APRIL 1995

FISHERY STATISTICS OF THE WESTERN PACIFIC

VOLUME X

Territory of American Samoa (1993)

Commonwealth of the Northern Mariana Islands (1993)

Territory of Guam (1993)

State of Hawaii (1993)

Compiled by

David C. Hamm, Michael M. C. Quach,
Lawrence M. K. So, and
Nathan T. S. Chan

Honolulu Laboratory
Southwest Fisheries Science Center
National Marine Fisheries Service, NOAA
Honolulu, Hawaii 96822-2396

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Administrative Report H-95-05

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PREFACE

In recent years, the demand for data and information concerning marine fisheries has greatly increased. To help meet these increased needs in the central and western Pacific areas, the National Marine Fisheries Service's Southwest Fisheries Center initiated the Western Pacific Fishery Information Network (WPACFIN), which assists Pacific island fisheries agencies in upgrading their data collecting, processing, and reporting capabilities. Several agencies are participating in this program: the National Marine Fisheries Service's Southwest Fisheries Science Center and its Honolulu Laboratory, and the Southwest Region and its Pacific Area Office, American Samoa's Department of Marine and Wildlife Resources, the Commonwealth of the Northern Mariana Islands' Division of Fish and Wildlife, Guam's Division of Aquatic and Wildlife Resources, Hawaii's Division of Aquatic Resources, and the Western Pacific Regional Fishery Management Council.

In 1982, these agencies formed a Fisheries Data Coordinating Committee (FDCC) and a FDCC Technical Subcommittee to help guide, coordinate, and monitor all of the many activities being undertaken by each agency to improve their systems. Significant progress has been made by all participating agencies, particularly in the areas of upgrading data collecting and processing systems.

As a major step in improving and coordinating the data reporting and distributing systems of the agencies, in May 1985, the FDCC agreed to begin producing a combined document reporting each island's major fisheries statistics. Production of the document would be the responsibility of the FDCC Technical Subcommittee and would be coordinated by the WPACFIN program manager. Each agency would supply the data required to produce the tables and graphs for its respective chapter of the report, and central WPACFIN staff would produce and distribute the document as part of the Administrative Report Series of the Southwest Fisheries Science Center.

This document is the tenth volume in the series "Fishery Statistics of the Western Pacific" and contains summaries of commercial and creel survey fishery landings data for 1993 for American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and Hawaii. The first nine volumes of this series contained similar reports for these areas for 1979 through 1992. Volumes nine and ten are different from the previous volumes in that the Guam chapter contains only commercial landings data because no creel survey data were available from the Division of Aquatic and Wildlife Resources.

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BACKGROUND

This report has been compiled by governmental fisheries agencies of several islands in the central and western Pacific area in a cooperative and continuing effort to improve the availability and dissemination of fisheries information. The data contained herein have been collected, computerized, edited, and processed by agencies participating in the Western Pacific Fishery Information Network (WPACFIN), including American Samoa's Department of Marine and Wildlife Resources (DMWR), the Commonwealth of the Northern Mariana Islands' (CNMI) Division of Fish and Wildlife (DFW), Guam's Division of Aquatic and Wildlife Resources (DAWR), Hawaii's Division of Aquatic Resources (HDAR) and the Southwest Fisheries Science Center's (SWFSC) Honolulu Laboratory, National Marine Fisheries Service (NMFS). The data summaries and graphs contained in this document were prepared by WPACFIN staff at the Honolulu Laboratory from data collected by WPACFIN or provided by these agencies. Data from DMWR and DFW were supplied on floppy diskettes in established WPACFIN data base formats, whereas data on the Guam commercial fisheries were collected on forms provided to fish wholesalers by WPACFIN through DAWR. Data for Hawaii were provided by HDAR on floppy diskettes or via a dial-in telecommunications link. Once data from all agencies were put into the proper format on the central WPACFIN computer and appropriate edit and verification procedures completed, summary reports and files were produced using software developed specifically for this purpose. Graphs were produced using commercially available software.

PROGRESS

In 1981, when WPACFIN began assisting agencies in improving their data collecting and processing systems, only the State of Hawaii had computerized processing. By mid-1982, fisheries offices in American Samoa, Guam, and the CNMI had implemented computerized processing on microcomputers supplied by WPACFIN. Since that time, these agencies have made many significant improvements to their data collecting systems and have established sound automated data processing systems. Most agencies can now provide fishery statistics to WPACFIN within 45 days of the date of collection. However, the Guam DAWR office experienced serious staff shortages in 1992 and 1993 that prevented them from processing their creel survey data into standardized formats, therefore only commercial landings data are presented in this volume. The HDAR has also improved its systems in recent years and has significantly reduced the lag time in data processing from about 2.5 years to less than 3 months for most data. The HDAR has also improved its procedures for editing, updating, and processing Hawaii's data. The biggest problems still facing HDAR in improving their data systems are reducing delinquency of fishermen reporting and implementing a validation system to ensure that what gets reported by fishermen is accurate.

PRECAUTIONS

Data collecting and processing systems vary greatly among Pacific island fisheries agencies. Although much standardization has taken place and is continuing, there remain many unique aspects of each island's systems based on local needs and capabilities. When using summaries contained in this report, especially if making comparisons, one should keep in mind the nature of the systems used to produce the data. For instance, Hawaii's commercial landings data are based on mandatory monthly reporting by licensed commercial fishermen, CNMI's data are based on voluntary monthly reporting of fish buyers using government-provided invoices, Guam's data are from WPACFIN-sponsored voluntary reporting by major commercial dealers, and American Samoa's data are based on creel survey sampling of participation and interviews of fishermen and a data expansion program. Each system has advantages and disadvantages, and the user should be aware of them when comparing or interpreting data.

The user should also be aware that species assemblages vary among island groups, as do cultural preferences and principal fishing techniques. Population size is of particular importance when making interpretations of the relative value and importance of the fisheries. To help the user make these value judgments, more detailed explanations of the data collecting and processing systems are provided in each island's section of this report.

CONTENTS

This document is divided into sections by island group. Each section contains reports on the monthly and annual landings by species or species groups for the commercial fleet. The section for American Samoa also contains estimates of total catch and effort of all boat-based fisheries including recreational and subsistence fishing activities. These estimates and their associated confidence limits were generated by computer-based data expansion systems using sample fishery data collected by creel survey programs. Commercial landings for American Samoa were calculated based on information gathered during the creel survey sampling program. Two sets of annual summaries are included for Hawaii, one each for commercial landings that were sold and not sold.

Definitions

In addition to the description of the systems and the monthly and annual reports, each section contains graphs of some of the summary fishery statistics of particular interest or

importance to participating WPACFIN agencies. For purposes of graphical presentation of the data, several categories have been defined for each island's fisheries. Because of differences in reporting systems and capabilities among the islands, species contained within each category may vary, but all categories are documented in each island's section. Overlap exists among some of the categories used for different graphs. Categories used in the graphs include the following:

1. Fisheries Categories - These are combinations of species of similar ecological types, specifically, pelagic, bottom fish, reef fish, and "other." "Other" includes groups that generally traverse these categories, such as certain sharks and jacks, or are not typically included in these groups, such as mullet and milkfish.

2. Pelagic Management Unit Species (PMUS) - The Magnuson Fishery Conservation and Management Act of 1976 was amended in 1992 to place tunas under U.S. jurisdiction for management. The Fishery Management Plan for Pacific pelagic species was amended to reflect this change. However, this report series will continue to treat the tunas as a separate category for graphical purposed. Therefore, the PMUS category in this document includes only the billfishes, wahoo, mahimahi, and oceanic sharks.

3. Bottom Fish Management Unit Species (BMUS) - Defined as the species of initial importance in the Fishery Management Plan for bottom fish and seamount fisheries, including the major deepwater snapper, grouper, emperor, and certain jacks.

4. Tunas - Predominantly skipjack and yellowfin tunas in all areas, but also including most other tuna species and excluding wahoo. In Hawaii bigeye tuna are also of major importance in recent years.

5. Other Tunas - All tunas as defined above, but excluding skipjack and yellowfin tunas.

6. Billfish - Combination of all marlin, sailfish, spearfish, and swordfish species.

Graphics

A minimum of four types of graphs are provided with each island's data. The chapter for American Samoa has an additional type of graph on catch and effort from creel survey data. Type I graphs present summary charts of the major species and species groups for 1993. Type II graphs are seasonality plots for the major species or species groups, showing the average weight

landed during each month for all years combined. Type III graphs are based on annual summary statistics and help visualize the variability among years. Type IV graphs are plots of monthly landings of some of the major commercially important species and document fluctuations in landings of these species over the entire time series. Type V graphs are based on creel survey data and include plots of catch and effort by fishing method plus a combination of several of the types I-IV graphs.

I. Monthly graphs for each year's data including:

- A. Major fisheries categories
- B. Tunas, PMUS, and BMUS
- C. Wahoo, mahimahi, and billfish
- D. Skipjack, yellowfin, and other tunas

II. Plots of average monthly landings for:

- A. Tunas, PMUS, and BMUS
- B. Wahoo and mahimahi
- C. Billfish species:
  1. Marlin and sailfish - American Samoa and CNMI
  2. Blue marlin, black marlin, and striped marlin - Hawaii
  3. Sailfish, shortbill spearfish, and swordfish - Hawaii
- D. Skipjack, yellowfin, and other tunas
- E. BMUS and the most important bottom fish species
  1. BMUS, ehu, and onaga - American Samoa
  2. BMUS, emperor, and grouper - CNMI and Guam
  3. BMUS, onaga, and opakapaka - Hawaii
  4. BMUS, ehu, and uku - Hawaii

III. Graphs of annual summary statistics for:

- A. Major fisheries categories
- B. Total commercial landings - pounds and dollars
- C. Tunas, PMUS, and BMUS
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- G. Shortbill spearfish - Guam and Hawaii
- H. Swordfish - Hawaii
- I. Skipjack tuna - All four areas
- J. Yellowfin tuna - All four areas

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AMERICAN SAMOA

Fishery Statistics
1993

AMERICAN SAMOA 1993 FISHERY STATISTICS

Compiled by

American Samoa

Department of Marine and Wildlife Resources

and the

Western Pacific Fishery Information Network

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AMERICAN SAMOA 1993 FISHERY STATISTICS

INTRODUCTION

American Samoa (approximately lat. 14° S, long. 170° W) is composed of the major island of Tutuila, where about 87% of the total population of 35,000 live; Aunu'u, a small island less than 1 mile off Tutuila's southeast shore; the Manu'a Islands of Ofu, Olesaga, and Ta'u, located about 105 km (65 miles) east of Tutuila and having about 4,300 residents; the uninhabited Rose Atoll, some 290 km (180 miles) east of Tutuila; and Swain's Island about 350 km (220 miles) north of Tutuila, where approximately 20 people live. The American Samoa Department of Marine and Wildlife Resources (DMWR), formerly the Office of Marine Resources, located in Pago on Tutuila, has been collecting commercial fisheries data from the local fleet on Tutuila since the early 1970's and from the Manu'a Islands since 1983. Most data collected over the years have been from the commercial fleet, but beginning in October 1985, DMWR's data collection programs were modified to include data on recreational and subsistence fisheries as well.

The domestic fisheries of American Samoa are typically small boat, one-day fisheries. Although one domestic longliner operated for a few years, the majority of the fleet is composed of two types of 28- to 29-foot outboard engine powered catamarans called alias and manta cats. During 1993, 43 boats were sampled, 32 from Tutuila and 11 from the Manu'a Islands. Fishing is mostly done by trolling and bottom fishing methods, and the majority of the catch is sold locally. During 1993, on average, trips on boats from Tutuila had three-man crews, fished 12 hours, and caught about 160 pounds of fish, while those from the Manu'a Islands had 3.4 man crews, fished 5 hours, and caught about 110 pounds of fish.

DATA COLLECTING SYSTEM

The major method used by DMWR for obtaining catch statistics has always been interviewing fishermen at the end of their trips. Before October 1985, the DMWR data collectors kept records of as much commercial fishing activity as possible and routinely obtained interviews from fishermen as often as possible. This method of data collection provided accurate data on the commercial fleet for the trips where interviews were conducted, but was very labor intensive, did not cover all trips, and intentionally excluded the recreational and subsistence fisheries. Therefore, in October 1985, a new sampling program was implemented on Tutuila to provide better coverage and statistics for all boat-based fisheries. The new sampling methods were not implemented in the Manu'a Islands because the fishing fleet is centrally located and is small enough that statistics were being collected for nearly every trip.

The boat-based fishery sampling program used for Tutuila since October 1985 is similar to the one used in Guam. This systematic, random sampling program stratifies sampling by type of day, either weekday or weekend-holiday. The DMWR staff normally sample 2 weekdays and 1 weekend-holiday per week. During survey days, counts of total participation are collected to facilitate expansion of the survey data to estimates of total catch and effort for Tutuila. Unless contrary information is available, a boat is assumed to be fishing if it is "out," as evidenced by its trailer at a boat ramp or being missing from its normal berthing area. Tutuila is divided into six areas, five of which are sampled. Presumably, fishing activity and success rate of boats in the non-sampled area are similar to those in the sampled areas. Further assumptions are that information given by the fishermen during the interview is accurate and that the fishermen interviewed are representative of the entire fishing population.

Survey data are collected in the field on interview log sheets and returned to the DMWR office for editing. The following information is collected for each interview:

* Date
* Type of day
* Time
* Boat name
  Captain or boat owner's name
* Method of fishing
* Disposition of catch
* Species caught
  Number of pieces for each species
* Weight in pounds for each species
  Price per pound for each species
  Area fished
* Home island
  Number of trips since last interview
* Total trip weight in pounds
  Total hours fished (trip length)
  Number of fishermen
  Number of gear used

It is not always possible for the interviewer to obtain information on all items listed. However, the ones marked with an asterisk (*) are considered essential for data expansion purposes. Identification and weight of each species are often not obtainable; in which case, a code for species groupings (e.g., miscellaneous bottom fish) is used.

DATA PROCESSING SYSTEM

Interview forms are returned to the office, edited, coded, and entered into computerized databases--the commercial landings database for data collected before October 1985, and the offshore

creel survey database for data collected since then. Edit and summary reports are produced to help verify that the data were entered correctly. The creel survey data are then processed using the offshore data expansion system programmed by WPACFIN specifically for DMWR. The data expansion system is menu-driven and steps the user through a series of processes that summarize creel survey data to produce catch and effort expansion and species composition files and reports. Typically 1 month of data is processed at a time, although the system allows for processing broader time increments of data. The data expansion system was modified in 1992 to improve the estimates generated by the system by pooling interview data for the time period in calculating mean catch rates for each fishing method.

In fisheries applications, calculation of catch per unit of effort (CPUE) may be done in several ways. In the pre-1992 version of the data expansion system average monthly CPUE was calculated by using daily CPUEs as observations and finding the simple mean of those observations. Daily CPUE measurements were calculated by dividing the sum of the catch by the sum of the hours fished from the interviews for each day sampled. The variance of the mean monthly CPUE was calculated using standard variance formulas with each daily CPUE as input to the equation, keeping day types and methods separate. This method requires a high interview rate be obtained for each day sampled if the daily estimates of effort, catch, and CPUE for each fishing method are to be representative of the whole offshore fishery. Since this is not always the case, it is believed that more representative estimates could be obtained by pooling interview data over the entire time period for which an expansion was being made and using daily participation counts to estimate effort. Therefore, the new expansion algorithms implemented in 1992 calculate the monthly mean CPUE for each fishing method the same as the daily measurements were previously calculated (the sum of the catch divided by the sum of the effort), but use all interviews for the time period. The variance of the CPUE is estimated by using the standard, but more complex, formula for a ratio estimator. Sample day participation counts and percent coverage estimates are still used to estimate total effort, but the split of the effort between fishing methods and the mean CPUE for each method are now calculated using interviews collected during the entire time period, thus reducing the potential biases caused by the small number of interviews on any given sample day.

The new expansion system generates estimates of time-period catch, effort, and participation for each fishing method and day type. Percent species composition by weight is calculated from the sampled catch and used to create estimates of total landings by species by multiplying the sampled percent by the expanded estimated catch. All steps in the expansion process are stratified by fishing method. The expansion system produces reports and files of the final totals for all important catch and effort statistics. These files are later used to produce the reports contained in this document. On a quarterly basis, copies

of the DMWR data bases are sent to the Honolulu Laboratory for updating the central WPACFIN files.

At the Honolulu Laboratory, the creel survey data are transferred to the central computer for further verification and processing before generating the summary reports contained in this report series. Because DMWR changed their data collecting systems during 1985, new processing procedures were established by WPACFIN to standardize reports as much as possible to facilitate comparisons between years. Data collected before October 1985 were adjusted upward by the percent coverage to account for missed trips. The offshore creel survey data collected since October 1985 were expanded to estimates of total Tutuila landings and then separated into commercial versus noncommercial landings (e.g., sold versus not sold). The expansion and separation algorithms stratify the data by fishing method to improve the final estimates of landings by species. After the file of estimated commercial landings for Tutuila was created from the expansion files, the adjusted commercial landings for Manu'a were added to it, thereby creating the commercial landings data base for American Samoa. Additionally, because price information was not obtained for all landings that were sold, the commercial data were edited to create price information when none was available. To accomplish this, a three-tiered editing system was designed to "create" price estimates based on the best information available. The edit system puts average price information in each record where it is missing, based on the following three levels of available information:

1. If price information is available for the same species in the same month, the weighted average price per pound is written into all records missing that information for that species and month.

2. If no price information is available for the same species and same month, the annual weighted average price for that species is written into records for that species and month.

3. If no price information is available for a species for the entire year, the program prompts the user for input and updates the file based on the response.

As data base records are updated, each is flagged to indicate which level of estimation was used for the price information. This makes it possible to easily exclude the "created" data, if desired, when doing economic analysis.

DATA REPORTING SYSTEM

After all editing, quality control, and other processing activities are completed on the central WPACFIN computer, monthly

and annual commercial landings reports by species are generated. Each of the commercial landings reports contains the common name, weight in pounds, value in dollars, and the average price per pound of each species or species group. Each monthly report contains a subtotal for the sum of all species for that month, and the December report contains the December subtotal and the annual total. Annual reports contain the total estimated commercial landings for each species and for all species combined for the calendar year.

Estimated total landings reports are provided separately for Tutuila and Manu'a. Monthly and annual estimated total landings reports are provided for the Manu'a Islands. Two types of total landings reports are included from the creel survey data expansion system for Tutuila: catch and effort expansion reports and species composition reports. These reports were produced by using the expansion and species composition files as input to report generating programs developed by WPACFIN. The programs reorganize, format, and summarize data from the expansion files to improve the presentation of data and reduce the amount of space required to report the important statistics. Monthly and annual estimated total landings reports for 1993 include the expansion summary of catch and effort statistics by fishing method and the summary species composition reports for all methods combined.

Monthly expansion and species composition reports have matching totals for catch by fishing method since the monthly species composition reports are based on the expansion files. Annual expansion and species composition reports also have identical totals because the species reports were generated from the annual expansion files. However, the totals on the annual report will not equal the total obtained by adding all of the monthly files together because the annual expansion reports were generated by re-expanding the entire year's data together, thereby increasing the sample size significantly, and it is hoped, improving the annual estimates of percent species composition and of catch and effort and their associated coefficients of variation (CV's). The annual species composition report was created by calculating annual percentages of species composition by combining all sampling for the year and then multiplying these percentages by the annual expansion totals. This allows calculation of annual percent species composition based on greatly increased sample size.

Computer generated numbers and all totals in the reports are subject to rounding error. All catches are reported in pounds, and effort, in boat hours. In the offshore expansion reports, the boat counts by fishing method will not add to the total boat count when the same boat was used for more than one method on a single trip. In these cases, the boat is included in the count for each method used but included only once in the total count. A CV is included for each statistic in the expansion reports. The CV provides a measurement of the relative variation

associated with the estimate preceding it and is calculated by dividing the standard error of the estimate by the estimate and multiplying by 100 and rounding to express the answer as a whole percentage. The larger the CV, the larger the relative variation in the data used to generate the estimate and, therefore, the less precise the estimate. An asterisk following a line means the number of samples collected for that method during that month were insufficient to properly calculate the CV. There must be at least two weekday and two weekend-holiday samples for each method to properly compute a standard error and, therefore, properly compute the CV. If an asterisk is present and the CV is greater than zero, then samples on either weekdays or weekend-holidays were sufficient to compute a standard error for that type of day but not for the other type of day. In this case, the CV provided in the report is for the type of day in which sample information met the minimum requirements for calculating CV. If an asterisk is present and the CV equals zero, then neither type of day had sufficient number of samples to calculate CV. It follows then, anytime an asterisk is present for any of the fishing methods, the totals for the month are questionable.

The following species, species groups, and abbreviations are used in the tables and graphs of American Samoa's data:

I. Pelagic Management Unit Species (PMUS)

Although the Magnuson Fishery Conservation and Management Act of 1976 was amended in 1992 to include tunas in the Pacific PMUS (PPMUS), this report series will continue to consider tunas as a separate category. The PMUS category includes:

Mahimahi (dolphin)
Blue marlin
Black marlin
Sailfish
Shortbill spearfish
Wahoo and Sharks

II. Bottom Fish Management Unit Species (BMUS)

Jacks (unclassified)
Black jack
Amberjack
Giant trevally
Bottom fish (unclassified)
Groupers (unclassified)
Blacktip grouper
Lunartail grouper
Snappers (unclassified)
Bluelined snapper
Gray jobfish (uku)
Deepwater bottom fish (unclassified)
Yellow opakapaka

II. Bottom Fish Management Unit Species (BMUS) (cont.)

Hawaiian opakapaka
Opakapaka
Gindai (flower snapper)
Yellowtail snapper
Lehi (silverjaw snapper)
Onaga (red or longtail snapper)
Ehu (red snapper)
Emperorfish (unclassified)
Ambon emperor
Redgill emperor

III. Billfish

Blue marlin
Black marlin
Sailfish
Shortbill spearfish

IV. Tunas

Tunas (unclassified)
Skipjack tuna
Yellowfin tuna
Dogtooth tuna
Albacore
Bigeye tuna
Kawakawa

V. Other Tuna

The above tuna species excluding skipjack and yellowfin tuna

VI. Fisheries Categories

A. Pelagics

All PMUS and tuna species plus the following:
- Troll fish (unclassified)
- Barracuda
- Rainbow runner

B. Bottom Fish

All BMUS plus the following:
- Bigeye trevally
- Bluefin trevally
- Goldspot trevally
- Trevally
- Whitemouth trevally
- Peacock grouper
- Flagtail grouper
- Tomato grouper

B. Bottom Fish (cont.)

Yellowspot grouper
Striped grouper
Spotted grouper
Small mouth grouper
Giant grouper
Rufous snapper
Blacktail snapper
Onespot snapper
Twinspot/red snapper
Humpback snapper
Blood snapper
Brown snapper
Bluelined gindai
Black snapper
Stone's snapper
Kusakar's snapper
Bigeye emperor
Goldenline bream
Longnose emperor
Bluelined bream
Orangespot emperor
Snake mackerel
Oilfish

C. Reef Fish

Reef fish (unclassified)
Mullet
Rabbitfish
Surgeonfish and tangs (unclassified)
Lined surgeon
Yelloweyed surgeon
Convict tang
Dussumier's surgeon
Spotted surgeon
Unicornfish
Squirrelfish (unclassified)
Berndt's soldierfish
Bigeye squirrelfish
Parrotfish
Terapon perch
Wrasse
Goatfish (unclassified)
Pink goatfish
Inshore groupers (unclassified)
Triggerfish
Butterflyfish
Porcupinefish
Inshore snappers (unclassified)

D. Other

Miscellaneous
Bigeye scad
Rays
Eels
Invertebrates (unclassified)
Crabs (unclassified)
Kona crab
Mangrove crab
Spiny lobster
Slipper lobster
Shrimp
Octopus
Squid
Clams
Turtle

INTERPRETATION OF STATISTICS

The user is reminded to pay heed to the precautions and assumptions identified earlier in this document, when making interpretations of or inferences from data reported in the tables and graphs. Remember also that neither the commercial landings summaries nor the creel summaries are based on a census of all the fishing activities, but on samples of those activities. One of the major factors in expanding the creel survey data into monthly and annual estimates is the use of proportionality constants to adjust for percent coverage of the surveys. The flexibility of the survey design allows for refinement of these constants as additional information is gained on the fishing activities. If the constants are improved upon, the basic survey data can be re-expanded to create better overall estimates. However, the variability and species composition would not be expected to change since these statistics are based on the actual survey information collected from the fishermen. The estimates of total landings are considered to be conservative because the catch from the subsistence inshore fisheries are currently not included in this document. DMWR has implemented an inshore sampling program and WPACFIN staff has nearly completed writing the computer software to process the data. Therefore, inshore data summaries should be available in future volumes of this report series.

Table II.1.1

American Samoa 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	1,073	2,038	1.90
Jacks (misc)	559	820	1.47
Black jack	330	643	1.95
Barracudas	40	40	1.00
Large barracuda	611	1,034	1.69
Small barracuda	965	1,496	1.55
Mullets	3	5	1.65
Flyingfish	3	5	1.75
Sharks	245	449	1.84
Eels	28	50	1.75
Bottomfish (Assorted)	473	781	1.65
Groupers (misc)	645	1,074	1.67
Peacock grouper	133	252	1.90
Flagtail grouper	7	12	1.65
Tomato grouper	262	457	1.74
Yellowspot grouper	104	261	2.50
Giant grouper	14	28	2.00
Lunartail grouper	520	868	1.67
Blue lined snapper	2,125	3,772	1.77
Twinspot/red snapper	145	276	1.90
Humpback snapper	909	1,564	1.72
Gray jobfish	2,318	4,001	1.73
Pristipomoides/Etelis	90	113	1.25
Hawaiian opakapaka	116	191	1.65
Opakapaka	551	900	1.63
Blue lined gindai	29	72	2.50
Gindai (flower snap)	193	344	1.78
Yellowtail snapper	68	171	2.50
Lehi (silverjaw)	463	1,341	2.90
Onaga (longtail snapper)	1,397	2,444	1.75
Ehu (squirrelfish snap.)	1,095	2,483	2.27
Emperors (misc)	2,218	3,784	1.71
Longnose emperor	17	48	2.75
Ambon emperor	935	1,665	1.78
Redgill emperor	168	319	1.90
Oilfish	120	301	2.50
Rudderfish	13	22	1.65
Rabbitfish	4	6	1.65
Lined surgeon	49	81	1.65
Striped bristletooth	3	5	1.65
Squirrelfish	188	302	1.61
Saber squirrelfish	12	12	1.00
Bigeye squirrelfish	47	65	1.40
Parrotfishes	32	53	1.65
Goatfish	24	38	1.60
Sweepers	31	55	1.75
Inshore groupers	9	14	1.65

Table .1.1 (Cont.)

Species	Pounds	Value	$/lb
Red snapper, mu	343	572	1.67
Mahimahi (dolphin)	3,823	9,896	2.59
Blue marlin	4,113	7,197	1.75
Sailfish	258	451	1.75
Rainbow runner	72	181	2.50
Wahoo	2,344	5,295	2.26
Skipjack tuna	24,690	29,529	1.20
Dogtooth tuna	1,931	3,276	1.70
Albacore	199	199	1.00
Yellowfin tuna	16,706	32,685	1.96
Kawakawa	89	168	1.90
Spiny lobster	112	365	3.25
** TOTAL **	74,061	124,567	1.68

Table II.1.2

American Samoa January 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Large barracuda	90	158	1.75
Gray jobfish	164	285	1.74
Opakapaka	109	186	1.70
Gindai (flower snap)	55	93	1.70
Yellowtail snapper	68	171	2.50
Lehi (silverjaw)	82	246	3.00
Mahimahi (dolphin)	180	453	2.51
Skipjack tuna	2,464	2,440	0.99
Yellowfin tuna	1,347	2,991	2.22
** SUBTOTAL **	4,560	7,022	1.54

Table II.1.3

American Samoa February 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Small barracuda	10	14	1.43
Groupers (misc)	10	17	1.73
Tomato grouper	185	352	1.90
Yellowspot grouper	104	261	2.50
Lunartail grouper	162	282	1.74
Blue lined snapper	80	219	2.75
Humpback snapper	35	61	1.75
Gray jobfish	210	365	1.74
Hawaiian opakapaka	116	191	1.65
Gindai (flower snap)	35	59	1.70
Lehi (silverjaw)	96	287	3.00
Onaga (longtail snapper)	235	411	1.75
Ehu (squirrelfish snap.)	275	688	2.50
Emperors (misc)	59	106	1.80
Longnose emperor	17	48	2.75
Saber squirrelfish	12	12	1.00
Wahoo	25	35	1.41
Skipjack tuna	1,629	1,633	1.00
Yellowfin tuna	1,243	2,773	2.23
** SUBTOTAL **	4,538	7,816	1.72

Table II.1.4

American Samoa March 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	30	38	1.25
Large barracuda	20	25	1.25
Small barracuda	10	17	1.76
Groupers (misc)	36	51	1.40
Blue lined snapper	55	77	1.39
Gray jobfish	31	53	1.74
Pristipomoides/Etelis	60	75	1.25
Opakapaka	244	415	1.70
Lehi (silverjaw)	206	618	3.00
Ehu (squirrelfish snap.)	116	291	2.50
Squirrelfish	6	9	1.65
Rainbow runner	13	31	2.50
Skipjack tuna	699	698	1.00
Dogtooth tuna	138	209	1.51
Yellowfin tuna	245	370	1.51
Kawakawa	48	91	1.90
** SUBTOTAL **	1,957	3,069	1.57

Table II.1.5

American Samoa April 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	536	1,018	1.90
Large barracuda	52	91	1.75
Small barracuda	35	40	1.15
Blue lined snapper	14	25	1.77
Humpback snapper	22	38	1.75
Gray jobfish	112	195	1.74
Emperors (misc)	86	154	1.80
Mahimahi (dolphin)	109	274	2.51
Rainbow runner	16	39	2.50
Wahoo	200	360	1.80
Skipjack tuna	823	820	1.00
Dogtooth tuna	105	188	1.79
Yellowfin tuna	2,132	4,564	2.14
** SUBTOTAL **	4,241	7,806	1.84

Table II.1.6

American Samoa May 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	70	88	1.25
Large barracuda	50	63	1.25
Small barracuda	40	50	1.25
Sharks	30	38	1.25
Tomato grouper	20	25	1.25
Humpback snapper	60	75	1.25
Gray jobfish	15	19	1.25
Pristipomoides/Etelis	30	38	1.25
Mahimahi (dolphin)	139	418	3.00
Blue marlin	1,180	2,065	1.75
Wahoo	165	361	2.20
Skipjack tuna	1,764	1,753	0.99
Dogtooth tuna	180	225	1.25
Yellowfin tuna	1,061	2,284	2.15
** SUBTOTAL **	4,804	7,501	1.56

Table II.1.7

American Samoa June 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	113	175	1.56
Black jack	8	12	1.50
Small barracuda	198	300	1.52
Mullets	3	5	1.65
Bottomfish (Assorted)	473	781	1.65
Flagtail grouper	7	12	1.65
Lunartail grouper	69	116	1.68
Blue lined snapper	268	451	1.69
Humpback snapper	34	44	1.29
Gray jobfish	78	136	1.74
Gindai (flower snap)	30	54	1.78
Lehi (silverjaw)	11	17	1.50
Ehu (squirrelfish snap.)	141	282	2.00
Redgill emperor	168	319	1.90
Rudderfish	13	22	1.65
Rabbitfish	4	6	1.65
Lined surgeon	49	81	1.65
Striped bristletooth	3	5	1.65
Squirrelfish	80	121	1.52
Parrotfishes	32	53	1.65
Goatfish	24	38	1.60
Inshore groupers	9	14	1.65
Red snapper, mu	157	262	1.67
Mahimahi (dolphin)	255	636	2.49
Blue marlin	200	350	1.75
Wahoo	18	25	1.41
Skipjack tuna	1,811	2,117	1.17
Dogtooth tuna	321	498	1.55
Yellowfin tuna	2,379	4,764	2.00
Spiny lobster	112	365	3.25
** SUBTOTAL **	7,066	12,059	1.71

Table II.1.8

American Samoa July 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	537	1,020	1.90
Jacks (misc)	25	48	1.90
Barracudas	40	40	1.00
Small barracuda	116	226	1.94
Sharks	87	167	1.92
Groupers (misc)	115	200	1.73
Peacock grouper	18	34	1.90
Lunartail grouper	7	14	1.90
Blue lined snapper	154	292	1.90
Twinspot/red snapper	110	210	1.90
Humpback snapper	253	486	1.92
Gray jobfish	146	277	1.90
Ambon emperor	157	298	1.90
Squirrelfish	78	129	1.65
Red snapper, mu	72	120	1.67
Mahimahi (dolphin)	6	12	2.00
Sailfish	258	451	1.75
Wahoo	142	343	2.42
Skipjack tuna	1,117	1,112	1.00
Dogtooth tuna	273	506	1.85
Yellowfin tuna	489	489	1.00
Kawakawa	23	44	1.90
** SUBTOTAL **	4,224	6,516	1.54

Table II.1.9

American Samoa August 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	76	120	1.58
Black jack	8	16	2.00
Large barracuda	60	105	1.75
Small barracuda	53	95	1.79
Flyingfish	3	5	1.75
Groupers (misc)	70	121	1.73
Peacock grouper	66	125	1.90
Tomato grouper	40	50	1.25
Lunartail grouper	105	165	1.58
Blue lined snapper	253	434	1.72
Twinspot/red snapper	20	38	1.90
Humpback snapper	76	133	1.75
Gray jobfish	233	399	1.71
Opakapaka	112	190	1.70
Blue lined gindai	29	72	2.50
Gindai (flower snap)	28	56	2.00
Lehi (silverjaw)	14	28	2.00
Onaga (longtail snapper)	586	1,026	1.75
Ehu (squirrelfish snap.)	157	384	2.44
Emperors (misc)	285	513	1.80
Oilfish	120	301	2.50
Mahimahi (dolphin)	1,797	5,391	3.00
Rainbow runner	12	29	2.50
Wahoo	655	1,589	2.43
Skipjack tuna	1,179	1,170	0.99
Dogtooth tuna	292	555	1.90
Albacore	199	199	1.00
Yellowfin tuna	2,580	6,196	2.40
Kawakawa	17	33	1.90
** SUBTOTAL **	9,125	19,540	2.14

Table II.1.10

American Samoa September 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	13	23	1.80
Black jack	36	60	1.65
Large barracuda	222	389	1.75
Small barracuda	193	334	1.73
Groupers (misc)	123	202	1.65
Peacock grouper	49	93	1.90
Tomato grouper	16	29	1.79
Giant grouper	14	28	2.00
Lunartail grouper	35	60	1.70
Blue lined snapper	871	1,540	1.77
Humpback snapper	87	152	1.75
Gray jobfish	603	1,003	1.66
Opakapaka	5	9	1.70
Gindai (flower snap)	46	83	1.81
Lehi (silverjaw)	54	146	2.71
Onaga (longtail snapper)	43	76	1.75
Emperors (misc)	1,186	1,956	1.65
Squirrelfish	24	43	1.77
Red snapper, mu	100	165	1.65
Mahimahi (dolphin)	383	962	2.51
Blue marlin	2,401	4,202	1.75
Rainbow runner	33	81	2.50
Wahoo	687	1,678	2.44
Skipjack tuna	4,175	8,876	2.13
Dogtooth tuna	308	544	1.76
Yellowfin tuna	1,506	2,556	1.70
** SUBTOTAL **	13,213	25,291	1.91

Table II.1.11

American Samoa October 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	13	23	1.80
Black jack	277	555	2.00
Large barracuda	117	204	1.75
Small barracuda	19	29	1.50
Sharks	128	245	1.92
Groupers (misc)	176	308	1.75
Lunartail grouper	15	26	1.74
Blue lined snapper	120	209	1.75
Twinspot/red snapper	15	28	1.90
Humpback snapper	146	255	1.75
Gray jobfish	67	116	1.74
Onaga (longtail snapper)	350	613	1.75
Ehu (squirrelfish snap.)	131	328	2.50
Emperors (misc)	602	1,054	1.75
Bigeye squirrelfish	47	65	1.40
Mahimahi (dolphin)	783	1,371	1.75
Blue marlin	131	230	1.75
Wahoo	192	457	2.38
Skipjack tuna	1,674	1,665	0.99
Dogtooth tuna	228	420	1.84
Yellowfin tuna	2,538	4,027	1.59
** SUBTOTAL **	7,769	12,226	1.57

Table II.1.12

American Samoa November 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	119	170	1.43
Small barracuda	130	200	1.53
Groupers (misc)	60	95	1.57
Lunartail grouper	109	175	1.61
Blue lined snapper	156	263	1.69
Humpback snapper	140	221	1.57
Gray jobfish	234	407	1.74
Opakapaka	40	50	1.25
Ehu (squirrelfish snap.)	114	214	1.88
Ambon emperor	523	921	1.76
Mahimahi (dolphin)	110	260	2.37
Blue marlin	200	350	1.75
Wahoo	163	308	1.90
Skipjack tuna	4,615	4,576	0.99
Dogtooth tuna	40	52	1.30
Yellowfin tuna	447	929	2.08
** SUBTOTAL **	7,200	9,191	1.28

Table II.1.13

American Samoa December 1993 Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	101	137	1.36
Small barracuda	161	192	1.19
Eels	28	50	1.75
Groupers (misc)	54	80	1.47
Lunartail grouper	17	30	1.75
Blue lined snapper	155	260	1.68
Humpback snapper	57	99	1.75
Gray jobfish	425	744	1.75
Opakapaka	40	50	1.25
Onaga (longtail snapper)	182	319	1.75
Ehu (squirrelfish snap.)	160	296	1.85
Ambon emperor	255	446	1.75
Sweepers	31	55	1.75
Red snapper, mu	14	25	1.75
Mahimahi (dolphin)	60	120	2.00
Wahoo	98	138	1.41
Skipjack tuna	2,739	2,668	0.97
Dogtooth tuna	45	79	1.75
Yellowfin tuna	740	740	1.00
** SUBTOTAL **	5,364	6,529	1.22
** TOTAL **	74,061	124,567	1.68

Table II.2.1

American Samoa 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	340	425	1.25
Black jack	52	88	1.68
Barracudas	40	40	1.00
Large barracuda	70	88	1.25
Small barracuda	486	647	1.33
Sharks	30	38	1.25
Groupers (misc)	75	94	1.25
Tomato grouper	76	104	1.37
Giant grouper	14	28	2.00
Lunartail grouper	125	181	1.44
Blue lined snapper	296	441	1.49
Humpback snapper	140	175	1.25
Gray jobfish	84	136	1.62
Pristipomoides/Etelis	90	113	1.25
Opakapaka	80	100	1.25
Gindai (flower snap)	104	192	1.85
Lehi (silverjaw)	36	60	1.70
Onaga (longtail snapper)	120	210	1.75
Ehu (squirrelfish snap.)	389	719	1.85
Squirrelfish	63	96	1.53
Mahimahi (dolphin)	105	210	2.00
Blue marlin	400	700	1.75
Wahoo	536	775	1.45
Skipjack tuna	8910	12061	1.35
Dogtooth tuna	668	897	1.34
Yellowfin tuna	3962	4177	1.05
** TOTAL **	17,292	22,794	1.32

Table II.2.2

American Samoa January 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Skipjack tuna	40	40	1.00
Yellowfin tuna	52	65	1.25
** SUBTOTAL **	92	105	1.14

Table II.2.3

American Samoa February 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Small barracuda	10	14	1.43
Wahoo	25	35	1.41
Skipjack tuna	60	80	1.33
Yellowfin tuna	30	32	1.06
** SUBTOTAL **	125	161	1.29

Table II.2.4

American Samoa March 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	30	38	1.25
Large barracuda	20	25	1.25
Groupers (misc)	25	31	1.25
Blue lined snapper	40	50	1.25
Pristipomoides/Etelis	60	75	1.25
Skipjack tuna	567	567	1.00
Dogtooth tuna	88	114	1.30
Yellowfin tuna	155	168	1.08
** SUBTOTAL **	985	1,068	1.08

Table II.2.5

American Samoa April 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Small barracuda	35	40	1.15
Wahoo	105	123	1.17
Skipjack tuna	475	475	1.00
Dogtooth tuna	15	19	1.25
Yellowfin tuna	330	330	1.00
** SUBTOTAL **	960	987	1.03

Table II.2.6

American Samoa May 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	70	88	1.25
Large barracuda	50	63	1.25
Small barracuda	40	50	1.25
Sharks	30	38	1.25
Tomato grouper	20	25	1.25
Humpback snapper	60	75	1.25
Gray jobfish	15	19	1.25
Pristipomoides/Etelis	30	38	1.25
Wahoo	40	50	1.25
Skipjack tuna	650	650	1.00
Dogtooth tuna	180	225	1.25
Yellowfin tuna	90	90	1.00
** SUBTOTAL **	1,275	1,409	1.10

Table II.2.7

American Samoa June 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	50	63	1.25
Black jack	8	12	1.50
Small barracuda	105	137	1.30
Lunartail grouper	18	27	1.50
Blue lined snapper	73	107	1.47
Humpback snapper	30	38	1.25
Gindai (flower snap)	30	54	1.78
Lehi (silverjaw)	11	17	1.50
Ehu (squirrelfish snap.)	141	282	2.00
Squirrelfish	55	80	1.45
Mahimahi (dolphin)	9	18	2.00
Blue marlin	200	350	1.75
Wahoo	18	25	1.41
Skipjack tuna	587	587	1.00
Dogtooth tuna	172	218	1.27
Yellowfin tuna	516	573	1.11
** SUBTOTAL **	2,023	2,586	1.28

Table II.2.8

American Samoa July 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Barracudas	40	40	1.00
Mahimahi (dolphin)	6	12	2.00
Wahoo	11	16	1.41
Skipjack tuna	606	606	1.00
Dogtooth tuna	33	43	1.30
Yellowfin tuna	489	489	1.00
** SUBTOTAL **	1,185	1,205	1.02

Table II.2.9

American Samoa August 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	30	38	1.25
Black jack	8	16	2.00
Small barracuda	7	14	2.00
Tomato grouper	40	50	1.25
Lunartail grouper	49	68	1.39
Blue lined snapper	71	112	1.58
Gray jobfish	29	43	1.48
Gindai (flower snap)	28	56	2.00
Lehi (silverjaw)	14	28	2.00
Ehu (squirrelfish snap.)	18	36	2.00
Wahoo	48	72	1.50
Skipjack tuna	366	366	1.00
Dogtooth tuna	57	114	2.00
Yellowfin tuna	179	193	1.08
** SUBTOTAL **	944	1,206	1.28

Table II.2.10

American Samoa September 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Black jack	36	60	1.65
Small barracuda	60	115	1.91
Tomato grouper	16	29	1.79
Giant grouper	14	28	2.00
Lunartail grouper	28	48	1.71
Blue lined snapper	47	81	1.73
Gray jobfish	40	75	1.87
Gindai (flower snap)	46	83	1.81
Lehi (silverjaw)	11	16	1.50
Squirrelfish	8	16	2.00
Wahoo	79	158	2.00
Skipjack tuna	1759	4890	2.78
Dogtooth tuna	67	91	1.35
Yellowfin tuna	748	845	1.13
** SUBTOTAL **	2,960	6,535	2.21

Table II.2.11

American Samoa October 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Small barracuda	19	29	1.50
Wahoo	22	31	1.41
Skipjack tuna	714	714	1.00
Dogtooth tuna	16	21	1.30
Yellowfin tuna	553	553	1.00
** SUBTOTAL **	1,324	1,347	1.02

Table II.2.12

American Samoa November 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	80	100	1.25
Small barracuda	90	129	1.43
Groupers (misc)	20	25	1.25
Lunartail grouper	30	38	1.25
Blue lined snapper	25	31	1.25
Humpback snapper	50	63	1.25
Opakapaka	40	50	1.25
Ehu (squirrelfish snap.)	70	105	1.50
Mahimahi (dolphin)	30	60	2.00
Blue marlin	200	350	1.75
Wahoo	90	127	1.41
Skipjack tuna	700	700	1.00
Dogtooth tuna	40	52	1.30
Yellowfin tuna	80	100	1.25
** SUBTOTAL **	1,545	1,929	1.25

Table II.2.13

American Samoa December 1993 Manu'a Estimated Commercial Landings

Species	Pounds	Value	$/lb
Jacks (misc)	80	100	1.25
Small barracuda	120	120	1.00
Groupers (misc)	30	38	1.25
Blue lined snapper	40	59	1.48
Opakapaka	40	50	1.25
Onaga (longtail snapper)	120	210	1.75
Ehu (squirrelfish snap.)	160	296	1.85
Mahimahi (dolphin)	60	120	2.00
Wahoo	98	138	1.41
Skipjack tuna	2386	2386	1.00
Yellowfin tuna	740	740	1.00
** SUBTOTAL **	3,874	4,257	1.10
** TOTAL **	17,292	22,794	1.32

Figure II.1.1

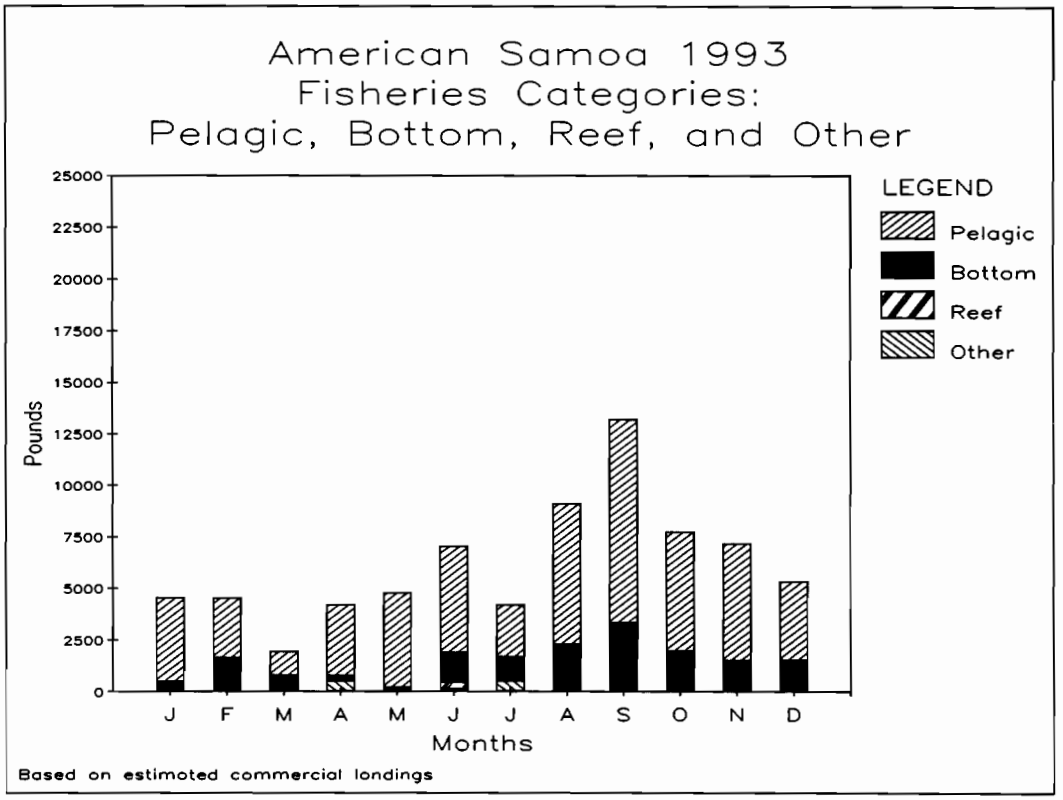


Figure II.1.2

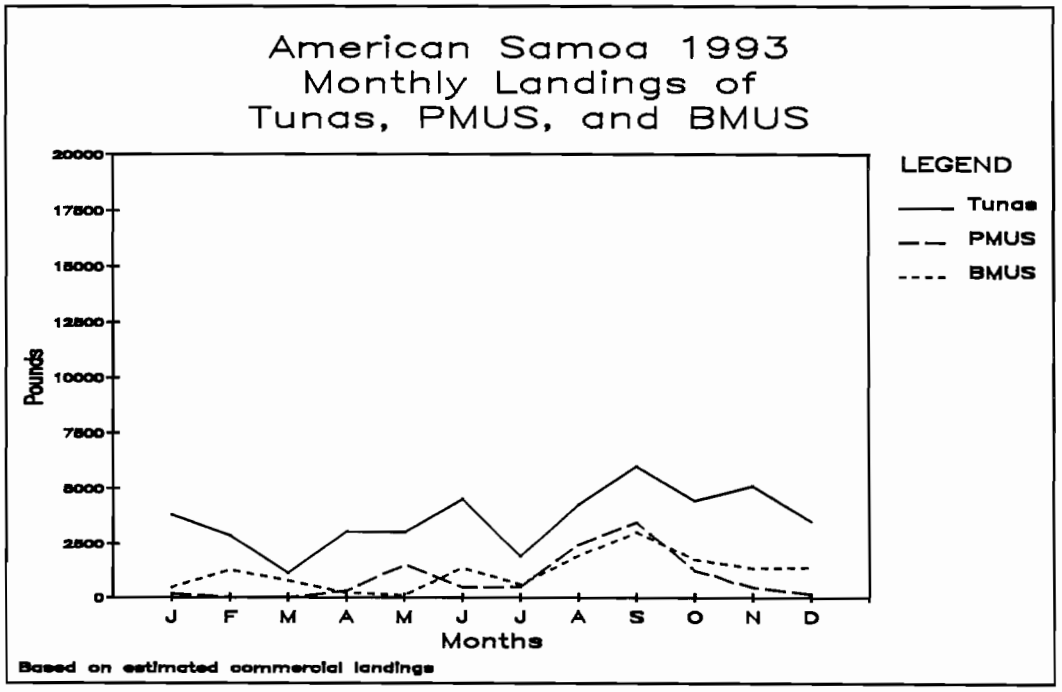


Figure II.1.3

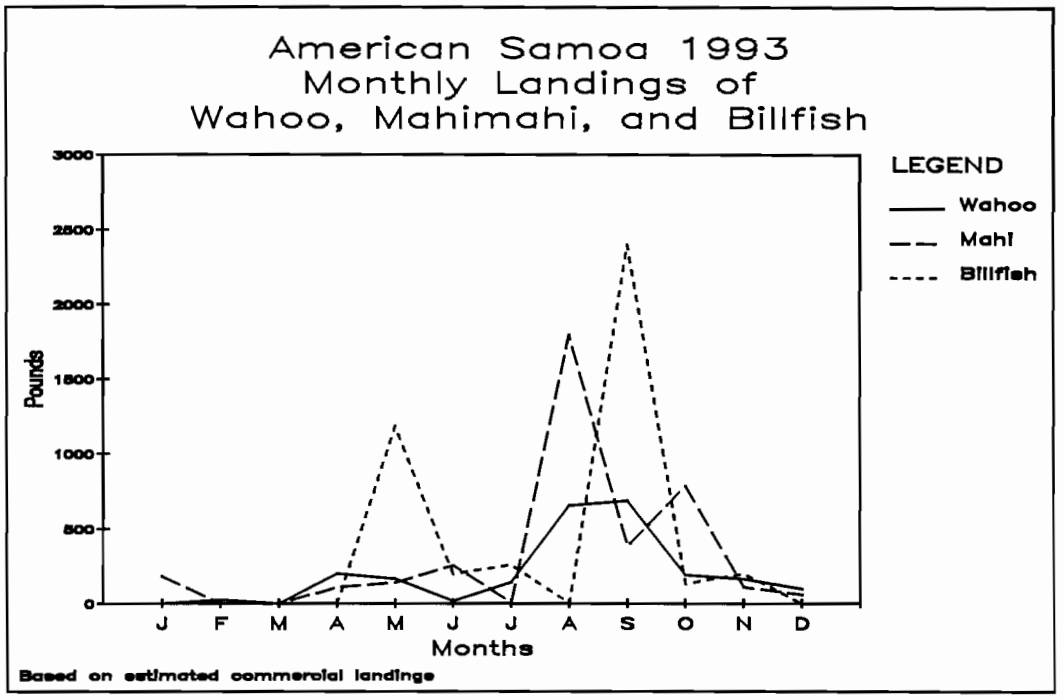


Figure II.1.4

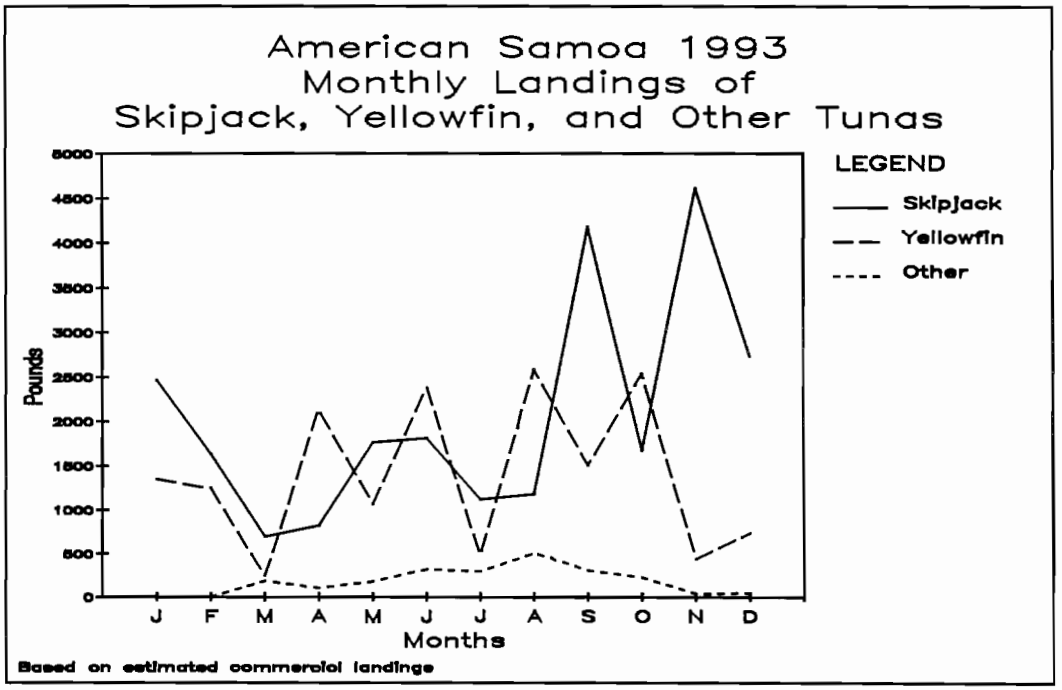
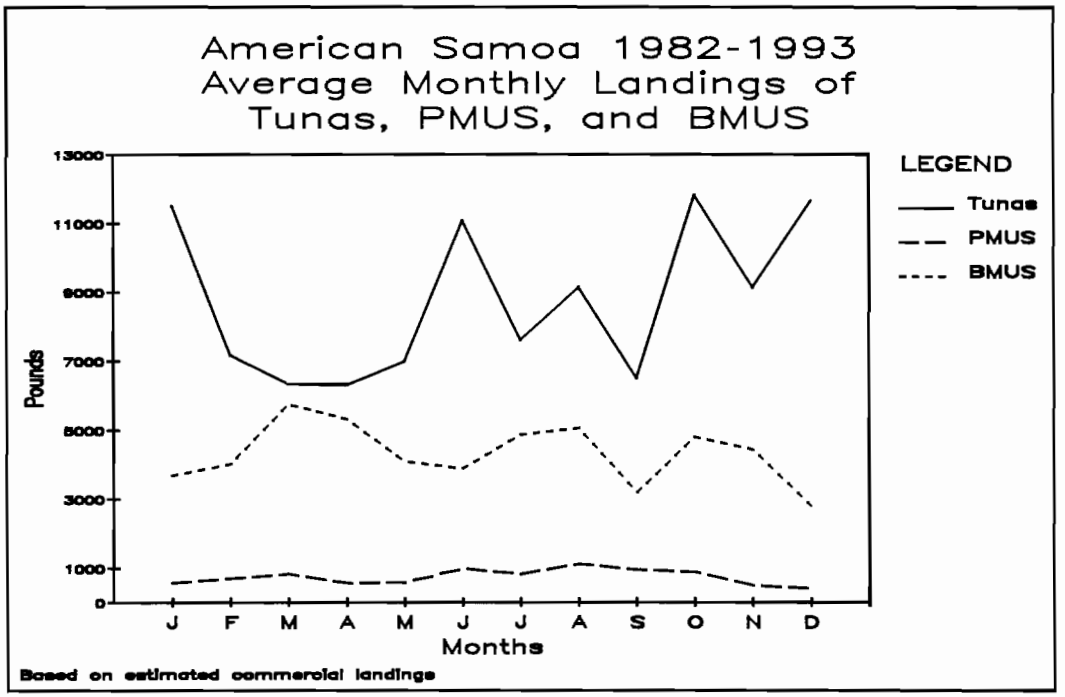


Figure II.2.1



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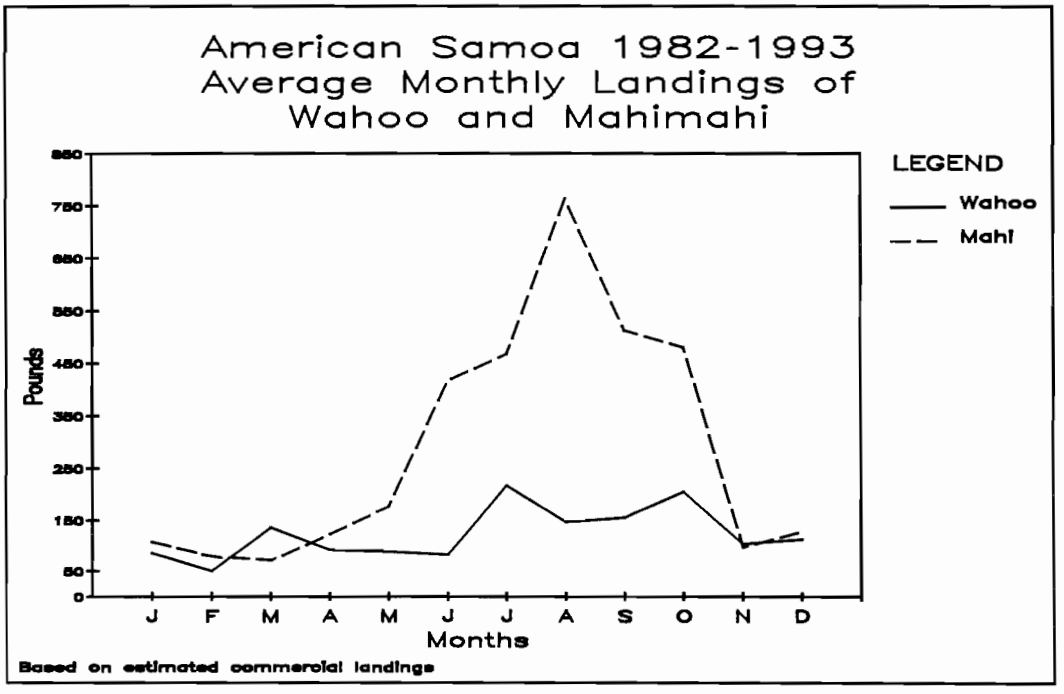


Figure II.2.3

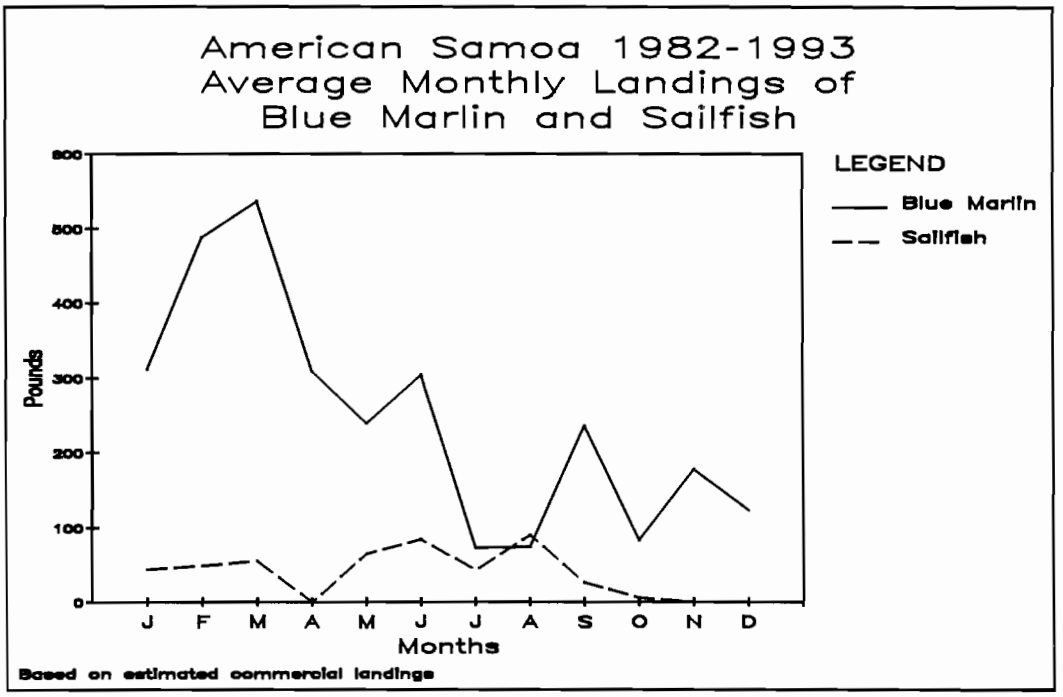


Figure II.2.4

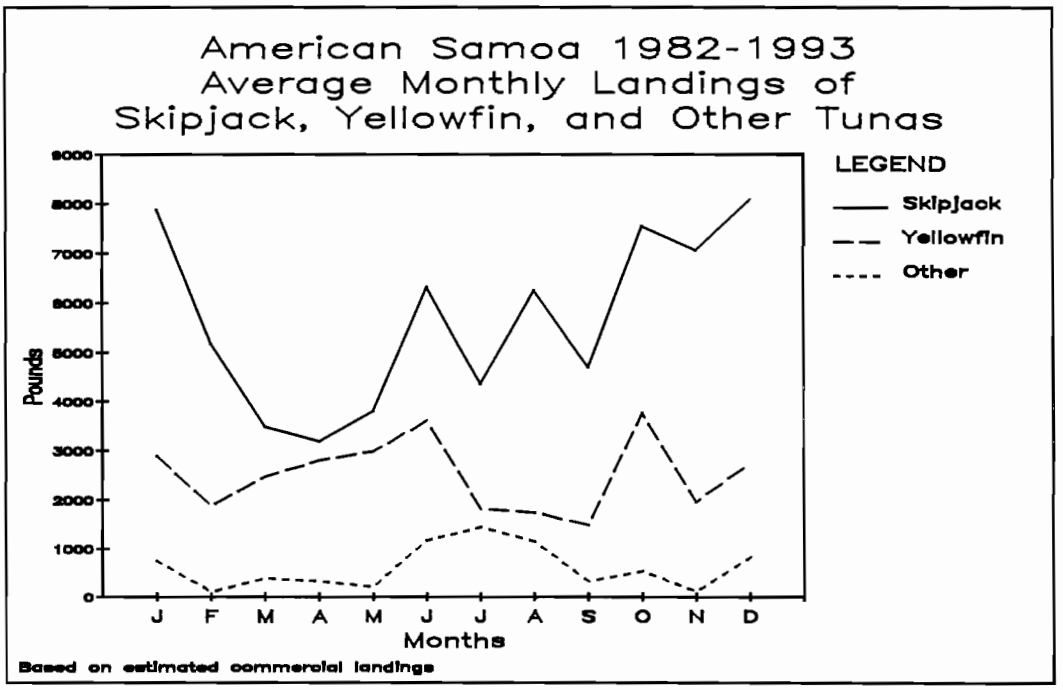


Figure II.2.5

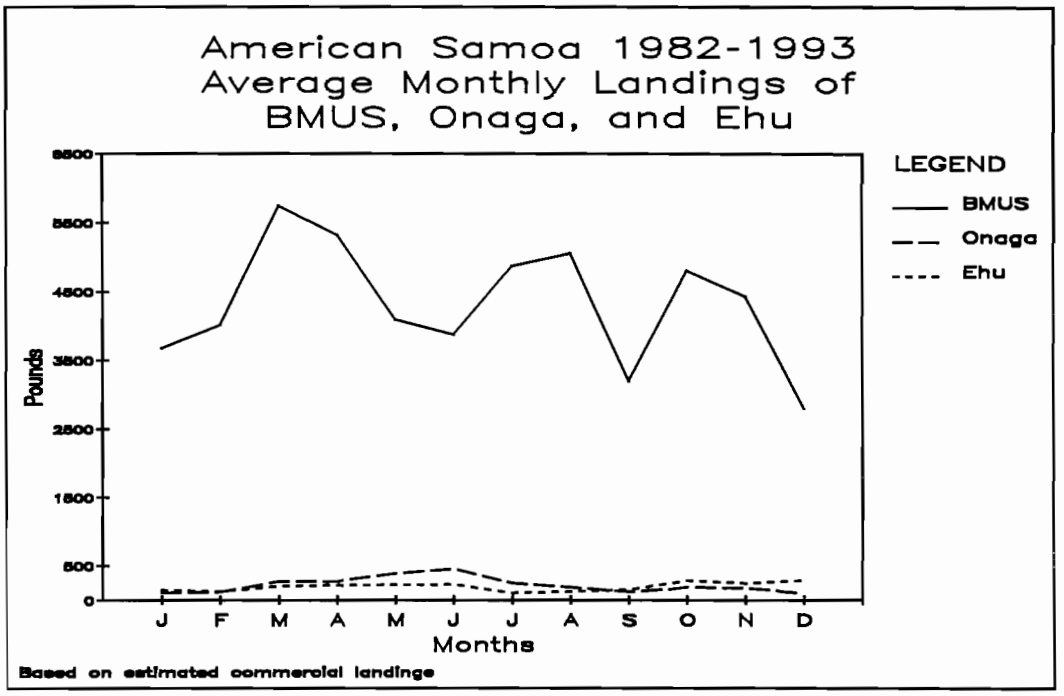


Figure II.3.1

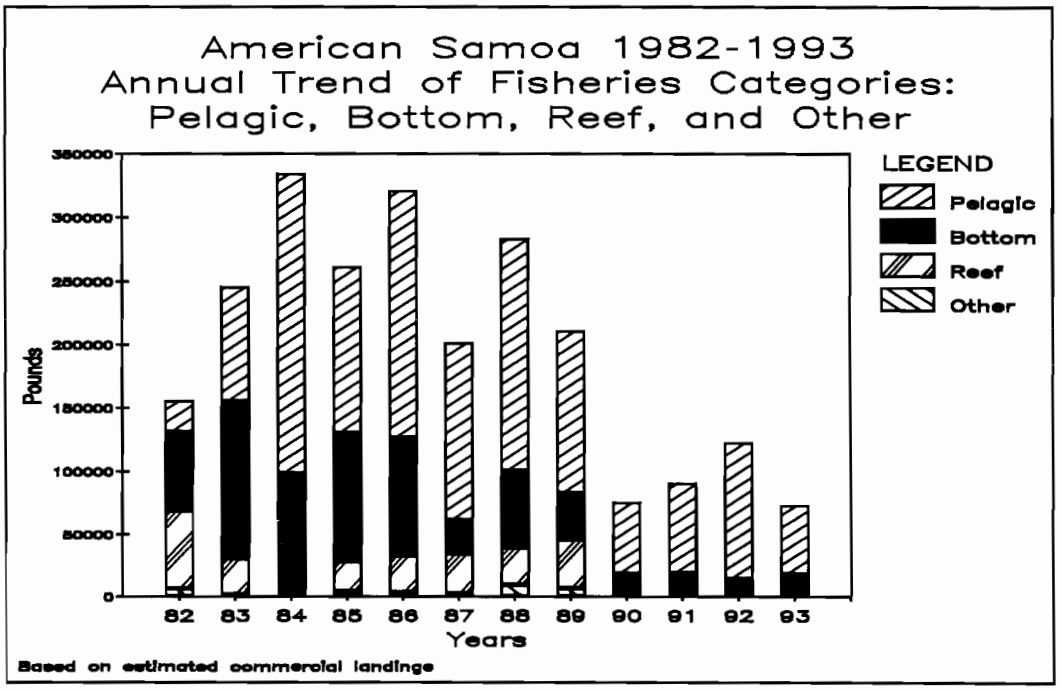


Figure II.3.2

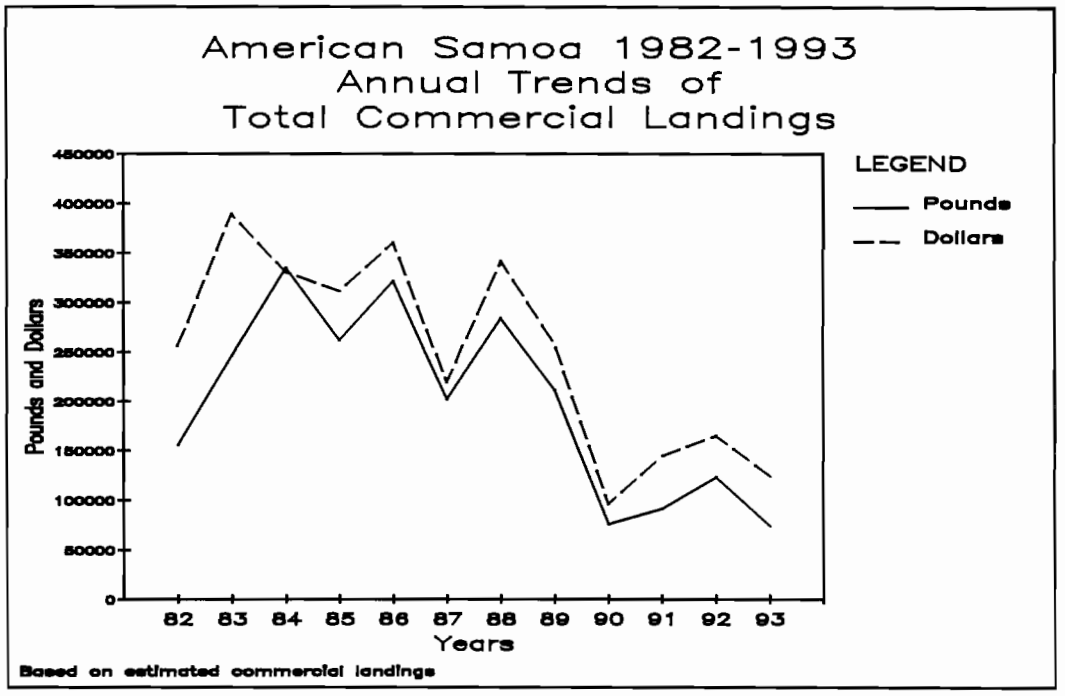


Figure II.3.3

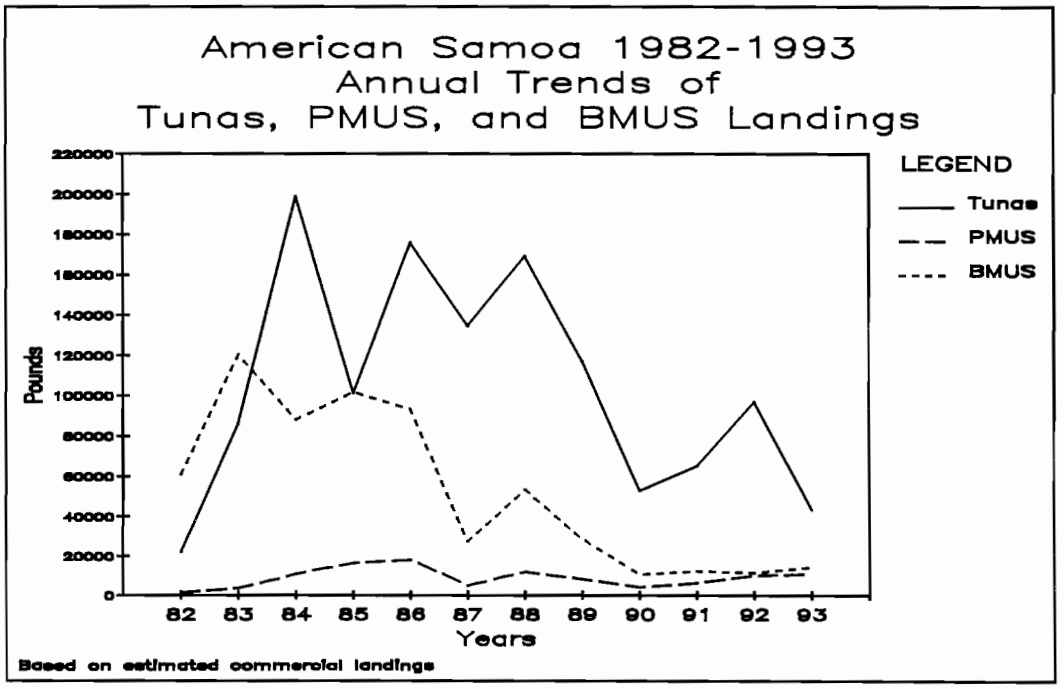


Figure II.3.4

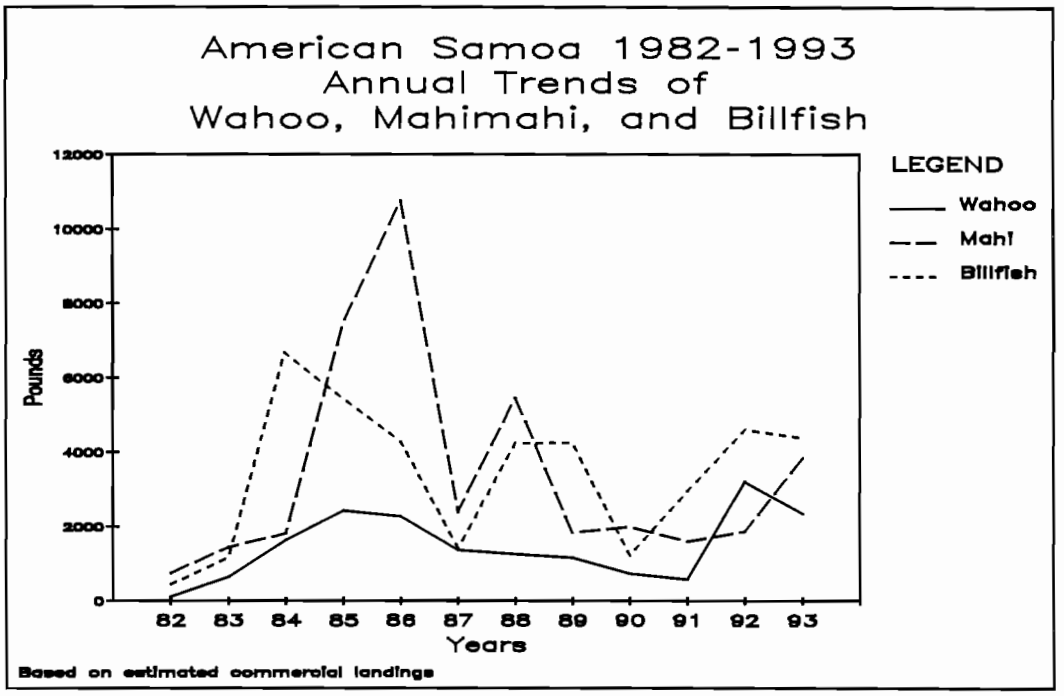


Figure II.3.5

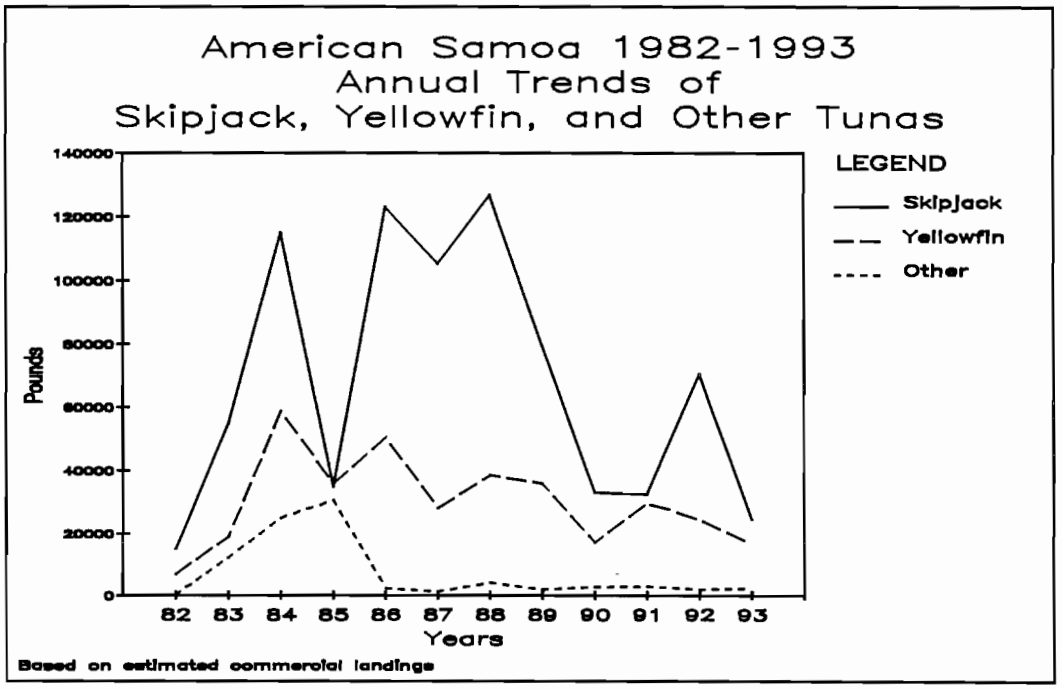
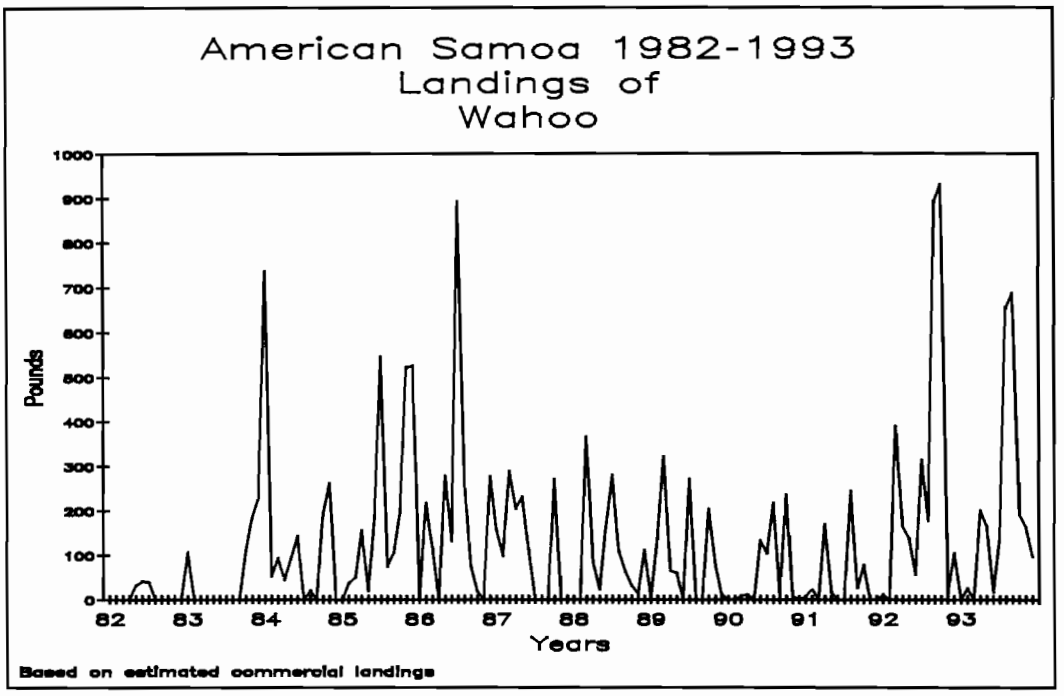


Figure II.4.1



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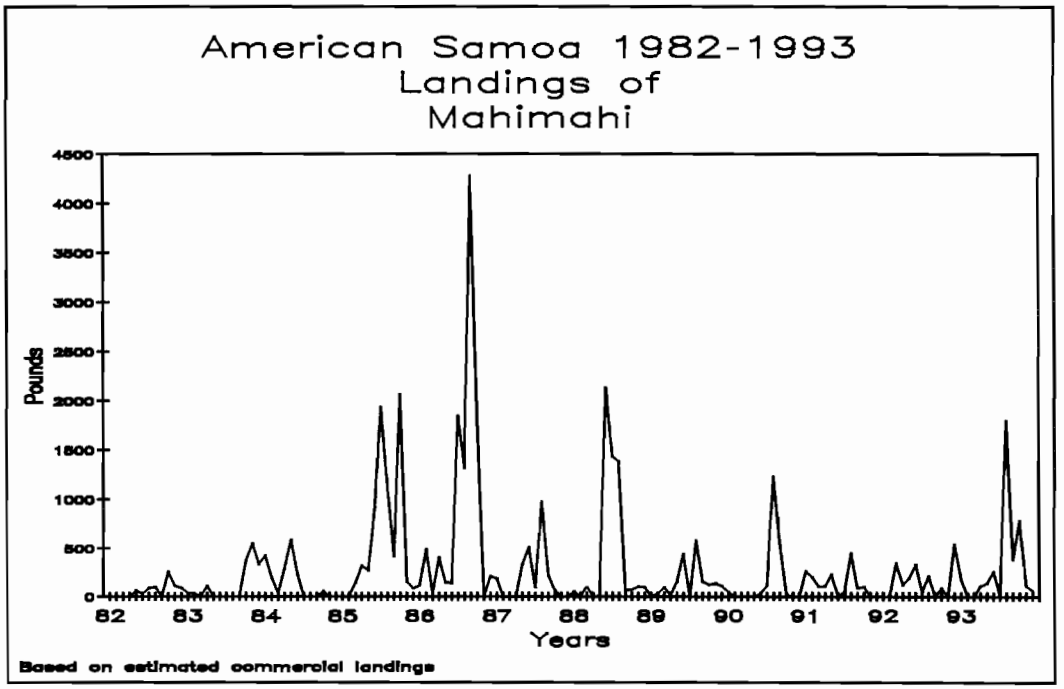

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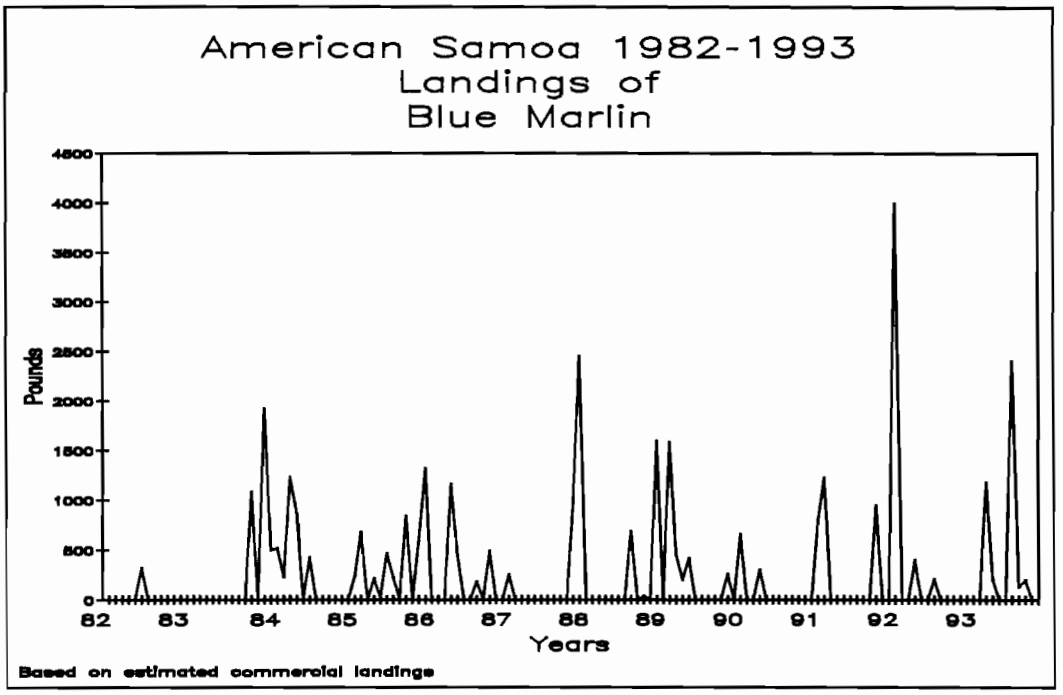
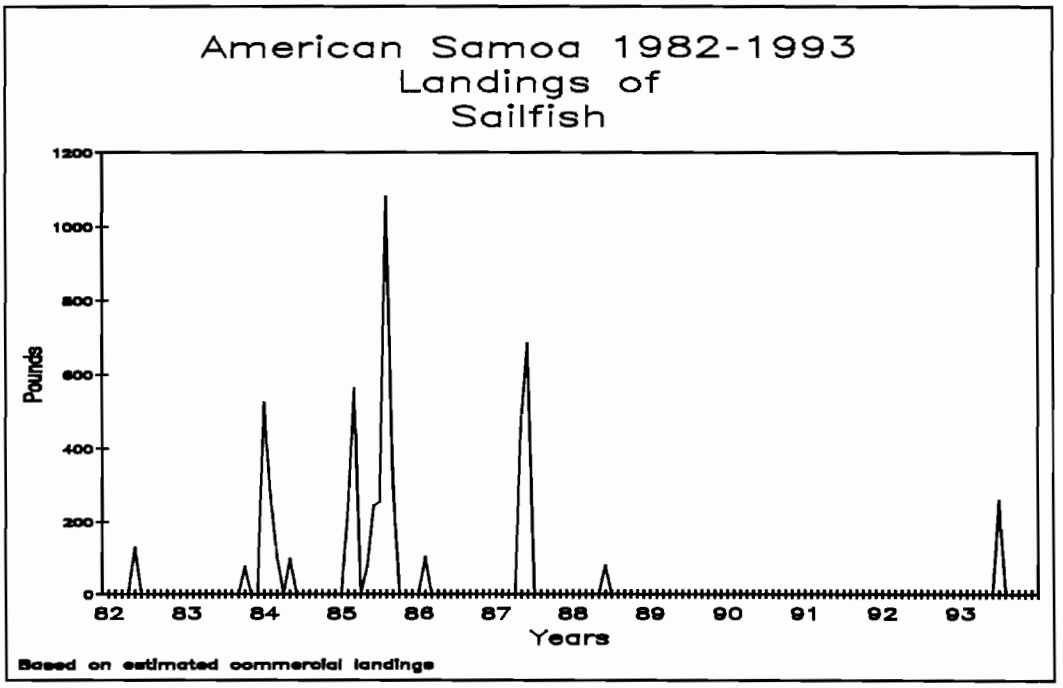


Figure II.4.4



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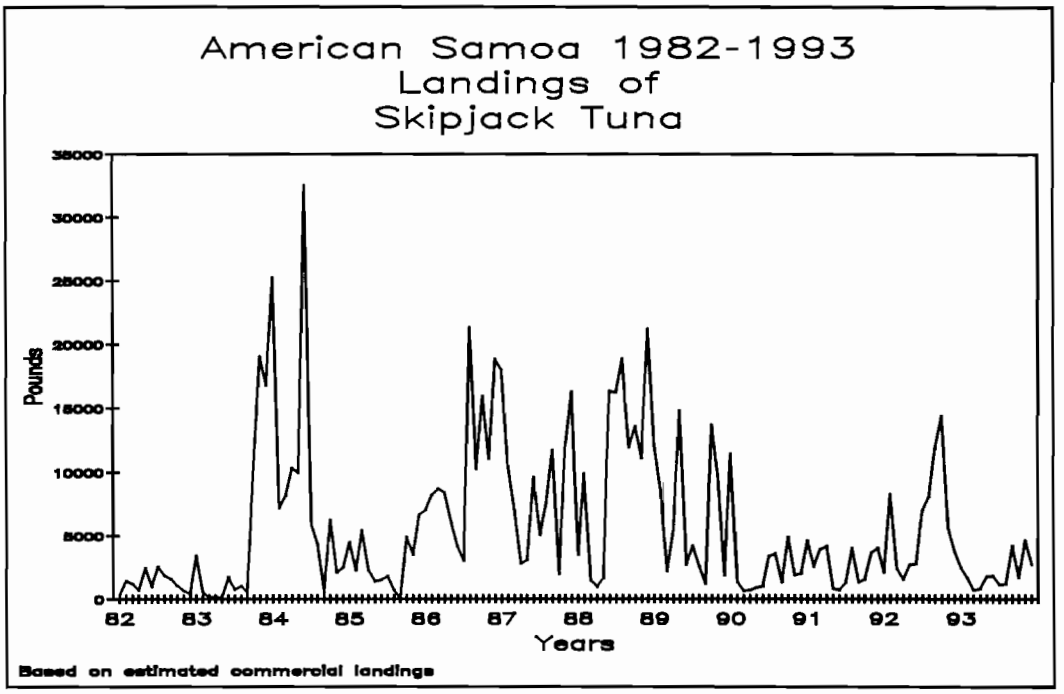


Figure II.4.6

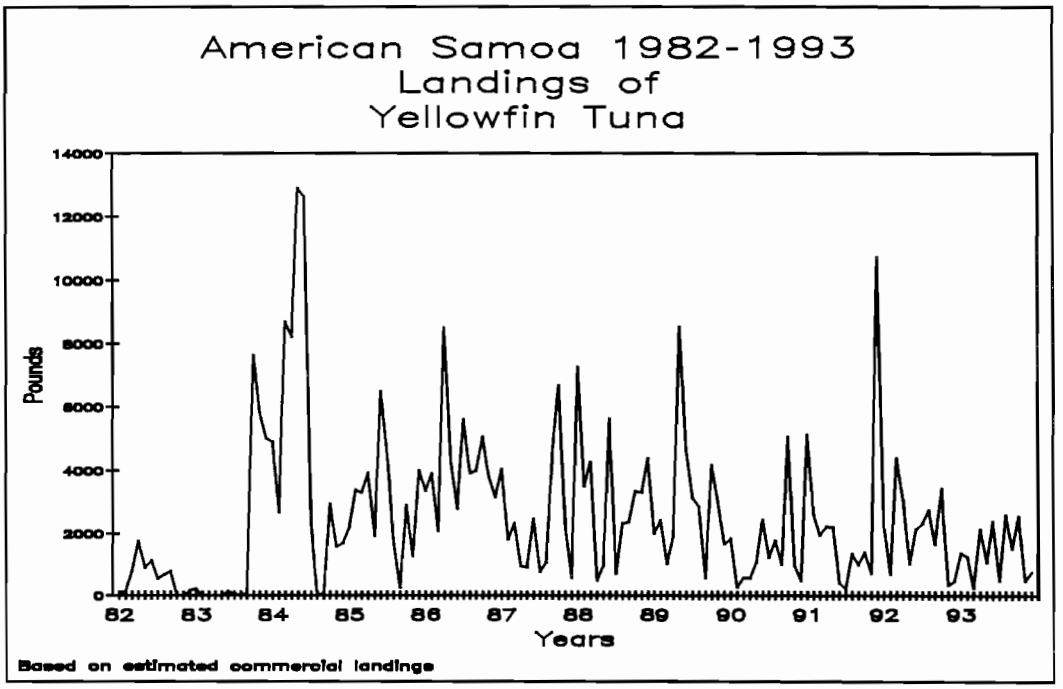


Figure II.4.7

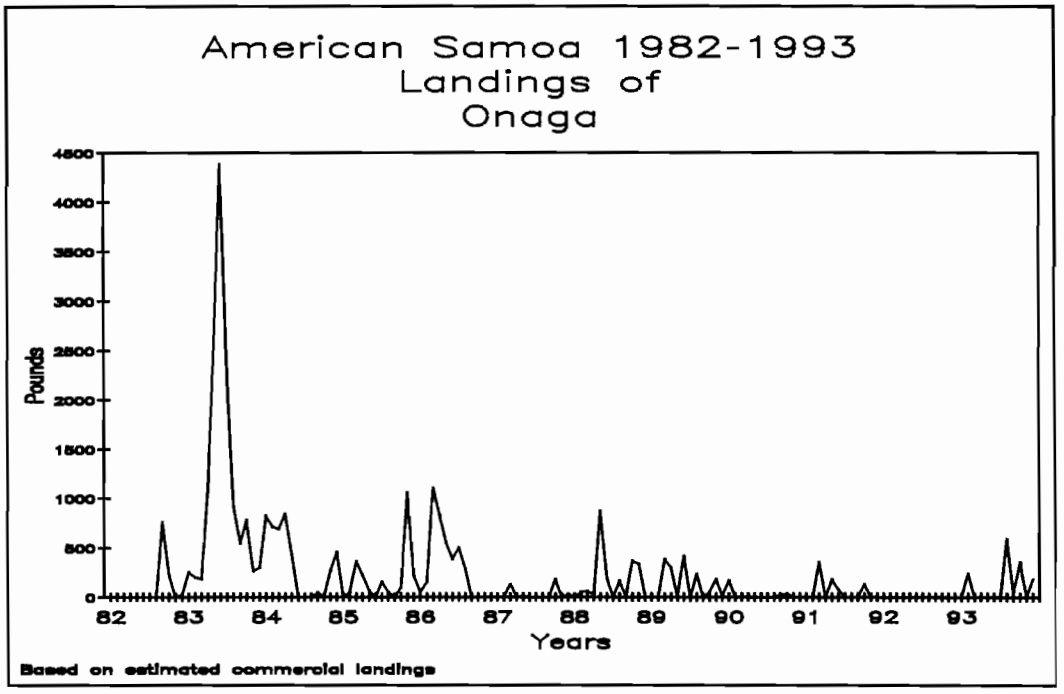


Figure II.4.8

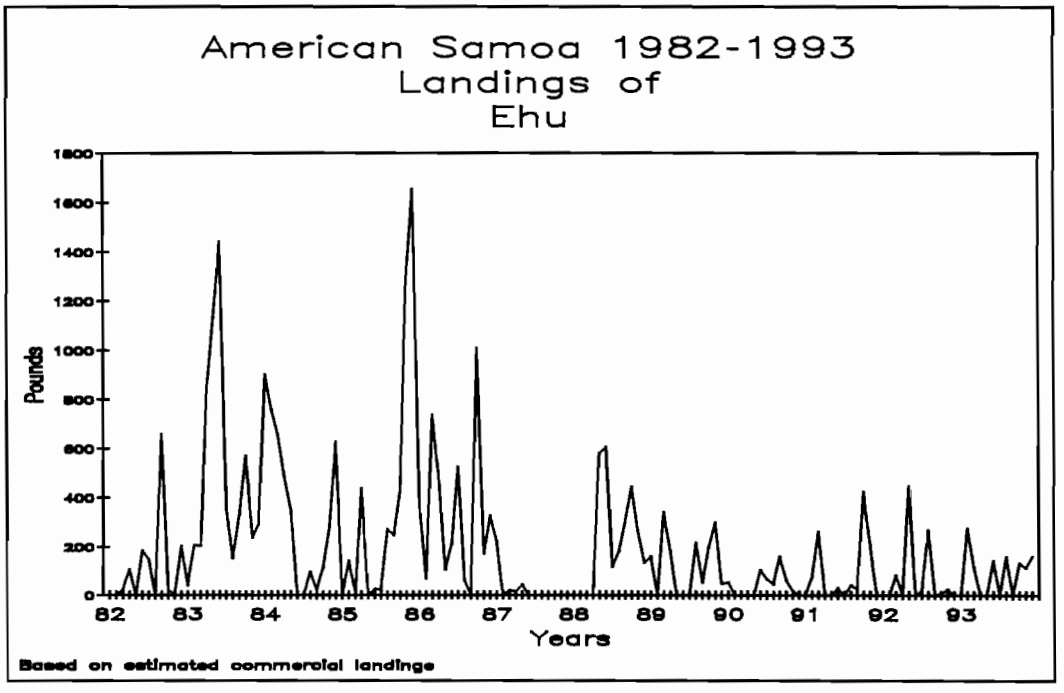


Table II.3.1

Tutuila 1993 Annual Offshore Creel Survey
Summary Expansion Report

Based on 243 Weekdays and 122 Weekend/Holidays

	TROLL(CV)	BOTTOM(CV)	BTM/TRL MIX(CV)	SPEAR(CV)	LONGLINE(CV)	TOTAL(CV)
Number of Days Sampled	148	148	148	101	101	148
Total Number of Interviews	79	38	3	1	5	126
Number of Interviews with Hours	79	38	5	1	5	128
Number of Interviews with Fishers	79	38	5	1	5	128
Estimated Trips on Survey Days	108	51	4	1	7	171
Average Trips per Day	0.7(30)	0.4(19)	0.0(24)	0.0(17)	0.1(12)	1.2(19)
Average Hours per Trip	8.1(7)	18.4(8)	21.6(14)	15.0(0)	18.0(19)	12.1(10)
Average Fishers per Trip	3.2(7)	2.4(6)	2.8(9)	5.0(0)	3.6(24)	2.9(9)
Average Catch per Trip	153.8(15)	124.2(12)	258.0(16)	69.7(0)	443.8(47)	158.2(30)
Average Catch per Hour	18.9(15)	6.8(12)	11.9(20)	4.6(0)	24.7(32)	13.2(21)
Expanded Number of Trips	268(12)	124(11)	11(10)	2(17)	17(12)	422(8)
Expanded Boat Hours Fished	2181(13)	2264(13)	248(11)	36(17)	306(23)	5035(8)
Expanded Number of Fishers	844(9)	294(11)	32(7)	12(17)	61(27)	1244(7)
Expanded Fisher Hours	3890(24)	4510(16)	525(16)	182(17)	1102(34)	10209(12)
Expanded Catch (based on trips)	41231(16)	15235(16)	2825(16)	169(0)	7549(49)	67009(12)
Expanded Catch (based on hours)	41243(16)	15240(17)	2825(18)	169(0)	7550(40)	67027(12)

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	41230.6	16	2181.1	13	267.8	12	3889.8	24	844.3	9	153.8	15
BOTTOM	15235.2	16	2263.6	13	124.0	11	4510.1	16	294.4	11	124.2	12
BTM/TRL MIX	2825.1	16	248.2	11	11.0	10	524.9	16	31.6	7	258.0	16
SPEAR	169.3	0	36.5	17	2.4	17	182.3	17	12.2	17	69.7	0
LONGLINE	7549.0	49	306.2	23	17.0	12	1102.3	34	61.2	27	443.8	47
Total:	67009.2	12	5035.5	8	422.2	8	10209.3	12	1243.7	7	1049.5	21

Table II.3.2

Tutuila 1993 Annual
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Miscellaneous	1179.0	1.78	0.0	0.00	1179.0	7.74	0.0	0.00
Jacks (misc)	160.1	0.24	11.8	0.03	148.3	0.97	0.0	0.00
Black jack	24.5	0.04	0.0	0.00	24.5	0.16	0.0	0.00
Large barracuda	532.2	0.81	160.9	0.39	137.8	0.90	233.5	2.43
Small barracuda	394.6	0.60	74.4	0.18	320.1	2.10	0.0	0.00
Mullets	1.8	0.00	0.0	0.00	0.0	0.00	1.8	0.02
Flyingfish	3.0	0.00	0.0	0.00	3.0	0.02	0.0	0.00
Sharks	520.1	0.79	226.1	0.55	294.0	1.93	0.0	0.00
Eels	30.6	0.05	0.0	0.00	30.6	0.20	0.0	0.00
Bottomfish (Assorted)	364.5	0.55	0.0	0.00	364.5	2.39	0.0	0.00
Groupers (misc)	425.5	0.64	0.0	0.00	425.5	2.79	0.0	0.00
Peacock grouper	152.8	0.23	0.0	0.00	152.8	1.00	0.0	0.00
Flagtail grouper	4.9	0.00	0.0	0.00	0.0	0.00	4.9	0.05
Tomato grouper	196.0	0.30	0.0	0.00	196.0	1.29	0.0	0.00
Yellowspot grouper	110.8	0.17	0.0	0.00	110.8	0.73	0.0	0.00
Giant grouper	699.9	1.06	0.0	0.00	0.0	0.00	699.9	7.28
Lunartail grouper	642.1	0.97	0.0	0.00	642.1	4.21	0.0	0.00
Blue lined snapper	1488.4	2.25	0.0	0.00	1488.4	9.77	0.0	0.00
Rufous snapper	22.8	0.03	0.0	0.00	22.8	0.15	0.0	0.00
Twinspot/red snapper	134.2	0.20	0.0	0.00	134.2	0.88	0.0	0.00
Humpback snapper	624.2	0.94	0.0	0.00	621.8	4.08	2.4	0.02
Gray jobfish	2049.7	3.10	39.6	0.10	2010.1	13.19	0.0	0.00
Hawaiian opakapaka	122.5	0.19	0.0	0.00	122.5	0.80	0.0	0.00
Opakapaka	379.1	0.57	0.0	0.00	379.1	2.49	0.0	0.00
Blue lined gindai	30.6	0.05	0.0	0.00	30.6	0.20	0.0	0.00
Gindai (flower snap)	106.1	0.16	0.0	0.00	106.1	0.70	0.0	0.00
Yellowtail snapper	36.9	0.06	0.0	0.00	36.9	0.24	0.0	0.00
Lehi (silverjaw)	381.1	0.58	0.0	0.00	381.1	2.50	0.0	0.00
Onaga (longtail snappe	1311.3	1.98	0.0	0.00	978.5	6.42	332.8	3.46
Ehu (squirrelfish snap	638.5	0.97	0.0	0.00	638.5	4.19	0.0	0.00
Emperors (misc)	1734.3	2.62	0.0	0.00	1734.3	11.38	0.0	0.00
Longnose emperor	128.7	0.19	0.0	0.00	128.7	0.84	0.0	0.00
Ambon emperor	905.6	1.37	0.0	0.00	905.6	5.94	0.0	0.00
Redgill emperor	262.5	0.40	0.0	0.00	262.5	1.72	0.0	0.00
Oilfish	227.4	0.34	0.0	0.00	128.7	0.84	98.7	1.03
Rudderfish	8.5	0.01	0.0	0.00	0.0	0.00	8.5	0.09
Rabbitfish	2.4	0.00	0.0	0.00	0.0	0.00	2.4	0.02
Lined surgeon	32.0	0.05	0.0	0.00	0.0	0.00	32.0	0.33
Striped bristletooth	1.8	0.00	0.0	0.00	0.0	0.00	1.8	0.02
Yellowfin surgeonfish	12.5	0.02	0.0	0.00	12.5	0.08	0.0	0.00
Unicornfishes (misc)	3.0	0.00	0.0	0.00	3.0	0.02	0.0	0.00
Squirrelfish	160.1	0.24	0.0	0.00	144.1	0.95	16.0	0.17
Saber squirrelfish	12.3	0.02	0.0	0.00	12.3	0.08	0.0	0.00
Parrotfishes	21.0	0.03	0.0	0.00	0.0	0.00	21.0	0.22
Goatfish	4.6	0.00	0.0	0.00	4.6	0.03	0.0	0.00
Sweepers	33.6	0.05	0.0	0.00	33.6	0.22	0.0	0.00
Inshore groupers	5.6	0.00	0.0	0.00	0.0	0.00	5.6	0.06
Triggerfish	19.2	0.03	0.0	0.00	19.2	0.13	0.0	0.00
Red snapper, mu	205.2	0.31	0.0	0.00	205.2	1.35	0.0	0.00
Mahimahi (dolphin)	3624.8	5.49	3405.4	8.26	0.0	0.00	219.5	2.28
Blue marlin	7624.8	11.54	5382.9	13.06	0.0	0.00	2241.9	23.33
Sailfish	825.8	1.25	186.3	0.45	0.0	0.00	639.6	6.66
Rainbow runner	64.0	0.10	45.6	0.11	18.4	0.12	0.0	0.00
Wahoo	2534.8	3.84	1670.9	4.05	0.0	0.00	863.9	8.99
Skipjack tuna	16969.7	25.68	16418.5	39.82	0.0	0.00	551.2	5.74
Dogtooth tuna	1399.0	2.12	756.7	1.84	642.3	4.22	0.0	0.00
Albacore	236.4	0.36	0.0	0.00	0.0	0.00	236.4	2.46
Yellowfin tuna	15994.6	24.21	12773.1	30.98	0.0	0.00	3221.5	33.52
Bigeye tuna	102.1	0.15	0.0	0.00	0.0	0.00	102.1	1.06
Kawakawa	78.3	0.12	78.3	0.19	0.0	0.00	0.0	0.00
Spiny lobster	72.9	0.11	0.0	0.00	0.0	0.00	72.9	0.76
Total all species:	66075.3	100.00	41230.5	62.40	15234.6	23.06	9610.3	14.54

Table II.4.1

Tutuila January 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	4959.5	71	255.8	69	29.6	65	106.1	**	86.0	12	169.1	33
BOTTOM	472.7	82	56.4	82	3.8	81	159.5	82	10.7	82	125.0	9
Total:	5432.2	65	312.1	59	33.4	58	265.6	**	96.7	14	294.2	19

Table II.4.2

Tutuila February 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	2782.4	48	146.4	40	15.0	38	233.4	66	38.9	15	188.7	40
BOTTOM	1630.7	48	172.5	30	11.6	21	344.9	37	23.2	29	140.7	42
Total:	4413.1	35	318.9	25	26.5	23	578.3	35	62.1	14	329.4	29

Table II.4.3

Tutuila March 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	332.7	97	44.9	71	5.4	71	157.1	73	19.0	73	61.2	54
BOTTOM	757.9	72	152.7	58	9.6	43	293.3	80	24.5	40	77.9	62
Total:	1090.6	58	197.5	47	15.1	37	450.3	58	43.6	39	139.1	42

Table II.4.4

Tutuila April 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	2354.3	73	93.6	50	13.0	49	337.0	61	46.8	60	181.1	49
BOTTOM	926.9	73	93.6	62	5.2	49	234.0	66	13.0	54	178.3	49
Total:	3281.2	57	187.2	40	18.2	38	571.0	45	59.8	49	359.4	34

Table II.4.5

Tutuila May 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	3529.1	72	148.3	57	18.4	57	86.2	**	60.5	14	192.6	44
Total:	3529.1	72	148.3	57	18.4	57	86.2	**	60.5	14	192.6	44

Table II.4.6

Tutuila June 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	4537.0	40	237.9	31	26.4	28	149.6	**	74.2	10	176.1	35
BOTTOM	631.7	66	164.6	49	7.5	48	411.4	53	18.7	52	84.5	41
SPEAR	260.6	0	56.1	48	3.7	48	280.5	48	18.7	48	69.7	0
Total:	5429.3	34	458.6	24	37.6	22	841.5	40	111.6	13	330.2	22

Table II.4.7

Tutuila July 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	1555.5	69	86.0	55	15.0	51	180.0	78	44.9	43	104.3	50
BOTTOM	2150.3	63	406.4	53	19.8	53	480.0	**	49.4	26	121.9	34
Total:	3705.8	46	492.4	44	34.7	38	660.0	85	94.2	25	226.2	30

Table II.4.8

Tutuila August 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	5401.0	20	462.5	15	51.1	11	1473.6	25	193.9	18	108.7	20
BOTTOM	2598.7	25	461.5	18	29.3	12	934.7	26	68.2	18	88.6	24
LONGLINE	5013.6	62	180.2	26	8.6	13	780.2	41	37.2	34	584.3	60
Total:	13013.2	26	1104.2	11	89.0	7	3188.4	17	299.2	13	781.7	45

Table II.4.9

Tutuila September 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	7789.8	60	239.2	39	32.9	36	497.8	44	75.9	36	236.1	48
BOTTOM	4161.2	47	606.4	39	25.6	39	1412.9	41	59.7	40	162.4	24
Total:	11951.0	42	845.6	30	58.5	26	1910.7	32	135.6	27	398.5	30

Table II.4.10

Tutuila October 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	3009.6	54	220.5	37	25.8	34	422.0	76	85.8	32	117.9	59
BOTTOM	345.1	56	41.2	56	2.8	55	116.5	56	7.8	56	125.0	9
BTM/TRL MIX	2232.3	37	196.6	35	8.7	34	424.1	48	25.0	30	258.0	16
LONGLINE	1264.8	67	51.3	48	2.9	43	184.7	55	10.3	51	443.8	47
Total:	6851.8	29	509.6	22	40.0	24	1147.2	35	128.9	23	944.8	24

Table II.4.11

Tutuila November 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	3141.8	59	142.8	49	20.7	43	233.7	80	52.5	31	144.0	45
BOTTOM	1220.9	46	155.0	45	6.5	45	387.6	50	16.2	50	189.0	9
LONGLINE	1433.5	69	58.1	50	3.2	45	209.3	57	11.6	52	443.8	47
Total:	5796.2	38	356.0	29	30.4	31	830.7	35	80.3	24	776.8	28

Table II.4.12

Tutuila December 1993
Offshore Creel Survey Expansion Summary

Gear	Catch	CV	Boat Hrs	CV	Boat Trips	CV	Prsn Hrs	CV	Prsn Cnt	CV	C/TRIP	CV
TROLL	385.1	55	18.0	55	3.2	54	58.1	55	10.2	55	122.3	6
BOTTOM	1263.2	74	110.3	54	6.3	54	275.6	59	15.8	59	200.5	44
Total:	1648.2	58	128.2	47	9.5	40	333.7	50	25.9	42	322.8	28

Table II.5.1

Tutuila January 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	% this trolling gear		% this bottom gear		% this other gear	
Large barracuda	95.7	1.76	95.7	1.93	0.0	0.00	0.0	0.00
Gray jobfish	162.1	2.98	0.0	0.00	162.1	34.30	0.0	0.00
Opakapaka	108.0	1.99	0.0	0.00	108.0	22.85	0.0	0.00
Gindai (flower snap)	54.0	0.99	0.0	0.00	54.0	11.43	0.0	0.00
Yellowtail snapper	67.5	1.24	0.0	0.00	67.5	14.28	0.0	0.00
Lehi (silverjaw)	81.0	1.49	0.0	0.00	81.0	17.14	0.0	0.00
Mahimahi (dolphin)	191.3	3.52	191.3	3.86	0.0	0.00	0.0	0.00
Blue marlin	665.8	12.26	665.8	13.42	0.0	0.00	0.0	0.00
Skipjack tuna	1965.3	36.18	1965.3	39.63	0.0	0.00	0.0	0.00
Yellowfin tuna	2041.4	37.58	2041.4	41.16	0.0	0.00	0.0	0.00
Total all species:	5432.1	100.00	4959.5	91.30	472.6	8.70	0.0	0.00

Table II.5.2

Tutuila February 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	% this trolling gear		% this bottom gear		% this other gear	
Groupers (misc)	10.1	0.23	0.0	0.00	10.1	0.62	0.0	0.00
Tomato grouper	185.4	4.20	0.0	0.00	185.4	11.37	0.0	0.00
Yellowspot grouper	104.3	2.36	0.0	0.00	104.3	6.40	0.0	0.00
Lunartail grouper	162.3	3.68	0.0	0.00	162.3	9.95	0.0	0.00
Blue lined snapper	79.7	1.81	0.0	0.00	79.7	4.89	0.0	0.00
Humpback snapper	34.8	0.79	0.0	0.00	34.8	2.13	0.0	0.00
Gray jobfish	210.1	4.76	0.0	0.00	210.1	12.88	0.0	0.00
Hawaiian opakapaka	115.9	2.63	0.0	0.00	115.9	7.11	0.0	0.00
Gindai (flower snap)	34.8	0.79	0.0	0.00	34.8	2.13	0.0	0.00
Lehi (silverjaw)	95.6	2.17	0.0	0.00	95.6	5.86	0.0	0.00
Onaga (longtail snappe	234.7	5.32	0.0	0.00	234.7	14.39	0.0	0.00
Ehu (squirrelfish snap	275.3	6.24	0.0	0.00	275.3	16.88	0.0	0.00
Emperors (misc)	58.8	1.33	0.0	0.00	58.8	3.61	0.0	0.00
Longnose emperor	17.4	0.39	0.0	0.00	17.4	1.07	0.0	0.00
Saber squirrelfish	11.6	0.26	0.0	0.00	11.6	0.71	0.0	0.00
Skipjack tuna	1232.1	27.92	1232.1	44.28	0.0	0.00	0.0	0.00
Yellowfin tuna	1550.3	35.13	1550.3	55.72	0.0	0.00	0.0	0.00
Total all species:	4413.2	100.00	2782.4	63.05	1630.8	36.95	0.0	0.00

Table II.5.3

Tutuila March 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Small barracuda	8.6	0.79	0.0	0.00	8.6	1.13	0.0	0.00
Groupers (misc)	10.4	0.95	0.0	0.00	10.4	1.37	0.0	0.00
Peacock grouper	27.8	2.55	0.0	0.00	27.8	3.67	0.0	0.00
Lunartail grouper	49.8	4.57	0.0	0.00	49.8	6.57	0.0	0.00
Blue lined snapper	13.8	1.27	0.0	0.00	13.8	1.82	0.0	0.00
Gray jobfish	27.6	2.53	0.0	0.00	27.6	3.64	0.0	0.00
Opakapaka	220.8	20.24	0.0	0.00	220.8	29.13	0.0	0.00
Lehi (silverjaw)	186.3	17.08	0.0	0.00	186.3	24.58	0.0	0.00
Ehu (squirrelfish snap	105.2	9.64	0.0	0.00	105.2	13.88	0.0	0.00
Squirrelfish	77.6	7.11	0.0	0.00	77.6	10.24	0.0	0.00
Triggerfish	30.1	2.76	0.0	0.00	30.1	3.97	0.0	0.00
Rainbow runner	5.2	0.48	5.2	1.56	0.0	0.00	0.0	0.00
Skipjack tuna	178.0	16.32	178.0	53.49	0.0	0.00	0.0	0.00
Dogtooth tuna	92.6	8.49	92.6	27.82	0.0	0.00	0.0	0.00
Yellowfin tuna	37.1	3.40	37.1	11.15	0.0	0.00	0.0	0.00
Kawakawa	19.9	1.82	19.9	5.98	0.0	0.00	0.0	0.00
Total all species:	1090.8	100.00	332.8	30.51	758.0	69.49	0.0	0.00

Table II.5.4

Tutuila April 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Miscellaneous	535.6	16.32	0.0	0.00	535.6	57.78	0.0	0.00
Large barracuda	52.0	1.58	0.0	0.00	52.0	5.61	0.0	0.00
Small barracuda	20.8	0.63	20.8	0.88	0.0	0.00	0.0	0.00
Blue lined snapper	14.3	0.44	0.0	0.00	14.3	1.54	0.0	0.00
Humpback snapper	21.8	0.66	0.0	0.00	21.8	2.35	0.0	0.00
Gray jobfish	111.8	3.41	0.0	0.00	111.8	12.06	0.0	0.00
Emperors (misc)	85.8	2.61	0.0	0.00	85.8	9.26	0.0	0.00
Mahimahi (dolphin)	87.5	2.67	87.5	3.72	0.0	0.00	0.0	0.00
Rainbow runner	15.6	0.48	0.0	0.00	15.6	1.68	0.0	0.00
Wahoo	107.3	3.27	107.3	4.56	0.0	0.00	0.0	0.00
Skipjack tuna	695.6	21.20	695.6	29.54	0.0	0.00	0.0	0.00
Dogtooth tuna	90.0	2.74	0.0	0.00	90.0	9.71	0.0	0.00
Yellowfin tuna	1443.2	43.98	1443.2	61.30	0.0	0.00	0.0	0.00
Total all species:	3281.3	100.00	2354.4	71.75	926.9	28.25	0.0	0.00

Table II.5.5

Tutuila May 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	% this trolling gear		% this bottom gear		% this other gear	
Mahimahi (dolphin)	201.0	5.70	201.0	5.70	0.0	0.00	0.0	0.00
Blue marlin	1075.9	30.49	1075.9	30.49	0.0	0.00	0.0	0.00
Wahoo	113.5	3.22	113.5	3.22	0.0	0.00	0.0	0.00
Skipjack tuna	1174.8	33.29	1174.8	33.29	0.0	0.00	0.0	0.00
Yellowfin tuna	963.9	27.31	963.9	27.31	0.0	0.00	0.0	0.00
Total all species:	3529.1	100.00	3529.1	100.00	0.0	0.00	0.0	0.00

Table II.5.6

Tutuila June 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	% this trolling gear		% this bottom gear		% this other gear	
Jacks (misc)	7.6	0.14	0.0	0.00	7.6	1.20	0.0	0.00
Black jack	15.2	0.28	0.0	0.00	15.2	2.41	0.0	0.00
Small barracuda	42.5	0.78	36.8	0.81	5.7	0.90	0.0	0.00
Mullets	2.8	0.05	0.0	0.00	0.0	0.00	2.8	1.07
Sharks	142.3	2.62	0.0	0.00	142.3	22.52	0.0	0.00
Bottomfish (Assorted)	225.8	4.16	0.0	0.00	225.8	35.73	0.0	0.00
Flagtail grouper	7.5	0.14	0.0	0.00	0.0	0.00	7.5	2.88
Lunartail grouper	40.3	0.74	0.0	0.00	40.3	6.38	0.0	0.00
Blue lined snapper	57.7	1.06	0.0	0.00	57.7	9.13	0.0	0.00
Humpback snapper	3.7	0.07	0.0	0.00	0.0	0.00	3.7	1.42
Gray jobfish	9.5	0.17	0.0	0.00	9.5	1.50	0.0	0.00
Gindai (flower snap)	24.7	0.45	0.0	0.00	24.7	3.91	0.0	0.00
Lehi (silverjaw)	20.9	0.38	0.0	0.00	20.9	3.31	0.0	0.00
Ehu (squirrelfish snap	39.9	0.73	0.0	0.00	39.9	6.31	0.0	0.00
Redgill emperor	20.4	0.38	0.0	0.00	20.4	3.23	0.0	0.00
Rudderfish	13.1	0.24	0.0	0.00	0.0	0.00	13.1	5.03
Rabbitfish	3.7	0.07	0.0	0.00	0.0	0.00	3.7	1.42
Lined surgeon	49.2	0.91	0.0	0.00	0.0	0.00	49.2	18.89
Striped bristletooth	2.8	0.05	0.0	0.00	0.0	0.00	2.8	1.07
Squirrelfish	24.7	0.45	0.0	0.00	0.0	0.00	24.7	9.48
Parrotfishes	32.2	0.59	0.0	0.00	0.0	0.00	32.2	12.36
Goatfish	2.9	0.05	0.0	0.00	2.9	0.46	0.0	0.00
Inshore groupers	8.6	0.16	0.0	0.00	0.0	0.00	8.6	3.30
Red snapper, mu	19.0	0.35	0.0	0.00	19.0	3.01	0.0	0.00
Mahimahi (dolphin)	197.7	3.64	197.7	4.36	0.0	0.00	0.0	0.00
Wahoo	13.8	0.25	13.8	0.30	0.0	0.00	0.0	0.00
Skipjack tuna	2025.7	37.31	2025.7	44.65	0.0	0.00	0.0	0.00
Dogtooth tuna	119.5	2.20	119.5	2.63	0.0	0.00	0.0	0.00
Yellowfin tuna	2143.6	39.48	2143.6	47.25	0.0	0.00	0.0	0.00
Spiny lobster	112.2	2.07	0.0	0.00	0.0	0.00	112.2	43.07
Total all species:	5429.5	100.00	4537.1	83.56	631.9	11.64	260.5	4.80

Table II.5.7

Tutuila July 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Miscellaneous	596.7	16.10	0.0	0.00	596.7	27.75	0.0	0.00
Jacks (misc)	17.4	0.47	0.0	0.00	17.4	0.81	0.0	0.00
Small barracuda	80.7	2.18	0.0	0.00	80.7	3.75	0.0	0.00
Sharks	82.9	2.24	0.0	0.00	82.9	3.86	0.0	0.00
Groupers (misc)	128.3	3.46	0.0	0.00	128.3	5.97	0.0	0.00
Peacock grouper	12.3	0.33	0.0	0.00	12.3	0.57	0.0	0.00
Lunartail grouper	5.1	0.14	0.0	0.00	5.1	0.24	0.0	0.00
Blue lined snapper	159.4	4.30	0.0	0.00	159.4	7.41	0.0	0.00
Twinspot/red snapper	122.7	3.31	0.0	0.00	122.7	5.71	0.0	0.00
Humpback snapper	280.6	7.57	0.0	0.00	280.6	13.05	0.0	0.00
Gray jobfish	130.4	3.52	0.0	0.00	130.4	6.06	0.0	0.00
Ambon emperor	153.1	4.13	0.0	0.00	153.1	7.12	0.0	0.00
Squirrelfish	86.7	2.34	0.0	0.00	86.7	4.03	0.0	0.00
Red snapper, mu	80.0	2.16	0.0	0.00	80.0	3.72	0.0	0.00
Sailfish	324.4	8.75	324.4	20.86	0.0	0.00	0.0	0.00
Wahoo	164.8	4.45	164.8	10.59	0.0	0.00	0.0	0.00
Skipjack tuna	465.7	12.57	465.7	29.94	0.0	0.00	0.0	0.00
Dogtooth tuna	232.0	6.26	17.9	1.15	214.1	9.96	0.0	0.00
Yellowfin tuna	566.4	15.28	566.4	36.41	0.0	0.00	0.0	0.00
Kawakawa	16.3	0.44	16.3	1.05	0.0	0.00	0.0	0.00
Total all species:	3705.9	100.00	1555.5	41.97	2150.4	58.03	0.0	0.00

Table II.5.8

Tutuila August 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Jacks (misc)	47.0	0.36	0.0	0.00	47.0	1.81	0.0	0.00
Large barracuda	145.8	1.12	0.0	0.00	0.0	0.00	145.8	2.91
Small barracuda	45.4	0.35	0.0	0.00	45.4	1.75	0.0	0.00
Flyingfish	2.8	0.02	0.0	0.00	2.8	0.11	0.0	0.00
Groupers (misc)	69.5	0.53	0.0	0.00	69.5	2.67	0.0	0.00
Peacock grouper	71.0	0.55	0.0	0.00	71.0	2.73	0.0	0.00
Lunartail grouper	230.4	1.77	0.0	0.00	230.4	8.86	0.0	0.00
Blue lined snapper	180.1	1.38	0.0	0.00	180.1	6.93	0.0	0.00
Twinspot/red snapper	19.9	0.15	0.0	0.00	19.9	0.77	0.0	0.00
Humpback snapper	75.2	0.58	0.0	0.00	75.2	2.89	0.0	0.00
Gray jobfish	207.0	1.59	39.7	0.74	167.4	6.44	0.0	0.00
Opakapaka	110.6	0.85	0.0	0.00	110.6	4.26	0.0	0.00
Blue lined gindai	28.4	0.22	0.0	0.00	28.4	1.09	0.0	0.00
Onaga (longtail snappe	579.9	4.46	0.0	0.00	579.9	22.31	0.0	0.00
Ehu (squirrelfish snap	137.5	1.06	0.0	0.00	137.5	5.29	0.0	0.00
Emperors (misc)	289.2	2.22	0.0	0.00	289.2	11.13	0.0	0.00
Longnose emperor	102.1	0.78	0.0	0.00	102.1	3.93	0.0	0.00
Redgill emperor	212.7	1.63	0.0	0.00	212.7	8.18	0.0	0.00
Oilfish	202.0	1.55	0.0	0.00	119.1	4.58	82.9	1.65
Yellowfin surgeonfish	11.6	0.09	0.0	0.00	11.6	0.45	0.0	0.00
Unicornfishes (misc)	2.8	0.02	0.0	0.00	2.8	0.11	0.0	0.00
Mahimahi (dolphin)	1583.8	12.17	1468.0	27.18	0.0	0.00	115.8	2.31
Blue marlin	2675.5	20.56	790.8	14.64	0.0	0.00	1884.7	37.59
Sailfish	537.7	4.13	0.0	0.00	0.0	0.00	537.7	10.73
Rainbow runner	10.6	0.08	10.6	0.20	0.0	0.00	0.0	0.00
Wahoo	993.7	7.64	519.0	9.61	0.0	0.00	474.7	9.47
Skipjack tuna	911.9	7.01	911.9	16.88	0.0	0.00	0.0	0.00
Dogtooth tuna	300.1	2.31	203.7	3.77	96.4	3.71	0.0	0.00
Albacore	198.8	1.53	0.0	0.00	0.0	0.00	198.8	3.97
Yellowfin tuna	2928.7	22.51	1441.6	26.69	0.0	0.00	1487.2	29.66
Bigeye tuna	85.8	0.66	0.0	0.00	0.0	0.00	85.8	1.71
Kawakawa	15.9	0.12	15.9	0.29	0.0	0.00	0.0	0.00
Total all species:	13013.4	100.00	5401.2	41.50	2599.0	19.97	5013.4	38.52

Table II.5.9

Tutuila September 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Jacks (misc)	14.9	0.12	0.0	0.00	14.9	0.36	0.0	0.00
Large barracuda	228.5	1.91	121.8	1.56	106.7	2.56	0.0	0.00
Small barracuda	158.0	1.32	0.0	0.00	158.0	3.80	0.0	0.00
Groupers (misc)	145.2	1.21	0.0	0.00	145.2	3.49	0.0	0.00
Peacock grouper	57.6	0.48	0.0	0.00	57.6	1.38	0.0	0.00
Lunartail grouper	8.5	0.07	0.0	0.00	8.5	0.20	0.0	0.00
Blue lined snapper	971.4	8.13	0.0	0.00	971.4	23.35	0.0	0.00
Humpback snapper	102.5	0.86	0.0	0.00	102.5	2.46	0.0	0.00
Gray jobfish	666.1	5.57	0.0	0.00	666.1	16.01	0.0	0.00
Opakapaka	6.4	0.05	0.0	0.00	6.4	0.15	0.0	0.00
Lehi (silverjaw)	51.2	0.43	0.0	0.00	51.2	1.23	0.0	0.00
Onaga (longtail snappe	51.2	0.43	0.0	0.00	51.2	1.23	0.0	0.00
Emperors (misc)	1398.5	11.70	0.0	0.00	1398.5	33.61	0.0	0.00
Squirrelfish	19.2	0.16	0.0	0.00	19.2	0.46	0.0	0.00
Red snapper, mu	119.6	1.00	0.0	0.00	119.6	2.87	0.0	0.00
Mahimahi (dolphin)	1011.7	8.47	1011.7	12.99	0.0	0.00	0.0	0.00
Blue marlin	2229.8	18.66	2229.8	28.62	0.0	0.00	0.0	0.00
Rainbow runner	30.0	0.25	30.0	0.39	0.0	0.00	0.0	0.00
Wahoo	564.7	4.73	564.7	7.25	0.0	0.00	0.0	0.00
Skipjack tuna	2865.0	23.97	2865.0	36.78	0.0	0.00	0.0	0.00
Dogtooth tuna	284.0	2.38	0.0	0.00	284.0	6.83	0.0	0.00
Yellowfin tuna	966.9	8.09	966.9	12.41	0.0	0.00	0.0	0.00
Total all species:	11950.9	100.00	7789.9	65.18	4161.0	34.82	0.0	0.00

Table II.5.10

Tutuila October 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Jacks (misc)	9.6	0.21	9.6	0.32	0.0	0.00	0.0	0.00
Sharks	96.2	2.08	96.2	3.20	0.0	0.00	0.0	0.00
Groupers (misc)	44.1	0.95	0.0	0.00	44.1	12.78	0.0	0.00
Lunartail grouper	14.7	0.32	0.0	0.00	14.7	4.26	0.0	0.00
Gray jobfish	66.1	1.43	0.0	0.00	66.1	19.15	0.0	0.00
Emperors (misc)	220.3	4.77	0.0	0.00	220.3	63.82	0.0	0.00
Mahimahi (dolphin)	649.5	14.06	534.6	17.76	0.0	0.00	115.0	9.09
Blue marlin	96.2	2.08	96.2	3.20	0.0	0.00	0.0	0.00
Wahoo	233.0	5.04	233.0	7.74	0.0	0.00	0.0	0.00
Skipjack tuna	1147.3	24.84	1147.3	38.12	0.0	0.00	0.0	0.00
Dogtooth tuna	94.1	2.04	94.1	3.13	0.0	0.00	0.0	0.00
Yellowfin tuna	1948.5	42.18	798.7	26.54	0.0	0.00	1149.8	90.91
Total all species:	4619.6	100.00	3009.7	65.15	345.2	7.47	1264.8	27.38

Table II.5.11

Tutuila November 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Jacks (misc)	38.8	0.67	0.0	0.00	38.8	3.18	0.0	0.00
Small barracuda	40.4	0.70	0.0	0.00	40.4	3.31	0.0	0.00
Sharks	132.8	2.29	132.8	4.23	0.0	0.00	0.0	0.00
Groupers (misc)	40.4	0.70	0.0	0.00	40.4	3.31	0.0	0.00
Lunartail grouper	79.1	1.36	0.0	0.00	79.1	6.48	0.0	0.00
Blue lined snapper	130.8	2.26	0.0	0.00	130.8	10.71	0.0	0.00
Humpback snapper	90.4	1.56	0.0	0.00	90.4	7.40	0.0	0.00
Gray jobfish	234.2	4.04	0.0	0.00	234.2	19.18	0.0	0.00
Ehu (squirrelfish snap	43.6	0.75	0.0	0.00	43.6	3.57	0.0	0.00
Ambon emperor	523.3	9.03	0.0	0.00	523.3	42.86	0.0	0.00
Mahimahi (dolphin)	75.4	1.30	75.4	2.40	0.0	0.00	0.0	0.00
Wahoo	68.8	1.19	68.8	2.19	0.0	0.00	0.0	0.00
Skipjack tuna	3935.8	67.90	2786.2	88.68	0.0	0.00	1149.6	80.20
Yellowfin tuna	362.5	6.25	78.7	2.50	0.0	0.00	283.9	19.80
Total all species:	5796.3	100.00	3141.9	54.21	1221.0	21.07	1433.5	24.73

Table II.5.12

Tutuila December 1993
Offshore Creel Survey Species Composition

Common Name	Total all gears	% all gears	trolling	% this gear	bottom	% this gear	other	% this gear
Jacks (misc)	23.6	1.43	0.0	0.00	23.6	1.87	0.0	0.00
Small barracuda	45.7	2.77	0.0	0.00	45.7	3.62	0.0	0.00
Eels	31.5	1.91	0.0	0.00	31.5	2.49	0.0	0.00
Groupers (misc)	26.8	1.63	0.0	0.00	26.8	2.12	0.0	0.00
Lunartail grouper	18.9	1.15	0.0	0.00	18.9	1.50	0.0	0.00
Blue lined snapper	127.6	7.74	0.0	0.00	127.6	10.10	0.0	0.00
Humpback snapper	63.0	3.82	0.0	0.00	63.0	4.99	0.0	0.00
Gray jobfish	472.5	28.66	0.0	0.00	472.5	37.40	0.0	0.00
Onaga (longtail snappe	69.3	4.20	0.0	0.00	69.3	5.49	0.0	0.00
Ambon emperor	283.5	17.20	0.0	0.00	283.5	22.44	0.0	0.00
Sweepers	34.7	2.11	0.0	0.00	34.7	2.75	0.0	0.00
Red snapper, mu	15.8	0.96	0.0	0.00	15.8	1.25	0.0	0.00
Skipjack tuna	385.1	23.36	385.1	100.00	0.0	0.00	0.0	0.00
Dogtooth tuna	50.4	3.06	0.0	0.00	50.4	3.99	0.0	0.00
Total all species:	1648.4	100.00	385.1	23.36	1263.3	76.64	0.0	0.00

Figure II.5.1

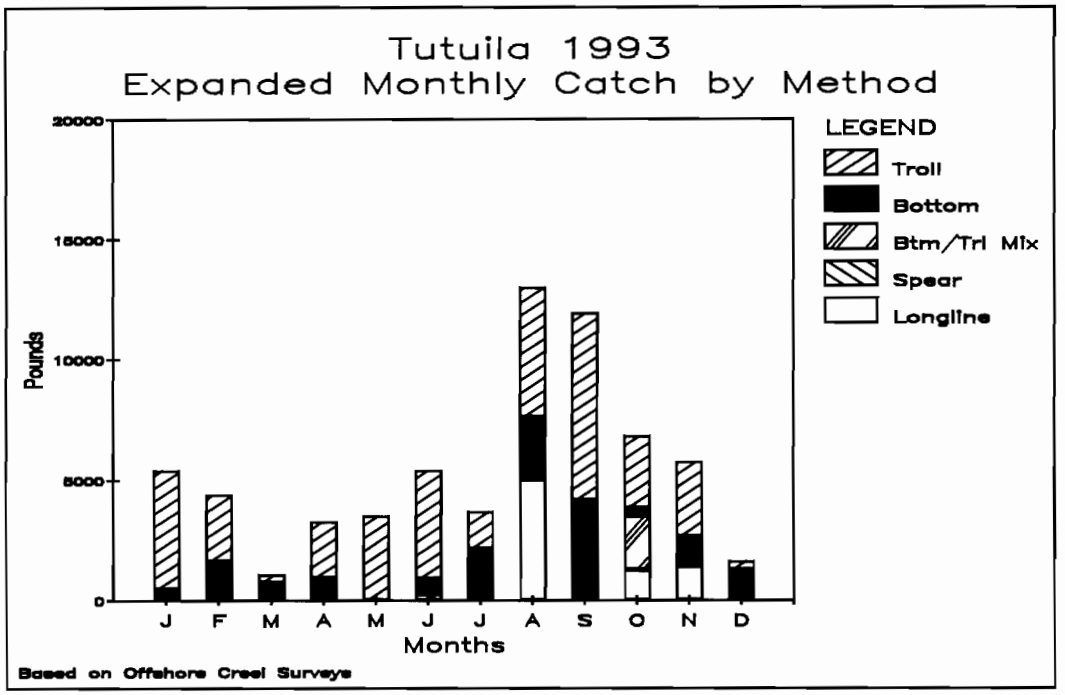


Figure II.5.2

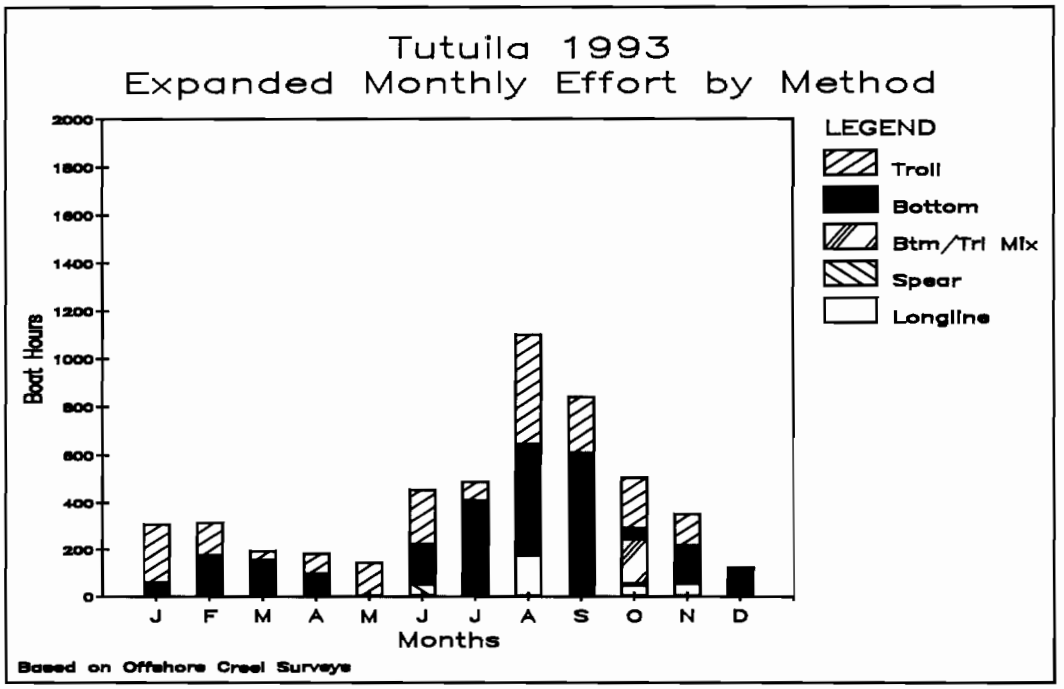
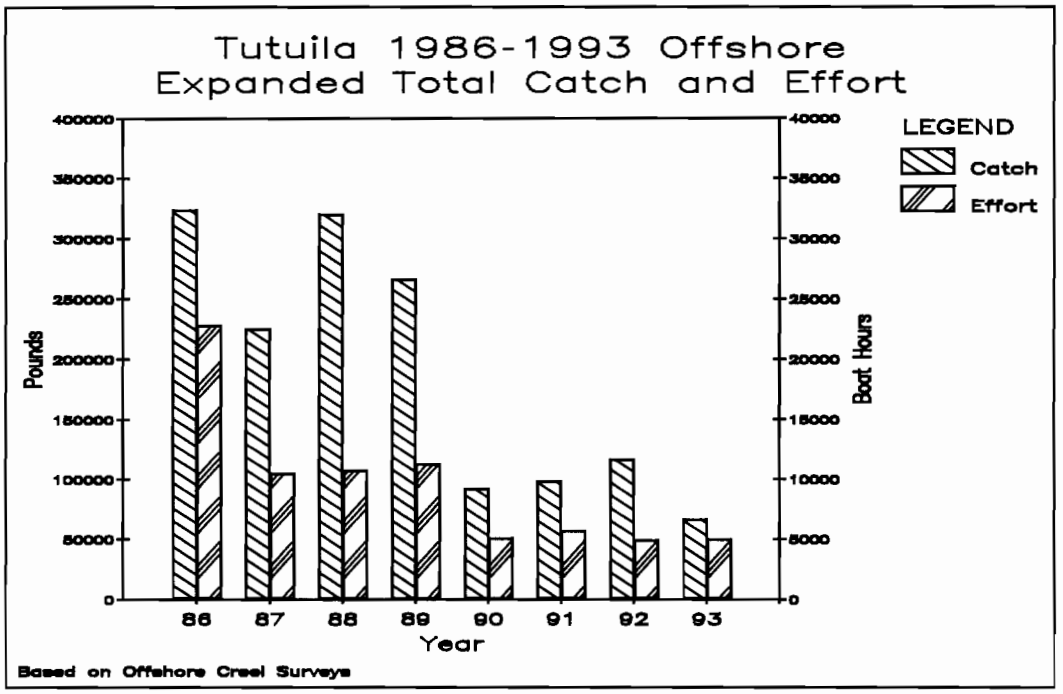


Figure II.5.3


Tutuila 1986-1993 Offshore
Expanded Total Catch and Effort
LEGEND
Catch
Effort
Pounds
Boat Hours
400000
350000
300000
250000
200000
150000
100000
50000
0
40000
35000
30000
25000
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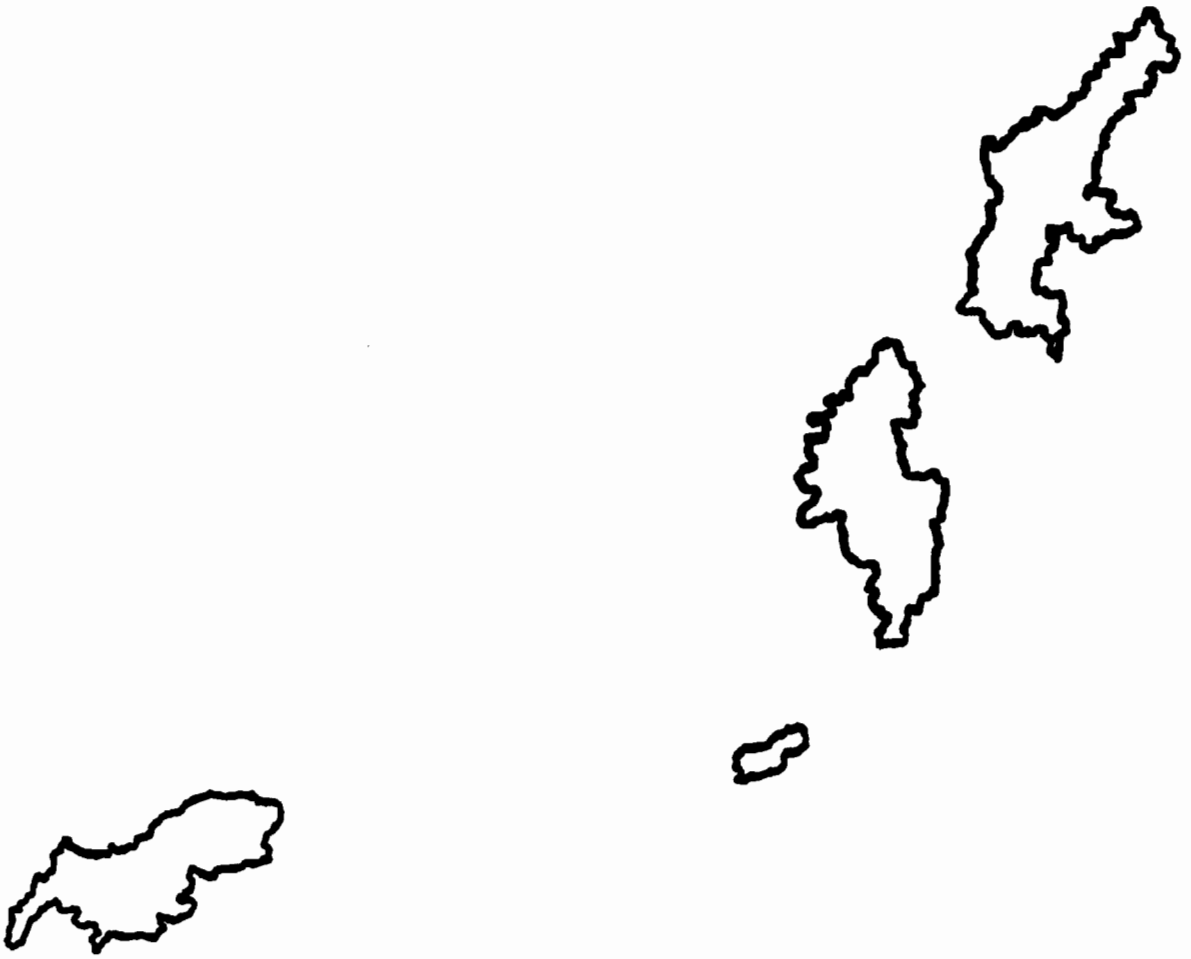
15000
10000
5000
0
86
87
88
89
90
91
92
93
Year
Based on Offshore Creel Surveys



COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

Fishery Statistics 1993

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS
1993 FISHERY STATISTICS

Compiled by

Division of Fish and Wildlife

and the

Western Pacific Fishery Information Network

April 1995

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III.1

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS
1993 FISHERY STATISTICS

INTRODUCTION

The Commonwealth of the Northern Mariana Islands (CNMI) comprises a string of islands located at about long. 145° E and extending northward from about lat. 14 to 21° N. About 99% of the approximately 21,000 inhabitants of the CNMI live on the three main islands, Saipan (87%), Rota (7%), and Tinian (5%). The Division of Fish and Wildlife (DFW) has been collecting fishery statistics on the commercial fishing fleet of Saipan since the mid-1970's. In 1983, DFW also began collecting information on vessels transshipping tuna out of Tinian. Significant improvements to the data collecting and processing systems were made in 1982 when microcomputer hardware, software, and training were provided by the WPACFIN program.

The major domestic commercial fishery of the CNMI is a small boat, one-day troll fishery. Most of the boats are 12- to 24-foot outboard-powered, runabout-type vessels; however, a few larger boats are also used. In the past few years, there has been a fairly rapid increase in the number of boats in the CNMI, about 70% of which are used in the commercial fisheries. Although trolling is by far the most common fishing method, many boats are also used for bottom fishing and reef fishing activities. Reef fish are an important component of the local diet and are a significant portion of the total commercial catch. Additionally, an increasing amount of reef fish is being imported from other Pacific islands to meet the local demand. In recent years, several larger boats have started fishing more intensively for bottom fish around the islands north of Saipan. The vast majority of the domestic catch is consumed locally, but there have been some exports of fish to Guam and Hawaii.

Beginning in 1983, fishing vessels from several nations began using the Tinian harbor as a port to off-load tuna catches to large transshipment vessels. In 1993, transshipments out of Tinian totaled a little over 20,000 metric tons, of which 88% were made by 11 U.S. registered purse seiners.

DATA COLLECTING SYSTEM

The principal method used by DFW to collect domestic commercial fisheries data is a dealer invoicing system, sometimes referred to as a "trip ticket" system. The DFW provides numbered two-part invoices to all purchasers of fresh fishery products, including hotels, restaurants, stores, fish markets, and roadside vendors. Dealers complete an invoice each time they purchase

fish directly from fishermen. They keep one copy for their records and provide one copy to DFW. Some advantages of this method of data collection are that it is relatively inexpensive to implement and maintain, nearly complete coverage of the commercial fisheries is fairly easy to accomplish, and DFW can provide feedback to dealers and fishermen to ensure data accuracy and continued cooperation. Disadvantages include a dependence on non-DFW personnel to identify the catch and record the data, the types of data that can be collected are somewhat restricted, education and cooperation of all fish purchasers are required, and only the fish that are actually sold to dealers are recorded and a potentially important portion of the total landings is unrecorded. Since 1982, DFW has tried to minimize these disadvantages as much as possible by maintaining a close working relationship with dealers, by educating and adding new dealers to their list as they enter the business, and by implementing a creel survey to help estimate total catch, including recreational and subsistence catch.

The current system collects data from dealers on the island of Saipan, where DFW estimates over 90% of all CNMI commercial landings are made. The DFW further estimates that the proportion of total commercial landings that is recorded in the data base for Saipan since 1983 is over 90%.

Information collected for each commercial purchase of fish from the fishermen includes the following:

Date
Buyer's name (dealer)
Seller's name (fisherman)
Species
Weight (pounds)
Price per pound
Value
Invoice number

All of these data elements are collected for all purchases of fishery products; however, species identification is frequently made only to a group level, especially for reef fish.

DATA PROCESSING SYSTEM

At the beginning of each month, a DFW employee visits each of the dealers on Saipan to obtain the previous month's invoices, resolve problems, and answer any questions the dealer may have. The invoices are returned to the office for an initial visual edit during the coding process, and are then entered into the "Purchase" data base on the microcomputer. After the records are entered, reports are generated to help verify that all data were entered correctly. On a quarterly basis, copies of the data base are sent to the Honolulu Laboratory, where the data are transferred to the central computer for additional editing and

verification before generation of summary reports. These reports and databases are then ready for use by qualified WPACFIN participants.

DATA REPORTING SYSTEM

After all editing and quality control activities have been accomplished, monthly and annual summary reports by species are generated. Each of the following reports for 1993 contains information on the pounds, value and the average price per pound. Each monthly report contains a subtotal for the sum of all species for that month, and the December report also includes the annual total. Annual reports contain the total landings for each species and the total recorded landings for all species for the calendar year.

The following species, species groups, and abbreviations are used in the tables and graphs of CNMI's data:

I. Pelagic Management Unit Species (PMUS)

- Mahimahi (dolphin)
- Marlin
- Shortbill spearfish
- Sailfish
- Wahoo
- Sharks

II. Bottomfish Management Unit Species (BMUS)

- Jacks (unclassified, but excluding bigeye scad)
- Bottom fish (unclassified)
- Ehu (red snapper)
- Gindai (flower snapper)
- Grouper (unclassified)
- Kalikali (pink snapper)
- Lehi (silverjaw snapper)
- Onaga (red or longtail snapper)
- Opakapaka (pink snapper)
- Uku (gray snapper)
- Emperorfish

III. Billfish

- Marlin (probably all blue marlin but could also include the rarely landed striped and black marlin)
- Shortbill spearfish
- Sailfish

IV. Tunas

- Tunas (unclassified)
- Skipjack tuna
- Yellowfin tuna

Dogtooth tuna

V. Other Tuna

The above tunas excluding skipjack and yellowfin tuna

VI. Fisheries Categories

A. Pelagics

All PMUS and tuna species plus the following:
Troll fish (unclassified)
Barracuda
Rainbow runner

B. Bottom Fish

Same as BMUS

C. Reef Fish

Reef fish (unclassified)
Giant wrasse
Rabbitfish (hitting, hitting feda, menahac, and sesjun)
Rudderfish
Squirrelfish
Parrotfish
Snapper
Surgeonfish
Unicornfish
Goatfish

D. Other

Miscellaneous
Bigeye scad
Mullet
Eels
Milkfish
Invertebrates (unclassified)
Crabs (unclassified)
Coconut crab
Lobster
Shrimp
Octopus
Squid
Turtle
Seaweeds
Imported

Table III.1.1

CNMI 1993 Commercial Landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	3,777	8,472	2.24
Jacks	363	923	2.54
Bottom fish	5,644	15,345	2.72
Gindai (flower snap)	186	731	3.94
Grouper	917	2,601	2.84
Onaga (red snapper)	474	2,077	4.38
Opakapaka (pink snp)	718	2,127	2.96
Reef fish	118,444	289,522	2.44
Wrasse	346	1,008	2.91
Rabbitfish (hitting)	1,283	2,814	2.19
Rudderfish (guilli)	138	341	2.48
Emperor (mafute)	6,467	13,506	2.09
Squirrelfish	15	30	2.00
Parrotfish	9,749	17,485	1.79
Surgeonfish	1,867	3,487	1.87
Unicornfish	24	51	2.09
Goatfish	647	1,348	2.08
Troll fish	16,232	26,825	1.65
Barracuda	27	54	2.00
Mahimahi (dolphin)	30,036	47,784	1.59
Marlin	2,950	3,036	1.03
Spearfish	309	378	1.22
Sailfish	96	241	2.50
Rainbow runner	644	1,156	1.80
Wahoo	2,257	4,277	1.89
Tunas	833	1,387	1.67
Skipjack tuna	77,832	133,203	1.71
Dogtooth tuna	1,979	4,285	2.17
Yellowfin tuna	11,919	26,510	2.22
Invertebrates	101	629	6.23
Lobster	2,393	10,769	4.50
Octopus	79	144	1.81
** TOTAL **	298,747	622,546	2.08

Table III.1.2

CNMI January 1993 Commercial Landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	50	175	3.50
Bottom fish	76	366	4.82
Grouper	10	40	4.00
Onaga (red snapper)	22	132	6.00
Reef fish	9,653	20,837	2.16
Rabbitfish (hitting)	74	204	2.76
Emperor (mafute)	140	420	3.00
Squirrelfish	15	30	2.00
Parrotfish	209	546	2.62
Surgeonfish	2	4	2.00
Unicornfish	20	40	2.00
Goatfish	20	65	3.25
Troll fish	2,279	4,002	1.76
Mahimahi (dolphin)	5,767	10,855	1.88
Marlin	88	110	1.25
Spearfish	91	160	1.75
Sailfish	37	93	2.50
Rainbow runner	241	381	1.58
Wahoo	144	366	2.54
Tunas	644	1,108	1.72
Skipjack tuna	3,780	8,129	2.15
Yellowfin tuna	1,658	4,181	2.52
Lobster	41	144	3.55
** SUBTOTAL **	25,061	52,386	2.09

Table III.1.3

CNMI February 1993 Commercial Landings

Species	Pounds	Value	$/lb
Bottom fish	631	1,876	2.97
Gindai (flower snap)	30	210	7.00
Grouper	239	664	2.78
Onaga (red snapper)	20	120	6.00
Opakapaka (pink snp)	18	126	7.00
Reef fish	8,909	18,464	2.07
Rabbitfish (hitting)	257	687	2.67
Emperor (mafute)	950	1,900	2.00
Parrotfish	129	472	3.68
Troll fish	1,951	3,646	1.87
Mahimahi (dolphin)	9,484	15,098	1.59
Spearfish	218	218	1.00
Rainbow runner	2	4	1.75
Wahoo	85	225	2.65
Tunas	86	151	1.75
Skipjack tuna	3,587	7,668	2.14
Dogtooth tuna	124	155	1.25
Yellowfin tuna	372	969	2.61
Lobster	133	412	3.09
** SUBTOTAL **	27,224	53,065	1.95

Table III.1.4

CNMI March 1993 Commercial Landings

Species	Pounds	Value	$/lb
Bottom fish	192	480	2.50
Onaga (red snapper)	53	185	3.50
Reef fish	6,972	13,412	1.92
Rabbitfish (hitting)	95	168	1.76
Parrotfish	202	648	3.21
Surgeonfish	87	148	1.70
Troll fish	136	340	2.50
Mahimahi (dolphin)	8,540	12,210	1.43
Rainbow runner	40	104	2.60
Wahoo	200	343	1.72
Skipjack tuna	10,606	20,717	1.95
Dogtooth tuna	103	256	2.50
Yellowfin tuna	1,740	3,087	1.77
Lobster	224	723	3.23
** SUBTOTAL **	29,189	52,820	1.81

Table III.1.5

CNMI April 1993 Commercial Landings

Species	Pounds	Value	$/lb
Jacks	51	76	1.50
Bottom fish	129	334	2.60
Grouper	102	460	4.50
Opakapaka (pink snp)	19	65	3.50
Reef fish	9,277	21,875	2.36
Rabbitfish (hitting)	42	77	1.86
Emperor (mafute)	1,782	3,572	2.01
Parrotfish	142	417	2.95
Goatfish	22	46	2.15
Troll fish	309	642	2.08
Mahimahi (dolphin)	3,649	4,948	1.36
Rainbow runner	145	166	1.15
Wahoo	710	1,318	1.86
Skipjack tuna	8,173	13,645	1.67
Dogtooth tuna	139	269	1.93
Yellowfin tuna	1,490	3,510	2.36
Lobster	143	620	4.35
Octopus	4	12	3.00
** SUBTOTAL **	26,325	52,050	1.98

Table III.1.6

CNMI May 1993 Commercial Landings

Species	Pounds	Value	$/lb
Jacks	21	78	3.69
Bottom fish	470	1,302	2.77
Onaga (red snapper)	9	45	5.00
Reef fish	8,304	20,084	2.42
Rabbitfish (hitting)	23	42	1.80
Emperor (mafute)	1,320	2,664	2.02
Parrotfish	33	97	2.94
Troll fish	4,216	6,581	1.56
Mahimahi (dolphin)	827	1,438	1.74
Rainbow runner	52	125	2.40
Wahoo	335	590	1.76
Tunas	32	40	1.25
Skipjack tuna	5,351	8,140	1.52
Dogtooth tuna	94	201	2.14
Yellowfin tuna	588	1,180	2.01
Lobster	70	261	3.73
** SUBTOTAL **	21,744	42,868	1.97

Table III.1.7

CNMI June 1993 Commercial Landings

Species	Pounds	Value	$/lb
Jacks	3	68	27.00
Bottom fish	828	2,389	2.89
Gindai (flower snap)	13	35	2.68
Grouper	89	222	2.50
Opakapaka (pink snp)	353	798	2.26
Reef fish	13,659	34,280	2.51
Wrasse	316	948	3.00
Rabbitfish (hitting)	110	220	2.00
Emperor (mafute)	1,596	3,192	2.00
Parrotfish	412	852	2.07
Surgeonfish	252	504	2.00
Troll fish	135	311	2.31
Mahimahi (dolphin)	30	83	2.80
Marlin	141	211	1.50
Rainbow runner	28	48	1.73
Wahoo	40	87	2.17
Skipjack tuna	8,271	12,350	1.49
Yellowfin tuna	1,586	3,458	2.18
Lobster	143	516	3.60
** SUBTOTAL **	28,002	60,571	2.16

Table III.1.8

CNMI July 1993 Commercial Landings

Species	Pounds	Value	$/lb
Jacks	93	245	2.63
Bottom fish	1,287	3,222	2.50
Gindai (flower snap)	37	120	3.23
Onaga (red snapper)	79	340	4.30
Opakapaka (pink snp)	24	84	3.50
Reef fish	8,676	22,018	2.54
Rabbitfish (hitting)	127	273	2.14
Emperor (mafute)	87	198	2.29
Parrotfish	1,700	2,628	1.55
Surgeonfish	532	970	1.83
Goatfish	43	65	1.50
Troll fish	290	533	1.84
Mahimahi (dolphin)	49	92	1.86
Marlin	1,416	1,521	1.07
Rainbow runner	33	87	2.68
Wahoo	152	280	1.84
Tunas	20	25	1.25
Skipjack tuna	11,937	18,844	1.58
Dogtooth tuna	96	120	1.25
Yellowfin tuna	972	1,800	1.85
Lobster	51	177	3.47
** SUBTOTAL **	27,700	53,639	1.94

Table III.1.9

CNMI August 1993 Commercial Landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	3,030	6,825	2.25
Jacks	61	153	2.50
Bottom fish	378	952	2.52
Onaga (red snapper)	34	125	3.68
Opakapaka (pink snp)	180	634	3.52
Reef fish	9,541	25,572	2.68
Rabbitfish (hitting)	156	351	2.26
Rudderfish (guilli)	131	328	2.50
Emperor (mafute)	552	1,437	2.61
Parrotfish	1,234	2,093	1.70
Surgeonfish	660	1,282	1.94
Unicornfish	4	11	2.50
Goatfish	78	188	2.41
Marlin	463	356	0.77
Sailfish	59	149	2.50
Rainbow runner	12	36	3.00
Wahoo	25	63	2.50
Skipjack tuna	6,520	10,562	1.62
Yellowfin tuna	808	1,968	2.44
Lobster	168	532	3.17
Octopus	15	23	1.50
** SUBTOTAL **	24,109	53,638	2.22

Table III.1.10

CNMI September 1993 Commercial Landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	472	948	2.01
Jacks	67	143	2.13
Bottom fish	971	2,581	2.66
Grouper	58	145	2.50
Onaga (red snapper)	193	738	3.82
Opakapaka (pink snp)	34	97	2.85
Reef fish	12,128	28,437	2.34
Rabbitfish (hitting)	176	336	1.91
Rudderfish (guilli)	6	13	2.00
Emperor (mafute)	41	123	3.00
Parrotfish	1,733	3,194	1.84
Surgeonfish	335	580	1.73
Goatfish	53	131	2.47
Troll fish	727	1,121	1.54
Barracuda	11	22	2.00
Mahimahi (dolphin)	27	57	2.10
Rainbow runner	20	59	2.90
Wahoo	131	211	1.61
Skipjack tuna	6,158	10,648	1.73
Dogtooth tuna	122	189	1.56
Yellowfin tuna	735	1,674	2.28
Invertebrates	101	629	6.23
Lobster	1,299	6,933	5.34
Octopus	57	104	1.83
** SUBTOTAL **	25,655	59,111	2.30

Table III.1.11

CNMI October 1993 Commercial Landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	158	356	2.25
Jacks	24	60	2.50
Bottom fish	628	1,665	2.65
Gindai (flower snap)	48	168	3.50
Grouper	146	366	2.50
Opakapaka (pink snp)	23	69	3.00
Reef fish	11,155	29,957	2.69
Rabbitfish (hitting)	160	331	2.07
Parrotfish	1,571	2,578	1.64
Goatfish	142	262	1.85
Troll fish	242	363	1.50
Barracuda	16	32	2.00
Mahimahi (dolphin)	89	160	1.79
Marlin	622	727	1.17
Rainbow runner	12	29	2.50
Wahoo	35	78	2.21
Tunas	25	31	1.25
Skipjack tuna	9,379	14,940	1.59
Dogtooth tuna	278	618	2.22
Yellowfin tuna	872	2,174	2.49
Lobster	94	284	3.02
Octopus	3	5	1.50
** SUBTOTAL **	25,721	55,251	2.15

Table III.1.12

CNMI November 1993 Commercial Landings

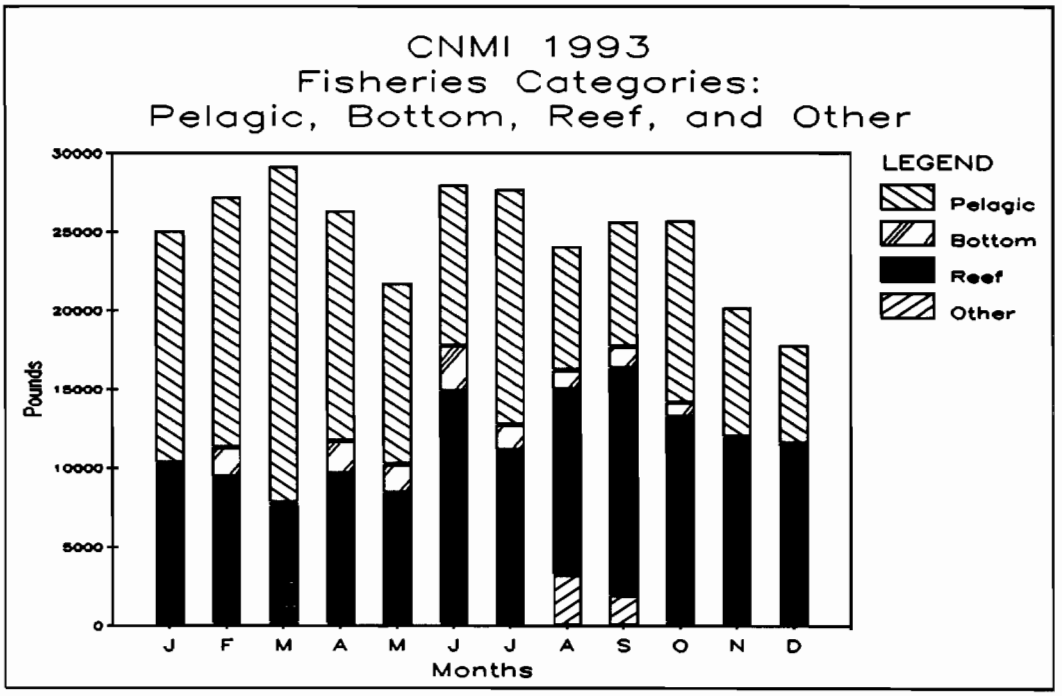
Species	Pounds	Value	$/lb
Bigeye scad (atulai)	67	168	2.53
Jacks	13	32	2.50
Bottom fish	42	137	3.25
Gindai (flower snap)	56	194	3.50
Onaga (red snapper)	42	267	6.39
Opakapaka (pink snp)	68	255	3.75
Reef fish	11,223	31,813	2.83
Wrasse	30	60	2.00
Parrotfish	177	448	2.53
Goatfish	245	501	2.05
Troll fish	2,923	4,411	1.51
Mahimahi (dolphin)	639	957	1.50
Marlin	220	110	0.50
Rainbow runner	40	70	1.73
Wahoo	358	617	1.72
Tunas	25	31	1.25
Skipjack tuna	2,681	4,592	1.71
Dogtooth tuna	337	774	2.29
Yellowfin tuna	966	2,235	2.31
Lobster	26	159	6.24
** SUBTOTAL **	20,176	47,832	2.37

Table III.1.13

CNMI December 1993 Commercial Landings

Species	Pounds	Value	$/lb
Jacks	31	70	2.25
Bottom fish	13	42	3.25
Gindai (flower snap)	2	4	2.00
Grouper	273	705	2.58
Onaga (red snapper)	23	125	5.56
Reef fish	8,949	22,773	2.54
Rabbitfish (hitting)	63	126	2.00
Parrotfish	2,209	3,511	1.59
Goatfish	46	91	2.00
Troll fish	3,025	4,877	1.61
Mahimahi (dolphin)	935	1,888	2.02
Rainbow runner	19	48	2.50
Wahoo	43	100	2.33
Skipjack tuna	1,391	2,969	2.13
Dogtooth tuna	687	1,703	2.48
Yellowfin tuna	131	274	2.09
Lobster	3	9	3.75
** SUBTOTAL **	17,840	39,315	2.20
** TOTAL **	298,747	622,546	2.08

Figure III.1.1



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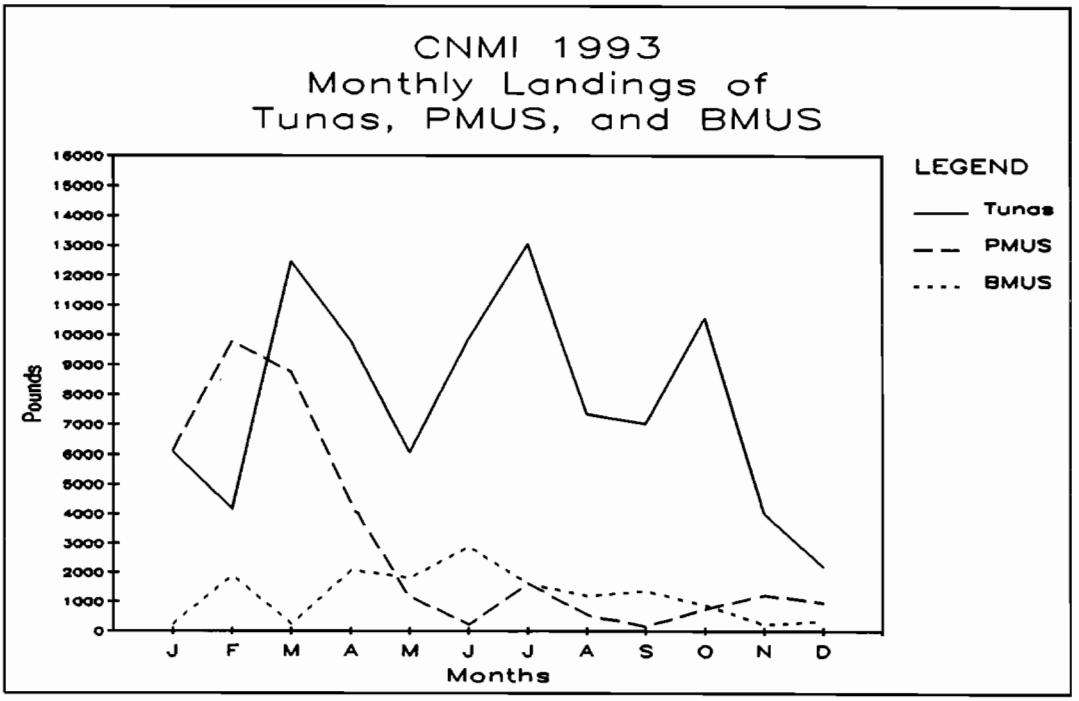

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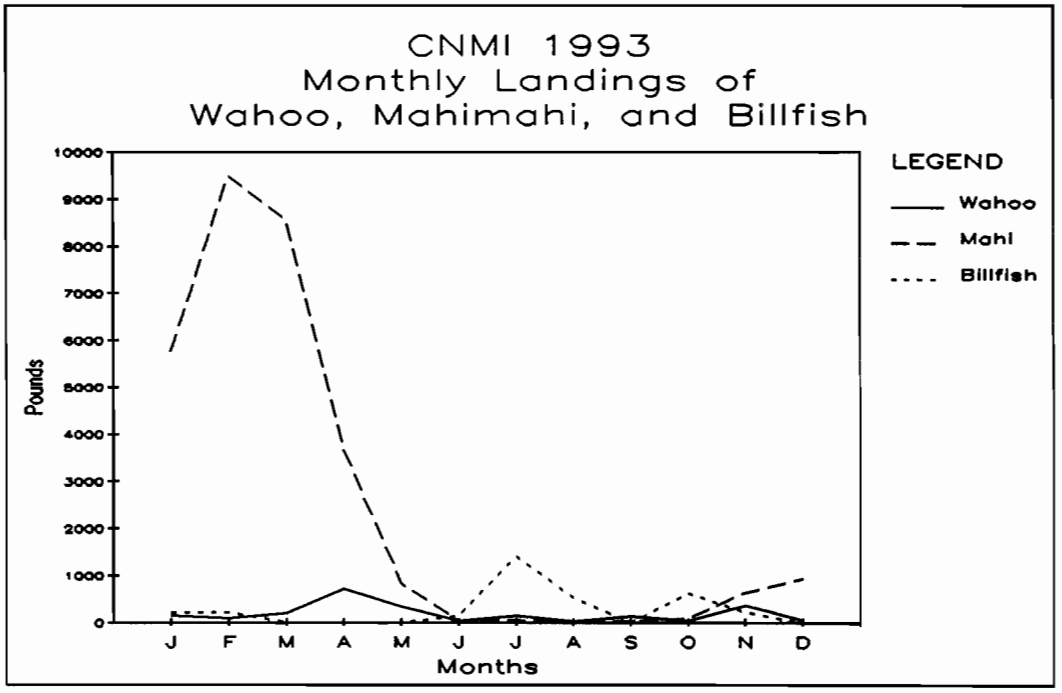

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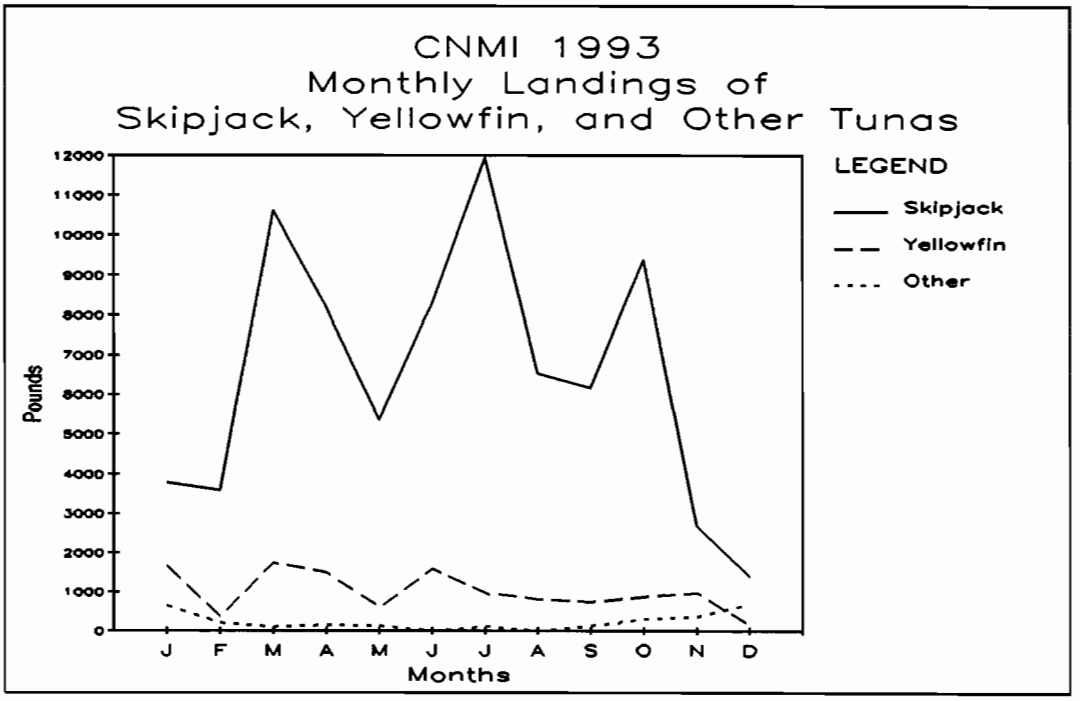

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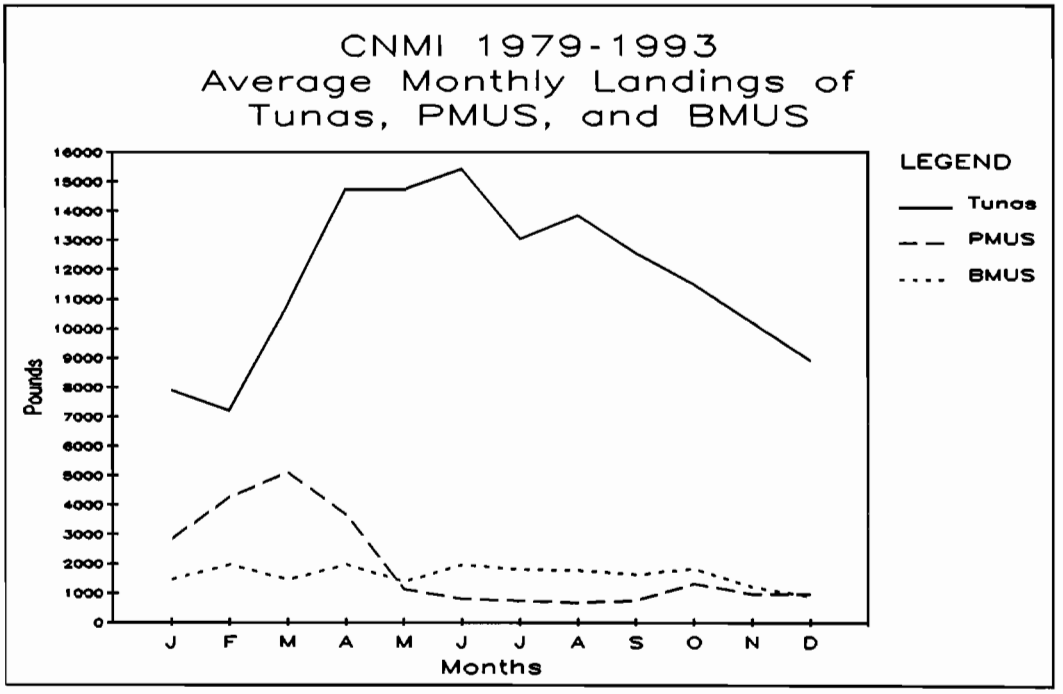

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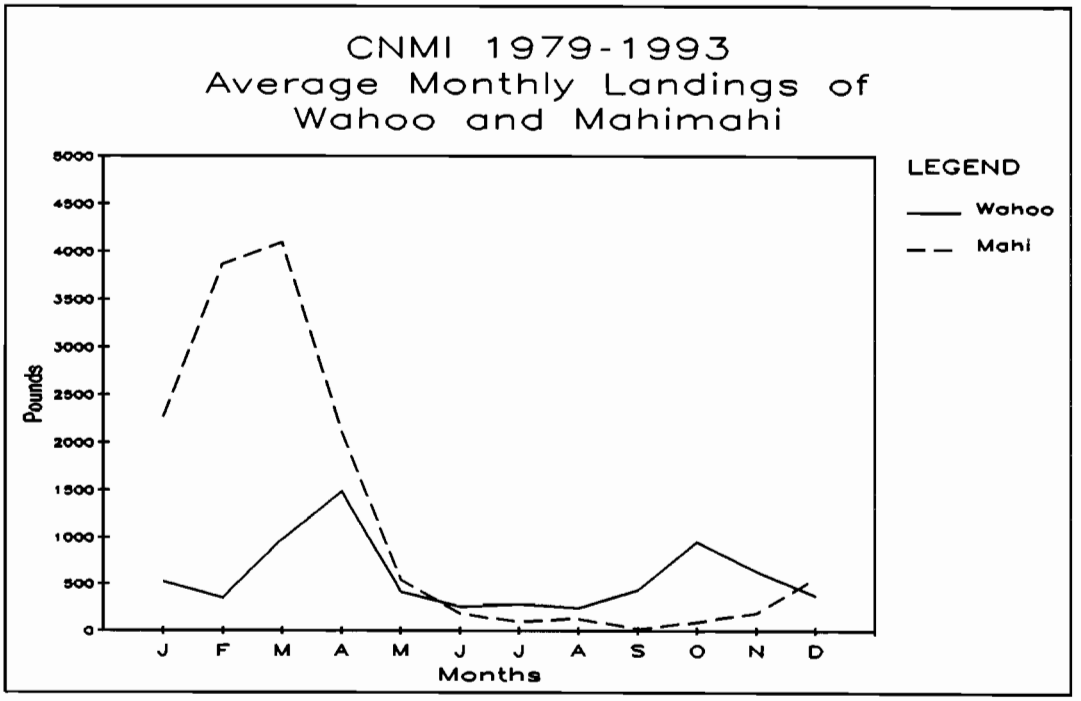

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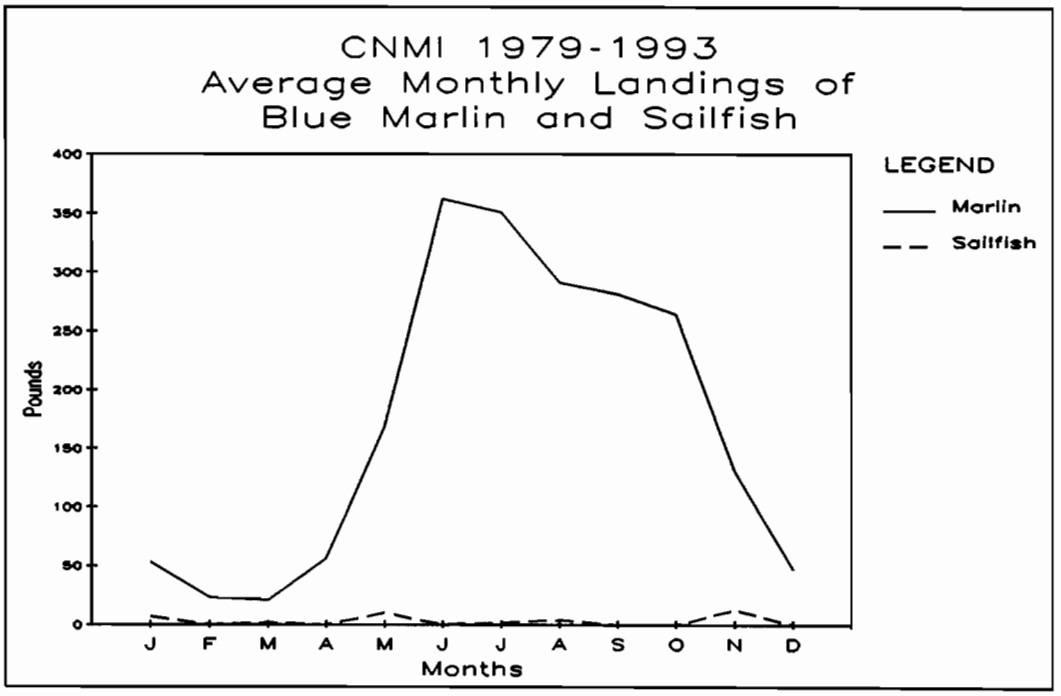

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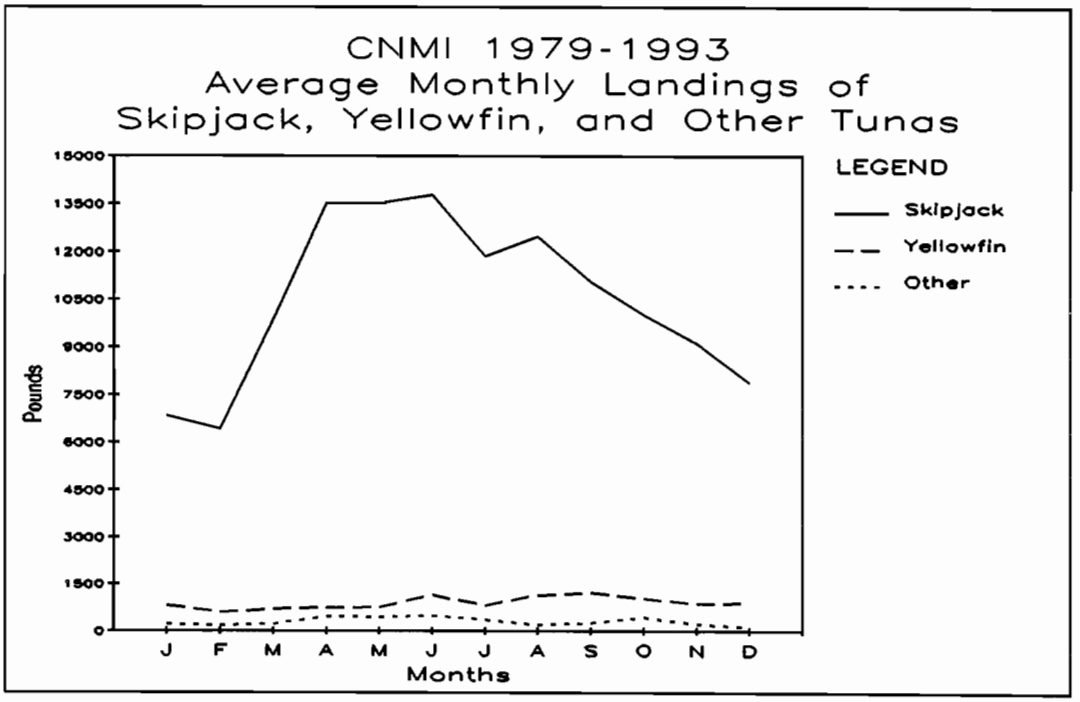

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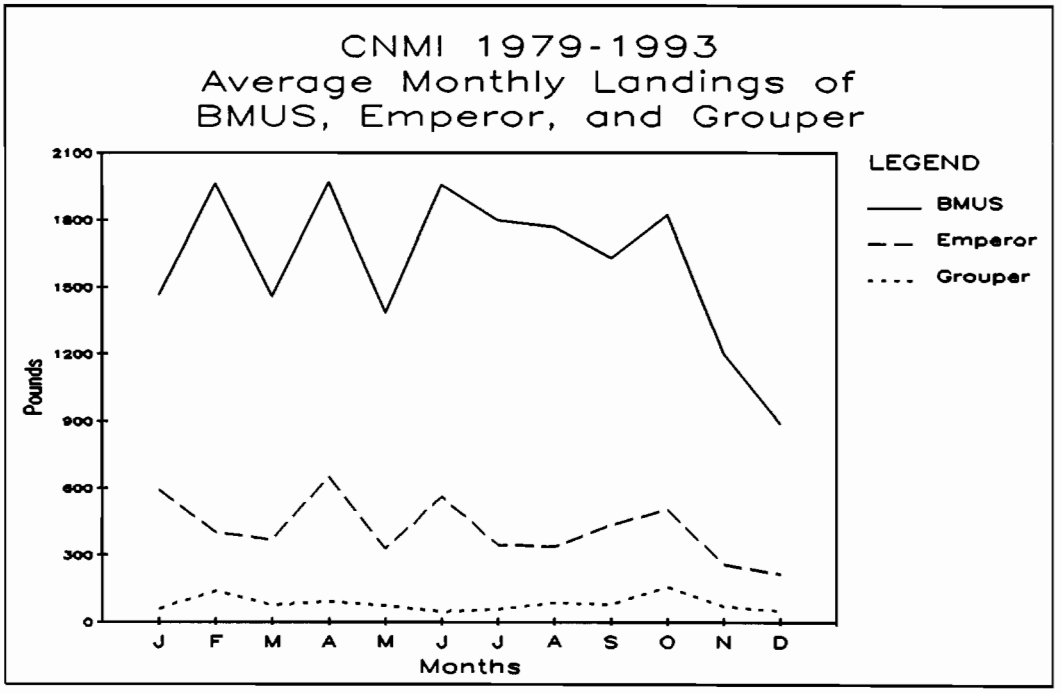

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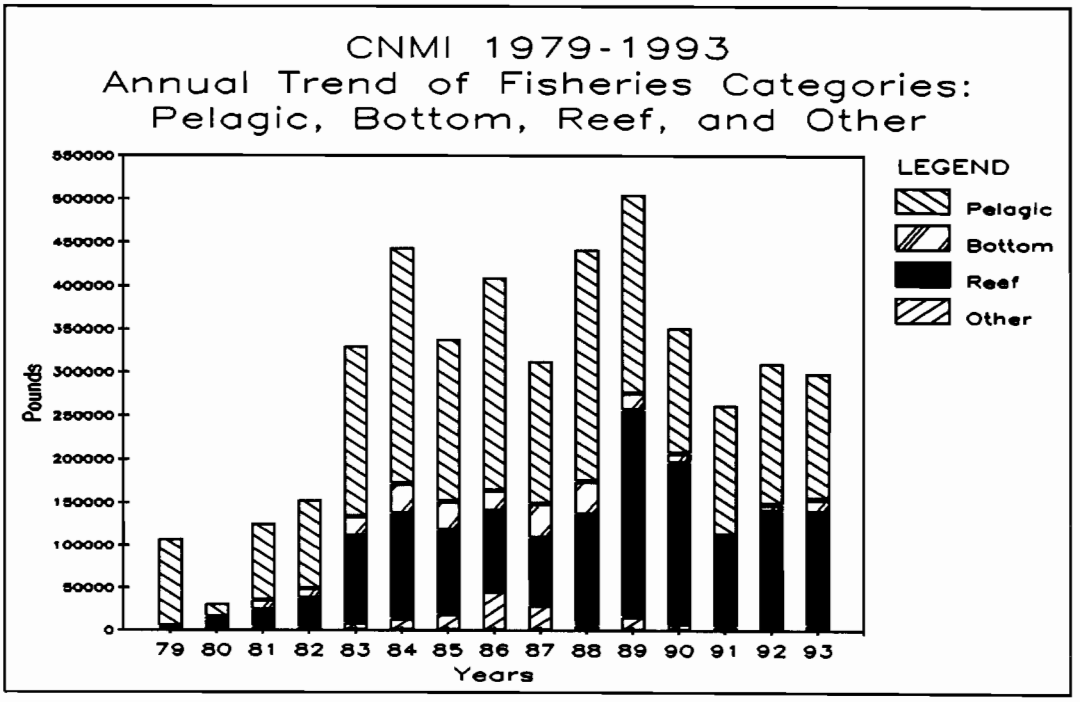

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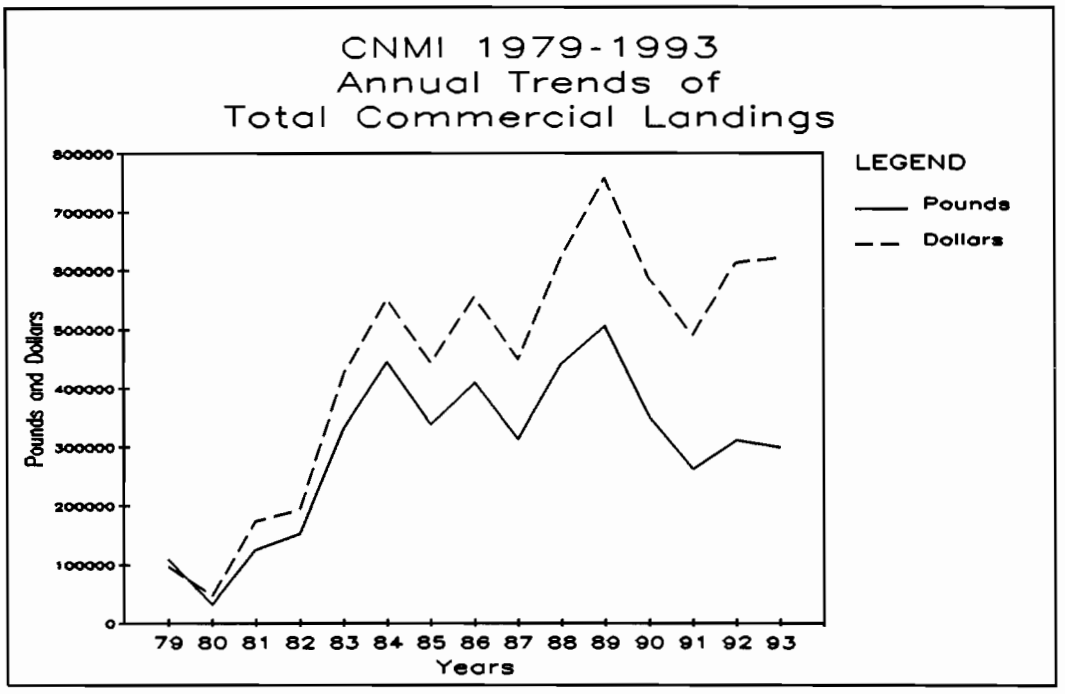

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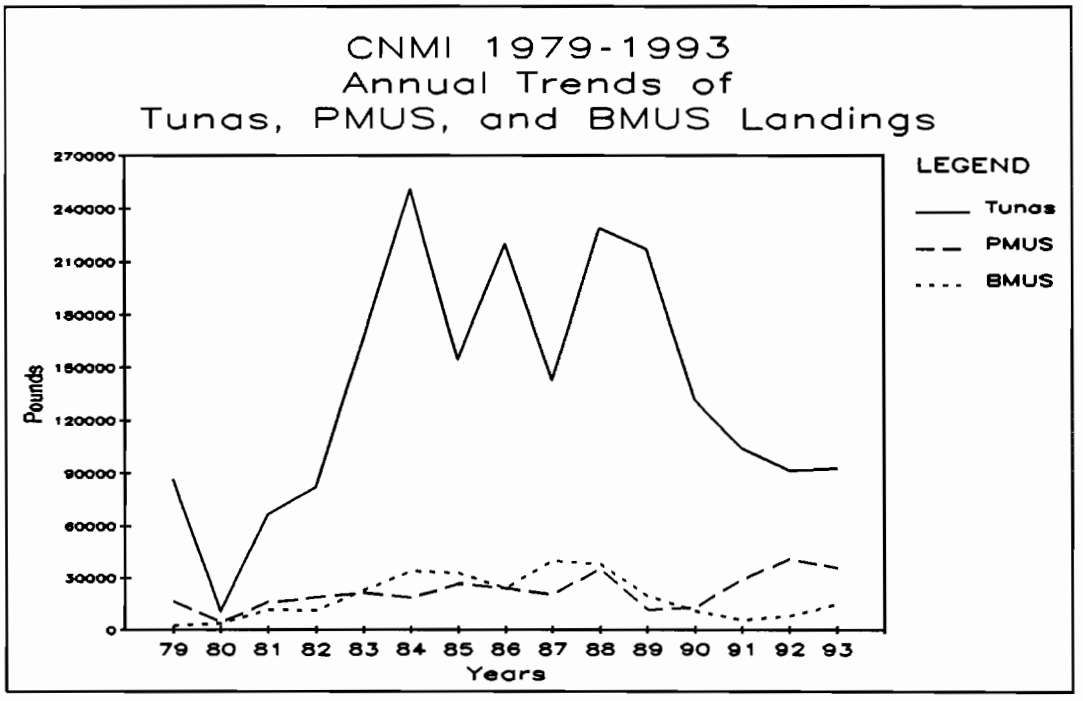

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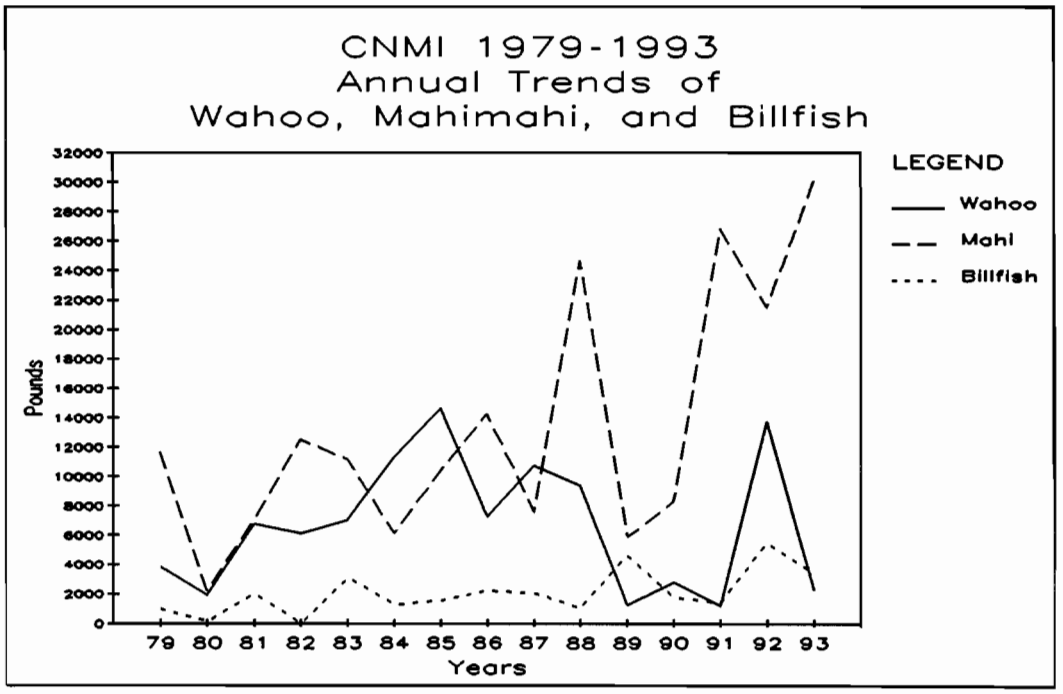

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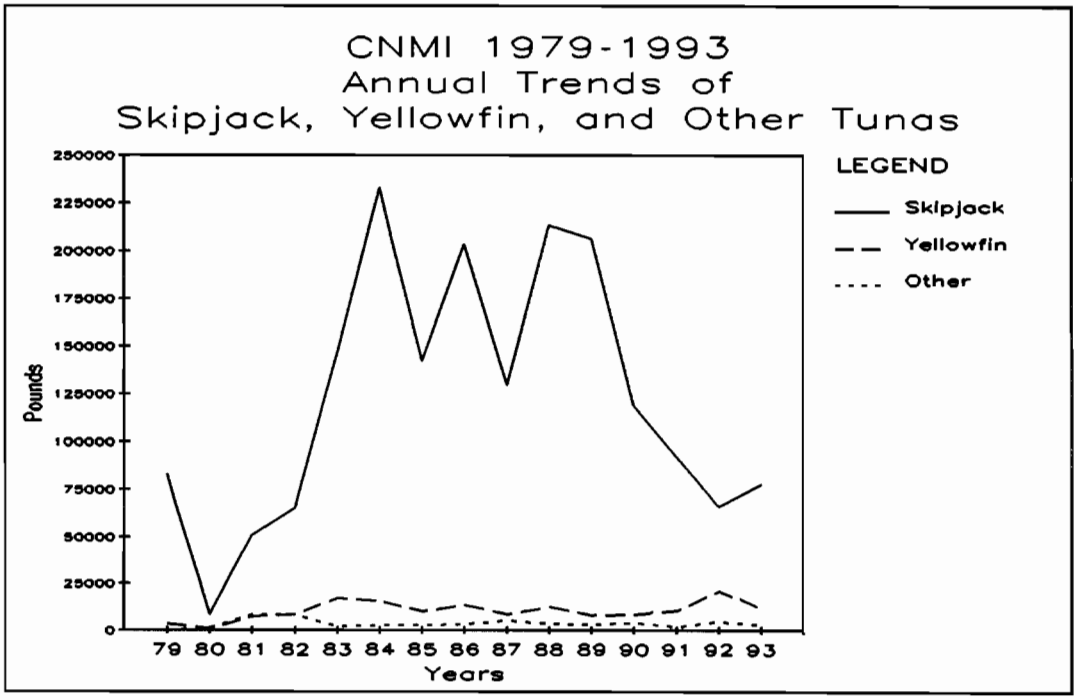

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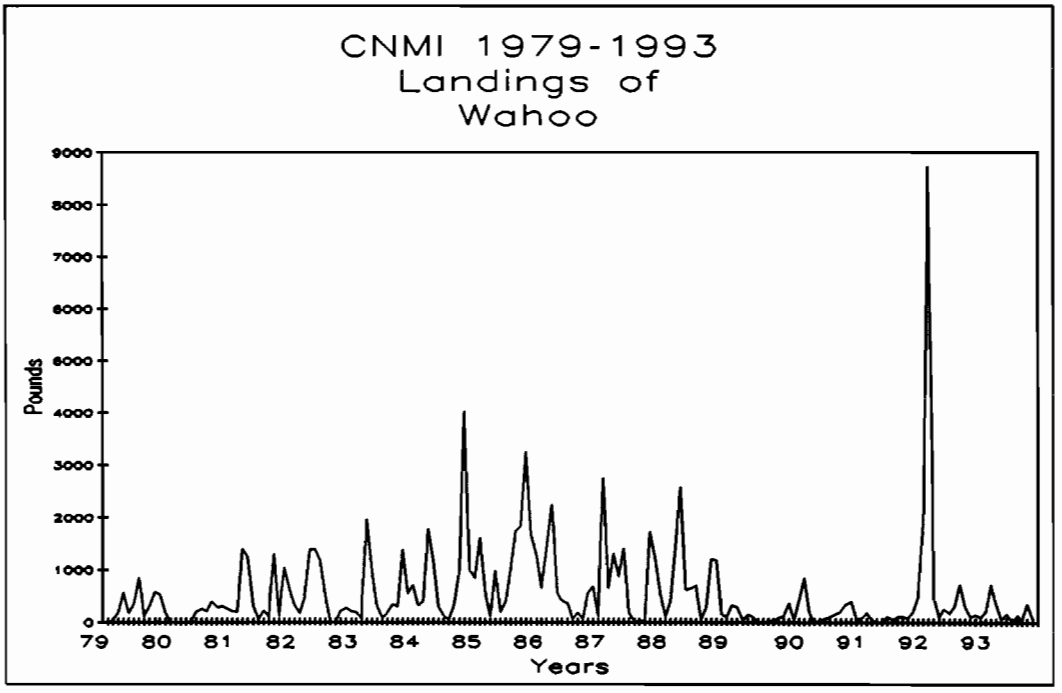

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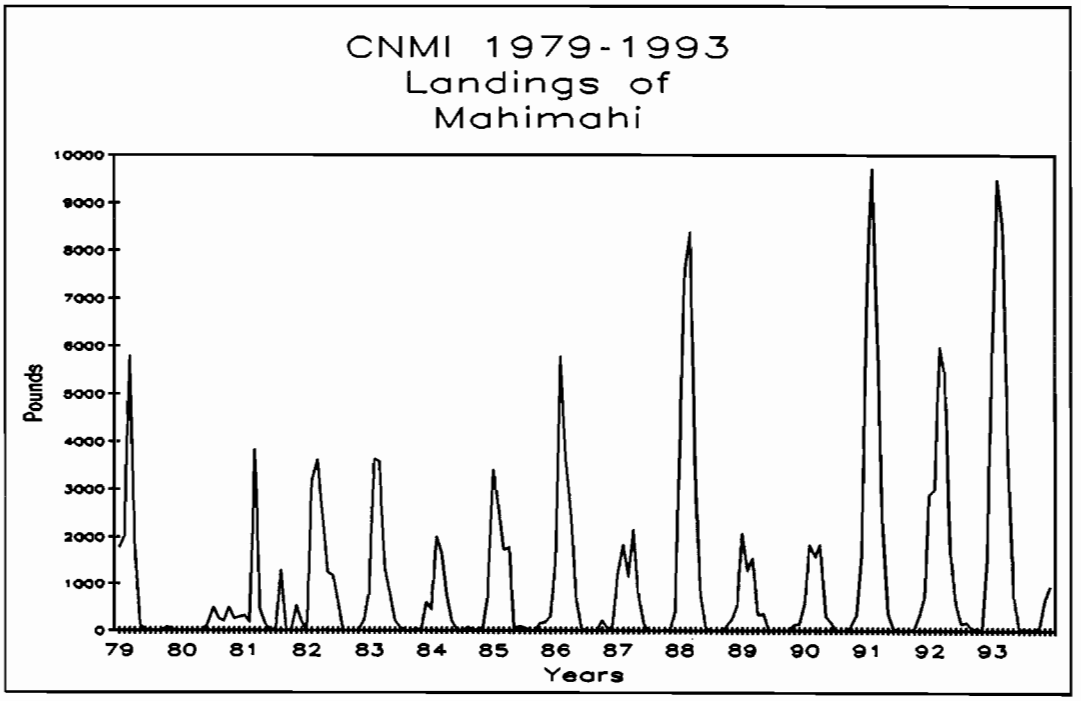

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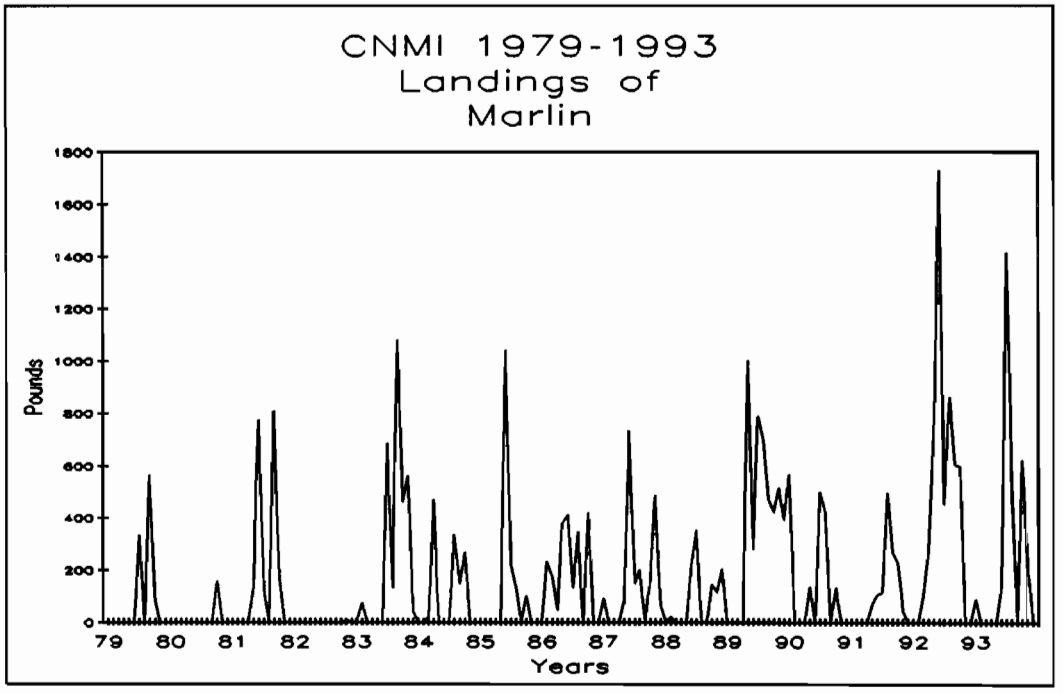

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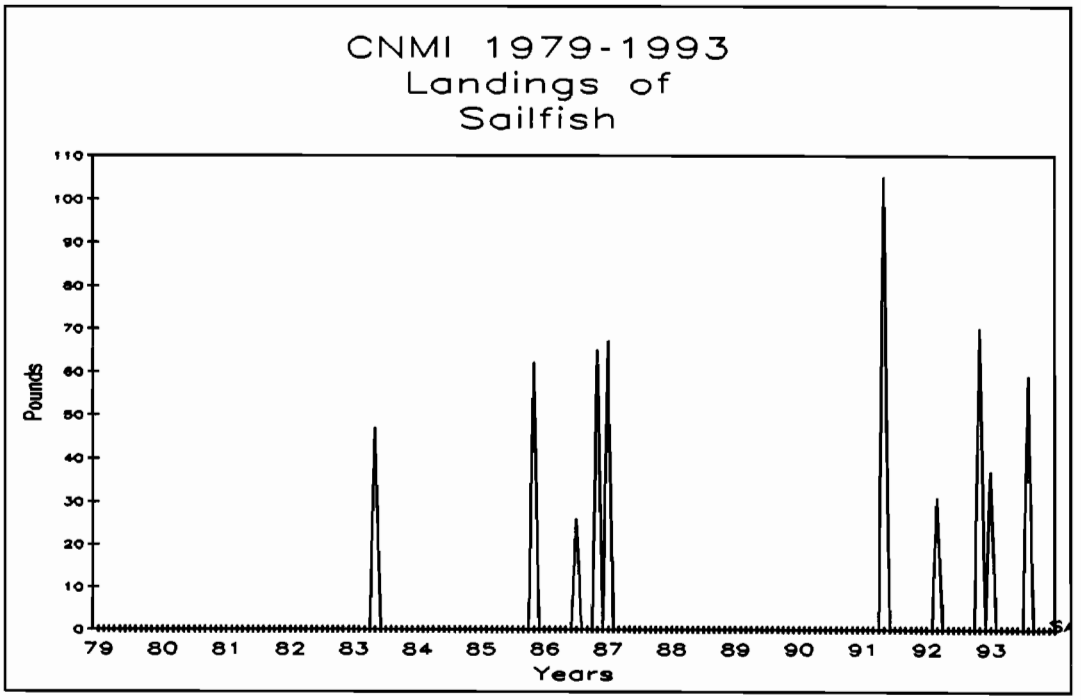

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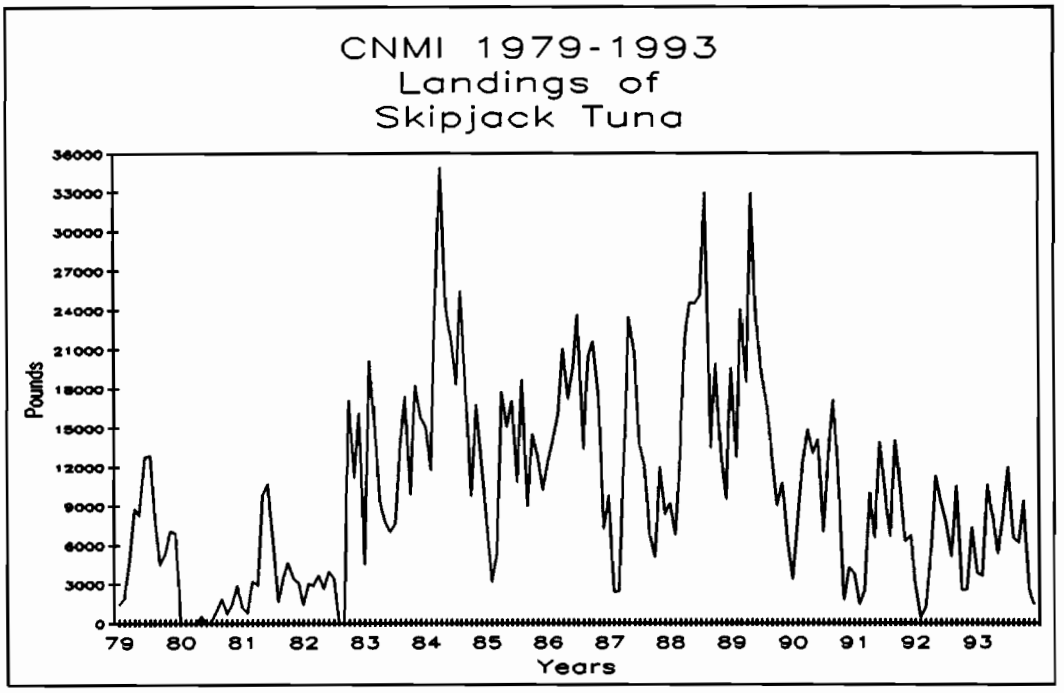

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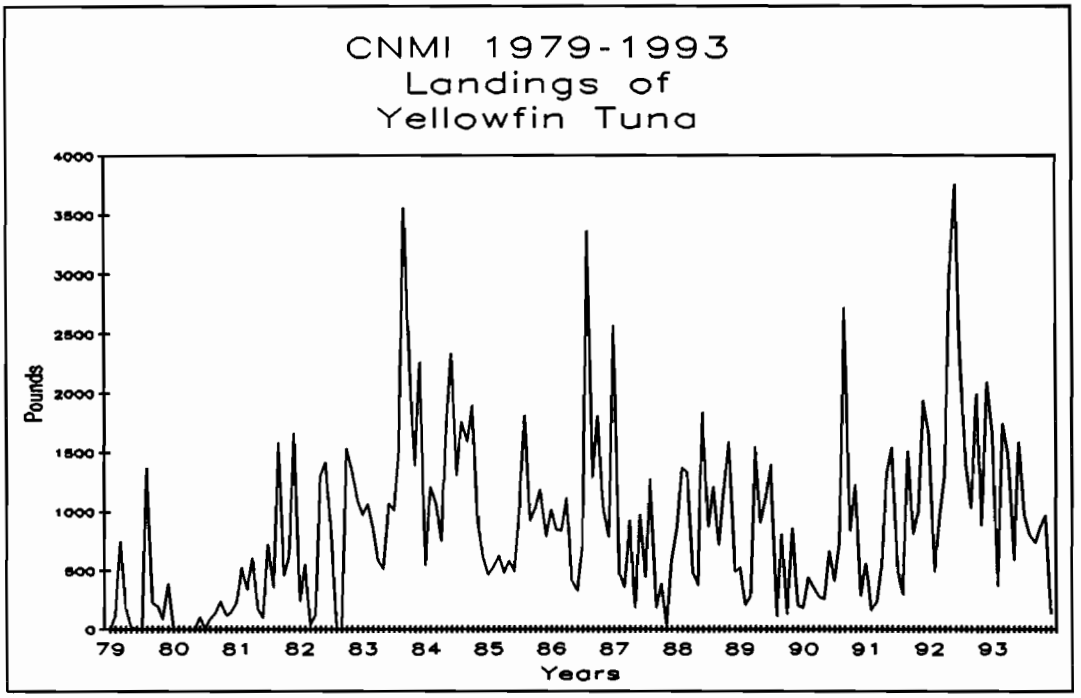

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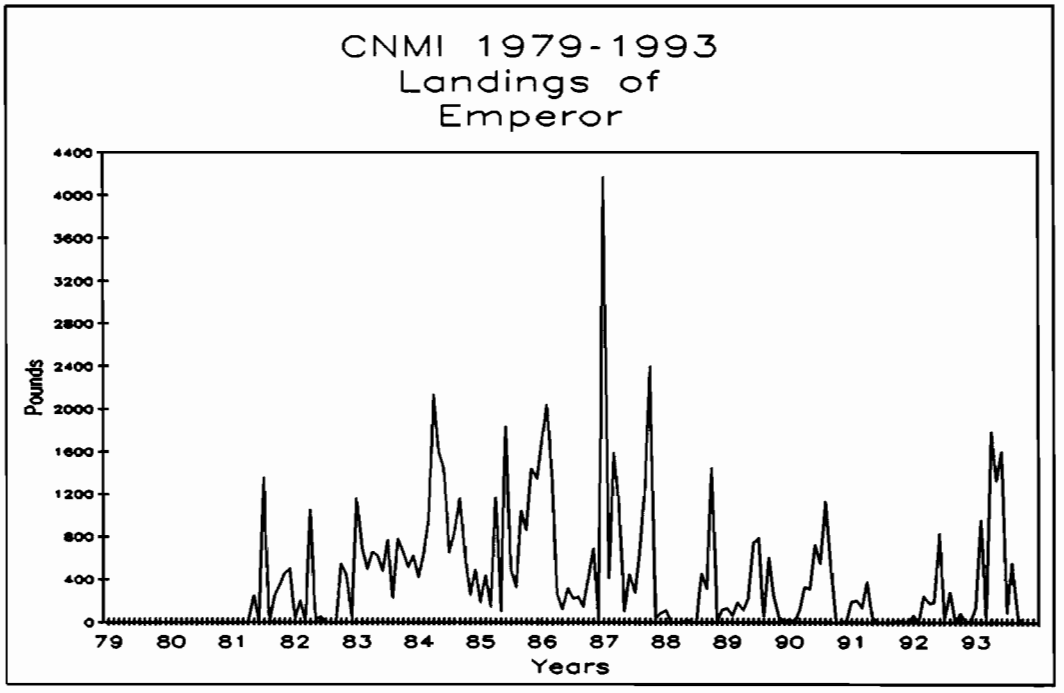

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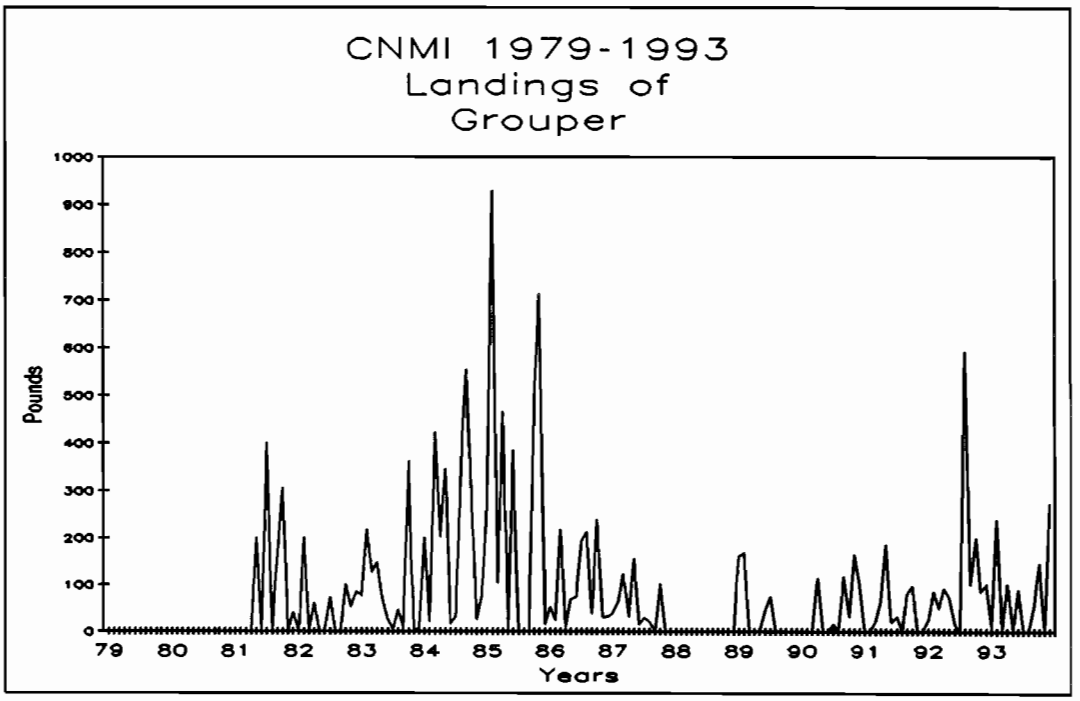

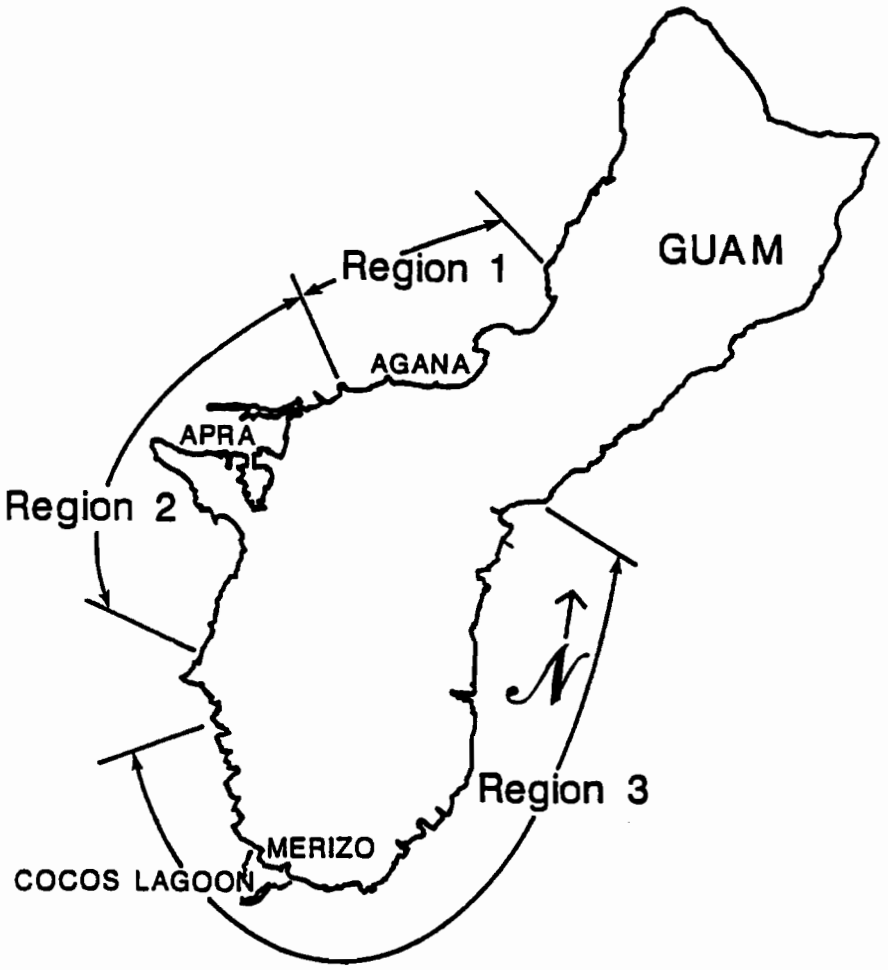

GUAM

Fishery Statistics 1993

GUAM 1993 FISHERY STATISTICS

Compiled by

Guam Division of Aquatic and Wildlife Resources

and the

Western Pacific Fishery Information Network

April 1995

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IV.1

GUAM 1993 FISHERY STATISTICS

INTRODUCTION

The Territory of Guam (lat. 13.4° N and long. 144.4° E) is the southernmost, largest, and most populous island in the Mariana Archipelago. All of the islands in the chain north of Guam belong to the Commonwealth of the Northern Mariana Islands. Guam is located about 6,000 km (3,700 mi) west-southwest of Honolulu, 2,500 km (1,550 mi) south-southeast of Tokyo, and 2,600 km (1,600 mi) east of Manila. Guam is about 48 km (30 mi) long, varies from 6 to 14 km (4 to 9 mi) wide, and has an estimated land area of 554 km^2 (214 mi^2) and a population of about 120,000.

Fishing activities on Guam can be divided into two basic categories: offshore and inshore fishing. Offshore fishing typically involves small boat (12 to 48 feet), 1 to 2-day trolling and bottom fishing trips that usually originate from one of the three principal harbors located on the west coast and southern tip of the island. In recent years, the sportfishing charter boat industry has increased significantly. Inshore fishing is typically conducted without the use of a boat and consists mostly of nearshore casting, netting, and spearfishing. The Guam Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR) has been conducting offshore and inshore creel surveys since the early 1970's. Beginning in 1982, DAWR began modifying its data collecting and processing systems to improve estimates of catch and effort by improving sampling techniques and by incorporating the use of microcomputers to expand the survey data. The WPACFIN provided microcomputers and training and worked with DAWR staff and a contractor to redesign the sampling program. Summary statistics from the inshore and offshore creel survey sampling programs have been included in previous volumes of this report series using the original data processing systems provided to DAWR through WPACFIN. However, DAWR is in the process of converting all data systems to a new microcomputer environment and survey data for 1993 are not available to include in this volume. Sampling has continued without interruption to maintain the continuity of the data base and summary statistics should be available for publication in the next volume of this report series.

In 1982, WPACFIN also began working with local fish wholesalers to obtain information on the commerical landings of Guam through volunteer use of invoices provided by WPACFIN. No interruptions in collecting or processing these data have occurred and summaries from all participating wholesalers combined are provided in this volume as in previous volumes of this report series.

COMMERICAL LANDINGS DATA COLLECTION SYSTEM

Fish enter the commercial market in Guam from three sources: full-time commercial fishermen, part-time commercial fishermen, and subsistence or recreational fishermen who frequently sell portions of their catch. No licenses are required to sell fish in Guam, nor are there any reporting requirements for those selling fish. Before 1979, there was no central place to sell fish, so fishermen had to develop their own markets and peddle their own fish after each trip. The Guam Fishermen's Coop was established, via some government funding, in Agana in July 1979. The Coop subsequently became the central distribution center for fresh local fish. In 1982, WPACFIN began working with the Coop to improve their invoicing system and obtain data on all fish purchases. A cooperative system was established whereby the Coop would use the forms and coding schemes designed by WPACFIN and would supply copies of all invoices to WPACFIN for entering into computer format. In return, WPACFIN would provide the Coop with document quality control and computer generated summary statistics. All purchase data back to July 1979 also were coded and computerized.

Data from two other fish wholesalers were collected beginning in 1983 and continued until early 1987 by which time both had left the business. One other major fish wholesaler and several other important retailers who make purchases directly from fishermen have begun operating since then, and are providing data to WPACFIN by using the invoices given to them through DAWR. A law is being developed that will require reporting by dealers and possibly fishermen, but until it is implemented, the commercial landings data collection system will remain a voluntary system. Therefore, the reported commercial data do not reflect the true commercial fisheries. All tables and figures of commercial landings information included in this report are provided with the consent of the participating dealers.

Data collected on commercial forms include

- Date
- Fisherman code
- Number of fishermen
- Hours fished
- Area fished
- Species caught
- Number of pieces caught
- Pounds caught
- Price per pound

COMMERICAL LANDINGS DATA PROCESSING SYSTEM

The processing system for the commercial landings data collected from the fish dealers is fairly straightforward. A purchase form is completed by the dealer each time fish are purchased from a fisherman. Catches are divided into categories

for weighing by species or species group, and where practicable, number of pieces is recorded. Preferably, coding and initial quality control of the forms are done by Coop or DAWR personnel before they are shipped to WPACFIN for computer processing; however, these activities must sometimes be done by WPACFIN staff. Invoices are collected by DAWR and sent to the WPACFIN central office in Honolulu. Data are entered into a computer and loaded into central WPACFIN data bases, where edit reports are generated and used to locate and correct any errors in the data base. Once all edits, verifications, and corrections are made, summary reports are generated. Standard reports available include total monthly and annual landings by species, total landings by fisherman, and landings by fisherman by species. Purchase forms are returned to DAWR along with summary reports and graphs for their use and for distribution to dealers.

COMMERICAL LANDINGS DATA REPORTING SYSTEM

After completing all editing and quality control activities for the commercial landings data, monthly and annual summary reports by species are generated. The commercial landings reports section of this document includes monthly and annual reports for 1993. Each table contains information on the pounds, value and the average price per pound for each species or species group. Each monthly report contains a subtotal for the sum of all species combined for that month, and the December report also includes the annual total. Annual reports contain the total landings for each species and the total recorded landings for all species for the calendar year.

Included with the commercial landings summary reports are graphs of some of the important statistics. The following groupings of species, species categories, and abbreviations are used in the tables and graphs for Guam's commercial landings:

I. Pelagic Management Unit Species (PMUS)

Although the Magnuson Fishery Conservation and Management Act of 1976 was amended in 1992 to include tunas in the Pacific PMUS (PPMUS), this report series will continue to consider tunas as a separate category. The PMUS category in this report includes:

Mahimahi (dolphinfish)
Marlin (probably all blue but possibly striped or black)
Shortbill spearfish
Sailfish
Wahoo
Sharks

II. Bottom Fish Management Unit Species (BMUS)

Jacks (unclassified but excluding bigeye scad)
Bottom fish (unclassified)
Ehu (red snapper)
Gindai (flower snapper)
Grouper
Kalekale (pink snapper)
Lehi (silverjaw snapper)
Onaga (red or longtail snapper)
Opakapaka (pink snapper)
Uku (gray snapper)
Emperorfish

III. Billfish

Marlin (probably all blue but possibly striped or black)
Shortbill spearfish
Sailfish

IV. Tunas

Tunas (unclassified)
Skipjack tuna
Yellowfin tuna
Dogtooth or white tuna
Kawakawa

V. Other Tuna

All the above tunas excluding skipjack and yellowfin tunas.

VI. Fisheries Categories

A. Pelagic Species

All PMUS and tuna species plus the following:
Troll fish (unclassified)
Barracuda
Rainbow runner

B. Bottom Fish

Same as the BMUS

C. Reef Fish

Reef fish (unclassified)	Parrotfish
Giant wrasse	Snapper
Rabbitfish	Surgeonfish
Rudderfish	Unicornfish
Squirrelfish	Goatfish

D. Other

Miscellaneous (unclassified)
Bigeye scad
Mullet
Eels
Milkfish
Invertebrates (unclassified)
Crabs (unclassified)
Coconut crab
Lobster
Shrimp
Octopus
Squid
Seaweeds
Imported

INTERPRETATION OF STATISTICS

The user is reminded again to pay heed to the precautions and assumptions identified earlier in this document, when making interpretations of or inferences from data reported in the tables and graphs. Remember also that the commercial landings summaries are not based on a census of all the fishing activities, but on samples of those activities. Commercial landings reports are believed to include a high percentage (approximately 75% in 1993) of the actual commercial landings made on Guam.

Table IV.1.1

Guam 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	160.50	422.62	2.63
Bigeye scad (atulai)	1,835.25	5,400.18	2.94
Jacks	1,127.75	2,551.67	2.26
Mullet	76.00	204.75	2.69
Bottom fish	2,010.25	5,850.70	2.91
Ehu (red snapper)	242.00	781.75	3.23
Gindai (flower snap)	469.75	1,446.87	3.08
Grouper	442.50	1,129.62	2.55
Kalikali (pink snap)	243.50	721.00	2.96
Lehi (silverjaw)	826.00	2,373.00	2.87
Onaga (red snapper)	563.00	2,667.88	4.74
Opakapaka (pink snp)	498.75	1,507.38	3.02
Uku (gray snapper)	622.75	1,510.80	2.43
Reef fish	5,975.11	17,039.20	2.85
Wrasse	246.50	493.00	2.00
Rabbitfish (hitting)	170.50	476.00	2.79
Emperor (mafute)	547.70	1,470.50	2.68
Squirrelfish	12.50	34.00	2.72
Parrotfish	364.50	785.25	2.15
Snapper	49.00	133.50	2.72
Goatfish	3.50	10.50	3.00
Troll fish	9.50	19.00	2.00
Barracuda	1,413.76	2,715.26	1.92
Mahimahi (dolphin)	112,878.75	161,957.96	1.43
Marlin	36,154.80	35,675.39	0.99
Spearfish	99.00	132.75	1.34
Sailfish	1,312.00	1,477.62	1.13
Rainbow runner	2,103.00	4,576.28	2.18
Wahoo	35,608.05	69,700.25	1.96
Skipjack tuna	29,416.25	35,355.53	1.20
Dogtooth tuna	1,605.50	3,101.76	1.93
Yellowfin tuna	42,775.25	96,114.73	2.25
Kawakawa	25.00	50.00	2.00
Lobster	83.00	300.99	3.63
Octopus	477.79	1,312.96	2.75
Imported	39,079.75	98,899.46	2.53
** TOTAL **	319,528.71	558,400.11	1.75

Table IV.1.2

Guam January 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	2.50	4.37	1.75
Bigeye scad (atulai)	291.00	873.00	3.00
Jacks	44.50	133.00	2.99
Mullet	12.50	37.50	3.00
Bottom fish	8.50	25.50	3.00
Ehu (red snapper)	81.50	284.50	3.49
Lehi (silverjaw)	21.00	73.50	3.50
Onaga (red snapper)	12.50	43.75	3.50
Opakapaka (pink snp)	0.75	2.25	3.00
Uku (gray snapper)	31.00	77.50	2.50
Reef fish	215.50	618.75	2.87
Parrotfish	7.00	21.00	3.00
Goatfish	3.50	10.50	3.00
Barracuda	43.50	90.00	2.07
Mahimahi (dolphin)	15,633.00	24,507.96	1.57
Marlin	542.00	800.25	1.48
Spearfish	81.00	105.75	1.31
Sailfish	83.00	124.50	1.50
Rainbow runner	45.00	121.76	2.71
Wahoo	2,375.25	5,620.26	2.37
Skipjack tuna	2,141.00	3,288.13	1.54
Dogtooth tuna	34.00	54.50	1.60
Yellowfin tuna	3,887.00	9,462.87	2.43
Kawakawa	5.00	10.00	2.00
Imported	8,427.00	21,648.83	2.57
** SUBTOTAL **	34,028.50	68,039.93	2.00

Table IV.1.3

Guam February 1993 commercial landings

Species	Pounds	Value	$/lb
Jacks	46.00	92.00	2.00
Bottom fish	65.00	192.00	2.95
Grouper	5.00	15.00	3.00
Reef fish	314.00	920.25	2.93
Parrotfish	109.00	218.00	2.00
Barracuda	88.50	189.25	2.14
Mahimahi (dolphin)	23,444.50	32,092.81	1.37
Marlin	496.00	716.50	1.44
Rainbow runner	13.50	35.76	2.65
Wahoo	3,184.50	7,252.85	2.28
Skipjack tuna	878.00	1,503.88	1.71
Dogtooth tuna	45.00	108.50	2.41
Yellowfin tuna	1,150.50	3,361.50	2.92
Kawakawa	13.50	27.00	2.00
Imported	7,829.50	21,235.48	2.71
** SUBTOTAL **	37,682.50	67,960.78	1.80

Table IV.1.4

Guam March 1993 commercial landings

Species	Pounds	Value	$/lb
Jacks	53.00	133.25	2.51
Bottom fish	95.50	279.38	2.93
Uku (gray snapper)	48.00	120.00	2.50
Reef fish	100.50	301.50	3.00
Barracuda	204.00	420.75	2.06
Mahimahi (dolphin)	26,758.25	34,074.83	1.27
Marlin	426.50	533.13	1.25
Sailfish	24.00	30.00	1.25
Rainbow runner	77.50	185.38	2.39
Wahoo	7,673.25	15,049.41	1.96
Skipjack tuna	1,857.50	3,014.00	1.62
Dogtooth tuna	64.00	128.00	2.00
Yellowfin tuna	2,017.00	5,527.25	2.74
Imported	7,757.00	19,459.94	2.51
** SUBTOTAL **	47,156.00	79,256.82	1.68

Table IV.1.5

Guam April 1993 commercial landings

Species	Pounds	Value	$/lb
Bottom fish	33.50	85.75	2.56
Reef fish	336.50	1,006.00	2.99
Wrasse	35.00	70.00	2.00
Snapper	10.00	30.00	3.00
Barracuda	152.50	298.75	1.96
Mahimahi (dolphin)	30,245.50	38,646.45	1.28
Marlin	1,070.50	1,235.38	1.15
Sailfish	72.00	108.00	1.50
Rainbow runner	23.00	46.00	2.00
Wahoo	4,571.80	7,432.37	1.63
Skipjack tuna	4,274.50	4,898.27	1.15
Dogtooth tuna	189.50	442.01	2.33
Yellowfin tuna	4,166.50	9,000.27	2.16
Imported	2,300.25	5,278.24	2.29
** SUBTOTAL **	47,481.05	68,577.49	1.44

Table IV.1.6

Guam May 1993 commercial landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	63.00	189.00	3.00
Jacks	154.00	349.75	2.27
Bottom fish	223.00	604.63	2.71
Grouper	17.50	48.12	2.75
Uku (gray snapper)	45.00	114.63	2.55
Reef fish	572.25	1,616.87	2.83
Rabbitfish (hitting)	105.00	315.00	3.00
Emperor (mafute)	28.00	77.00	2.75
Troll fish	9.50	19.00	2.00
Barracuda	334.50	569.87	1.70
Mahimahi (dolphin)	3,877.00	6,107.00	1.58
Marlin	4,926.50	4,956.26	1.01
Sailfish	213.00	259.75	1.22
Rainbow runner	179.50	409.75	2.28
Wahoo	679.00	1,440.25	2.12
Skipjack tuna	4,452.50	4,212.92	0.95
Dogtooth tuna	127.50	276.50	2.17
Yellowfin tuna	7,589.00	16,434.88	2.17
Octopus	42.35	127.05	3.00
Imported	4,583.50	11,447.12	2.50
** SUBTOTAL **	28,221.60	49,575.35	1.76

Table IV.1.7

Guam June 1993 commercial landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	86.00	258.00	3.00
Jacks	117.25	267.93	2.29
Mullet	18.00	36.00	2.00
Bottom fish	111.50	326.00	2.92
Gindai (flower snap)	24.00	72.00	3.00
Grouper	22.50	61.88	2.75
Kalikali (pink snap)	79.50	238.50	3.00
Lehi (silverjaw)	76.50	220.25	2.88
Onaga (red snapper)	48.50	235.63	4.86
Opakapaka (pink snp)	55.00	176.13	3.20
Uku (gray snapper)	46.75	126.55	2.71
Reef fish	652.25	1,728.87	2.65
Emperor (mafute)	188.50	518.37	2.75
Barracuda	56.50	108.00	1.91
Mahimahi (dolphin)	590.00	920.50	1.56
Marlin	7,055.00	6,521.34	0.92
Spearfish	18.00	27.00	1.50
Sailfish	359.00	280.62	0.78
Rainbow runner	80.50	171.26	2.13
Wahoo	288.00	694.63	2.41
Skipjack tuna	4,937.00	4,572.14	0.93
Dogtooth tuna	286.00	510.50	1.78
Yellowfin tuna	8,828.25	15,554.64	1.76
Lobster	21.00	84.00	4.00
Octopus	63.50	190.50	3.00
Imported	4,266.50	10,413.20	2.44
** SUBTOTAL **	28,375.50	44,314.44	1.56

Table IV.1.8

Guam July 1993 commercial landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	63.00	189.00	3.00
Jacks	29.50	85.99	2.91
Mullet	6.00	16.50	2.75
Bottom fish	270.50	752.87	2.78
Ehu (red snapper)	29.50	97.25	3.30
Gindai (flower snap)	60.00	210.00	3.50
Grouper	8.50	23.37	2.75
Kalikali (pink snap)	3.00	9.00	3.00
Lehi (silverjaw)	11.50	34.50	3.00
Onaga (red snapper)	81.00	283.50	3.50
Opakapaka (pink snp)	30.00	90.00	3.00
Uku (gray snapper)	276.00	651.50	2.36
Reef fish	249.36	744.08	2.98
Rabbitfish (hitting)	35.50	71.00	2.00
Emperor (mafute)	71.00	190.13	2.68
Squirrelfish	9.00	24.75	2.75
Parrotfish	54.50	136.25	2.50
Barracuda	66.50	121.87	1.83
Mahimahi (dolphin)	566.50	1,274.75	2.25
Marlin	8,577.80	7,552.28	0.88
Sailfish	137.50	137.50	1.00
Rainbow runner	571.00	1,119.50	1.96
Wahoo	338.00	894.62	2.65
Skipjack tuna	3,025.50	3,172.74	1.05
Dogtooth tuna	225.50	371.75	1.65
Yellowfin tuna	5,354.90	12,176.32	2.27
Octopus	76.56	198.65	2.59
Imported	316.00	742.60	2.35
** SUBTOTAL **	20,543.62	31,372.27	1.53

Table IV.1.9

Guam August 1993 commercial landings

Species	Pounds	Value	$/lb
Miscellaneous	33.00	89.00	2.70
Bigeye scad (atulai)	409.50	1,228.50	3.00
Jacks	125.00	296.88	2.38
Mullet	15.00	41.25	2.75
Bottom fish	680.50	2,074.75	3.05
Ehu (red snapper)	35.00	105.00	3.00
Gindai (flower snap)	91.50	274.50	3.00
Grouper	141.00	462.75	3.28
Lehi (silverjaw)	194.50	599.38	3.08
Onaga (red snapper)	27.50	137.50	5.00
Opakapaka (pink snp)	86.00	258.00	3.00
Uku (gray snapper)	10.50	28.88	2.75
Reef fish	1,115.00	3,280.00	2.94
Wrasse	76.00	152.00	2.00
Rabbitfish (hitting)	30.00	90.00	3.00
Emperor (mafute)	138.00	363.62	2.63
Squirrelfish	2.00	5.50	2.75
Parrotfish	194.00	410.00	2.11
Snapper	19.50	50.00	2.56
Barracuda	37.50	75.00	2.00
Mahimahi (dolphin)	215.50	637.50	2.96
Marlin	3,405.00	4,238.87	1.24
Sailfish	59.50	89.25	1.50
Rainbow runner	399.50	957.00	2.40
Wahoo	1,266.00	3,649.00	2.88
Skipjack tuna	1,478.00	2,027.50	1.37
Dogtooth tuna	177.00	312.25	1.76
Yellowfin tuna	3,338.75	8,043.13	2.41
Lobster	18.50	64.75	3.50
Octopus	48.50	121.25	2.50
Imported	187.50	439.25	2.34
** SUBTOTAL **	14,054.75	30,602.26	2.18

Table IV.1.10

Guam September 1993 commercial landings

Species	Pounds	Value	$/lb
Miscellaneous	40.00	116.75	2.92
Bigeye scad (atulai)	325.50	967.00	2.97
Jacks	238.50	556.86	2.33
Mullet	5.00	15.00	3.00
Bottom fish	132.50	381.01	2.88
Ehu (red snapper)	78.00	234.00	3.00
Gindai (flower snap)	198.00	598.75	3.02
Grouper	248.00	518.50	2.09
Kalikali (pink snap)	57.00	171.00	3.00
Lehi (silverjaw)	267.50	737.25	2.76
Onaga (red snapper)	166.00	830.00	5.00
Opakapaka (pink snp)	256.00	768.00	3.00
Uku (gray snapper)	73.00	185.74	2.54
Reef fish	943.25	2,538.99	2.69
Wrasse	74.00	148.00	2.00
Emperor (mafute)	79.00	203.88	2.58
Snapper	10.00	25.00	2.50
Barracuda	51.50	100.25	1.95
Mahimahi (dolphin)	164.00	425.00	2.59
Marlin	4,318.00	4,094.87	0.95
Sailfish	123.00	169.00	1.37
Rainbow runner	383.50	796.62	2.08
Wahoo	1,395.50	3,138.50	2.25
Skipjack tuna	2,742.00	3,140.01	1.15
Dogtooth tuna	287.00	546.75	1.91
Yellowfin tuna	2,652.50	6,545.25	2.47
Lobster	31.25	109.37	3.50
Octopus	68.50	171.25	2.50
Imported	481.00	1,156.00	2.40
** SUBTOTAL **	15,889.00	29,388.60	1.85

Table IV.1.11

Guam October 1993 commercial landings

Species	Pounds	Value	$/lb
Bigeye scad (atulai)	424.75	1,178.18	2.77
Jacks	288.00	572.01	1.99
Bottom fish	168.75	491.56	2.91
Ehu (red snapper)	18.00	61.00	3.39
Gindai (flower snap)	90.50	271.50	3.00
Kalikali (pink snap)	52.00	146.50	2.82
Lehi (silverjaw)	131.50	368.50	2.80
Onaga (red snapper)	227.50	1,137.50	5.00
Opakapaka (pink snp)	47.00	141.00	3.00
Uku (gray snapper)	48.50	118.00	2.43
Reef fish	754.00	2,163.71	2.87
Wrasse	61.50	123.00	2.00
Emperor (mafute)	21.00	57.75	2.75
Squirrelfish	1.50	3.75	2.50
Snapper	9.50	28.50	3.00
Barracuda	224.76	433.52	1.93
Mahimahi (dolphin)	1,633.00	3,738.87	2.29
Marlin	4,104.50	3,409.38	0.83
Sailfish	241.00	279.00	1.16
Rainbow runner	126.50	312.25	2.47
Wahoo	1,758.00	4,753.26	2.70
Skipjack tuna	2,246.75	3,302.94	1.47
Dogtooth tuna	124.50	240.75	1.93
Yellowfin tuna	1,556.40	4,330.00	2.78
Kawakawa	6.50	13.00	2.00
Lobster	5.75	20.12	3.50
Octopus	30.00	75.00	2.50
Imported	502.25	1,255.62	2.50
** SUBTOTAL **	14,903.91	29,026.17	1.95

Table IV.1.12

Guam November 1993 commercial landings

Species	Pounds	Value	$/lb
Miscellaneous	85.00	212.50	2.50
Bigeye scad (atulai)	172.50	517.50	3.00
Jacks	32.00	64.00	2.00
Mullet	19.50	58.50	3.00
Bottom fish	200.00	574.25	2.87
Gindai (flower snap)	5.75	20.12	3.50
Kalikali (pink snap)	52.00	156.00	3.00
Lehi (silverjaw)	123.50	339.62	2.75
Opakapaka (pink snp)	24.00	72.00	3.00
Uku (gray snapper)	40.00	80.00	2.00
Reef fish	214.25	595.43	2.78
Emperor (mafute)	17.00	46.75	2.75
Barracuda	132.00	264.00	2.00
Mahimahi (dolphin)	3,662.50	7,950.46	2.17
Marlin	945.00	1,139.88	1.21
Rainbow runner	21.50	47.88	2.23
Wahoo	8,556.25	13,764.72	1.61
Skipjack tuna	749.50	1,242.75	1.66
Dogtooth tuna	45.50	110.25	2.42
Yellowfin tuna	1,205.95	2,983.62	2.47
Lobster	6.50	22.75	3.50
Octopus	75.83	211.61	2.79
Imported	1,516.75	3,630.37	2.39
** SUBTOTAL **	17,902.78	34,104.96	1.91

Table IV.1.13

Guam December 1993 commercial landings

Species	Pounds	Value	$/lb
Bottom fish	21.00	63.00	3.00
Uku (gray snapper)	4.00	8.00	2.00
Reef fish	508.25	1,524.75	3.00
Emperor (mafute)	5.20	13.00	2.50
Barracuda	22.00	44.00	2.00
Mahimahi (dolphin)	6,089.00	11,581.83	1.90
Marlin	288.00	477.25	1.66
Rainbow runner	182.00	373.12	2.05
Wahoo	3,522.50	6,010.38	1.71
Skipjack tuna	634.00	980.25	1.55
Yellowfin tuna	1,028.50	2,695.00	2.62
Octopus	72.55	217.65	3.00
Imported	912.50	2,192.81	2.40
** SUBTOTAL **	13,289.50	26,181.04	1.97
** TOTAL **	319,528.71	558,400.11	1.75

Figure IV.1.1

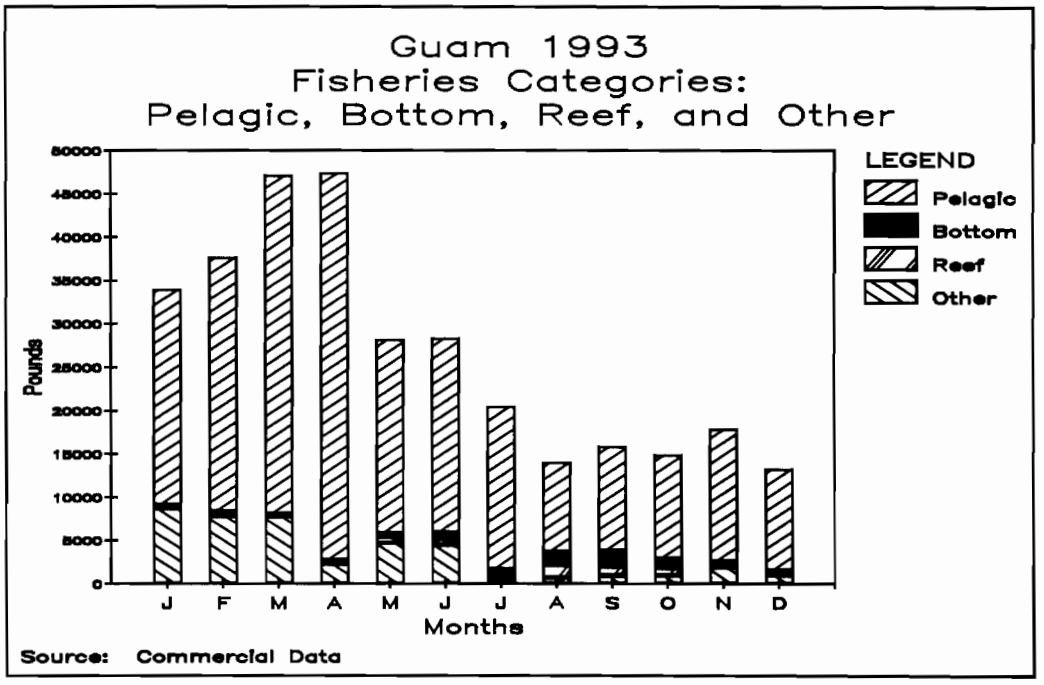


Figure IV.1.2

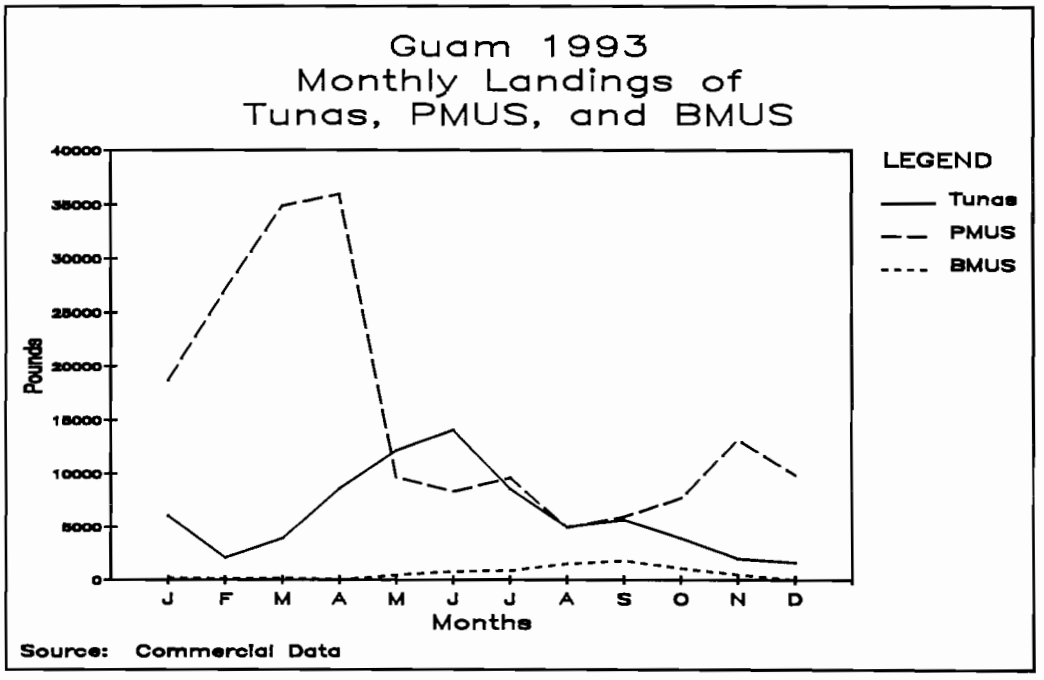


Figure IV.1.3

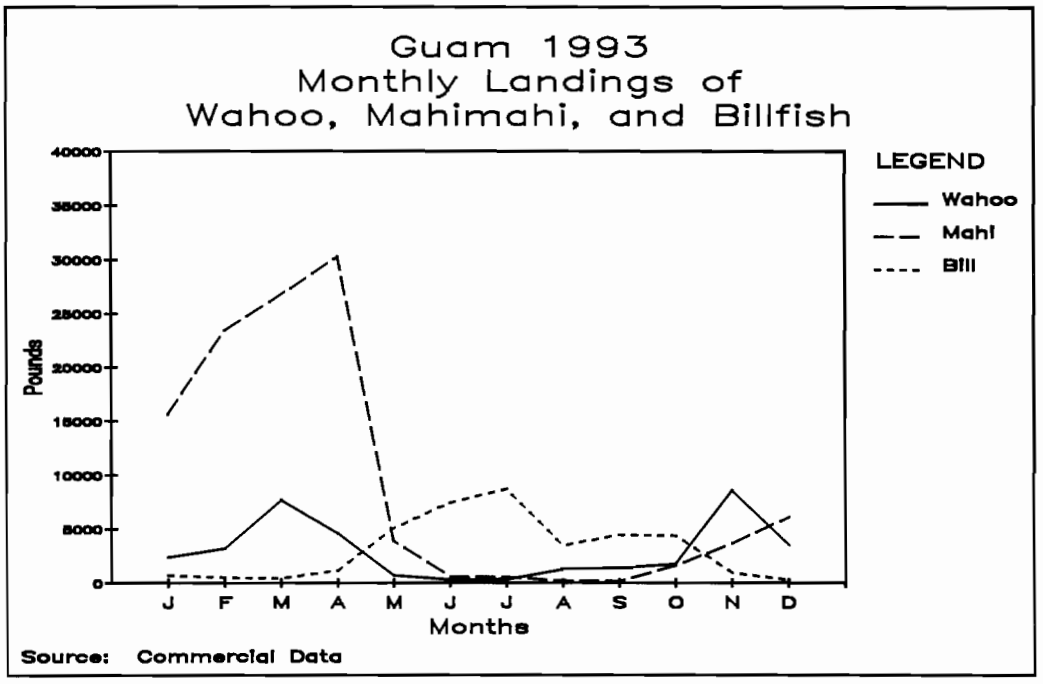


Figure IV.1.4

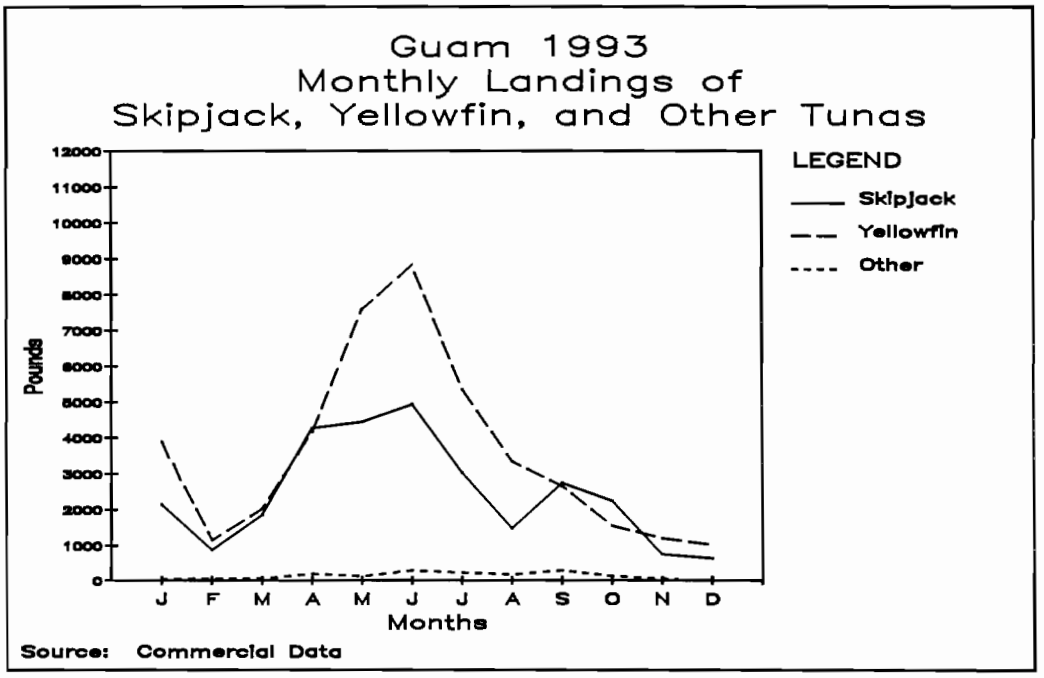


Figure IV.2.1

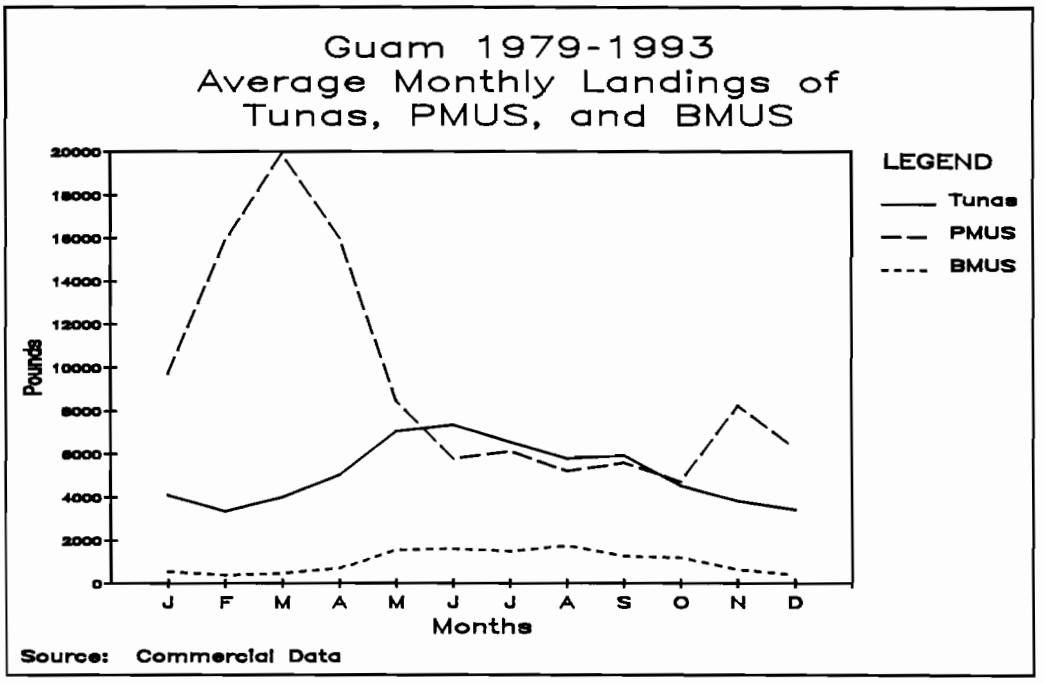


Figure IV.2.2

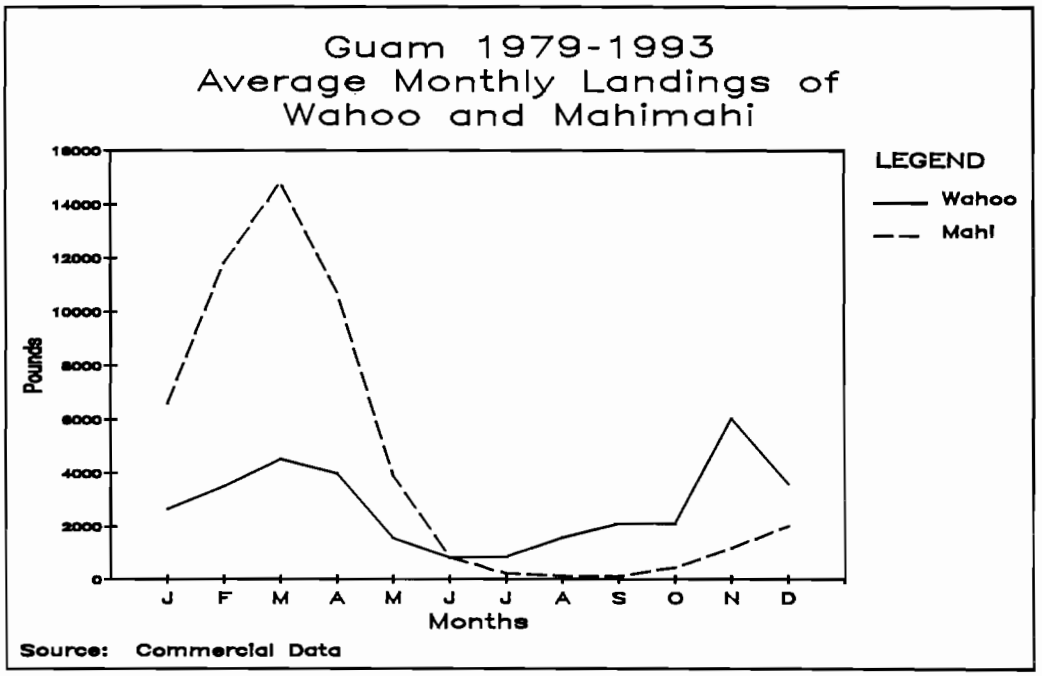
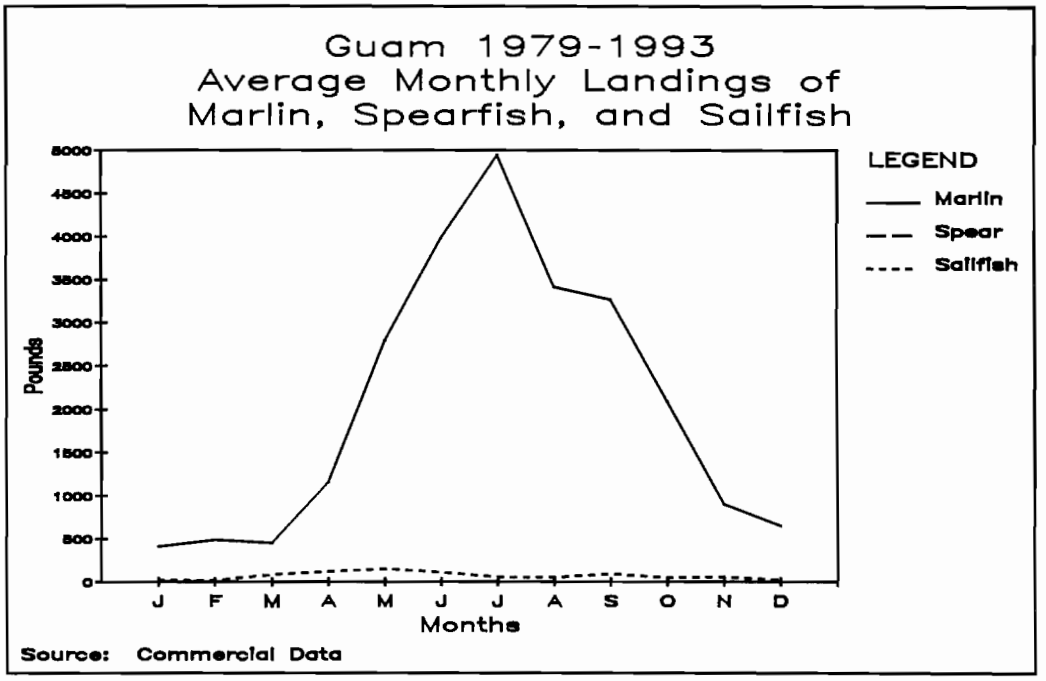


Figure IV.2.3



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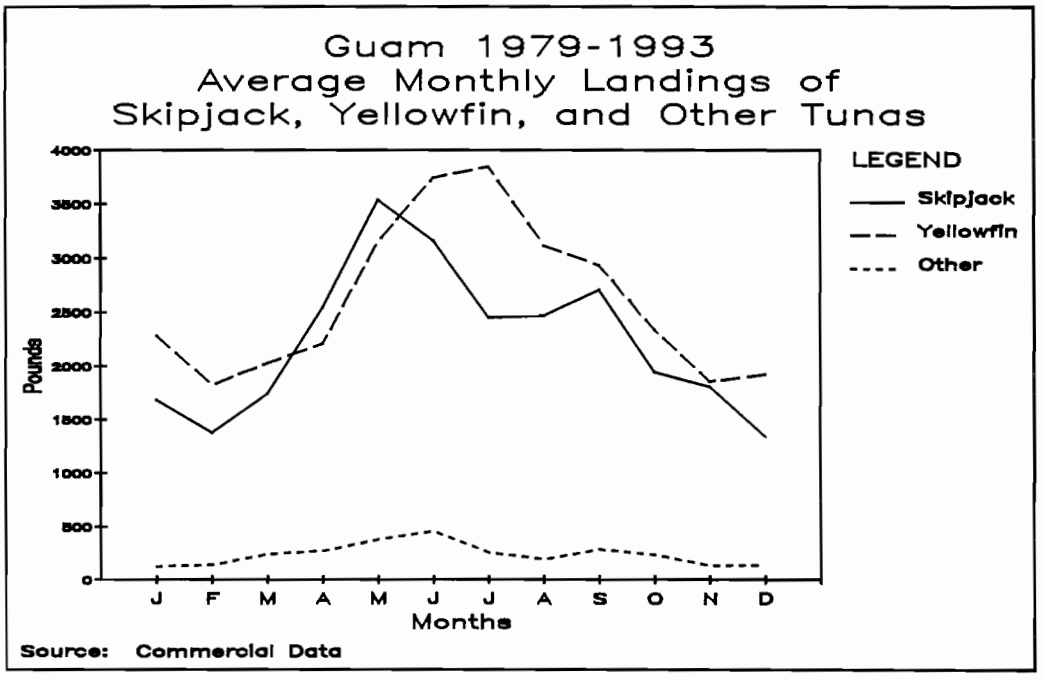


Figure IV.2.5

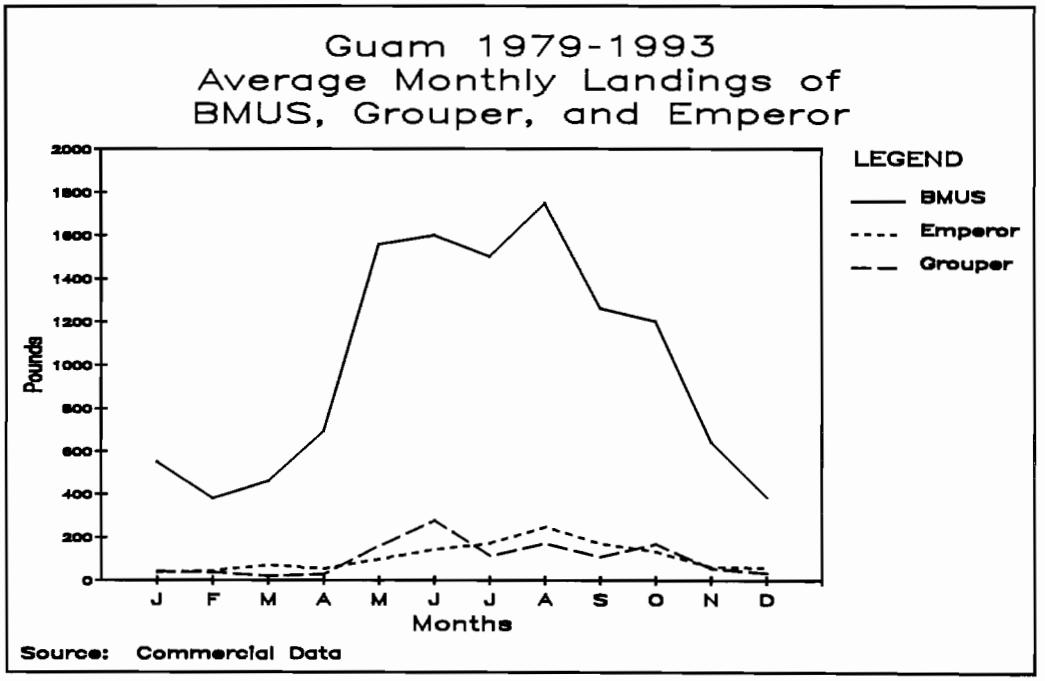


Figure IV.3.1

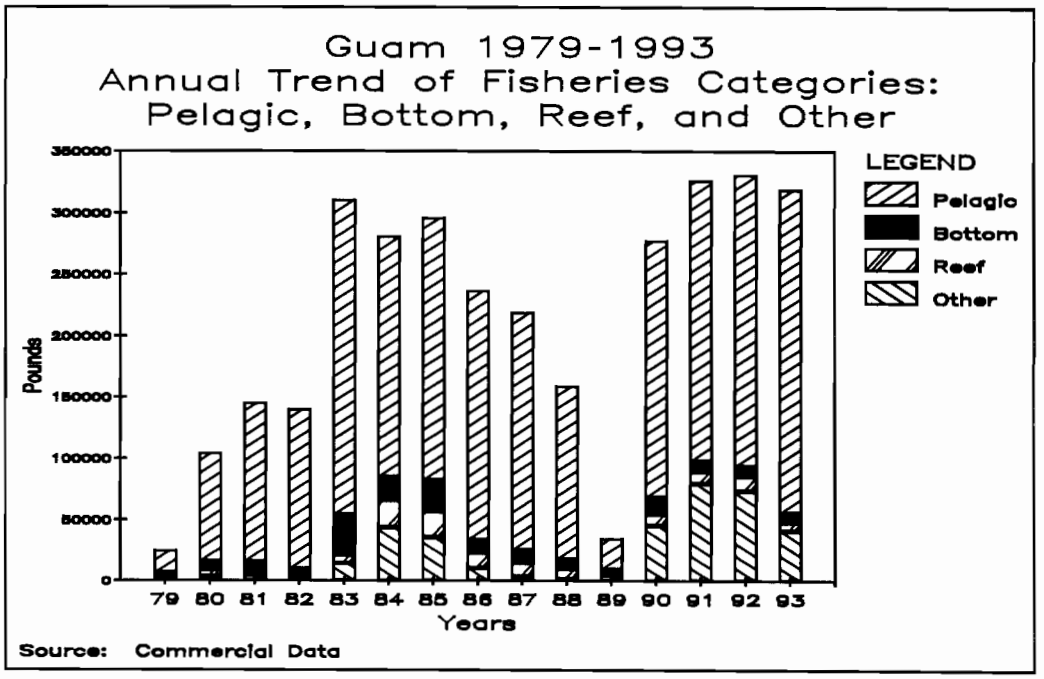
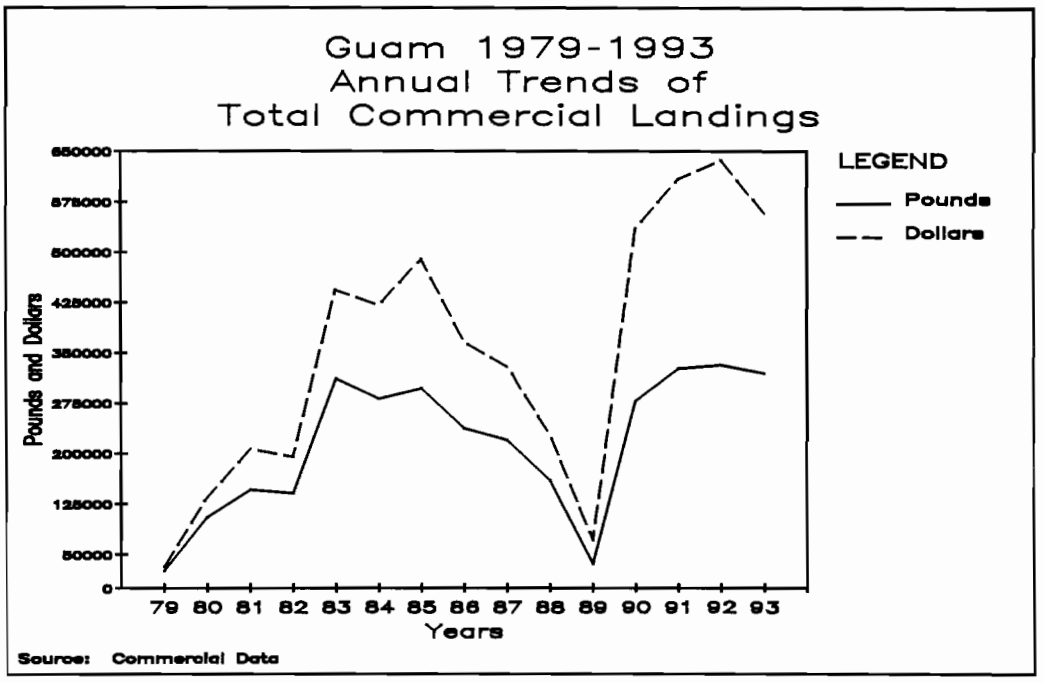


Figure IV.3.2



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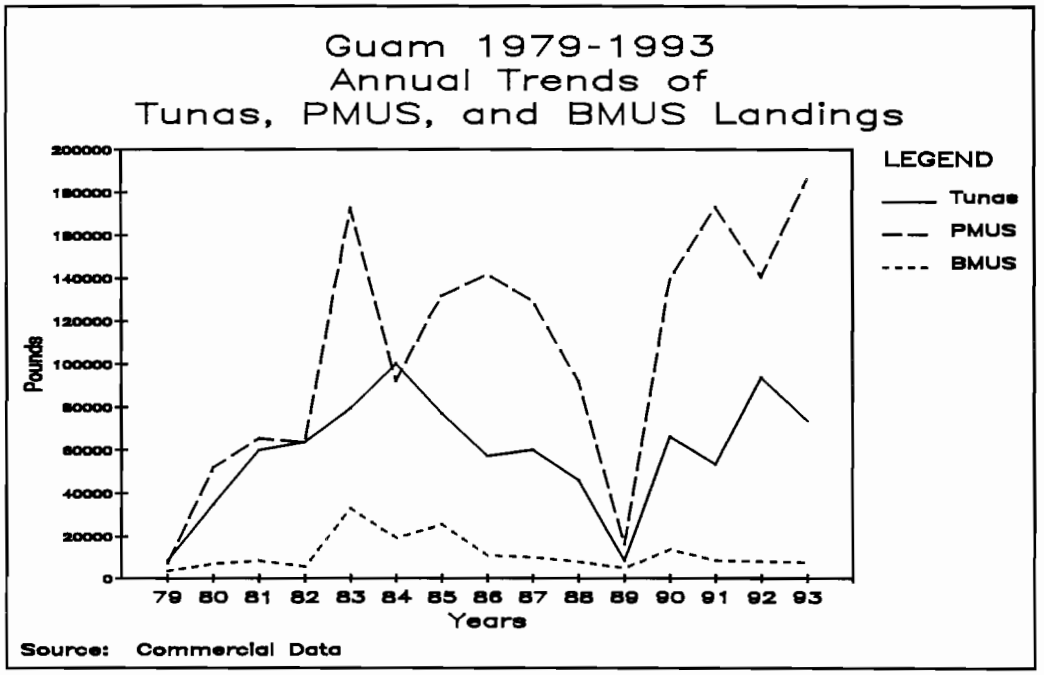


Figure IV.3.4

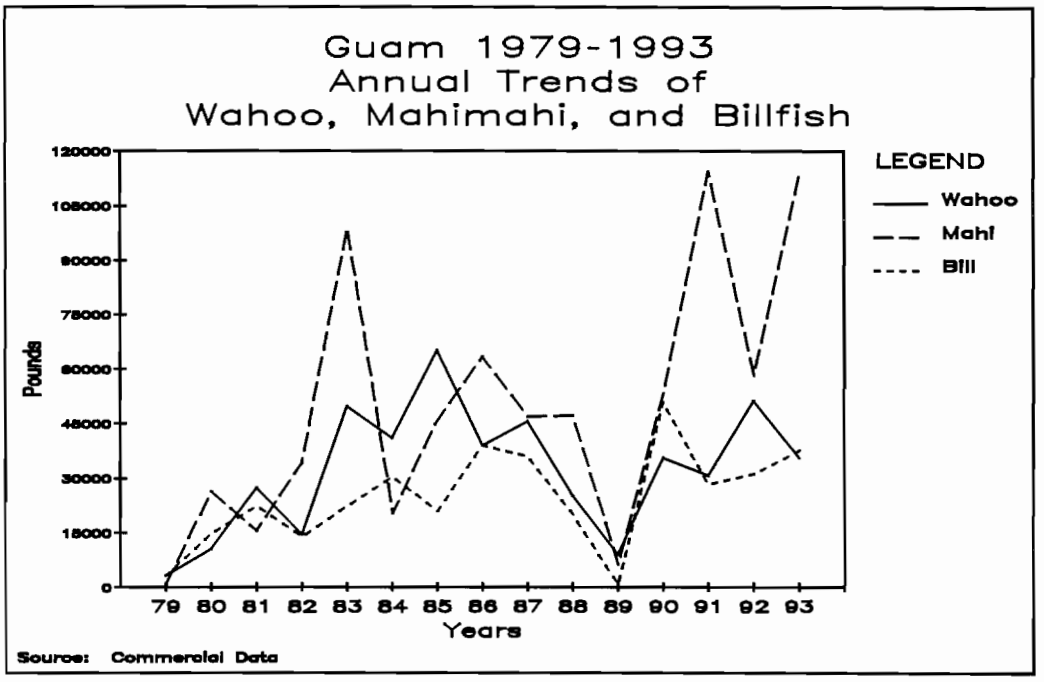


Figure IV.3.5

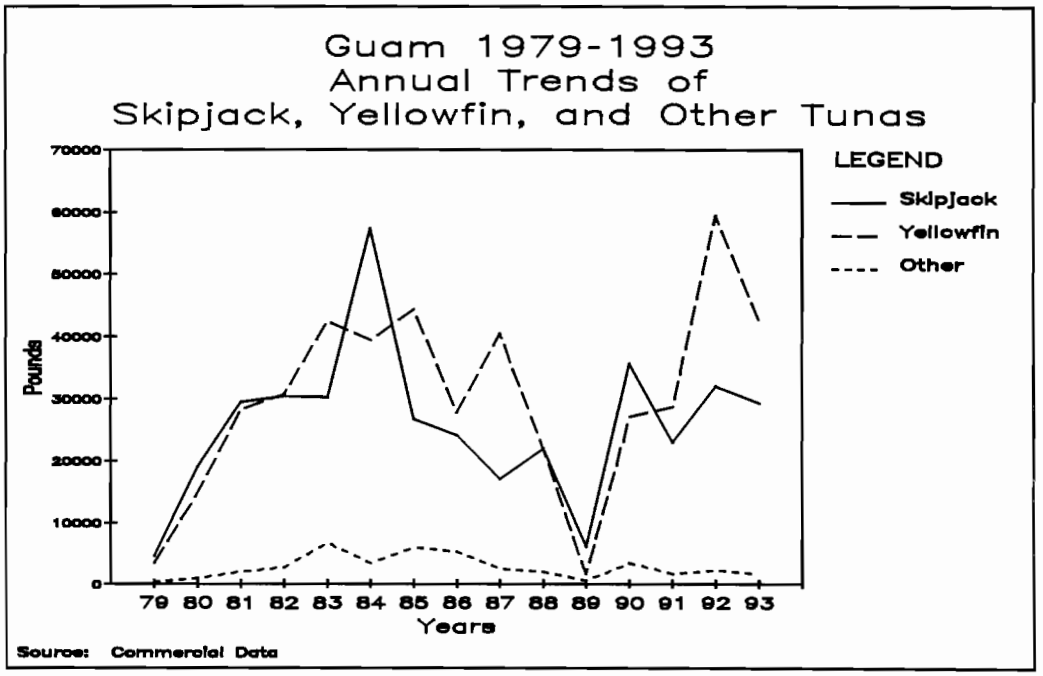
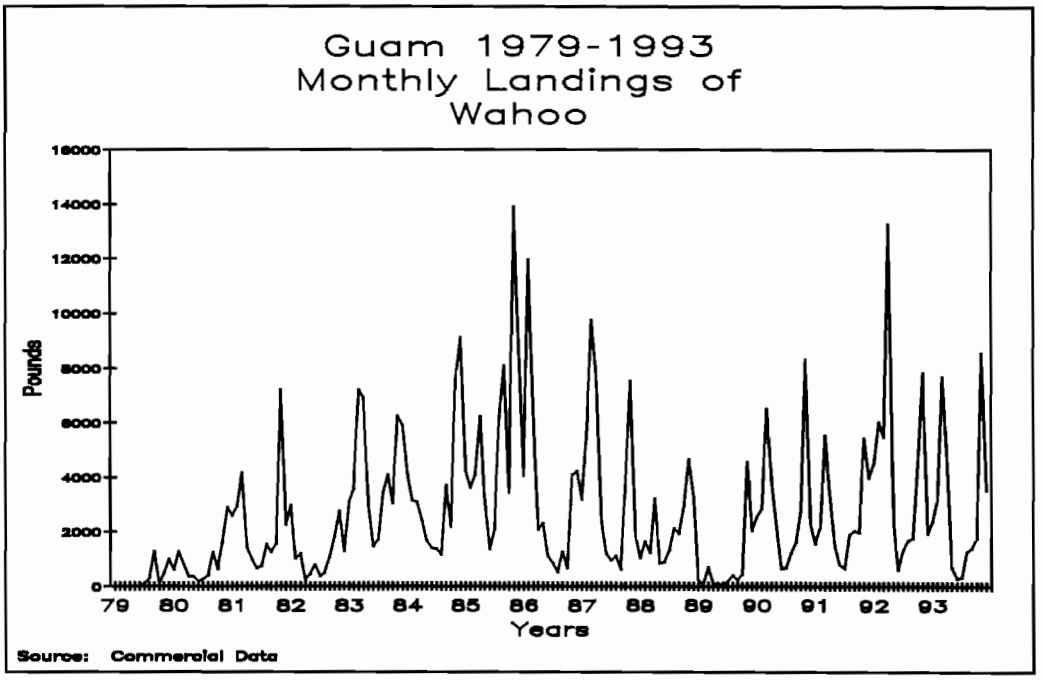


Figure IV.4.1



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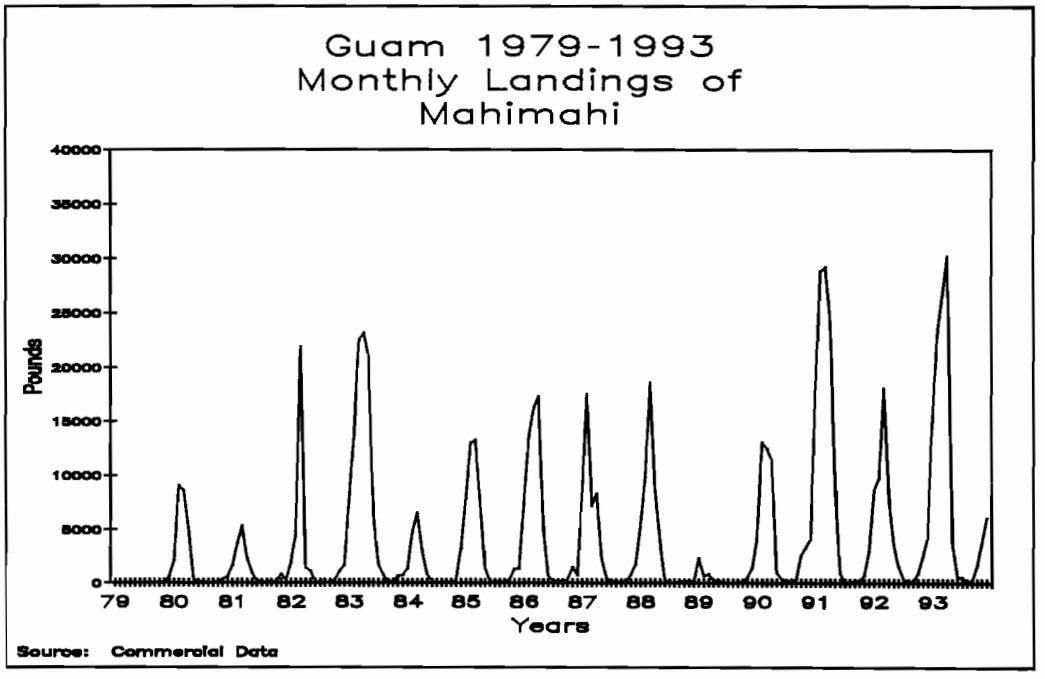

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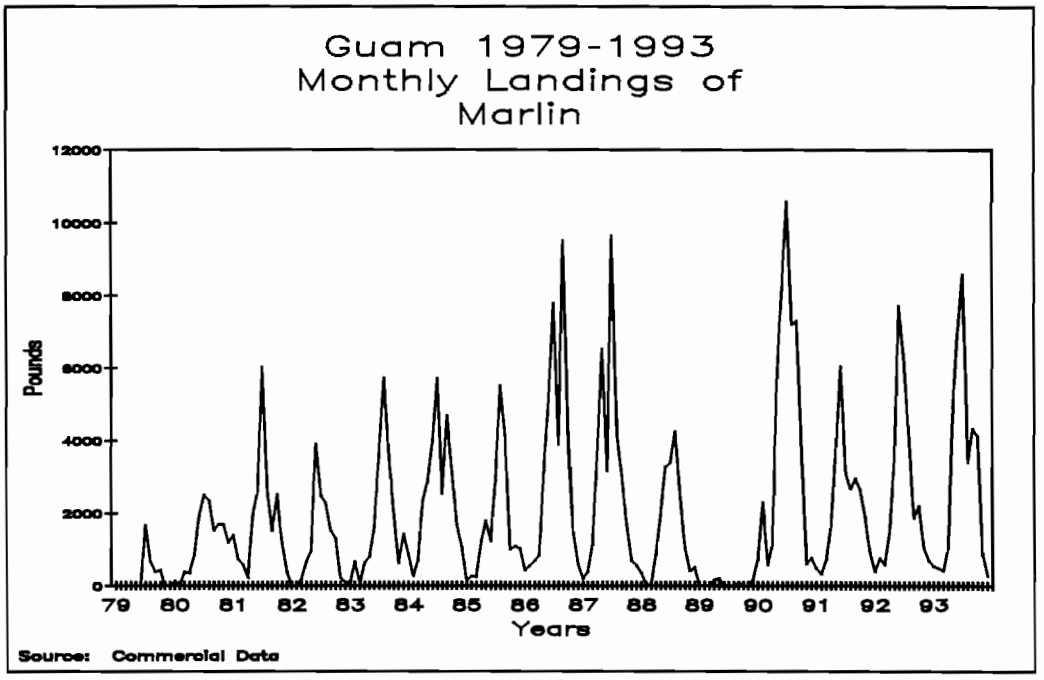


Figure IV.4.4

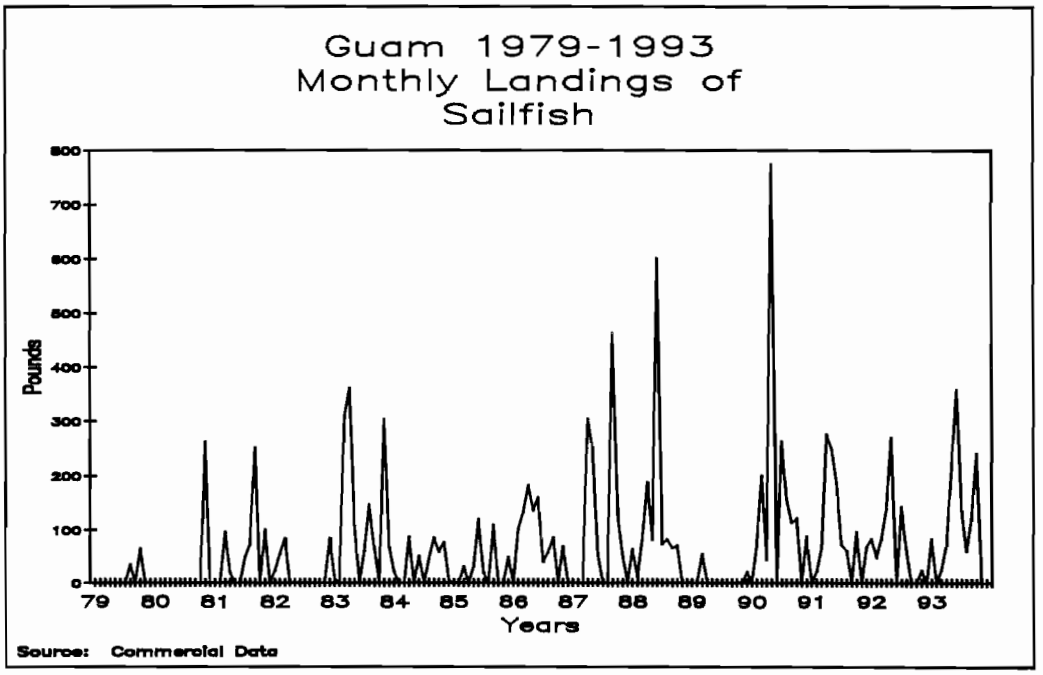


Figure IV.4.5

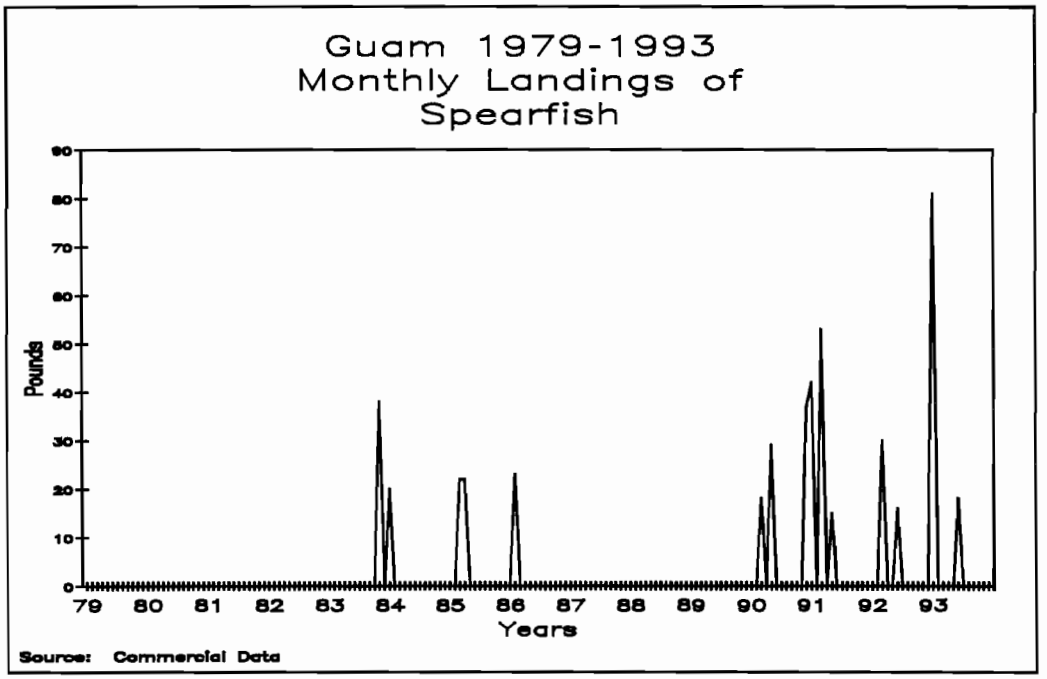


Figure IV.4.6

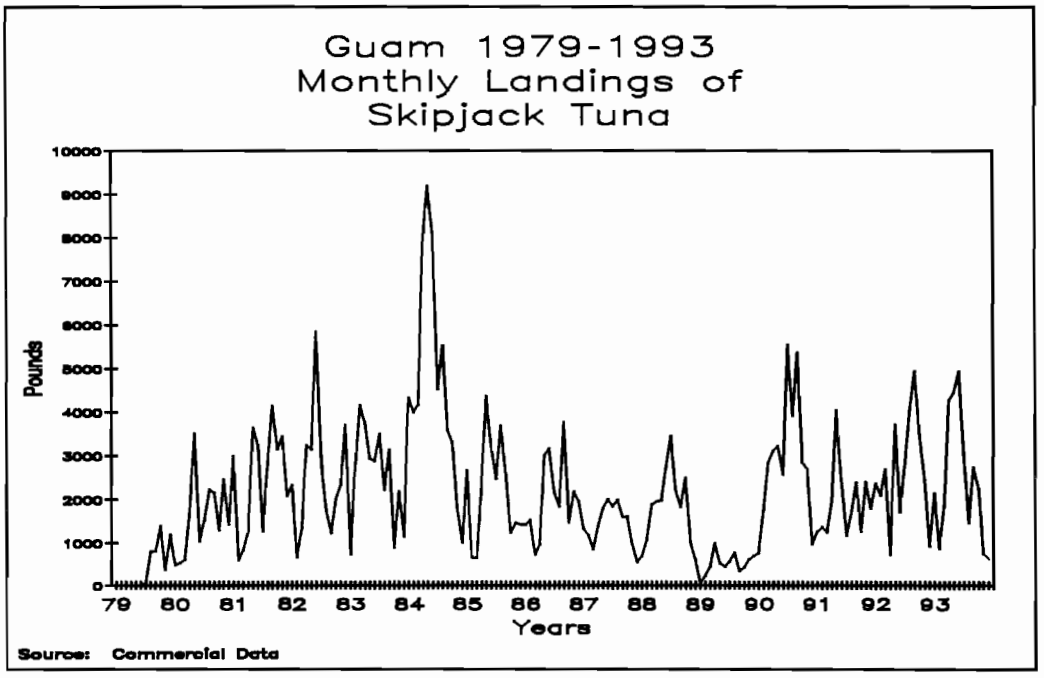
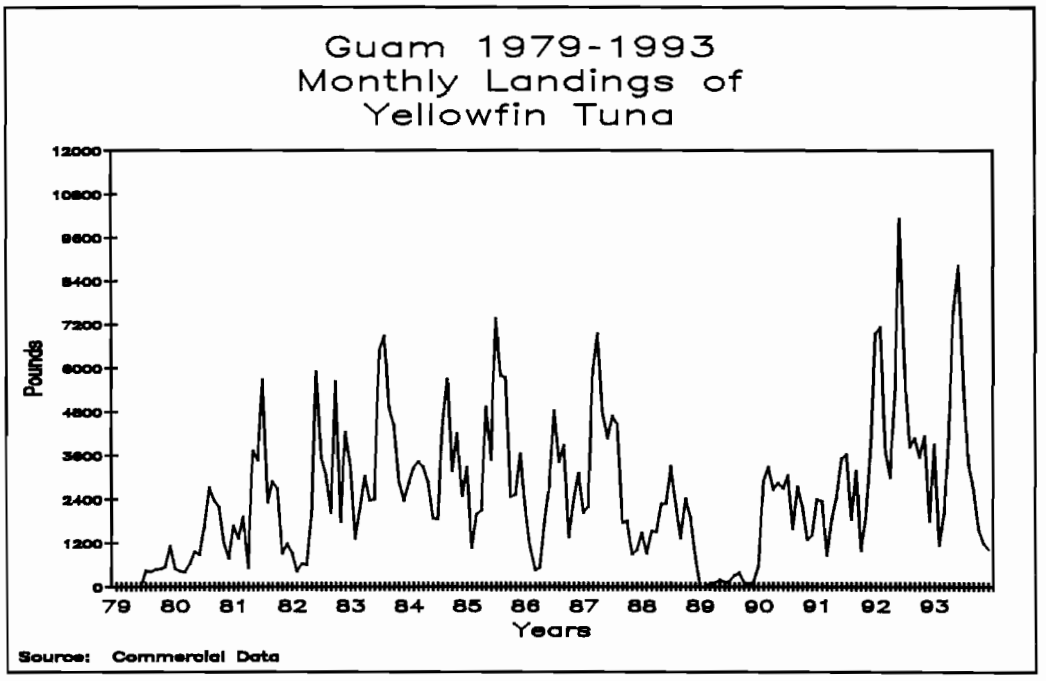


Figure IV.4.7



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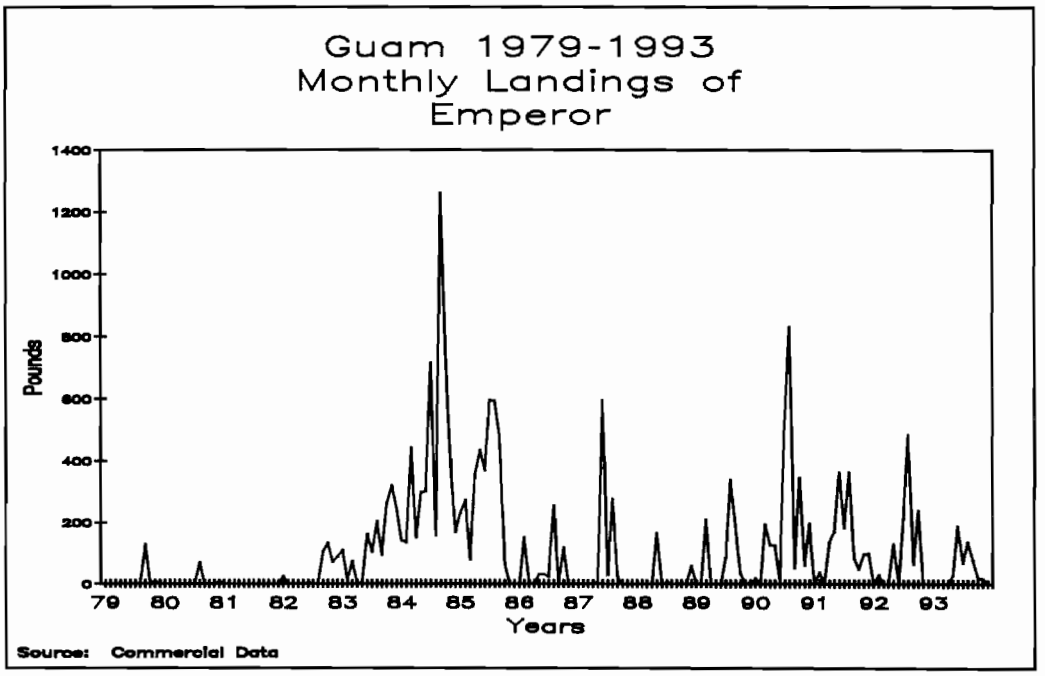

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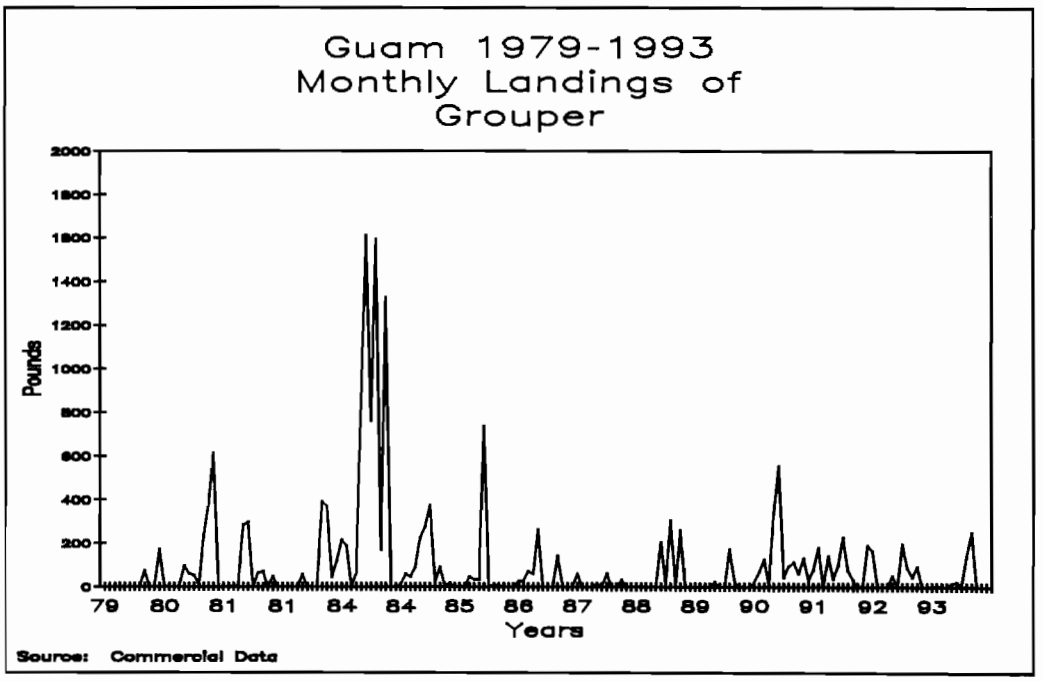
Guam 1979-1993
Monthly Landings of
Grouper
Pounds
2000
1800
1600
1400
1200
1000
800
600
400
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Years
Source: Commercial Data

HAWAII

Fishery Statistics
1993

STATE OF HAWAII 1993 FISHERY STATISTICS

Compiled by

Division of Aquatic Resources

and the

Western Pacific Fishery Information Network

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STATE OF HAWAII 1992 FISHERY STATISTICS

INTRODUCTION

The Hawaiian Archipelago stretches northwestward over 1,500 miles, from about lat. 19° N and long. 155° W to about lat. 28° N and long. 178° W. The seven main Hawaiian Islands--Hawaii, Maui, Lanai, Molokai, Oahu, Kauai, and Niihau--comprise over 99% of the total land area and have virtually all of the State's population of approximately 1 million residents. Over half of the State's commercial fish catch is landed on Oahu and about a third on Hawaii. The Department of Land and Natural Resources' Division of Aquatic Resources (DAR) has been collecting statistics on the commercial fisheries of Hawaii for over 40 years.

The fisheries of the State of Hawaii are quite diverse and vary from hand harvesting algae to large vessel fisheries, such as longlining and lobster fishing. The major fisheries include tuna fishing using several methods, longlining for broadbill swordfish and tuna, lobster trapping, hook-and-line bottom fishing for the grouper-snapper-jack complex, net fishing for such species as the bigeye scad, and trolling for such pelagic species as marlin, wahoo, and mahimahi. Of the approximately 16,000 vessels in Hawaii, about 80% are pleasure boats, 10% commercial fishing or charter boats, and the remainder are registered in other categories. The pleasure category includes boats used for recreational, subsistence, and part-time commercial fishing as well as boats not typically used for fishing such as sailboats. To fish commercially (i.e., sell catches or provide charter fishing services) in Hawaii requires purchasing commercial marine fishing license. In 1993 there were about 2,600 licensed commercial fishermen required to submit monthly reports to DAR. Substantial subsistence and recreational fisheries, which are primarily small boat, one-day fisheries, also exist. Summary data provided in this document were created from reports submitted to DAR by licensed commercial fishermen as of December 1994.

DATA COLLECTING SYSTEM

The major data collecting system used by DAR is based on a State law that requires commercial fishermen to report their catches on a monthly basis. Several different data collection forms are used because of the diversity of fishing methods and a desire to obtain specific information on some of these methods. The vast majority of commercial fishermen use the standard C-3 Fish Catch Report, which is submitted each month and requires the following information for each trip taken:

Fisherman's name and commercial license number
Boat's name and its registration number
Date
Area or buoy fished
Type of gear used
Species caught
Number caught
Pounds caught
Pounds sold
Value of sales
Port of landing

The other forms used to report commercial catches are for specific fisheries including the C-4 Aku Catch Report for the pole-and-line or bait-boat fishery for skipjack tuna, the C-5 Flagline Catch Report for the longline fishery for tunas and other pelagic species, and the Pond Operator's Monthly Fish Report for operators of saltwater fish ponds. All of the forms request basic catch and revenue information by species, plus additional fishery-specific information such as effort and bait.

Commercial collectors of tropical marine fish are required to have an aquarium permit in addition to their commercial marine license and are required to report monthly on the C-6 Aquarium Fish Catch Report. However, the aquarium fish catch is not included in the statistics provided in this document.

Some of the advantages of a mandatory fisherman-reporting system are its relative efficiency, low cost, the potential for excellent percent coverage, and the amount of information that can be collected directly from the fishermen. The major disadvantage is that it places the responsibility for accurate data recording and timely data submission on the fishermen. The assumption is made, therefore, that the data submitted by the fishermen are complete and accurate. The DAR is continuing its efforts to improve the quality of data and decrease the time delays in receiving and processing the data. No real measurement is available for what percent of the total commercial catch is actually reported to DAR, but estimates have ranged from about 10% to over 99%, depending on the species and fishery. The overall percent coverage was probably over 80% in 1993.

DATA PROCESSING SYSTEM

When the various data reporting forms are received by DAR, they undergo a series of coding and editing procedures before being sent out for keypunching. Forms that fail the initial editing by DAR staff are returned to the fishermen for correction and resubmission. Notices are sent to fishermen who fall more than a few months behind in the submission of their reports. Once the data are keypunched, computer generated reports are used

by DAR staff to verify and correct errors in the database. When the database is considered to be reasonably complete and error free, it is ready for production of a variety of summary catch reports.

Since this system is based on submission of data from fishermen, late reporting has always been a problem. The DAR has tried to include as much information as possible in its published monthly and annual reports. Before about 1982, statistics from fishermen's reports received after the generation of the computerized monthly summary reports were hand tallied and added to the final version of the reports before they were published. However, because of processing restrictions or complications, the original databases were not updated. Since 1982, additional editing and data correction procedures were implemented, making database updates possible. The DAR has made significant progress recently in reducing late reporting by fishermen and the time lag before data are available. Data presented in this report series for 1979-86 were based on published monthly DAR reports and differ from final annual data base totals by some small percent (refer to Volumes I and III for details). Beginning with 1987, data were processed directly from the annual detailed databases received from DAR after enough time had passed to ensure that a high percentage of the required fisherman had submitted all reports.

DATA REPORTING SYSTEM

Recorded in DAR's monthly landings reports are more than 150 marine species and species groups, many of which are insignificant in the total catch. To help reduce the volume of this document and improve the usability of the tables, WPACFIN staff combined some of the less important species, reorganized the order of presentation, created a new species coding system, and translated all records in the database. The new coding system has 100 species and species groups based on flexible ecological and phylogenetic criteria. All of the commercially important pelagic and bottom fish species or unique species groups have individual codes and are reported separately. Marine pond catches are included in the species totals, but are less than 0.4% of the total landings for each year.

The monthly and annual reports included in this document contain the common name, weight in pounds, value rounded to the nearest dollar, and the average price per pound for each species. Also included are separate annual reports for commercial fishermen's landings that were not sold. Each monthly report contains a subtotal for the sum of all species for that month, and the December report contains the December subtotal and the annual total. Annual reports contain the total landings for each species and the total recorded landings for all species combined for the calendar year.

Four graphs of monthly landings are presented for 1993, and 26 trend and seasonality graphs, based on 1979-93 data, are also provided. The following species, species groups, and abbreviations are used in the tables and graphs of Hawaii's fishery statistics:

I. Pelagic Management Unit Species (PMUS)

Although the Magnuson Fishery Conservation and Management Act of 1976 was amended in 1992 to include tunas in the Pacific PMUS (PPMUS), this report series will continue to consider tunas as a separate category. The PMUS category in this report includes:

Mahimahi (dolphin)	Wahoo
Blue marlin	Black marlin
Striped marlin	Shortbill spearfish
Sailfish	Swordfish
Sharks	Billfish (misc)

II. Bottomfish Management Unit Species (BMUS)

Deep water jacks (misc.)	Amberjack
Pig-lipped ulua (jack)	White ulua
Giant sea bass	Bluelined snapper
Ehu (red snapper)	Gindai (flower snapper)
Kalikali (pink snapper)	Lehi (silverjaw snapper)
Onaga (long tailed snapper)	Opakapaka (pink snapper)
Uku (gray snapper)	

III. Billfish

Billfish (misc.)	Blue marlin
Black marlin	Striped marlin
Shortbill spearfish	Sailfish
Swordfish	

IV. Tunas

Tunas (misc.)	Skipjack tuna
Yellowfin tuna	Albacore
Bigeye tuna	Kawakawa
Dogtooth tuna	

V. Other Tunas

All of the previous tunas excluding skipjack and yellowfin tuna

VI. Fisheries Categories

A. Pelagics

All PMUS and tuna species plus the following:

Rainbow runner	Barracuda
Japanese mackerel	Frigate tuna
Ocean sunfish	Ocean moonfish

B. Bottom Fish

All BMUS plus the following:

Blue crevally	Dobe ulua (jack)
Paapaa ulua	Blue spot grouper
Porgy	

C. Reef Fish

Reef jacks (misc.)	Squirrelfish
Trumpetfish	Scorpionfish
Mountain bass	Bigeyes
Cardinalfish	Goatfish
Rudderfish	Butterflyfish
Damselfish	Hawkfish
Tilapia	Wrasse
Parrotfish	Gobies
Surgeonfish-tangs	Flounders
Triggerfish	Filefish
Pufferfish	

D. Other

Miscellaneous	Rays
Eels	Bigeye scad (akule)
Mackerel scad (opelu)	Leatherback
Anchovy	Ten pounder
Bonefish	Herring-sardine
Milkfish	Flyingfish
Needlefish	Halfbeaks
Threadfin	Mullet
Pomfret	Snake mackerel
Freshwater fish	Spiny lobster
Slipper lobster	Crabs
Shrimp (freshwater)	Shrimp (saltwater)
Octopus	Squid
Limpets (saltwater)	Limpets (freshwater)
Clams	Stoney corals
Precious corals	Sea urchins
Sea cucumbers	Sea turtles
Algae	

Table V.1.1

Hawaii 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	10,375	22,175	2.14
Sharks	87,437	95,134	1.09
Eels	102	86	0.84
Alfonsin	8	19	2.31
Bigeye scad (akule)	606,230	933,858	1.54
Mackerel scad	296,307	510,460	1.72
Leatherback	454	877	1.93
Ten pounder	1,380	1,232	0.89
Bonefish	3,546	3,498	0.99
Milkfish	4,821	8,377	1.74
Flying fish	1	1	0.75
Needlefish	201	206	1.02
Halfbeaks	905	1,650	1.82
Threadfin	777	4,073	5.24
Mullet	7,833	20,896	2.67
Pomfret	79,134	112,993	1.43
Snake mackerel	433	343	0.79
Jacks (misc)	28,738	56,585	1.97
Amberjack	679	816	1.20
Blue crevally	1,940	3,292	1.70
Pig-lipped ulua	61,290	107,769	1.76
Dobe ulua	98	189	1.93
Paapaa ulua	4,909	9,853	2.01
White ulua	6,984	8,698	1.25
Black ulua	988	1,364	1.38
Giant sea bass	66,402	191,386	2.88
Blue spot grouper	1,302	2,797	2.15
Snappers	2,978	9,495	3.19
Blue lined snapper	57,639	47,194	0.82
Ehu (red snapper)	31,676	130,548	4.12
Gindai (flower snapper)	7,289	20,461	2.81
Kalekale (pink snapper)	16,388	44,185	2.70
Lehi (silverjaw)	9,569	30,420	3.18
Onaga (red snapper)	98,934	514,429	5.20
Opakapaka (pink snapper)	285,113	1,143,637	4.01
Uku (gray snapper)	96,587	303,625	3.14
Porgy	3,147	7,795	2.48
Reef jacks	147	432	2.94
Squirrelfish	40,248	120,864	3.00
Trumpetfish	89	67	0.75
Scorpionfish	3,728	14,465	3.88
Mountain bass	4,899	10,774	2.20
Bigeyes	4,120	9,001	2.18
Cardinalfish	3	6	1.83

Table V.1.1 (Cont.)

Species	Pounds	Value	$/lb
Goatfish	52,043	140,373	2.70
Rudderfish	7,109	6,482	0.91
Damselfish	1,898	3,314	1.75
Hawkfish	923	1,892	2.05
Tilapia	24,190	17,586	0.73
Wrasse	7,935	18,364	2.31
Parrotfish	30,852	62,255	2.02
Surgeon/tangs	71,413	89,107	1.25
Flounders	31	42	1.36
Triggerfish	275	91	0.33
Filefish	370	534	1.44
Rainbow runner	2,417	3,244	1.34
Mahimahi (dolphin)	667,584	1,365,038	2.04
Barracudas	27,687	25,951	0.94
Wahoo	396,932	909,165	2.29
Japanese mackerel	23	59	2.56
Tunas	17,798	181,158	10.18
Skipjack tuna	2,411,533	2,851,382	1.18
Yellowfin tuna	3,535,305	7,887,253	2.23
Albacore	924,033	1,082,941	1.17
Bigeye tuna	3,736,031	12,855,055	3.44
Kawakawa	13,029	16,738	1.28
Frigate tuna	1,563	2,196	1.41
Broadbill swordfish	8,231,374	24,892,952	3.02
Blue marlin	994,812	891,815	0.90
Black marlin	18,120	18,897	1.04
Striped marlin	1,111,880	1,283,731	1.15
Shortnose spearfish	143,560	136,298	0.95
Sailfish	6,885	6,842	0.99
Ocean moonfish	370,548	342,449	0.92
Spiny lobster	2,360	19,831	8.40
Slipper lobster	408	3,891	9.54
Crabs	45,350	182,997	4.04
Shrimp (freshwater)	5	20	4.05
Shrimp (saltwater)	33,746	173,844	5.15
Octopus	11,764	32,882	2.80
Squid	2,303	5,488	2.38
Limpets (saltwater)	5,920	23,319	3.94
Precious corals	769	15,380	20.00
Sea cucumbers	112	774	6.91
Algae	13,440	42,310	3.15
** TOTAL **	24,860,158	60,099,962	2.42

Table V.1.2

Hawaii 1993 Annual Commercial Landings (not sold)

Species	Pounds
Miscellaneous	280
Sharks	21,206
Eels	11
Bigeye scad (akule)	43,262
Mackerel scad	13,468
Leatherback	82
Ten pounder	18
Bonefish	479
Herring/sardine	50
Milkfish	130
Flying fish	4
Needlefish	60
Threadfin	160
Mullet	961
Pomfret	521
Snake mackerel	50
Jacks (misc)	7,227
Amberjack	4,965
Blue crevally	419
Pig-lipped ulua	405
Paapaa ulua	91
White ulua	475
Giant sea bass	362
Blue spot grouper	100
Snappers	109
Blue lined snapper	4,346
Ehu (red snapper)	1,633
Gindai (flower snapper)	351
Kalekale (pink snapper)	2,163
Lehi (silverjaw)	695
Onaga (red snapper)	2,617
Opakapaka (pink snapper)	8,061
Uku (gray snapper)	2,248
Porgy	106
Reef jacks	6
Squirrelfish	3,276
Trumpetfish	26
Scorpionfish	152
Mountain bass	624
Bigeyes	482
Goatfish	4,367
Rudderfish	491
Damselfish	54
Hawkfish	16

Table V.1.2 (Cont.)

Species	Pounds
Tilapia	328
Wrasse	1,087
Parrotfish	1,556
Surgeon/tangs	3,468
Flounders	11
Triggerfish	56
Filefish	10
Rainbow runner	348
Mahimahi (dolphin)	56,925
Barracudas	1,960
Wahoo	38,635
Tunas	558
Skipjack tuna	92,246
Yellowfin tuna	93,516
Albacore	6,281
Bigeye tuna	17,916
Kawakawa	4,325
Frigate tuna	226
Broadbill swordfish	30,880
Blue marlin	92,434
Black marlin	1,126
Striped marlin	34,557
Shortnose spearfish	7,138
Sailfish	894
Ocean sunfish	721
Ocean moonfish	171
Spiny lobster	477
Slipper lobster	9
Crabs	4,390
Shrimp (saltwater)	2,815
Octopus	5,406
Squid	555
Limpets (saltwater)	809
Limpets (freshwater)	20
Precious corals	95
Algae	1,224
** TOTAL **	629,782

Table V.1.3

Hawaii January 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	554	901	1.63
Sharks	5,825	6,187	1.06
Eels	24	30	1.25
Alfonsin	4	11	2.63
Bigeye scad (akule)	26,385	54,208	2.05
Mackerel scad	16,040	28,293	1.76
Leatherback	46	63	1.38
Ten pounder	66	56	0.85
Bonefish	129	212	1.65
Milkfish	544	898	1.65
Needlefish	5	2	0.40
Threadfin	87	489	5.62
Mullet	78	342	4.39
Pomfret	3,174	6,486	2.04
Snake mackerel	232	287	1.24
Jacks (misc)	3,251	6,668	2.05
Amberjack	150	211	1.41
Blue crevally	30	53	1.77
Pig-lipped ulua	3,329	6,381	1.92
Paapaa ulua	221	542	2.45
White ulua	1,288	1,558	1.21
Black ulua	475	716	1.51
Giant sea bass	5,683	16,484	2.90
Blue spot grouper	75	173	2.30
Snappers	464	1,388	2.99
Blue lined snapper	5,433	4,948	0.91
Ehu (red snapper)	3,210	12,500	3.89
Gindai (flower snapper)	594	1,849	3.11
Kalekale (pink snapper)	2,606	6,870	2.64
Lehi (silverjaw)	797	2,400	3.01
Onaga (red snapper)	12,692	62,051	4.89
Opakapaka (pink snapper)	27,278	118,557	4.35
Uku (gray snapper)	6,165	21,376	3.47
Porgy	723	2,066	2.86
Squirrelfish	2,655	8,414	3.17
Trumpetfish	31	28	0.90
Scorpionfish	373	1,512	4.05
Mountain bass	563	1,305	2.32
Bigeyes	451	1,001	2.22
Cardinalfish	2	4	2.00
Goatfish	6,436	16,086	2.50
Rudderfish	284	274	0.96

Table V.1.3 (Cont.)

Species	Pounds	Value	$/lb
Damselfish	122	139	1.14
Hawkfish	56	105	1.87
Tilapia	1,881	1,170	0.62
Wrasse	934	1,912	2.05
Parrotfish	1,845	3,630	1.97
Surgeon/tangs	4,537	5,428	1.20
Flounders	2	2	0.85
Triggerfish	93	9	0.10
Filefish	42	88	2.10
Rainbow runner	146	185	1.27
Mahimahi (dolphin)	13,473	35,735	2.65
Barracudas	724	1,201	1.66
Wahoo	9,361	35,859	3.83
Tunas	300	3,095	10.32
Skipjack tuna	44,639	101,348	2.27
Yellowfin tuna	132,660	285,844	2.15
Albacore	32,236	52,414	1.63
Bigeye tuna	280,691	1,159,756	4.13
Kawakawa	1,394	1,951	1.40
Frigate tuna	102	152	1.49
Broadbill swordfish	387,616	1,361,695	3.51
Blue marlin	16,835	18,866	1.12
Black marlin	125	156	1.25
Striped marlin	43,390	80,471	1.85
Shortnose spearfish	4,673	6,243	1.34
Sailfish	82	59	0.72
Ocean moonfish	13,336	17,250	1.29
Spiny lobster	1,395	13,276	9.52
Slipper lobster	356	3,522	9.89
Crabs	4,214	18,926	4.49
Shrimp (saltwater)	3,149	16,653	5.29
Octopus	736	2,519	3.42
Limpets (saltwater)	358	1,404	3.92
Sea cucumbers	10	67	6.65
Algae	962	3,271	3.40
** SUBTOTAL **	1,140,927	3,628,277	3.18

Table V.1.4

Hawaii February 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	612	1,289	2.11
Sharks	8,711	12,368	1.42
Eels	9	12	1.35
Bigeye scad (akule)	39,409	74,708	1.90
Mackerel scad	14,236	24,288	1.71
Leatherback	13	15	1.12
Ten pounder	12	9	0.79
Bonefish	347	317	0.91
Milkfish	751	1,314	1.75
Needlefish	35	37	1.06
Threadfin	92	489	5.31
Mullet	39	101	2.59
Pomfret	5,363	8,965	1.67
Jacks (misc)	1,779	3,460	1.94
Amberjack	107	97	0.91
Blue crevally	108	176	1.63
Pig-lipped ulua	3,237	7,294	2.25
Dobe ulua	42	52	1.23
Paapaa ulua	364	841	2.31
White ulua	150	237	1.58
Black ulua	38	78	2.06
Giant sea bass	2,376	8,575	3.61
Blue spot grouper	348	704	2.02
Snappers	172	515	2.99
Blue lined snapper	5,513	4,188	0.76
Ehu (red snapper)	3,866	16,223	4.20
Gindai (flower snapper)	309	1,056	3.42
Kalekale (pink snapper)	973	2,998	3.08
Lehi (silverjaw)	821	2,469	3.01
Onaga (red snapper)	4,930	25,713	5.22
Opakapaka (pink snapper)	16,370	72,116	4.41
Uku (gray snapper)	4,043	12,684	3.14
Porgy	101	198	1.96
Squirrelfish	2,882	8,994	3.12
Trumpetfish	10	5	0.50
Scorpionfish	279	1,279	4.58
Mountain bass	465	1,138	2.45
Bigeyes	824	1,470	1.78
Goatfish	4,415	12,590	2.85
Rudderfish	350	387	1.10
Damselfish	87	180	2.07
Hawkfish	45	80	1.77

Table V.1.4 (Cont.)

Species	Pounds	Value	$/lb
Tilapia	2,829	1,887	0.67
Wrasse	455	758	1.67
Parrotfish	2,453	4,404	1.80
Surgeon/tangs	3,543	4,100	1.16
Filefish	60	131	2.19
Rainbow runner	395	535	1.35
Mahimahi (dolphin)	34,927	69,420	1.99
Barracudas	1,496	2,097	1.40
Wahoo	15,576	51,109	3.28
Tunas	468	4,345	9.28
Skipjack tuna	34,982	70,248	2.01
Yellowfin tuna	224,142	480,846	2.15
Albacore	51,627	69,768	1.35
Bigeye tuna	514,924	1,735,352	3.37
Kawakawa	1,161	1,561	1.34
Frigate tuna	117	174	1.49
Broadbill swordfish	633,951	2,221,243	3.50
Blue marlin	19,256	23,952	1.24
Black marlin	160	160	1.00
Striped marlin	78,850	125,687	1.59
Shortnose spearfish	13,359	17,002	1.27
Sailfish	20	9	0.46
Ocean moonfish	25,930	31,212	1.20
Spiny lobster	48	317	6.60
Slipper lobster	3	16	5.42
Crabs	898	3,587	3.99
Shrimp (saltwater)	1,479	6,942	4.69
Octopus	592	1,558	2.63
Limpets (saltwater)	269	1,112	4.13
Sea cucumbers	24	169	7.06
Algae	1,057	3,049	2.88
** SUBTOTAL **	1,789,684	5,242,457	2.93

Table V.1.5

Hawaii March 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	730	1,240	1.70
Sharks	8,673	10,666	1.23
Eels	5	4	0.75
Bigeye scad (akule)	110,143	158,918	1.44
Mackerel scad	20,130	33,901	1.68
Leatherback	12	17	1.42
Ten pounder	84	71	0.85
Bonefish	205	256	1.25
Milkfish	390	583	1.49
Needlefish	16	23	1.43
Threadfin	73	417	5.71
Mullet	1,024	3,288	3.21
Pomfret	8,638	11,883	1.38
Jacks (misc)	2,715	5,219	1.92
Amberjack	139	150	1.08
Blue crevally	101	127	1.26
Pig-lipped ulua	6,346	12,156	1.92
Dobe ulua	18	27	1.50
Paapaa ulua	569	855	1.50
White ulua	597	821	1.38
Black ulua	299	320	1.07
Giant sea bass	12,550	28,628	2.28
Blue spot grouper	306	610	1.99
Snappers	124	366	2.95
Blue lined snapper	3,953	3,592	0.91
Ehu (red snapper)	2,140	10,673	4.99
Gindai (flower snapper)	529	1,800	3.40
Kalekale (pink snapper)	1,232	3,562	2.89
Lehi (silverjaw)	840	2,926	3.48
Onaga (red snapper)	9,518	46,004	4.83
Opakapaka (pink snapper)	24,015	105,407	4.39
Uku (gray snapper)	5,888	18,638	3.17
Porgy	526	1,450	2.76
Reef jacks	9	27	3.00
Squirrelfish	2,957	8,689	2.94
Trumpetfish	6	3	0.50
Scorpionfish	279	1,051	3.77
Mountain bass	485	1,456	3.00
Bigeyes	549	1,225	2.23
Goatfish	4,988	13,762	2.76
Rudderfish	847	731	0.86
Damselfish	34	69	2.03

Table V.1.5 (Cont.)

Species	Pounds	Value	$/lb
Hawkfish	57	123	2.16
Tilapia	89	50	0.56
Wrasse	385	1,042	2.71
Parrotfish	1,710	3,441	2.01
Surgeon/tangs	4,552	6,549	1.44
Filefish	20	30	1.51
Rainbow runner	95	142	1.50
Mahimahi (dolphin)	49,746	93,458	1.88
Barracudas	3,268	3,124	0.96
Wahoo	32,462	81,346	2.51
Japanese mackerel	1	2	1.60
Tunas	378	3,976	10.52
Skipjack tuna	43,771	97,999	2.24
Yellowfin tuna	248,350	606,343	2.44
Albacore	39,680	58,553	1.48
Bigeye tuna	474,905	1,404,565	2.96
Kawakawa	1,239	1,916	1.55
Frigate tuna	111	169	1.52
Broadbill swordfish	1,160,377	3,659,149	3.15
Blue marlin	22,571	28,036	1.24
Black marlin	853	949	1.11
Striped marlin	94,023	147,774	1.57
Shortnose spearfish	29,409	26,159	0.89
Sailfish	54	48	0.88
Ocean moonfish	42,617	35,324	0.83
Spiny lobster	156	976	6.26
Crabs	2,319	11,144	4.81
Shrimp (saltwater)	4,933	24,017	4.87
Octopus	802	2,160	2.69
Squid	39	238	6.10
Limpets (saltwater)	244	944	3.87
Sea cucumbers	14	95	6.75
Algae	1,207	3,184	2.64
** SUBTOTAL **	2,493,119	6,794,638	2.73

Table V.1.6

Hawaii April 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	581	1,251	2.15
Sharks	8,944	10,495	1.17
Bigeye scad (akule)	76,152	121,908	1.60
Mackerel scad	18,335	33,535	1.83
Leatherback	5	6	1.20
Ten pounder	323	292	0.90
Bonefish	208	237	1.14
Milkfish	414	728	1.76
Threadfin	50	281	5.62
Mullet	598	1,724	2.88
Pomfret	13,534	13,553	1.00
Jacks (misc)	3,209	5,661	1.76
Amberjack	61	75	1.23
Blue crevally	88	182	2.07
Pig-lipped ulua	4,687	7,758	1.66
Paapaa ulua	80	165	2.06
White ulua	313	225	0.72
Black ulua	16	39	2.42
Giant sea bass	4,141	13,551	3.27
Blue spot grouper	307	671	2.19
Snappers	114	399	3.50
Blue lined snapper	5,371	4,512	0.84
Ehu (red snapper)	2,366	11,249	4.75
Gindai (flower snapper)	497	1,579	3.18
Kalekale (pink snapper)	1,120	3,354	2.99
Lehi (silverjaw)	593	1,815	3.06
Onaga (red snapper)	3,823	24,176	6.32
Opakapaka (pink snapper)	12,542	55,901	4.46
Uku (gray snapper)	5,606	21,391	3.82
Porgy	301	598	1.99
Reef jacks	10	30	3.00
Squirrelfish	3,088	9,222	2.99
Trumpetfish	10	9	0.88
Scorpionfish	228	904	3.96
Mountain bass	536	1,045	1.95
Bigeyes	446	1,039	2.33
Goatfish	5,040	13,814	2.74
Rudderfish	329	373	1.13
Damselfish	142	202	1.42
Hawkfish	134	291	2.17
Tilapia	1,675	1,115	0.67
Wrasse	566	1,155	2.04

Table V.1.6 (Cont.)

Species	Pounds	Value	$/lb
Parrotfish	2,472	5,223	2.11
Surgeon/tangs	5,349	7,268	1.36
Triggerfish	2	0	0.08
Filefish	61	113	1.86
Rainbow runner	204	304	1.49
Mahimahi (dolphin)	101,339	169,629	1.67
Barracudas	4,855	2,995	0.62
Wahoo	76,306	133,447	1.75
Tunas	3	4	1.25
Skipjack tuna	69,132	159,973	2.31
Yellowfin tuna	196,504	611,026	3.11
Albacore	78,769	121,818	1.55
Bigeye tuna	244,197	901,751	3.69
Kawakawa	678	1,061	1.56
Frigate tuna	302	450	1.49
Broadbill swordfish	1,425,907	3,664,423	2.57
Blue marlin	27,608	35,580	1.29
Black marlin	1,289	1,869	1.45
Striped marlin	106,524	164,261	1.54
Shortnose spearfish	20,325	17,065	0.84
Sailfish	24	26	1.10
Ocean moonfish	37,241	35,126	0.94
Spiny lobster	238	1,902	7.99
Slipper lobster	11	55	4.98
Crabs	4,496	22,242	4.95
Shrimp (saltwater)	4,015	20,257	5.05
Octopus	314	753	2.40
Limpets (saltwater)	428	1,787	4.18
Algae	1,257	3,494	2.78
** SUBTOTAL **	2,586,433	6,450,412	2.49

Table V.1.7

Hawaii May 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	723	1,418	1.96
Sharks	6,382	5,132	0.80
Eels	12	9	0.72
Bigeye scad (akule)	96,906	136,833	1.41
Mackerel scad	20,799	37,338	1.80
Leatherback	21	29	1.39
Ten pounder	171	166	0.97
Bonefish	156	157	1.00
Milkfish	199	324	1.63
Flying fish	1	1	0.75
Needlefish	5	4	0.79
Threadfin	101	503	4.98
Mullet	420	1,045	2.49
Pomfret	9,956	10,044	1.01
Snake mackerel	65	7	0.10
Jacks (misc)	2,438	4,748	1.95
Amberjack	11	11	1.04
Blue crevally	242	434	1.79
Pig-lipped ulua	7,958	13,799	1.73
Paapaa ulua	217	392	1.80
White ulua	332	406	1.22
Black ulua	47	85	1.80
Giant sea bass	7,235	19,452	2.69
Blue spot grouper	66	165	2.49
Snappers	470	1,827	3.89
Blue lined snapper	7,769	6,288	0.81
Ehu (red snapper)	1,843	7,996	4.34
Gindai (flower snapper)	632	1,851	2.93
Kalekale (pink snapper)	739	2,041	2.76
Lehi (silverjaw)	403	1,203	2.98
Onaga (red snapper)	2,515	17,497	6.96
Opakapaka (pink snapper)	14,762	61,321	4.15
Uku (gray snapper)	18,641	52,595	2.82
Porgy	224	516	2.30
Reef jacks	10	30	3.00
Squirrelfish	3,406	10,239	3.01
Trumpetfish	23	17	0.72
Scorpionfish	256	1,082	4.23
Mountain bass	326	740	2.27
Bigeyes	296	726	2.45
Goatfish	5,319	11,323	2.13
Rudderfish	1,238	952	0.77

Table V.1.7 (Cont.)

Species	Pounds	Value	$/lb
Damselfish	188	319	1.69
Hawkfish	132	269	2.04
Tilapia	2,378	1,551	0.65
Wrasse	302	557	1.85
Parrotfish	1,820	3,983	2.19
Surgeon/tangs	5,711	6,396	1.12
Flounders	1	1	1.00
Triggerfish	7	12	1.75
Filefish	15	25	1.70
Rainbow runner	288	353	1.22
Mahimahi (dolphin)	57,352	119,040	2.08
Barracudas	2,939	2,905	0.99
Wahoo	69,152	129,325	1.87
Tunas	15	15	0.97
Skipjack tuna	89,706	148,957	1.66
Yellowfin tuna	349,722	740,960	2.12
Albacore	80,910	112,242	1.39
Bigeye tuna	215,386	803,396	3.73
Kawakawa	1,393	2,113	1.52
Frigate tuna	286	387	1.35
Broadbill swordfish	965,374	2,868,251	2.97
Blue marlin	37,946	42,680	1.12
Black marlin	2,298	2,634	1.15
Striped marlin	156,516	173,808	1.11
Shortnose spearfish	11,181	12,079	1.08
Sailfish	193	303	1.57
Ocean moonfish	32,787	27,185	0.83
Crabs	589	2,703	4.59
Shrimp (saltwater)	3,224	15,441	4.79
Octopus	443	1,108	2.50
Squid	98	233	2.38
Limpets (saltwater)	411	1,573	3.83
Sea cucumbers	26	180	6.93
Algae	1,406	4,045	2.88
** SUBTOTAL **	2,303,530	5,635,770	2.45

Table V.1.8

Hawaii June 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	815	1,753	2.15
Sharks	6,969	4,922	0.71
Bigeye scad (akule)	81,175	83,400	1.03
Mackerel scad	17,176	30,648	1.78
Leatherback	38	55	1.44
Ten pounder	193	134	0.69
Bonefish	114	108	0.95
Milkfish	623	829	1.33
Threadfin	2	10	5.13
Mullet	2,092	5,053	2.42
Pomfret	6,747	8,622	1.28
Snake mackerel	82	41	0.50
Jacks (misc)	2,450	4,595	1.88
Amberjack	23	6	0.25
Blue crevally	457	752	1.65
Pig-lipped ulua	6,380	10,676	1.67
Paapaa ulua	305	545	1.79
White ulua	357	538	1.51
Black ulua	10	15	1.52
Giant sea bass	3,551	11,190	3.15
Snappers	232	710	3.06
Blue lined snapper	2,694	2,292	0.85
Ehu (red snapper)	1,796	8,535	4.75
Gindai (flower snapper)	625	1,917	3.07
Kalekale (pink snapper)	1,052	2,571	2.44
Lehi (silverjaw)	407	1,358	3.34
Onaga (red snapper)	2,158	16,197	7.51
Opakapaka (pink snapper)	12,293	57,257	4.66
Uku (gray snapper)	12,685	36,568	2.88
Porgy	167	344	2.06
Reef jacks	24	69	2.88
Squirrelfish	3,371	10,010	2.97
Trumpetfish	2	1	0.57
Scorpionfish	292	991	3.39
Mountain bass	336	734	2.18
Bigeyes	156	343	2.20
Goatfish	2,978	6,996	2.35
Rudderfish	916	715	0.78
Damselfish	128	236	1.84
Hawkfish	63	140	2.22
Tilapia	2,527	1,583	0.63
Wrasse	375	606	1.62

Table V.1.8 (Cont.)

Species	Pounds	Value	$/lb
Parrotfish	2,990	6,062	2.03
Surgeon/tangs	7,709	8,878	1.15
Filefish	27	13	0.46
Rainbow runner	22	26	1.18
Mahimahi (dolphin)	35,482	76,858	2.17
Barracudas	3,373	2,712	0.80
Wahoo	53,630	97,406	1.82
Skipjack tuna	133,975	189,487	1.41
Yellowfin tuna	611,702	1,157,398	1.89
Albacore	118,494	120,217	1.01
Bigeye tuna	315,673	797,985	2.53
Kawakawa	3,541	3,679	1.04
Frigate tuna	33	48	1.46
Broadbill swordfish	940,916	3,223,274	3.43
Blue marlin	103,831	82,645	0.80
Black marlin	3,720	2,878	0.77
Striped marlin	167,141	122,281	0.73
Shortnose spearfish	12,017	8,110	0.67
Sailfish	1,041	858	0.82
Ocean moonfish	26,203	24,036	0.92
Crabs	221	1,183	5.35
Shrimp (saltwater)	3,702	19,152	5.17
Octopus	327	971	2.97
Squid	71	400	5.64
Limpets (saltwater)	430	1,594	3.71
Algae	1,428	4,881	3.42
** SUBTOTAL **	2,722,535	6,267,093	2.30

Table V.1.9

Hawaii July 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	733	1,666	2.27
Sharks	5,715	3,522	0.62
Eels	23	8	0.33
Alfonsin	4	8	2.00
Bigeye scad (akule)	23,473	42,339	1.80
Mackerel scad	16,986	32,684	1.92
Leatherback	42	52	1.25
Ten pounder	61	50	0.83
Bonefish	852	759	0.89
Milkfish	274	477	1.74
Threadfin	1	4	3.75
Mullet	221	626	2.83
Pomfret	7,322	12,226	1.67
Snake mackerel	30	8	0.25
Jacks (misc)	1,444	3,227	2.23
Blue crevally	96	152	1.58
Pig-lipped ulua	7,060	11,059	1.57
Paapaa ulua	252	432	1.72
White ulua	1,337	1,346	1.01
Black ulua	25	33	1.30
Giant sea bass	6,174	17,057	2.76
Blue spot grouper	83	203	2.44
Snappers	125	377	3.02
Blue lined snapper	4,197	3,283	0.78
Ehu (red snapper)	2,274	8,555	3.76
Gindai (flower snapper)	508	1,307	2.57
Kalekale (pink snapper)	1,275	3,381	2.65
Lehi (silverjaw)	172	526	3.06
Onaga (red snapper)	13,951	48,861	3.50
Opakapaka (pink snapper)	14,016	61,593	4.39
Uku (gray snapper)	13,769	43,781	3.18
Porgy	194	411	2.12
Squirrelfish	3,745	11,079	2.96
Trumpetfish	1	1	0.75
Scorpionfish	226	862	3.82
Mountain bass	192	481	2.50
Bigeyes	262	524	2.00
Goatfish	2,925	7,431	2.54
Rudderfish	710	615	0.87
Damselfish	132	257	1.95
Hawkfish	62	131	2.12
Tilapia	1,281	835	0.65

Table V.1.9 (Cont.)

Species	Pounds	Value	$/lb
Wrasse	404	953	2.36
Parrotfish	2,522	5,142	2.04
Surgeon/tangs	3,819	4,495	1.18
Filefish	8	4	0.55
Rainbow runner	101	125	1.24
Mahimahi (dolphin)	27,675	70,877	2.56
Barracudas	4,235	2,924	0.69
Wahoo	34,982	78,779	2.25
Skipjack tuna	256,768	319,602	1.24
Yellowfin tuna	594,253	1,025,640	1.73
Albacore	93,762	100,940	1.08
Bigeye tuna	339,027	731,649	2.16
Kawakawa	685	735	1.07
Frigate tuna	28	31	1.12
Broadbill swordfish	569,475	1,821,254	3.20
Blue marlin	137,216	113,838	0.83
Black marlin	1,882	1,914	1.02
Striped marlin	69,436	63,179	0.91
Shortnose spearfish	10,664	10,654	1.00
Sailfish	2,204	1,865	0.85
Ocean moonfish	36,019	38,477	1.07
Crabs	2,598	9,510	3.66
Shrimp (saltwater)	2,506	14,368	5.73
Octopus	469	1,379	2.94
Squid	125	262	2.09
Limpets (saltwater)	850	3,448	4.06
Algae	977	3,225	3.30
** SUBTOTAL **	2,324,915	4,747,497	2.04

Table V.1.10

Hawaii August 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	1,004	2,661	2.65
Sharks	8,215	6,818	0.83
Eels	6	3	0.50
Bigeye scad (akule)	24,172	47,194	1.95
Mackerel scad	22,948	44,378	1.93
Leatherback	65	81	1.24
Ten pounder	58	58	1.00
Bonefish	99	113	1.14
Milkfish	628	1,509	2.40
Needlefish	11	5	0.48
Threadfin	1	4	3.75
Mullet	273	593	2.17
Pomfret	3,302	7,121	2.16
Jacks (misc)	2,982	5,276	1.77
Amberjack	13	10	0.75
Blue crevally	145	290	2.00
Pig-lipped ulua	4,688	9,805	2.09
Dobe ulua	2	5	2.25
Paapaa ulua	843	2,017	2.39
White ulua	1,473	1,762	1.20
Giant sea bass	7,811	23,902	3.06
Blue spot grouper	29	73	2.51
Snappers	208	813	3.91
Blue lined snapper	2,856	2,802	0.98
Ehu (red snapper)	3,437	13,271	3.86
Gindai (flower snapper)	1,119	2,520	2.25
Kalekale (pink snapper)	1,768	5,192	2.94
Lehi (silverjaw)	467	1,497	3.21
Onaga (red snapper)	8,672	46,594	5.37
Opakapaka (pink snapper)	15,519	71,674	4.62
Uku (gray snapper)	12,559	41,131	3.27
Porgy	227	514	2.27
Reef jacks	26	76	2.91
Squirrelfish	4,756	14,238	2.99
Trumpetfish	3	2	0.78
Scorpionfish	214	773	3.61
Mountain bass	419	973	2.32
Bigeyes	225	546	2.43
Goatfish	3,556	10,531	2.96
Rudderfish	742	701	0.94
Damselfish	265	532	2.01
Hawkfish	70	164	2.34

Table V.1.10 (Cont.)

Species	Pounds	Value	$/lb
Tilapia	2,816	2,070	0.73
Wrasse	870	2,199	2.53
Parrotfish	3,109	6,170	1.98
Surgeon/tangs	5,388	6,940	1.29
Flounders	2	2	0.85
Triggerfish	16	25	1.55
Filefish	8	16	1.99
Rainbow runner	151	227	1.50
Mahimahi (dolphin)	79,798	182,278	2.28
Barracudas	3,256	2,890	0.89
Wahoo	27,498	79,891	2.91
Skipjack tuna	397,963	427,845	1.08
Yellowfin tuna	396,006	1,009,830	2.55
Albacore	74,569	91,679	1.23
Bigeye tuna	156,962	500,790	3.19
Kawakawa	752	856	1.14
Frigate tuna	94	93	0.99
Broadbill swordfish	339,323	1,087,406	3.20
Blue marlin	154,356	146,884	0.95
Black marlin	1,198	821	0.68
Striped marlin	25,891	32,114	1.24
Shortnose spearfish	4,218	5,510	1.31
Sailfish	821	860	1.05
Ocean moonfish	32,527	32,661	1.00
Spiny lobster	9	31	3.44
Crabs	4,655	16,499	3.54
Shrimp (freshwater)	5	20	4.05
Shrimp (saltwater)	3,118	14,968	4.80
Octopus	1,732	5,438	3.14
Squid	387	780	2.02
Limpets (saltwater)	1,143	3,743	3.27
Sea cucumbers	28	196	7.00
Algae	840	2,739	3.26
** SUBTOTAL **	1,855,385	4,032,687	2.17

Table V.1.11

Hawaii September 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	1,111	2,308	2.08
Sharks	3,353	2,885	0.86
Eels	23	21	0.91
Bigeye scad (akule)	35,162	60,279	1.71
Mackerel scad	44,541	73,279	1.65
Leatherback	68	90	1.32
Ten pounder	51	47	0.93
Bonefish	992	851	0.86
Milkfish	181	293	1.62
Needlefish	36	40	1.11
Threadfin	118	584	4.95
Mullet	909	2,451	2.70
Pomfret	2,134	5,135	2.41
Jacks (misc)	3,511	6,710	1.91
Amberjack	42	47	1.11
Blue crevally	298	537	1.80
Pig-lipped ulua	4,746	8,636	1.82
Dobe ulua	34	102	3.00
Paapaa ulua	904	1,400	1.55
White ulua	425	918	2.16
Giant sea bass	2,833	9,493	3.35
Blue spot grouper	77	169	2.20
Snappers	630	1,857	2.95
Blue lined snapper	6,586	5,891	0.89
Ehu (red snapper)	2,592	9,120	3.52
Gindai (flower snapper)	665	1,861	2.80
Kalekale (pink snapper)	1,027	2,590	2.52
Lehi (silverjaw)	1,331	4,192	3.15
Onaga (red snapper)	8,243	40,702	4.94
Opakapaka (pink snapper)	34,028	120,706	3.55
Uku (gray snapper)	8,275	26,657	3.22
Porgy	200	522	2.61
Reef jacks	39	116	2.98
Squirrelfish	5,647	17,168	3.04
Scorpionfish	601	2,250	3.74
Mountain bass	253	619	2.45
Bigeyes	379	819	2.16
Goatfish	6,078	17,145	2.82
Rudderfish	644	643	1.00
Damselfish	329	506	1.54
Hawkfish	167	325	1.95
Tilapia	1,645	1,350	0.82

Table V.1.11 (Cont.)

Species	Pounds	Value	$/lb
Wrasse	1,340	3,265	2.44
Parrotfish	4,137	7,471	1.81
Surgeon/tangs	7,838	9,945	1.27
Flounders	6	4	0.67
Triggerfish	142	26	0.18
Rainbow runner	312	438	1.40
Mahimahi (dolphin)	90,014	185,141	2.06
Barracudas	1,957	2,310	1.18
Wahoo	19,086	55,782	2.92
Tunas	1,367	8,648	6.33
Skipjack tuna	442,786	309,234	0.70
Yellowfin tuna	227,182	581,658	2.56
Albacore	45,735	66,871	1.46
Bigeye tuna	79,592	251,835	3.16
Kawakawa	1,155	1,335	1.16
Frigate tuna	13	17	1.29
Broadbill swordfish	524,386	1,331,387	2.54
Blue marlin	171,716	135,738	0.79
Black marlin	1,634	1,566	0.96
Striped marlin	23,769	30,298	1.27
Shortnose spearfish	6,516	6,604	1.01
Sailfish	1,274	1,595	1.25
Ocean moonfish	14,944	17,289	1.16
Spiny lobster	197	1,289	6.54
Slipper lobster	14	94	6.70
Crabs	9,627	37,974	3.94
Shrimp (saltwater)	2,777	15,299	5.51
Octopus	2,233	5,853	2.62
Squid	604	1,101	1.82
Limpets (saltwater)	482	1,869	3.88
Precious corals	661	13,220	20.00
Algae	1,020	3,639	3.57
** SUBTOTAL **	1,865,424	3,520,106	1.89

Table V.1.12

Hawaii October 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	974	2,327	2.39
Sharks	2,430	2,215	0.91
Bigeye scad (akule)	15,534	29,906	1.93
Mackerel scad	48,298	74,912	1.55
Leatherback	43	46	1.06
Ten pounder	54	51	0.94
Bonefish	162	200	1.24
Milkfish	309	533	1.73
Needlefish	12	14	1.13
Threadfin	69	385	5.58
Mullet	564	1,284	2.28
Pomfret	1,890	4,487	2.37
Jacks (misc)	2,012	3,912	1.94
Amberjack	30	35	1.15
Blue crevally	249	378	1.52
Pig-lipped ulua	3,653	7,075	1.94
Paapaa ulua	285	711	2.49
White ulua	192	369	1.92
Giant sea bass	4,962	14,504	2.92
Blue spot grouper	4	9	2.15
Snappers	241	676	2.81
Blue lined snapper	4,875	3,595	0.74
Ehu (red snapper)	1,812	6,952	3.84
Gindai (flower snapper)	605	1,534	2.53
Kalekale (pink snapper)	1,159	3,037	2.62
Lehi (silverjaw)	1,294	4,062	3.14
Onaga (red snapper)	9,035	45,877	5.08
Opakapaka (pink snapper)	39,113	135,046	3.45
Uku (gray snapper)	3,611	11,264	3.12
Porgy	128	330	2.58
Reef jacks	9	26	2.83
Squirrelfish	3,712	10,909	2.94
Scorpionfish	317	1,196	3.77
Mountain bass	114	420	3.69
Bigeyes	140	339	2.42
Goatfish	3,254	10,039	3.09
Rudderfish	329	352	1.07
Damselfish	108	218	2.01
Hawkfish	71	129	1.82
Tilapia	2,002	1,391	0.70
Wrasse	682	1,583	2.32
Parrotfish	2,778	5,784	2.08

Table V.1.12 (Cont.)

Species	Pounds	Value	$/lb
Surgeon/tangs	5,460	6,186	1.13
Flounders	3	1	0.42
Filefish	3	7	2.33
Rainbow runner	226	309	1.37
Mahimahi (dolphin)	75,248	163,783	2.18
Barracudas	618	1,180	1.91
Wahoo	21,222	58,665	2.76
Tunas	1,811	13,417	7.41
Skipjack tuna	436,565	409,517	0.94
Yellowfin tuna	155,986	381,568	2.45
Albacore	73,126	76,987	1.05
Bigeye tuna	148,007	537,263	3.63
Kawakawa	419	752	1.80
Frigate tuna	96	109	1.13
Broadbill swordfish	458,974	1,085,465	2.36
Blue marlin	114,754	99,902	0.87
Black marlin	1,759	2,333	1.33
Striped marlin	68,963	63,343	0.92
Shortnose spearfish	5,671	6,522	1.15
Sailfish	803	908	1.13
Ocean moonfish	22,830	25,730	1.13
Spiny lobster	201	1,282	6.38
Slipper lobster	3	16	5.42
Crabs	8,861	33,386	3.77
Shrimp (saltwater)	2,643	15,480	5.86
Octopus	1,958	5,208	2.66
Squid	718	1,896	2.64
Limpets (saltwater)	642	2,945	4.59
Precious corals	108	2,160	20.00
Algae	991	3,338	3.37
** SUBTOTAL **	1,765,784	3,387,774	1.92

Table V.1.13

Hawaii November 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	1,276	2,549	2.00
Sharks	5,833	6,158	1.06
Bigeye scad (akule)	57,230	84,819	1.48
Mackerel scad	34,452	57,146	1.66
Leatherback	84	399	4.75
Ten pounder	270	264	0.98
Bonefish	155	187	1.21
Milkfish	70	126	1.80
Needlefish	16	16	1.00
Halfbeaks	500	900	1.80
Threadfin	37	181	4.88
Mullet	1,508	4,078	2.70
Pomfret	6,637	9,963	1.50
Jacks (misc)	1,053	2,205	2.09
Amberjack	44	58	1.31
Blue crevally	66	107	1.61
Pig-lipped ulua	2,131	4,218	1.98
Paapaa ulua	256	633	2.47
White ulua	51	58	1.13
Black ulua	78	78	1.00
Giant sea bass	3,564	10,749	3.02
Snappers	99	289	2.92
Blue lined snapper	4,267	3,041	0.71
Ehu (red snapper)	1,943	7,741	3.98
Gindai (flower snapper)	372	951	2.56
Kalekale (pink snapper)	1,055	2,930	2.78
Lehi (silverjaw)	1,202	3,828	3.18
Onaga (red snapper)	7,227	44,803	6.20
Opakapaka (pink snapper)	28,085	103,686	3.69
Uku (gray snapper)	2,608	8,670	3.32
Porgy	164	362	2.21
Squirrelfish	2,097	6,142	2.93
Trumpetfish	1	0	0.10
Scorpionfish	180	733	4.07
Mountain bass	133	504	3.79
Bigeyes	169	426	2.52
Goatfish	3,318	9,877	2.98
Rudderfish	322	387	1.20
Damselfish	150	266	1.77
Hawkfish	34	59	1.74
Tilapia	2,172	2,381	1.10
Wrasse	699	1,721	2.46

Table V.1.13 (Cont.)

Species	Pounds	Value	$/lb
Parrotfish	2,692	5,395	2.00
Surgeon/tangs	7,828	9,666	1.23
Flounders	15	32	2.10
Filefish	15	25	1.67
Rainbow runner	182	260	1.43
Mahimahi (dolphin)	74,683	136,584	1.83
Barracudas	414	738	1.78
Wahoo	12,722	36,842	2.90
Tunas	9,227	88,245	9.56
Skipjack tuna	280,684	323,250	1.15
Yellowfin tuna	140,175	336,170	2.40
Albacore	103,901	92,654	0.89
Bigeye tuna	291,480	1,212,167	4.16
Kawakawa	329	414	1.26
Frigate tuna	91	119	1.31
Broadbill swordfish	401,653	1,274,148	3.17
Blue marlin	104,096	85,354	0.82
Black marlin	1,346	1,622	1.21
Striped marlin	115,869	116,352	1.00
Shortnose spearfish	8,374	8,907	1.06
Ocean moonfish	43,599	30,300	0.69
Spiny lobster	54	349	6.46
Slipper lobster	12	135	11.25
Crabs	4,549	17,246	3.79
Shrimp (saltwater)	501	2,486	4.96
Octopus	1,189	3,132	2.63
Squid	191	407	2.13
Limpets (saltwater)	396	1,903	4.81
Sea cucumbers	10	67	6.75
Algae	1,128	3,718	3.30
** SUBTOTAL **	1,779,013	4,172,374	2.35

Table V.1.14

Hawaii December 1993 Commercial Landings

Species	Pounds	Value	$/lb
Miscellaneous	1,262	2,812	2.23
Sharks	16,387	23,767	1.45
Bigeye scad (akule)	20,489	39,346	1.92
Mackerel scad	22,366	40,058	1.79
Leatherback	17	25	1.47
Ten pounder	37	33	0.89
Bonefish	127	101	0.80
Milkfish	438	764	1.74
Needlefish	65	65	1.00
Halfbeaks	405	750	1.85
Threadfin	146	727	4.98
Mullet	107	311	2.90
Pomfret	10,437	14,508	1.39
Snake mackerel	24	1	0.05
Jacks (misc)	1,894	4,902	2.59
Amberjack	59	117	1.98
Blue crevally	60	105	1.75
Pig-lipped ulua	7,075	8,912	1.26
Dobe ulua	2	4	2.00
Paapaa ulua	613	1,321	2.15
White ulua	469	459	0.98
Giant sea bass	5,522	17,800	3.22
Blue spot grouper	7	22	3.11
Snappers	99	279	2.82
Blue lined snapper	4,125	2,761	0.67
Ehu (red snapper)	4,397	17,734	4.03
Gindai (flower snapper)	834	2,235	2.68
Kalekale (pink snapper)	2,382	5,660	2.38
Lehi (silverjaw)	1,242	4,144	3.34
Onaga (red snapper)	16,170	95,954	5.93
Opakapaka (pink snapper)	47,092	180,374	3.83
Uku (gray snapper)	2,737	8,872	3.24
Porgy	192	483	2.51
Reef jacks	20	59	2.93
Squirrelfish	1,932	5,761	2.98
Trumpetfish	2	1	0.50
Scorpionfish	483	1,833	3.79
Mountain bass	1,077	1,359	1.26
Bigeyes	223	543	2.43
Cardinalfish	1	2	1.50
Goatfish	3,736	10,780	2.89
Rudderfish	398	352	0.88

Table V.1.14 (Cont.)

Species	Pounds	Value	$/lb
Damselfish	213	390	1.83
Hawkfish	32	76	2.38
Tilapia	2,895	2,205	0.76
Wrasse	923	2,613	2.83
Parrotfish	2,324	5,550	2.39
Surgeon/tangs	9,679	13,255	1.37
Flounders	2	1	0.50
Triggerfish	15	19	1.23
Filefish	111	81	0.73
Rainbow runner	295	339	1.15
Mahimahi (dolphin)	27,847	62,235	2.23
Barracudas	552	874	1.58
Wahoo	24,935	70,716	2.84
Japanese mackerel	22	57	2.60
Tunas	4,229	59,414	14.05
Skipjack tuna	180,562	293,922	1.63
Yellowfin tuna	258,623	669,971	2.59
Albacore	131,224	118,795	0.91
Bigeye tuna	675,187	2,818,546	4.17
Kawakawa	283	366	1.29
Frigate tuna	290	447	1.54
Broadbill swordfish	423,422	1,295,258	3.06
Blue marlin	84,627	78,338	0.93
Black marlin	1,856	1,995	1.07
Striped marlin	161,508	164,164	1.02
Shortnose spearfish	17,153	11,444	0.67
Sailfish	369	310	0.84
Ocean moonfish	42,515	27,859	0.66
Spiny lobster	62	410	6.61
Slipper lobster	9	54	5.97
Crabs	2,323	8,596	3.70
Shrimp (saltwater)	1,699	8,784	5.17
Octopus	969	2,804	2.89
Squid	70	171	2.45
Limpets (saltwater)	267	997	3.74
Algae	1,167	3,727	3.19
** SUBTOTAL **	2,233,409	6,220,878	2.79
** TOTAL **	24,860,158	60,099,962	2.42

Figure V.1.1

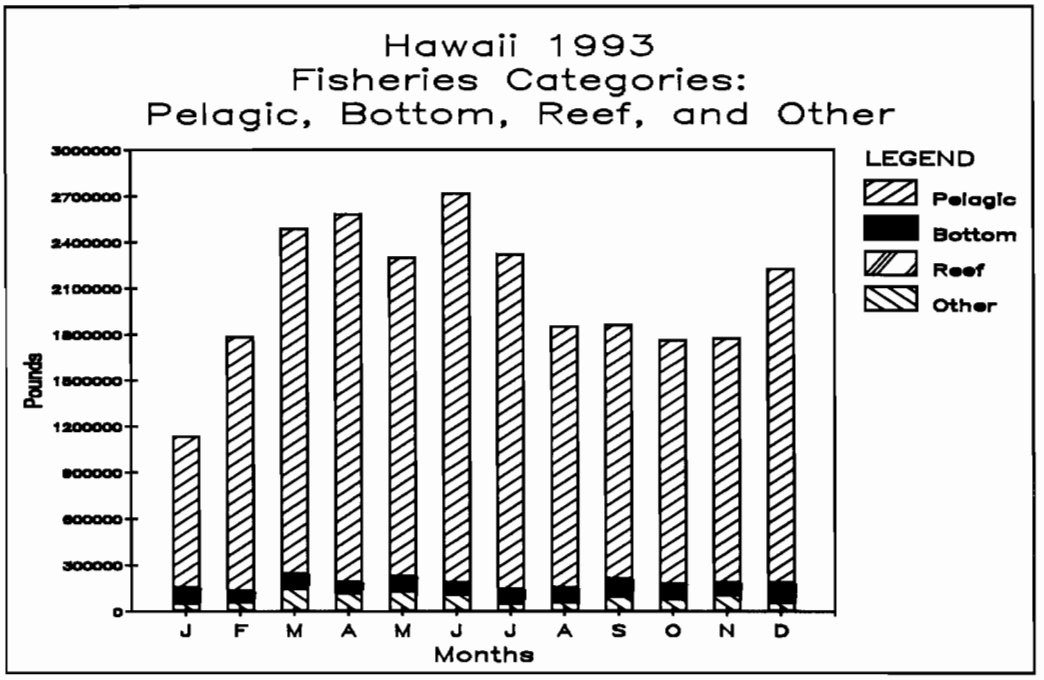


Figure V.1.2

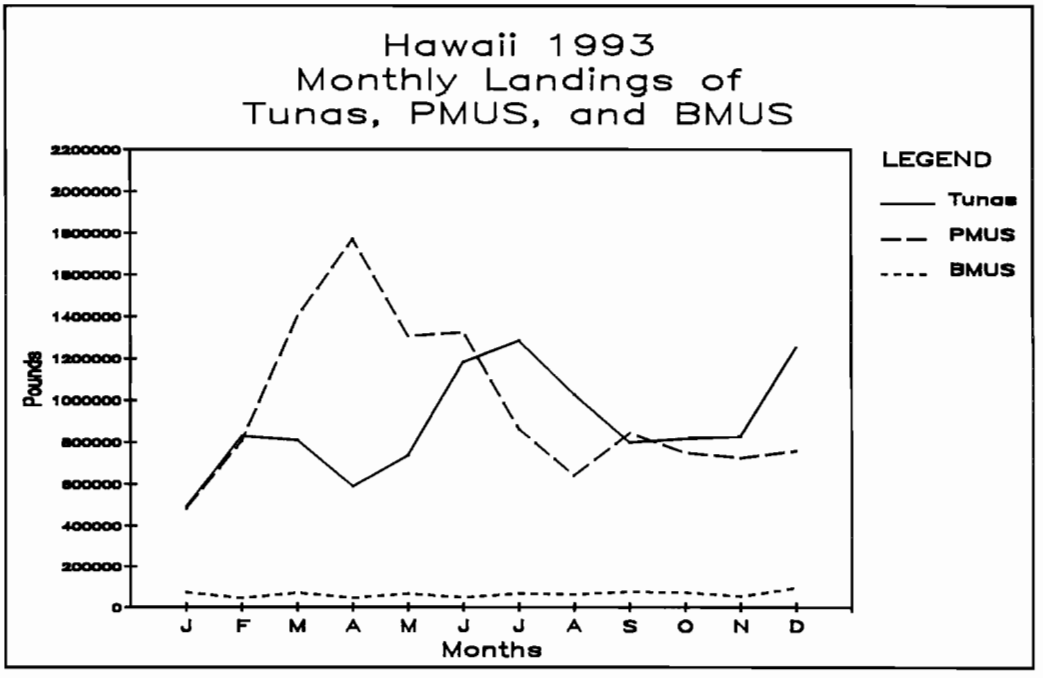


Figure V.1.3

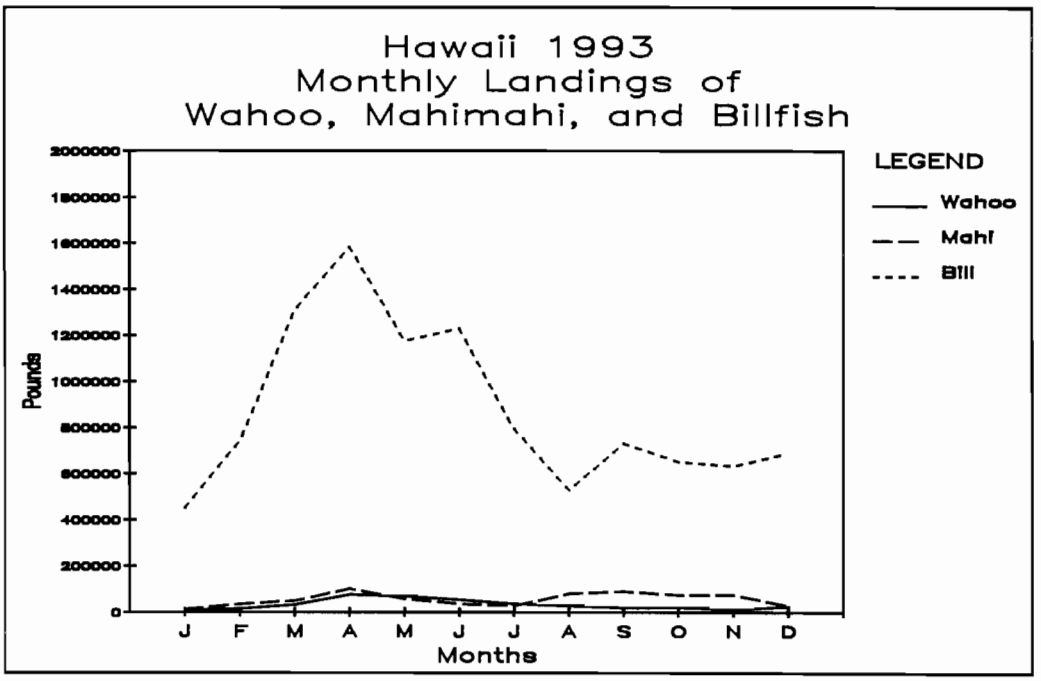
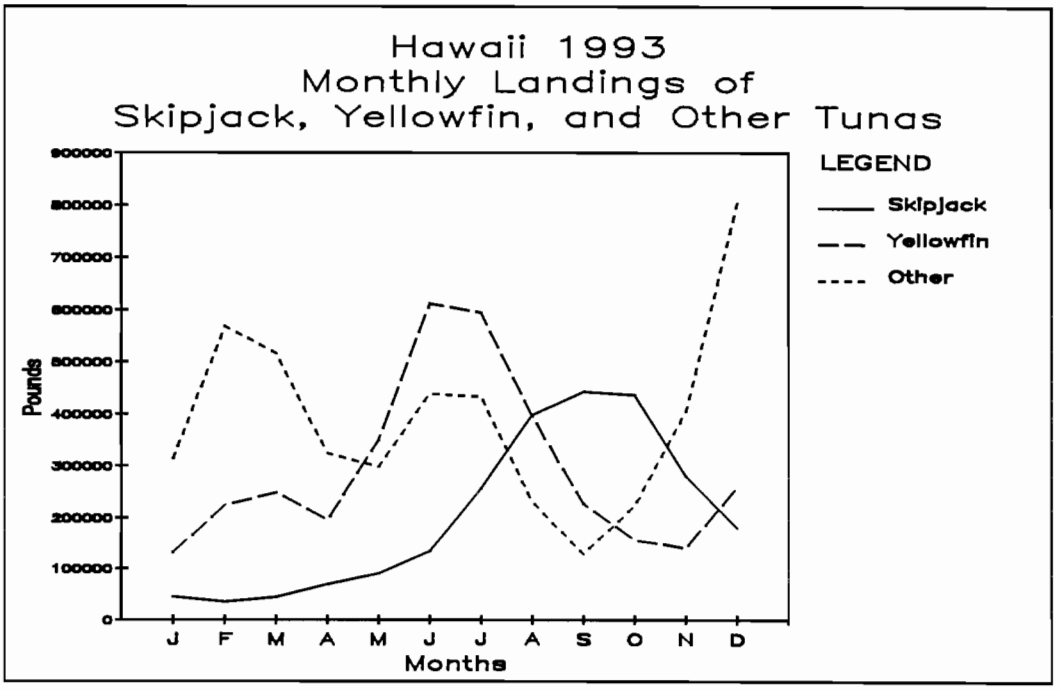


Figure V.1.4



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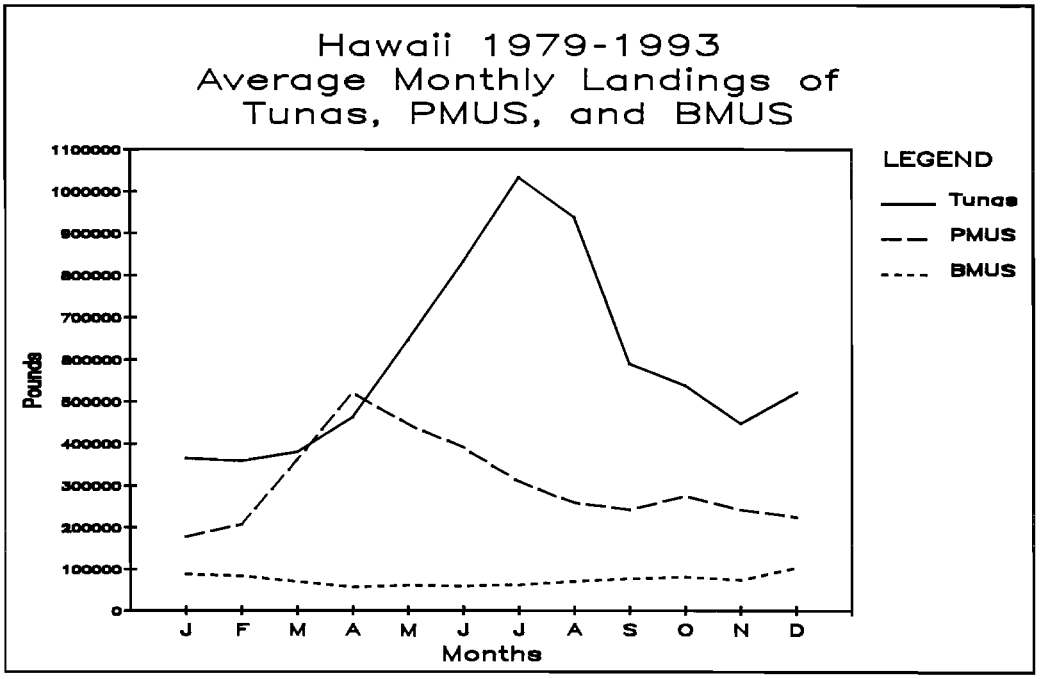

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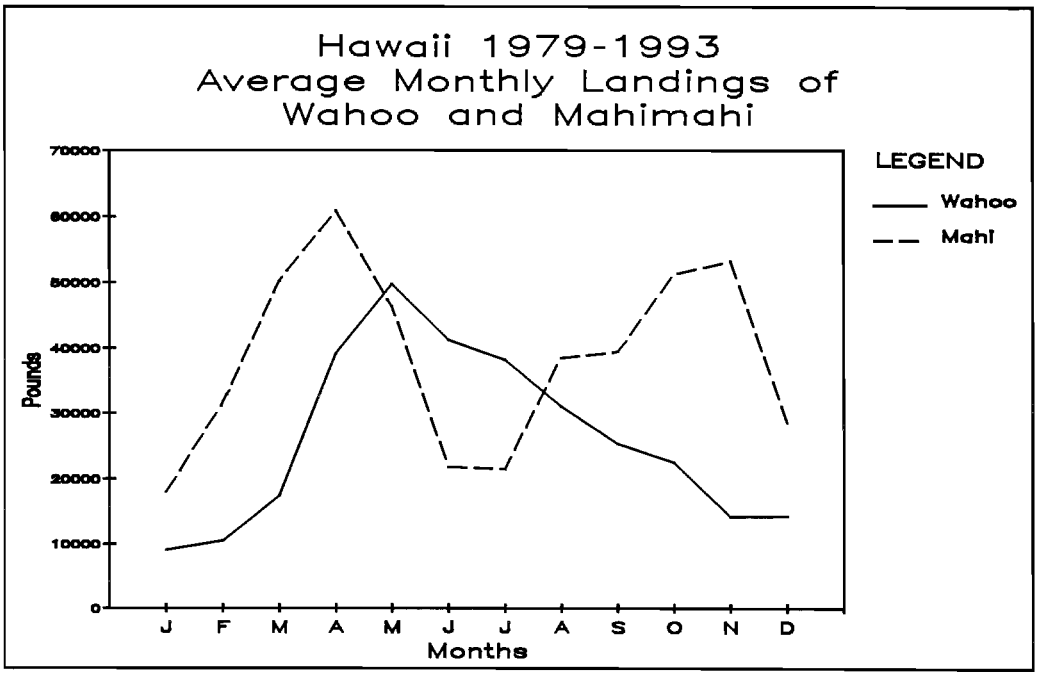

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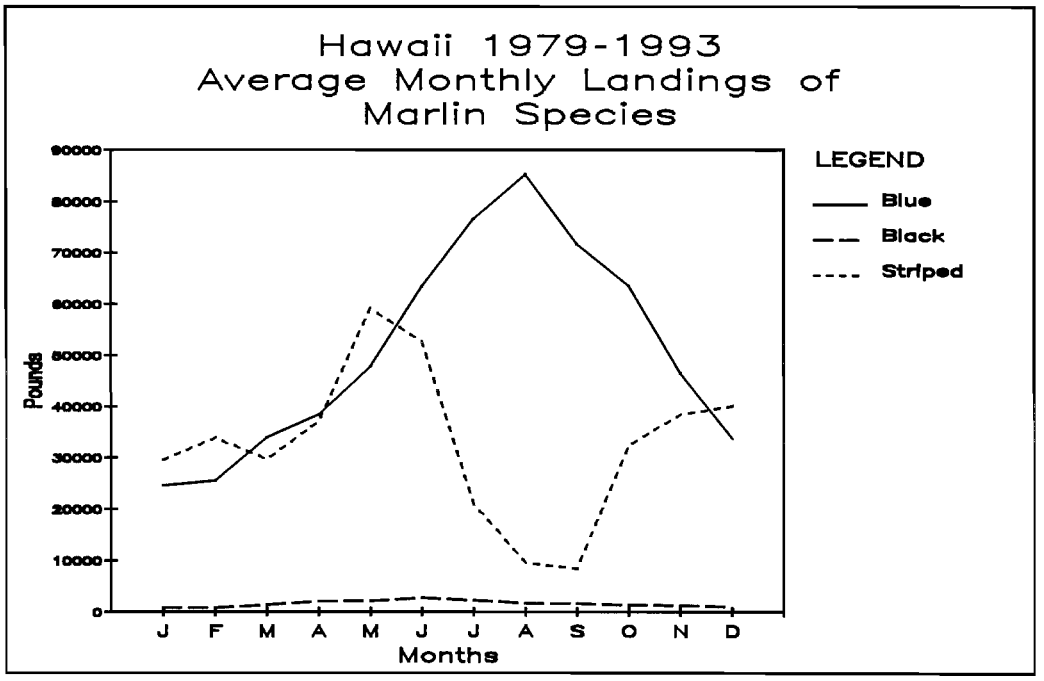

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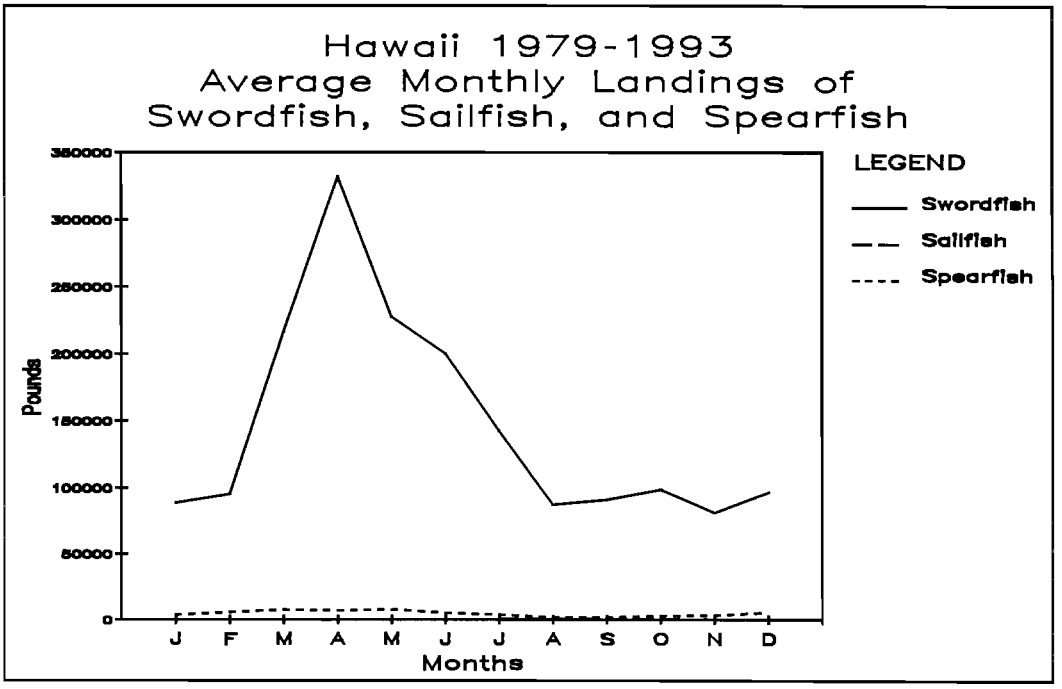


Figure V.2.5

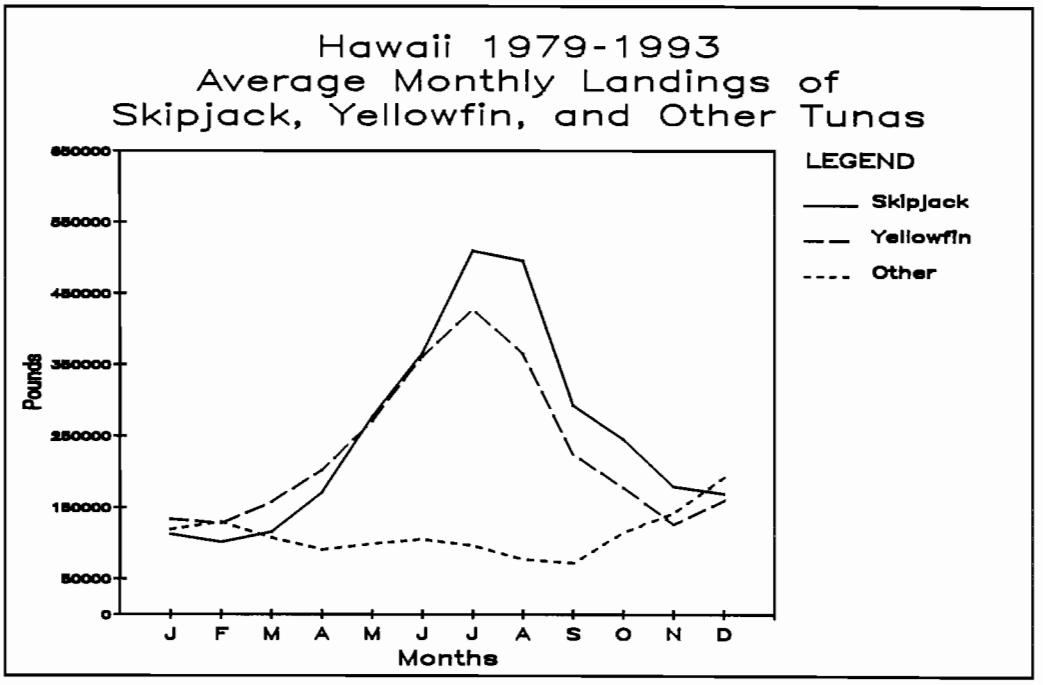
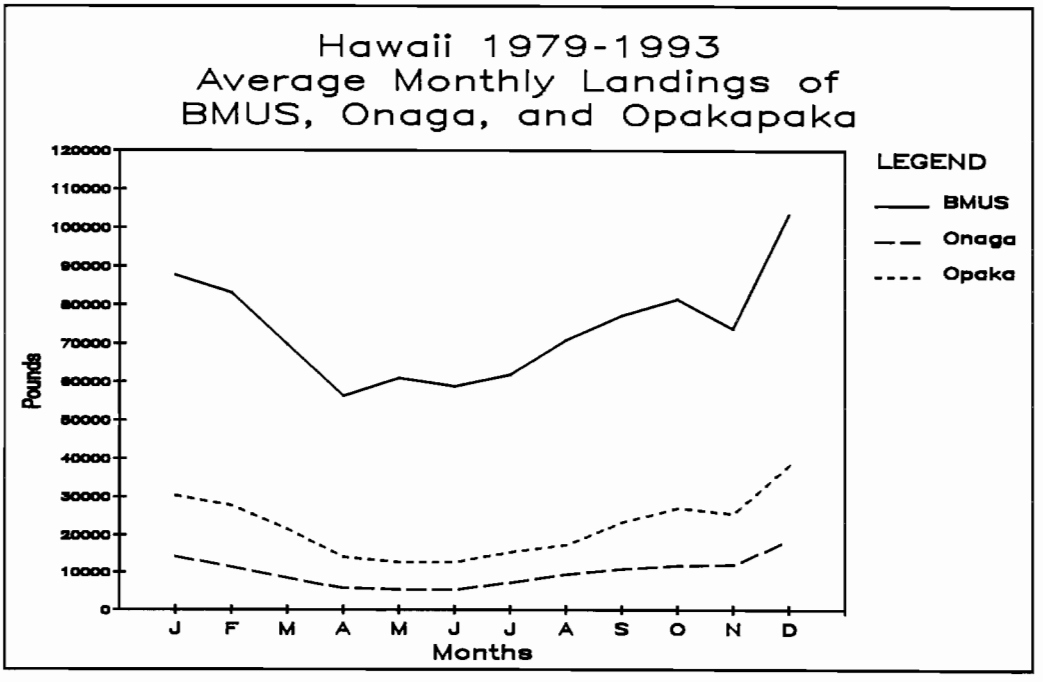


Figure V.2.6



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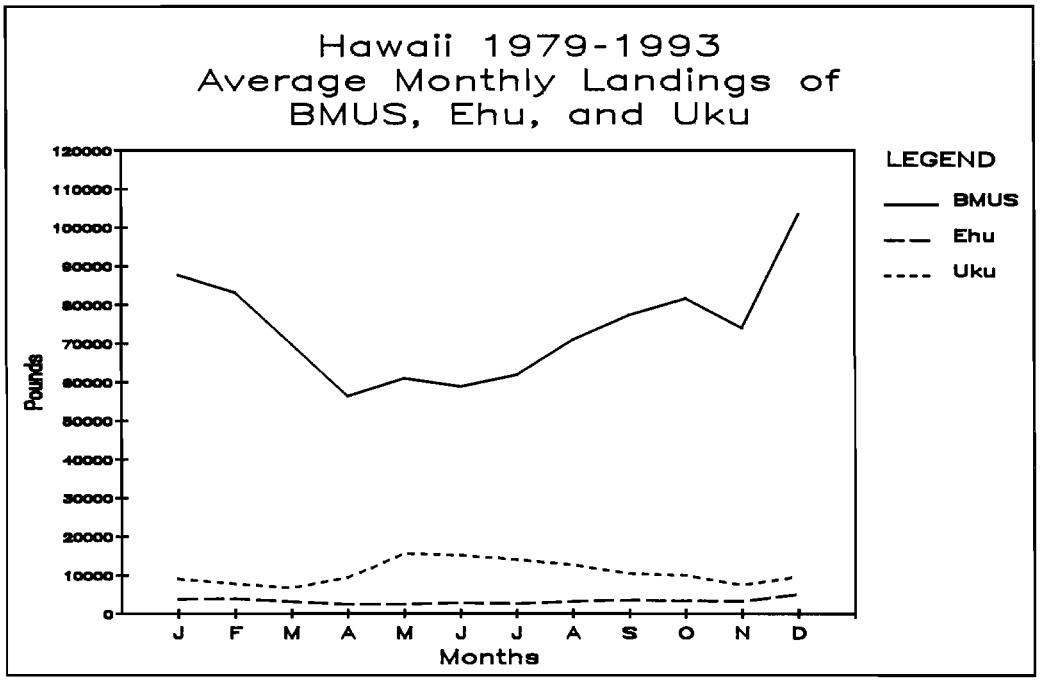
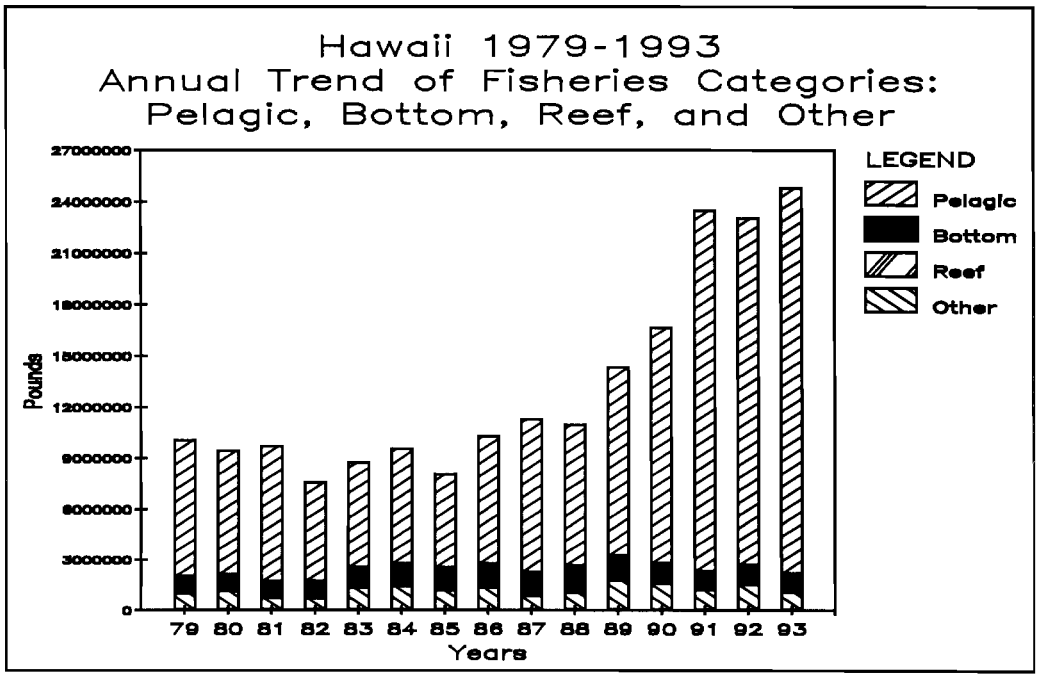


Figure V.3.1



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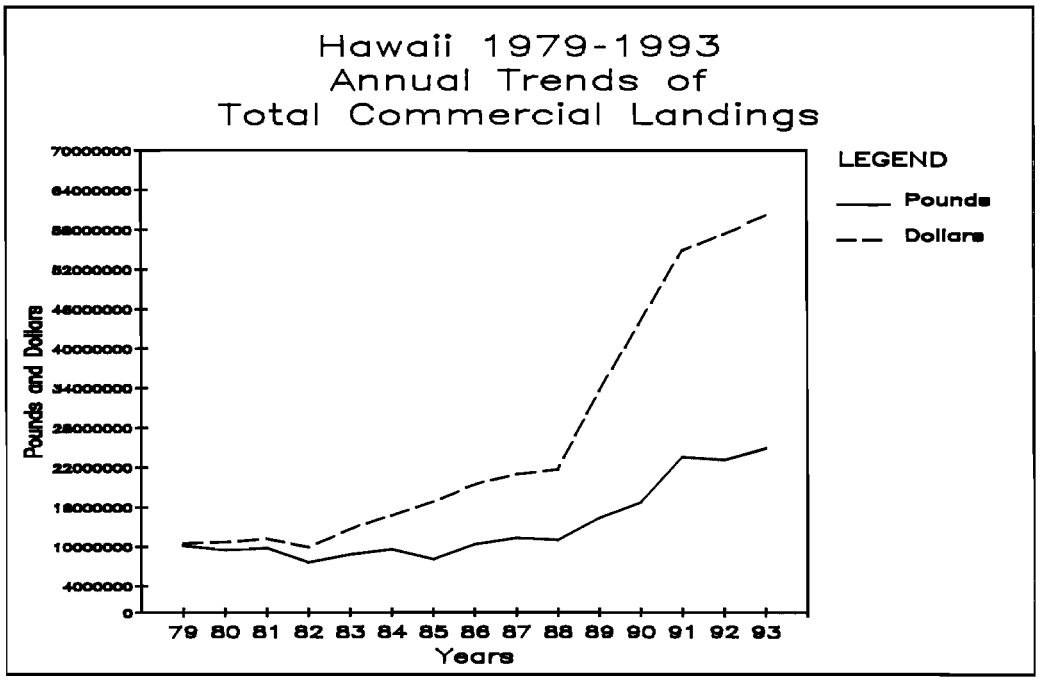

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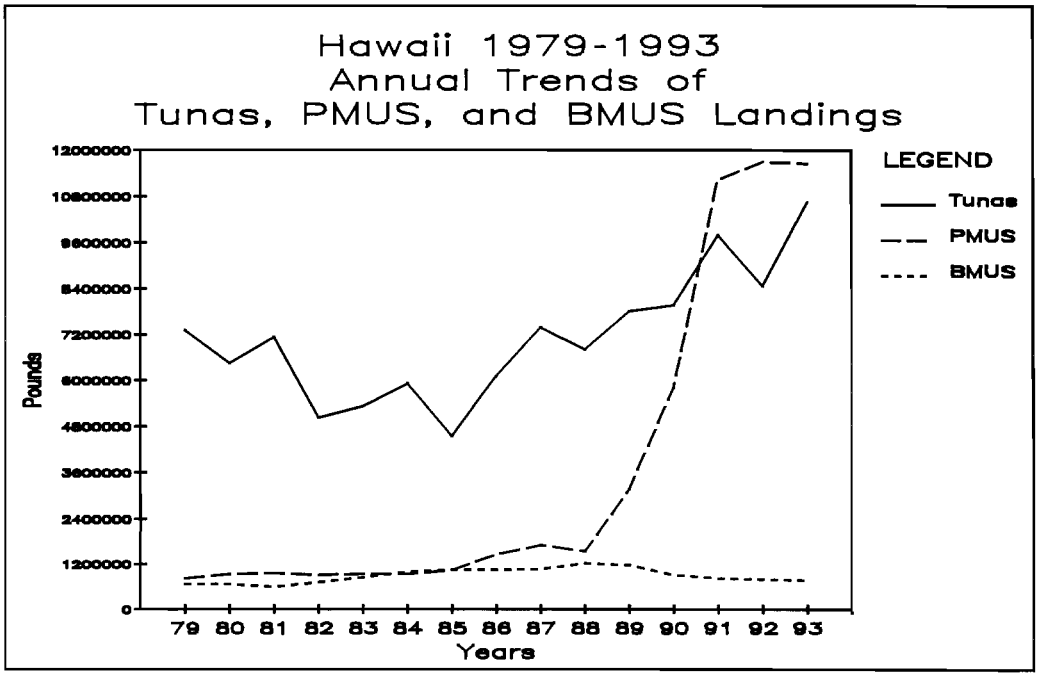

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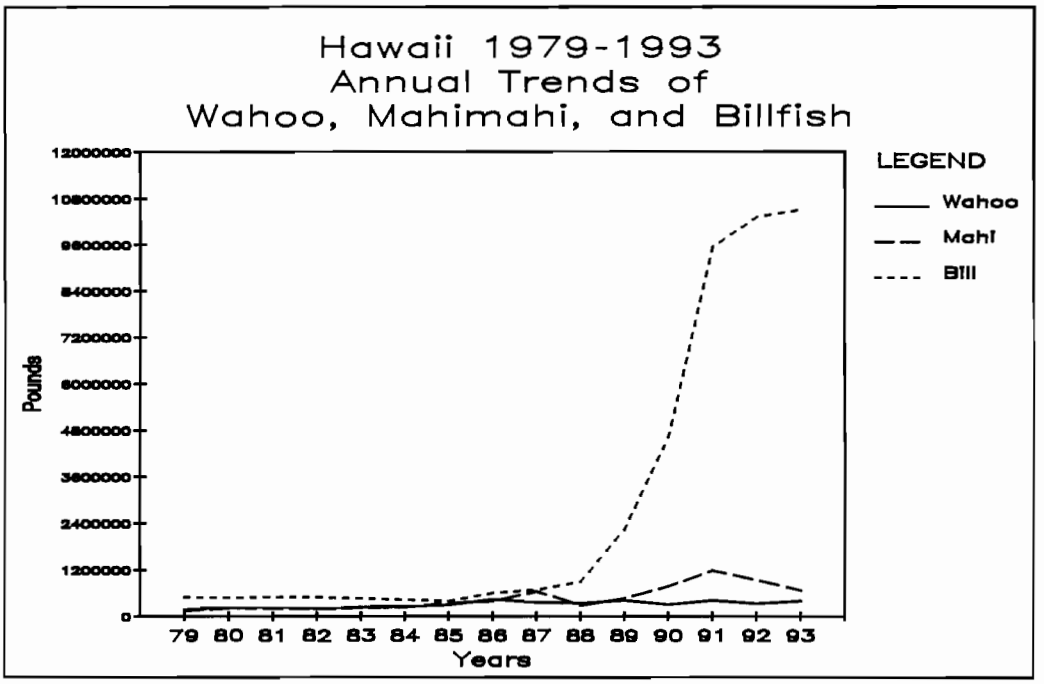


Figure V.3.5

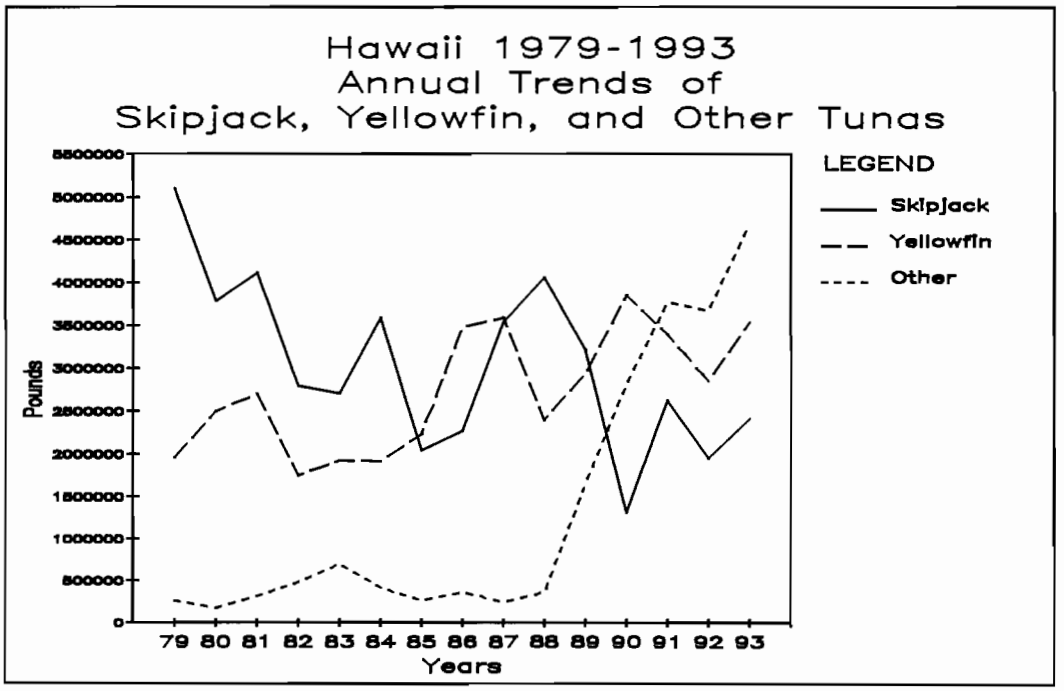
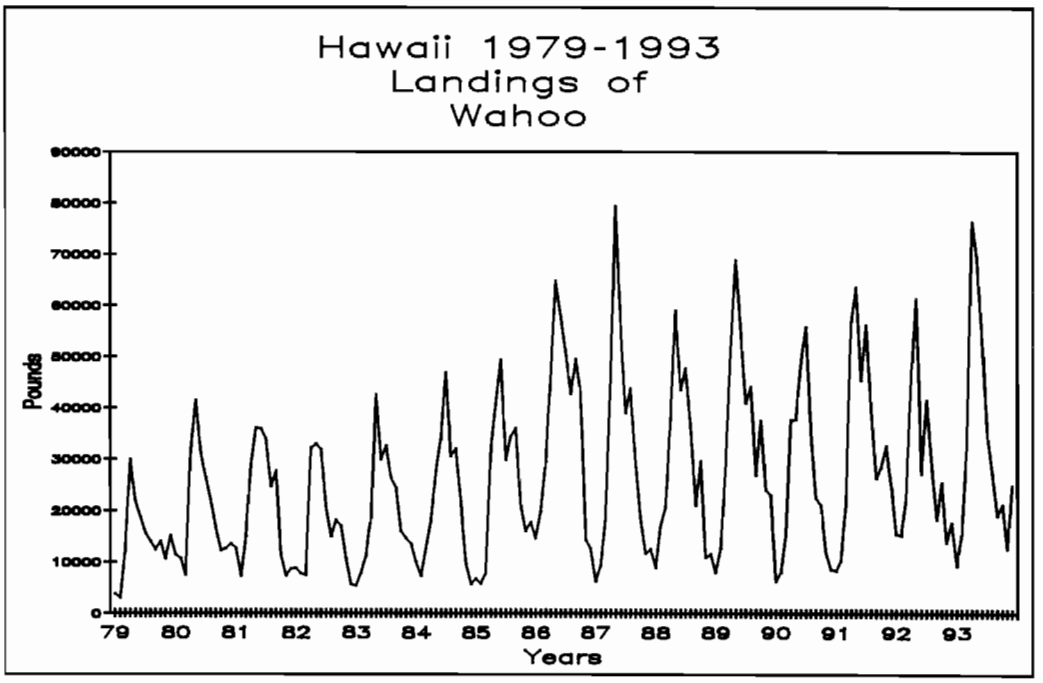


Figure V.4.1



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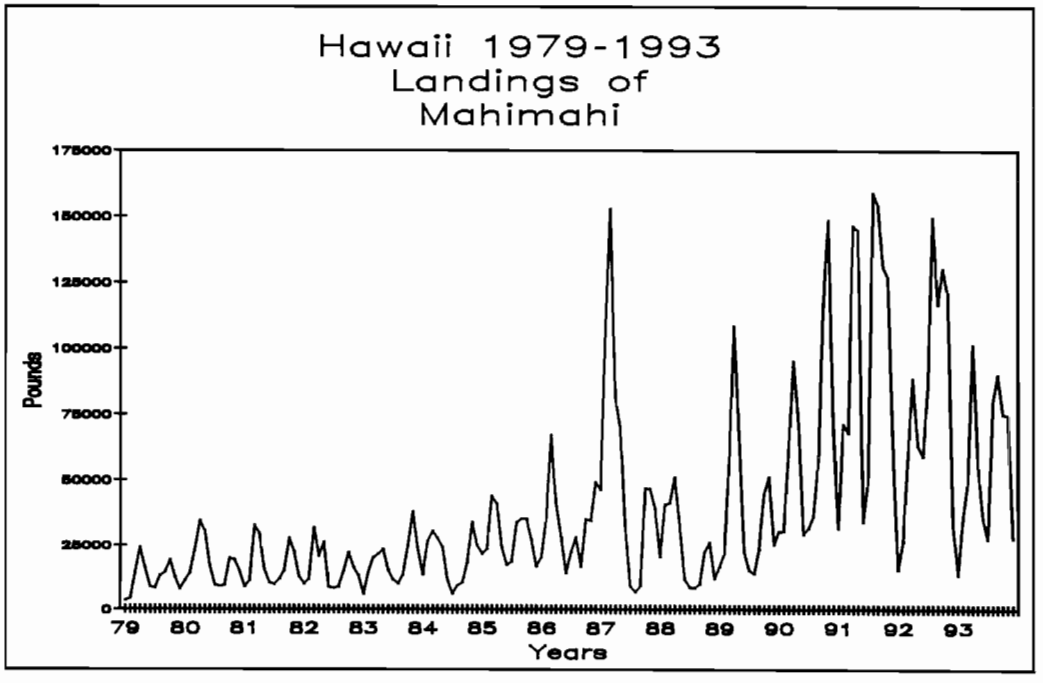

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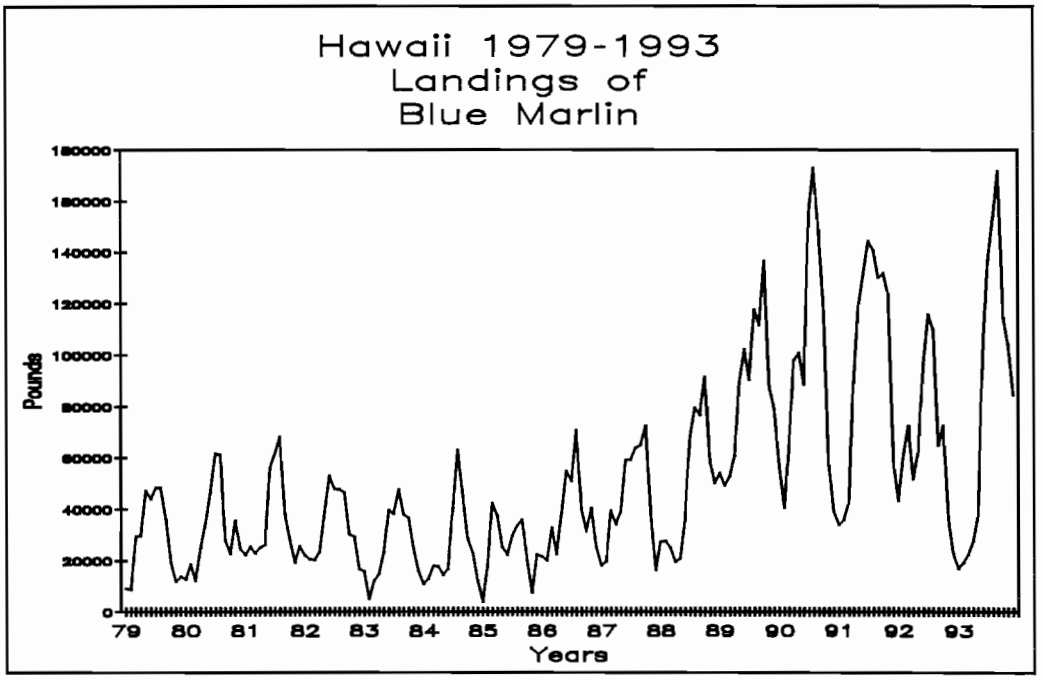

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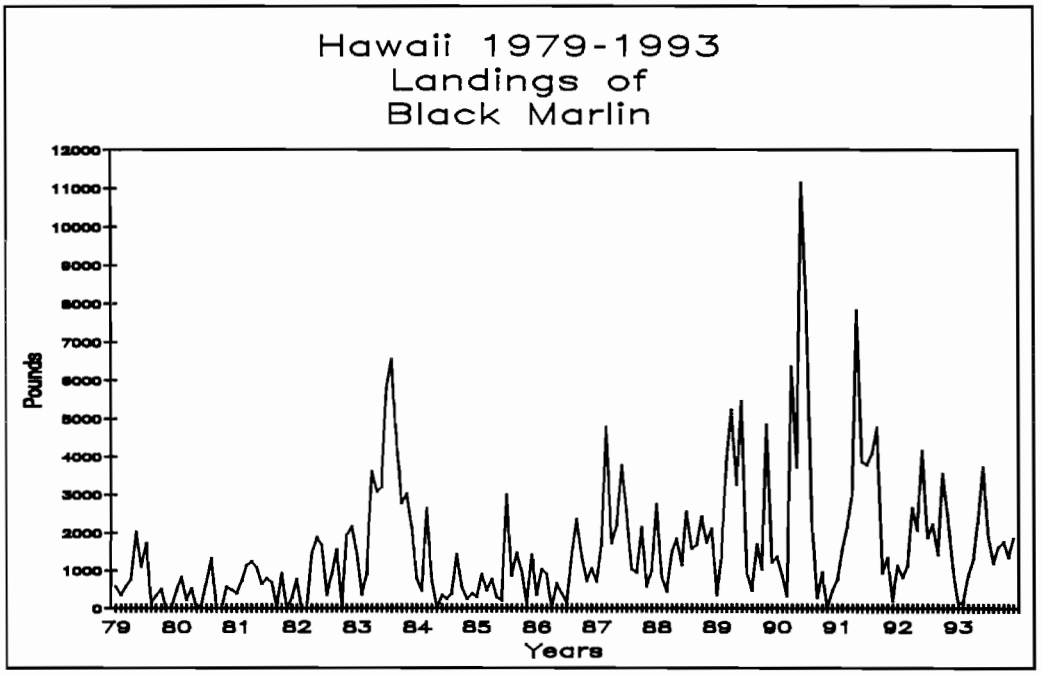

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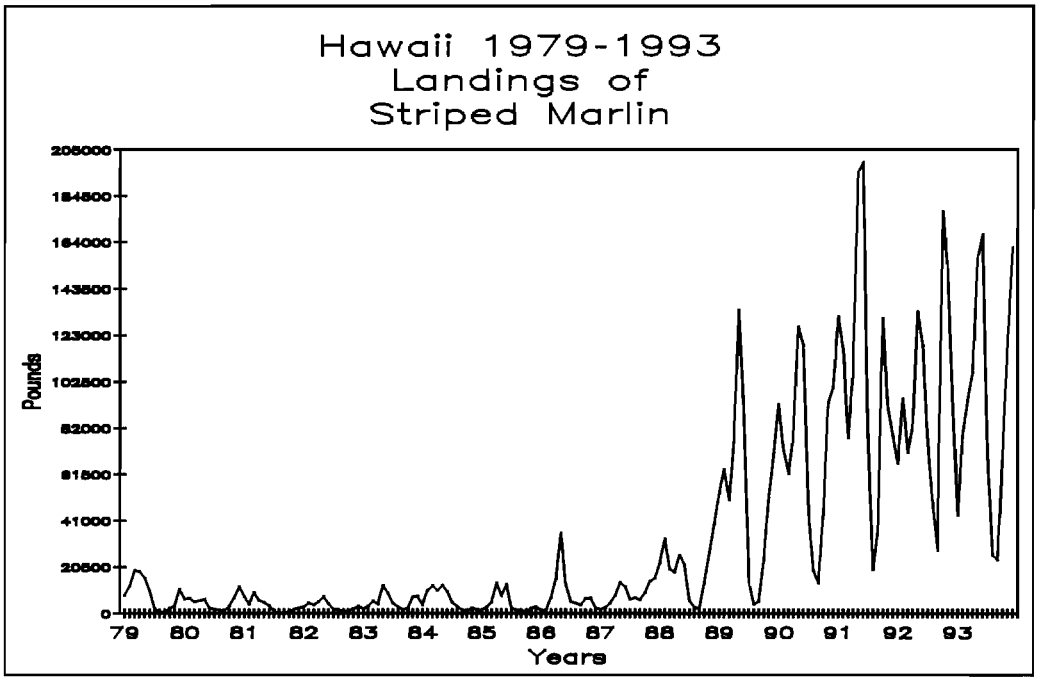

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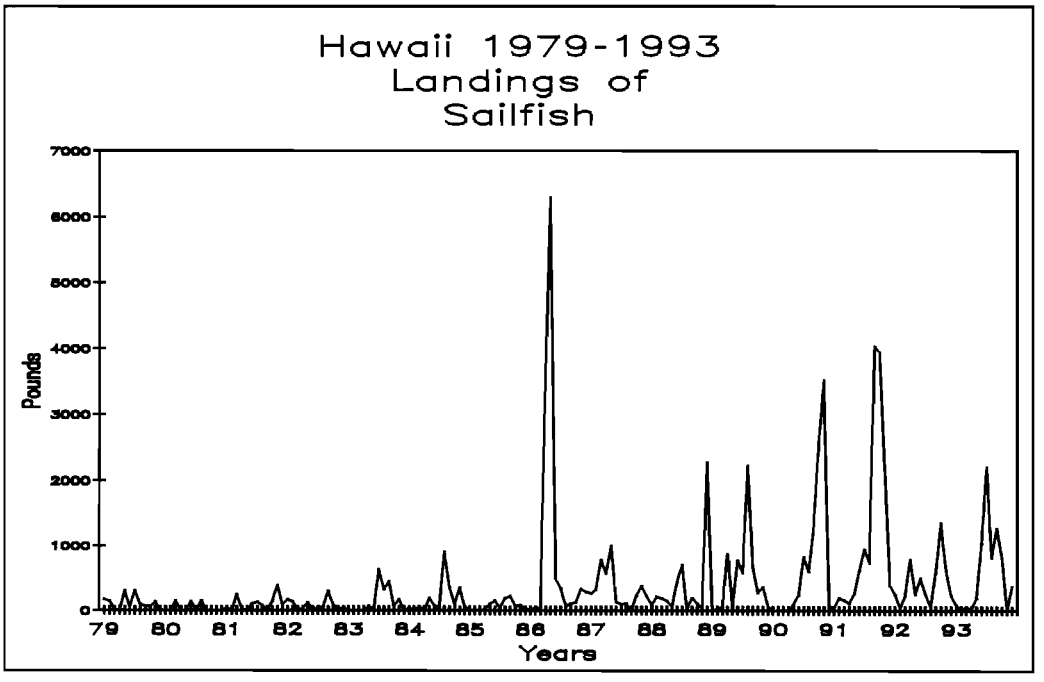

Figure V.4.7

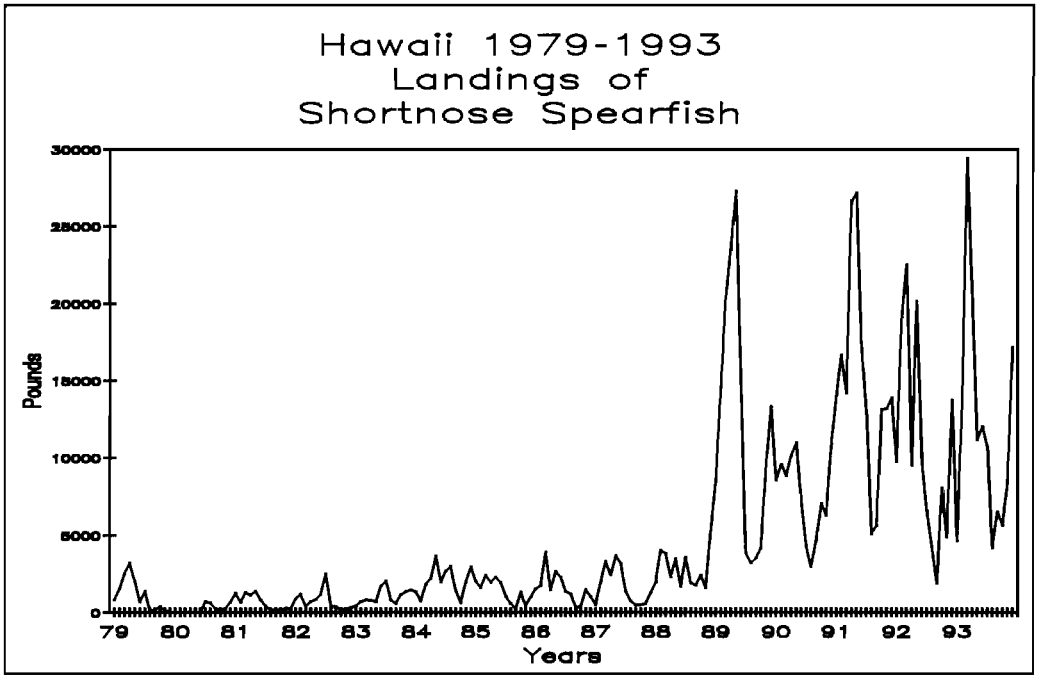

Figure V.4.8

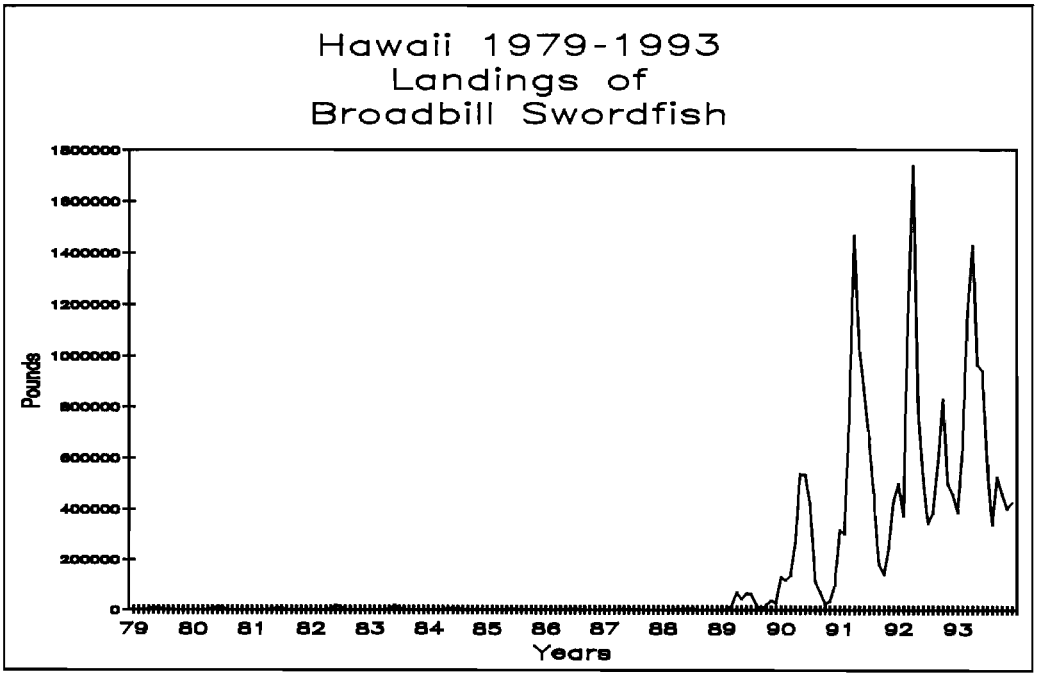

Figure V.4.9

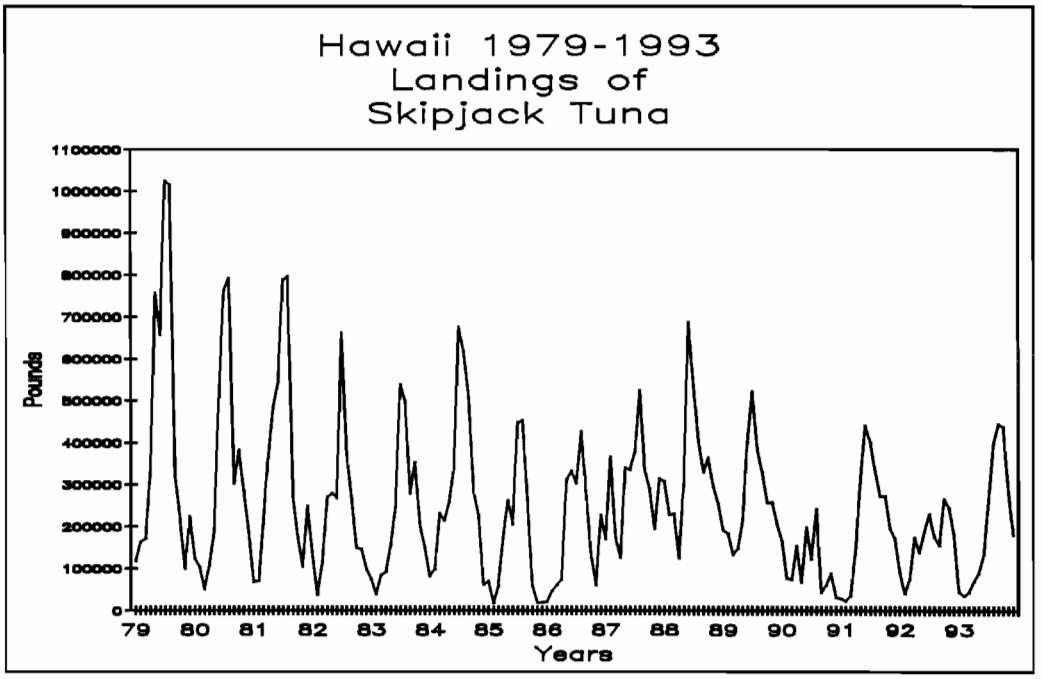

Figure V.4.10

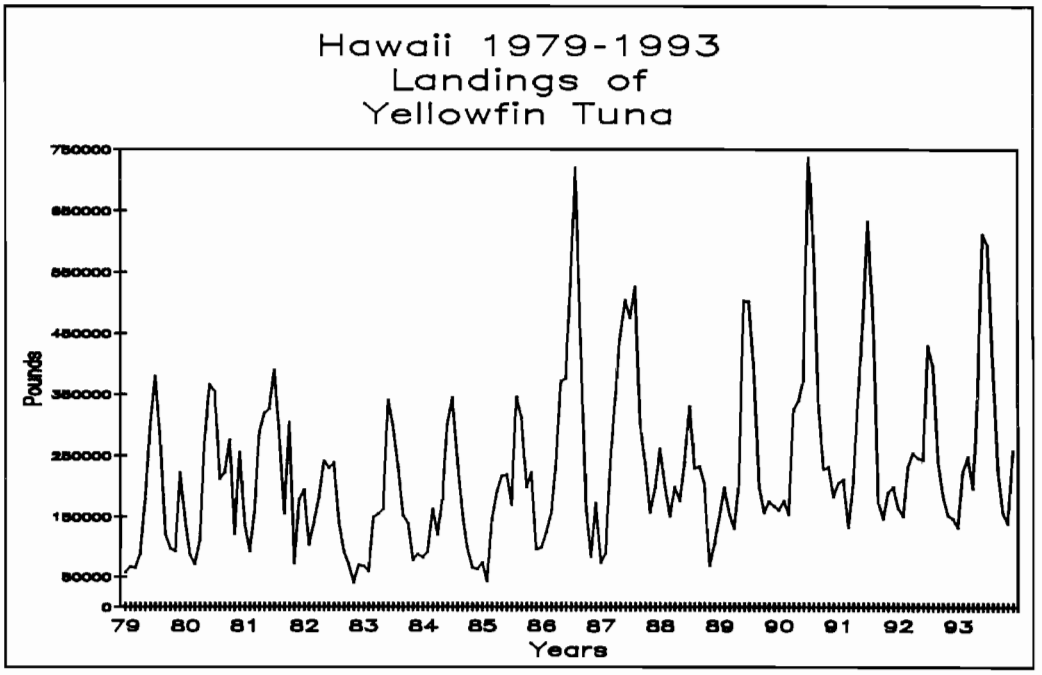

Figure V.4.11

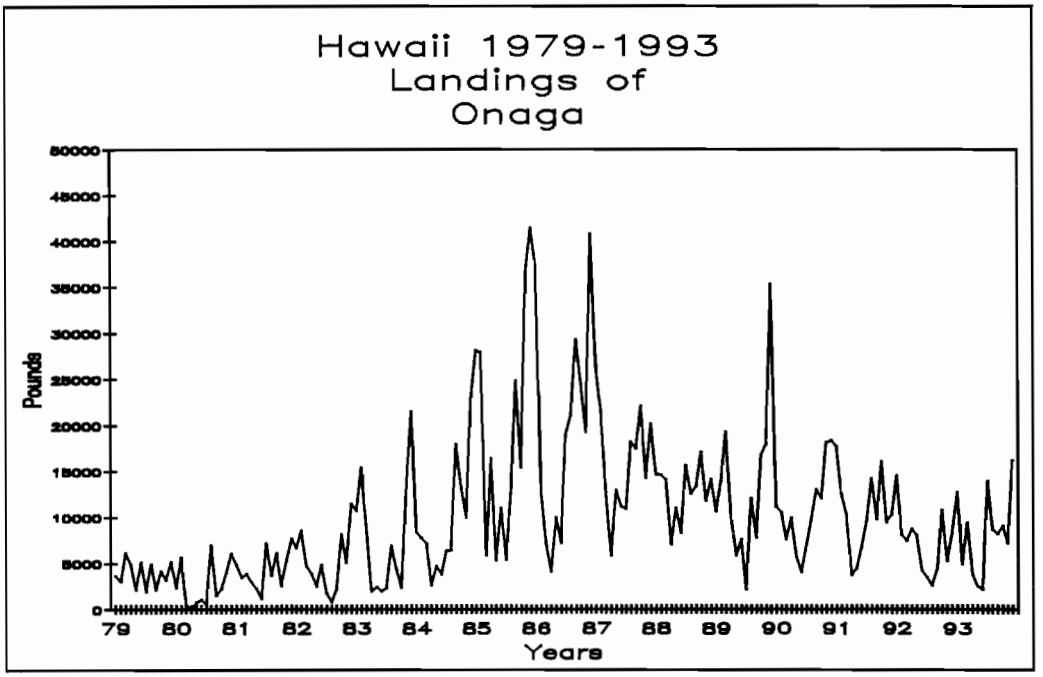

Figure V.4.12

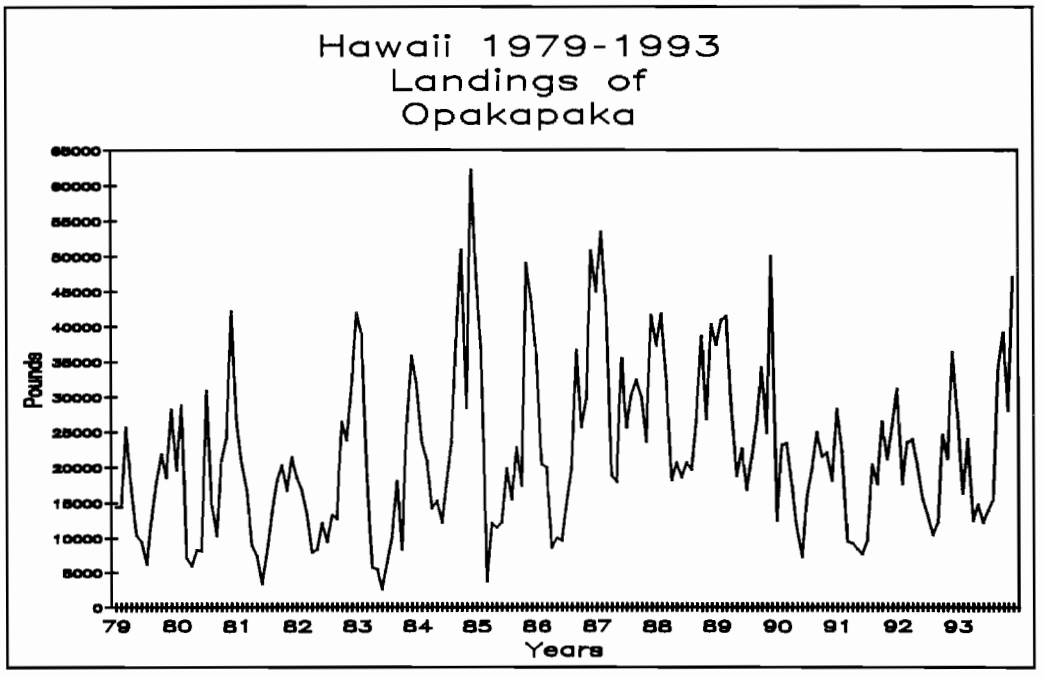

Figure V.4.13

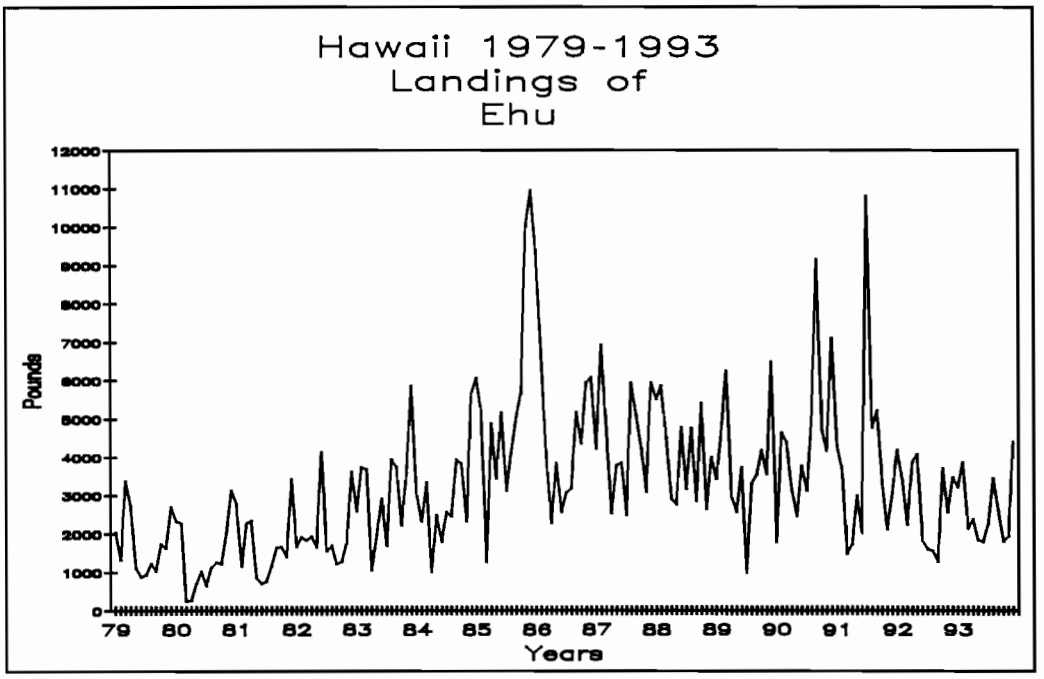

Figure V.4.14