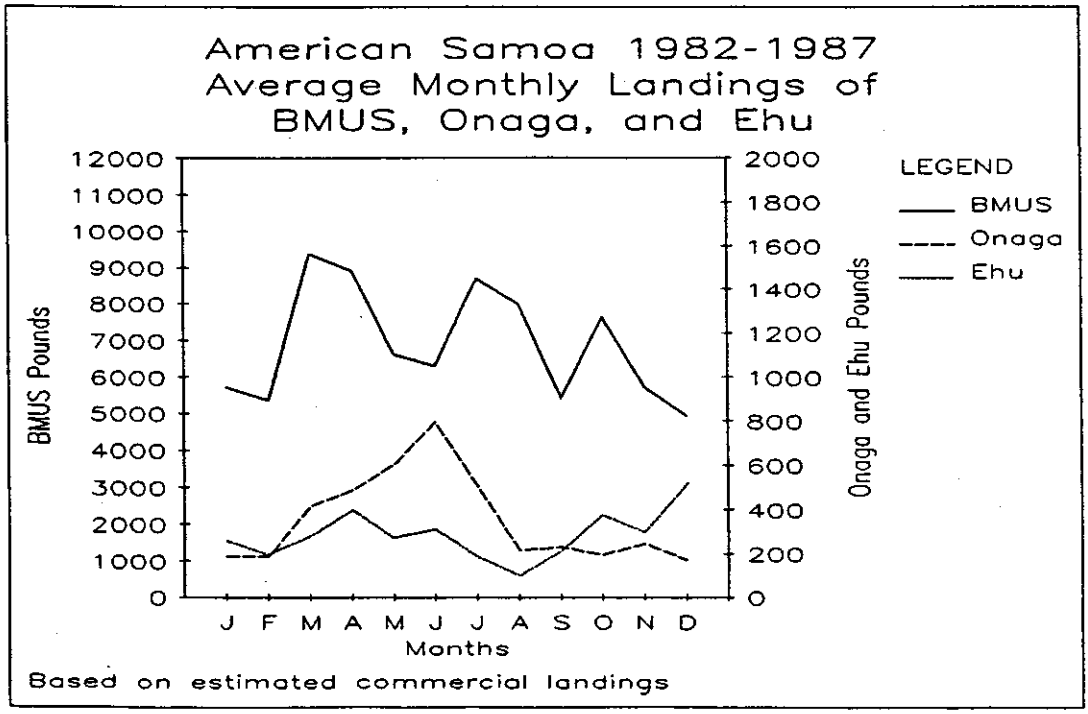


Figure 12



GUAM

TERRITORY OF GUAM

This section updates previously published data on the bottom fish fishery of Guam. Data on Guam's commercial fisheries are from invoices voluntarily submitted by wholesalers to the WPACFIN. Data on the bottom fish fishing are from the Guam Division of Aquatic and Wildlife Resource's (DAWR) offshore creel survey data base and expansion files and include all handline and pole-and-line bottom fish fishing done from a boat. For a more complete explanation of the data sources or for additional data, refer to Hamm and Quach (1988). Data summaries and analyses presented herein are preliminary.

Although Guam's commercial bottom fish landings generally comprise <5% of the total commercial harvest, the fishery is important culturally and economically, having a high demand and drawing a higher average price than the dominant pelagic fishery. The relative importance of the general fisheries categories (i.e., pelagic, bottom, reef, and other fishes) in Guam from 1979 through 1987 is shown in Figure 1. In 1987, the bottom fish category comprised 4.6% of the total commercial landings.

Landings and Revenue

As defined in the Bottomfish FMP, Guam is an "area" for reporting purposes. The commercial landings (pounds, value, and price per pound) of bottom fish for 1987 are in Table 1, and the monthly landings for 1987 are in Table 2. In these tables, the column labeled "RECORDS" is the number of individual landings made of each species, regardless of the size of the landing, and is an indication of the number of trips resulting in commercial landings of that species. Figure 2 graphically compares the landings of the bottom fish management unit species (BMUS) with those of tunas and the pelagic management units species (PMUS) for 1979-87. Figure 3 shows the growth and vast fluctuations of the bottom fish fishery since 1979. Peak years of the fishery were 1983 and 1985, followed by sharp declines in landings in 1984 and 1986. The landings during 1987 were essentially the same as in 1986.

In 1984, WPACFIN worked with the participating Guam fish wholesalers and the DAWR to develop and implement a mapping scheme to identify fishing locations (Fig. 4). Since that time, the wholesalers have recorded the location of the grounds fished for the majority of trips taken. For analytical purposes, these areas were combined into five major categories: the Northern Mariana Islands (99), the northeast banks (33-35), the southwest banks (74-79), the north and south nearshore island tips (11 and 73), and other nearshore reefs (all other codes). The first three categories represent fishing in the Exclusive Economic Zone (EEZ) (e.g., outside 3 nmi), and the last two, within Guam waters (inside 3 nmi). Table 3 provides a breakdown of the percentages of known landings from these five categories, and Figures 5 and 6 show these data graphically. The trend seems to be toward increased use of EEZ areas, despite fishing declining to zero in the Northern Marianas.

Tables 1 and 2 provide the 1987 annual and monthly ex-vessel values by species and the average price paid for each species. Figure 3 shows the historical fluctuations in the value of the fishery; the 1987 value was only slightly higher than in 1986.

Fishing Effort

Number of Vessels and Trips

The highest number of vessels making commercial bottom fish landings during the 1983-87 period occurred in 1985 (Fig. 7). The total number of vessels making commercial landings of bottom fish was essentially the same in 1987 as in 1986, but the number of vessels landing >500 lb for the year doubled, from two in 1986 to four in 1987. Three of four boats had commercial landings of >1,000 lb, compared to 1986 when only one boat landed >1,000 lb.

Table 4 provides estimates of the total catch (in pounds), effort (boat hours), and number of trips with their associated coefficients of variation (CV) from the DAWR creel surveys. The catch per unit effort (CPUE) which is a measure of catch per boat hour was calculated from the individual sample observations over the whole year rather than by dividing the estimated annual catch by the estimated annual boat hours. Figure 8 shows these creel survey estimates of catch, effort, and number of bottom fish fishing trips taken by all boats for 1979-87. Similar to the data on commercial landings, these creel survey data also show a significant peak in 1985, followed by a sharp decline in 1986, and a slight increase in 1987.

The average trip length, catch per trip, and catch per hour fished are in Figures 9 and 10 for the commercial boats and the average boat, respectively. The catch rate (in pounds per hour) generally is slightly higher for the average boat than the commercial boat. This is probably because trip time rather than fishing time is usually recorded for the commercial boats, and because commercial boats generally travel farther (e.g., to the banks) and spend more time in transit, as evidenced by the length of trip by commercial boats generally being more than twice that of the average boat. The commercial catch per trip is about twice the average creel survey trip. The absence of obvious trends in CPUE seems to indicate a relatively stable fishery resource available for exploitation.

Species Composition and Other Indicators of Fishery Performance

Changes in species composition typically indicate changes in a fishery, either in the stocks or the fishing activity itself. The percent composition of commercial bottom fish catch for eight important deep bottom fish species are plotted in Figures 11 and 12. A relative stability seems to exist for gindai, onaga, and opakapaka, whereas groupers appear to be steadily decreasing, uku appear to be increasing, and lehi, kalekale, and

ehu all but disappeared in 1987. It is believed that the apparent decrease in groupers is largely due to large catches of groupers from the Northern Mariana Islands in 1983-84. Additionally, most of the variability in the commercial data is thought to be a result of changes in the commercial fishing activity rather than the fish stocks.

The apparent trends in species composition for the commercial data do not seem to hold true for the creel survey data, which show a fluctuating, but stable, species composition for all species. Tables 5 and 6 report the percent species composition for the most important species. Not all landings inspected by DAWR staff during the creel surveys are identified to the species level; therefore, Table 5 includes three general categories. Assuming the identified portion of the catch is representative of the total catch, then landings combined in these three general categories can be allocated proportionately to the identified species as in Table 6. The allocated catches for the eight species listed above are in Figures 13 and 14.

The banks southwest of Guam have been increasing in their importance in the bottom fish fishery (Table 3). To investigate the stability of the fishery on these banks, the commercial landings records indicating the locations where fishing occurred were analyzed. One area, Baby Bank, has been the most heavily fished and productive southwest bank since 1985 when it first appeared in the data base. Increases during 1985-87 occurred in the number of boats, number of trips, and bottom fish landings from Baby Bank (Table 7). Summaries of catch per trip, average catch per hour, and individual catch per hour for three active fishermen seem to indicate a fairly stable population (Table 7). However, in the commercial data base, there is some question about the accuracy and meaning of "location fished," which may not identify the place of actual capture, but rather the farthest point fished. This needs to be clarified. Additionally, it should be remembered that essentially all bottom fish fishing trips to Baby Bank include trolling activities, and because the known total bottom fish harvest from Baby Bank is a small percentage of the total catch from this bank (3.5% in 1987), interpretation of bottom fish catch and effort exclusive of pelagics catch and effort may be misleading.

The seasonal distribution of the bottom fish landings is in Figure 15. Most landings are made during the calmer summer months, May through August, when the major pelagic fisheries for mahimahi and wahoo are least active. However, even during the peak bottom fish fishing season, landings of pelagic species far outweigh bottom fish, and virtually all commercial bottom fish fishing trips are also trolling trips. Guam does not have an exclusive bottom fish fishery.

Biological Characteristics of the Landings

Although some size-frequency data are available from the commercial data and the creel survey data, they are inadequate for any meaningful analyses and are not included in this report. This shortcoming of both data bases needs to be addressed and resolved.

Recent Research and Survey Results

Results of DAWR's offshore creel surveys are presented, in part, in the previous section. For additional information on these surveys, refer to Hamm et al. (1986) and Hamm and Quach (1988). The DAWR recently began more in-depth analyses of their existing creel survey data, and have entered into an arrangement with Steven Amesbury at the University of Guam to conduct other analyses. No other bottom fish specific research or investigations will be undertaken until the results from the current analyses projects are available.

Table 1

GUAM 1987 ANNUAL COMMERCIAL LANDINGS
OF BOTTOM FISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
JACKS	57	1208.50	1727.61	1.43
BOTTOM FISH	152	5900.90	11637.78	1.97
EHU (RED SNAPPER)	4	53.50	120.37	2.25
GINDAI (FLOWER SNAP)	14	372.00	793.13	2.13
GROUPER	6	168.00	273.37	1.63
KALEKALE (PINK SNAP)	2	14.50	31.38	2.16
LEHI (SILVERJAW)	1	29.00	65.25	2.25
ONAGA (RED SNAPPER)	5	93.00	211.63	2.28
OPAKAPAKA (PINK SNP)	7	154.00	346.50	2.25
UKU (GRAY SNAPPER)	55	1186.50	1775.75	1.50
EMPEROR (MAFUTE)	13	931.00	1858.25	2.00
** Total Bottom Fish**	316	10110.90	18841.02	
** TOTAL ALL SPECIES**	4519	219507.30	329225.23	

Table 2

GUAM 1987 MONTHLY COMMERCIAL LANDINGS
OF BOTTOM FISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
** January **				
JACKS	2	54.00	81.00	1.50
BOTTOM FISH	7	250.00	500.00	2.00
GROUPER	1	59.00	88.50	1.50
UKU (GRAY SNAPPER)	1	51.50	77.25	1.50
** Total Bottom Fish**	11	414.50	746.75	
** TOTAL ALL SPECIES**	434	17564.50	31345.85	
** February **				
JACKS	4	143.50	215.25	1.50
BOTTOM FISH	3	123.00	246.00	2.00
UKU (GRAY SNAPPER)	1	19.50	29.25	1.50
** Total Bottom Fish**	8	286.00	490.50	
** TOTAL ALL SPECIES**	565	29008.25	48392.47	
** March **				
JACKS	6	129.50	194.25	1.50
BOTTOM FISH	3	157.50	315.00	2.00
UKU (GRAY SNAPPER)	1	32.50	48.75	1.50
** Total Bottom Fish**	10	319.50	558.00	
** TOTAL ALL SPECIES**	518	26957.00	42760.61	
** April **				
JACKS	9	112.50	168.75	1.50
BOTTOM FISH	6	129.00	252.32	1.96
UKU (GRAY SNAPPER)	1	5.00	7.50	1.50
** Total Bottom Fish**	16	246.50	428.57	
** TOTAL ALL SPECIES**	586	30746.70	44627.12	
** May **				
JACKS	9	188.50	235.74	1.25
BOTTOM FISH	26	977.90	1859.96	1.90
EHU (RED SNAPPER)	2	36.50	82.12	2.25
GINDAI (FLOWER SNAP)	3	96.50	174.37	1.81
GROUPER	1	16.50	37.12	2.25
ONAGA (RED SNAPPER)	1	18.00	40.50	2.25
UKU (GRAY SNAPPER)	5	54.50	81.75	1.50
EMPEROR (MAFUTE)	1	7.50	11.25	1.50
** Total Bottom Fish**	48	1395.90	2522.81	
** TOTAL ALL SPECIES**	500	23848.15	31868.06	

Table 2 (Cont.)

GUAM 1987 MONTHLY COMMERCIAL LANDINGS
OF BOTTOM FISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
** June **				
JACKS	5	110.50	145.12	1.31
BOTTOM FISH	28	715.00	1432.50	2.00
GINDAI (FLOWER SNAP)	2	98.50	221.63	2.25
KALEKALE (PINK SNAP)	1	9.50	21.38	2.25
ONAGA (RED SNAPPER)	1	41.50	93.38	2.25
OPAKAPAKA (PINK SNP)	1	12.00	27.00	2.25
UKU (GRAY SNAPPER)	11	225.50	334.25	1.48
EMPEROR (MAFUTE)	5	594.50	1189.00	2.00
** Total Bottom Fish**	54	1807.00	3464.26	
** TOTAL ALL SPECIES**	306	15285.25	23387.22	
** July **				
JACKS	1	9.00	13.50	1.50
BOTTOM FISH	24	1106.75	2188.75	1.98
GINDAI (FLOWER SNAP)	1	6.00	13.50	2.25
GROUPER	3	60.50	99.75	1.65
KALEKALE (PINK SNAP)	1	5.00	10.00	2.00
OPAKAPAKA (PINK SNP)	1	15.00	33.75	2.25
UKU (GRAY SNAPPER)	10	223.00	334.50	1.50
EMPEROR (MAFUTE)	2	30.50	61.00	2.00
** Total Bottom Fish**	43	1455.75	2754.75	
** TOTAL ALL SPECIES**	320	20762.10	24803.23	
** August **				
JACKS	2	47.00	70.50	1.50
BOTTOM FISH	21	1035.00	2063.50	1.99
EHU (RED SNAPPER)	1	7.00	15.75	2.25
GINDAI (FLOWER SNAP)	2	58.00	130.51	2.25
ONAGA (RED SNAPPER)	1	19.00	42.75	2.25
UKU (GRAY SNAPPER)	13	321.50	482.25	1.50
EMPEROR (MAFUTE)	4	275.50	551.00	2.00
** Total Bottom Fish**	44	1763.00	3356.26	
** TOTAL ALL SPECIES**	285	15623.25	22118.50	

Table 2 (Cont.)

GUAM 1987 MONTHLY COMMERCIAL LANDINGS
OF BOTTOM FISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
** September **				
JACKS	4	109.00	163.50	1.50
BOTTOM FISH	9	350.75	701.50	2.00
GINDAI (FLOWER SNAP)	1	64.50	145.12	2.25
UKU (GRAY SNAPPER)	2	54.50	81.75	1.50
EMPEROR (MAFUTE)	1	23.00	46.00	2.00
** Total Bottom Fish**	17	601.75	1137.87	
** TOTAL ALL SPECIES**	166	9185.50	12063.63	
** October **				
JACKS	8	177.50	266.25	1.50
BOTTOM FISH	14	695.50	1391.00	2.00
EHU (RED SNAPPER)	1	10.00	22.50	2.25
GINDAI (FLOWER SNAP)	2	31.00	69.75	2.25
GROUPER	1	32.00	48.00	1.50
LEHI (SILVERJAW)	1	29.00	65.25	2.25
OPAKAPAKA (PINK SNP)	5	127.00	285.75	2.25
UKU (GRAY SNAPPER)	8	156.00	234.00	1.50
** Total Bottom Fish**	40	1258.00	2382.50	
** TOTAL ALL SPECIES**	257	11608.85	18032.17	
** November **				
JACKS	4	36.50	54.75	1.50
BOTTOM FISH	8	306.00	579.00	1.89
GINDAI (FLOWER SNAP)	2	13.00	29.25	2.25
ONAGA (RED SNAPPER)	2	14.50	35.00	2.41
UKU (GRAY SNAPPER)	2	43.00	64.50	1.50
** Total Bottom Fish**	18	413.00	762.50	
** TOTAL ALL SPECIES**	362	12298.75	18798.11	
** December **				
JACKS	3	91.00	119.00	1.31
BOTTOM FISH	3	54.50	108.25	1.99
GINDAI (FLOWER SNAP)	1	4.50	9.00	2.00
** Total Bottom Fish**	7	150.00	236.25	
** TOTAL ALL SPECIES**	220	6619.00	11028.26	

Table 3

PERCENT OF TOTAL KNOWN BOTTOM FISH LANDINGS
BY AREA FISHED

AREA	84	85	86	87
NORTHERN MARIANA ISLANDS	38	10	10	0
NORTHEAST BANKS	7	16	9	16
SOUTHWEST BANKS	9	17	36	48
NEARSHORE ISLAND TIPS	4	17	14	16
OTHER NEARSHORE REEFS	42	40	31	20
EEZ - >3 MILES FROM SHORE	54	43	55	64
GUAM - <3 MILES FROM SHORE	46	57	45	36

Table 4

GUAM DAWR CREEL SURVEY SUMMARY STATISTICS

YEAR	CATCH	CV	BOAT HR	CV	TRIPS	CV	CPUE	CV
1979	28243	22	8416	20	1918	17	4.3	13
1980	37149	38	4734	29	919	24	6.6	53
1981	61639	27	8523	17	2082	14	6.9	36
1982	60417	21	8215	11	2129	9	7.2	20
1983	53002	25	8620	16	2378	12	5.2	13
1984	52355	14	7141	12	2019	11	6.9	10
1985	92916	13	16242	11	3419	8	5.5	10
1986	29892	34	4945	18	1229	15	5.1	22
1987	34718	22	6210	20	1432	16	5.5	13

Table 5

GUAM CREEL SURVEY SPECIES COMPOSITION OF SELECTED BOTTOM FISH
(UNALLOCATED MISCELLANEOUS BOTTOM FISH)

SPECIES %	1979	1980	1981	1982	1983	1984	1985	1986	1987
Grouper	2011	627	6442	9441	3971	1519	7736	1226	4087
	7.58%	2.40%	11.79%	17.95%	8.75%	3.02%	9.25%	4.67%	13.09%
Jacks	3102	2591	3887	2255	2918	1747	5028	5852	2501
	11.70%	9.90%	7.11%	4.29%	6.43%	3.47%	6.01%	22.28%	8.01%
Snapper	4110	615	2028	3716	2125	765	2976	1911	1097
	15.50%	2.35%	3.71%	7.06%	4.68%	1.52%	3.56%	7.27%	3.51%
Lehi	455	347	2444	2708	2726	322	1161	609	514
	1.72%	1.33%	4.47%	5.15%	6.01%	0.64%	1.39%	2.32%	1.65%
Uku	292	1363	1557	4964	1330	841	3149	1348	1052
	1.10%	5.21%	2.85%	9.44%	2.93%	1.67%	3.77%	5.13%	3.37%
Ehu	2334	828	4845	1283	1147	32	1506	694	434
	8.80%	3.16%	8.86%	2.44%	2.53%	0.06%	1.80%	2.64%	1.39%
Onaga	1167	0	4095	1087	3809	220	2904	310	466
	4.40%	0.00%	7.49%	2.07%	8.39%	0.44%	3.47%	1.18%	1.49%
Taape	73	80	486	479	172	60	1022	199	1438
	0.28%	0.31%	0.89%	0.91%	0.38%	0.12%	1.22%	0.76%	4.61%
Y.T. Kalekale	300	793	2768	1602	5783	1110	3211	1179	555
	1.13%	3.03%	5.06%	3.05%	12.74%	2.21%	3.84%	4.49%	1.78%
Opakapaka	115	1491	698	744	1221	117	1219	704	340
	0.43%	5.70%	1.28%	1.41%	2.69%	0.23%	1.46%	2.68%	1.09%
Y.E. Opaka	898	389	2353	1723	4342	484	1677	1394	435
	3.39%	1.49%	4.31%	3.28%	9.57%	0.96%	2.01%	5.31%	1.39%
Kalekale	247	0	17	307	764	0	183	23	0
	0.93%	0.00%	0.03%	0.58%	1.68%	0.00%	0.22%	0.09%	0.00%
Gindai	1085	197	1558	1896	1632	291	2521	842	650
	4.09%	0.75%	2.85%	3.60%	3.60%	0.58%	3.02%	3.21%	2.08%
Emperor	7573	10184	11321	17146	11281	10124	28305	4273	11966
	28.56%	38.91%	20.71%	32.59%	24.86%	20.13%	33.85%	16.27%	38.33%
Shallow Bottomfish	0	0	0	0	0	0	6159	1114	899
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.37%	4.24%	2.88%
Mixed Bottomfish	2755	6668	10155	3254	2154	32651	13168	3323	3166
	10.39%	25.48%	18.58%	6.19%	4.75%	64.93%	15.75%	12.65%	10.14%
Deep Bottomfish	0	0	0	0	0	0	1687	1268	1615
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.02%	4.83%	5.17%
TOTAL SELECTED SPECIES:	26517	26173	54654	52605	45375	50283	83612	26269	31215
TOTAL ALL BOTTOM FISH SPECIES:	28245	37149	61639	60417	53002	52355	92916	29893	34718

Table 6

GUAM CREEL SURVEY SPECIES COMPOSITION OF SELECTED BOTTOM FISH
(ALLOCATED MISCELLANEOUS BOTTOM FISH)

SPECIES %	1979	1980	1981	1982	1983	1984	1985	1986	1987
Grouper	2230	778	7746	9983	4140	4221	9658	1603	5376
	8.46%	3.21%	14.48%	19.13%	9.19%	8.62%	11.87%	6.27%	17.56%
Jacks	3440	3215	4674	2384	3042	4854	6678	7072	2878
	13.05%	13.28%	8.74%	4.57%	6.75%	9.91%	8.21%	27.69%	9.40%
Snapper	4557	763	2438	3929	2216	2126	3953	2309	1262
	17.30%	3.15%	4.56%	7.53%	4.92%	4.34%	4.86%	9.04%	4.12%
Lehi	505	431	2939	2863	2842	895	1449	796	676
	1.91%	1.78%	5.49%	5.49%	6.31%	1.83%	1.78%	3.12%	2.21%
Uku	324	1691	1872	5249	1387	2337	4182	1629	1211
	1.23%	6.99%	3.50%	10.06%	3.08%	4.77%	5.14%	6.38%	3.95%
Ehu	2588	1027	5825	1357	1196	89	1880	907	571
	9.82%	4.25%	10.89%	2.60%	2.65%	0.18%	2.31%	3.55%	1.86%
Onaga	1294	0	4924	1149	3972	611	3625	405	613
	4.91%	0.00%	9.20%	2.20%	8.81%	1.25%	4.46%	1.59%	2.00%
Taape	81	99	584	506	179	167	1357	240	1655
	0.31%	0.41%	1.09%	0.97%	0.40%	0.34%	1.67%	0.94%	5.41%
Y.T. Kalekale	333	984	3328	1694	6030	3084	4009	1541	730
	1.26%	4.07%	6.22%	3.25%	13.38%	6.30%	4.93%	6.03%	2.38%
Opakapaka	128	1850	839	787	1273	325	1522	920	447
	0.48%	7.64%	1.57%	1.51%	2.83%	0.66%	1.87%	3.60%	1.46%
Y.E. Opaka	996	483	2829	1822	4527	1345	2094	1822	572
	3.78%	1.99%	5.29%	3.49%	10.05%	2.75%	2.57%	7.13%	1.87%
Kalekale	274	0	20	325	797	0	228	30	0
	1.04%	0.00%	0.04%	0.62%	1.77%	0.00%	0.28%	0.12%	0.00%
Gindai	1203	244	1873	2005	1702	809	3147	1101	855
	4.57%	1.01%	3.50%	3.84%	3.78%	1.65%	3.87%	4.31%	2.79%
Emperor	8397	12637	13612	18130	11762	28130	37593	5164	13770
	31.87%	52.21%	25.44%	34.74%	26.10%	57.42%	46.20%	20.22%	44.98%
TOTAL SELECTED SPECIES:	26348	24203	53503	52184	45065	48991	81376	25541	30616

Table 7

BABY BANK SUMMARY INFORMATION

	1985	1986	1987
NUMBER OF BOATS	12	13	16
NUMBER OF TRIPS	24	27	30
BOTTOM FISH LANDINGS	1325	1613	1814
HOURS FISHED	305	432	355
CATCH PER TRIP	55	60	60
CATCH PER HOUR	4.3	3.7	5.1
CATCH PER HOUR FISHER 1	8.6	2.0	4.0
CATCH PER HOUR FISHER 2	7.9	1.7	5.3
CATCH PER HOUR FISHER 3	5.7	5.3	-

Figure 1

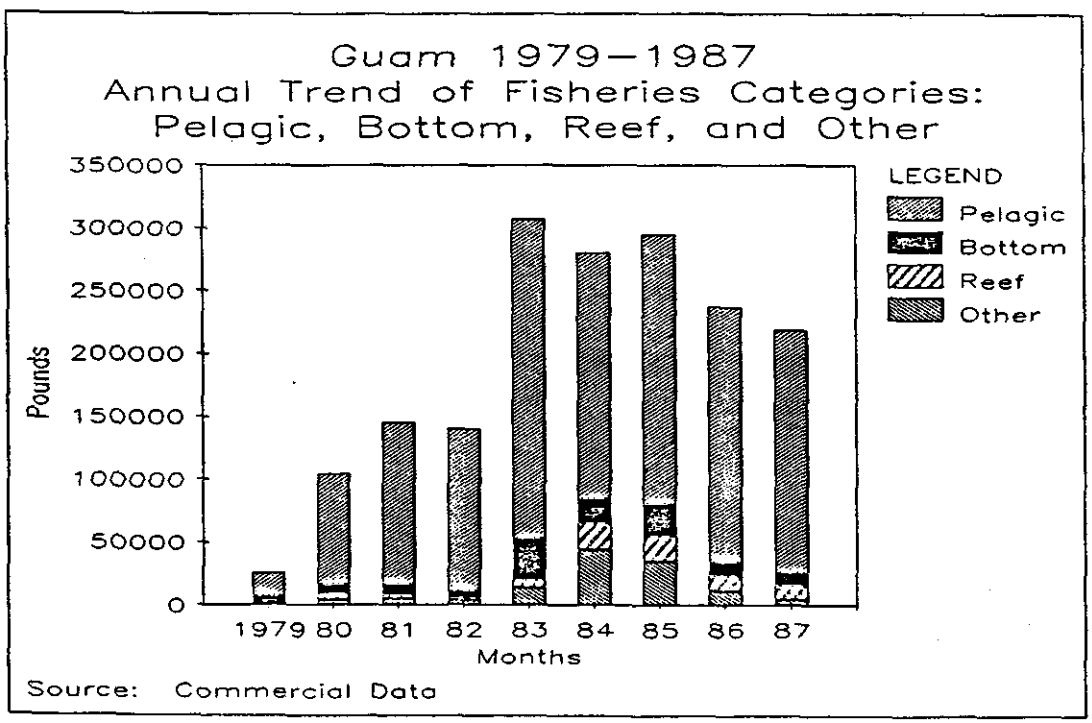


Figure 2

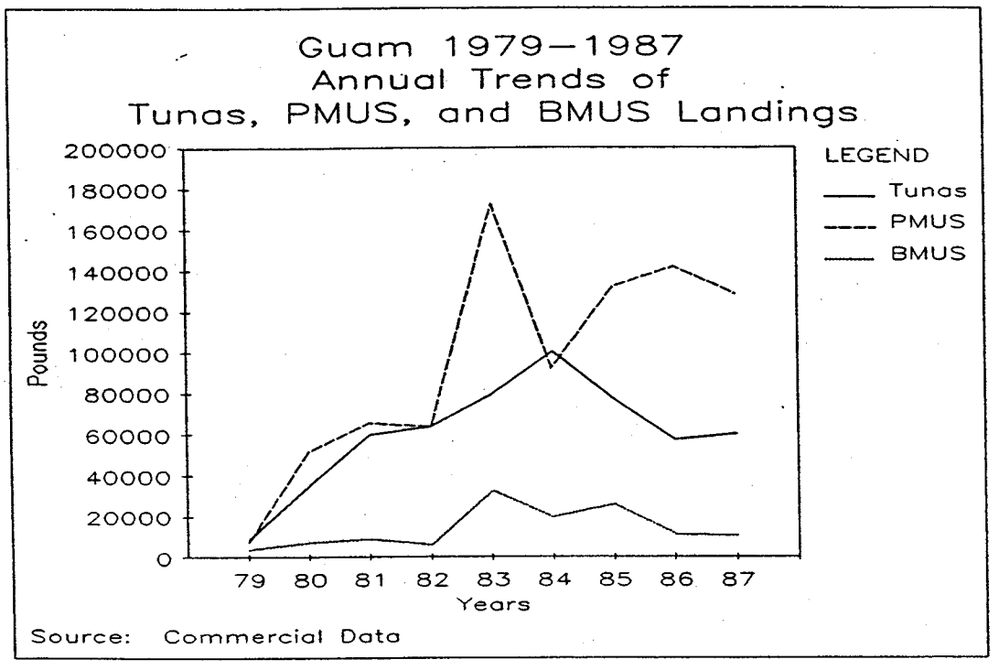


Figure 3

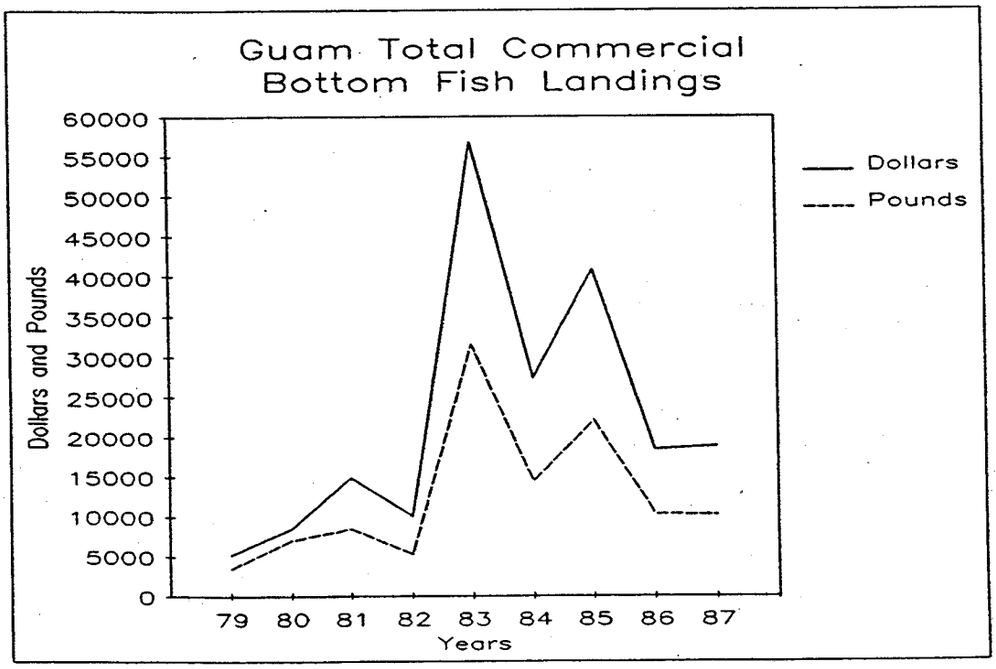


Figure 4

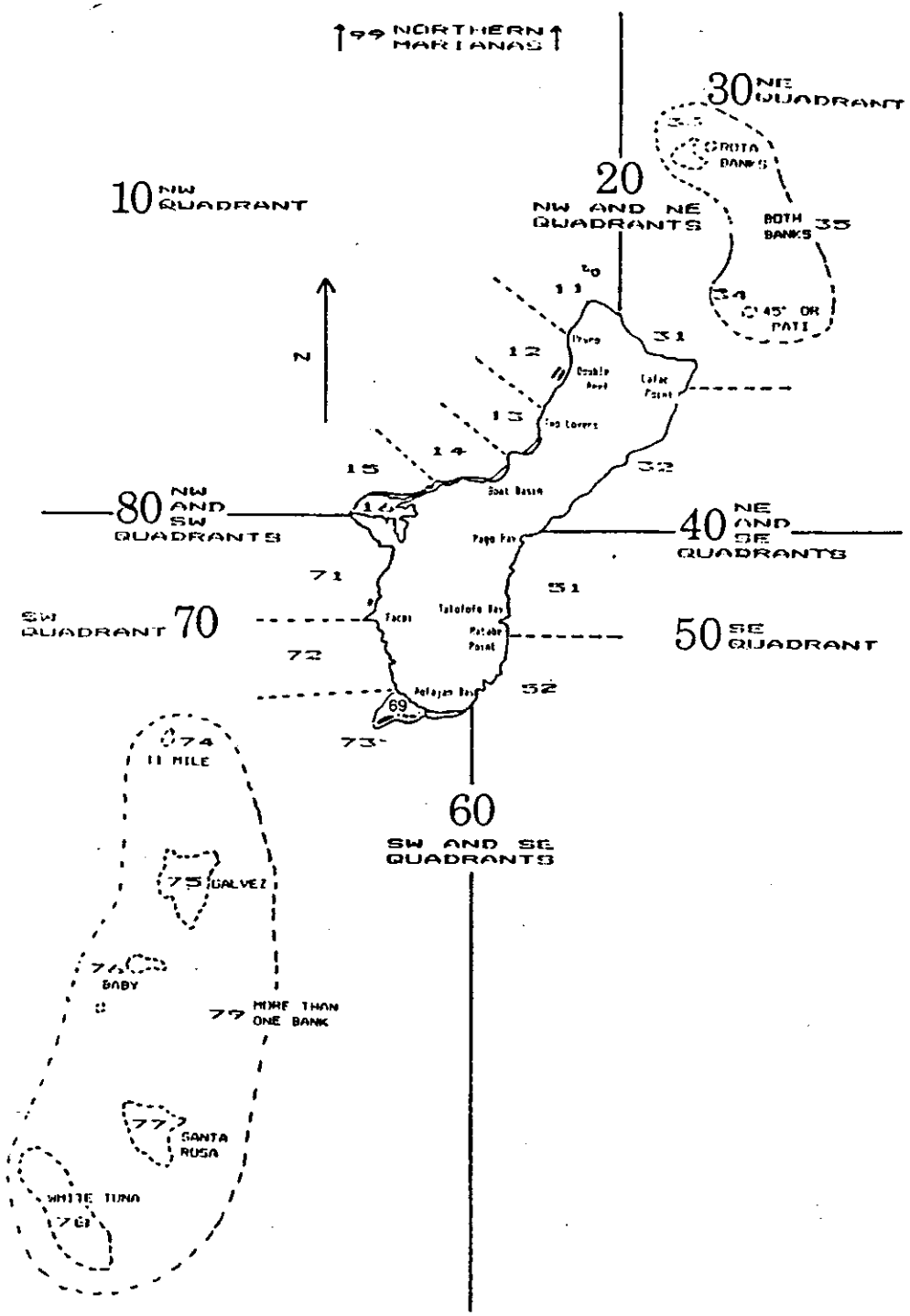

99 NORTHERN MARIANAS
30 NE QUADRANT
ROTA BANKS
10 NW QUADRANT
20 NW AND NE QUADRANTS
BOTH BANKS 35
34 45° OR PATI
11
12
13
14
15
31
32
N
80 NW AND SW QUADRANTS
40 NE AND SE QUADRANTS
71
51
SW QUADRANT 70
50 SE QUADRANT
72
52
69
73
74 11 MILE
75 GALVEZ
76 BABY
77 MORE THAN ONE BANK
77 SANTA ROSA
WHITE TUNA
78
60 SW AND SE QUADRANTS

Figure 5

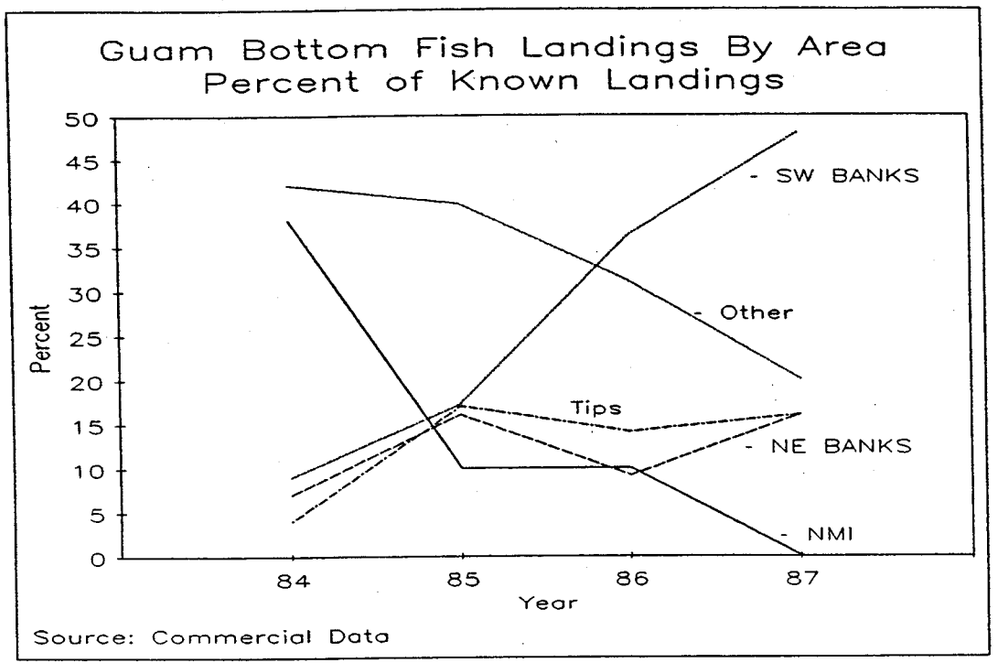


Figure 6

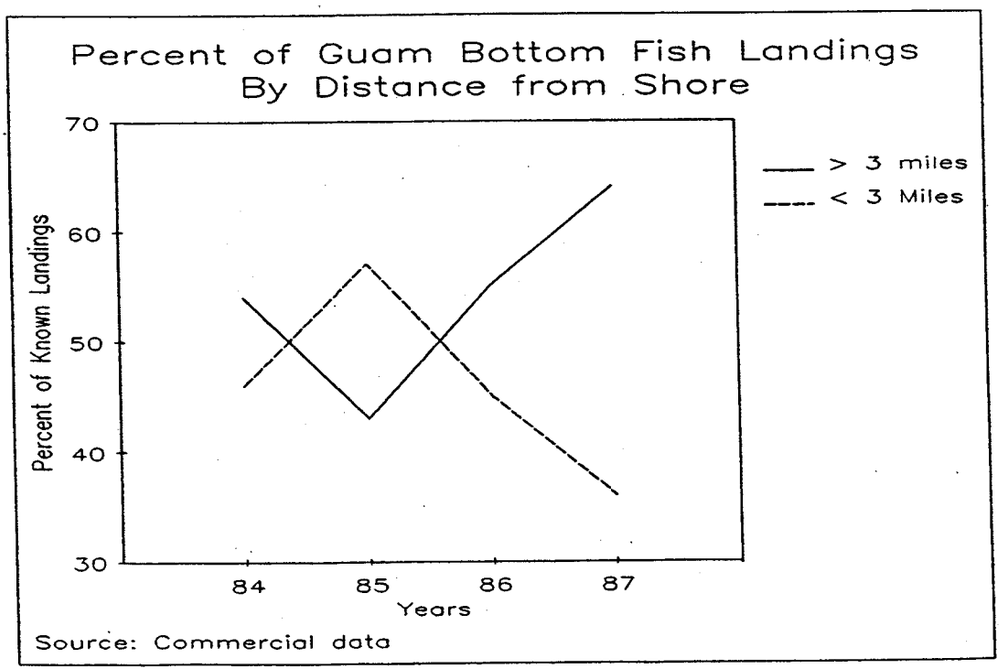


Figure 7

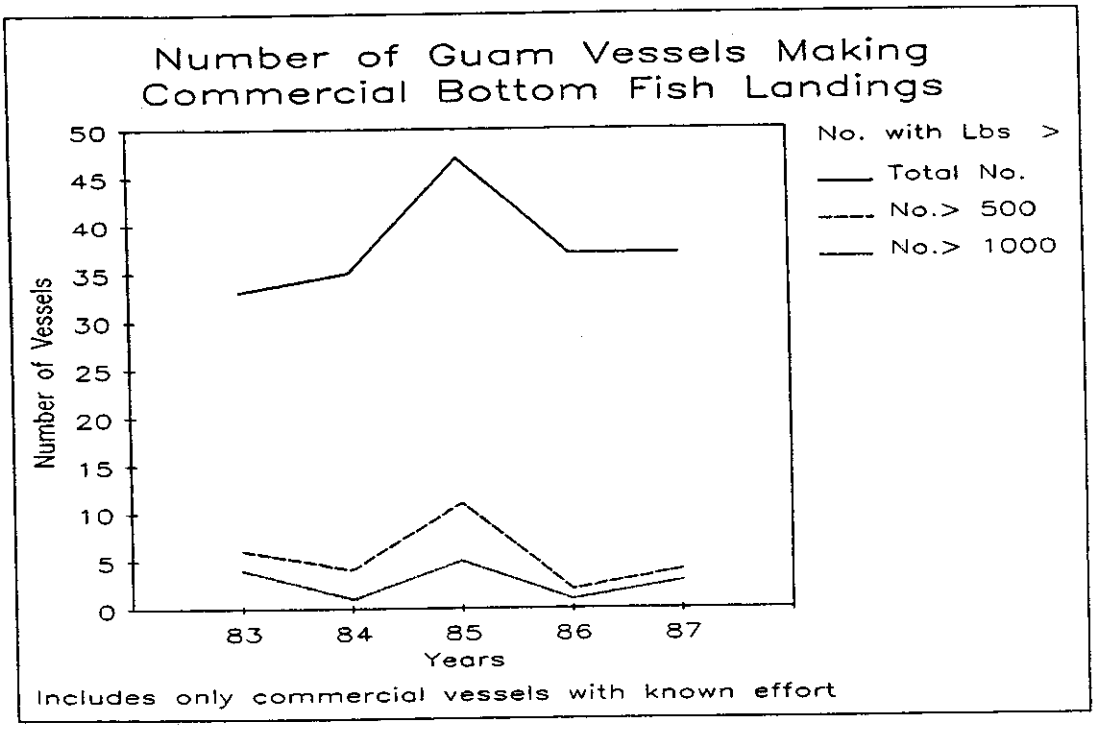


Figure 8

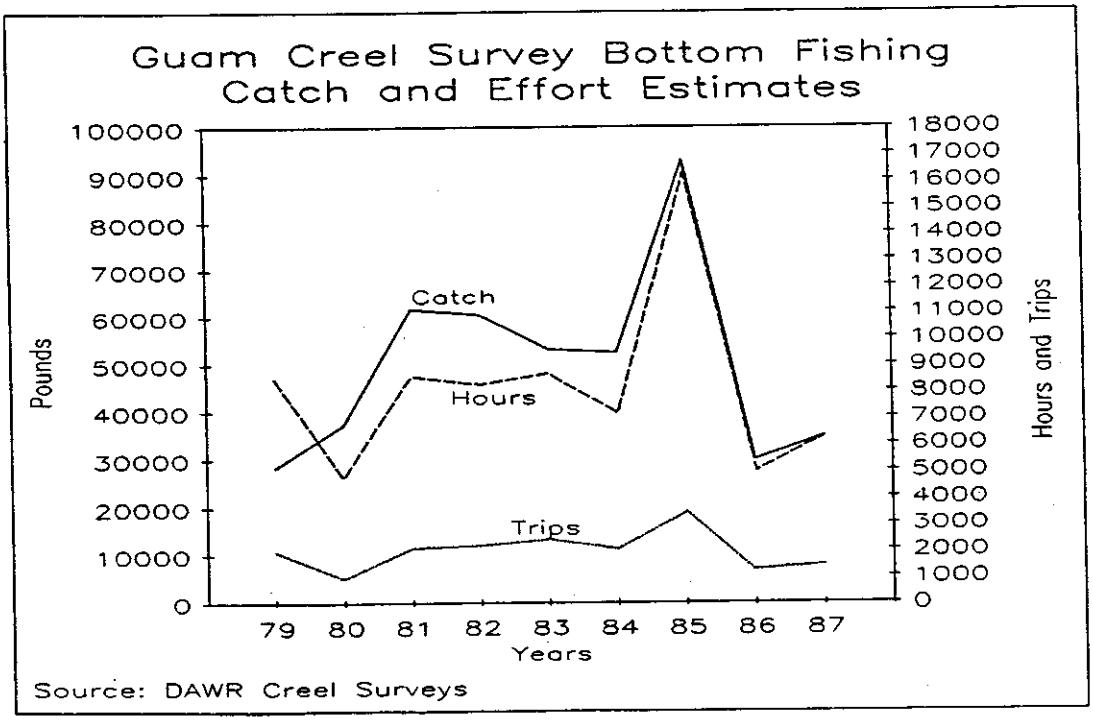


Figure 9

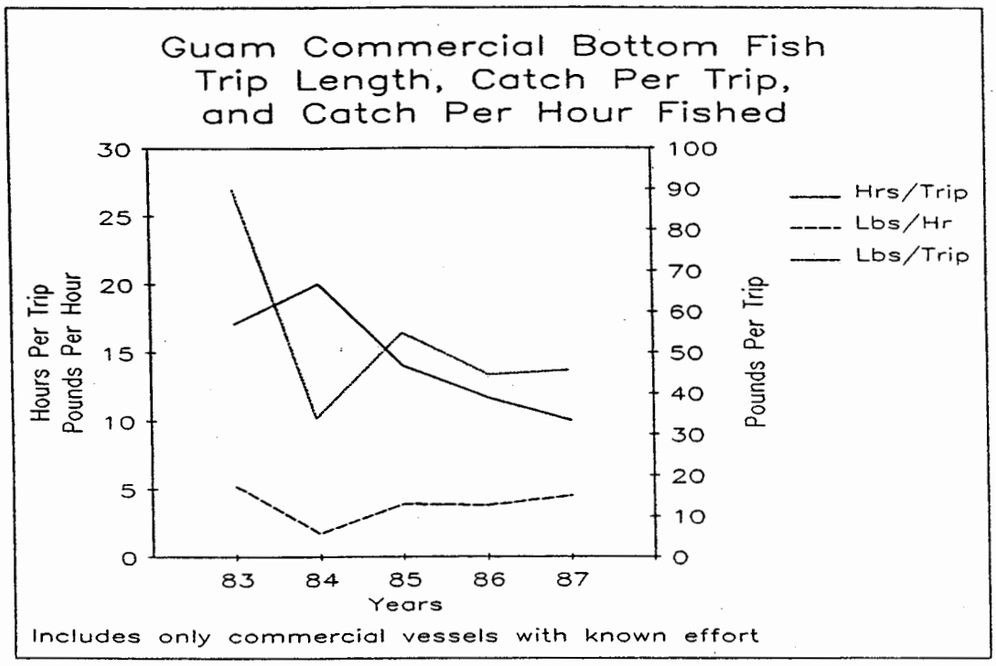


Figure 10

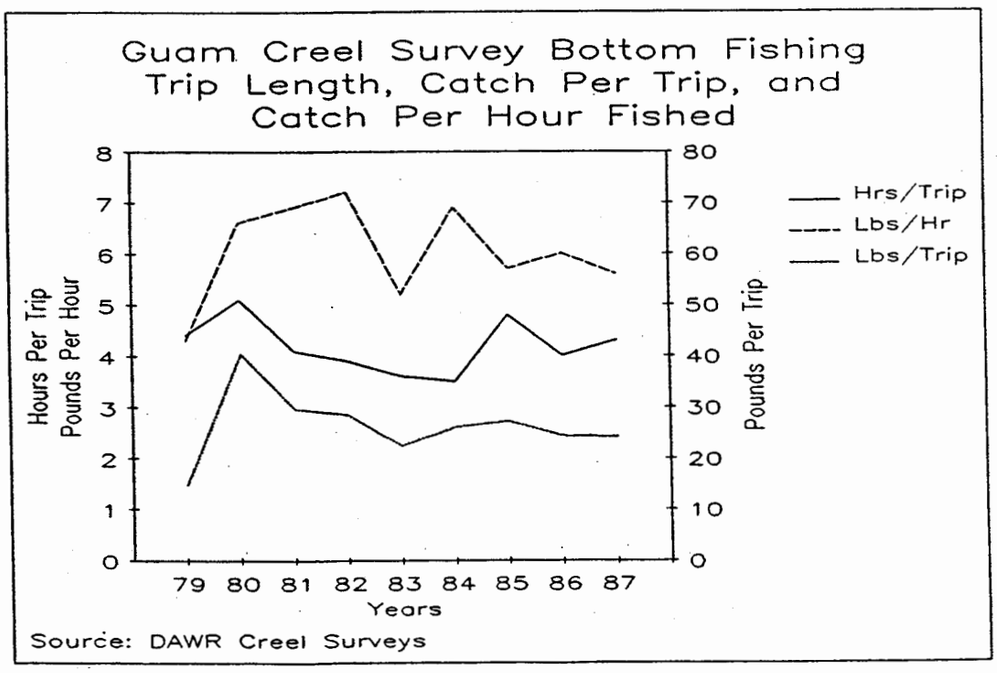


Figure 11

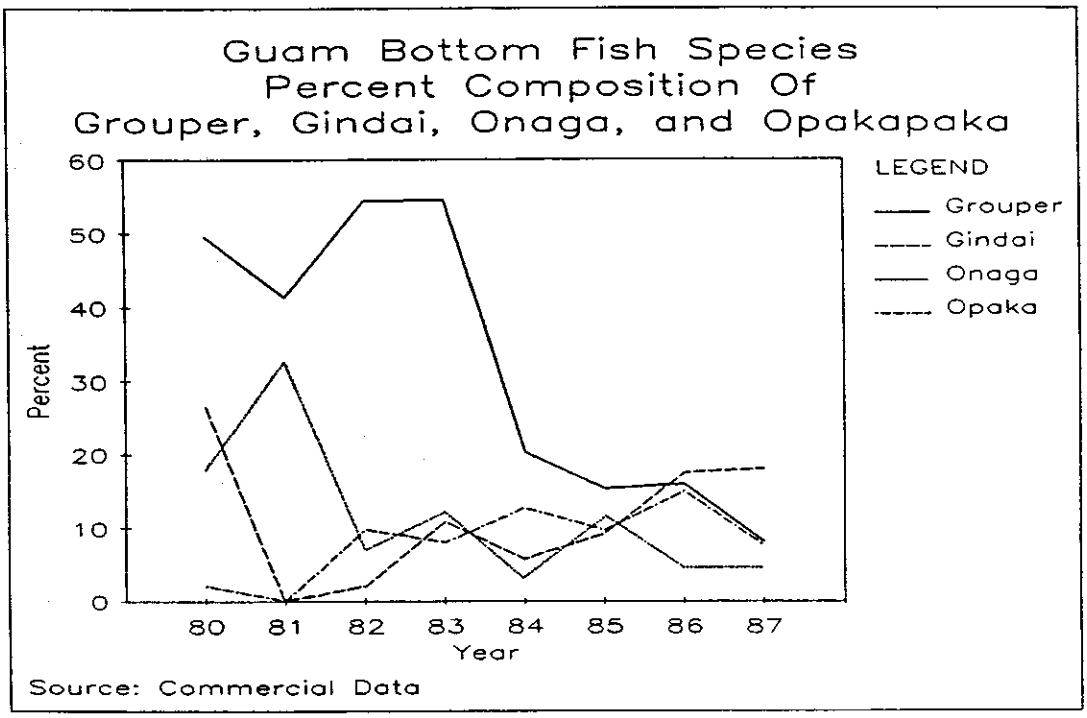


Figure 12

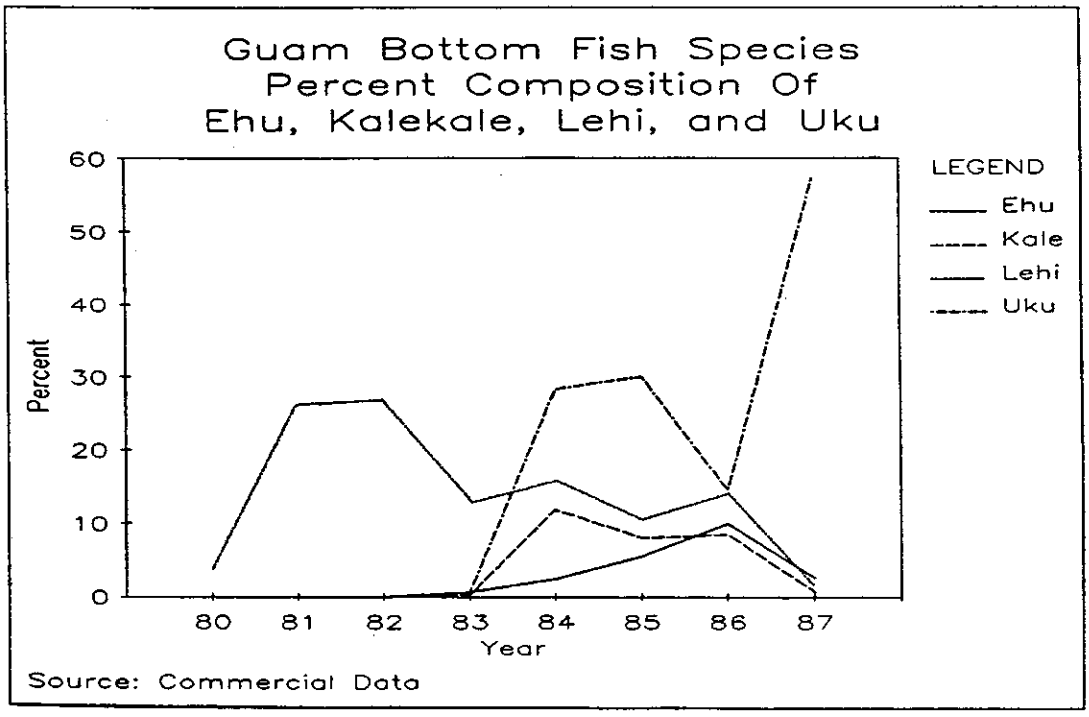


Figure 13

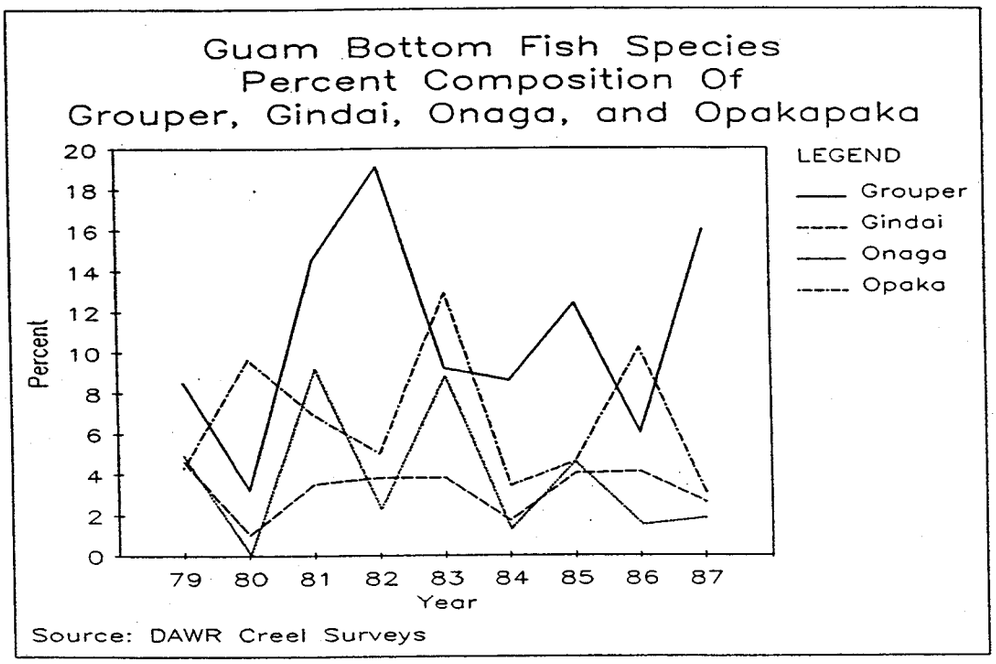


Figure 14

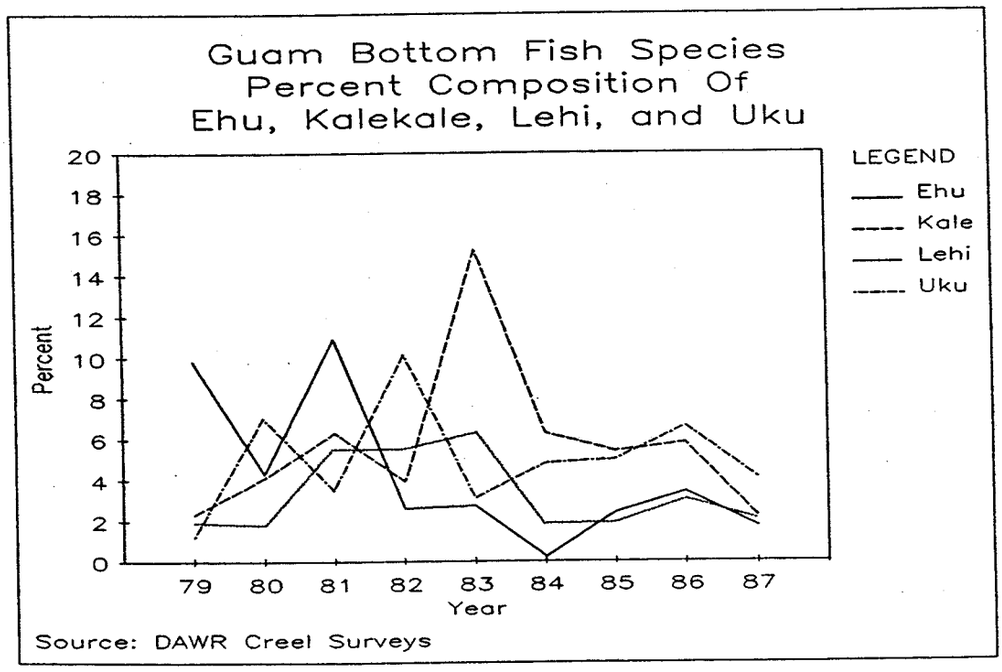
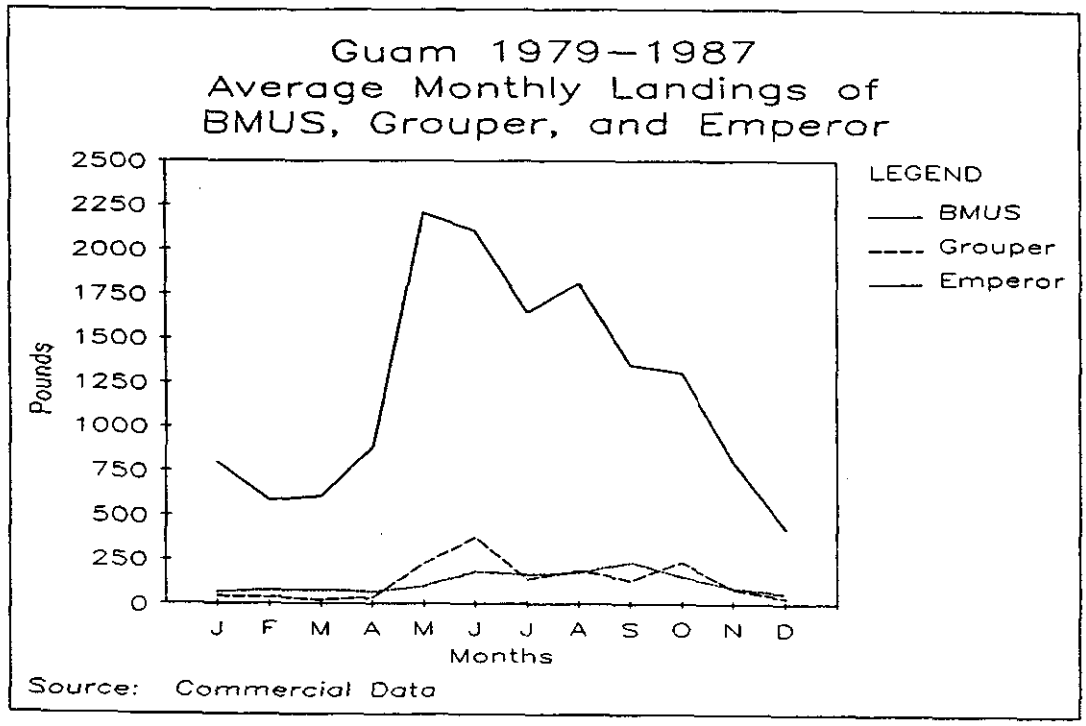


Figure 15


Guam 1979–1987
Average Monthly Landings of
BMUS, Grouper, and Emperor
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
Pounds
J F M A M J J A S O N D
Months
LEGEND
BMUS
Grouper
Emperor
Source: Commercial Data

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

This section provides new data and updates previously published data on the bottom fish fishery of the Commonwealth of the Northern Mariana Islands (CNMI). Data contained herein are from the commercial landings data bases of the CNMI's Division of Fish and Wildlife (DFW). The DFW collects "trip ticket" receipts from all major fish purchasers on Saipan. Commercial sales data currently are not collected on Tinian or Rota. The data collection system was significantly improved during 1982; therefore, data collected prior to 1983 are generally not comparable to data collected from 1983 to the present. This report includes 1982 data, which may not be comparable. Additionally, the DFW suspects that the percent coverage of the data collection system may have decreased over the past year or so because of new entrants to the retail market business from which DFW has not yet made arrangments for obtaining receipts. The DFW is investigating this situation. As always, caution is advised when interpreting summary statistics, and all analyses reported herein are subject to change based on subsequent revelations of other data.

The current trip ticket receipt system does not obtain information on the number of hours fished per trip; therefore, the catch per unit effort (CPUE) for all analyses in this report is based on number of trips. Two assumptions were made in determining the number of trips: All of the catch sold by a fisherman on a particular day was from a single trip, and all of the catch from a single trip was sold on 1 d. Based on our knowledge of the fishery, these are good assumptions. Additionally, in this report, the terms fisherman, vessel, and boat all refer to the same fishing unit. The 1986 annual report (Council 1988) of the Council's Plan Monitoring Team on the bottom fish fishery for the CNMI omitted emperorfish from the tables, figures, and analyses, but this year's report includes this group and provides updated information for years back to 1982. Summaries and analyses in this year's report are based solely on landings of bottom fish species. For additional background information or specifics on other CNMI fisheries, refer to Hamm et al. (1986) and Hamm and Quach (1988).

Landings and Revenue

Similar to Guam, the CNMI's bottom fish fishery comprises a relatively small percentage of the total commercial landings but is a very important fishery culturally and economically. Bottom fish are in high demand and relatively short supply, so the markets generally sell out of them very rapidly. This fishery is believed to be currently underexploited in the CNMI; therefore, no management system is proposed for this area.

The annual landings (pounds, value, and price per pound) of bottom fish for 1982-87 are in Tables 1-6. Table 7 presents the 1987 monthly landings. In these tables, the column labeled "RECORDS" is the number of individual landings made of each species, regardless of the size of the landing, and is an indication of the number of trips resulting in commercial landings of that species. Figure 1 shows the relative importance of the general fisheries categories (i.e., pelagic, bottom,

reef, and other) in the CNMI for 1979-87. In 1987, the bottom fish category comprised 12.7% of the total commercial landings, the largest on record. The landings of the BMUS were about equal to landings of the PMUS and the tunas have been the most important species in the commercial fisheries (Fig. 2). Landings of the BMUS have been larger than the PMUS every year since 1983.

The total commercial landings increased from 1982 to 1984, dropped considerably in 1985, rose to near-1984 levels in 1986, and then dropped in 1987 to the lowest level since 1982 (Fig. 3). Commercial bottom fish landings, however, increased until 1984, leveled off in 1985, dropped in 1986, and increased during 1987 to a new all-time high in both total landings and as a percentage of the total fisheries. The apparent negative correlation between the total landings and the bottom fish landings for 1985-87 may be a result of fisheries interactions. That is, when the tuna fishery is poor, as it was in 1985 and 1987 (Fig. 2), more fishermen turn to bottom fish fishing, causing an increase in that fishery. However, the correlaion does not hold true for 1984 when both fisheries had peaks.

Tables 1-6 provide annual ex-vessel values and average price per pound by species for the bottom fish landed in the CNMI for 1982-87, and Table 7 provides these statistics on a monthly basis for 1987. Figure 3 graphs the annual value of the bottom fish fishery.

Fishing Effort

Number of Vessels and Trips

A wealth of annual summary information on the CNMI's bottom fish fishery is in Table 8, including the total number of fishermen (vessels) making bottom fish landings and the number landing >1,000 lb of bottom fish per year. Since it is sometimes very useful to separately analyze the major contributors, or highliners, in a fishery, most of the statistics in Table 8, and subsequent corresponding figures, include this split.

The annual number of fishermen (vessels) making landings of bottom fish reached a maximum of 102 in 1984, declined to just over half that number in 1985, remained the same in 1986, and then declined further in 1987 (Fig. 4). However, the number of vessels landing >1,000 lb annually has remained fairly constant since 1983. In the 5-yr period from 1983 to 1987 (1982 data are excluded from these analyses but are included in the figures), 206 vessels recorded landings of bottom fish; however, 110 of these landed <100 lb each. Only 24 vessels landed >1,000 total lb of bottom fish over the 5-yr period, and only 6 vessels landed >5,000 lb total. Figure 5 shows the relative importance of these six bottom fish highliners, whose trend in catch mirrors the total bottom fish catch (Fig. 3). These six highliners were responsible for making 34% of the number of trips and landing over 57% of the total bottom fish landings, and one of these six was singly responsible for about 32% of the catch and 11% of the trips over the 5-yr period. This highliner was the only vessel that made landings of >1,000 lb per yr in all 5 yr summarized. Over 1,000-lb

per yr occurred for one other vessel for 4 yr, one vessel for 3 yr, and only four vessels for 2 of the 5 yr. This helps explain why the total landings were not significantly affected by the drastic reduction in the number of vessels making bottom fish landings during 1985-87.

The trend in the total number of individual landings of bottom fish species and the total number of bottom fish fishing trips (Fig. 6) is very similar to that for the total number of fishermen (Fig. 4), reflecting the significant declines in 1985 and the somewhat more stable fishery since then. Annual changes in the number of trips plotted for fishermen landing >1,000 lb of bottom fish per year are proportionately less dramatic.

Ignoring 1982 because of possible data problems, the bottom fish catch per trip has been increasing steadily since 1983, especially for the highliners. As might be expected, the average catch per trip for the highliners is higher than the average catch of all vessels combined (Fig. 7). In fact, if the highliners are separated from the other vessels, their average catch per trip for the 5-yr period is 146 lb per trip compared to only 55 lb per trip for all other vessels combined. The highliners typically travel farther and fish longer on each trip than do the other vessels. It would be interesting to compare their catch rates based on catch per hour rather than catch per trip to see whether they actually benefit from traveling farther and fishing longer, but unfortunately, no data on length of trip data are currently available.

Species Composition and Other Indicators of Fishery Performance

Changes in species composition typically indicate changes in a fishery, either in the stocks or the fishing activity itself. Table 9 provides annual summaries of landed weight and percent species composition for all bottom fish species. Not all trip ticket receipts identify bottom fish below the general "bottom fish" category. However, assuming those receipts that do identify catch to the species or family level are representative of the actual species composition, then the combined or unallocated miscellaneous bottom fish catch can be proportionately allocated to subgroups as in Table 10. Figure 8 graphs the percent species composition for the four most important species, shows that the emperorfish is by far the dominant group, and shows a fairly stable mix with the other species (i.e., grouper, onaga, and opakapaka). No problems with the bottom fish fishery are indicated, based on changes in species composition.

Figure 9 shows the seasonality of the total bottom fish catch and of the two most important species groups, emperorfish and groupers. Bottom fish fishing is conducted throughout the year, with slightly more activity in the calmer summer and fall months. The apparent trimodal fluctuations in bottom fish landings are believed to be an artifact of the relatively small magnitude of the fishery. However, since this is a seasonality summary based on 9 yr of data, there may actually be some unknown fishery- or resource-based explanation. That remains to be investigated.

Biological Characteristics of the Landings

No specific size-frequency data are currently available for bottom fish landed in the CNMI. Additionally, the current trip ticket receipt system does not collect information on the number of pieces landed, so size-frequency data can not be generated from it.

Recent Research and Survey Results

The DFW recently reinstituted an offshore creel survey data collection system that should provide additional information on CNMI's bottom fish fishery in the future.

REFERENCES

Hamm, D. C., and M. M. C. Quach.
1988. Fishery statistics of the western Pacific, volume III. Territory of American Samoa (1985-86), Commonwealth of the Northern Mariana Islands (1985-86), Territory of Guam (1985-86), State of Hawaii (1985-86). Southwest Fish. Cent. Honolulu Lab., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396. Southwest Fish. Cent. Admin. Rep. H-88-4, var. pag.

Hamm, D. C., M. M. C. Quach, and T. T. Kassman.
1986. Fishery statistics of the western Pacific, volume II. Territory of Guam. Southwest Fish. Cent. Honolulu Lab., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396. Southwest Fish. Cent. Admin. Rep. H-86-20, var. pag.

Western Pacific Regional Fishery Management Council (Council).
1988. 1986 Western Pacific Regional Fishery Management Council annual report for the fishery management plan for the bottomfish and seamount groundfish fisheries of the western Pacific region. Western Pacific Regional Fishery Management Council, 1164 Bishop Street, Honolulu, HI 96813, 33 p.

In prep. 1987 Western Pacific Regional Fishery Management Council annual report for the fishery management plan for the bottom fish and seamount groundfish fisheries of the western Pacific region. Western Pacific Regional Fishery Management Council, 1164 Bishop Street, Honolulu, HI 96813.

Table 1

CNMI 1982 COMMERCIAL LANDINGS
OF BOTTOMFISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
JACKS	14	573.50	995.85	1.74
BOTTOMFISH	26	7256.50	11242.63	1.55
GINDAI (FLOWER SNAP)	1	10.50	16.27	1.55
GROUPER	20	569.00	977.35	1.72
ONAGA (RED SNAPPER)	6	198.50	526.84	2.65
OPAKAPAKA (PINK SNP)	2	86.00	215.00	2.50
EMPEROR (MAFUTE)	30	2382.50	4110.01	1.73
** Total Bottomfish**	99	11076.50	18083.95	1.63
** TOTAL ALL SPECIES**	1058	150762.74	191418.21	1.27

Table 2

CNMI 1983 COMMERCIAL LANDINGS
OF BOTTOMFISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
JACKS	34	825.15	1322.47	1.60
BOTTOMFISH	199	10398.10	18178.89	1.75
GINDAI (FLOWER SNAP)	11	213.50	432.35	2.03
GROUPER	59	1090.50	1713.03	1.57
ONAGA (RED SNAPPER)	23	894.00	2527.64	2.83
OPAKAPAKA (PINK SNP)	38	1617.90	2917.41	1.80
EMPEROR (MAFUTE)	309	7644.10	12910.91	1.69
** Total Bottomfish**	673	22683.25	40002.70	1.76
** TOTAL ALL SPECIES**	4904	330752.47	423832.71	1.28

Table 3

CNMI 1984 COMMERCIAL LANDINGS
OF BOTTOMFISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
JACKS	18	724.50	1194.23	1.65
BOTTOMFISH	272	16777.00	29665.84	1.77
GINDAI (FLOWER SNAP)	19	638.50	1255.77	1.97
GROUPER	47	2512.90	3300.30	1.31
ONAGA (RED SNAPPER)	26	820.80	2075.36	2.53
OPAKAPAKA (PINK SNP)	22	1311.00	2560.00	1.95
EMPEROR (MAFUTE)	236	11139.60	18953.45	1.70
** Total Bottomfish**	640	33924.30	59004.95	1.74
** TOTAL ALL SPECIES**	4976	444558.57	551200.93	1.24

Table 4

CNMI 1985 COMMERCIAL LANDINGS
OF BOTTOMFISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
JACKS	12	769.84	1066.99	1.39
BOTTOMFISH	180	17522.84	29615.52	1.69
GINDAI (FLOWER SNAP)	3	166.25	325.63	1.96
GROUPER	22	3368.00	4537.31	1.35
ONAGA (RED SNAPPER)	23	893.75	2424.88	2.71
OPAKAPAKA (PINK SNP)	10	544.95	1190.26	2.18
UKU (GRAY SNAPPER)	3	65.00	162.00	2.49
AMBERJACK	3	108.25	222.11	2.05
EMPEROR (MAFUTE)	92	9341.15	15851.09	1.70
** Total Bottomfish**	348	32780.03	55395.79	1.69
** TOTAL ALL SPECIES**	3590	338427.73	443229.69	1.31

Table 5

CNMI 1986 COMMERCIAL LANDINGS
OF BOTTOMFISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
JACKS	14	654.50	1255.73	1.92
BOTTOMFISH	125	11622.09	20529.67	1.77
GINDAI (FLOWER SNAP)	15	698.96	1623.15	2.32
GROUPER	23	1195.00	2326.75	1.95
ONAGA (RED SNAPPER)	32	1278.27	3852.76	3.01
OPAKAPAKA (PINK SNP)	14	789.80	1632.60	2.07
UKU (GRAY SNAPPER)	3	290.50	859.25	2.96
EMPEROR (MAFUTE)	71	7400.05	12998.74	1.76
** Total Bottomfish**	297	23929.17	45078.65	1.88
** TOTAL ALL SPECIES**	3880	410024.50	554676.40	1.35

Table 6

CNMI 1987 ANNUAL COMMERCIAL LANDINGS
OF BOTTOM FISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
JACKS	12	485.62	1109.39	2.28
BOTTOM FISH	151	24742.92	43633.83	1.76
GINDAI (FLOWER SNAP)	4	217.00	469.50	2.16
GROUPER	13	577.00	1055.70	1.83
ONAGA (RED SNAPPER)	12	377.50	1045.07	2.77
OPAKAPAKA (PINK SNP)	19	917.00	2107.21	2.30
EMPEROR (MAFUTE)	82	12454.75	22447.21	1.80
** Total Bottom Fish**	293	39771.79	71867.91	1.81
** TOTAL ALL SPECIES**	2706	312608.99	448409.83	1.43

Table 7

CNMI MONTHLY 1987 COMMERCIAL LANDINGS
OF BOTTOM FISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
** January **				
JACKS	2	74.00	148.00	2.00
BOTTOM FISH	8	583.00	1037.50	1.78
GINDAI (FLOWER SNAP)	1	40.00	100.00	2.50
GROUPER	1	40.00	70.00	1.75
ONAGA (RED SNAPPER)	1	20.00	38.00	1.90
OPAKAPAKA (PINK SNP)	5	173.00	367.40	2.12
EMPEROR (MAFUTE)	17	4161.25	7287.78	1.75
** Total Bottom Fish**	35	5091.25	9048.68	1.78
** TOTAL ALL SPECIES**	268	29791.94	42477.43	1.43
** February **				
JACKS	2	209.25	499.63	2.39
BOTTOM FISH	23	5042.00	9191.70	1.82
GINDAI (FLOWER SNAP)	1	22.00	49.50	2.25
GROUPER	1	62.00	124.00	2.00
ONAGA (RED SNAPPER)	2	50.00	104.50	2.09
OPAKAPAKA (PINK SNP)	3	217.50	629.35	2.89
EMPEROR (MAFUTE)	7	407.50	767.50	1.88
** Total Bottom Fish**	39	6010.25	11366.18	1.89
** TOTAL ALL SPECIES**	221	23634.82	38701.36	1.64
** March **				
JACKS	4	84.89	212.23	2.50
BOTTOM FISH	16	3256.75	5740.05	1.76
GINDAI (FLOWER SNAP)	1	65.00	162.50	2.50
GROUPER	2	123.00	331.45	2.69
ONAGA (RED SNAPPER)	2	113.00	321.45	2.84
OPAKAPAKA (PINK SNP)	2	33.00	68.50	2.08
EMPEROR (MAFUTE)	9	1583.75	3017.01	1.90
** Total Bottom Fish**	36	5259.39	9853.19	1.87
** TOTAL ALL SPECIES**	163	16592.44	26873.03	1.62

Table 7 (Cont.)

CNMI MONTHLY 1987 COMMERCIAL LANDINGS
OF BOTTOM FISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
** April **				
JACKS	4	117.48	249.53	2.12
BOTTOM FISH	15	3958.00	7080.63	1.79
GROUPER	1	32.00	56.00	1.75
ONAGA (RED SNAPPER)	1	30.00	60.00	2.00
OPAKAPAKA (PINK SNP)	1	35.00	70.00	2.00
EMPEROR (MAFUTE)	5	1077.50	1956.30	1.82
** Total Bottom Fish**	27	5249.98	9472.46	1.80
** TOTAL ALL SPECIES**	245	31001.25	45298.15	1.46
** May **				
BOTTOM FISH	13	1434.00	2412.30	1.68
GROUPER	3	155.00	205.25	1.32
ONAGA (RED SNAPPER)	1	26.00	91.00	3.50
OPAKAPAKA (PINK SNP)	1	24.00	69.60	2.90
EMPEROR (MAFUTE)	3	103.25	202.66	1.96
** Total Bottom Fish**	21	1742.25	2980.81	1.71
** TOTAL ALL SPECIES**	246	36837.24	46171.10	1.25
** June **				
BOTTOM FISH	15	2282.18	3774.71	1.65
GROUPER	1	15.00	26.25	1.75
ONAGA (RED SNAPPER)	2	88.00	262.00	2.98
OPAKAPAKA (PINK SNP)	2	201.50	356.15	1.77
EMPEROR (MAFUTE)	5	445.75	743.80	1.67
** Total Bottom Fish**	25	3032.43	5162.91	1.70
** TOTAL ALL SPECIES**	297	36722.24	48921.55	1.33
** July **				
BOTTOM FISH	5	437.82	1014.26	2.32
GROUPER	1	29.00	50.75	1.75
OPAKAPAKA (PINK SNP)	1	41.75	118.99	2.85
EMPEROR (MAFUTE)	4	272.00	592.41	2.18
** Total Bottom Fish**	11	780.57	1776.41	2.28
** TOTAL ALL SPECIES**	252	24606.24	33766.65	1.37

Table 7 (Cont.)

CNMI MONTHLY 1987 COMMERCIAL LANDINGS
OF BOTTOM FISH SPECIES

SPECIES	RECORDS	POUNDS	VALUE	$/LB
** August **				
BOTTOM FISH	9	581.00	1092.30	1.88
GINDAI (FLOWER SNAP)	1	90.00	157.50	1.75
GROUPER	1	20.00	37.00	1.85
ONAGA (RED SNAPPER)	1	18.00	58.50	3.25
OPAKAPAKA (PINK SNP)	2	104.75	222.64	2.13
EMPEROR (MAFUTE)	7	644.00	1125.95	1.75
** Total Bottom Fish**	21	1457.75	2693.89	1.85
** TOTAL ALL SPECIES**	251	26442.78	37380.46	1.41
** September **				
BOTTOM FISH	13	1640.00	2723.70	1.66
EMPEROR (MAFUTE)	6	1257.75	2226.00	1.77
** Total Bottom Fish**	19	2897.75	4949.70	1.71
** TOTAL ALL SPECIES**	173	21230.00	31629.67	1.49
** October **				
BOTTOM FISH	22	3460.92	5830.46	1.68
GROUPER	2	101.00	155.00	1.53
ONAGA (RED SNAPPER)	2	32.50	109.62	3.37
EMPEROR (MAFUTE)	15	2389.25	4288.26	1.79
** Total Bottom Fish**	41	5983.67	10383.34	1.74
** TOTAL ALL SPECIES**	250	24801.94	37301.01	1.50
** November **				
BOTTOM FISH	9	793.25	1506.72	1.90
OPAKAPAKA (PINK SNP)	2	86.50	204.58	2.37
EMPEROR (MAFUTE)	1	26.00	41.60	1.60
** Total Bottom Fish**	12	905.75	1752.90	1.94
** TOTAL ALL SPECIES**	173	23039.20	33448.40	1.45
** December **				
BOTTOM FISH	3	1274.00	2229.50	1.75
EMPEROR (MAFUTE)	3	86.75	197.94	2.28
** Total Bottom Fish**	6	1360.75	2427.44	1.78
** TOTAL ALL SPECIES**	167	17908.90	26441.02	1.48

Table 8

ANNUAL CNMI BOTTOM FISH STATISTICS

	1982	1983	1984	1985	1986	1987
TOTAL COMMERCIAL LANDINGS (LB)	150763	330752	444559	338428	410025	312186
BOTTOM FISH LANDINGS	11076	22683	33924	32780	23929	39772
PERCENT BOTTOM FISH TO TOTAL COMMERCIAL LANDINGS	7.3%	6.8%	7.6%	9.7%	5.8%	12.7%
NUMBER OF RECORDED SPECIES LANDINGS	99	673	640	348	297	293
NUMBER OF TRIPS	50	533	492	283	229	237
NUMBER OF FISHERMEN	17	90	102	55	54	43
BOTTOM FISH CATCH/TRIP	222	43	69	116	104	168
CATCH OF FISHERMEN WITH > 1000 LB/YR	10373	10027	21729	24542	17767	33598
PERCENT OF TOTAL CATCH BY FISHERMEN LANDING > 1000 LB	94%	44%	64%	75%	74%	84%
NUMBER OF TRIPS BY FISHERMEN LANDING>1000 LB/YR	25	140	252	195	124	134
NUMBER OF FISHERMEN LANDING >= 1000 LB/YR	2	6	8	5	7	6
Catch/Trip for Fishermen Landing 1000 > lbs/yr	415	72	86	126	143	251

Table 9

CNMI COMMERCIAL BOTTOM FISH LANDINGS
(UNALLOCATED MISCELLANEOUS BOTTOM FISH)

SPECIES %	1982	1983	1984	1985	1986	1987
GROUPER	569 5.14%	1091 4.81%	2513 7.41%	3368 10.27%	1195 4.99%	577 1.45%
JACKS	574 5.18%	825 3.64%	725 2.14%	770 2.35%	655 2.74%	486 1.22%
GINDAI	11 0.10%	214 0.94%	639 1.88%	166 0.51%	699 2.92%	217 0.55%
ONAGA	199 1.80%	894 3.94%	821 2.42%	894 2.73%	1278 5.34%	378 0.95%
OPAKAPAKA	86 0.78%	1618 7.13%	1311 3.86%	545 1.66%	790 3.30%	917 2.31%
EMPEROR	2383 21.51%	7644 33.70%	11140 32.84%	9341 28.50%	7400 30.92%	12455 31.32%
AMBERJACK	0 0.00%	0 0.00%	0 0.00%	108 0.33%	0 0.00%	0 0.00%
UKU	0 0.00%	0 0.00%	0 0.00%	65 0.20%	291 1.22%	0 0.00%
BOTTOM FISH	7257 65.50%	10398 45.84%	16777 49.45%	17523 53.46%	11622 48.57%	24743 62.21%
TOTAL:	11079	22684	33926	32780	23930	39773

Table 10

CNMI COMMERCIAL BOTTOM FISH LANDINGS
(ALLOCATED MISCELLANEOUS BOTTOM FISH)

SPECIES %	1982	1983	1984	1985	1986	1987
GROUPER	1649 14.89%	2014 8.88%	4971 14.65%	7236 22.08%	2323 9.71%	1527 3.84%
JACKS	1664 15.02%	1523 6.71%	1434 4.23%	1654 5.05%	1273 5.32%	1286 3.23%
GINDAI	32 0.29%	395 1.74%	1264 3.73%	357 1.09%	1359 5.68%	574 1.44%
ONAGA	577 5.21%	1651 7.28%	1624 4.79%	1921 5.86%	2485 10.38%	1000 2.51%
OPAKAPAKA	249 2.25%	2987 13.17%	2594 7.64%	1171 3.57%	1536 6.42%	2427 6.10%
EMPEROR	6908 62.35%	14113 62.22%	22038 64.96%	20069 61.22%	14388 60.12%	32959 82.87%
AMBERJACK	0 0.00%	0 0.00%	0 0.00%	232 0.71%	0 0.00%	0 0.00%
UKU	0 0.00%	0 0.00%	0 0.00%	140 0.43%	566 2.36%	0 0.00%
TOTAL:	11079	22684	33926	32780	23930	39773

Figure 1

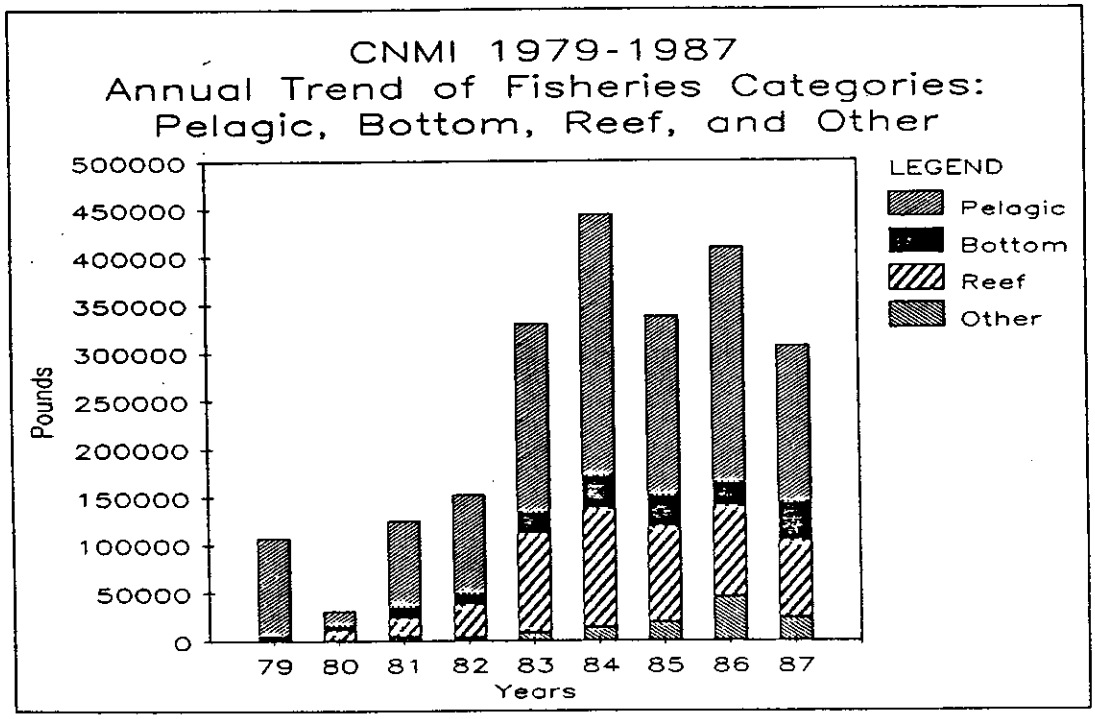


Figure 2

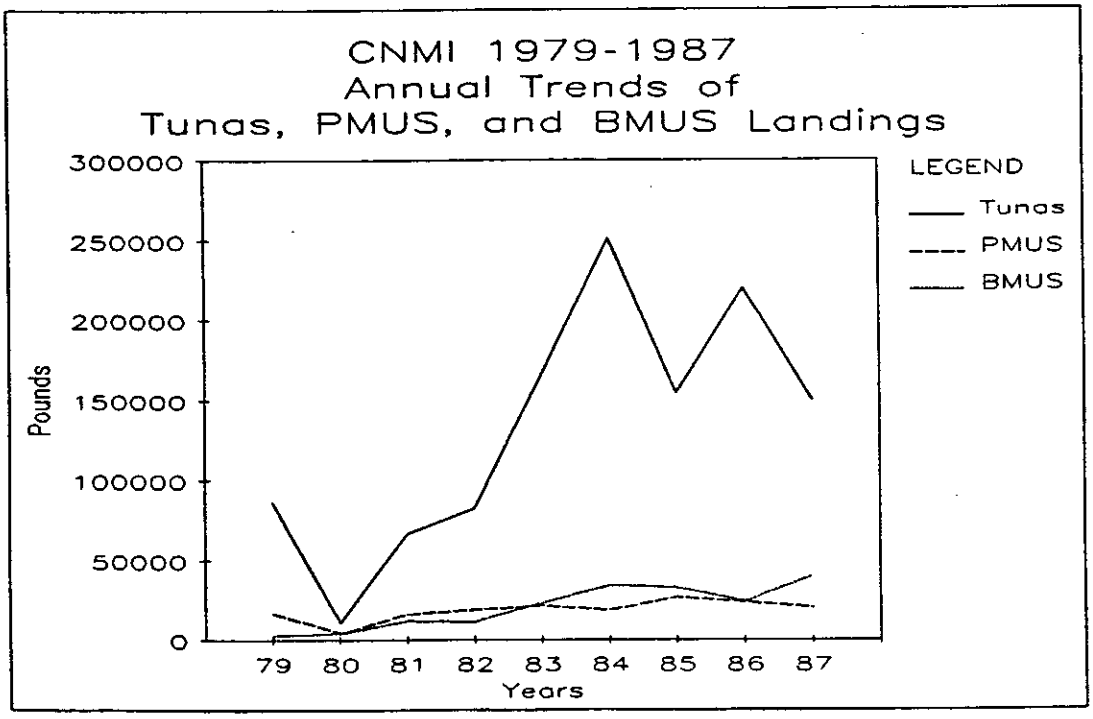


Figure 3

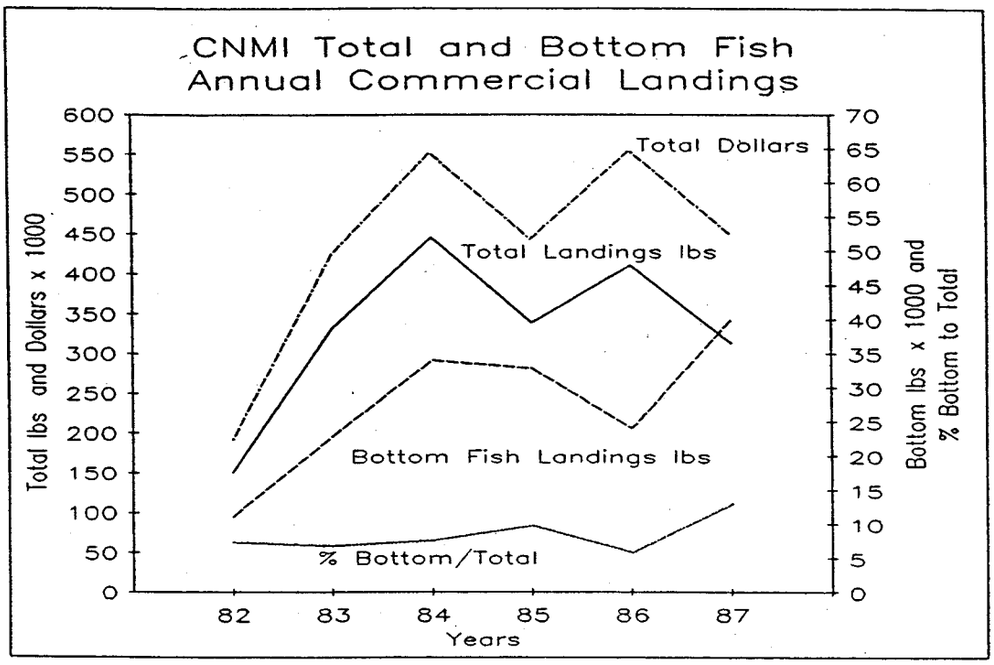


Figure 4

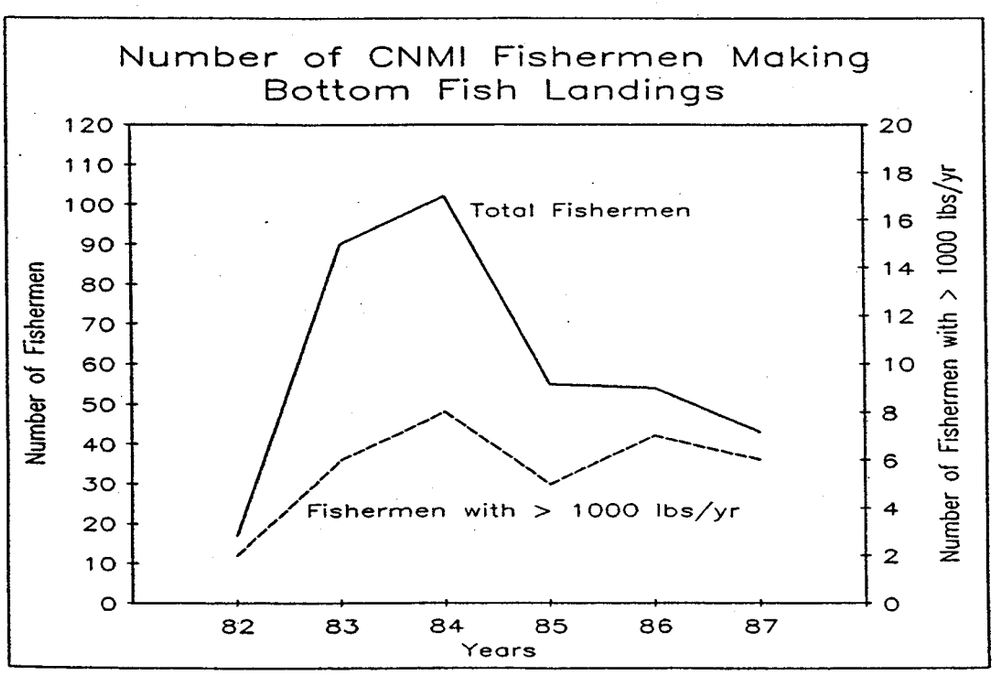


Figure 5

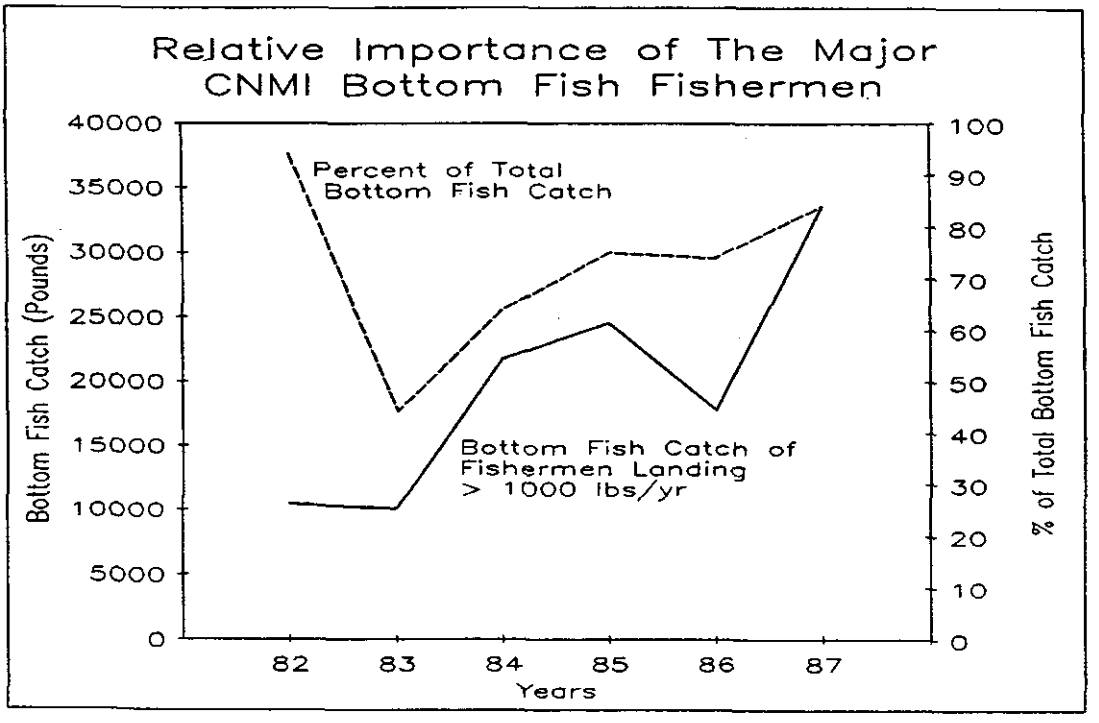


Figure 6

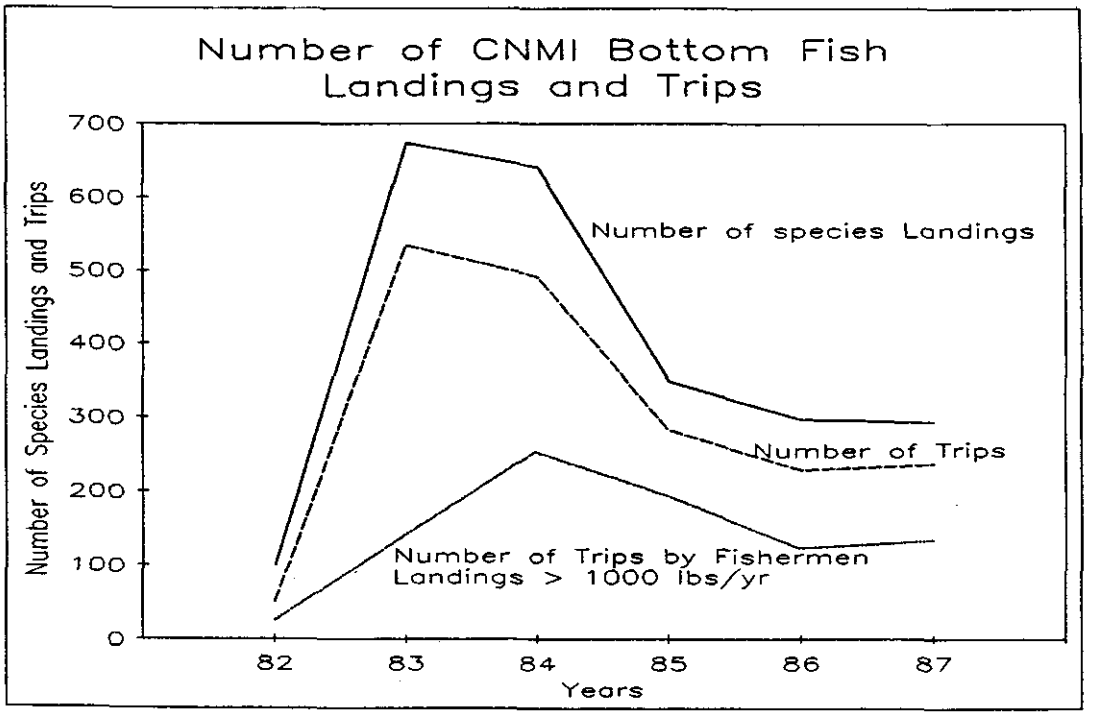


Figure 7

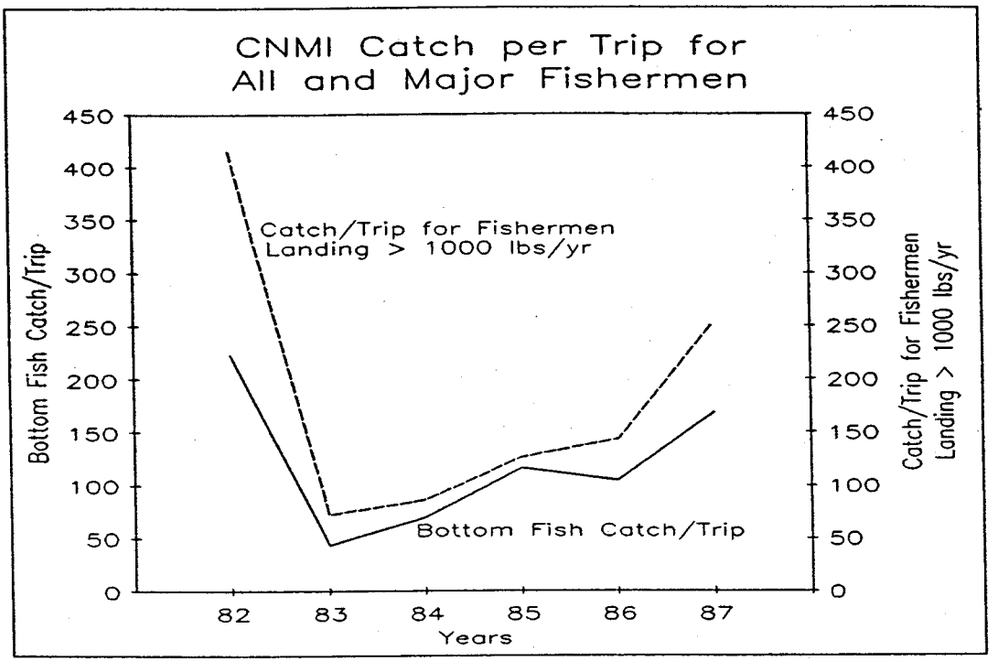


Figure 8

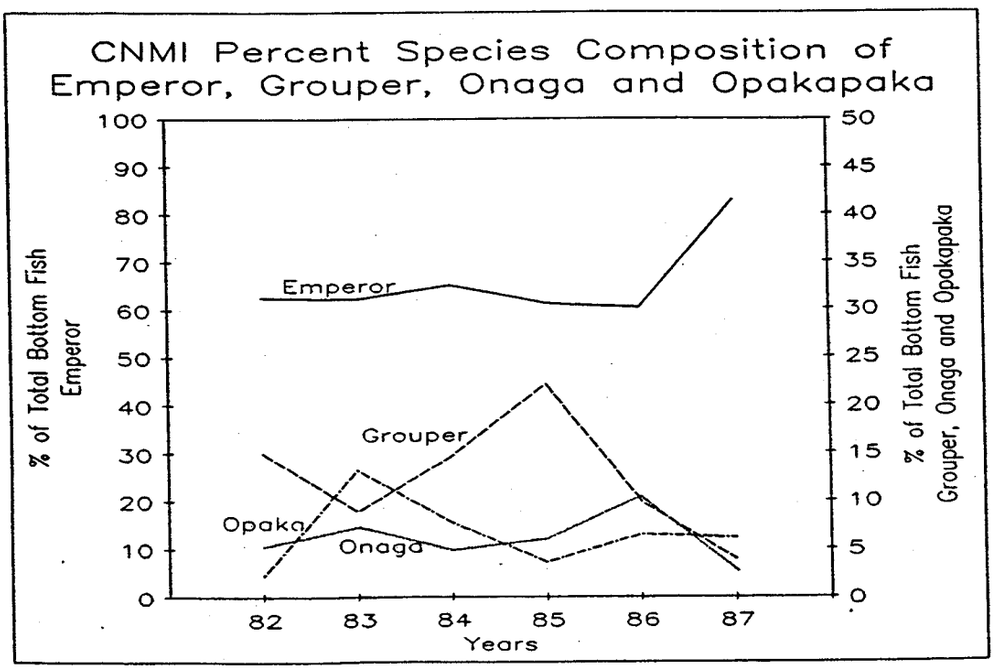
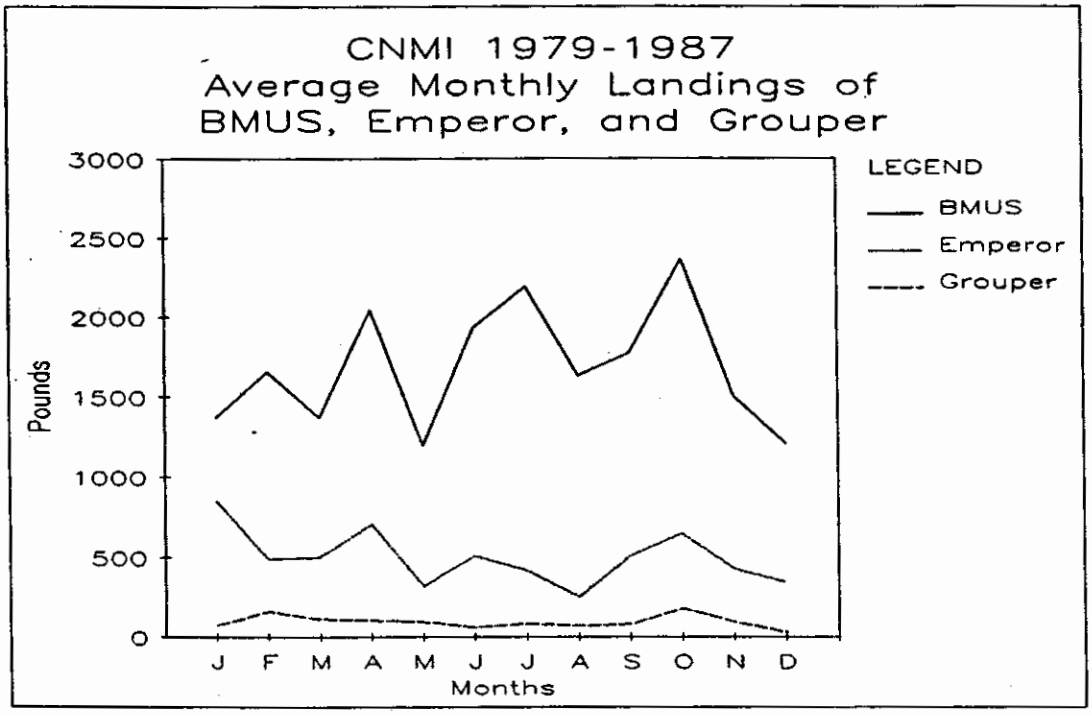


Figure 9


CNMI 1979-1987
Average Monthly Landings of
BMUS, Emperor, and Grouper
3000
2500
2000
1500
1000
500
0
Pounds
J F M A M J J A S O N D
Months
LEGEND
BMUS
Emperor
Grouper