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# SOUTHWEST FISHERIES CENTER

NATIONAL MARINE FISHERIES SERVICE

HONOLULU LABORATORY

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HONOLULU, HAWAII 96822-2396

May 1990

## FISHERY STATISTICS OF THE WESTERN PACIFIC, VOLUME V

Territory of American Samoa (1988)

Commonwealth of the  
Northern Mariana Islands (1988)

Territory of Guam (1988)

State of Hawaii (1988)

Compiled by

David C. Hamm, Michael M. C. Quach,  
Robert S. Antonio, and John J. Czyz

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National Marine Fisheries Service, NOAA  
Honolulu, Hawaii 96822-2396



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CAUTION: Data in this volume may have been revised in subsequent volumes.



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**FISHERY STATISTICS OF THE WESTERN PACIFIC**

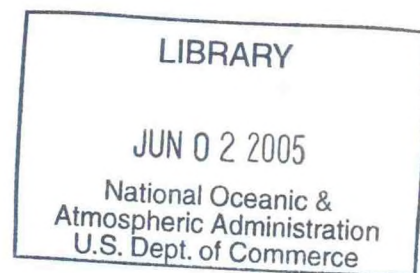
**VOLUME V**

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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 Center and its Honolulu Laboratory, and the Southwest Region and its Western Pacific Program 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 required summaries, graphs, and text for its respective chapter of the report; WPACFIN would combine the chapters and distribute the document as part of the Administrative Report Series of the Southwest Fisheries Center.

This document is the fifth volume in the series "Fishery Statistics of the Western Pacific" and contains summaries of commercial and creel survey fishery landings data for 1988 for American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and Hawaii. The first four volumes of this series contained similar reports for these areas for 1979 through 1987.



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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 Center's (SWFC) 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, DFW, and DAWR 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. Data for Hawaii were provided by HDAR on computer tape. Once data from all of these 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 and a lazerjet printer.

## 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. 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 1 year. It has also improved the procedures used for editing, updating, and processing Hawaii's data. Implementation of additional planned improvements could reduce the lag time to about 6 months.



## 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 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 DAWR- operated creel survey sampling and data expansion programs, and American Samoa's data are based on an integration of almost daily interviews of fishermen and a creel survey and data expansion program similar to Guam's. 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 sections for American Samoa and Guam also contain estimates of total catch and effort of all 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 offshore 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



### I.3

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 sharks and certain jacks, or are not typically included in these groups, such as mullet and milkfish.
2. Pelagic Management Unit Species (PMUS) - Defined in the Fishery Management Plan for pelagic species to include the billfishes, wahoo, mahimahi, and 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.
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.
7. Other Methods - In the American Samoa and Guam sections, fishing methods other than trolling and bottom fishing are combined into this single "other" category for certain graphs.

### Graphics

A minimum of four types of graphs are provided with each island's data. The chapters for American Samoa and Guam have an additional type of graphics on catch and effort from their creel survey data. Type I graphs present summary charts of the major species and species groups for 1988. 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



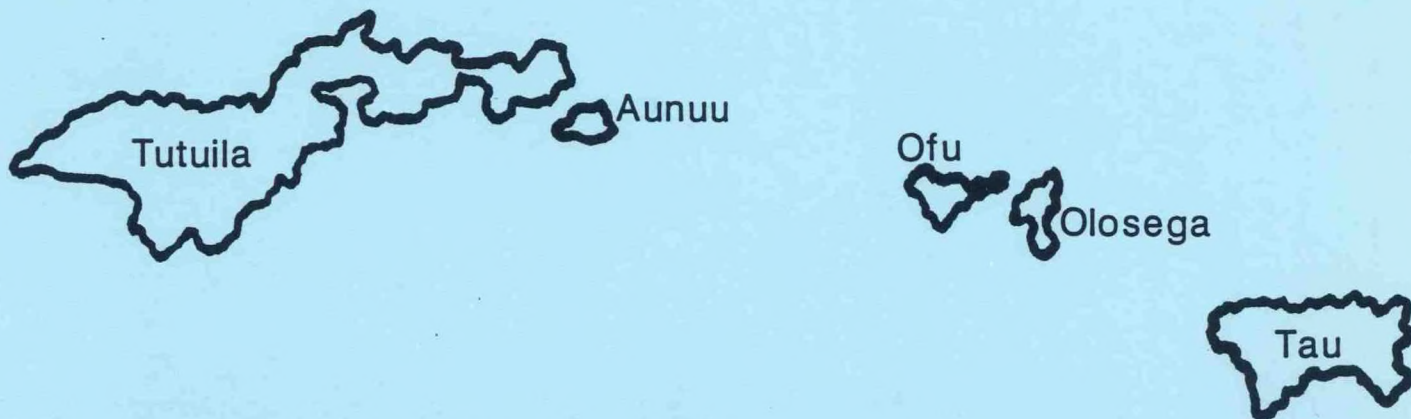
fishing method plus a combination of several of the types I-IV graphs.

- 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
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  - F. Sailfish - American Samoa, Guam, and Hawaii
  - 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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  - L. Onaga - American Samoa and Hawaii
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- B. Offshore monthly effort by method
- C. Offshore annual catch by method
- D. Offshore annual effort by method
- E. Inshore Total Catch and Effort
- F. Offshore and Inshore Total Catch





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# American Samoa

**Fishery Statistics  
1988**

**AMERICAN SAMOA 1988 FISHERY STATISTICS**

Compiled by

American Samoa

Department of Marine and Wildlife Resources

and the

Western Pacific Fishery Information Network

May 1990



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## AMERICAN SAMOA 1988 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 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 1988, 34 boats were sampled, 32 from Tutuila and 2 from the Manu'a Islands. Fishing is mostly by trolling and bottom fishing methods, and the majority of the catch is sold locally, but some is exported to Hawaii. During 1988, on average, trips on boats from Tutuila had three-man crews, fished 10 hours, and caught a little over 200 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.



## II.2

The new sampling program for Tutuila was based on a survey design that had been used in Guam for about 4 years. This systematic, random sampling program stratifies sampling by type of day, either weekday or weekend-holiday. For the new program, DMWR staff normally sample 2 weekdays and 1 weekend-holiday per week. In addition, they obtain as many interviews as possible on their "off days" to maintain as much overall coverage of the fisheries as possible. During official 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. The "TIME" field is used to distinguish between interviews collected on survey days versus "off days." Only data collected on official survey days are used in the data expansion process. 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 data bases--the commercial landings data base for data collected before October 1985, and the offshore creel survey data base for data collected since then. Edit and summary reports are produced to help verify that the data were entered correctly. The creel survey data bases are then translated into standard record formats to be used by the American Samoa Offshore Expansion System (ASOES), programmed by WPACFIN specifically for DMWR. As data are converted into ASOES formats, additional error checks are performed by the computer to make sure only valid information enters the expansion system. The ASOES is a menu-driven system that 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 expansion system generates estimates of daily catch, effort, and participation for each fishing method. These daily estimates are considered measurements of the Tutuila fisheries for that day. Average weekday and weekend-holiday estimates and their associated variances or confidence intervals are created from individual daily measurements. These are weighted by the number of each type of day in the month, or other timespan being expanded, and multiplied by proportionality constants that adjust for percent coverage to produce estimates of total catch, effort, and participation along with their confidence intervals. 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 ASOES 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 data are translated into different formats and transferred to the central computer for further editing, verification, and processing before generation of summary reports. 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 using ASOES and then separated into commercial versus noncommercial landings (e.g., sold versus not sold). The expansion and separation algorithms stratify the data by fishing



## II.4

method to improve the final estimates of landings by species. After the file of estimated commercial landings for Tutuila was created from the ASOES 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, ASOES, for Tutuila: catch and effort expansion reports and species composition reports. These reports were produced by using the expansion and species composition files



## II.5

created by ASOES as input to utility programs developed by WPACFIN. The utility programs reorganize, format, and summarize data from ASOES 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 1988 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



## II.6

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.

In fisheries applications, calculation of catch per unit of effort (CPUE) may be done in several ways. In the ASOES expansion reports, average monthly CPUE is calculated by using the same type of algorithm as for the other expansion elements, and it has an associated CV. First, the average daily CPUE is calculated by dividing the total weight of the fish sampled for a day by the total number of hours fished to produce that catch. Next, the average weekday and weekend-holiday CPUE's are calculated by summing the average daily CPUE's for each type of day and then dividing by the number of survey days for each type of day. These averages are multiplied by the number of weekdays and weekend-holidays, respectively, in that month, then the products are summed and divided by the total number of days in the month to produce the average monthly CPUE for each fishing method. The average monthly CPUE could also be calculated by dividing the estimated monthly catch by the estimated monthly boat hours, but this would provide no indication of the variability of the CPUE and also essentially weight the average CPUE by the level of participation. Therefore, the CPUE provided in the monthly and annual expansion reports will not be equal to the catch divided by the effort as presented in those reports.

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)

- Dolphin (mahimahi)
- Blue marlin
- Black marlin
- Sailfish
- Shortbill spearfish
- Wahoo
- 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 strictly based on the actual survey information collected from the fishermen. The estimates of total landings are considered to be conservative because the inshore fisheries are currently not included in DMWR's sampling programs. However, WPACFIN has developed the basic design for inshore sampling and data expansion systems, and DMWR plans to implement them when resources become available.

## II.10

Table II.1.1

## American Samoa 1988 Estimated Commercial Landings

| Species              | Pounds | Value  | \$/lb |
|----------------------|--------|--------|-------|
| Miscellaneous        | 44     | 66     | 1.50  |
| Bigeye scad          | 1,148  | 1,561  | 1.36  |
| Jacks                | 706    | 1,115  | 1.58  |
| Black jack           | 2,078  | 3,607  | 1.74  |
| Whitemouth trevally  | 50     | 75     | 1.50  |
| Barracudas           | 1,173  | 1,790  | 1.53  |
| Small barracuda      | 671    | 895    | 1.33  |
| Sharks               | 978    | 484    | 0.49  |
| Eels                 | 248    | 336    | 1.35  |
| Bottom fish          | 24,570 | 37,273 | 1.52  |
| Groupers             | 900    | 1,394  | 1.55  |
| Peacock grouper      | 643    | 1,039  | 1.62  |
| Flagtail grouper     | 670    | 1,047  | 1.56  |
| Tomato grouper       | 56     | 94     | 1.67  |
| Striped grouper      | 51     | 84     | 1.65  |
| Spotted grouper      | 273    | 450    | 1.65  |
| Giant grouper        | 45     | 72     | 1.60  |
| Lunartail grouper    | 2,925  | 4,622  | 1.58  |
| Blue lined snapper   | 7,059  | 11,773 | 1.67  |
| Onespot snapper      | 24     | 37     | 1.52  |
| Twinspot/red snapper | 82     | 111    | 1.35  |
| Humpback snapper     | 778    | 1,272  | 1.63  |
| Blood snapper        | 180    | 291    | 1.62  |
| Brown jobfish        | 231    | 383    | 1.66  |
| Gray jobfish         | 1,272  | 2,104  | 1.66  |
| Deepwater bottomfish | 619    | 1,006  | 1.63  |
| Opakapaka            | 1,012  | 1,671  | 1.65  |
| Gindai (flower snap) | 571    | 926    | 1.62  |
| Lehi (silverjaw)     | 2,276  | 4,487  | 1.97  |
| Onaga (red snapper)  | 2,101  | 4,074  | 1.94  |
| Ehu (red snapper)    | 2,645  | 4,684  | 1.77  |
| Stone's snapper      | 288    | 559    | 1.94  |
| Bigeye emperor       | 157    | 251    | 1.60  |
| Emperors (misc)      | 554    | 933    | 1.69  |
| Longnose emperor     | 3,736  | 6,076  | 1.63  |
| Ambon emperor        | 1,185  | 1,886  | 1.59  |
| Blueline bream       | 133    | 219    | 1.65  |
| Orangespot emperor   | 457    | 757    | 1.66  |
| Redgill emperor      | 3,272  | 5,404  | 1.65  |
| Reef fish            | 5,237  | 7,868  | 1.50  |
| Rudderfish           | 26     | 35     | 1.35  |
| Rabbitfish           | 10     | 15     | 1.50  |
| Lined surgeon        | 10,453 | 15,943 | 1.53  |
| Yellow eyed surgeon  | 2,844  | 4,398  | 1.55  |
| Convict tang         | 17     | 25     | 1.47  |



## II.11

Table II.1.1 (cont.)

| Species              | Pounds         | Value          | \$/lb |
|----------------------|----------------|----------------|-------|
| Dussumier's surgeon  | 93             | 154            | 1.66  |
| Spotted surgeonfish  | 35             | 49             | 1.40  |
| Unicornfish (misc)   | 2,177          | 3,114          | 1.43  |
| Unicornfish          | 1,982          | 3,005          | 1.52  |
| Squirreelfish        | 1,525          | 2,380          | 1.56  |
| Saber squirreelfish  | 238            | 356            | 1.50  |
| Berndt's soldierfish | 439            | 712            | 1.62  |
| Bigeye squirreelfish | 40             | 66             | 1.65  |
| Parrotfish           | 4,889          | 7,573          | 1.55  |
| Wrasse               | 553            | 829            | 1.50  |
| Inshore groupers     | 283            | 465            | 1.64  |
| Dolphin (mahimahi)   | 5,481          | 11,115         | 2.03  |
| Blue marlin          | 4,381          | 3,504          | 0.80  |
| Sailfish             | 77             | 58             | 0.75  |
| Rainbow runner       | 573            | 690            | 1.20  |
| Wahoo                | 1,237          | 1,804          | 1.46  |
| Tunas                | 156            | 82             | 0.53  |
| Skipjack tuna        | 129,443        | 88,927         | 0.69  |
| Dogtooth tuna        | 2,152          | 3,539          | 1.64  |
| Albacore             | 1,398          | 2,796          | 2.00  |
| Yellowfin tuna       | 39,095         | 49,951         | 1.28  |
| Kawakawa             | 246            | 316            | 1.29  |
| Spiny lobster        | 6,303          | 14,307         | 2.27  |
| Octopus              | 146            | 198            | 1.36  |
| Squid                | 6              | 8              | 1.33  |
| Giant clam           | 2,136          | 5,926          | 2.77  |
| <b>** TOTAL **</b>   | <b>289,528</b> | <b>335,113</b> |       |

Table II.1.2

American Samoa January 1988 Estimated Commercial Landings

| Species               | Pounds        | Value         | \$/lb |
|-----------------------|---------------|---------------|-------|
| Jacks                 | 23            | 32            | 1.39  |
| Barracudas            | 38            | 38            | 1.00  |
| Small barracuda       | 44            | 65            | 1.48  |
| Eels                  | 35            | 47            | 1.34  |
| Bottom fish           | 5,688         | 7,708         | 1.36  |
| Groupers              | 35            | 54            | 1.54  |
| Lunartail grouper     | 5             | 6             | 1.20  |
| Blue lined snapper    | 54            | 86            | 1.59  |
| Twinspot/red snapper  | 12            | 16            | 1.33  |
| Gray jobfish          | 89            | 159           | 1.79  |
| Longnose emperor      | 145           | 218           | 1.50  |
| Reef fish             | 714           | 1,071         | 1.50  |
| Lined surgeon         | 1,003         | 1,484         | 1.48  |
| Yellow eyed surgeon   | 369           | 512           | 1.39  |
| Convict tang          | 17            | 25            | 1.47  |
| Unicornfish (misc)    | 313           | 359           | 1.15  |
| Parrotfish            | 306           | 492           | 1.61  |
| Wrasse                | 63            | 94            | 1.49  |
| Dolphin (mahimahi)    | 53            | 92            | 1.74  |
| Blue marlin           | 1,020         | 775           | 0.76  |
| Skipjack tuna         | 3,617         | 3,797         | 1.05  |
| Yellowfin tuna        | 7,609         | 8,065         | 1.06  |
| Spiny lobster         | 1,314         | 2,930         | 2.23  |
| Octopus               | 48            | 65            | 1.35  |
| Squid                 | 6             | 8             | 1.33  |
| Giant clam            | 1,956         | 5,261         | 2.69  |
| <b>** SUBTOTAL **</b> | <b>24,575</b> | <b>33,458</b> |       |



Table II.1.3

## American Samoa February 1988 Estimated Commercial Landings

| Species             | Pounds | Value  | \$/lb |
|---------------------|--------|--------|-------|
| Jacks               | 353    | 554    | 1.57  |
| Black jack          | 128    | 212    | 1.66  |
| Barracudas          | 698    | 1,053  | 1.51  |
| Small barracuda     | 40     | 60     | 1.50  |
| Eels                | 213    | 289    | 1.36  |
| Bottom fish         | 12,363 | 19,162 | 1.55  |
| Flagtail grouper    | 92     | 152    | 1.65  |
| Blue lined snapper  | 308    | 472    | 1.54  |
| Humpback snapper    | 19     | 23     | 1.25  |
| Blood snapper       | 180    | 291    | 1.62  |
| Brown jobfish       | 231    | 383    | 1.66  |
| Opakapaka           | 287    | 473    | 1.65  |
| Onaga (red snapper) | 60     | 120    | 2.00  |
| Emperors (misc)     | 100    | 151    | 1.51  |
| Ambon emperor       | 458    | 760    | 1.66  |
| Orangespot emperor  | 132    | 219    | 1.66  |
| Redgill emperor     | 56     | 70     | 1.25  |
| Reef fish           | 1,449  | 2,187  | 1.51  |
| Lined surgeon       | 1,156  | 1,872  | 1.62  |
| Yellow eyed surgeon | 136    | 214    | 1.57  |
| Unicornfish (misc)  | 1,001  | 1,451  | 1.45  |
| Unicornfish         | 60     | 99     | 1.65  |
| Parrotfish          | 323    | 503    | 1.56  |
| Wrasse              | 490    | 735    | 1.50  |
| Inshore groupers    | 18     | 29     | 1.61  |
| Blue marlin         | 2,631  | 1,999  | 0.76  |
| Rainbow runner      | 88     | 132    | 1.50  |
| Tunas               | 156    | 82     | 0.53  |
| Skipjack tuna       | 10,574 | 6,166  | 0.58  |
| Dogtooth tuna       | 259    | 445    | 1.72  |
| Yellowfin tuna      | 3,740  | 3,447  | 0.92  |
| Spiny lobster       | 2,209  | 5,986  | 2.71  |
| Octopus             | 98     | 133    | 1.36  |
| Giant clam          | 136    | 544    | 4.00  |
| ** SUBTOTAL **      | 40,241 | 50,469 |       |

Table II.1.4

## American Samoa March 1988 Estimated Commercial Landings

| Species               | Pounds        | Value         | \$/lb |
|-----------------------|---------------|---------------|-------|
| Black jack            | 159           | 283           | 1.78  |
| Barracudas            | 76            | 120           | 1.58  |
| Small barracuda       | 20            | 25            | 1.25  |
| Bottom fish           | 5,207         | 8,569         | 1.65  |
| Groupers              | 62            | 102           | 1.65  |
| Peacock grouper       | 16            | 27            | 1.69  |
| Lunartail grouper     | 91            | 146           | 1.60  |
| Blue lined snapper    | 344           | 553           | 1.61  |
| Humpback snapper      | 125           | 213           | 1.70  |
| Opakapaka             | 153           | 252           | 1.65  |
| Lehi (silverjaw)      | 125           | 246           | 1.97  |
| Onaga (red snapper)   | 59            | 122           | 2.07  |
| Longnose emperor      | 146           | 235           | 1.61  |
| Redgill emperor       | 700           | 1,127         | 1.61  |
| Reef fish             | 1,893         | 2,839         | 1.50  |
| Lined surgeon         | 2,970         | 4,633         | 1.56  |
| Yellow eyed surgeon   | 720           | 1,224         | 1.70  |
| Dussumier's surgeon   | 93            | 154           | 1.66  |
| Unicornfish (misc)    | 134           | 199           | 1.49  |
| Unicornfish           | 412           | 675           | 1.64  |
| Squirrelfish          | 209           | 351           | 1.68  |
| Berndt's soldierfish  | 17            | 28            | 1.65  |
| Parrotfish            | 1,035         | 1,718         | 1.66  |
| Dolphin (mahimahi)    | 107           | 165           | 1.54  |
| Rainbow runner        | 61            | 83            | 1.35  |
| Wahoo                 | 362           | 543           | 1.50  |
| Skipjack tuna         | 1,478         | 1,517         | 1.03  |
| Dogtooth tuna         | 191           | 321           | 1.68  |
| Albacore              | 231           | 462           | 2.00  |
| Yellowfin tuna        | 4,338         | 6,168         | 1.42  |
| Kawakawa              | 207           | 266           | 1.29  |
| Spiny lobster         | 614           | 1,234         | 2.01  |
| Giant clam            | 44            | 121           | 2.75  |
| <b>** SUBTOTAL **</b> | <b>22,399</b> | <b>34,720</b> |       |



## II.15

Table II.1.5

American Samoa April 1988 Estimated Commercial Landings

| Species               | Pounds        | Value         | \$/lb |
|-----------------------|---------------|---------------|-------|
| Black jack            | 65            | 104           | 1.60  |
| Small barracuda       | 58            | 67            | 1.16  |
| Bottom fish           | 144           | 180           | 1.25  |
| Peacock grouper       | 231           | 371           | 1.61  |
| Lunartail grouper     | 58            | 88            | 1.52  |
| Blue lined snapper    | 825           | 1,270         | 1.54  |
| Onespot snapper       | 13            | 20            | 1.54  |
| Humpback snapper      | 91            | 146           | 1.60  |
| Gray jobfish          | 211           | 322           | 1.53  |
| Lehi (silverjaw)      | 120           | 193           | 1.61  |
| Onaga (red snapper)   | 19            | 30            | 1.58  |
| Stone's snapper       | 32            | 51            | 1.59  |
| Bigeye emperor        | 10            | 16            | 1.60  |
| Longnose emperor      | 162           | 259           | 1.60  |
| Redgill emperor       | 682           | 1,050         | 1.54  |
| Reef fish             | 1,174         | 1,761         | 1.50  |
| Lined surgeon         | 2,079         | 3,367         | 1.62  |
| Yellow eyed surgeon   | 599           | 958           | 1.60  |
| Spotted surgeonfish   | 6             | 9             | 1.50  |
| Unicornfish (misc)    | 178           | 293           | 1.65  |
| Unicornfish           | 801           | 1,265         | 1.58  |
| Berndt's soldierfish  | 266           | 430           | 1.62  |
| Bigeye squirrelfish   | 32            | 53            | 1.66  |
| Parrotfish            | 1,363         | 2,194         | 1.61  |
| Wahoo                 | 81            | 122           | 1.51  |
| Skipjack tuna         | 1,179         | 1,190         | 1.01  |
| Dogtooth tuna         | 32            | 51            | 1.59  |
| Albacore              | 1,167         | 2,334         | 2.00  |
| Yellowfin tuna        | 419           | 514           | 1.23  |
| Spiny lobster         | 1,294         | 2,303         | 1.78  |
| <b>** SUBTOTAL **</b> | <b>13,391</b> | <b>21,011</b> |       |

## II.16

Table II.1.6

American Samoa May 1988 Estimated Commercial Landings

| Species               | Pounds        | Value         | \$/lb |
|-----------------------|---------------|---------------|-------|
| Bigeye scad           | 1,148         | 1,561         | 1.36  |
| Black jack            | 330           | 648           | 1.96  |
| Small barracuda       | 150           | 188           | 1.25  |
| Bottom fish           | 88            | 109           | 1.25  |
| Peacock grouper       | 103           | 232           | 2.25  |
| Lunartail grouper     | 83            | 129           | 1.55  |
| Blue lined snapper    | 703           | 1,296         | 1.84  |
| Humpback snapper      | 89            | 143           | 1.61  |
| Lehi (silverjaw)      | 979           | 2,095         | 2.14  |
| Onaga (red snapper)   | 914           | 1,910         | 2.09  |
| Ehu (red snapper)     | 611           | 1,341         | 2.20  |
| Redgill emperor       | 670           | 1,232         | 1.84  |
| Rudderfish            | 26            | 35            | 1.35  |
| Lined surgeon         | 1,466         | 1,993         | 1.36  |
| Yellow eyed surgeon   | 183           | 248           | 1.36  |
| Unicornfish           | 164           | 223           | 1.36  |
| Parrotfish            | 1,054         | 1,475         | 1.40  |
| Dolphin (mahimahi)    | 10            | 13            | 1.25  |
| Rainbow runner        | 50            | 65            | 1.30  |
| Wahoo                 | 24            | 30            | 1.25  |
| Skipjack tuna         | 1,655         | 1,682         | 1.02  |
| Dogtooth tuna         | 31            | 31            | 1.00  |
| Yellowfin tuna        | 955           | 1,064         | 1.11  |
| Spiny lobster         | 277           | 626           | 2.26  |
| <b>** SUBTOTAL **</b> | <b>11,762</b> | <b>18,367</b> |       |



## II.17

Table II.1.7

## American Samoa June 1988 Estimated Commercial Landings

| Species              | Pounds | Value  | \$/lb |
|----------------------|--------|--------|-------|
| Whitemouth trevally  | 50     | 75     | 1.50  |
| Barracudas           | 12     | 18     | 1.50  |
| Small barracuda      | 106    | 133    | 1.25  |
| Groupers             | 105    | 169    | 1.61  |
| Peacock grouper      | 73     | 125    | 1.71  |
| Flagtail grouper     | 217    | 329    | 1.52  |
| Lunartail grouper    | 249    | 373    | 1.50  |
| Blue lined snapper   | 630    | 927    | 1.47  |
| Gray jobfish         | 119    | 179    | 1.50  |
| Deepwater bottomfish | 44     | 66     | 1.50  |
| Lehi (silverjaw)     | 263    | 515    | 1.96  |
| Onaga (red snapper)  | 193    | 397    | 2.06  |
| Ehu (red snapper)    | 610    | 945    | 1.55  |
| Bigeye emperor       | 147    | 235    | 1.60  |
| Longnose emperor     | 512    | 773    | 1.51  |
| Ambon emperor        | 203    | 304    | 1.50  |
| Lined surgeon        | 228    | 348    | 1.53  |
| Yellow eyed surgeon  | 123    | 189    | 1.54  |
| Squirrelfish         | 172    | 273    | 1.59  |
| Parrotfish           | 154    | 240    | 1.56  |
| Dolphin (mahimahi)   | 2,124  | 3,525  | 1.66  |
| Sailfish             | 77     | 58     | 0.75  |
| Rainbow runner       | 140    | 108    | 0.78  |
| Wahoo                | 163    | 238    | 1.46  |
| Skipjack tuna        | 16,277 | 10,091 | 0.62  |
| Dogtooth tuna        | 123    | 211    | 1.72  |
| Yellowfin tuna       | 5,596  | 6,600  | 1.18  |
| Kawakawa             | 18     | 23     | 1.28  |
| Spiny lobster        | 102    | 216    | 2.12  |
| ** SUBTOTAL **       | 28,830 | 27,682 |       |

Table II.1.8

## American Samoa July 1988 Estimated Commercial Landings

| Species               | Pounds        | Value         | \$/lb |
|-----------------------|---------------|---------------|-------|
| Black jack            | 189           | 308           | 1.63  |
| Barracudas            | 139           | 225           | 1.62  |
| Bottom fish           | 1,081         | 1,545         | 1.43  |
| Groupers              | 95            | 136           | 1.43  |
| Lunartail grouper     | 27            | 43            | 1.59  |
| Blue lined snapper    | 258           | 420           | 1.63  |
| Gray jobfish          | 31            | 46            | 1.48  |
| Lehi (silverjaw)      | 153           | 246           | 1.61  |
| Ehu (red snapper)     | 119           | 238           | 2.00  |
| Longnose emperor      | 506           | 819           | 1.62  |
| Redgill emperor       | 163           | 270           | 1.66  |
| Reef fish             | 7             | 10            | 1.43  |
| Rabbitfish            | 10            | 15            | 1.50  |
| Lined surgeon         | 556           | 806           | 1.45  |
| Yellow eyed surgeon   | 92            | 125           | 1.36  |
| Unicornfish (misc)    | 289           | 433           | 1.50  |
| Unicornfish           | 306           | 419           | 1.37  |
| Squirrelfish          | 50            | 72            | 1.44  |
| Bigeye squirrelfish   | 8             | 13            | 1.63  |
| Parrotfish            | 168           | 231           | 1.38  |
| Dolphin (mahimahi)    | 1,460         | 4,063         | 2.78  |
| Rainbow runner        | 67            | 92            | 1.37  |
| Wahoo                 | 284           | 414           | 1.46  |
| Skipjack tuna         | 16,512        | 8,872         | 0.54  |
| Dogtooth tuna         | 118           | 175           | 1.48  |
| Yellowfin tuna        | 721           | 895           | 1.24  |
| Spiny lobster         | 136           | 273           | 2.01  |
| <b>** SUBTOTAL **</b> | <b>23,543</b> | <b>21,203</b> |       |



Table II.1.9

## American Samoa August 1988 Estimated Commercial Landings

| Species              | Pounds | Value  | \$/lb |
|----------------------|--------|--------|-------|
| Jacks                | 133    | 211    | 1.58  |
| Black jack           | 88     | 176    | 2.00  |
| Barracudas           | 200    | 316    | 1.58  |
| Small barracuda      | 38     | 47     | 1.25  |
| Sharks               | 280    | 72     | 0.26  |
| Groupers             | 88     | 136    | 1.55  |
| Peacock grouper      | 133    | 134    | 1.01  |
| Spotted grouper      | 273    | 450    | 1.65  |
| Giant grouper        | 45     | 72     | 1.60  |
| Lunartail grouper    | 522    | 817    | 1.56  |
| Blue lined snapper   | 1,120  | 2,022  | 1.81  |
| Twinspot/red snapper | 70     | 95     | 1.36  |
| Humpback snapper     | 119    | 208    | 1.75  |
| Gray jobfish         | 137    | 275    | 2.01  |
| Deepwater bottomfish | 519    | 856    | 1.65  |
| Gindai (flower snap) | 56     | 84     | 1.50  |
| Lehi (silverjaw)     | 221    | 444    | 2.01  |
| Onaga (red snapper)  | 161    | 262    | 1.63  |
| Ehu (red snapper)    | 181    | 272    | 1.50  |
| Stone's snapper      | 239    | 478    | 2.00  |
| Emperors (misc)      | 19     | 28     | 1.50  |
| Longnose emperor     | 701    | 1,254  | 1.79  |
| Lined surgeon        | 130    | 146    | 1.12  |
| Yellow eyed surgeon  | 63     | 74     | 1.17  |
| Unicornfish (misc)   | 106    | 149    | 1.41  |
| Unicornfish          | 53     | 53     | 1.00  |
| Squirrelfish         | 18     | 18     | 1.00  |
| Parrotfish           | 70     | 98     | 1.40  |
| Dolphin (mahimahi)   | 1,387  | 2,768  | 2.00  |
| Rainbow runner       | 5      | 7      | 1.30  |
| Wahoo                | 102    | 151    | 1.48  |
| Skipjack tuna        | 18,984 | 10,939 | 0.58  |
| Dogtooth tuna        | 123    | 211    | 1.72  |
| Yellowfin tuna       | 2,306  | 3,405  | 1.48  |
| Spiny lobster        | 53     | 106    | 2.00  |
| ** SUBTOTAL **       | 28,743 | 26,834 |       |

## II.20

Table II.1.10

American Samoa September 1988 Estimated Commercial Landings

| Species            | Pounds | Value  | \$/lb |
|--------------------|--------|--------|-------|
| Black jack         | 50     | 100    | 2.00  |
| Barracudas         | 10     | 20     | 2.00  |
| Groupers           | 338    | 523    | 1.55  |
| Lunartail grouper  | 643    | 1,009  | 1.57  |
| Blue lined snapper | 588    | 1,181  | 2.01  |
| Humpback snapper   | 33     | 66     | 2.00  |
| Gray jobfish       | 27     | 54     | 2.00  |
| Opakapaka          | 300    | 495    | 1.65  |
| Ehu (red snapper)  | 300    | 594    | 1.98  |
| Stone's snapper    | 17     | 30     | 1.76  |
| Emperors (misc)    | 60     | 120    | 2.00  |
| Longnose emperor   | 440    | 712    | 1.62  |
| Blueline bream     | 133    | 219    | 1.65  |
| Orangespot emperor | 50     | 82     | 1.64  |
| Redgill emperor    | 331    | 549    | 1.66  |
| Squirrelfish       | 245    | 389    | 1.59  |
| Dolphin (mahimahi) | 63     | 104    | 1.65  |
| Wahoo              | 63     | 94     | 1.49  |
| Skipjack tuna      | 11,905 | 5,595  | 0.47  |
| Dogtooth tuna      | 400    | 684    | 1.71  |
| Yellowfin tuna     | 2,356  | 3,416  | 1.45  |
| ** SUBTOTAL **     | 18,352 | 16,036 |       |



Table II.1.11

## American Samoa October 1988 Estimated Commercial Landings

| Species               | Pounds        | Value         | \$/lb |
|-----------------------|---------------|---------------|-------|
| Jacks                 | 85            | 141           | 1.66  |
| Black jack            | 311           | 511           | 1.64  |
| Small barracuda       | 103           | 170           | 1.65  |
| Sharks                | 330           | 178           | 0.54  |
| Groupers              | 66            | 102           | 1.54  |
| Tomato grouper        | 31            | 50            | 1.60  |
| Striped grouper       | 51            | 84            | 1.65  |
| Lunartail grouper     | 415           | 681           | 1.64  |
| Blue lined snapper    | 374           | 587           | 1.57  |
| Onespot snapper       | 11            | 17            | 1.50  |
| Humpback snapper      | 90            | 135           | 1.50  |
| Gray jobfish          | 229           | 382           | 1.67  |
| Lehi (silverjaw)      | 221           | 366           | 1.66  |
| Onaga (red snapper)   | 344           | 611           | 1.77  |
| Ehu (red snapper)     | 429           | 705           | 1.64  |
| Emperors (misc)       | 44            | 72            | 1.64  |
| Longnose emperor      | 528           | 839           | 1.59  |
| Ambon emperor         | 19            | 30            | 1.60  |
| Orangespot emperor    | 275           | 456           | 1.66  |
| Redgill emperor       | 31            | 47            | 1.50  |
| Lined surgeon         | 270           | 378           | 1.40  |
| Yellow eyed surgeon   | 154           | 235           | 1.53  |
| Spotted surgeonfish   | 29            | 40            | 1.38  |
| Unicornfish           | 113           | 159           | 1.41  |
| Squirreelfish         | 271           | 392           | 1.44  |
| Saber squirreelfish   | 24            | 36            | 1.50  |
| Parrotfish            | 191           | 269           | 1.41  |
| Inshore groupers      | 75            | 123           | 1.64  |
| Dolphin (mahimahi)    | 72            | 119           | 1.65  |
| Blue marlin           | 688           | 688           | 1.00  |
| Rainbow runner        | 88            | 109           | 1.25  |
| Wahoo                 | 31            | 39            | 1.25  |
| Skipjack tuna         | 13,523        | 9,537         | 0.71  |
| Dogtooth tuna         | 63            | 104           | 1.65  |
| Yellowfin tuna        | 3,327         | 5,817         | 1.75  |
| Spiny lobster         | 72            | 144           | 2.00  |
| <b>** SUBTOTAL **</b> | <b>22,976</b> | <b>24,350</b> |       |

Table II.1.12

## American Samoa November 1988 Estimated Commercial Landings

| Species               | Pounds        | Value         | \$/lb |
|-----------------------|---------------|---------------|-------|
| Miscellaneous         | 44            | 66            | 1.50  |
| Jacks                 | 112           | 178           | 1.58  |
| Black jack            | 341           | 523           | 1.53  |
| Sharks                | 180           | 46            | 0.26  |
| Groupers              | 111           | 172           | 1.55  |
| Peacock grouper       | 87            | 150           | 1.72  |
| Flagtail grouper      | 215           | 337           | 1.57  |
| Tomato grouper        | 25            | 44            | 1.75  |
| Lunartail grouper     | 554           | 894           | 1.61  |
| Blue lined snapper    | 1,411         | 2,230         | 1.58  |
| Humpback snapper      | 109           | 161           | 1.48  |
| Gray jobfish          | 429           | 687           | 1.60  |
| Deepwater bottomfish  | 56            | 84            | 1.50  |
| Opakapaka             | 272           | 451           | 1.66  |
| Gindai (flower snap)  | 515           | 841           | 1.64  |
| Lehi (silverjaw)      | 194           | 382           | 1.97  |
| Onaga (red snapper)   | 351           | 623           | 1.77  |
| Ehu (red snapper)     | 263           | 328           | 1.25  |
| Longnose emperor      | 436           | 710           | 1.63  |
| Ambon emperor         | 505           | 792           | 1.57  |
| Redgill emperor       | 638           | 1,059         | 1.66  |
| Lined surgeon         | 595           | 916           | 1.54  |
| Yellow eyed surgeon   | 405           | 619           | 1.53  |
| Unicornfish (misc)    | 156           | 230           | 1.47  |
| Unicornfish           | 73            | 112           | 1.53  |
| Squirrelfish          | 421           | 665           | 1.58  |
| Saber squirrelfish    | 214           | 321           | 1.50  |
| Berndt's soldierfish  | 156           | 254           | 1.63  |
| Parrotfish            | 225           | 353           | 1.57  |
| Inshore groupers      | 190           | 313           | 1.65  |
| Dolphin (mahimahi)    | 104           | 105           | 1.01  |
| Rainbow runner        | 56            | 70            | 1.25  |
| Wahoo                 | 13            | 16            | 1.25  |
| Skipjack tuna         | 11,218        | 12,715        | 1.13  |
| Yellowfin tuna        | 3,289         | 4,759         | 1.45  |
| Kawakawa              | 21            | 27            | 1.29  |
| Spiny lobster         | 232           | 489           | 2.11  |
| <b>** SUBTOTAL **</b> | <b>24,214</b> | <b>32,721</b> |       |



Table II.1.13

## American Samoa December 1988 Estimated Commercial Landings

| Species               | Pounds         | Value          | \$/lb |
|-----------------------|----------------|----------------|-------|
| Black jack            | 417            | 742            | 1.78  |
| Small barracuda       | 113            | 141            | 1.25  |
| Sharks                | 188            | 188            | 1.00  |
| Flagtail grouper      | 146            | 229            | 1.57  |
| Lunartail grouper     | 278            | 436            | 1.57  |
| Blue lined snapper    | 445            | 729            | 1.64  |
| Humpback snapper      | 104            | 177            | 1.70  |
| Ehu (red snapper)     | 132            | 261            | 1.98  |
| Emperors (misc)       | 331            | 562            | 1.70  |
| Longnose emperor      | 160            | 257            | 1.61  |
| Squirreelfish         | 139            | 221            | 1.59  |
| Dolphin (mahimahi)    | 101            | 161            | 1.60  |
| Blue marlin           | 43             | 43             | 1.00  |
| Rainbow runner        | 19             | 24             | 1.30  |
| Wahoo                 | 114            | 158            | 1.38  |
| Skipjack tuna         | 22,522         | 16,827         | 0.75  |
| Dogtooth tuna         | 812            | 1,306          | 1.61  |
| Yellowfin tuna        | 4,441          | 5,802          | 1.31  |
| <b>** SUBTOTAL **</b> | <b>30,503</b>  | <b>28,264</b>  |       |
| <b>** TOTAL **</b>    | <b>289,528</b> | <b>335,113</b> |       |

Table II.2.1

## American Samoa 1988 Estimated Manu'a Landings

| Species              | Pounds        | Value         | \$/lb |
|----------------------|---------------|---------------|-------|
| Miscellaneous        | 44            | 66            | 1.50  |
| Jacks                | 94            | 131           | 1.40  |
| Black jack           | 136           | 187           | 1.37  |
| Whitemouth trevally  | 50            | 75            | 1.50  |
| Barracudas           | 38            | 38            | 1.00  |
| Small barracuda      | 426           | 533           | 1.25  |
| Sharks               | 313           | 313           | 1.00  |
| Bottom fish          | 531           | 664           | 1.25  |
| Groupers             | 15            | 23            | 1.50  |
| Tomato grouper       | 56            | 94            | 1.67  |
| Lunartail grouper    | 244           | 369           | 1.51  |
| Blue lined snapper   | 635           | 905           | 1.42  |
| Onespot snapper      | 11            | 17            | 1.50  |
| Humpback snapper     | 160           | 220           | 1.37  |
| Gray jobfish         | 28            | 34            | 1.25  |
| Deepwater bottomfish | 100           | 150           | 1.50  |
| Gindai (flower snap) | 132           | 198           | 1.50  |
| Onaga (red snapper)  | 415           | 591           | 1.42  |
| Ehu (red snapper)    | 794           | 1,125         | 1.42  |
| Emperors (misc)      | 19            | 28            | 1.50  |
| Ambon emperor        | 19            | 30            | 1.60  |
| Redgill emperor      | 103           | 136           | 1.33  |
| Squirrelfish         | 151           | 229           | 1.52  |
| Saber squirrelfish   | 48            | 71            | 1.50  |
| Dolphin (mahimahi)   | 124           | 155           | 1.25  |
| Blue marlin          | 730           | 730           | 1.00  |
| Rainbow runner       | 316           | 411           | 1.30  |
| Wahoo                | 213           | 266           | 1.25  |
| Skipjack tuna        | 5,108         | 5,302         | 1.04  |
| Dogtooth tuna        | 206           | 206           | 1.00  |
| Yellowfin tuna       | 5,312         | 5,727         | 1.08  |
| Kawakawa             | 8             | 8             | 1.00  |
| <b>** TOTAL **</b>   | <b>16,575</b> | <b>19,029</b> |       |



## II.25

Table II.2.2

American Samoa January 1988 Estimated Manu'a Landings

| Species        | Pounds | Value | \$/lb |
|----------------|--------|-------|-------|
| Barracudas     | 38     | 38    | 1.00  |
| Bottom fish    | 244    | 305   | 1.25  |
| ** SUBTOTAL ** | 281    | 342   |       |

Table II.2.3

American Samoa February 1988 Estimated Manu'a Landings

| Species            | Pounds | Value | \$/lb |
|--------------------|--------|-------|-------|
| Jacks              | 38     | 47    | 1.25  |
| Blue lined snapper | 63     | 78    | 1.25  |
| Humpback snapper   | 19     | 23    | 1.25  |
| Redgill emperor    | 56     | 70    | 1.25  |
| Skipjack tuna      | 81     | 81    | 1.00  |
| Yellowfin tuna     | 88     | 88    | 1.00  |
| ** SUBTOTAL **     | 344    | 388   |       |

Table II.2.4

American Samoa March 1988 Estimated Manu'a Landings

| Species            | Pounds | Value | \$/lb |
|--------------------|--------|-------|-------|
| Small barracuda    | 20     | 25    | 1.25  |
| Bottom fish        | 56     | 70    | 1.25  |
| Dolphin (mahimahi) | 31     | 39    | 1.25  |
| Rainbow runner     | 11     | 15    | 1.30  |
| Skipjack tuna      | 686    | 686   | 1.00  |
| Dogtooth tuna      | 10     | 10    | 1.00  |
| Yellowfin tuna     | 678    | 678   | 1.00  |
| Kawakawa           | 8      | 8     | 1.00  |
| ** SUBTOTAL **     | 1,500  | 1,530 |       |

## II.26

Table II.2.5

American Samoa April 1988 Estimated Manu'a Landings

| Species        | Pounds | Value | \$/lb |
|----------------|--------|-------|-------|
| Bottom fish    | 144    | 180   | 1.25  |
| Yellowfin tuna | 50     | 50    | 1.00  |
| ** SUBTOTAL ** | 194    | 230   |       |

Table II.2.6

American Samoa May 1988 Estimated Manu'a Landings

| Species             | Pounds | Value | \$/lb |
|---------------------|--------|-------|-------|
| Black jack          | 34     | 51    | 1.50  |
| Small barracuda     | 150    | 188   | 1.25  |
| Bottom fish         | 88     | 109   | 1.25  |
| Lunartail grouper   | 50     | 75    | 1.50  |
| Blue lined snapper  | 50     | 75    | 1.50  |
| Humpback snapper    | 15     | 21    | 1.39  |
| Onaga (red snapper) | 15     | 23    | 1.50  |
| Ehu (red snapper)   | 44     | 66    | 1.50  |
| Dolphin (mahimahi)  | 10     | 13    | 1.25  |
| Rainbow runner      | 50     | 65    | 1.30  |
| Wahoo               | 24     | 30    | 1.25  |
| Skipjack tuna       | 906    | 933   | 1.03  |
| Dogtooth tuna       | 31     | 31    | 1.00  |
| Yellowfin tuna      | 768    | 829   | 1.08  |
| ** SUBTOTAL **      | 2,234  | 2,507 |       |

Table II.2.7

American Samoa June 1988 Estimated Manu'a Landings

| Species              | Pounds | Value | \$/lb |
|----------------------|--------|-------|-------|
| Whitemouth trevally  | 50     | 75    | 1.50  |
| Small barracuda      | 106    | 133   | 1.25  |
| Blue lined snapper   | 50     | 75    | 1.50  |
| Deepwater bottomfish | 44     | 66    | 1.50  |
| Rainbow runner       | 38     | 56    | 1.50  |
| Wahoo                | 30     | 38    | 1.25  |
| Yellowfin tuna       | 31     | 34    | 1.08  |
| ** SUBTOTAL **       | 349    | 476   |       |

Table II.2.8

American Samoa July 1988 Estimated Manu'a Landings

| Species            | Pounds | Value | \$/lb |
|--------------------|--------|-------|-------|
| Dolphin (mahimahi) | 43     | 53    | 1.25  |
| Rainbow runner     | 50     | 65    | 1.30  |
| Wahoo              | 53     | 66    | 1.25  |
| Skipjack tuna      | 243    | 250   | 1.03  |
| Dogtooth tuna      | 14     | 14    | 1.00  |
| Yellowfin tuna     | 449    | 485   | 1.08  |
| ** SUBTOTAL **     | 850    | 932   |       |



Table II.2.9

## American Samoa August 1988 Estimated Manu'a Landings

| Species               | Pounds       | Value        | \$/lb |
|-----------------------|--------------|--------------|-------|
| Jacks                 | 31           | 47           | 1.50  |
| Small barracuda       | 38           | 47           | 1.25  |
| Lunartail grouper     | 31           | 47           | 1.50  |
| Blue lined snapper    | 50           | 75           | 1.50  |
| Humpback snapper      | 14           | 19           | 1.39  |
| Gindai (flower snap)  | 56           | 84           | 1.50  |
| Onaga (red snapper)   | 119          | 178          | 1.50  |
| Ehu (red snapper)     | 181          | 272          | 1.50  |
| Emperors (misc)       | 19           | 28           | 1.50  |
| Dolphin (mahimahi)    | 26           | 33           | 1.25  |
| Rainbow runner        | 5            | 7            | 1.30  |
| Wahoo                 | 11           | 14           | 1.25  |
| Skipjack tuna         | 656          | 676          | 1.03  |
| Dogtooth tuna         | 35           | 35           | 1.00  |
| Yellowfin tuna        | 398          | 429          | 1.08  |
| <b>** SUBTOTAL **</b> | <b>1,670</b> | <b>1,991</b> |       |

Table II.2.10

## American Samoa October 1988 Estimated Manu'a Landings

| Species             | Pounds | Value | \$/lb |
|---------------------|--------|-------|-------|
| Black jack          | 31     | 47    | 1.50  |
| Sharks              | 125    | 125   | 1.00  |
| Groupers            | 15     | 23    | 1.50  |
| Tomato grouper      | 31     | 50    | 1.60  |
| Lunartail grouper   | 63     | 97    | 1.55  |
| Blue lined snapper  | 169    | 257   | 1.52  |
| Onespot snapper     | 11     | 17    | 1.50  |
| Humpback snapper    | 73     | 107   | 1.47  |
| Onaga (red snapper) | 155    | 233   | 1.50  |
| Ehu (red snapper)   | 306    | 459   | 1.50  |
| Ambon emperor       | 19     | 30    | 1.60  |
| Redgill emperor     | 31     | 47    | 1.50  |
| Squirrelfish        | 100    | 153   | 1.53  |
| Saber squirrelfish  | 24     | 36    | 1.50  |
| Blue marlin         | 688    | 688   | 1.00  |
| Rainbow runner      | 88     | 109   | 1.25  |
| Wahoo               | 31     | 39    | 1.25  |

Table II.2.10 (cont.)

| Species               | Pounds       | Value        | \$/lb |
|-----------------------|--------------|--------------|-------|
| Skipjack tuna         | 238          | 238          | 1.00  |
| Yellowfin tuna        | 309          | 355          | 1.15  |
| <b>** SUBTOTAL **</b> | <b>2,505</b> | <b>3,107</b> |       |

Table II.2.11

American Samoa November 1988 Estimated Manu'a Landings

| Species               | Pounds       | Value        | \$/lb |
|-----------------------|--------------|--------------|-------|
| Miscellaneous         | 44           | 66           | 1.50  |
| Jacks                 | 25           | 38           | 1.50  |
| Black jack            | 71           | 89           | 1.25  |
| Tomato grouper        | 25           | 44           | 1.75  |
| Lunartail grouper     | 100          | 150          | 1.50  |
| Blue lined snapper    | 254          | 345          | 1.36  |
| Humpback snapper      | 40           | 50           | 1.25  |
| Gray jobfish          | 28           | 34           | 1.25  |
| Deepwater bottomfish  | 56           | 84           | 1.50  |
| Gindai (flower snap)  | 76           | 113          | 1.50  |
| Onaga (red snapper)   | 126          | 158          | 1.25  |
| Ehu (red snapper)     | 263          | 328          | 1.25  |
| Redgill emperor       | 15           | 19           | 1.25  |
| Squirreelfish         | 51           | 77           | 1.52  |
| Saber squirreelfish   | 24           | 36           | 1.50  |
| Rainbow runner        | 56           | 70           | 1.25  |
| Wahoo                 | 13           | 16           | 1.25  |
| Skipjack tuna         | 324          | 405          | 1.25  |
| Yellowfin tuna        | 200          | 250          | 1.25  |
| <b>** SUBTOTAL **</b> | <b>1,789</b> | <b>2,371</b> |       |

Table II.2.12

American Samoa December 1988 Estimated Manu'a Landings

| Species            | Pounds | Value  | \$/lb |
|--------------------|--------|--------|-------|
| Small barracuda    | 113    | 141    | 1.25  |
| Sharks             | 188    | 188    | 1.00  |
| Dolphin (mahimahi) | 14     | 17     | 1.25  |
| Blue marlin        | 43     | 43     | 1.00  |
| Rainbow runner     | 19     | 24     | 1.30  |
| Wahoo              | 51     | 64     | 1.25  |
| Skipjack tuna      | 1,975  | 2,034  | 1.03  |
| Dogtooth tuna      | 116    | 116    | 1.00  |
| Yellowfin tuna     | 2,343  | 2,530  | 1.08  |
| ** SUBTOTAL **     | 4,860  | 5,157  |       |
| ** TOTAL **        | 16,575 | 19,029 |       |



## II.31

Figure II.1.1

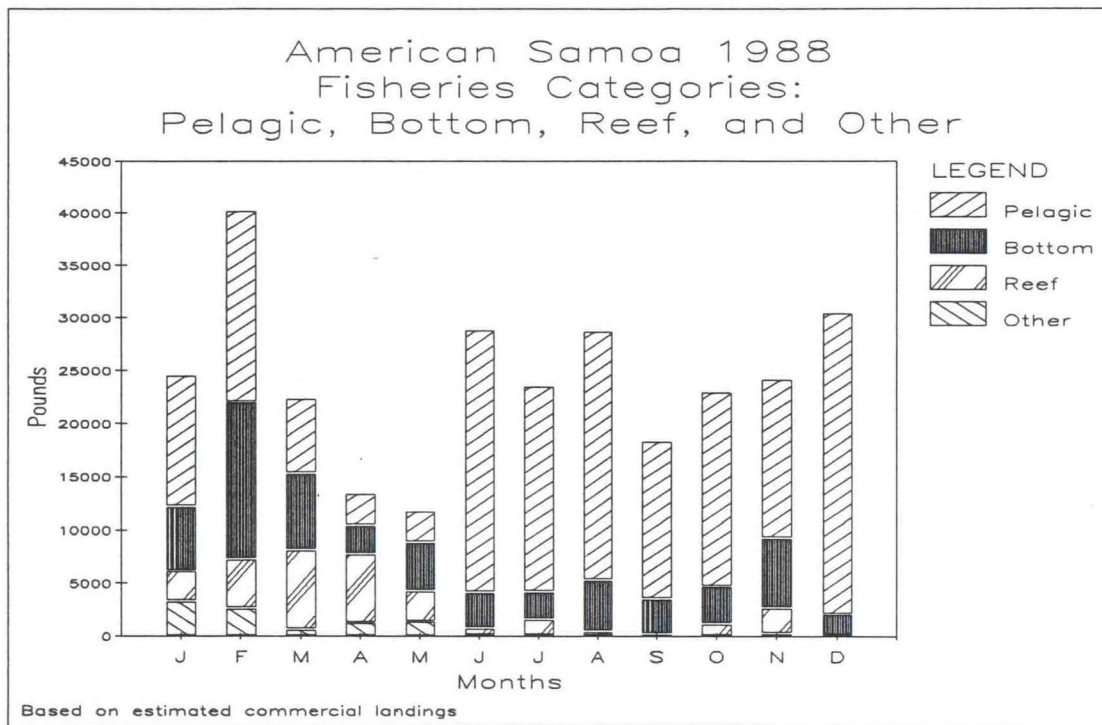


Figure II.1.2

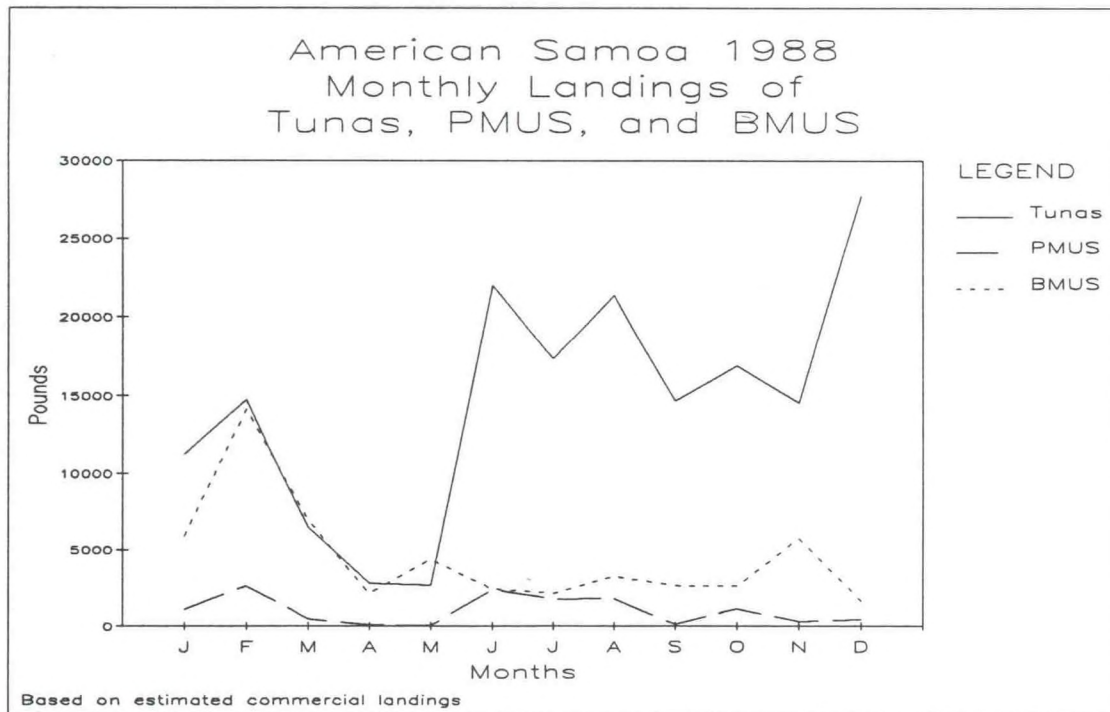


Figure II.1.3

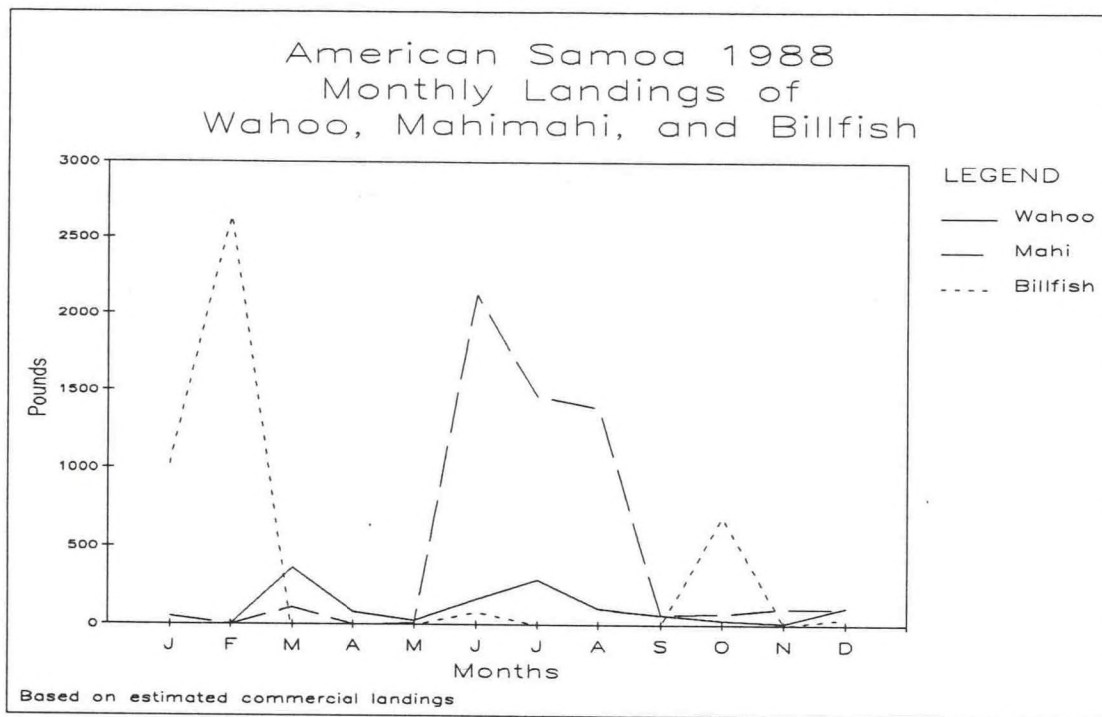
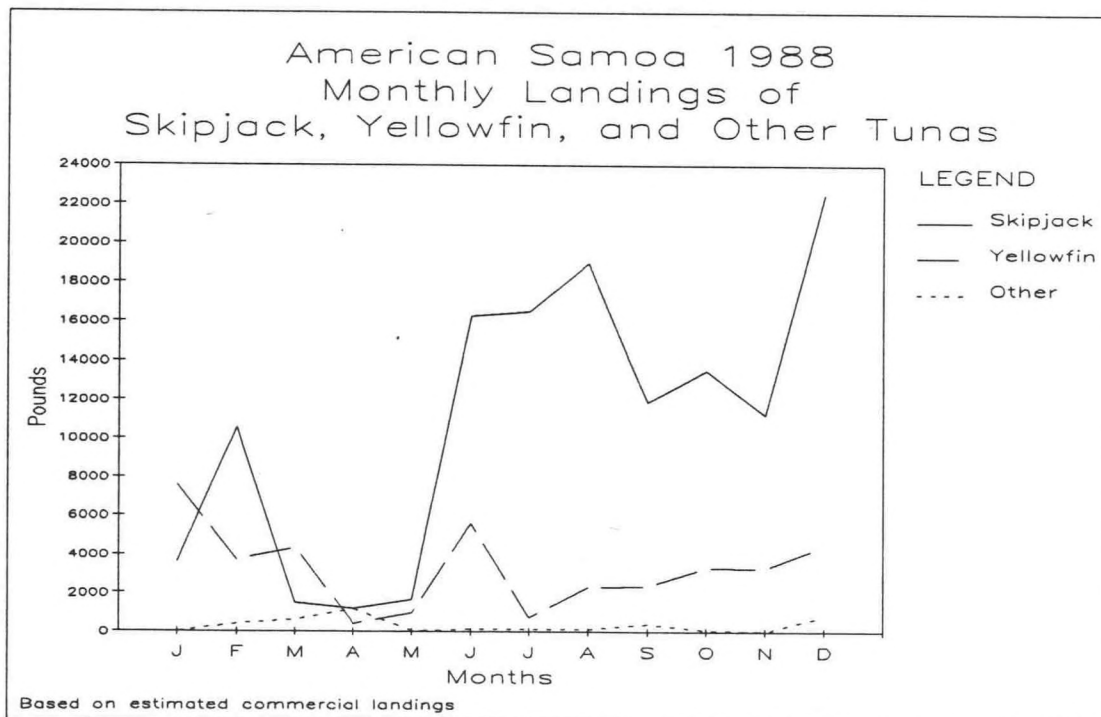


Figure II.1.4



## II.33

Figure II.2.1

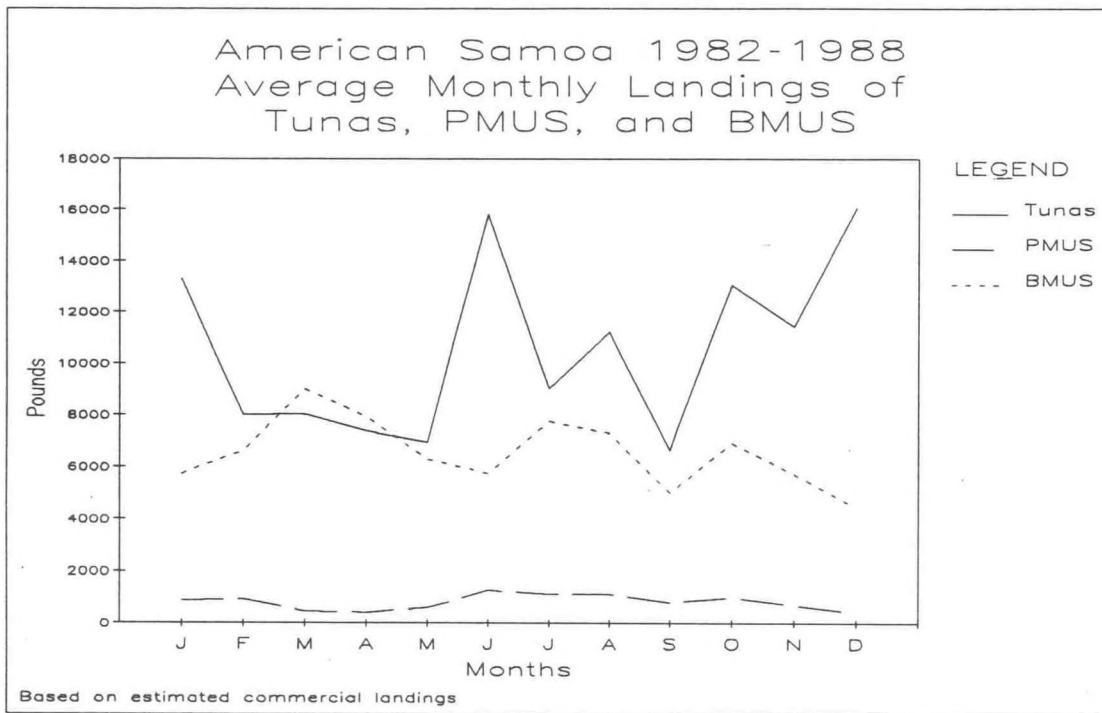


Figure II.2.2

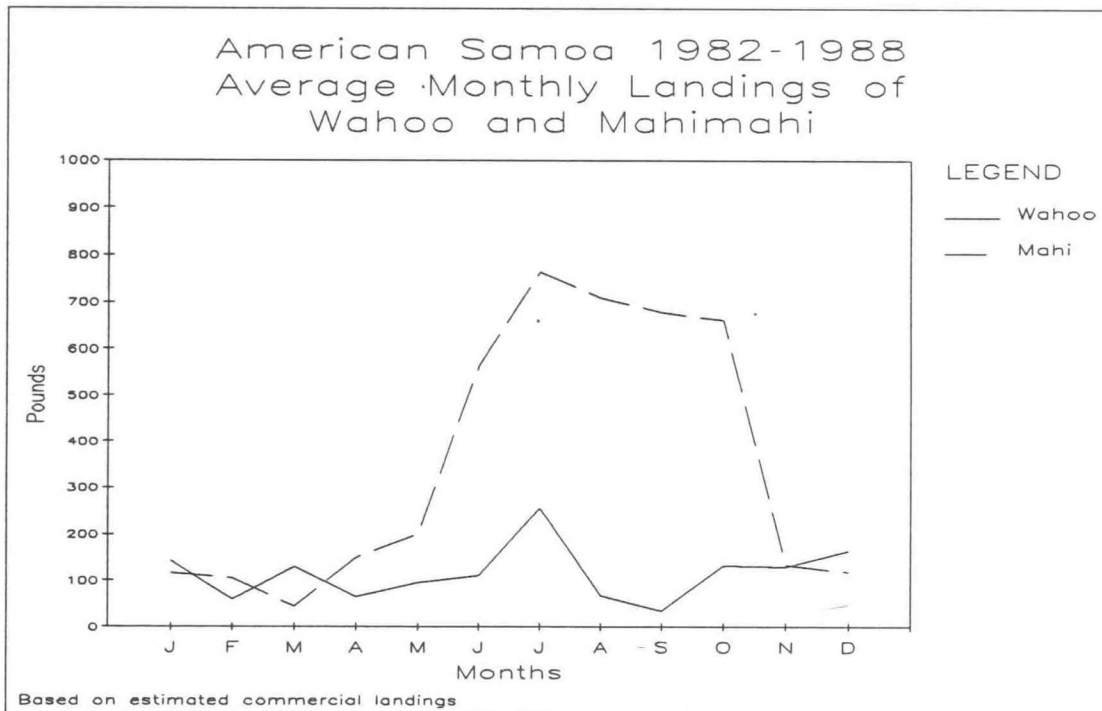




Figure II.2.3

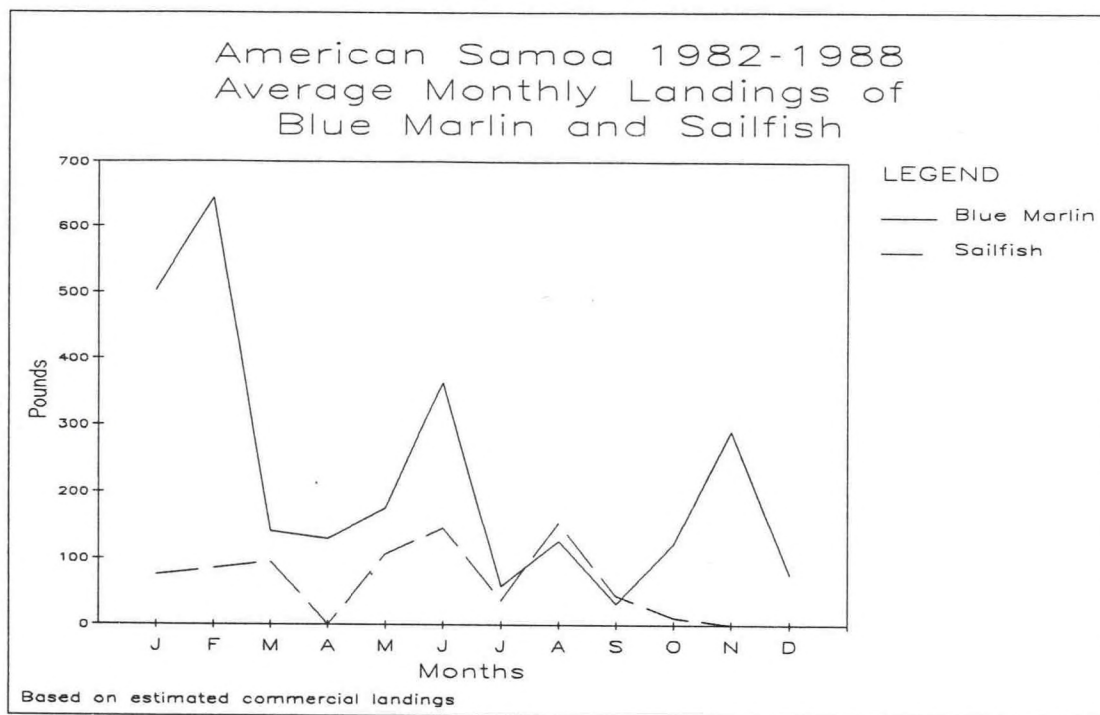
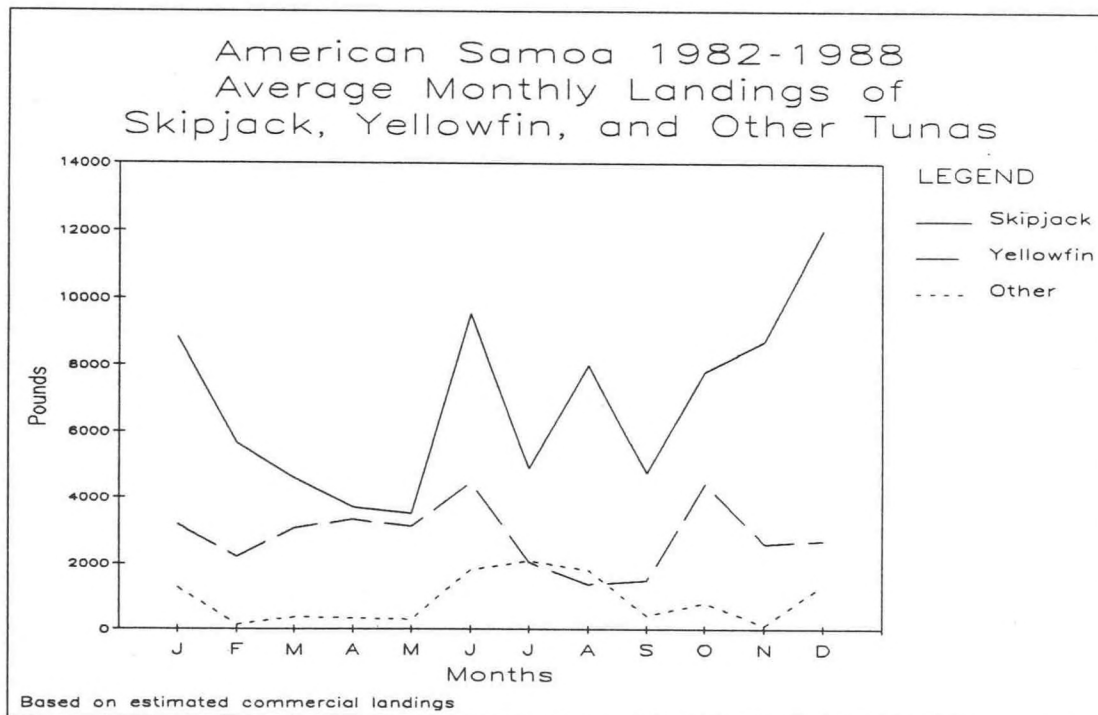


Figure II.2.4



## II.35

Figure II.2.5

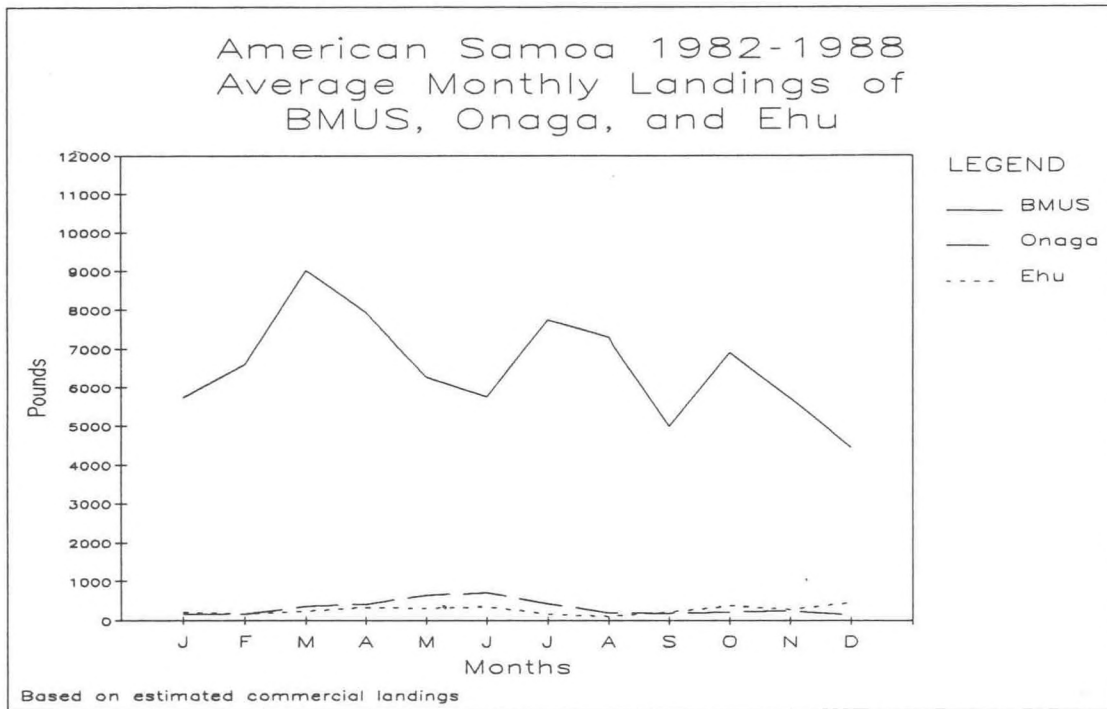
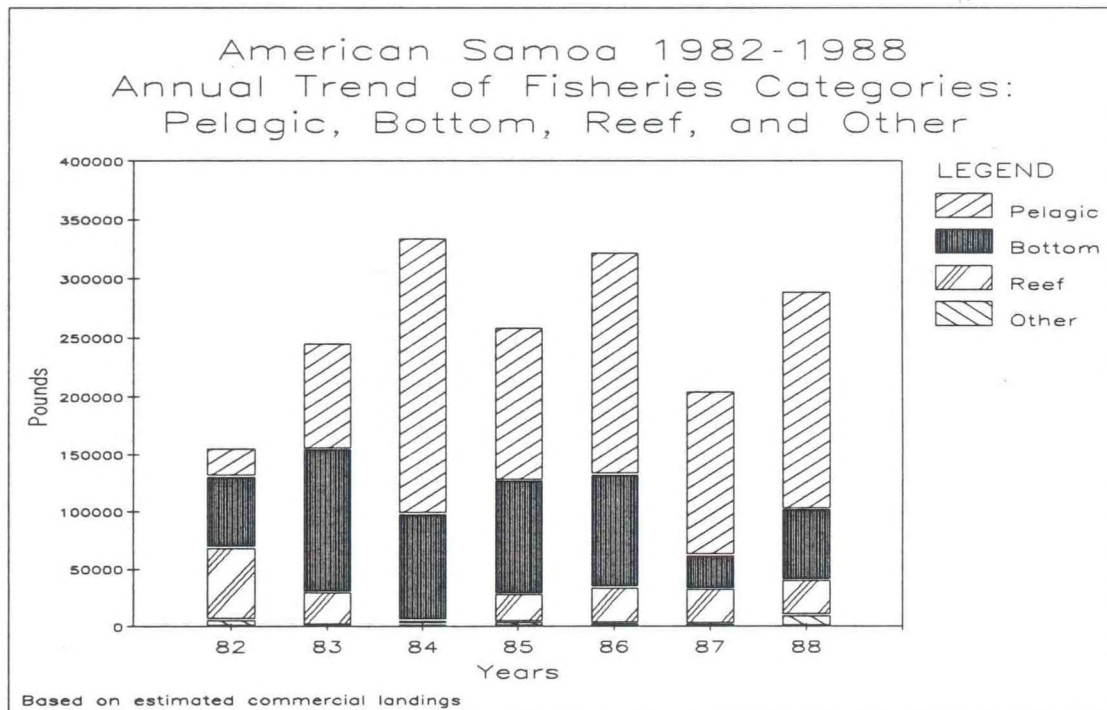


Figure II.3.1



## II.36

Figure II.3.2

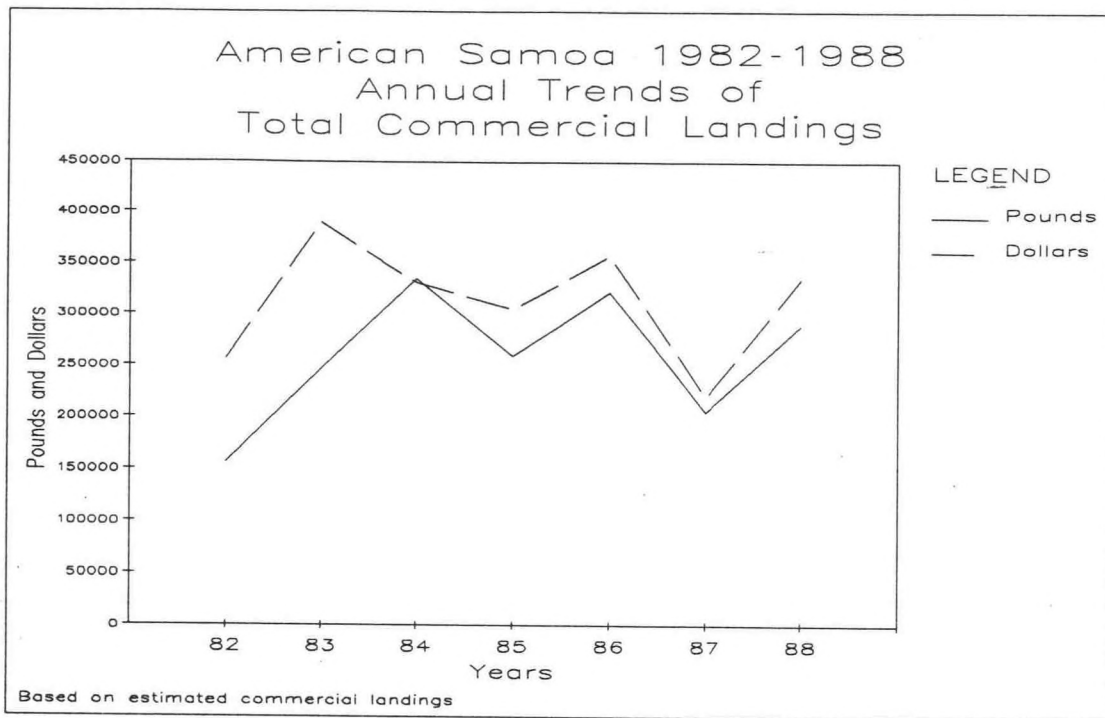


Figure II.3.3

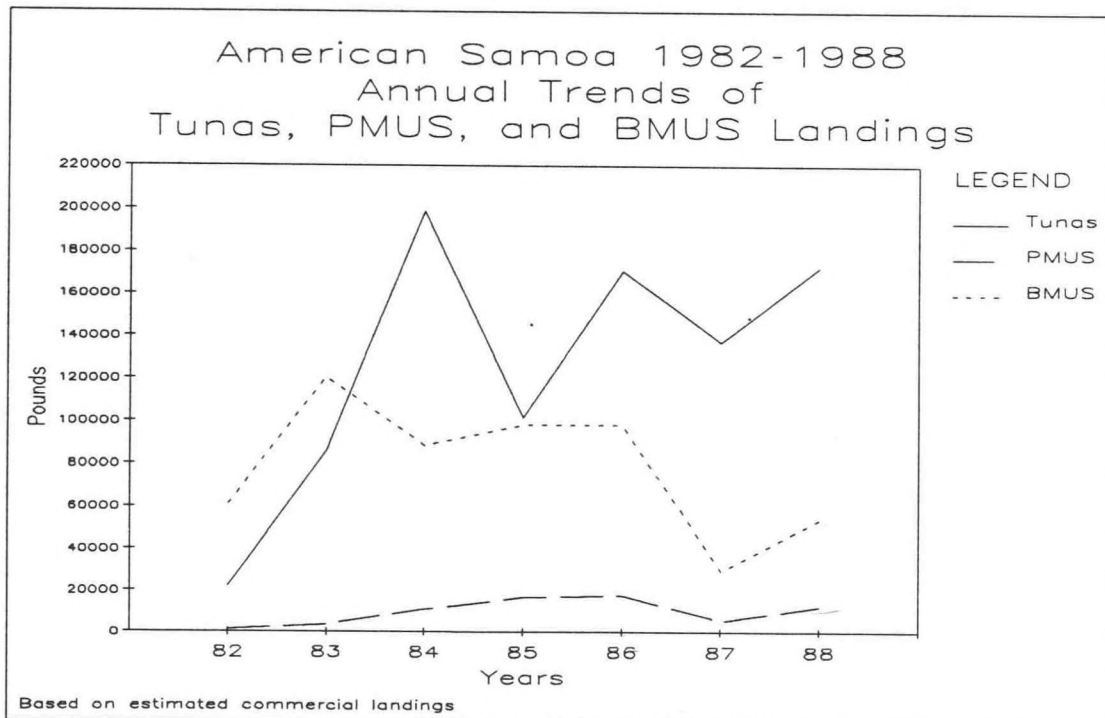




Figure II.3.4

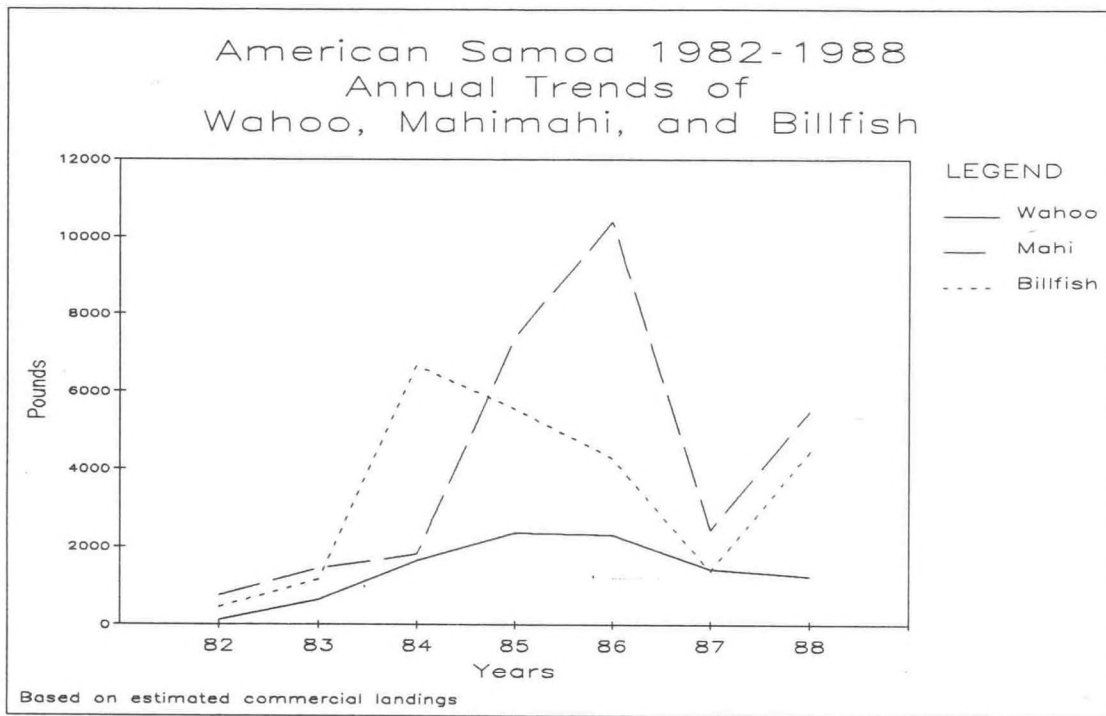
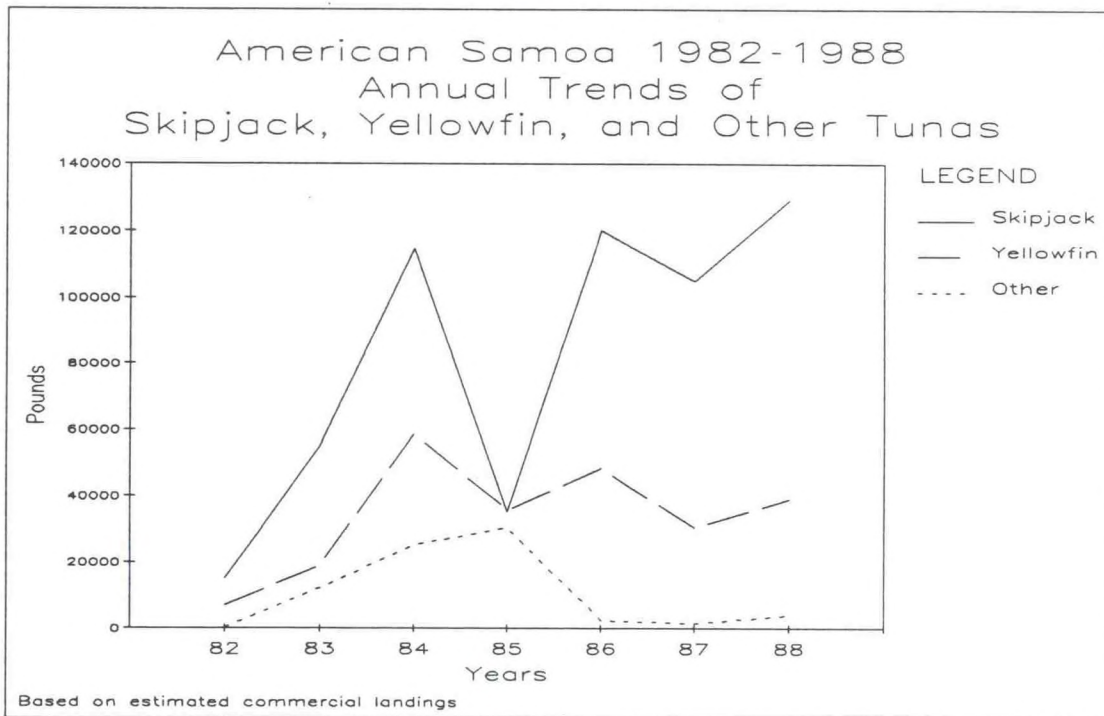


Figure II.3.5



II.38

Figure II.4.1

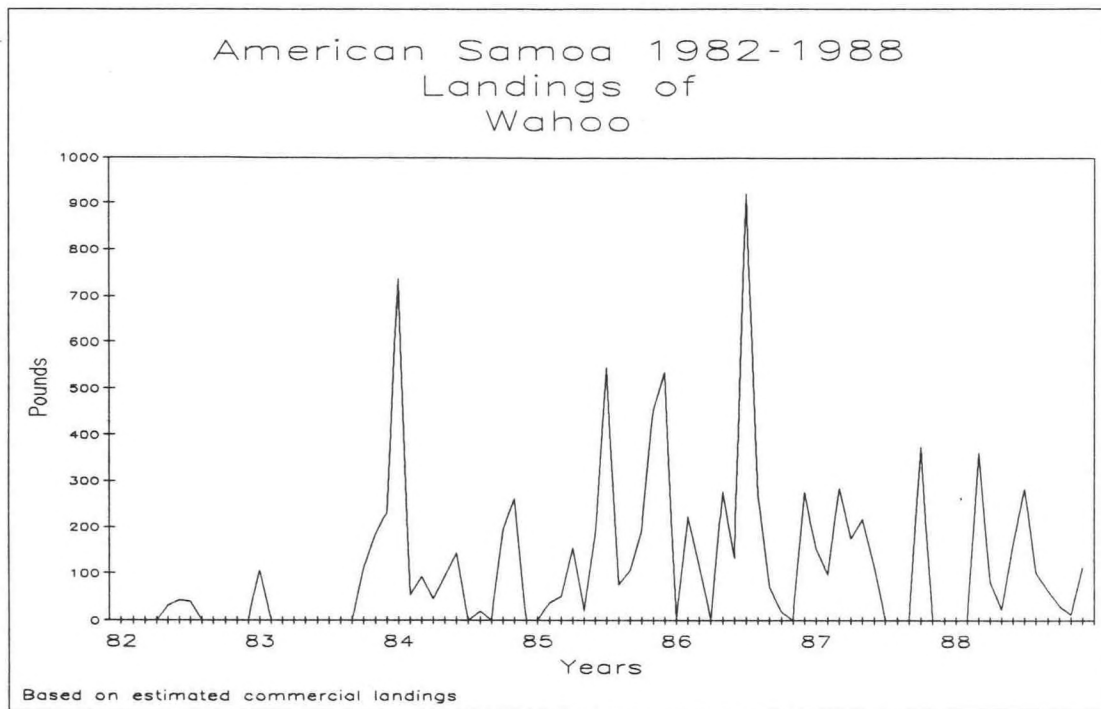
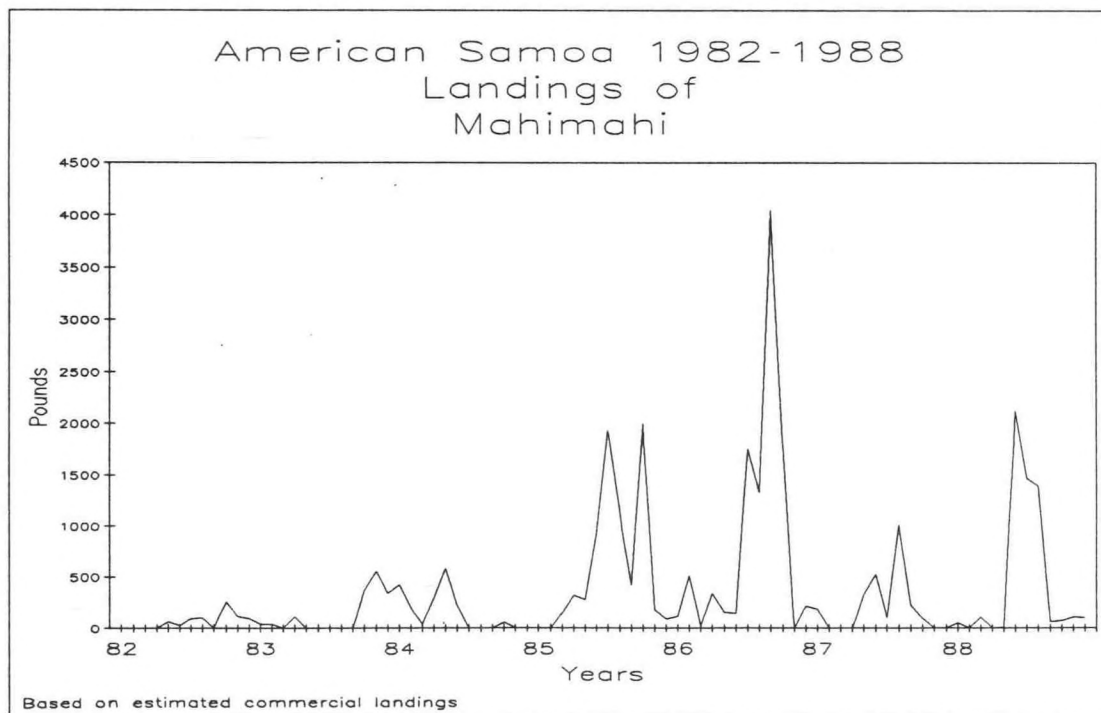


Figure II.4.2



II.39

Figure II.4.3

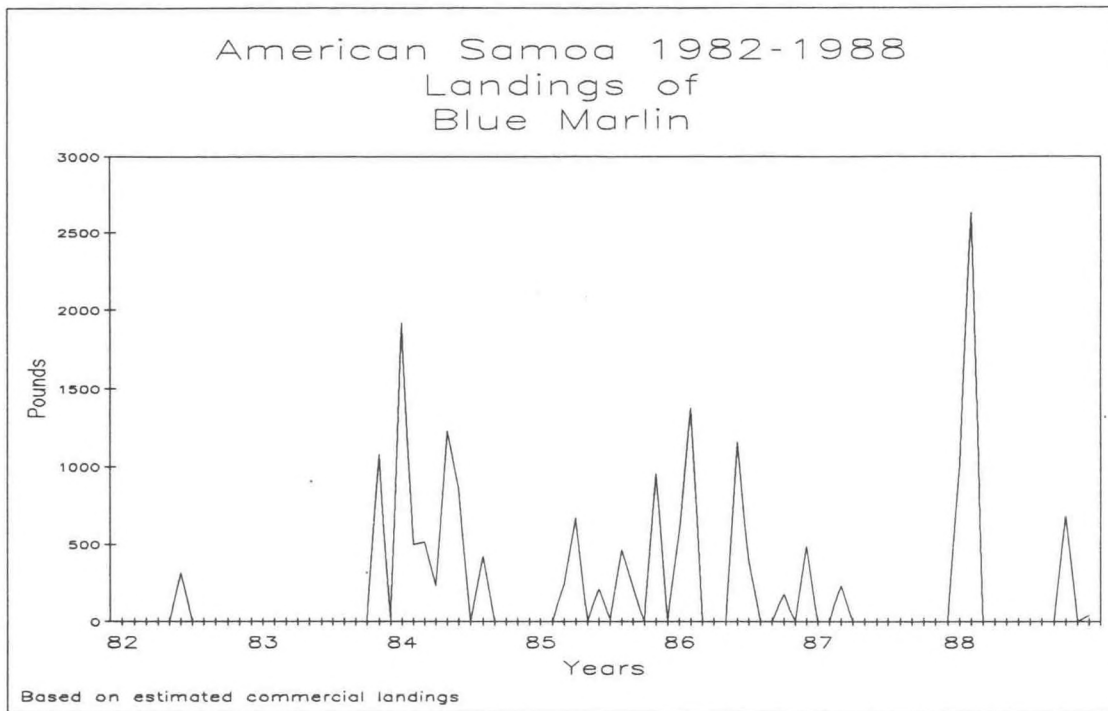


Figure II.4.4

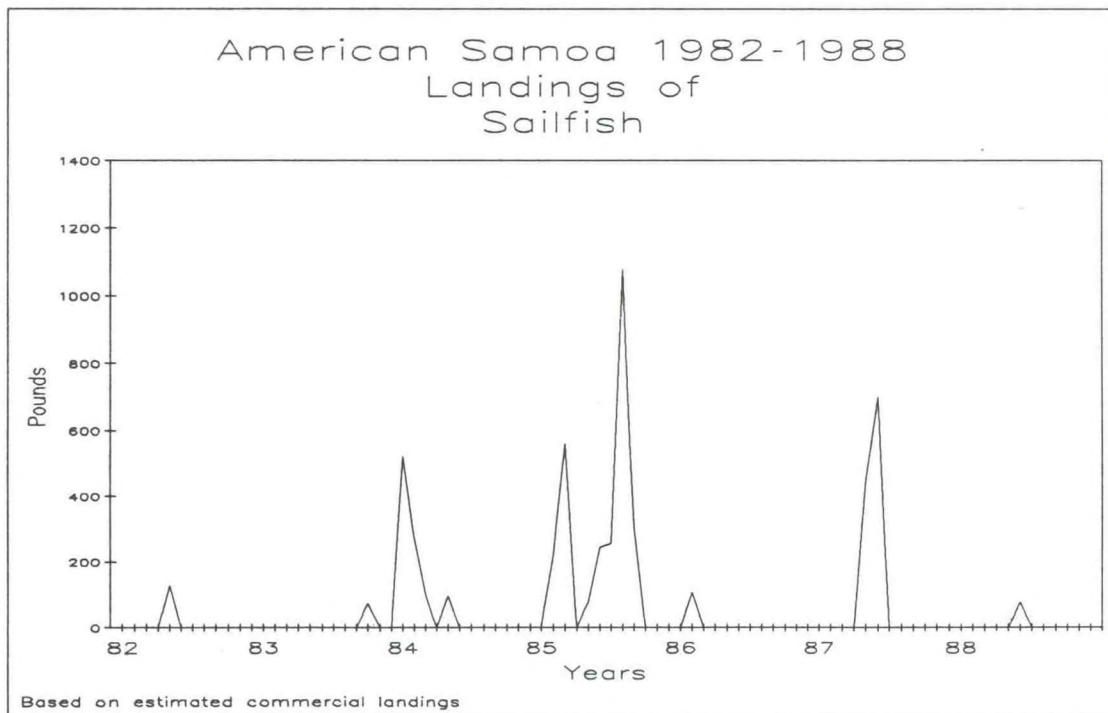




Figure II.4.5

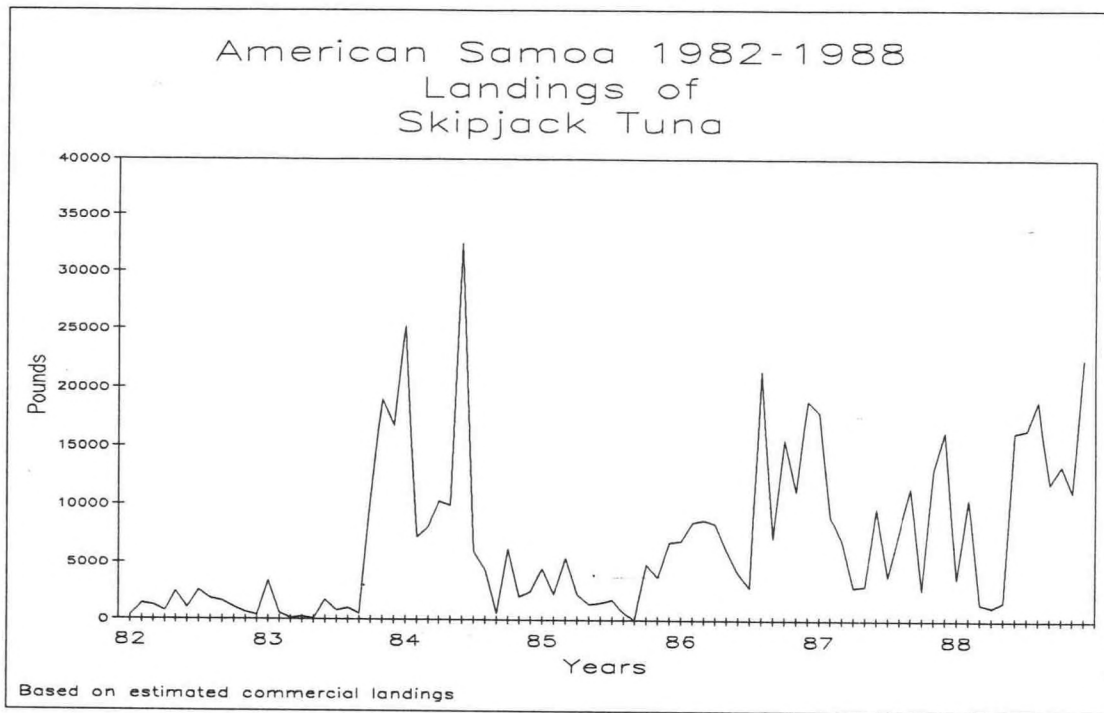
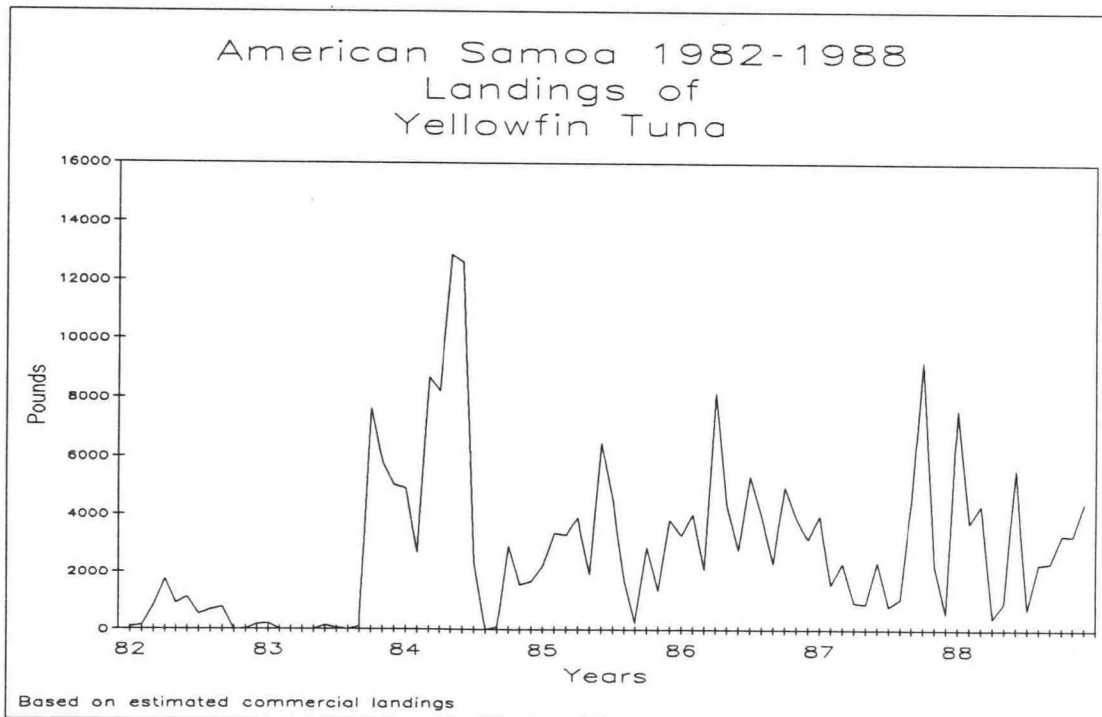


Figure II.4.6



II.41

Figure II.4.7

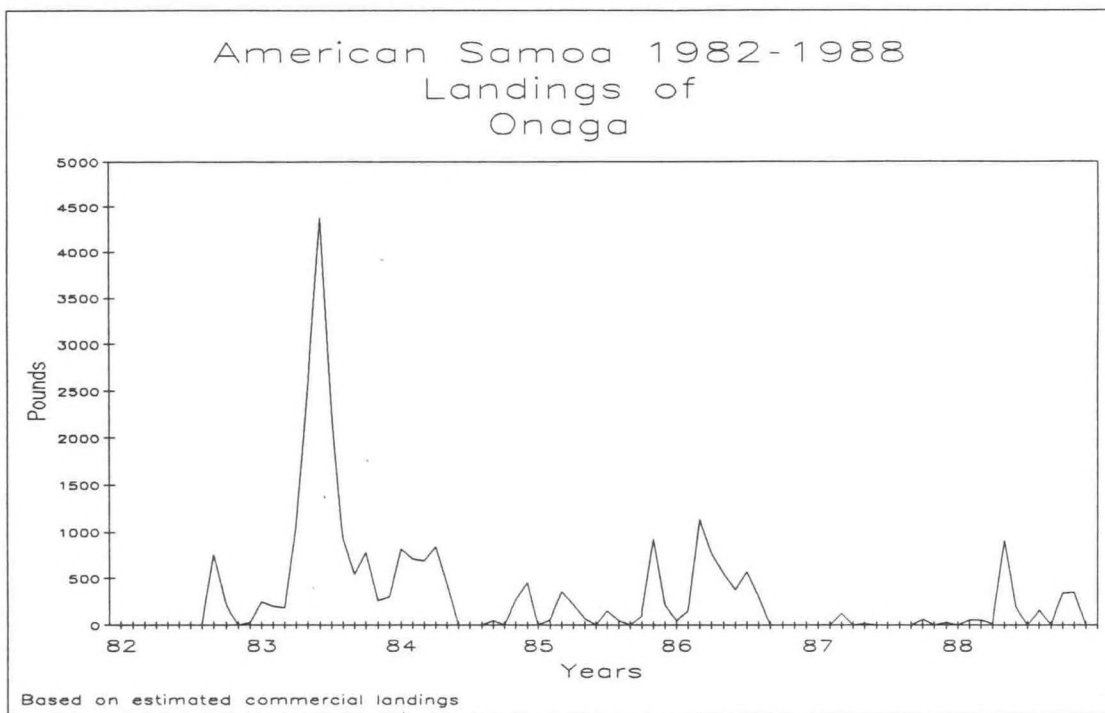


Figure II.4.8

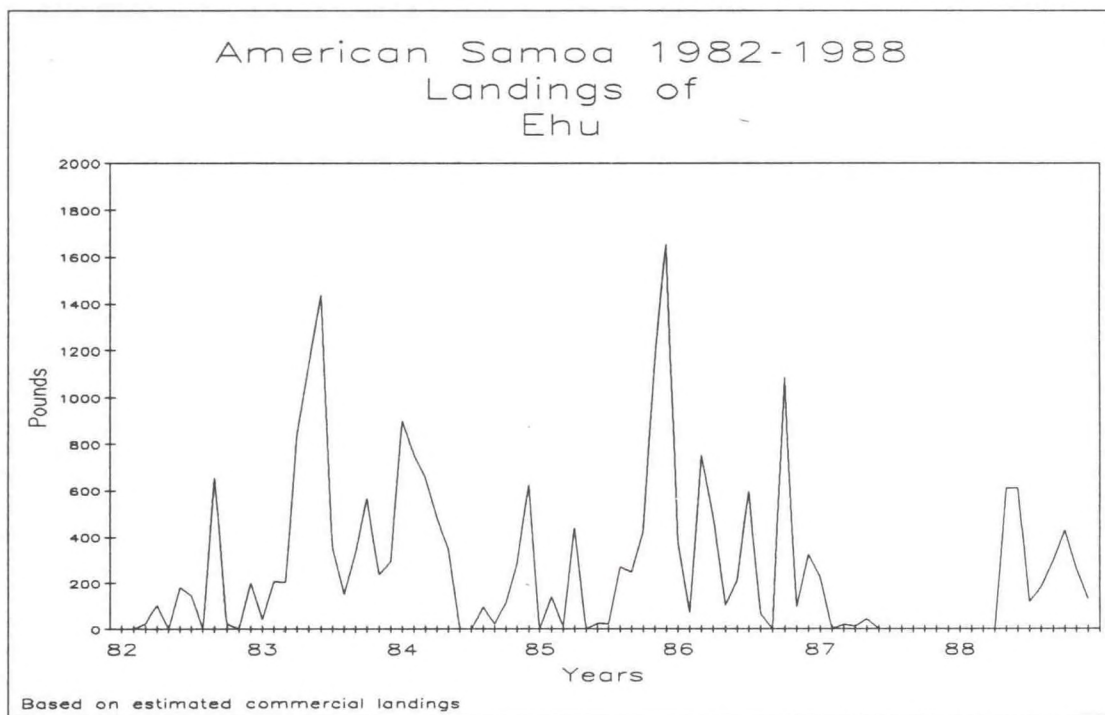


Table II.3.1

Tutuila 1988 Annual  
Offshore Creel Survey Species Composition

| Common Name          | Total Pounds | % SP. Comp. | Common Name          | TOTAL POUNDS | % SP. COMP. |
|----------------------|--------------|-------------|----------------------|--------------|-------------|
| Bigeye scad          | 1157.5       | 0.36        | Jacks                | 582.2        | 0.18        |
| Black jack           | 1949.1       | 0.61        | Barracudas           | 1202.5       | 0.38        |
| Large barracuda      | 39.1         | 0.01        | Small barracuda      | 633.5        | 0.20        |
| Sharks               | 3686.9       | 1.15        | Eels                 | 222.0        | 0.07        |
| Bottom fish          | 23196.4      | 7.24        | Groupers             | 930.3        | 0.29        |
| Peacock grouper      | 642.7        | 0.20        | Flagtail grouper     | 675.5        | 0.21        |
| Striped grouper      | 55.0         | 0.02        | Spotted grouper      | 270.9        | 0.08        |
| Giant grouper        | 45.2         | 0.01        | Lunartail grouper    | 3297.1       | 1.03        |
| Blue lined snapper   | 6694.5       | 2.09        | Onespot snapper      | 14.7         | .00         |
| Twinspot/red snapper | 482.6        | 0.15        | Humpback snapper     | 643.1        | 0.20        |
| Blood snapper        | 160.1        | 0.05        | Brown jobfish        | 201.5        | 0.06        |
| Gray jobfish         | 1320.0       | 0.41        | Deepwater bottomfish | 515.1        | 0.16        |
| Opakapaka            | 1060.6       | 0.33        | Blue lined gindai    | 156.3        | 0.05        |
| Gindai (flower snap) | 453.7        | 0.14        | Lehi (silverjaw)     | 2126.5       | 0.66        |
| Onaga (red snapper)  | 1525.5       | 0.48        | Ehu (red snapper)    | 1761.1       | 0.55        |
| Stone's snapper      | 457.2        | 0.14        | Bigeye emperor       | 158.0        | 0.05        |
| Emperors (misc)      | 531.7        | 0.17        | Longnose emperor     | 4348.1       | 1.36        |
| Ambon emperor        | 1145.1       | 0.36        | Blueline bream       | 146.5        | 0.05        |
| Orangespot emperor   | 893.2        | 0.28        | Redgill emperor      | 3277.4       | 1.02        |
| Reef fish            | 5384.2       | 1.68        | Rudderfish           | 19.2         | 0.01        |
| Rabbitfish           | 10.5         | 0           | Lined surgeon        | 10520.4      | 3.28        |
| Yellow eyed surgeon  | 2925.4       | 0.91        | Convict tang         | 17.5         | 0.01        |
| Dussumier's surgeon  | 105.0        | 0.03        | Spotted surgeonfish  | 36.7         | 0.01        |
| Unicornfish (misc)   | 2094.0       | 0.65        | Unicornfish          | 2060.6       | 0.64        |
| Squirrelfish         | 1530.0       | 0.48        | Saber squirrelfish   | 201.5        | 0.06        |
| Berndt's soldierfish | 471.1        | 0.15        | Bigeye squirrelfish  | 43.7         | 0.01        |
| Parrotfish           | 4832.4       | 1.51        | Wrasse               | 521.3        | 0.16        |
| Inshore groupers     | 329.0        | 0.10        | Dolphin (mahimahi)   | 7060.3       | 2.20        |
| Blue marlin          | 8966.7       | 2.80        | Sailfish             | 390.0        | 0.12        |
| Rainbow runner       | 623.4        | 0.19        | Wahoo                | 1710.9       | 0.53        |
| Tunas                | 466.1        | 0.15        | Skipjack tuna        | 145622.5     | 45.43       |
| Dogtooth tuna        | 2238.0       | 0.70        | Albacore             | 1830.8       | 0.57        |
| Yellowfin tuna       | 43766.9      | 13.65       | Kawakawa             | 692.7        | 0.22        |
| Spiny lobster        | 6143.9       | 1.92        | Octopus              | 134.0        | 0.04        |
| Squid                | 5.5          | 0           | Giant clam           | 3111.8       | 0.97        |
| Total all species:   | 320524.4     | 100.00      |                      |              |             |



Table II.3.2

Tutuila 1988 Annual  
Offshore Creel Survey Expansion Summary

| Gear         | Catch    | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|----------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 200701.1 | 9  | 5164.8   | 8  | 704.4    | 8  | 15711.3  | 8  | 2143.2   | 8  | 43.3 | 7   |
| Bottom fish  | 26358.5  | 18 | 1589.1   | 16 | 150.2    | 15 | 3922.7   | 16 | 373.9    | 16 | 16.3 | 11  |
| Troll-bottom | 33642.9  | 17 | 1621.9   | 16 | 118.6    | 14 | 5065.9   | 18 | 362.4    | 15 | 22.8 | 17  |
| Spearing     | 54985.9  | 12 | 2172.3   | 11 | 256.1    | 10 | 10092.2  | 12 | 1143.5   | 11 | 26.1 | 8   |
| Atulai       | 1157.5   | 60 | 49.0     | 52 | 10.3     | 44 | 90.1     | 52 | 26.7     | 51 | 37.6 | 54* |
| Long line    | 3678.5   | 33 | 195.5    | 36 | 30.5     | 32 | 405.4    | 36 | 67.5     | 36 | 23.3 | 30  |
| Total:       | 320524.3 | 7  | 10792.6  | 7  | 1246.4   | 6  | 35287.7  | 7  | 4041.8   | 6  | 33.7 | 6   |

\* Not enough data to properly compute Coefficient of Variation (CV).

## II.44

Table II.4.1

Tutuila January 1988  
Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 13490.7 | 33 | 616.8    | 29 | 82.4     | 27 | 1930.1   | 28 | 254.6    | 27 | 21.9 | 20  |
| Bottom fish  | 1217.8  | 64 | 112.0    | 53 | 8.7      | 53 | 278.0    | 54 | 21.2     | 53 | 11.1 | 86* |
| Troll-bottom | 2235.5  | 39 | 147.3    | 37 | 13.4     | 36 | 527.7    | 36 | 49.8     | 37 | 17.0 | 41  |
| Spearing     | 11009.4 | 26 | 485.8    | 26 | 54.8     | 20 | 1972.1   | 28 | 217.4    | 22 | 29.6 | 36  |
| Total:       | 27953.3 | 16 | 1361.9   | 14 | 154.4    | 13 | 4708.0   | 16 | 523.8    | 15 | 21.1 | 15  |

Table II.4.2

Tutuila February 1988  
Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 24922.6 | 38 | 575.8    | 34 | 63.2     | 35 | 1870.9   | 30 | 204.7    | 32 | 38.8 | 28  |
| Bottom fish  | 2318.3  | 48 | 218.5    | 51 | 20.7     | 55 | 560.2    | 52 | 53.4     | 56 | 11.2 | 23* |
| Troll-bottom | 8713.5  | 49 | 340.1    | 44 | 18.2     | 37 | 1175.1   | 55 | 53.8     | 40 | 22.4 | 20  |
| Spearing     | 15578.0 | 24 | 530.3    | 17 | 53.5     | 16 | 2908.4   | 18 | 289.1    | 17 | 27.9 | 16  |
| Total:       | 51532.4 | 32 | 1664.8   | 28 | 151.1    | 24 | 6514.6   | 26 | 592.1    | 21 | 28.5 | 13  |

Table II.4.3

Tutuila March 1988  
Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 7281.4  | 23 | 285.4    | 22 | 41.1     | 22 | 1002.4   | 23 | 142.7    | 24 | 24.9 | 17  |
| Bottom fish  | 2440.8  | 57 | 158.6    | 53 | 15.8     | 50 | 388.5    | 57 | 38.0     | 54 | 14.0 | 20* |
| Troll-bottom | 2822.4  | 40 | 139.3    | 40 | 9.7      | 39 | 330.4    | 42 | 22.7     | 40 | 20.2 | 14* |
| Spearing     | 10893.5 | 21 | 424.2    | 20 | 50.1     | 18 | 1926.6   | 23 | 226.5    | 20 | 27.5 | 14  |
| Atulai       | 225.4   | 76 | 2.8      | 76 | 2.8      | 76 | 14.1     | 76 | 14.1     | 76 | 80.0 | 0*  |
| Long line    | 1973.5  | 44 | 60.6     | 45 | 12.1     | 45 | 147.2    | 54 | 29.4     | 54 | 34.7 | 58* |
| Total:       | 25636.8 | 13 | 1070.8   | 13 | 126.1    | 12 | 3809.2   | 14 | 445.2    | 12 | 24.2 | 8   |

\* Not enough data to properly compute Coefficient of Variation (CV).

# II.45

Table II.4.4

## Tutuila 1988 Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 874.3   | 73 | 17.1     | 73 | 2.9      | 73 | 34.3     | 73 | 5.7      | 73 | 51.0 | 0*  |
| Bottom fish  | 1385.0  | 55 | 107.1    | 53 | 8.6      | 52 | 251.4    | 55 | 20.0     | 54 | 12.4 | 17* |
| Troll-bottom | 1285.0  | 56 | 81.9     | 60 | 7.6      | 61 | 245.7    | 60 | 22.9     | 61 | 16.6 | 0*  |
| Spearing     | 7999.6  | 29 | 263.8    | 25 | 35.2     | 24 | 1118.1   | 34 | 137.1    | 26 | 28.6 | 11  |
| Atulai       | 28.6    | 73 | 14.3     | 73 | 2.9      | 73 | 14.3     | 73 | 2.9      | 73 | 2.0  | 0*  |
| Long line    | 1653.8  | 57 | 150.5    | 63 | 18.1     | 52 | 264.3    | 57 | 34.3     | 48 | 11.8 | 63* |
| Total:       | 13226.2 | 26 | 634.8    | 27 | 75.2     | 25 | 1928.1   | 28 | 222.9    | 25 | 22.0 | 12  |

Table II.4.5

## Tutuila May 1988 Offshore Creel Survey Expansion Summary

| Gear        | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|-------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling    | 1466.7  | 88 | 100.0    | 88 | 14.3     | 88 | 266.7    | 88 | 38.1     | 88 | 14.7 | 0*  |
| Bottom fish | 4508.6  | 65 | 149.8    | 60 | 14.8     | 62 | 299.5    | 60 | 29.5     | 62 | 27.9 | 0*  |
| Spearing    | 3146.9  | 50 | 147.5    | 52 | 18.5     | 50 | 689.9    | 56 | 87.0     | 53 | 23.0 | 15* |
| Atulai      | 919.7   | 81 | 30.0     | 81 | 3.8      | 81 | 60.0     | 81 | 7.5      | 81 | 30.7 | 0*  |
| Total:      | 10041.8 | 44 | 427.2    | 45 | 46.3     | 43 | 1316.1   | 47 | 152.1    | 44 | 25.0 | 8   |

Table II.4.6

## Tutuila June 1988 Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 23996.2 | 25 | 447.2    | 22 | 61.9     | 21 | 1100.3   | 25 | 156.8    | 25 | 61.5 | 13  |
| Bottom fish  | 1682.6  | 57 | 96.9     | 55 | 9.6      | 56 | 307.4    | 55 | 29.3     | 55 | 17.0 | 0*  |
| Troll-bottom | 2766.1  | 60 | 119.6    | 57 | 10.9     | 56 | 280.9    | 59 | 25.4     | 58 | 22.0 | 18* |
| Spearing     | 935.0   | 79 | 29.0     | 79 | 3.6      | 79 | 174.0    | 79 | 21.7     | 79 | 32.3 | 0*  |
| Total:       | 29379.9 | 20 | 692.7    | 15 | 86.0     | 15 | 1862.5   | 18 | 233.3    | 18 | 48.6 | 15  |

\* Not enough data to properly compute Coefficient of Variation (CV).



## II.46

Table II.4.7

Tutuila July 1988  
Offshore Creel Survey Expansion Summary

| Gear         | catch   | cv | boat hrs | cv | boat cnt | cv | prsn hrs | cv | prsn cnt | cv | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 19922.3 | 22 | 382.7    | 20 | 54.4     | 22 | 926.2    | 24 | 132.6    | 26 | 53.7 | 18  |
| Bottom fish  | 962.3   | 57 | 68.2     | 56 | 6.8      | 56 | 136.4    | 56 | 13.6     | 56 | 14.1 | 0*  |
| Troll-bottom | 909.3   | 58 | 78.5     | 57 | 6.8      | 56 | 190.9    | 56 | 17.0     | 57 | 11.4 | 0*  |
| Spearing     | 2754.2  | 36 | 151.5    | 35 | 20.4     | 33 | 823.2    | 42 | 95.3     | 36 | 18.0 | 42* |
| Total:       | 24548.0 | 17 | 680.9    | 11 | 88.5     | 13 | 2076.8   | 18 | 258.6    | 16 | 39.9 | 19  |

Table II.4.8

Tutuila August 1988  
Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 26145.4 | 25 | 666.5    | 28 | 83.3     | 24 | 1846.6   | 28 | 229.4    | 25 | 49.3 | 34  |
| Bottom fish  | 1018.4  | 56 | 129.7    | 58 | 7.6      | 53 | 259.4    | 58 | 15.3     | 53 | 10.7 | 94* |
| Troll-bottom | 3003.5  | 50 | 180.3    | 52 | 10.6     | 43 | 518.9    | 53 | 31.0     | 44 | 19.0 | 12* |
| Spearing     | 554.2   | 54 | 68.7     | 56 | 7.6      | 53 | 228.9    | 64 | 22.9     | 56 | 8.6  | 24* |
| Total:       | 30721.5 | 24 | 1045.1   | 25 | 109.1    | 23 | 2853.7   | 24 | 298.5    | 22 | 32.3 | 14  |

Table II.4.9

Tutuila September 1988  
Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv   |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|------|
| Trolling     | 15213.9 | 31 | 366.4    | 25 | 46.3     | 24 | 1055.3   | 25 | 138.7    | 25 | 37.1 | 16   |
| Bottom fish  | 1316.7  | 76 | 36.7     | 63 | 6.7      | 51 | 103.3    | 67 | 16.7     | 53 | 22.9 | 129* |
| Troll-bottom | 3743.3  | 46 | 273.3    | 54 | 16.7     | 47 | 804.4    | 61 | 46.7     | 54 | 17.0 | 46*  |
| Total:       | 20273.9 | 28 | 676.4    | 34 | 69.6     | 28 | 1963.1   | 36 | 202.0    | 28 | 33.9 | 19   |

\* Not enough data to properly compute Coefficient of Variation (CV).

## II.47

Table II.4.10

Tutuila October 1988  
Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 19944.1 | 28 | 492.2    | 28 | 75.2     | 30 | 1546.2   | 32 | 236.0    | 35 | 43.4 | 17  |
| Bottom fish  | 2713.2  | 46 | 125.8    | 47 | 13.6     | 46 | 350.0    | 49 | 37.4     | 47 | 23.8 | 82* |
| Troll-bottom | 3027.4  | 57 | 133.7    | 49 | 6.9      | 49 | 709.7    | 55 | 37.7     | 57 | 23.6 | 77* |
| Spearing     | 921.1   | 61 | 37.5     | 56 | 6.8      | 56 | 136.8    | 63 | 23.9     | 61 | 23.8 | 0*  |
| Total:       | 26605.8 | 27 | 789.3    | 22 | 102.5    | 25 | 2742.8   | 26 | 335.0    | 28 | 32.2 | 15  |

Table II.4.11

Tutuila November 1988  
Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv  |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling     | 21923.3 | 23 | 742.1    | 17 | 112.8    | 17 | 2489.6   | 17 | 373.7    | 17 | 27.5 | 20  |
| Bottom fish  | 6293.0  | 40 | 363.9    | 37 | 35.3     | 32 | 919.3    | 36 | 92.5     | 34 | 15.6 | 10  |
| Troll-bottom | 1828.6  | 53 | 69.2     | 44 | 10.5     | 41 | 213.5    | 43 | 39.8     | 50 | 23.2 | 70* |
| Spearing     | 1992.5  | 52 | 67.7     | 52 | 7.5      | 52 | 338.3    | 52 | 37.6     | 52 | 30.0 | 25* |
| Total:       | 32037.4 | 19 | 1242.9   | 16 | 162.4    | 14 | 3960.8   | 16 | 536.1    | 14 | 27.5 | 16  |

Table II.4.12

Tutuila December 1988  
Offshore Creel Survey Expansion Summary

| Gear         | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | cpue | cv   |
|--------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|------|
| Trolling     | 26532.9 | 18 | 441.4    | 19 | 61.2     | 19 | 1474.8   | 23 | 204.9    | 23 | 65.6 | 14   |
| Troll-bottom | 3875.3  | 66 | 68.8     | 56 | 7.2      | 53 | 137.5    | 56 | 14.5     | 53 | 70.7 | 111* |
| Total:       | 30408.2 | 21 | 510.2    | 20 | 68.4     | 20 | 1612.3   | 23 | 219.4    | 23 | 66.5 | 14   |

\* Not enough data to properly compute Coefficient of Variation (CV).

## II.48

Table II.5.1

Tutuila January 1988  
Offshore Creel Survey Species Composition

| Common Name         | Total Pounds | % SP. Comp. | Common Name          | Total Pounds | % SP. Comp. |
|---------------------|--------------|-------------|----------------------|--------------|-------------|
| Jacks               | 23.4         | 0.08        | Barracudas           | 54.7         | 0.20        |
| Small barracuda     | 42.4         | 0.15        | Sharks               | 91.6         | 0.33        |
| Eels                | 35.8         | 0.13        | Bottom fish          | 5587.2       | 19.99       |
| Groupers            | 36.0         | 0.13        | Lunartail grouper    | 5.0          | 0.02        |
| Blue lined snapper  | 62.5         | 0.22        | Twinspot/red snapper | 12.6         | 0.05        |
| Gray jobfish        | 96.9         | 0.35        | Longnose emperor     | 159.6        | 0.57        |
| Reef fish           | 731.0        | 2.62        | Lined surgeon        | 1050.3       | 3.76        |
| Yellow eyed surgeon | 373.7        | 1.34        | Convict tang         | 18.0         | 0.06        |
| Unicornfish (misc)  | 320.5        | 1.15        | Parrotfish           | 311.0        | 1.11        |
| Wrasse              | 64.8         | 0.23        | Dolphin (mahimahi)   | 290.7        | 1.04        |
| Blue marlin         | 991.7        | 3.55        | Rainbow runner       | 65.0         | 0.23        |
| Skipjack tuna       | 5008.0       | 17.92       | Yellowfin tuna       | 8094.0       | 28.96       |
| Spiny lobster       | 1342.8       | 4.80        | Octopus              | 49.5         | 0.18        |
| Squid               | 5.7          | 0.02        | Giant clam           | 3028.9       | 10.84       |
| Total all species:  | 27953.3      | 100.00      |                      |              |             |

Table II.5.2

Tutuila February 1988  
Offshore Creel Survey Species Composition

| Common Name         | Total Pounds | % SP. Comp. | Common Name        | Total Pounds | % SP. Comp. |
|---------------------|--------------|-------------|--------------------|--------------|-------------|
| Jacks               | 300.5        | 0.58        | Black jack         | 129.7        | 0.25        |
| Barracudas          | 674.9        | 1.31        | Small barracuda    | 60.8         | 0.12        |
| Sharks              | 118.0        | 0.23        | Eels               | 206.0        | 0.40        |
| Bottom fish         | 11942.3      | 23.17       | Flagtail grouper   | 86.9         | 0.17        |
| Blue lined snapper  | 241.6        | 0.47        | Blood snapper      | 175.5        | 0.34        |
| Brown jobfish       | 219.2        | 0.43        | Opakapaka          | 291.7        | 0.57        |
| Onaga (red snapper) | 60.8         | 0.12        | Emperors (misc)    | 101.3        | 0.20        |
| Ambon emperor       | 444.2        | 0.86        | Orangespot emperor | 124.7        | 0.24        |
| Reef fish           | 1399.5       | 2.72        | Lined surgeon      | 1116.8       | 2.17        |
| Yellow eyed surgeon | 130.9        | 0.25        | Unicornfish (misc) | 966.6        | 1.88        |
| Unicornfish         | 57.8         | 0.11        | Parrotfish         | 311.9        | 0.61        |
| Wrasse              | 473.7        | 0.92        | Inshore groupers   | 17.3         | 0.03        |
| Blue marlin         | 6438.6       | 12.49       | Rainbow runner     | 99.9         | 0.19        |
| Wahoo               | 153.2        | 0.30        | Tunas              | 536.2        | 1.04        |
| Skipjack tuna       | 14112.0      | 27.38       | Dogtooth tuna      | 251.4        | 0.49        |
| Yellowfin tuna      | 7899.9       | 15.33       | Kawakawa           | 29.3         | 0.06        |
| Spiny lobster       | 2133.9       | 4.14        | Octopus            | 94.5         | 0.18        |
| Giant clam          | 130.9        | 0.25        |                    |              |             |
| Total all species:  | 51532.4      | 100.00      |                    |              |             |



Table II.5.3

Tutuila March 1988  
Offshore Creel Survey Species Composition

| Common Name          | Total Pounds | % SP. Comp. | Common Name         | Total Pounds | % SP. Comp. |
|----------------------|--------------|-------------|---------------------|--------------|-------------|
| Bigeye scad          | 225.4        | 0.88        | Black jack          | 162.5        | 0.63        |
| Barracudas           | 77.7         | 0.30        | Sharks              | 174.9        | 0.68        |
| Bottom fish          | 5150.8       | 20.09       | Groupers            | 63.3         | 0.25        |
| Peacock grouper      | 15.8         | 0.06        | Lunartail grouper   | 93.2         | 0.36        |
| Blue lined snapper   | 352.0        | 1.37        | Humpback snapper    | 127.4        | 0.50        |
| Opakapaka            | 156.1        | 0.61        | Lehi (silverjaw)    | 127.4        | 0.50        |
| Onaga (red snapper)  | 60.5         | 0.24        | Longnose emperor    | 149.7        | 0.58        |
| Redgill emperor      | 715.1        | 2.79        | Reef fish           | 1916.4       | 7.48        |
| Lined surgeon        | 3009.1       | 11.74       | Yellow eyed surgeon | 728.7        | 2.84        |
| Dussumier's surgeon  | 94.6         | 0.37        | Unicornfish (misc)  | 135.6        | 0.53        |
| Unicornfish          | 417.2        | 1.63        | Squirrelfish        | 211.7        | 0.83        |
| Berndt's soldierfish | 17.4         | 0.07        | Parrotfish          | 1048.1       | 4.09        |
| Dolphin (mahimahi)   | 354.6        | 1.38        | Blue marlin         | 2164.7       | 8.44        |
| Rainbow runner       | 46.5         | 0.18        | Wahoo               | 375.8        | 1.47        |
| Skipjack tuna        | 841.1        | 3.28        | Dogtooth tuna       | 184.8        | 0.72        |
| Albacore             | 551.5        | 2.15        | Yellowfin tuna      | 5035.8       | 19.64       |
| Kawakawa             | 186.0        | 0.73        | Spiny lobster       | 621.4        | 2.42        |
| Giant clam           | 44.2         | 0.17        |                     |              |             |
| Total all species:   | 25636.8      | 100.00      |                     |              |             |

Table II.5.4

Tutuila April 1988  
Offshore Creel Survey Species Composition

| Common Name         | Total Pounds | % SP. Comp. | Common Name          | Total Pounds | % SP. Comp. |
|---------------------|--------------|-------------|----------------------|--------------|-------------|
| Bigeye scad         | 28.6         | 0.22        | Black jack           | 57.1         | 0.43        |
| Small barracuda     | 58.7         | 0.44        | Peacock grouper      | 226.7        | 1.71        |
| Lunartail grouper   | 55.9         | 0.42        | Blue lined snapper   | 786.9        | 5.95        |
| Onespot snapper     | 11.4         | 0.09        | Humpback snapper     | 80.0         | 0.60        |
| Gray jobfish        | 199.8        | 1.51        | Lehi (silverjaw)     | 105.7        | 0.80        |
| Onaga (red snapper) | 17.1         | 0.13        | Stone's snapper      | 28.6         | 0.22        |
| Bigeye emperor      | 8.6          | 0.06        | Longnose emperor     | 142.9        | 1.08        |
| Redgill emperor     | 663.6        | 5.02        | Reef fish            | 1176.0       | 8.89        |
| Lined surgeon       | 2082.7       | 15.75       | Yellow eyed surgeon  | 600.2        | 4.54        |
| Spotted surgeonfish | 6.5          | 0.05        | Unicornfish (misc)   | 178.4        | 1.35        |
| Unicornfish         | 802.9        | 6.07        | Berndt's soldierfish | 266.0        | 2.01        |
| Bigeye squirrelfish | 32.4         | 0.25        | Parrotfish           | 1365.9       | 10.33       |
| Wahoo               | 93.2         | 0.70        | Skipjack tuna        | 1073.5       | 8.12        |
| Dogtooth tuna       | 28.6         | 0.22        | Albacore             | 1344.3       | 10.16       |
| Yellowfin tuna      | 407.8        | 3.08        | Spiny lobster        | 1296.0       | 9.80        |
| Total all species:  | 13226.2      | 100.00      |                      |              |             |

II.50

Table II.5.5

Tutuila May 1988  
Offshore Creel Survey Species Composition

| Common Name         | Total Pounds | % SP. Comp. | Common Name         | Total Pounds | % SP. Comp. |
|---------------------|--------------|-------------|---------------------|--------------|-------------|
| Bigeye scad         | 919.7        | 9.16        | Black jack          | 312.7        | 3.11        |
| Barracudas          | 38.1         | 0.38        | Peacock grouper     | 108.7        | 1.08        |
| Lunartail grouper   | 34.6         | 0.34        | Blue lined snapper  | 689.2        | 6.86        |
| Humpback snapper    | 78.1         | 0.78        | Lehi (silverjaw)    | 1032.5       | 10.28       |
| Onaga (red snapper) | 948.5        | 9.45        | Ehu (red snapper)   | 597.8        | 5.95        |
| Redgill emperor     | 706.5        | 7.04        | Rudderfish          | 25.6         | 0.25        |
| Lined surgeon       | 1455.4       | 14.49       | Yellow eyed surgeon | 181.3        | 1.81        |
| Unicornfish         | 162.7        | 1.62        | Parrotfish          | 1046.2       | 10.42       |
| Dolphin (mahimahi)  | 261.9        | 2.61        | Wahoo               | 71.4         | 0.71        |
| Skipjack tuna       | 761.9        | 7.59        | Dogtooth tuna       | 142.9        | 1.42        |
| Yellowfin tuna      | 190.5        | 1.90        | Spiny lobster       | 275.5        | 2.74        |
| Total all species:  | 10041.8      | 100.00      |                     |              |             |

Table II.5.6

Tutuila June 1988  
Offshore Creel Survey Species Composition

| Common Name         | Total Pounds | % SP. Comp. | Common Name         | Total Pounds | % SP. Comp. |
|---------------------|--------------|-------------|---------------------|--------------|-------------|
| Barracudas          | 11.0         | 0.04        | Large barracuda     | 40.8         | 0.14        |
| Grouper             | 94.7         | 0.32        | Peacock grouper     | 76.1         | 0.26        |
| Flagtail grouper    | 206.9        | 0.70        | Lunartail grouper   | 233.9        | 0.80        |
| Blue lined snapper  | 548.1        | 1.87        | Gray jobfish        | 107.3        | 0.37        |
| Lehi (silverjaw)    | 271.8        | 0.93        | Onaga (red snapper) | 199.3        | 0.68        |
| Ehu (red snapper)   | 592.7        | 2.02        | Stone's snapper     | 9.1          | 0.03        |
| Bigeye emperor      | 152.2        | 0.52        | Longnose emperor    | 525.4        | 1.79        |
| Ambon emperor       | 183.1        | 0.62        | Lined surgeon       | 235.6        | 0.80        |
| Yellow eyed surgeon | 126.8        | 0.43        | Squirrelfish        | 165.0        | 0.56        |
| Parrotfish          | 159.5        | 0.54        | Dolphin (mahimahi)  | 2131.4       | 7.25        |
| Sailfish            | 77.4         | 0.26        | Rainbow runner      | 112.9        | 0.38        |
| Wahoo               | 221.2        | 0.75        | Skipjack tuna       | 16656.0      | 56.69       |
| Dogtooth tuna       | 289.9        | 0.99        | Yellowfin tuna      | 5829.0       | 19.84       |
| Kawakawa            | 17.6         | 0.06        | Spiny lobster       | 105.1        | 0.36        |
| Total all species:  | 29379.9      | 100.00      |                     |              |             |

## II.51

Table II.5.7

Tutuila July 1988  
Offshore Creel Survey Species Composition

| Common Name        | Total Pounds | % SP. Comp. | Common Name         | Total Pounds | % SP. Comp. |
|--------------------|--------------|-------------|---------------------|--------------|-------------|
| Black jack         | 190.0        | 0.77        | Barracudas          | 139.7        | 0.57        |
| Sharks             | 85.4         | 0.35        | Bottom fish         | 1081.6       | 4.41        |
| Groupers           | 95.4         | 0.39        | Lunartail grouper   | 27.2         | 0.11        |
| Blue lined snapper | 259.2        | 1.06        | Gray jobfish        | 30.7         | 0.13        |
| Lehi (silverjaw)   | 153.5        | 0.63        | Ehu (red snapper)   | 119.5        | 0.49        |
| Longnose emperor   | 508.1        | 2.07        | Redgill emperor     | 163.5        | 0.67        |
| Reef fish          | 6.8          | 0.03        | Rabbitfish          | 10.2         | 0.04        |
| Lined surgeon      | 556.1        | 2.27        | Yellow eyed surgeon | 91.8         | 0.37        |
| Unicornfish (misc) | 289.1        | 1.18        | Unicornfish         | 306.1        | 1.25        |
| Squirrelfish       | 50.2         | 0.20        | Bigeye squirrelfish | 8.5          | 0.03        |
| Parrotfish         | 168.4        | 0.69        | Dolphin (mahimahi)  | 1457.2       | 5.94        |
| Rainbow runner     | 17.0         | 0.07        | Wahoo               | 231.0        | 0.94        |
| Skipjack tuna      | 17914.9      | 72.98       | Dogtooth tuna       | 104.2        | 0.42        |
| Yellowfin tuna     | 299.1        | 1.22        | Kawakawa            | 47.6         | 0.19        |
| Spiny lobster      | 136.1        | 0.55        |                     |              |             |
| Total all species: | 24548.0      | 100.00      |                     |              |             |

Table II.5.8

Tutuila August 1988  
Offshore Creel Survey Species Composition

| Common Name          | Total Pounds | % SP. Comp. | Common Name          | Total Pounds | % SP. Comp. |
|----------------------|--------------|-------------|----------------------|--------------|-------------|
| Jacks                | 104.1        | 0.34        | Black jack           | 95.4         | 0.31        |
| Barracudas           | 249.7        | 0.81        | Sharks               | 2372.2       | 7.72        |
| Groupers             | 86.9         | 0.28        | Peacock grouper      | 137.5        | 0.45        |
| Spotted grouper      | 279.9        | 0.91        | Giant grouper        | 46.6         | 0.15        |
| Lunartail grouper    | 497.9        | 1.62        | Blue lined snapper   | 1092.4       | 3.56        |
| Twinspot/red snapper | 107.7        | 0.35        | Humpback snapper     | 111.0        | 0.36        |
| Gray jobfish         | 147.6        | 0.48        | Deepwater bottomfish | 517.7        | 1.69        |
| Lehi (silverjaw)     | 240.3        | 0.78        | Onaga (red snapper)  | 45.8         | 0.15        |
| Stone's snapper      | 239.1        | 0.78        | Longnose emperor     | 717.3        | 2.33        |
| Lined surgeon        | 141.1        | 0.46        | Yellow eyed surgeon  | 68.7         | 0.22        |
| Unicornfish (misc)   | 115.6        | 0.38        | Unicornfish          | 57.2         | 0.19        |
| Squirrelfish         | 19.1         | 0.06        | Parrotfish           | 76.3         | 0.25        |
| Dolphin (mahimahi)   | 1396.9       | 4.55        | Wahoo                | 93.3         | 0.30        |
| Skipjack tuna        | 18633.0      | 60.65       | Dogtooth tuna        | 95.4         | 0.31        |
| Yellowfin tuna       | 2756.9       | 8.97        | Kawakawa             | 121.7        | 0.40        |
| Spiny lobster        | 57.2         | 0.19        |                      |              |             |
| Total all species:   | 30721.5      | 100.00      |                      |              |             |



## II.52

Table II.5.9

Tutuila September 1988  
Offshore Creel Survey Species Composition

| Common Name        | Total Pounds | % SP. Comp. | Common Name        | Total Pounds | % SP. Comp. |
|--------------------|--------------|-------------|--------------------|--------------|-------------|
| Black jack         | 50.0         | 0.25        | Barracudas         | 10.0         | 0.05        |
| Small barracuda    | 13.3         | 0.07        | Groupers           | 341.7        | 1.69        |
| Lunartail grouper  | 643.3        | 3.17        | Blue lined snapper | 588.3        | 2.90        |
| Humpback snapper   | 33.3         | 0.16        | Gray jobfish       | 26.7         | 0.13        |
| Opakapaka          | 300.0        | 1.48        | Ehu (red snapper)  | 300.0        | 1.48        |
| Stone's snapper    | 16.7         | 0.08        | Emperors (misc)    | 60.0         | 0.30        |
| Longnose emperor   | 440.0        | 2.17        | Blueline bream     | 133.3        | 0.66        |
| Orangespot emperor | 50.0         | 0.25        | Redgill emperor    | 331.7        | 1.64        |
| Squirrelfish       | 245.0        | 1.21        | Dolphin (mahimahi) | 246.6        | 1.22        |
| Sailfish           | 249.8        | 1.23        | Wahoo              | 63.3         | 0.31        |
| Skipjack tuna      | 12709.0      | 62.69       | Dogtooth tuna      | 400.0        | 1.97        |
| Yellowfin tuna     | 3021.8       | 14.90       |                    |              |             |
| Total all species: | 20273.9      | 100.00      |                    |              |             |

Table II.5.10

Tutuila October 1988  
Offshore Creel Survey Species Composition

| Common Name          | Total Pounds | % SP. Comp. | Common Name         | Total Pounds | % SP. Comp. |
|----------------------|--------------|-------------|---------------------|--------------|-------------|
| Jacks                | 84.9         | 0.32        | Black jack          | 279.2        | 1.05        |
| Small barracuda      | 410.5        | 1.54        | Sharks              | 634.5        | 2.38        |
| Groupers             | 51.4         | 0.19        | Striped grouper     | 51.0         | 0.19        |
| Lunartail grouper    | 388.4        | 1.46        | Blue lined snapper  | 358.2        | 1.35        |
| Twinspot/red snapper | 318.4        | 1.20        | Humpback snapper    | 17.0         | 0.06        |
| Gray jobfish         | 227.7        | 0.86        | Blue lined gindai   | 154.3        | 0.58        |
| Lehi (silverjaw)     | 220.9        | 0.83        | Onaga (red snapper) | 187.7        | 0.71        |
| Ehu (red snapper)    | 122.3        | 0.46        | Stone's snapper     | 154.3        | 0.58        |
| Emperors (misc)      | 44.2         | 0.17        | Longnose emperor    | 620.9        | 2.33        |
| Orangespot emperor   | 403.8        | 1.52        | Lined surgeon       | 270.0        | 1.01        |
| Yellow eyed surgeon  | 153.8        | 0.58        | Spotted surgeonfish | 29.1         | 0.11        |
| Unicornfish          | 112.8        | 0.42        | Squirrelfish        | 170.0        | 0.64        |
| Parrotfish           | 191.4        | 0.72        | Wrasse              | 27.4         | 0.10        |
| Inshore groupers     | 109.5        | 0.41        | Dolphin (mahimahi)  | 449.9        | 1.69        |
| Sailfish             | 51.3         | 0.19        | Rainbow runner      | 222.9        | 0.84        |
| Wahoo                | 153.9        | 0.58        | Skipjack tuna       | 15899.3      | 59.76       |
| Dogtooth tuna        | 62.9         | 0.24        | Yellowfin tuna      | 3739.5       | 14.06       |
| Kawakawa             | 160.9        | 0.60        | Spiny lobster       | 71.8         | 0.27        |
| Total all species:   | 26605.8      | 100.00      |                     |              |             |

II.53

Table II.5.11

Tutuila November 1988  
Offshore Creel Survey Species Composition

| Common Name          | Total Pounds | % SP. Comp. | Common Name          | Total Pounds | % SP. Comp. |
|----------------------|--------------|-------------|----------------------|--------------|-------------|
| Jacks                | 83.6         | 0.26        | Black jack           | 264.2        | 0.82        |
| Small barracuda      | 31.9         | 0.10        | Sharks               | 173.9        | 0.54        |
| Groupers             | 107.0        | 0.33        | Peacock grouper      | 94.0         | 0.29        |
| Flagtail grouper     | 207.4        | 0.65        | Lunartail grouper    | 857.2        | 2.68        |
| Blue lined snapper   | 1129.7       | 3.53        | Twinspot/red snapper | 36.8         | 0.11        |
| Humpback snapper     | 67.7         | 0.21        | Gray jobfish         | 388.0        | 1.21        |
| Opakapaka            | 262.6        | 0.82        | Gindai (flower snap) | 430.8        | 1.34        |
| Lehi (silverjaw)     | 192.8        | 0.60        | Onaga (red snapper)  | 217.4        | 0.68        |
| Longnose emperor     | 687.2        | 2.15        | Ambon emperor        | 492.7        | 1.54        |
| Orangespot emperor   | 271.0        | 0.85        | Redgill emperor      | 602.1        | 1.88        |
| Lined surgeon        | 646.6        | 2.02        | Yellow eyed surgeon  | 439.8        | 1.37        |
| Unicornfish (misc)   | 169.2        | 0.53        | Unicornfish          | 78.9         | 0.25        |
| Squirrelfish         | 446.8        | 1.39        | Saber squirrelfish   | 184.0        | 0.57        |
| Berndt's soldierfish | 150.5        | 0.47        | Parrotfish           | 244.4        | 0.76        |
| Inshore groupers     | 184.0        | 0.57        | Dolphin (mahimahi)   | 353.5        | 1.10        |
| Rainbow runner       | 55.3         | 0.17        | Wahoo                | 104.0        | 0.32        |
| Skipjack tuna        | 17600.1      | 54.94       | Yellowfin tuna       | 4488.6       | 14.01       |
| Kawakawa             | 41.5         | 0.13        | Spiny lobster        | 251.9        | 0.79        |
| Total all species:   | 32037.4      | 100.00      |                      |              |             |

Table II.5.12

Tutuila December 1988  
Offshore Creel Survey Species Composition

| Common Name        | Total Pounds | % SP. Comp. | Common Name        | Total Pounds | % SP. Comp. |
|--------------------|--------------|-------------|--------------------|--------------|-------------|
| Black jack         | 434.2        | 1.43        | Flagtail grouper   | 152.0        | 0.50        |
| Lunartail grouper  | 289.5        | 0.95        | Blue lined snapper | 463.2        | 1.52        |
| Humpback snapper   | 108.6        | 0.36        | Ehu (red snapper)  | 137.5        | 0.45        |
| Emperors (misc)    | 343.8        | 1.13        | Longnose emperor   | 166.4        | 0.55        |
| Squirrelfish       | 144.7        | 0.48        | Dolphin (mahimahi) | 86.4         | 0.28        |
| Wahoo              | 158.9        | 0.52        | Skipjack tuna      | 25026.7      | 82.30       |
| Dogtooth tuna      | 723.7        | 2.38        | Yellowfin tuna     | 2120.9       | 6.97        |
| Kawakawa           | 51.8         | 0.17        |                    |              |             |
| Total all species: | 30408.2      | 100.00      |                    |              |             |

Figure II.5.1

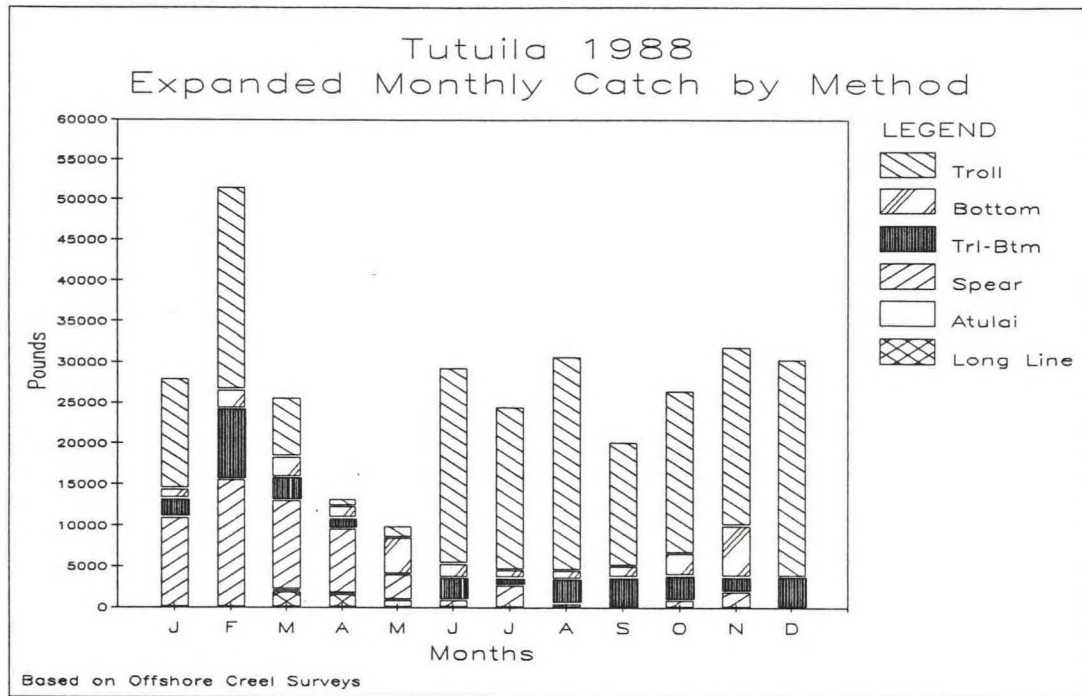


Figure II.5.2

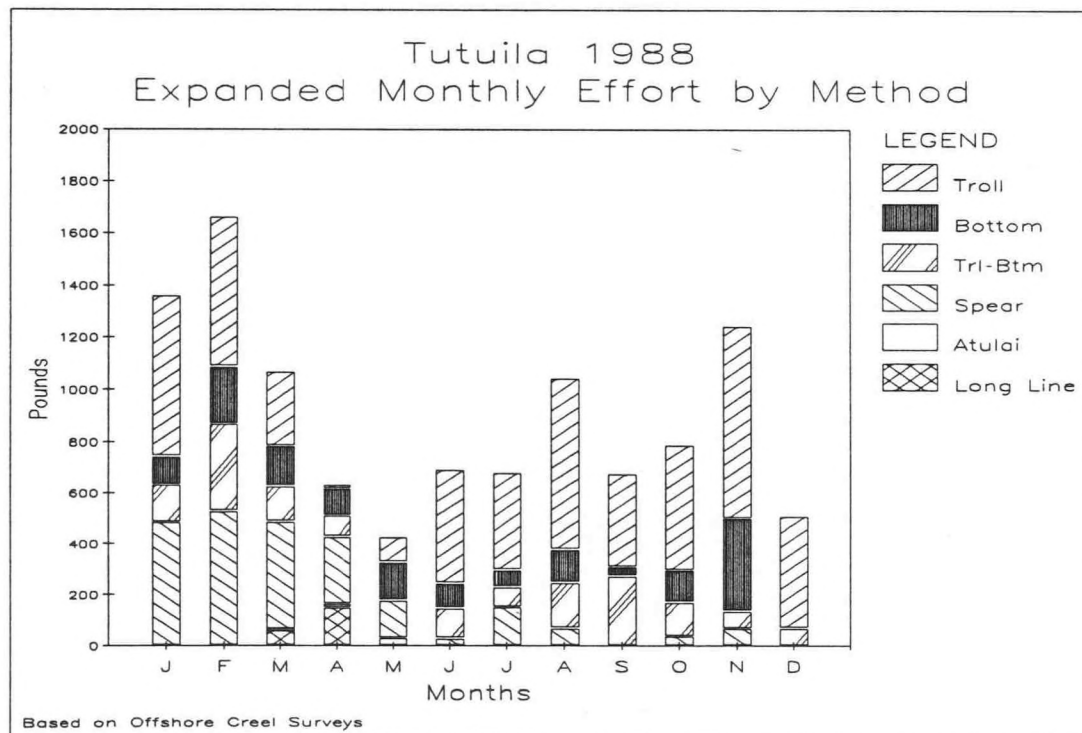
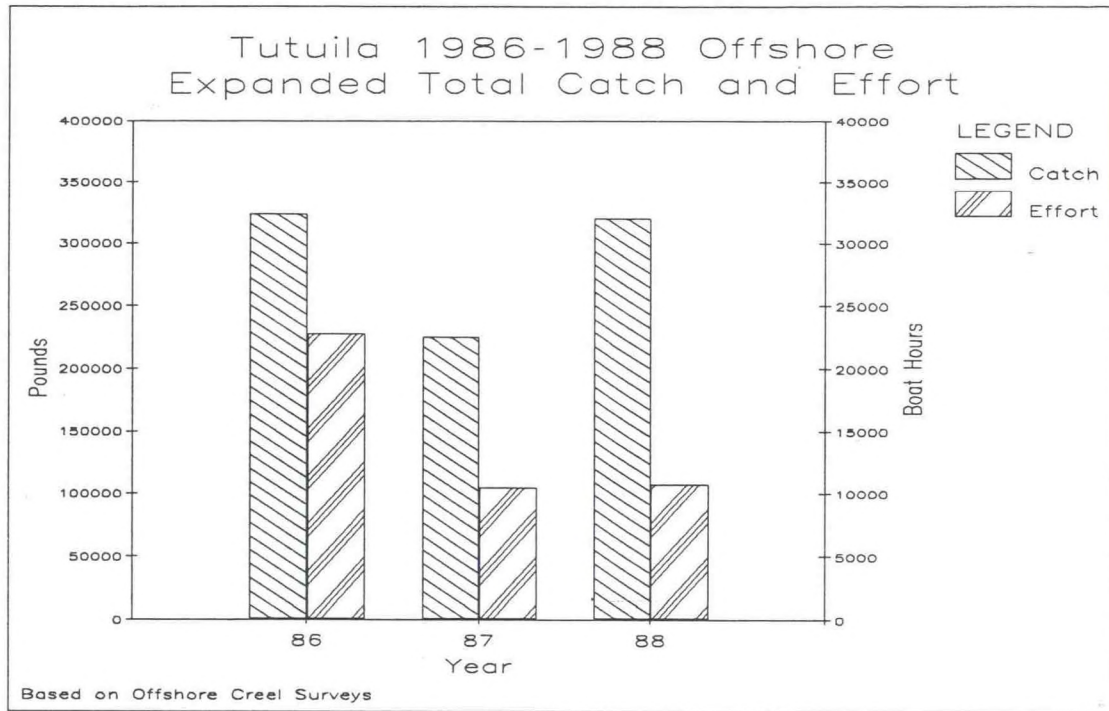
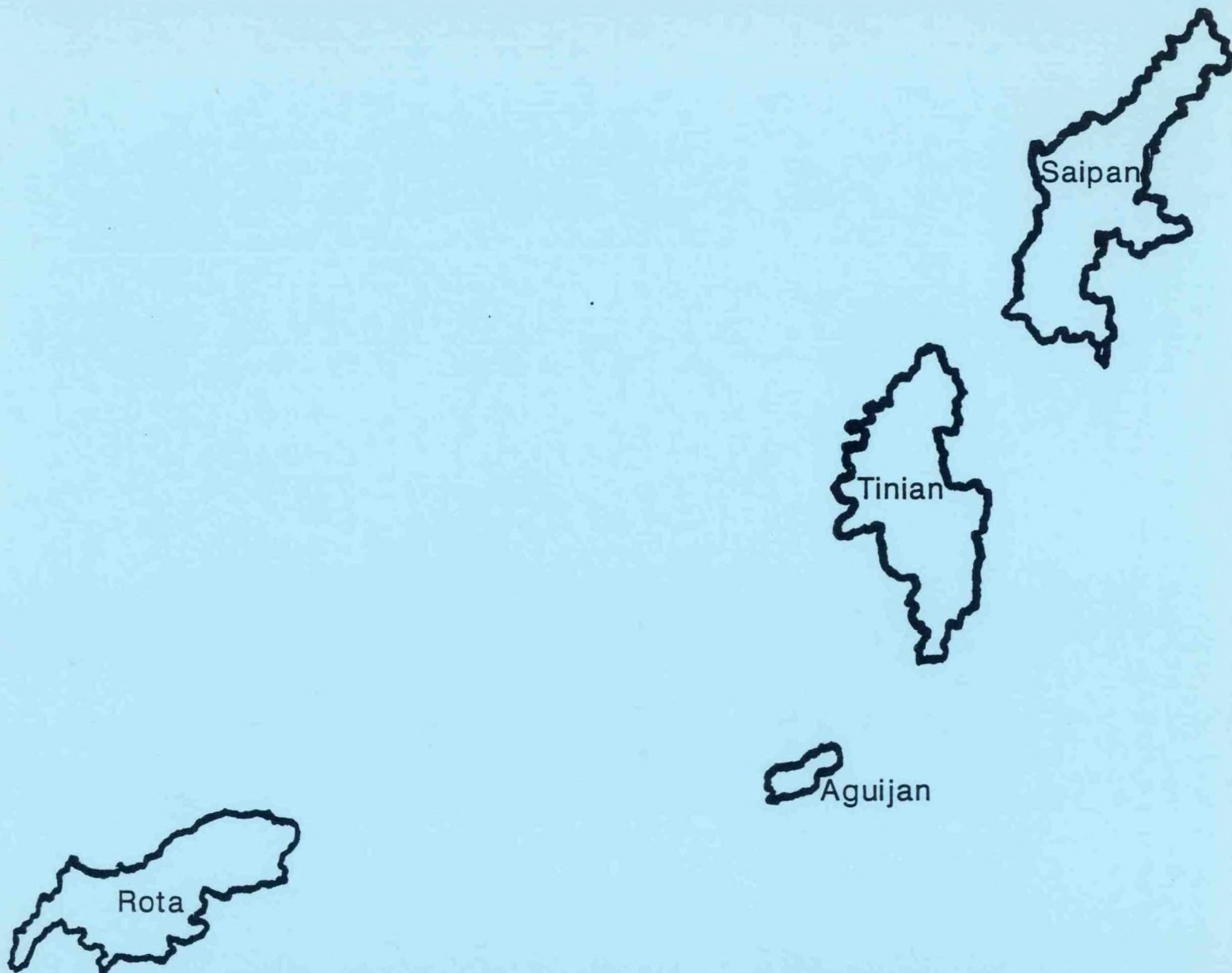




Figure II.5.3





# Commonwealth of the Northern Mariana Islands

**Fishery Statistics  
1988**

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS  
1988 FISHERY STATISTICS

Compiled by

Division of Fish and Wildlife

and the

Western Pacific Fishery Information Network

May 1990



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COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS  
1988 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. The DFW began collecting statistics on these activities in February 1983. From 1983 to 1988, transshipments out of Tinian were 53,000, 114,000, 69,000, 73,000, 58,000 and 64,000 metric tons, respectively. None of the vessels involved in the transshipments is CNMI vessels; however, many of them are U.S. registered purse seiners. The proportion of transshipments made by American vessels declined steadily from over 75% in 1983 to only 43% in 1987 but increased in 1988 to 65% of total transshipments. The number of U.S. vessels making transshipments also declined from a high of about 40 in 1984 to about 12-14 in 1986, about 16 in 1987, and 13 in 1988.



### III.2

#### 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.

### III.3

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 translated into a different format and transferred to the central computer for additional editing and verification before generation of summary reports. These reports and data bases 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 1988 contains information on the pounds, value, average price per pound, and number of recorded landings for each species or species groups. The number of recorded landings ("RECORDS" in the tables) is a measurement of how many times each species was landed, regardless of the number or weight of the fish in the landing. This statistic is provided to give an indication of the frequency each species is reported. The POUNDS can be divided by the RECORDS for the average weight of each landing. 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)

- Dolphin (mahimahi)
- 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                | Lobster  |
| Bigeye scad                  | Shrimp   |
| Mullet                       | Octopus  |
| Eels                         | Squid    |
| Milkfish                     | Turtle   |
| Invertebrates (unclassified) | Seaweeds |
| Crabs (unclassified)         | Imported |
| Coconut crab                 |          |

## III.5

Table III.1.1

## CNMI 1988 Commercial Landings

| Species              | Records      | Pounds            | Value             | \$/lb |
|----------------------|--------------|-------------------|-------------------|-------|
| Bigeye scad (atulai) | 22           | 1,472.00          | 2,576.40          | 1.75  |
| Bottom fish          | 205          | 33,458.00         | 58,686.16         | 1.75  |
| Gindai (flower snap) | 1            | 68.00             | 119.00            | 1.75  |
| Onaga (red snapper)  | 19           | 1,601.00          | 4,819.50          | 3.01  |
| Opakapaka (pink snp) | 6            | 261.00            | 676.30            | 2.59  |
| Reef fish            | 617          | 102,883.52        | 161,132.56        | 1.57  |
| Wrasse               | 2            | 68.60             | 77.30             | 1.13  |
| Rabbitfish (hitting) | 237          | 5,322.75          | 10,269.15         | 1.93  |
| Rudderfish (guilli)  | 2            | 66.00             | 115.20            | 1.75  |
| Emperor (mafute)     | 12           | 2,462.00          | 4,750.95          | 1.93  |
| Parrotfish           | 60           | 10,467.00         | 16,658.00         | 1.59  |
| Surgeonfish          | 44           | 8,138.00          | 12,904.90         | 1.59  |
| Unicornfish          | 13           | 3,988.00          | 6,370.75          | 1.60  |
| Goatfish             | 5            | 185.75            | 363.45            | 1.96  |
| Barracuda            | 5            | 269.50            | 273.85            | 1.02  |
| Dolphin (mahimahi)   | 261          | 24,638.93         | 34,069.07         | 1.38  |
| Marlin               | 8            | 1,047.00          | 1,225.50          | 1.17  |
| Rainbow runner       | 31           | 3,483.00          | 4,358.05          | 1.25  |
| Wahoo                | 105          | 9,357.84          | 12,466.38         | 1.33  |
| Skipjack tuna        | 1,129        | 213,197.85        | 253,235.64        | 1.19  |
| Dogtooth tuna        | 32           | 3,324.50          | 4,188.60          | 1.26  |
| Yellowfin tuna       | 145          | 12,299.89         | 17,442.87         | 1.42  |
| Lobster              | 112          | 3,766.75          | 14,615.75         | 3.88  |
| Octopus              | 8            | 500.00            | 567.65            | 1.14  |
| <b>** TOTAL **</b>   | <b>3,081</b> | <b>442,326.88</b> | <b>621,962.98</b> |       |

## III.6

Table III.1.2

CNMI January 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Bottom fish           | 16         | 3,535.50         | 6,032.38         | 1.71  |
| Reef fish             | 37         | 4,701.02         | 7,400.41         | 1.57  |
| Rabbitfish (hitting)  | 19         | 897.00           | 1,906.25         | 2.13  |
| Emperor (mafute)      | 1          | 115.00           | 258.75           | 2.25  |
| Parrotfish            | 1          | 296.00           | 488.40           | 1.65  |
| Surgeonfish           | 3          | 558.00           | 920.70           | 1.65  |
| Barracuda             | 2          | 220.50           | 220.50           | 1.00  |
| Dolphin (mahimahi)    | 46         | 3,828.93         | 5,513.39         | 1.44  |
| Wahoo                 | 3          | 100.00           | 124.85           | 1.25  |
| Skipjack tuna         | 51         | 9,180.10         | 12,012.74        | 1.31  |
| Dogtooth tuna         | 1          | 44.00            | 48.40            | 1.10  |
| Yellowfin tuna        | 8          | 871.50           | 1,134.60         | 1.30  |
| Lobster               | 9          | 78.50            | 235.50           | 3.00  |
| Octopus               | 1          | 7.00             | 10.50            | 1.50  |
| <b>** SUBTOTAL **</b> | <b>198</b> | <b>24,433.05</b> | <b>36,307.37</b> |       |

Table III.1.3

CNMI February 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Bigeye scad (atulai)  | 3          | 153.00           | 303.00           | 1.98  |
| Bottom fish           | 17         | 3,639.00         | 6,268.15         | 1.72  |
| Onaga (red snapper)   | 1          | 38.00            | 152.00           | 4.00  |
| Reef fish             | 48         | 7,887.00         | 12,514.70        | 1.59  |
| Rabbitfish (hitting)  | 16         | 164.25           | 328.50           | 2.00  |
| Surgeonfish           | 6          | 1,896.00         | 3,128.40         | 1.65  |
| Goatfish              | 1          | 103.00           | 206.00           | 2.00  |
| Dolphin (mahimahi)    | 52         | 7,605.75         | 10,491.41        | 1.38  |
| Marlin                | 1          | 22.00            | 35.20            | 1.60  |
| Wahoo                 | 7          | 399.84           | 675.23           | 1.69  |
| Skipjack tuna         | 51         | 6,788.25         | 9,165.98         | 1.35  |
| Dogtooth tuna         | 3          | 294.50           | 323.95           | 1.10  |
| Yellowfin tuna        | 16         | 1,367.39         | 2,079.42         | 1.52  |
| Lobster               | 6          | 110.00           | 484.00           | 4.40  |
| Octopus               | 2          | 376.00           | 376.90           | 1.00  |
| <b>** SUBTOTAL **</b> | <b>230</b> | <b>30,843.98</b> | <b>46,532.84</b> |       |



## III.7

Table III.1.4

CNMI March 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Bottom fish           | 13         | 3,183.00         | 5,868.30         | 1.84  |
| Onaga (red snapper)   | 2          | 130.00           | 373.00           | 2.87  |
| Reef fish             | 49         | 9,003.75         | 14,463.90        | 1.61  |
| Rabbitfish (hitting)  | 18         | 399.50           | 738.45           | 1.85  |
| Parrotfish            | 1          | 493.00           | 813.45           | 1.65  |
| Surgeonfish           | 3          | 516.00           | 859.10           | 1.66  |
| Unicornfish           | 1          | 356.00           | 587.40           | 1.65  |
| Dolphin (mahimahi)    | 86         | 8,368.25         | 11,523.32        | 1.38  |
| Wahoo                 | 8          | 1,424.00         | 1,946.90         | 1.37  |
| Skipjack tuna         | 97         | 12,793.00        | 17,407.49        | 1.36  |
| Yellowfin tuna        | 20         | 1,330.00         | 1,852.40         | 1.39  |
| Lobster               | 1          | 69.00            | 207.00           | 3.00  |
| <b>** SUBTOTAL **</b> | <b>299</b> | <b>38,065.50</b> | <b>56,640.71</b> |       |

Table III.1.5

CNMI April 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Bigeye scad (atulai)  | 3          | 134.00           | 255.90           | 1.91  |
| Bottom fish           | 27         | 3,216.00         | 5,622.75         | 1.75  |
| Onaga (red snapper)   | 3          | 94.00            | 313.00           | 3.33  |
| Opakapaka (pink snp)  | 1          | 11.00            | 27.50            | 2.50  |
| Reef fish             | 39         | 5,900.00         | 9,315.05         | 1.58  |
| Rabbitfish (hitting)  | 13         | 329.00           | 637.00           | 1.94  |
| Parrotfish            | 1          | 398.00           | 656.70           | 1.65  |
| Surgeonfish           | 2          | 611.00           | 1,008.15         | 1.65  |
| Unicornfish           | 2          | 532.00           | 877.80           | 1.65  |
| Dolphin (mahimahi)    | 46         | 3,186.00         | 4,304.75         | 1.35  |
| Wahoo                 | 23         | 2,568.00         | 3,388.90         | 1.32  |
| Skipjack tuna         | 114        | 21,679.00        | 28,491.80        | 1.31  |
| Dogtooth tuna         | 2          | 315.00           | 504.00           | 1.60  |
| Yellowfin tuna        | 8          | 478.00           | 807.30           | 1.69  |
| Lobster               | 8          | 115.00           | 345.00           | 3.00  |
| Octopus               | 2          | 73.00            | 109.50           | 1.50  |
| <b>** SUBTOTAL **</b> | <b>294</b> | <b>39,639.00</b> | <b>56,665.10</b> |       |

## III.8

Table III.1.6

CNMI May 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Bigeye scad (atulai) | 1       | 250.00    | 400.00    | 1.60  |
| Bottom fish          | 17      | 3,494.50  | 6,255.68  | 1.79  |
| Onaga (red snapper)  | 1       | 55.00     | 275.00    | 5.00  |
| Reef fish            | 67      | 10,116.00 | 15,351.50 | 1.52  |
| Rabbitfish (hitting) | 13      | 118.00    | 236.00    | 2.00  |
| Emperor (mafute)     | 1       | 19.00     | 30.40     | 1.60  |
| Dolphin (mahimahi)   | 17      | 741.00    | 1,027.65  | 1.39  |
| Rainbow runner       | 1       | 185.00    | 185.00    | 1.00  |
| Wahoo                | 6       | 625.00    | 741.85    | 1.19  |
| Skipjack tuna        | 122     | 24,533.50 | 27,613.67 | 1.13  |
| Dogtooth tuna        | 5       | 170.00    | 269.30    | 1.58  |
| Yellowfin tuna       | 7       | 376.00    | 455.75    | 1.21  |
| Lobster              | 27      | 735.50    | 2,241.00  | 3.05  |
| ** SUBTOTAL **       | 285     | 41,418.50 | 55,082.80 |       |

Table III.1.7

CNMI June 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Bigeye scad (atulai) | 6       | 382.00    | 668.50    | 1.75  |
| Bottom fish          | 21      | 3,339.00  | 5,957.50  | 1.78  |
| Onaga (red snapper)  | 3       | 739.00    | 1,517.00  | 2.05  |
| Opakapaka (pink snp) | 1       | 12.00     | 24.00     | 2.00  |
| Reef fish            | 63      | 9,192.00  | 14,734.25 | 1.60  |
| Rabbitfish (hitting) | 12      | 294.00    | 525.70    | 1.79  |
| Parrotfish           | 3       | 1,148.00  | 1,894.20  | 1.65  |
| Surgeonfish          | 3       | 848.00    | 1,399.20  | 1.65  |
| Unicornfish          | 2       | 705.00    | 1,163.25  | 1.65  |
| Goatfish             | 1       | 23.00     | 40.25     | 1.75  |
| Dolphin (mahimahi)   | 1       | 49.00     | 78.40     | 1.60  |
| Marlin               | 2       | 215.00    | 317.00    | 1.47  |
| Rainbow runner       | 2       | 256.00    | 289.60    | 1.13  |
| Wahoo                | 11      | 662.00    | 805.10    | 1.22  |
| Skipjack tuna        | 123     | 24,501.00 | 27,905.50 | 1.14  |
| Dogtooth tuna        | 4       | 1,038.00  | 1,061.70  | 1.02  |
| Yellowfin tuna       | 14      | 1,828.00  | 2,612.45  | 1.43  |
| Lobster              | 4       | 125.00    | 545.00    | 4.36  |
| Octopus              | 3       | 44.00     | 70.75     | 1.61  |
| ** SUBTOTAL **       | 279     | 45,400.00 | 61,609.35 |       |

## III.9

Table III.1.8

CNMI July 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Bigeye scad (atulai) | 5       | 310.00    | 542.50    | 1.75  |
| Bottom fish          | 14      | 2,233.00  | 3,936.70  | 1.76  |
| Reef fish            | 43      | 7,445.00  | 11,932.05 | 1.60  |
| Rabbitfish (hitting) | 15      | 169.00    | 338.00    | 2.00  |
| Rudderfish (guilli)  | 1       | 24.00     | 48.00     | 2.00  |
| Parrotfish           | 5       | 1,660.00  | 2,739.00  | 1.65  |
| Surgeonfish          | 1       | 463.00    | 763.95    | 1.65  |
| Unicornfish          | 1       | 401.00    | 661.65    | 1.65  |
| Marlin               | 1       | 350.00    | 262.50    | 0.75  |
| Rainbow runner       | 5       | 485.00    | 557.75    | 1.15  |
| Wahoo                | 9       | 707.00    | 823.55    | 1.16  |
| Skipjack tuna        | 117     | 25,056.50 | 27,950.00 | 1.12  |
| Dogtooth tuna        | 1       | 40.00     | 40.00     | 1.00  |
| Yellowfin tuna       | 11      | 878.00    | 1,035.20  | 1.18  |
| Lobster              | 21      | 986.00    | 4,175.50  | 4.23  |
| ** SUBTOTAL **       | 250     | 41,207.50 | 55,806.35 |       |

Table III.1.9

CNMI August 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Bigeye scad (atulai) | 1       | 52.00     | 91.00     | 1.75  |
| Bottom fish          | 26      | 4,528.00  | 7,551.80  | 1.67  |
| Gindai (flower snap) | 1       | 68.00     | 119.00    | 1.75  |
| Onaga (red snapper)  | 3       | 146.00    | 471.00    | 3.23  |
| Opakapaka (pink snp) | 2       | 82.00     | 197.00    | 2.40  |
| Reef fish            | 64      | 12,506.25 | 19,616.60 | 1.57  |
| Rabbitfish (hitting) | 21      | 426.75    | 785.50    | 1.84  |
| Emperor (mafute)     | 3       | 455.00    | 870.25    | 1.91  |
| Parrotfish           | 1       | 383.00    | 631.95    | 1.65  |
| Surgeonfish          | 2       | 474.00    | 782.10    | 1.65  |
| Unicornfish          | 1       | 493.00    | 813.45    | 1.65  |
| Rainbow runner       | 12      | 1,189.00  | 1,501.00  | 1.26  |
| Wahoo                | 1       | 40.00     | 60.00     | 1.50  |
| Skipjack tuna        | 138     | 32,925.50 | 36,894.93 | 1.12  |
| Dogtooth tuna        | 5       | 500.00    | 491.00    | 0.98  |
| Yellowfin tuna       | 12      | 1,206.00  | 1,689.00  | 1.40  |
| Lobster              | 12      | 736.25    | 3,178.75  | 4.32  |
| ** SUBTOTAL **       | 305     | 56,210.75 | 75,744.33 |       |



## III.10

Table III.1.10

CNMI September 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Bottom fish          | 17      | 1,712.00  | 3,069.55  | 1.79  |
| Onaga (red snapper)  | 3       | 269.00    | 1,153.50  | 4.29  |
| Opakapaka (pink snp) | 1       | 108.00    | 307.80    | 2.85  |
| Reef fish            | 54      | 7,753.50  | 11,926.50 | 1.54  |
| Wrasse               | 2       | 68.60     | 77.30     | 1.13  |
| Rabbitfish (hitting) | 20      | 479.25    | 902.55    | 1.88  |
| Emperor (mafute)     | 2       | 309.00    | 585.80    | 1.90  |
| Parrotfish           | 5       | 1,710.00  | 2,800.20  | 1.64  |
| Surgeonfish          | 4       | 442.00    | 569.40    | 1.29  |
| Unicornfish          | 1       | 31.00     | 35.65     | 1.15  |
| Goatfish             | 1       | 5.75      | 9.20      | 1.60  |
| Barracuda            | 1       | 27.00     | 31.05     | 1.15  |
| Rainbow runner       | 3       | 328.00    | 416.20    | 1.27  |
| Wahoo                | 6       | 289.00    | 391.80    | 1.36  |
| Skipjack tuna        | 79      | 13,487.00 | 14,662.28 | 1.09  |
| Dogtooth tuna        | 10      | 836.00    | 1,345.85  | 1.61  |
| Yellowfin tuna       | 9       | 721.00    | 1,077.35  | 1.49  |
| Lobster              | 18      | 651.50    | 2,586.00  | 3.97  |
| ** SUBTOTAL **       | 236     | 29,227.60 | 41,947.98 |       |

## III.11

Table III.1.11

CNMI October 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Bigeye scad (atulai) | 2       | 138.00    | 222.75    | 1.61  |
| Bottom fish          | 9       | 1,485.00  | 2,572.50  | 1.73  |
| Onaga (red snapper)  | 2       | 95.00     | 355.00    | 3.74  |
| Reef fish            | 55      | 12,087.00 | 18,849.40 | 1.56  |
| Rabbitfish (hitting) | 29      | 467.00    | 885.60    | 1.90  |
| Emperor (mafute)     | 3       | 1,444.00  | 2,730.75  | 1.89  |
| Parrotfish           | 10      | 1,280.00  | 1,924.00  | 1.50  |
| Surgeonfish          | 14      | 1,010.00  | 1,334.60  | 1.32  |
| Unicornfish          | 3       | 612.00    | 978.60    | 1.60  |
| Goatfish             | 1       | 16.00     | 32.00     | 2.00  |
| Barracuda            | 2       | 22.00     | 22.30     | 1.01  |
| Dolphin (mahimahi)   | 2       | 105.00    | 130.25    | 1.24  |
| Marlin               | 1       | 144.00    | 172.80    | 1.20  |
| Rainbow runner       | 4       | 185.00    | 212.75    | 1.15  |
| Wahoo                | 13      | 1,211.00  | 1,627.00  | 1.34  |
| Skipjack tuna        | 110     | 19,856.00 | 23,243.80 | 1.17  |
| Yellowfin tuna       | 14      | 1,167.00  | 1,841.95  | 1.58  |
| Lobster              | 5       | 156.00    | 606.00    | 3.88  |
| ** SUBTOTAL **       | 279     | 41,480.00 | 57,742.05 |       |

## III.12

Table III.1.12

CNMI November 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Bigeye scad (atulai) | 1       | 53.00     | 92.75     | 1.75  |
| Bottom fish          | 15      | 2,109.00  | 3,690.75  | 1.75  |
| Reef fish            | 45      | 7,560.00  | 11,629.50 | 1.54  |
| Rabbitfish (hitting) | 21      | 458.00    | 914.00    | 2.00  |
| Rudderfish (guilli)  | 1       | 42.00     | 67.20     | 1.60  |
| Parrotfish           | 12      | 1,151.00  | 1,666.05  | 1.45  |
| Surgeonfish          | 4       | 1,082.00  | 1,758.50  | 1.63  |
| Unicornfish          | 2       | 858.00    | 1,252.95  | 1.46  |
| Dolphin (mahimahi)   | 6       | 237.00    | 323.90    | 1.37  |
| Marlin               | 1       | 115.00    | 201.25    | 1.75  |
| Rainbow runner       | 4       | 855.00    | 1,195.75  | 1.40  |
| Wahoo                | 14      | 1,186.00  | 1,696.95  | 1.43  |
| Skipjack tuna        | 69      | 12,900.00 | 16,081.05 | 1.25  |
| Dogtooth tuna        | 1       | 87.00     | 104.40    | 1.20  |
| Yellowfin tuna       | 20      | 1,583.00  | 2,115.20  | 1.34  |
| Lobster              | 1       | 4.00      | 12.00     | 3.00  |
| ** SUBTOTAL **       | 217     | 30,280.00 | 42,802.20 |       |



## III.13

Table III.1.13

CNMI December 1988 Commercial Landings

| Species              | Records | Pounds     | Value      | \$/lb |
|----------------------|---------|------------|------------|-------|
| Bottom fish          | 13      | 984.00     | 1,860.10   | 1.89  |
| Onaga (red snapper)  | 1       | 35.00      | 210.00     | 6.00  |
| Opakapaka (pink snp) | 1       | 48.00      | 120.00     | 2.50  |
| Reef fish            | 53      | 8,732.00   | 13,398.70  | 1.53  |
| Rabbitfish (hitting) | 40      | 1,121.00   | 2,071.60   | 1.85  |
| Emperor (mafute)     | 2       | 120.00     | 275.00     | 2.29  |
| Parrotfish           | 21      | 1,948.00   | 3,044.05   | 1.56  |
| Surgeonfish          | 2       | 238.00     | 380.80     | 1.60  |
| Goatfish             | 1       | 38.00      | 76.00      | 2.00  |
| Dolphin (mahimahi)   | 5       | 518.00     | 676.00     | 1.31  |
| Marlin               | 2       | 201.00     | 236.75     | 1.18  |
| Wahoo                | 4       | 146.00     | 184.25     | 1.26  |
| Skipjack tuna        | 58      | 9,498.00   | 11,806.40  | 1.24  |
| Yellowfin tuna       | 6       | 494.00     | 742.25     | 1.50  |
| ** SUBTOTAL **       | 209     | 24,121.00  | 35,081.90  |       |
| ** TOTAL **          | 3,081   | 442,326.88 | 621,962.98 |       |

# III.14

Figure III.1.1

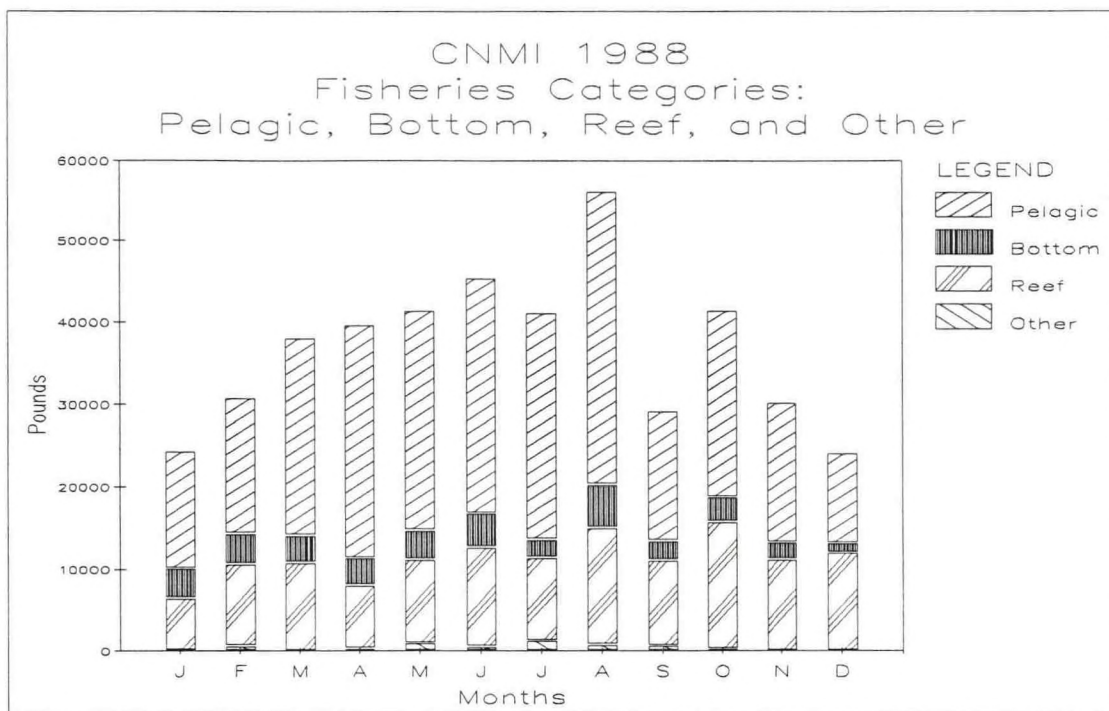


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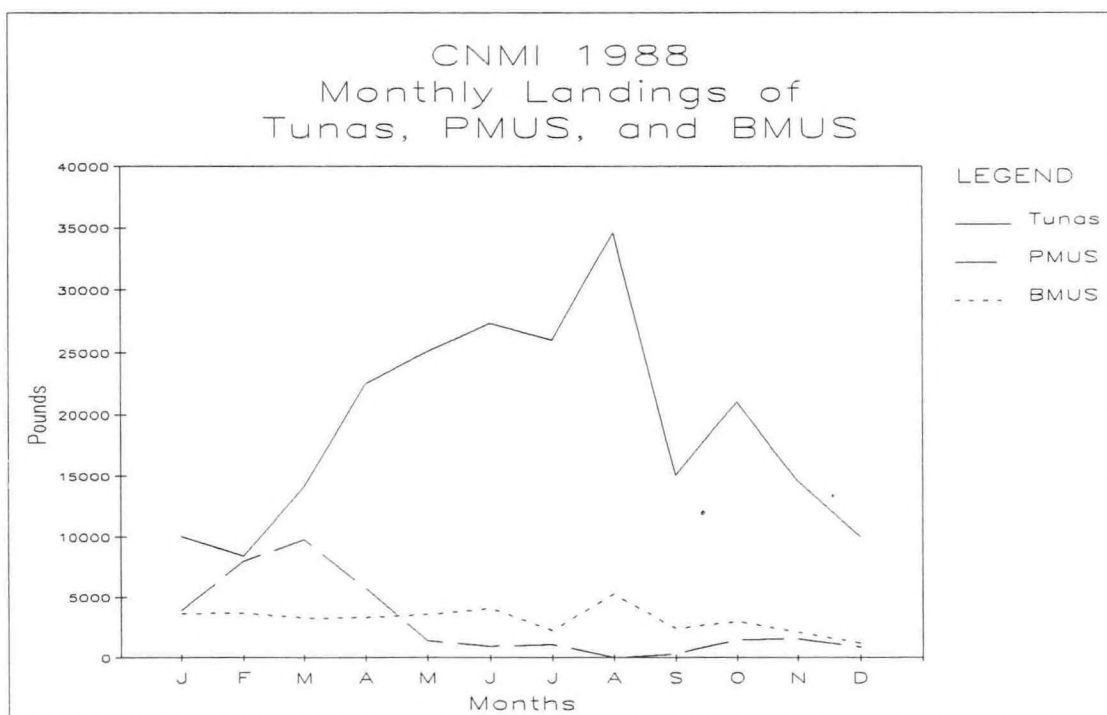


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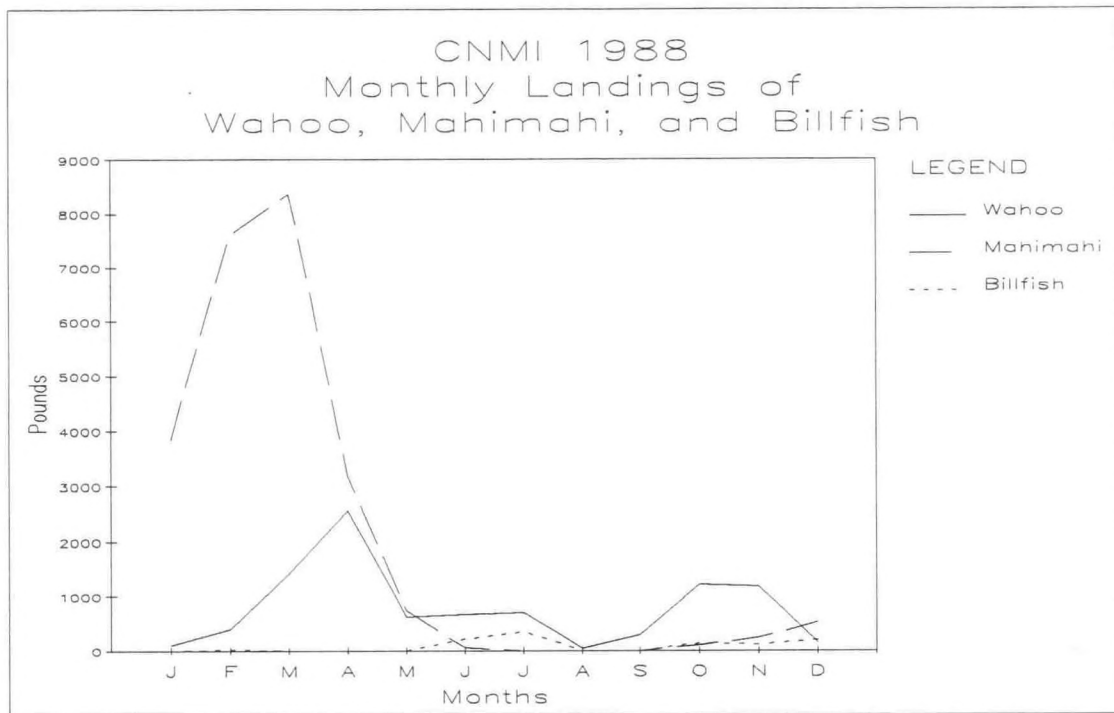
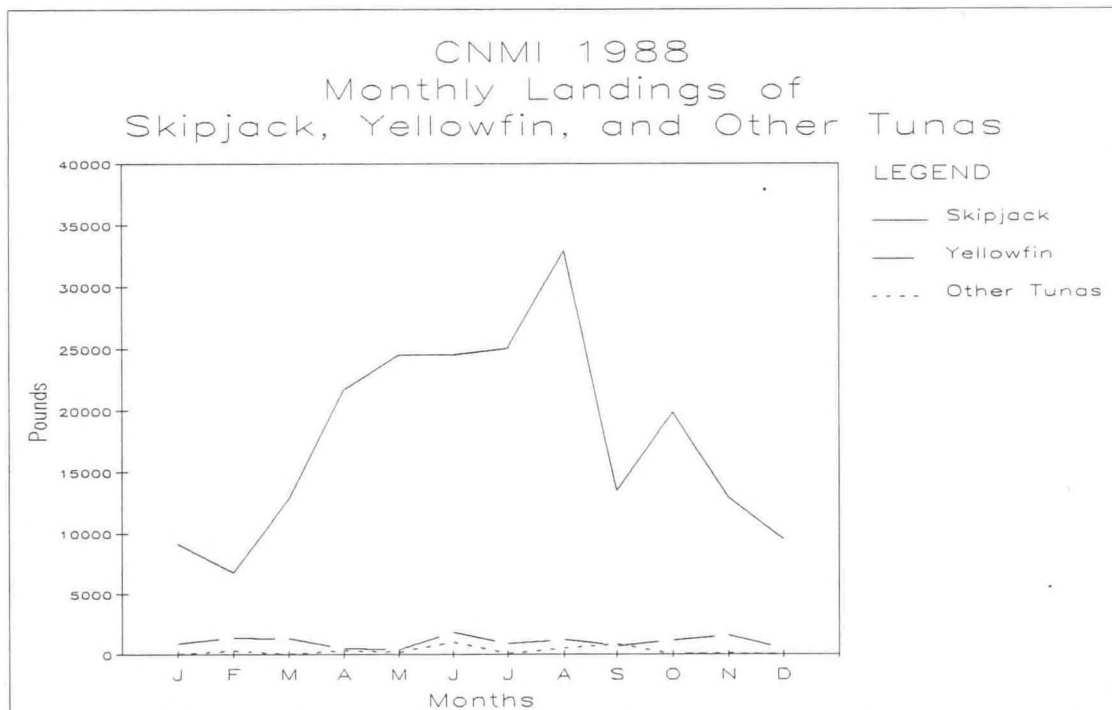


Figure III.1.4





### III.16

Figure III.2.1

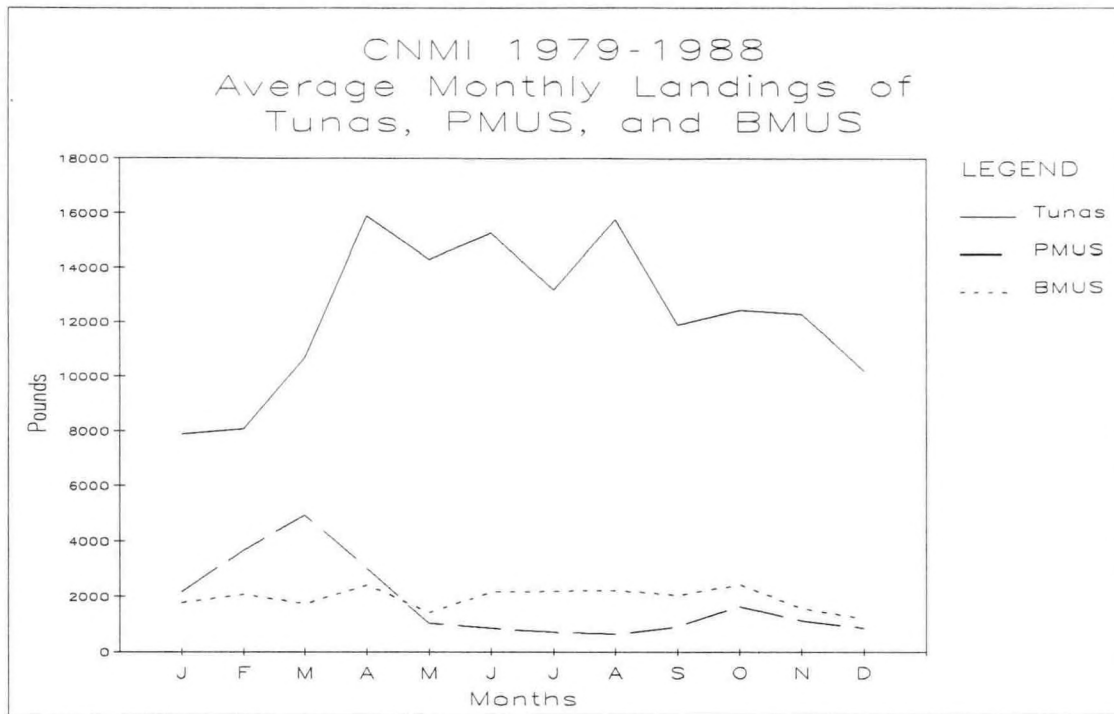


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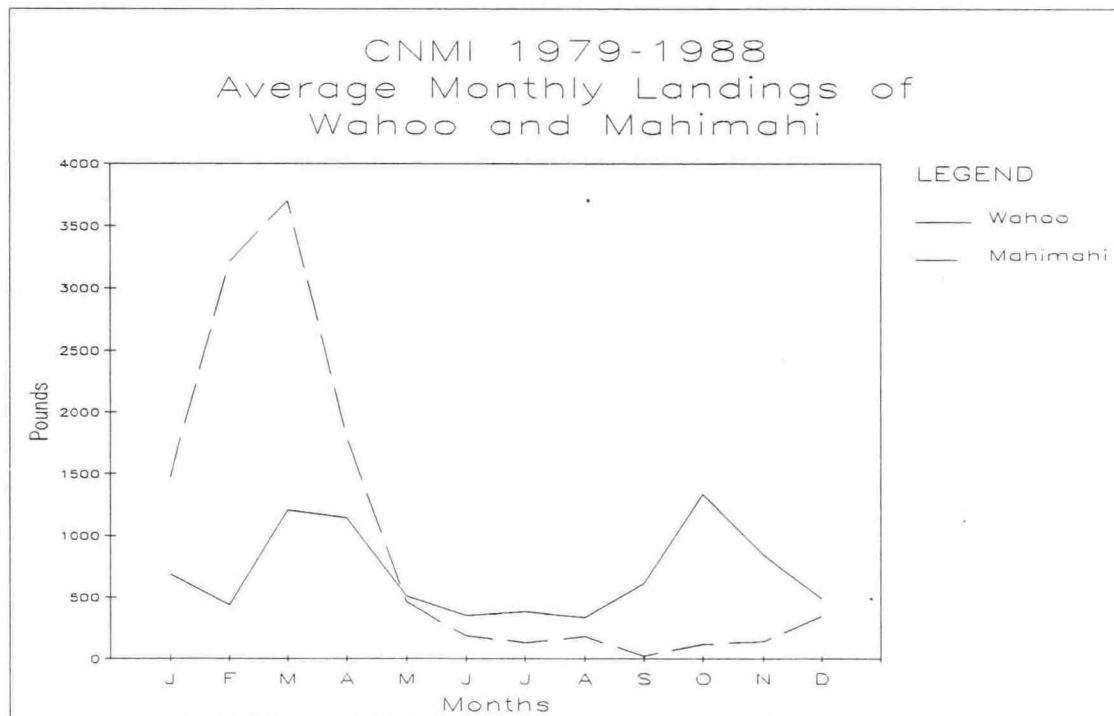


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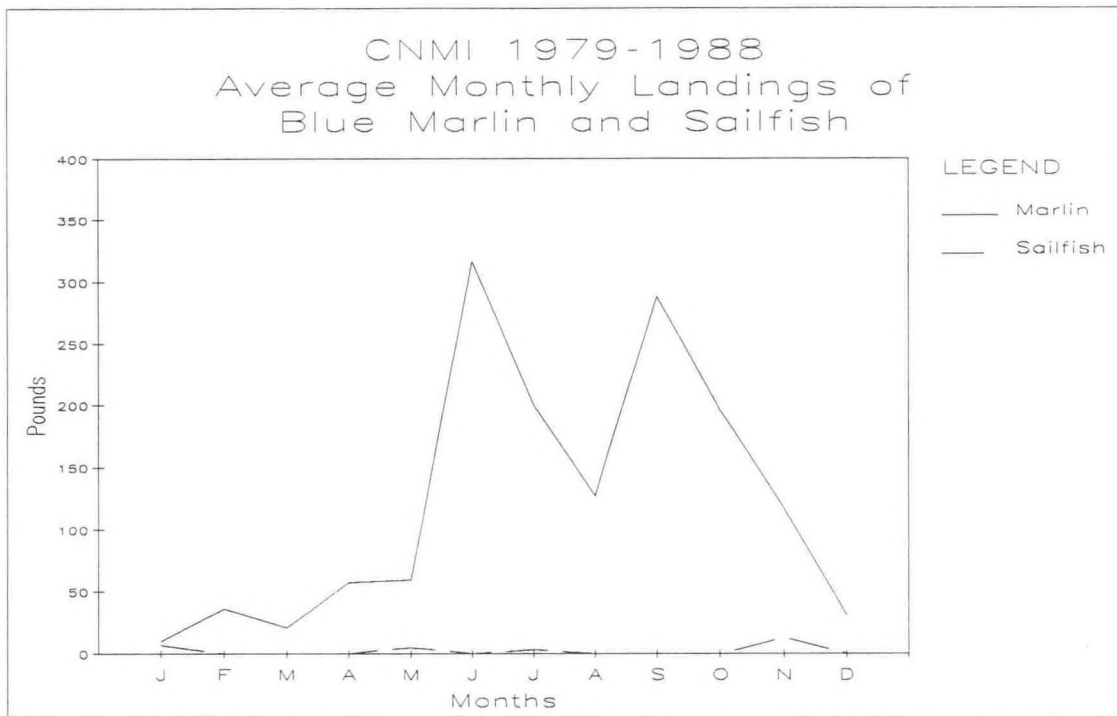


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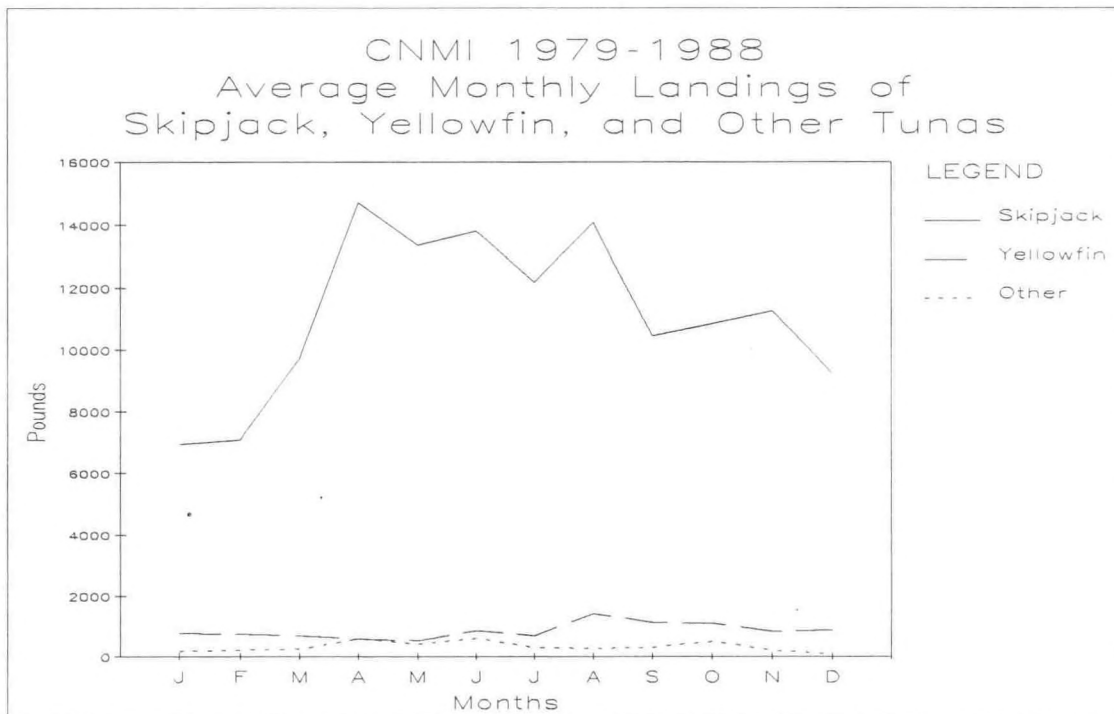


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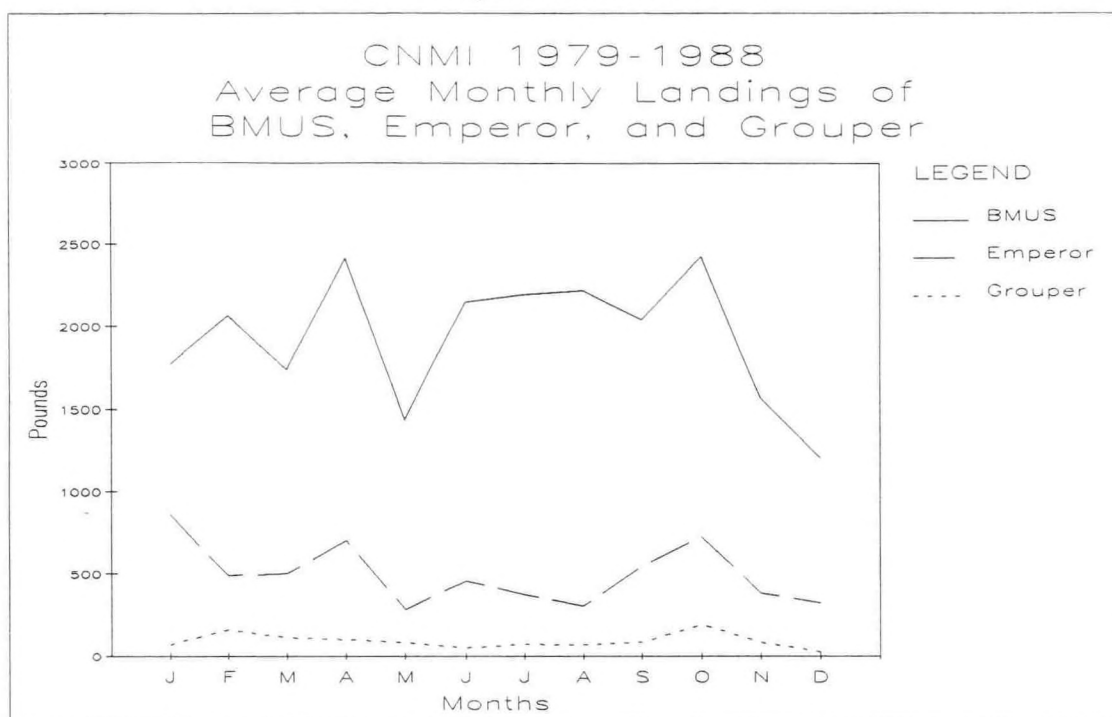
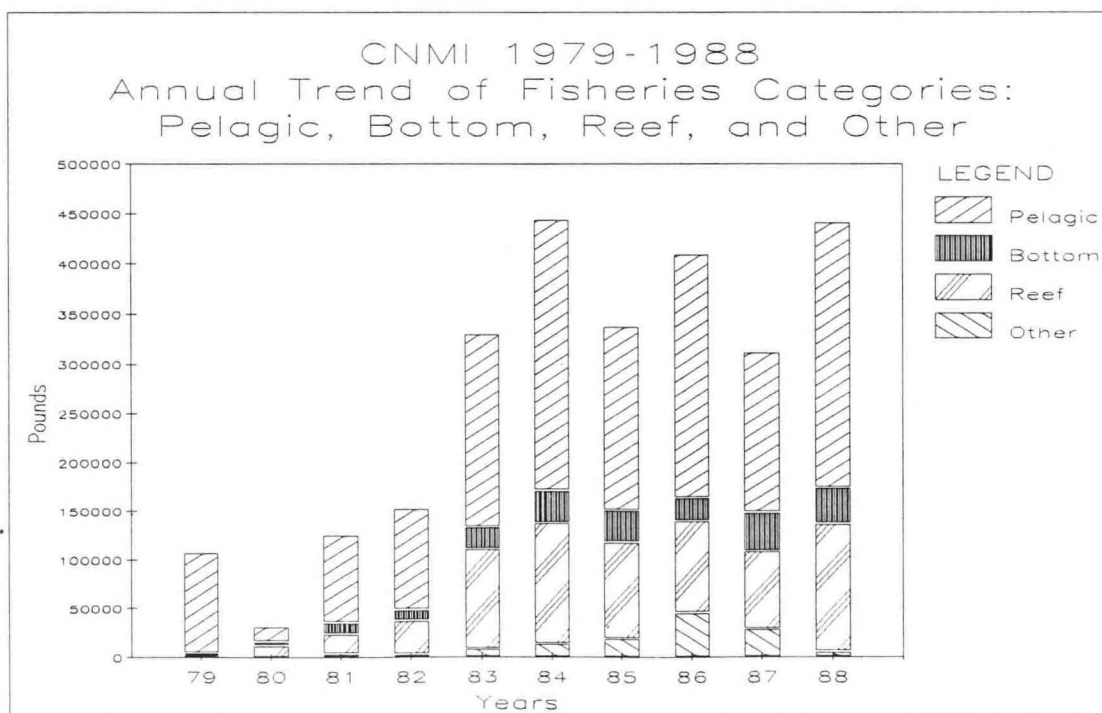


Figure III.3.1





### III.19

Figure III.3.2

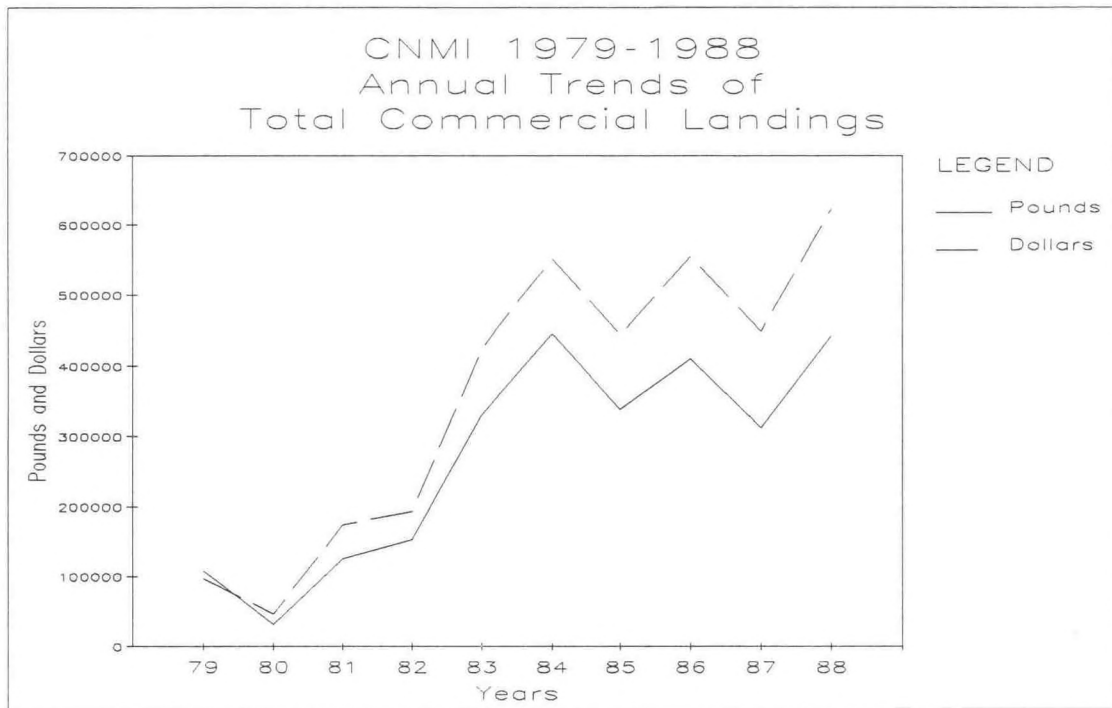
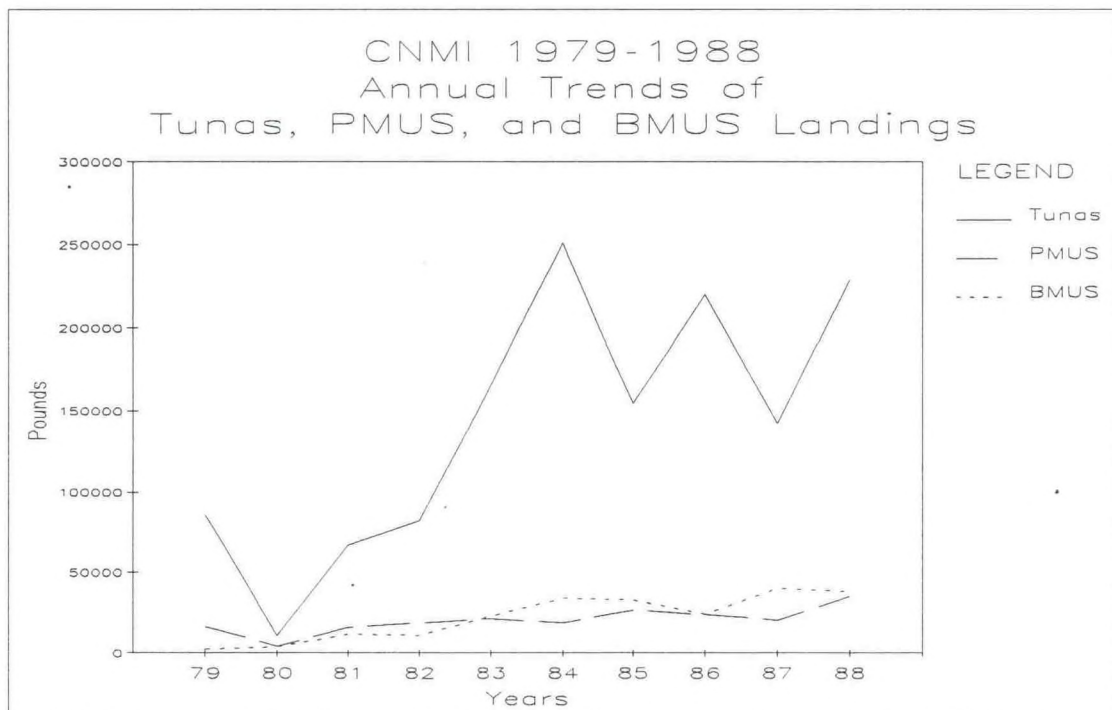


Figure III.3.3



### III.20

Figure III.3.4

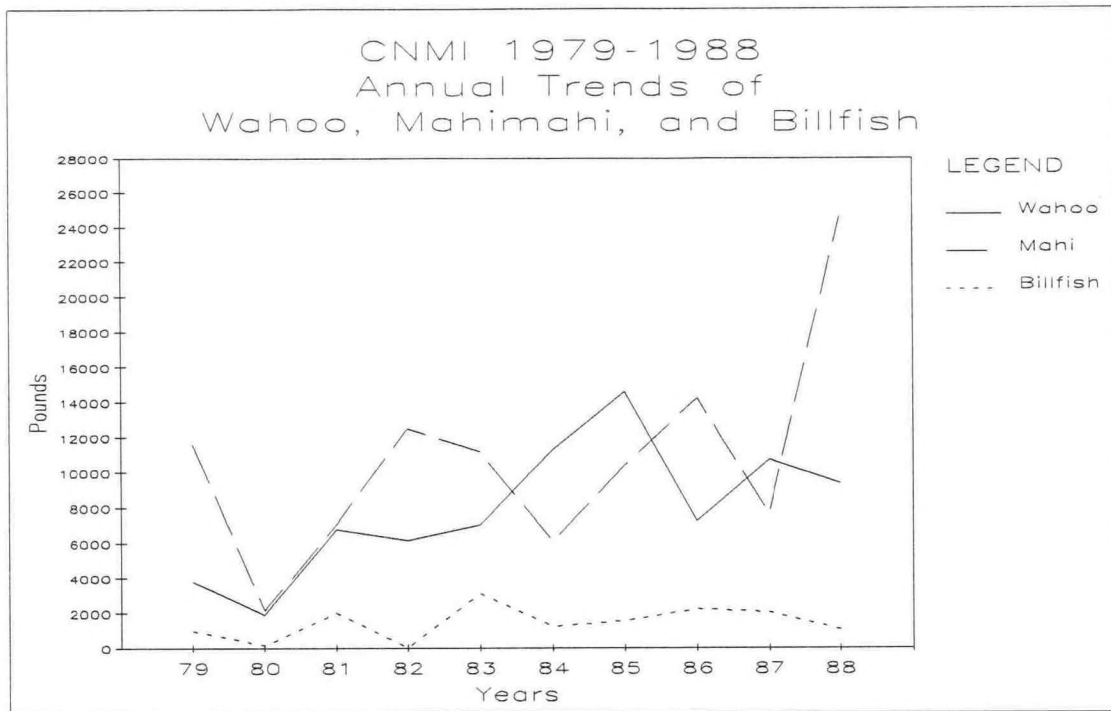
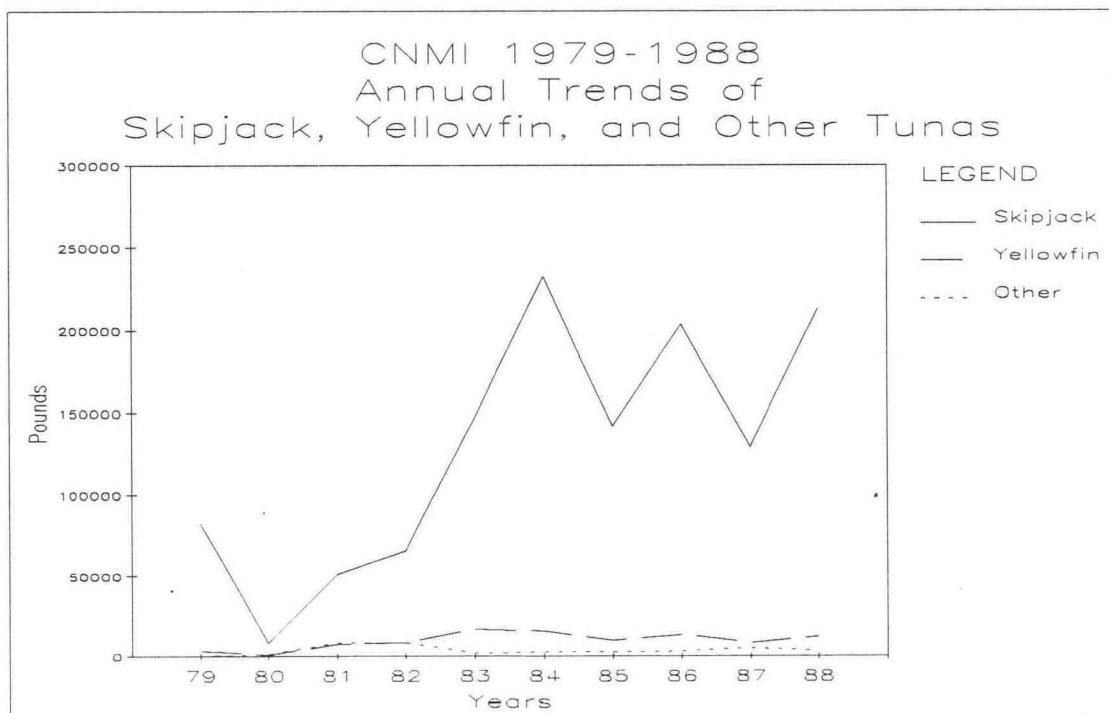


Figure III.3.5



III.21

Figure III.4.1

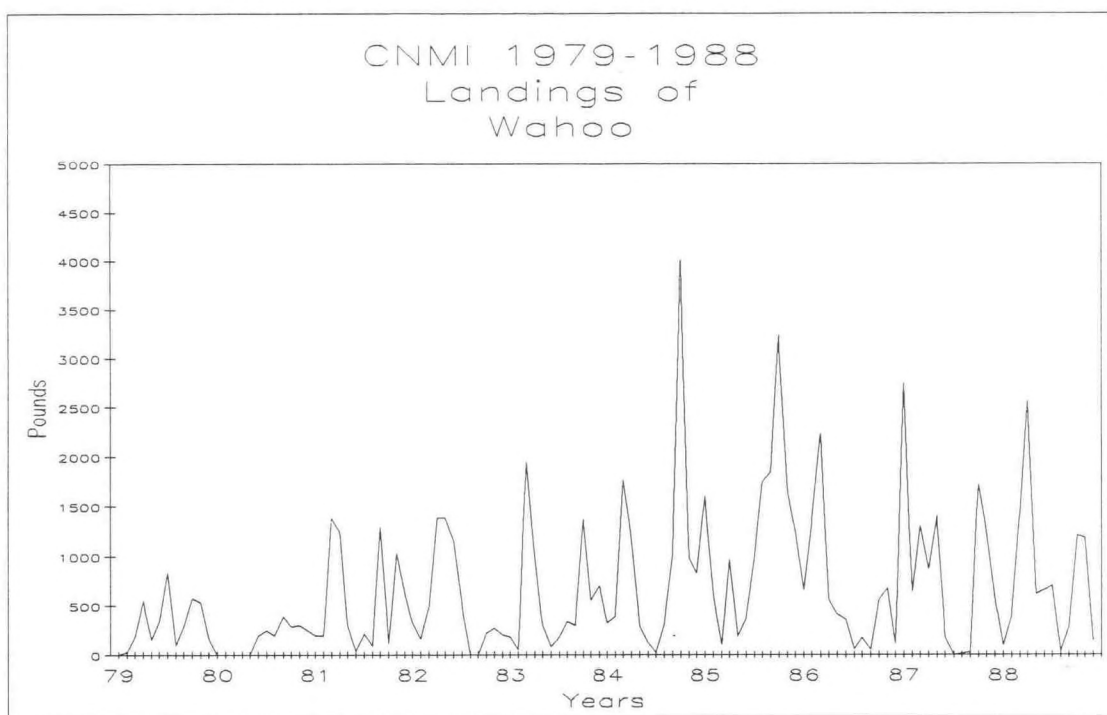
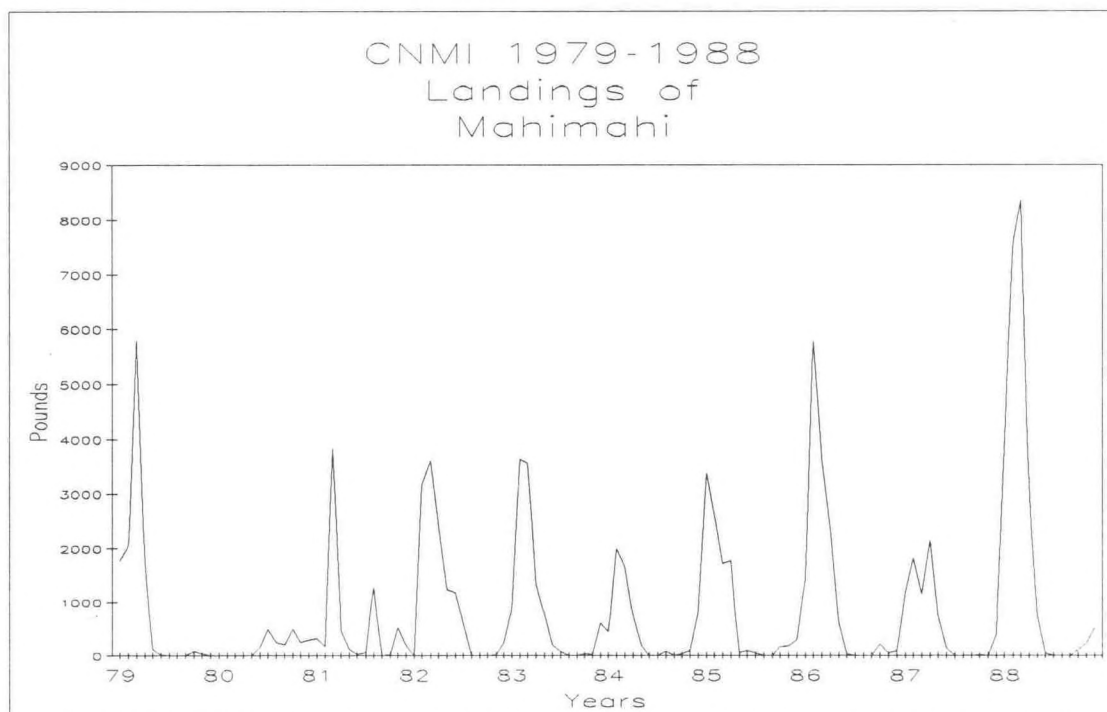


Figure III.4.2





III.22

Figure III.4.3

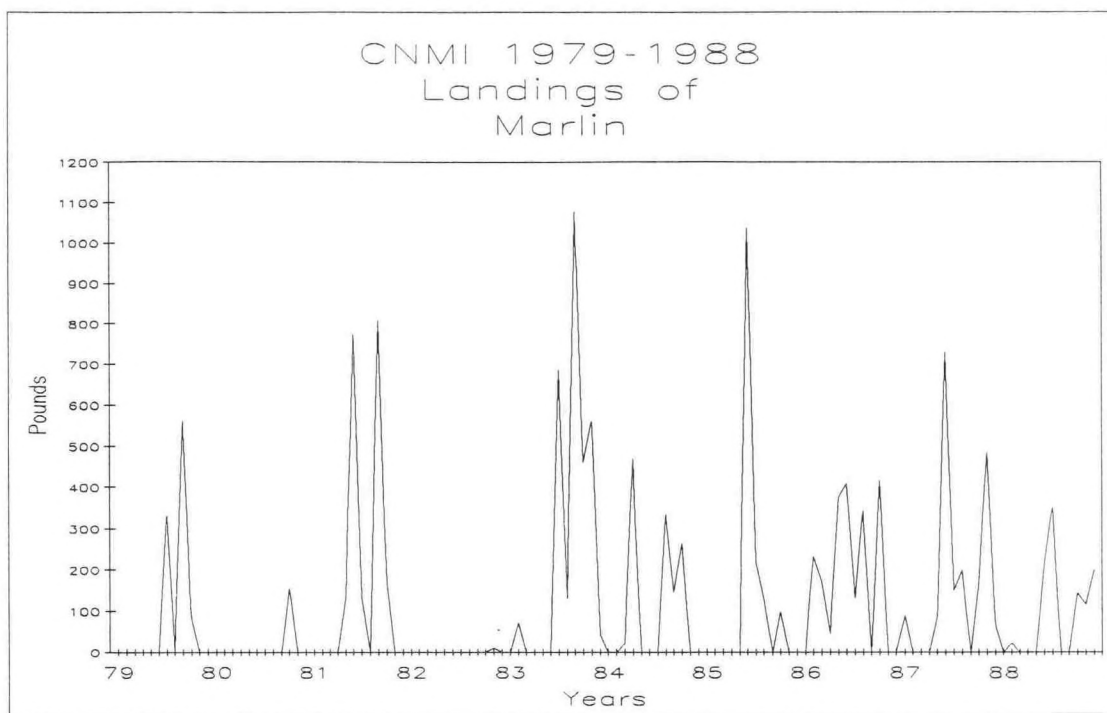
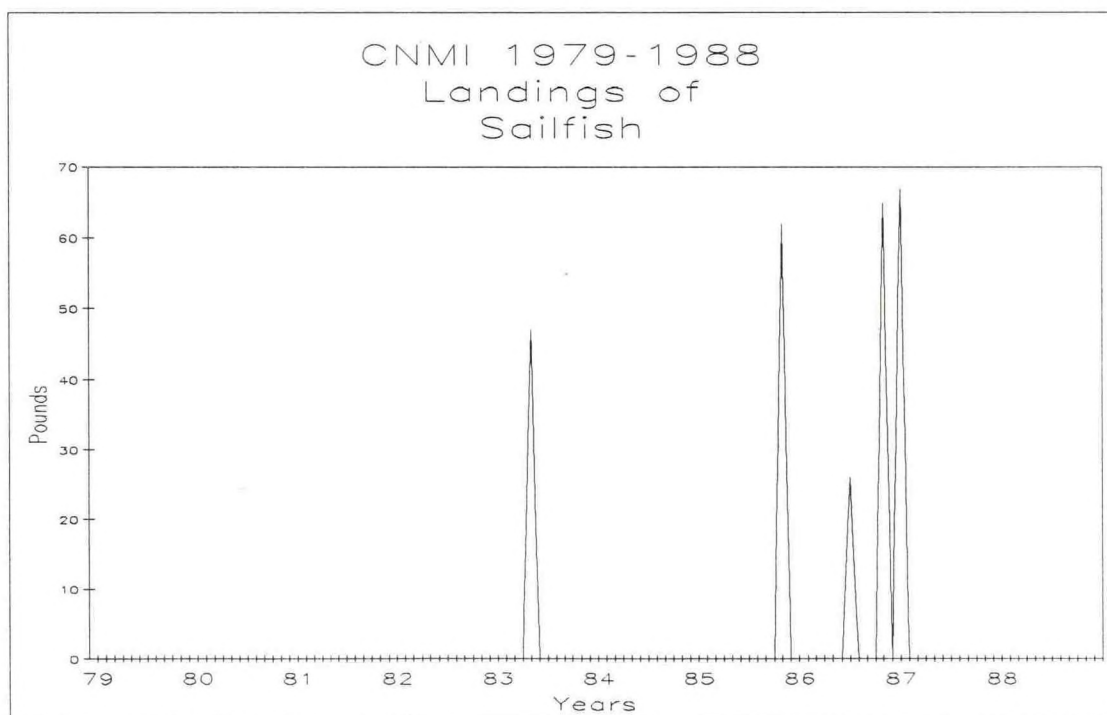


Figure III.4.4



III.23

Figure III.4.5

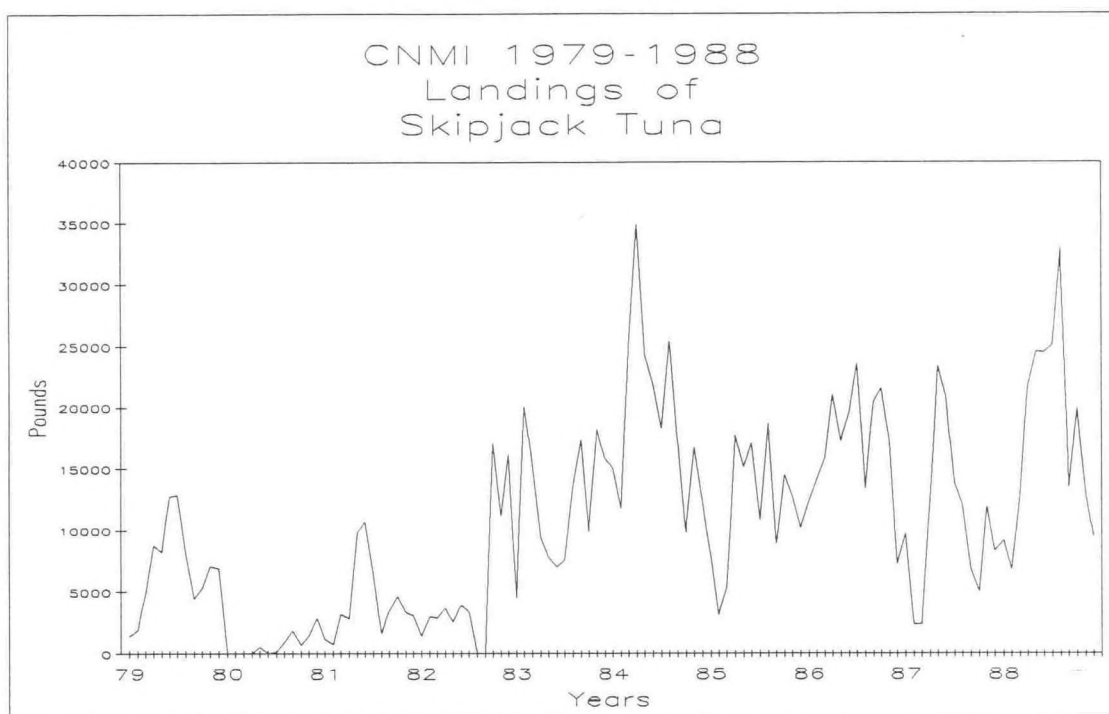
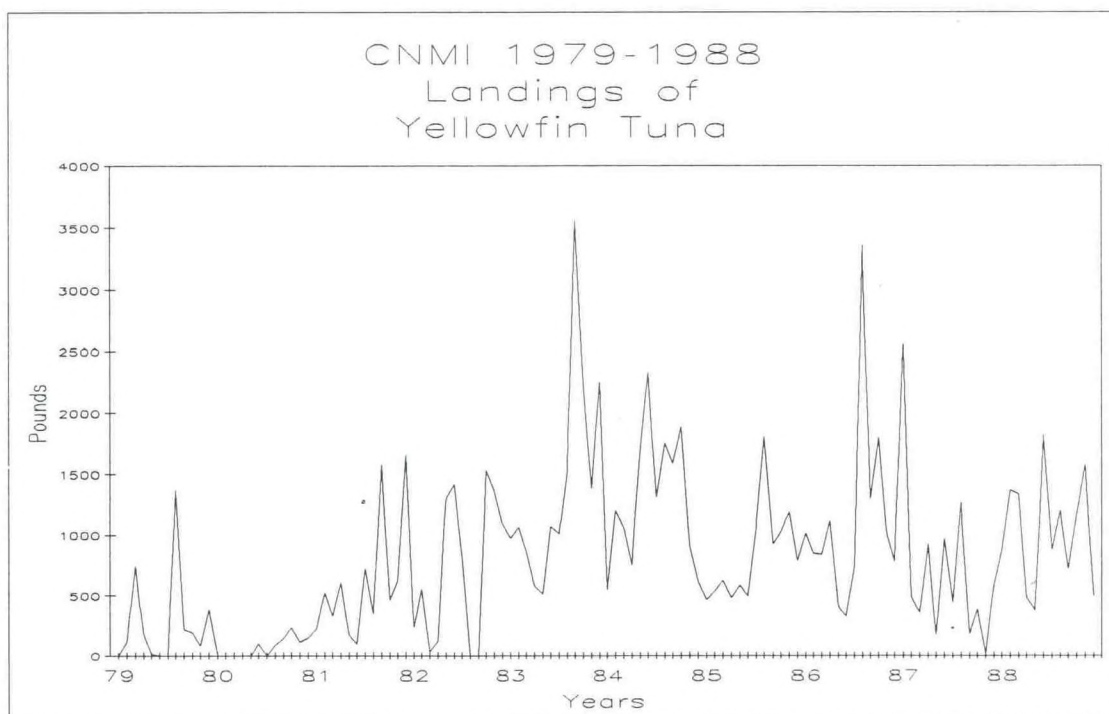


Figure III.4.6



III.24

Figure III.4.7

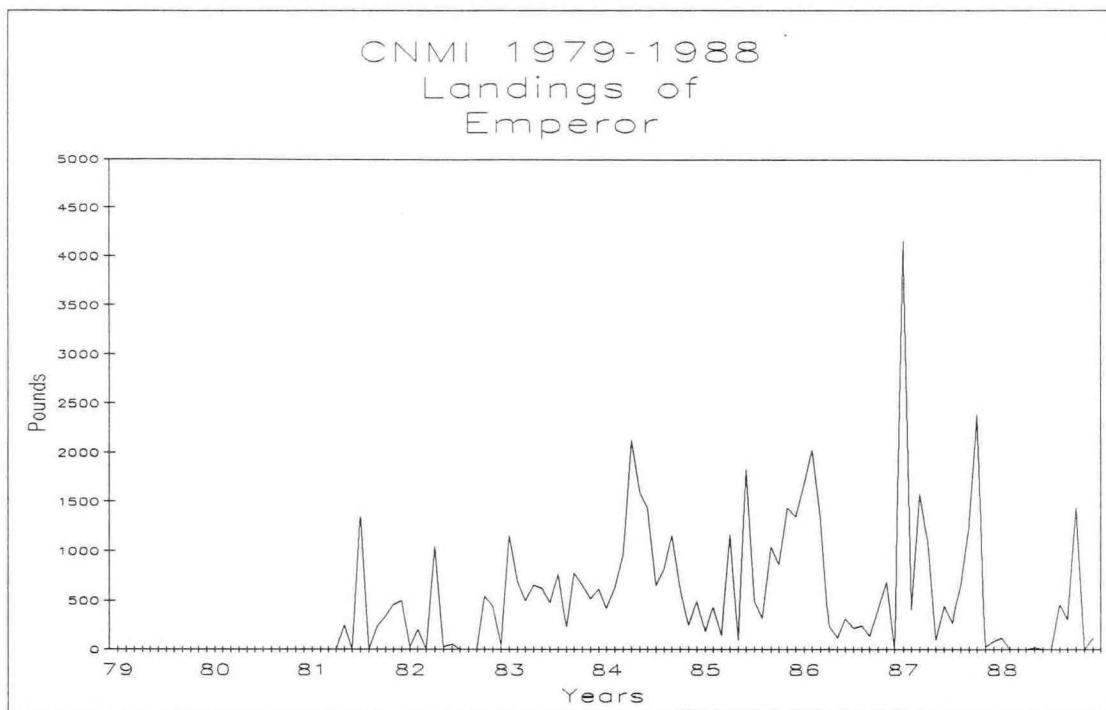
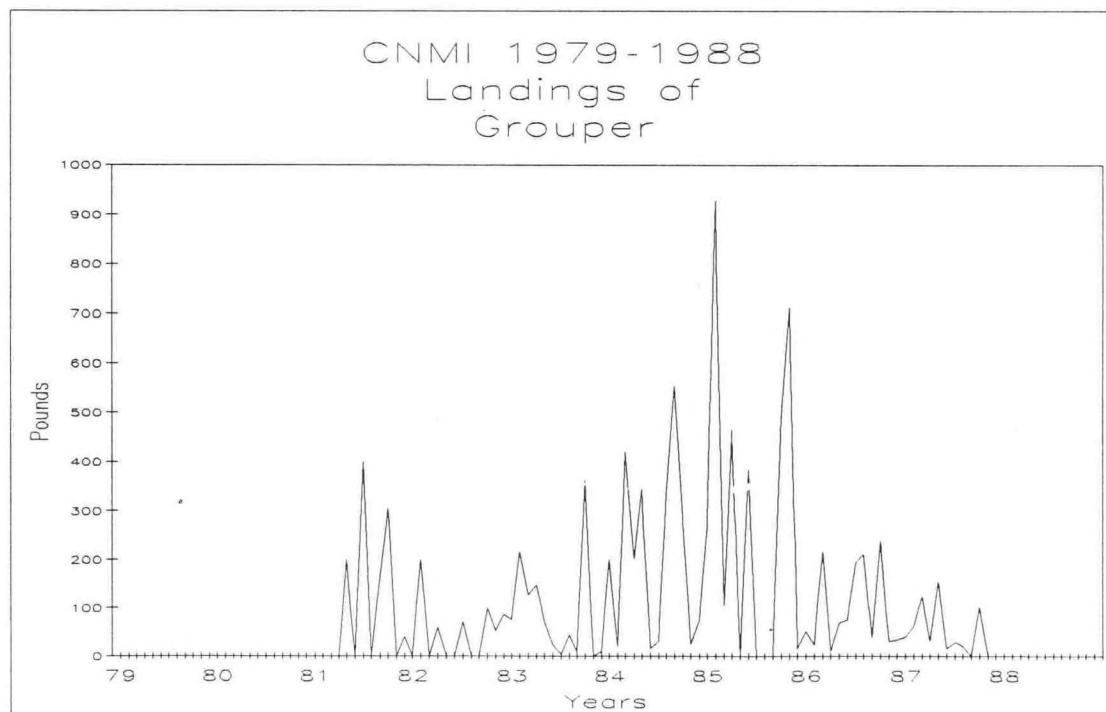


Figure III.4.8







# Territory of Guam

**Fishery Statistics  
1988**

**GUAM 1988 FISHERY STATISTICS**

Compiled by

Guam Division of Aquatic and Wildlife Resources  
and the  
Western Pacific Fishery Information Network

May 1990

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## GUAM 1988 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<sup>2</sup> (214 mi<sup>2</sup>) 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. 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. In 1982, WPACFIN also began working with local fish wholesalers to obtain information on the commercial landings of Guam. It is from these two sources, DAWR and wholesalers, that the original data for the statistics presented in this report have come.

### DATA COLLECTING SYSTEMS

The Guam data collecting systems are divided into two distinctly different systems, one for collecting commercial landings information and one for collecting total landings information through creel surveys.

#### Commercial Landings

Fish entering the commercial market in Guam come 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



## IV.2

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. During 1987, a foreign tuna longline fleet began transshipping fish out of Guam. Excess fish from these boats became available to local buyers and the Coop's business suffered. Because of these and other marketing problems in 1987 and 1988 the recorded commercial purchases made by the Coop declined. Therefore our percent coverage of the total commercial landings declined, and the reported commercial data for 1988 do not reflect the true commercial fisheries as well as previous years. All tables and figures of commercial landings information included in this report are provided with the consent of the Coop wholesalers.

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

### Creel Surveys

The DAWR has the responsibility to monitor and protect the wildlife and marine resources of Guam. To this end, it began conducting creel surveys in the early 1970's. By systematic, random interviewing of fishermen, DAWR developed a means of estimating total catch and effort by fishing method for the inshore and offshore fisheries. Sampling methodologies were frequently modified in the early years to incorporate new information and insights gained during the surveys. Aerial surveys were conducted for several years to help improve estimates of percent coverage. The basic survey methodology was fairly well established by 1979. All data processing was done by hand.



#### IV.3

In the 1970's, an annual fishing derby was organized on Guam by groups of local fishermen. This 3-day tournament soon became a highly successful event, with much participation by local recreational and commercial fishermen. The DAWR began collecting census information on the Annual Mariana's Fishing Derby activities as a means of obtaining additional catch and effort information. Although the significance of these data is minor compared to the creel surveys, summaries of derby results are included in this document as a point of interest.

In 1982, WPACFIN hired a contractor to work with DAWR staff to improve the statistical validity of the creel surveys and to establish mathematical algorithms to expand the sample data to estimate total catch and effort with confidence intervals. Consequently, DAWR further improved its sampling methodologies based on the contractor's recommendations, such as adding surveys to better estimate total participation. The WPACFIN developed computer processing systems to automate the data handling and expansion activities. The system design is flexible enough to allow for continued improvements as additional information, insight, and funding are gained. It is essential for the user to understand the basic sampling design and some of the assumptions made for the offshore and inshore surveys to facilitate proper interpretation of the resultant statistics.

The DAWR's fishermen interviews, also called creel surveys, are divided into two separate, major surveys, offshore and inshore. Both are based on a systematic, random sampling of the fisheries; field sampling and interviews are done on a specific number of randomly selected weekdays and weekend-holidays each month. Both surveys are stratified by weekday and weekend- holiday sampling and, during 1988, were conducted on 4 days per month. Both include two subsurveys, one for counting and estimating total participation and one for actually interviewing fishermen for catch and effort information. Both are based on the assumptions that the information given by the fishermen is accurate and the fishermen interviewed are representative of the entire fishing population.

##### *Offshore Creel*

Most offshore fishing trips originate from one of three harbors on Guam. Apra Harbor is the largest of these harbors, serves military and commercial shipping activities, and is considered one of the best natural harbors in the western Pacific. It ranks third among the harbors as points of origination for offshore fishing trips. Cocos Lagoon on Guam's southern tip is the second largest protected harbor and ranks second as a launching area for offshore fishing trips. The Agana Boat Basin, centrally located on the west coast of Guam in the capitol of Agana, is the smallest of the three harbors but is the busiest launching area for offshore fishing trips. Therefore, DAWR selected the boat basin as the site for interviewing offshore fishermen.



#### IV.4

Concurrent with interviewing fishermen returning from trips at the boat basin, a participation survey is conducted to obtain counts of boating activity for the entire island. For estimating total participation for a survey day, 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. A further assumption is made that the fishing activity and success rate of fishermen originating at the Agana Boat Basin are not statistically different from those of fishermen leaving from other areas on the island. The basic premise of the offshore sampling program is that the combined interviews collected on each survey day are sufficient to estimate the average catch and effort for each fishing method used during that day. Therefore, each survey day represents a measurement of the offshore fisheries. Data collected during the participation portion of the offshore creel survey are limited to boat count by launching area, whereas data collected during interviews include the following:

- \* Date (year, month, day)
- \* Type day (weekday or weekend-holiday)
- \* Fishing method
- \* Interview time
  - Area fished
  - Boat number
- \* Number of fishermen
- \* Number of gear units
- \* Hours fished per gear
  - Total count for all species combined
  - Type total count
- \* Total weight for all species combined
  - Type total weight
  - Total number of species
  - Type total number of species
- # Total count for each species
  - Type count for each species
- # Total weight for each species
  - Type total weight for each species
- # Species name (or species group)
  - Length for an individual fish
  - Type individual length
  - Weight for an individual fish
  - Type individual weight
  - Bait used (up to three different types)
  - Wind direction and speed
  - Weather conditions
  - Cloud cover
  - Lunar day
  - Percent of catch kept
  - Percent of catch sold to the Coop
  - Percent of catch sold elsewhere

It is not always possible for the interviewer to obtain information on all items listed. However, those marked with an asterisk (\*)



are essential to the data expansion process for estimating total catch and effort. Those marked with a pound or number sign (#) are essential to estimating the percent species composition of the catch. The "type" elements (e.g., type individual length) identify the kind of measurements, i.e., either actual, estimated, or calculated.

### *Inshore Creel Survey*

Fielding the inshore creel survey is considerably more complex and troublesome than the offshore survey for several reasons. For instance, fishing activities originate from and occur over a large portion of the coastline, making participation counts and fishermen interviews much more difficult to obtain. Additionally, it is more difficult to obtain interviews for completed fishing trips because the interviewer must survey many miles of coastline where fishermen may quickly terminate their activities at any time. The turnover rate of fishermen during the sampling period is a difficult factor for which to adjust. Tidal stage and moon phase also influence inshore fishing much more than offshore fishing. Nighttime and seasonal pulse fishing are also major considerations for the inshore fisheries. In October 1984, DAWR began additional survey efforts to help quantify the nighttime and seasonal inshore fisheries.

Notwithstanding these complexities and problems, the basic designs of the offshore and inshore surveys are very similar in that they both have participation counts and creel interviews. Two of the significant differences between the offshore and inshore surveys are that the inshore participation counts are made by fishing method as well as by location, and that interview information is combined to form averages of catch and effort for a much larger time period (month, quarter, year) than a single day as in the offshore survey. Therefore, daily measurements of the inshore fisheries are based on island-wide participation counts for a survey day by using averages for the catch information based on user-specified, flexible time periods, typically quarterly and annual averages. This modification of the expansion algorithm was required for DAWR to physically complete an inshore survey with limited manpower. Participation counts for essentially the entire island can be obtained during a single sample day, but adequate creel interviews for all methods for the entire island cannot be obtained with the manpower available. Additionally, the surveyable portions of the coastline are divided into three regions to facilitate statistically sound sampling of fishermen. Data for the day and night surveys are processed and expanded separately. Data on the seasonal fisheries for juvenile rabbitfish and bigeye scad are collected at irregular intervals when the fisheries are active. Information collected during the inshore participation surveys includes

- \* Date (year, month, day)
- \* Type day (weekday or weekend-holiday)



#### IV.6

- \* Location fished
- Time sighted
- \* Method used
- \* Number of persons
- \* Number of gear units
- Reef zone fished
- Weather and water conditions
- Tidal stage

Information collected during the inshore interviews includes

- \* Date (year, month, day)
- \* Type day (weekday or weekend-holiday)
- \* Fishing method
- \* Interview time
- \* Location
- Reef zone fished
- \* Number of fishermen
- \* Number of gear units
- \* Actual hours fished per gear
- \* Estimated trip time
- Total count for all species combined
- Type total count
- \* Total weight for all species combined
- Type total weight
- Total number of species
- # Total count for each species
- Type count for each species
- # Total weight for each species
- Type total weight for each species
- # Species name (or species group)
- Length for an individual fish
- Type individual length
- Weight for an individual fish
- Type individual weight
- Bait
- Wind direction
- Wind speed
- Weather conditions
- Cloud cover
- Surf
- Tidal stage
- Swell direction

As in the offshore survey, the interviewer cannot always obtain information on all items listed. Those marked with an asterisk are essential to the data expansion process for estimating total catch and effort. Those marked with a pound or number sign are essential to estimating the percent species composition of the catch. The "type" elements (e.g., type individual length) identify the kind of measurements, i.e., either actual, estimated, or calculated.

## IV.7

### DATA PROCESSING SYSTEMS

The Guam data processing systems are divided into two separate and distinctly different systems, one for processing the commercial landings data and one for processing the DAWR creel survey data.

#### Commercial Landings

The processing system for the commercial landings data collected from the wholesalers is fairly straightforward. A purchase form is completed by the wholesaler 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. 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 the wholesalers along with summary reports and graphs for their use.

#### Creel Surveys

The processing systems for the creel surveys are much more complex than those for the commercial landings data. The basic data handling and processing systems for the inshore and offshore surveys are the same. Data forms completed in the field during the participation and creel surveys are returned to the office and edited for completeness and legibility before the data are entered into structured computer data bases by using commercially available data base management software. Edit and summary reports are produced to verify the quality of the data, and any errors are corrected in the data bases. Data bases are then translated into standard record formats, which are readable by the data processing and expansion systems programmed by WPACFIN specifically for the offshore and inshore surveys. As data are converted into the Guam Offshore Expansion System (GOES) and the Guam Inshore Expansion System (GIES), additional error checks are performed by the computer to ensure only valid information enters the expansion systems. Errors are flagged and printed to facilitate correction. The GOES and GIES are menu-driven systems that step the user through a series of processes that summarize creel survey and participation data to produce catch and effort expansion and species composition files and reports. Although the GOES and GIES allow processing data for whatever time increment the user specifies, typically 1 month of data is processed at a time for the



offshore surveys, and 3-month or annual data are combined for the inshore surveys.

Generally speaking, the expansion algorithms for the offshore and inshore surveys are very similar. Estimates of total catch, effort, and participation for each fishing method are generated from information collected during the participation and creel surveys. The GOES uses same-day catch and effort averages to expand the participation counts, whereas the GIES uses user-specified, time period catch and effort averages to expand the daily participation counts. Inshore day and night surveys are treated identically but separately. The daily estimates are considered measurements of the fisheries for that day. Average weekday and weekend-holiday estimates and their associated variances or confidence intervals are created from individual daily measurements. These are weighted by the number of each type of day in the month, or other timespan, and multiplied by proportionality constants to adjust for percent coverage to produce estimates of total catch, effort, and participation along with their confidence intervals. All steps in the expansion process are stratified by fishing method. The expansion systems produce several detailed summary reports and a summary expansion data file containing the final totals for all important catch and effort statistics. This summary expansion file is later used to produce the types of reports contained in this document.

Estimates of species composition of the expanded catch are obtained for each method by multiplying the calculated percent species composition of the surveyed catch by the expanded total catch. Percent species composition by fishing method is obtained from the sampled catch based on the average individual weight and the total number of individuals recorded for that species. The average size of each species is obtained by one of three methods, depending on the availability of data in the data base. If total weight and count information are available, the average size per individual is calculated by dividing the total weight by the total count. If total weight and count information are not available but individual weight measurements for a species are available, the average size per individual is calculated by dividing the sum of all individual weights by the total number of individuals weighed. If neither of these methods can be used because no size information is available in the data base, the user is asked to input the species' average size, which is then multiplied by its total count to estimate total sampled catch of that species. Therefore, percent species composition is calculated by dividing the estimated sampled weight of the species by the estimated total sampled weight of all species combined. The species composition programs produce summary reports for immediate reference and summary data files for later use by reporting and summarizing software for generating the types of reports contained in this document.

Catch, effort, and participation data collected during the seasonal fisheries for bigeye scad and juvenile rabbitfish are processed by hand. Interview records are scarce, so hand



tabulations and expansions are made to produce ballpark estimates of catch.

#### DATA REPORTING SYSTEMS

The Guam data reporting systems are divided into two separate systems, one for reporting on the commercial landings data and one for reporting the results of the creel survey.

#### Commercial Landings

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 1988. Each table contains information on the pounds, value, average price per pound, and number of recorded landings for each species or species group. The number of recorded landings ("RECORDS" in the tables) is a measurement of how many times each species was purchased, regardless of its number or weight in the landing. This statistic is provided to give an indication of the frequency each species is reported. The POUNDS can be divided by the RECORDS to calculate the average weight of each landing. 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)

- 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)

IV.10

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)  
Giant wrasse  
Rabbitfish  
Rudderfish  
Squirrelfish  
Parrotfish  
Snapper  
Surgeonfish  
Unicornfish  
Goatfish

D. Other

Miscellaneous (unclassified)  
Bigeye scad  
Mullet  
Eels



#### IV.11

- Milkfish
- Invertebrates (unclassified)
- Crabs (unclassified)
- Coconut crab
- Lobster
- Shrimp
- Octopus
- Squid
- Seaweeds
- Imported

#### Creel Surveys

Two general types of reports are included in this document from the DAWR creel surveys, catch and effort expansion reports and species composition reports. These reports are produced by using the expansion and species composition files created by the GOES and GIES as input to a series of utility programs developed by WPACFIN. The utility programs reorganize, format, and summarize data from the GOES and GIES files to improve the presentation of the data and reduce the amount of space required to report the important statistics. Two of the most significant space saving improvements are the combining of many species into species groups, usually to the family level, and the combining of lesser used fishing methods into a single category. The original offshore and inshore species composition files contained about 300 different species categories, which were reduced to about 90 categories. For instance, 22 species of squirrelfish and 20 species of wrasse were reduced to just the 2 family groupings. All significant or important species retain their individual identity and are reported separately in the tables. In the original offshore species composition files, catches were reported for nine fishing methods; however, only two methods, trolling and bottom fishing, were significant as they generally accounted for over 97% of the catch. Therefore, reports of offshore species composition were reduced to just three method categories, trolling, bottom fishing, and other. Inshore species composition reports were reduced to totals only. Expansion reports for the inshore and offshore surveys include estimates of total catch and effort for each method recorded.

Monthly and annual catch and effort expansion reports and species composition reports are presented for the offshore fisheries for 1988. 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 reports will not equal those 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). This also makes expansion possible for months in which sampling was insufficient or nonexistent. The annual species composition reports were 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 percent species composition based on greatly increased sample size. Annual expansion and species composition reports are presented for the day and night inshore creel surveys for 1988. Combined day-night and offshore-inshore species composition reports are also presented.

Computer generated numbers and all totals in the reports are subject to rounding error. All catches are reported in pounds, and effort, in hours (boat hours for the offshore survey and gear hours for the inshore surveys). 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 boat count. A separate CV is included for each statistic reported in the offshore expansion reports, but because of the differences in the offshore and inshore expansion algorithms, only a single CV is included for all statistics reported in the inshore 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 the weekdays or the 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 day had sufficient number of samples to calculate CV. It follows then, anytime an asterisk is present for any of the methods, the totals for the month are questionable.

In the offshore expansion reports, average monthly catch per unit of effort (CPUE) is calculated by using the same type of algorithm as for the other expansion elements, and it has an associated CV. First, the average daily CPUE is calculated by dividing the total weight of the fish sampled for a day by the total number of hours fished to produce that catch. Next, the average weekday and weekend-holiday CPUE's are calculated by summing the average daily CPUE's for each type of day and then dividing by the number of survey days for each type of day. These



averages are multiplied by the number of weekdays and weekend-holidays, respectively, in that month, then the products are summed and divided by the total number of days in the month to produce the average monthly CPUE for each offshore fishing method. The average monthly offshore CPUE could also be calculated by dividing the estimated monthly catch by the estimated monthly boat hours, but this would provide no indication of the variability of the CPUE and also essentially weight the average CPUE by the level of participation. However, for the inshore fisheries, which have a much lower number of creel interviews, the average monthly CPUE by fishing method is calculated by combining catch and effort information over a large timespan and, therefore, does not have an associated CV. Thus, the CPUE's for inshore fishing methods are calculated by dividing the sum of the catch by the sum of the gear-hours for whatever time period is included in the expansion.

Offshore species composition reports provide estimated landings and percent species composition for each species or species group for the two major offshore fishing methods, trolling and bottom fishing; a total for all other methods combined; and an overall total for all methods. The combined offshore-inshore and inshore species composition reports provide the statistics only for all methods combined.

The reports for the 1988 Annual Mariana's Fishing Derby include derby and species totals by day for a variety of catch and effort statistics. Seven major pelagic species are targeted during the derby, including billfish (primarily blue marlin but also sailfish, spearfish, and black marlin), yellowfin tuna, skipjack tuna, mahimahi, wahoo, rainbow runner, and barracuda. Most effort is directed at marlin, wahoo, and yellowfin tuna because prizes for these categories are the best. This tournament continues to grow in popularity and is the biggest organized fishing event in Guam.

#### 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 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. Commercial landings reports are believed to include a high percentage of the actual commercial landings made on Guam. The creel survey expansion reports are based on surveys of the offshore and inshore fisheries conducted 4 times per month. One of the major factors in expanding the 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 Guam's 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 strictly based on the actual survey information collected from the fishermen.

The creel survey reports in this section do not include estimates of catches made during the seasonal fisheries for bigeye scad and juvenile rabbitfish. Therefore, the user must remember to adjust estimates of the total inshore and combined inshore-offshore fisheries. Based on a special sampling program designed to target these seasonal fisheries, but still an admittedly small sample size, DAWR's best estimates for 1988 are 64,000 and 60,000 pounds for juvenile rabbitfish and bigeye scad, respectively. The rabbitfish harvest was exceptionally high compared to previous years (16 times as much as 1987) and the bigeye scad harvest was 50% higher than 1987.



Table IV.1.1

## Guam 1988 Annual Commercial Landings

| Species              | Records      | Pounds            | Value             | \$/lb |
|----------------------|--------------|-------------------|-------------------|-------|
| Miscellaneous        | 3            | 238.00            | 239.00            | 1.00  |
| Bigeye scad (atulai) | 18           | 1,305.50          | 2,611.00          | 2.00  |
| Jacks                | 48           | 1,215.45          | 1,649.40          | 1.36  |
| Sharks               | 1            | 19.00             | 23.75             | 1.25  |
| Bottom fish          | 104          | 3,198.25          | 6,377.22          | 1.99  |
| Ehu (red snapper)    | 7            | 82.50             | 185.62            | 2.25  |
| Gindai (flower snap) | 31           | 580.00            | 1,304.95          | 2.25  |
| Grouper              | 5            | 773.50            | 726.00            | 0.94  |
| Kalikali (pink snap) | 7            | 60.50             | 122.12            | 2.02  |
| Lehi (silverjaw)     | 3            | 97.00             | 218.25            | 2.25  |
| Onaga (red snapper)  | 19           | 910.50            | 2,272.87          | 2.50  |
| Opakapaka (pink snp) | 17           | 462.50            | 1,040.63          | 2.25  |
| Uku (gray snapper)   | 21           | 286.50            | 428.50            | 1.50  |
| Reef fish            | 262          | 7,824.20          | 15,480.90         | 1.98  |
| Rabbitfish (hitting) | 2            | 17.00             | 25.50             | 1.50  |
| Rabbitfish (menahac) | 2            | 501.00            | 708.50            | 1.41  |
| Emperor (mafute)     | 9            | 229.25            | 458.50            | 2.00  |
| Parrotfish           | 1            | 4.00              | 8.00              | 2.00  |
| Snapper              | 1            | 37.50             | 56.25             | 1.50  |
| Goatfish             | 1            | 9.50              | 14.25             | 1.50  |
| Barracuda            | 84           | 1,419.50          | 1,927.50          | 1.36  |
| Dolphin (mahimahi)   | 834          | 47,160.50         | 66,741.38         | 1.42  |
| Marlin               | 129          | 18,670.50         | 15,995.07         | 0.86  |
| Sailfish             | 15           | 1,317.00          | 1,331.62          | 1.01  |
| Rainbow runner       | 101          | 1,982.50          | 2,865.42          | 1.45  |
| Wahoo                | 679          | 25,079.50         | 44,095.20         | 1.76  |
| Skipjack tuna        | 730          | 21,953.59         | 20,301.77         | 0.92  |
| Dogtooth tuna        | 70           | 2,002.25          | 2,763.51          | 1.38  |
| Yellowfin tuna       | 505          | 22,027.50         | 37,188.88         | 1.69  |
| Lobster              | 9            | 206.00            | 595.00            | 2.89  |
| Octopus              | 4            | 45.12             | 71.81             | 1.59  |
| <b>** TOTAL **</b>   | <b>3,722</b> | <b>159,715.61</b> | <b>227,828.37</b> |       |

IV.16

Table IV.1.2

Guam January 1988 Commercial Landings

| Species            | Records | Pounds   | Value     | \$/lb |
|--------------------|---------|----------|-----------|-------|
| Jacks              | 2       | 118.00   | 131.75    | 1.12  |
| Bottom fish        | 3       | 42.00    | 84.00     | 2.00  |
| Reef fish          | 15      | 301.50   | 557.75    | 1.85  |
| Barracuda          | 12      | 235.50   | 290.53    | 1.23  |
| Dolphin (mahimahi) | 115     | 5,303.25 | 10,396.50 | 1.96  |
| Marlin             | 5       | 353.50   | 441.88    | 1.25  |
| Sailfish           | 1       | 63.00    | 78.75     | 1.25  |
| Rainbow runner     | 4       | 41.00    | 61.50     | 1.50  |
| Wahoo              | 37      | 1,027.00 | 1,903.29  | 1.85  |
| Skipjack tuna      | 37      | 693.50   | 709.88    | 1.02  |
| Dogtooth tuna      | 4       | 76.00    | 95.01     | 1.25  |
| Yellowfin tuna     | 38      | 1,465.50 | 2,667.95  | 1.82  |
| ** SUBTOTAL **     | 273     | 9,719.75 | 17,418.79 |       |

Table IV.1.3

Guam February 1988 Commercial Landings

| Species            | Records | Pounds    | Value     | \$/lb |
|--------------------|---------|-----------|-----------|-------|
| Jacks              | 1       | 35.00     | 43.75     | 1.25  |
| Bottom fish        | 1       | 6.00      | 12.00     | 2.00  |
| Reef fish          | 8       | 255.00    | 497.39    | 1.95  |
| Barracuda          | 7       | 134.50    | 175.12    | 1.30  |
| Dolphin (mahimahi) | 192     | 9,850.75  | 14,290.01 | 1.45  |
| Marlin             | 1       | 56.50     | 70.63     | 1.25  |
| Sailfish           | 1       | 11.50     | 14.37     | 1.25  |
| Rainbow runner     | 2       | 13.50     | 20.25     | 1.50  |
| Wahoo              | 45      | 1,622.00  | 3,181.51  | 1.96  |
| Skipjack tuna      | 47      | 1,073.25  | 1,073.25  | 1.00  |
| Dogtooth tuna      | 7       | 114.00    | 145.38    | 1.28  |
| Yellowfin tuna     | 29      | 914.50    | 1,647.87  | 1.80  |
| ** SUBTOTAL **     | 341     | 14,086.50 | 21,171.53 |       |

## IV.17

Table IV.1.4

## Guam March 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Bottom fish           | 3          | 127.00           | 245.75           | 1.94  |
| Reef fish             | 18         | 532.75           | 1,041.20         | 1.95  |
| Barracuda             | 5          | 88.00            | 132.00           | 1.50  |
| Dolphin (mahimahi)    | 218        | 18,607.75        | 25,411.60        | 1.37  |
| Sailfish              | 1          | 82.00            | 102.50           | 1.25  |
| Wahoo                 | 38         | 1,237.50         | 2,437.22         | 1.97  |
| Skipjack tuna         | 74         | 1,886.25         | 1,886.25         | 1.00  |
| Dogtooth tuna         | 4          | 121.00           | 181.50           | 1.50  |
| Yellowfin tuna        | 37         | 1,528.50         | 2,910.36         | 1.90  |
| Octopus               | 1          | 18.87            | 28.31            | 1.50  |
| <b>** SUBTOTAL **</b> | <b>399</b> | <b>24,229.62</b> | <b>34,376.69</b> |       |

Table IV.1.5

## Guam April 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Jacks                 | 3          | 60.00            | 80.37            | 1.34  |
| Bottom fish           | 11         | 457.00           | 1,001.85         | 2.19  |
| Gindai (flower snap)  | 1          | 19.50            | 43.87            | 2.25  |
| Uku (gray snapper)    | 5          | 85.50            | 128.25           | 1.50  |
| Reef fish             | 35         | 858.75           | 1,850.76         | 2.16  |
| Barracuda             | 3          | 52.00            | 58.00            | 1.12  |
| Dolphin (mahimahi)    | 164        | 8,512.25         | 9,406.30         | 1.11  |
| Marlin                | 6          | 868.50           | 1,085.62         | 1.25  |
| Sailfish              | 3          | 187.00           | 221.25           | 1.18  |
| Rainbow runner        | 1          | 3.50             | 5.25             | 1.50  |
| Wahoo                 | 82         | 3,199.50         | 5,662.55         | 1.77  |
| Skipjack tuna         | 60         | 1,962.00         | 1,967.00         | 1.00  |
| Dogtooth tuna         | 6          | 122.50           | 183.75           | 1.50  |
| Yellowfin tuna        | 47         | 1,522.00         | 2,972.72         | 1.95  |
| Octopus               | 1          | 18.00            | 27.00            | 1.50  |
| <b>** SUBTOTAL **</b> | <b>428</b> | <b>17,928.00</b> | <b>24,694.54</b> |       |



## IV.18

Table IV.1.6

## Guam May 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Bigeye scad (atulai)  | 2          | 19.00            | 38.00            | 2.00  |
| Jacks                 | 6          | 73.00            | 109.50           | 1.50  |
| Bottom fish           | 8          | 139.00           | 251.00           | 1.81  |
| Gindai (flower snap)  | 3          | 102.50           | 230.62           | 2.25  |
| Onaga (red snapper)   | 3          | 135.00           | 334.12           | 2.47  |
| Opakapaka (pink snp)  | 2          | 6.50             | 14.62            | 2.25  |
| Uku (gray snapper)    | 2          | 12.00            | 18.00            | 1.50  |
| Reef fish             | 51         | 1,253.70         | 2,484.80         | 1.98  |
| Rabbitfish (hitting)  | 1          | 11.00            | 16.50            | 1.50  |
| Rabbitfish (menahac)  | 2          | 501.00           | 708.50           | 1.41  |
| Emperor (mafute)      | 5          | 164.75           | 329.50           | 2.00  |
| Goatfish              | 1          | 9.50             | 14.25            | 1.50  |
| Barracuda             | 8          | 195.00           | 292.50           | 1.50  |
| Dolphin (mahimahi)    | 101        | 4,042.75         | 5,871.62         | 1.45  |
| Marlin                | 13         | 1,979.00         | 2,201.88         | 1.11  |
| Sailfish              | 1          | 81.00            | 81.00            | 1.00  |
| Rainbow runner        | 6          | 87.00            | 130.50           | 1.50  |
| Wahoo                 | 36         | 846.00           | 1,414.01         | 1.67  |
| Skipjack tuna         | 84         | 1,979.50         | 1,912.75         | 0.97  |
| Dogtooth tuna         | 7          | 239.50           | 359.25           | 1.50  |
| Yellowfin tuna        | 58         | 2,273.50         | 3,457.99         | 1.52  |
| Lobster               | 2          | 54.00            | 139.00           | 2.57  |
| Octopus               | 2          | 8.25             | 16.50            | 2.00  |
| <b>** SUBTOTAL **</b> | <b>404</b> | <b>14,212.45</b> | <b>20,426.41</b> |       |

Table IV.1.7

## Guam June 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Bigeye scad (atulai)  | 3          | 56.00            | 112.00           | 2.00  |
| Jacks                 | 11         | 168.45           | 222.67           | 1.32  |
| Bottom fish           | 18         | 426.00           | 825.00           | 1.94  |
| Ehu (red snapper)     | 1          | 4.00             | 9.00             | 2.25  |
| Gindai (flower snap)  | 6          | 171.50           | 385.87           | 2.25  |
| Grouper               | 1          | 208.00           | 156.00           | 0.75  |
| Kalikali (pink snap)  | 2          | 13.00            | 26.00            | 2.00  |
| Lehi (silverjaw)      | 1          | 18.00            | 40.50            | 2.25  |
| Onaga (red snapper)   | 3          | 175.50           | 438.75           | 2.50  |
| Opakapaka (pink snp)  | 6          | 113.00           | 254.26           | 2.25  |
| Uku (gray snapper)    | 4          | 54.50            | 81.75            | 1.50  |
| Reef fish             | 24         | 886.50           | 1,760.25         | 1.99  |
| Rabbitfish (hitting)  | 1          | 6.00             | 9.00             | 1.50  |
| Snapper               | 1          | 37.50            | 56.25            | 1.50  |
| Barracuda             | 10         | 160.50           | 199.86           | 1.25  |
| Dolphin (mahimahi)    | 12         | 243.25           | 364.88           | 1.50  |
| Marlin                | 19         | 3,262.00         | 2,927.03         | 0.90  |
| Sailfish              | 2          | 601.00           | 601.00           | 1.00  |
| Rainbow runner        | 11         | 333.00           | 452.81           | 1.36  |
| Wahoo                 | 38         | 888.00           | 1,506.52         | 1.70  |
| Skipjack tuna         | 68         | 2,749.50         | 2,910.13         | 1.06  |
| Dogtooth tuna         | 10         | 321.25           | 462.13           | 1.44  |
| Yellowfin tuna        | 52         | 2,282.00         | 3,877.00         | 1.70  |
| Lobster               | 1          | 59.00            | 177.00           | 3.00  |
| <b>** SUBTOTAL **</b> | <b>305</b> | <b>13,237.45</b> | <b>17,855.66</b> |       |

## IV.20

Table IV.1.8

Guam July 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Jacks                | 6       | 255.00    | 352.25    | 1.38  |
| Bottom fish          | 16      | 740.00    | 1,459.50  | 1.97  |
| Ehu (red snapper)    | 1       | 8.00      | 18.00     | 2.25  |
| Gindai (flower snap) | 5       | 65.00     | 146.25    | 2.25  |
| Grouper              | 1       | 4.50      | 9.00      | 2.00  |
| Kalikali (pink snap) | 2       | 25.00     | 50.00     | 2.00  |
| Onaga (red snapper)  | 3       | 93.50     | 233.75    | 2.50  |
| Opakapaka (pink snp) | 4       | 187.00    | 420.75    | 2.25  |
| Uku (gray snapper)   | 7       | 114.00    | 169.75    | 1.49  |
| Reef fish            | 17      | 494.00    | 891.25    | 1.80  |
| Emperor (mafute)     | 1       | 5.00      | 10.00     | 2.00  |
| Barracuda            | 7       | 118.50    | 154.25    | 1.30  |
| Dolphin (mahimahi)   | 3       | 21.00     | 42.00     | 2.00  |
| Marlin               | 30      | 3,379.00  | 2,798.26  | 0.83  |
| Sailfish             | 2       | 74.00     | 70.50     | 0.95  |
| Rainbow runner       | 12      | 354.00    | 508.38    | 1.44  |
| Wahoo                | 48      | 1,324.50  | 2,432.16  | 1.84  |
| Skipjack tuna        | 107     | 3,445.15  | 2,773.52  | 0.81  |
| Dogtooth tuna        | 9       | 347.50    | 474.88    | 1.37  |
| Yellowfin tuna       | 67      | 3,293.50  | 5,058.92  | 1.54  |
| ** SUBTOTAL **       | 348     | 14,348.15 | 18,073.37 |       |



Table IV.1.9

Guam August 1988 Commercial Landings

| Species              | Records | Pounds    | Value     | \$/lb |
|----------------------|---------|-----------|-----------|-------|
| Miscellaneous        | 2       | 126.00    | 127.00    | 1.01  |
| Bigeye scad (atulai) | 1       | 62.00     | 124.00    | 2.00  |
| Jacks                | 5       | 118.50    | 159.25    | 1.34  |
| Sharks               | 1       | 19.00     | 23.75     | 1.25  |
| Bottom fish          | 11      | 293.50    | 570.12    | 1.94  |
| Ehu (red snapper)    | 2       | 44.00     | 99.00     | 2.25  |
| Gindai (flower snap) | 4       | 82.00     | 184.49    | 2.25  |
| Grouper              | 1       | 303.50    | 303.50    | 1.00  |
| Kalikali (pink snap) | 2       | 18.00     | 36.00     | 2.00  |
| Lehi (silverjaw)     | 1       | 17.00     | 38.25     | 2.25  |
| Onaga (red snapper)  | 2       | 216.00    | 540.00    | 2.50  |
| Opakapaka (pink snp) | 1       | 47.50     | 106.87    | 2.25  |
| Uku (gray snapper)   | 1       | 4.50      | 6.75      | 1.50  |
| Reef fish            | 38      | 1,535.50  | 3,042.50  | 1.98  |
| Barracuda            | 6       | 55.50     | 65.49     | 1.18  |
| Dolphin (mahimahi)   | 2       | 9.00      | 18.00     | 2.00  |
| Marlin               | 24      | 4,242.25  | 2,081.22  | 0.49  |
| Sailfish             | 1       | 82.00     | 41.00     | 0.50  |
| Rainbow runner       | 15      | 205.00    | 267.74    | 1.31  |
| Wahoo                | 51      | 2,108.25  | 3,758.65  | 1.78  |
| Skipjack tuna        | 69      | 2,204.00  | 1,759.35  | 0.80  |
| Dogtooth tuna        | 7       | 253.00    | 257.87    | 1.02  |
| Yellowfin tuna       | 49      | 2,277.75  | 2,976.93  | 1.31  |
| Lobster              | 1       | 56.00     | 168.00    | 3.00  |
| ** SUBTOTAL **       | 297     | 14,379.75 | 16,755.73 |       |

## IV.22

Table IV.1.10

Guam September 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Bigeye scad (atulai)  | 3          | 316.00           | 632.00           | 2.00  |
| Jacks                 | 9          | 208.50           | 286.49           | 1.37  |
| Bottom fish           | 15         | 432.25           | 864.50           | 2.00  |
| Ehu (red snapper)     | 1          | 9.00             | 20.25            | 2.25  |
| Gindai (flower snap)  | 8          | 97.00            | 218.24           | 2.25  |
| Lehi (silverjaw)      | 1          | 62.00            | 139.50           | 2.25  |
| Onaga (red snapper)   | 5          | 134.50           | 336.25           | 2.50  |
| Opakapaka (pink snp)  | 3          | 72.00            | 162.00           | 2.25  |
| Uku (gray snapper)    | 1          | 4.00             | 6.00             | 1.50  |
| Reef fish             | 18         | 616.50           | 1,221.00         | 1.98  |
| Barracuda             | 5          | 59.50            | 89.25            | 1.50  |
| Dolphin (mahimahi)    | 1          | 138.00           | 138.00           | 1.00  |
| Marlin                | 17         | 2,579.25         | 2,438.05         | 0.95  |
| Sailfish              | 1          | 66.00            | 49.50            | 0.75  |
| Rainbow runner        | 10         | 157.00           | 233.12           | 1.48  |
| Wahoo                 | 33         | 1,928.25         | 3,606.48         | 1.87  |
| Skipjack tuna         | 54         | 1,834.50         | 1,657.75         | 0.90  |
| Dogtooth tuna         | 2          | 42.00            | 31.50            | 0.75  |
| Yellowfin tuna        | 31         | 1,331.50         | 2,563.98         | 1.93  |
| <b>** SUBTOTAL **</b> | <b>218</b> | <b>10,087.75</b> | <b>14,693.86</b> |       |

## IV.23

Table IV.1.11

## Guam October 1988 Commercial Landings

| Species               | Records    | Pounds           | Value            | \$/lb |
|-----------------------|------------|------------------|------------------|-------|
| Miscellaneous         | 1          | 112.00           | 112.00           | 1.00  |
| Bigeye scad (atulai)  | 9          | 852.50           | 1,705.00         | 2.00  |
| Jacks                 | 2          | 137.00           | 205.50           | 1.50  |
| Bottom fish           | 14         | 438.50           | 869.50           | 1.98  |
| Ehu (red snapper)     | 1          | 15.00            | 33.75            | 2.25  |
| Gindai (flower snap)  | 4          | 42.50            | 95.61            | 2.25  |
| Grouper               | 2          | 257.50           | 257.50           | 1.00  |
| Kalikali (pink snap)  | 1          | 4.50             | 10.12            | 2.25  |
| Onaga (red snapper)   | 2          | 130.50           | 326.25           | 2.50  |
| Opakapaka (pink snp)  | 1          | 36.50            | 82.13            | 2.25  |
| Uku (gray snapper)    | 1          | 12.00            | 18.00            | 1.50  |
| Reef fish             | 20         | 677.00           | 1,352.00         | 2.00  |
| Barracuda             | 8          | 97.50            | 136.00           | 1.39  |
| Dolphin (mahimahi)    | 10         | 171.50           | 343.00           | 2.00  |
| Marlin                | 6          | 1,035.50         | 1,035.50         | 1.00  |
| Sailfish              | 2          | 69.50            | 71.75            | 1.03  |
| Rainbow runner        | 14         | 343.50           | 515.25           | 1.50  |
| Wahoo                 | 72         | 2,980.50         | 5,468.44         | 1.83  |
| Skipjack tuna         | 79         | 2,490.94         | 2,150.68         | 0.86  |
| Dogtooth tuna         | 9          | 284.00           | 449.99           | 1.58  |
| Yellowfin tuna        | 45         | 2,400.50         | 4,500.60         | 1.87  |
| Lobster               | 5          | 37.00            | 111.00           | 3.00  |
| <b>** SUBTOTAL **</b> | <b>308</b> | <b>12,625.94</b> | <b>19,849.57</b> |       |



## IV.24

Table IV.1.12

## Guam November 1988 Commercial Landings

| Species            | Records | Pounds   | Value     | \$/lb |
|--------------------|---------|----------|-----------|-------|
| Bottom fish        | 2       | 53.00    | 106.00    | 2.00  |
| Reef fish          | 10      | 161.00   | 316.25    | 1.96  |
| Parrotfish         | 1       | 4.00     | 8.00      | 2.00  |
| Barracuda          | 5       | 96.50    | 144.75    | 1.50  |
| Dolphin (mahimahi) | 10      | 151.00   | 266.98    | 1.77  |
| Marlin             | 4       | 412.00   | 412.00    | 1.00  |
| Rainbow runner     | 14      | 270.00   | 408.12    | 1.51  |
| Wahoo              | 114     | 4,636.25 | 7,200.44  | 1.55  |
| Skipjack tuna      | 25      | 1,024.50 | 897.09    | 0.88  |
| Dogtooth tuna      | 2       | 31.00    | 46.50     | 1.50  |
| Yellowfin tuna     | 30      | 1,913.00 | 3,104.35  | 1.62  |
| ** SUBTOTAL **     | 217     | 8,752.25 | 12,910.48 |       |

Table IV.1.13

## Guam December 1988 Commercial Landings

| Species             | Records | Pounds     | Value      | \$/lb |
|---------------------|---------|------------|------------|-------|
| Jacks               | 3       | 42.00      | 57.87      | 1.38  |
| Bottom fish         | 2       | 44.00      | 88.00      | 2.00  |
| Ehu (red snapper)   | 1       | 2.50       | 5.62       | 2.25  |
| Onaga (red snapper) | 1       | 25.50      | 63.75      | 2.50  |
| Reef fish           | 8       | 252.00     | 465.75     | 1.85  |
| Emperor (mafute)    | 3       | 59.50      | 119.00     | 2.00  |
| Barracuda           | 8       | 126.50     | 189.75     | 1.50  |
| Dolphin (mahimahi)  | 6       | 110.00     | 192.49     | 1.75  |
| Marlin              | 4       | 503.00     | 503.00     | 1.00  |
| Rainbow runner      | 12      | 175.00     | 262.50     | 1.50  |
| Wahoo               | 85      | 3,281.75   | 5,523.93   | 1.68  |
| Skipjack tuna       | 26      | 610.50     | 604.12     | 0.99  |
| Dogtooth tuna       | 3       | 50.50      | 75.75      | 1.50  |
| Yellowfin tuna      | 22      | 825.25     | 1,450.21   | 1.76  |
| ** SUBTOTAL **      | 184     | 6,108.00   | 9,601.74   |       |
| ** TOTAL **         | 3,722   | 159,715.61 | 227,828.37 |       |

# IV.25

Figure IV.1.1

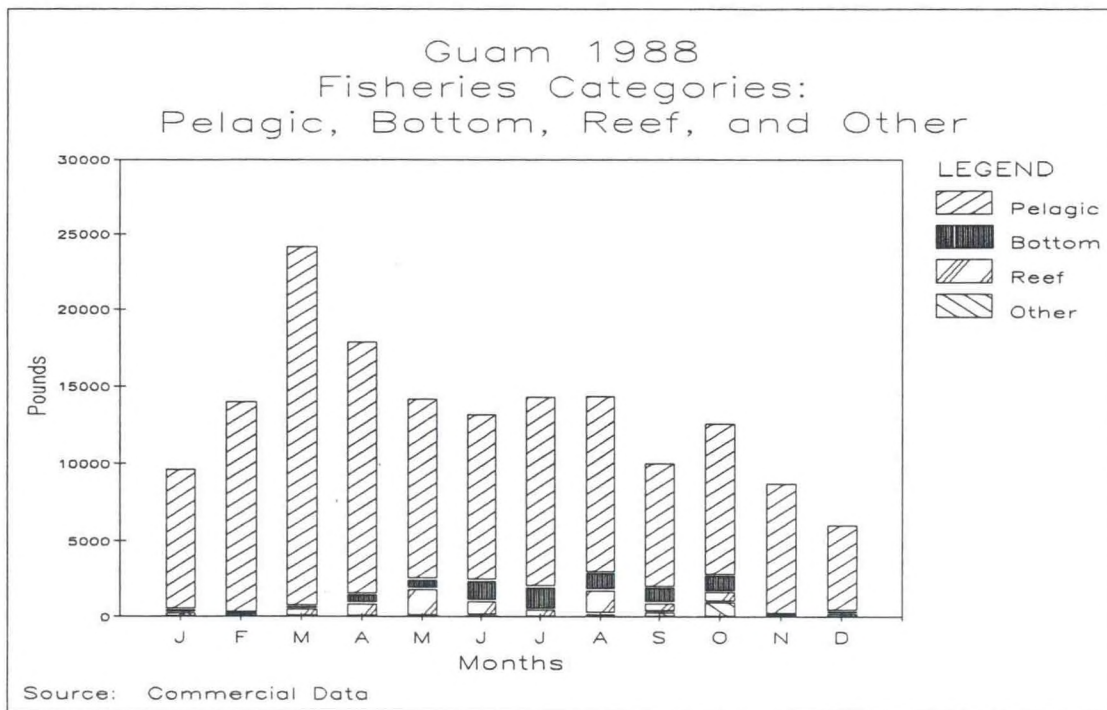
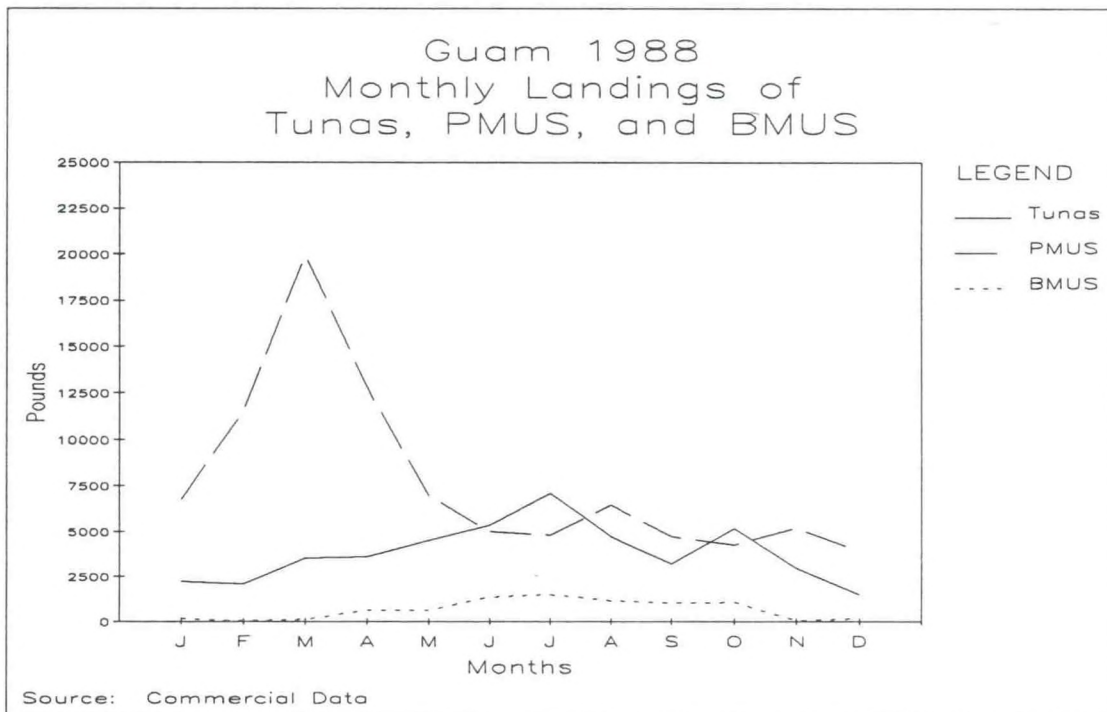


Figure IV.1.2



IV.26

Figure IV.1.3

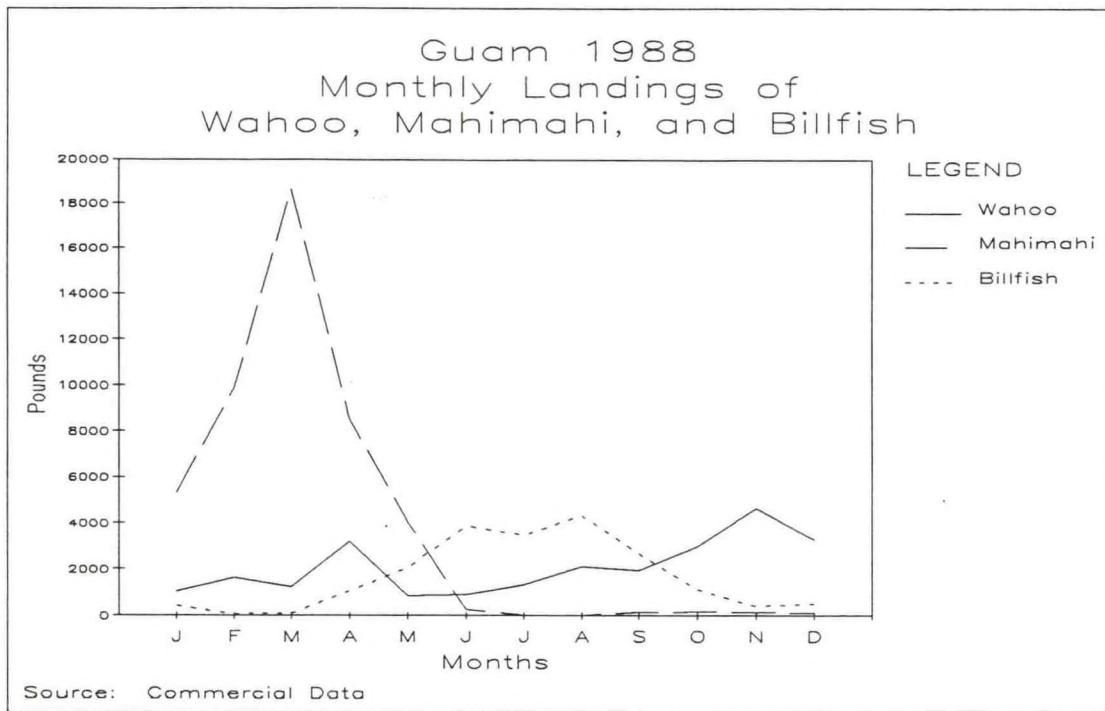
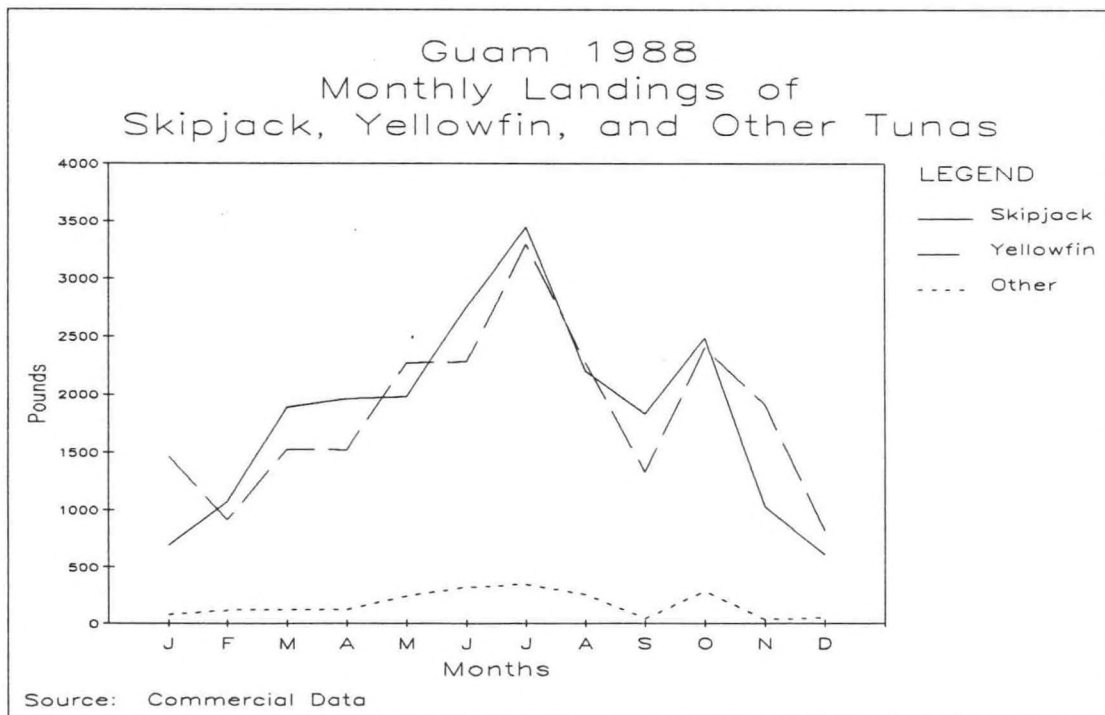


Figure IV.1.4





IV.27

Figure IV.2.1

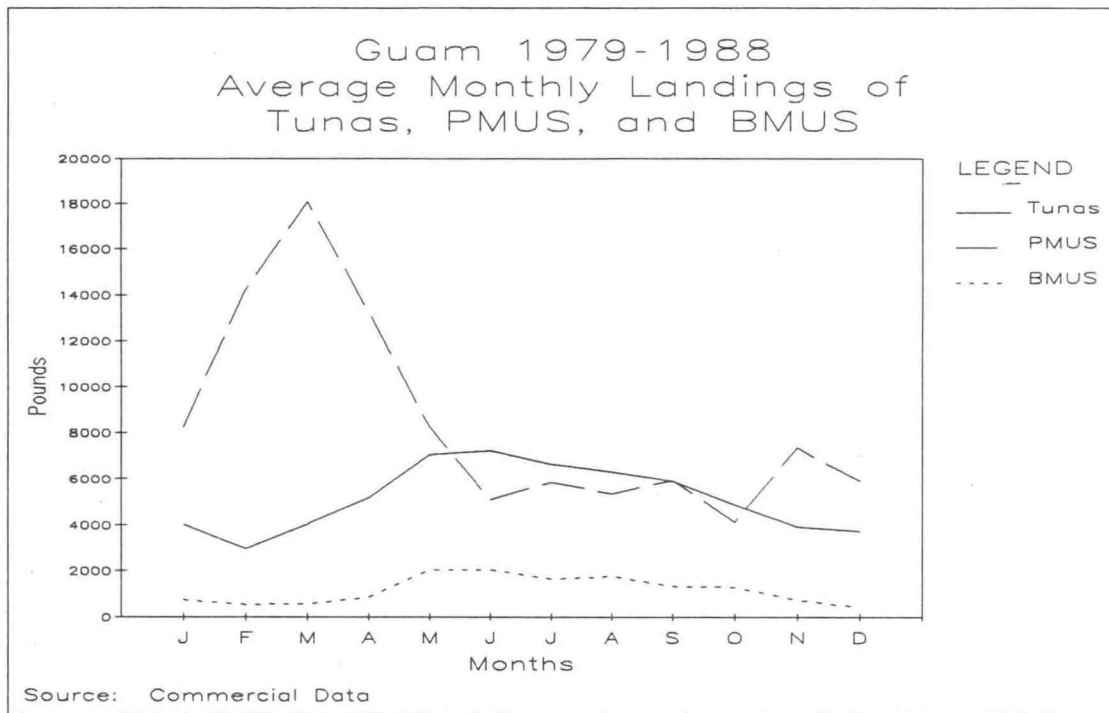
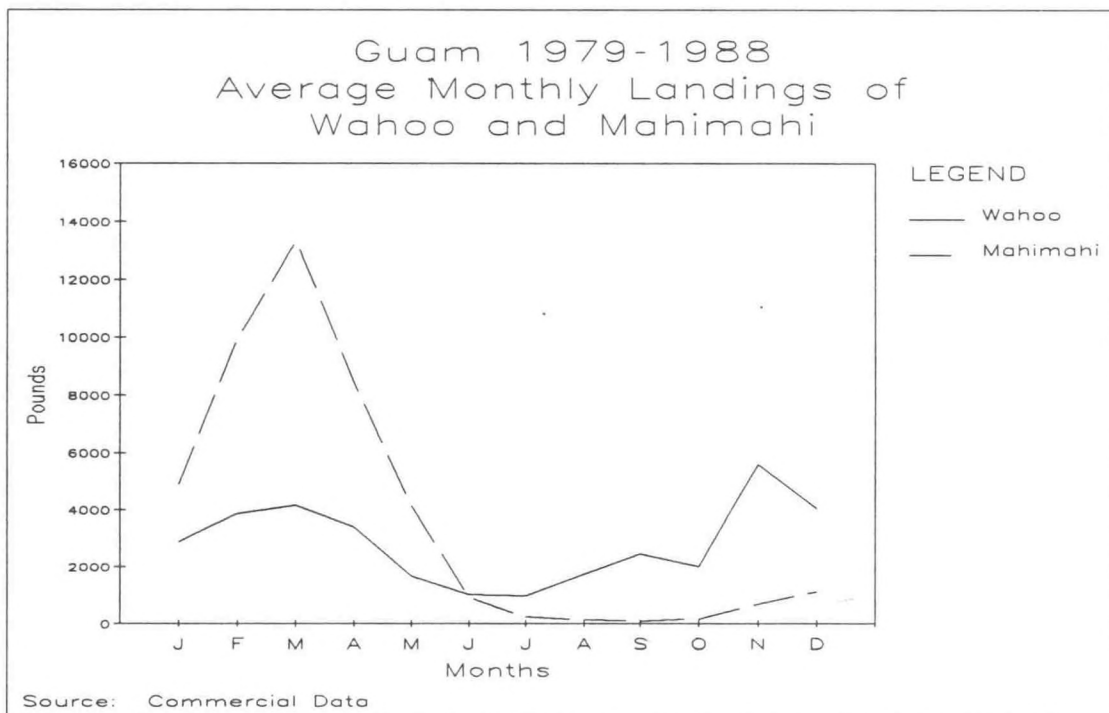


Figure IV.2.2



# IV.28

Figure IV.2.3

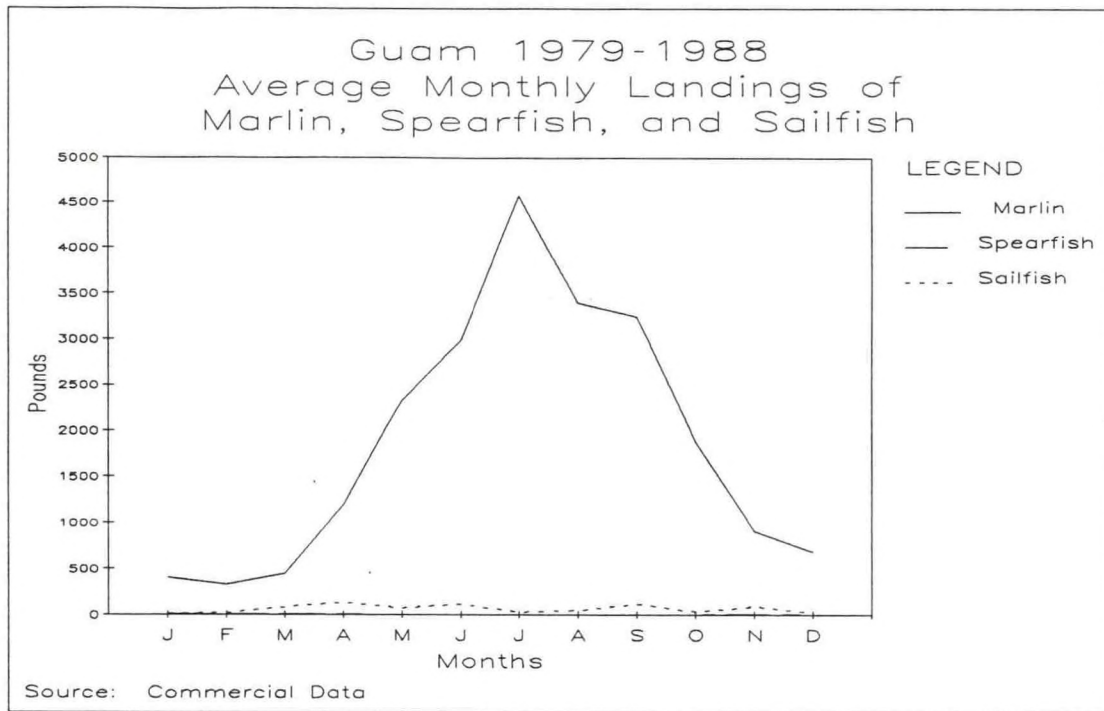
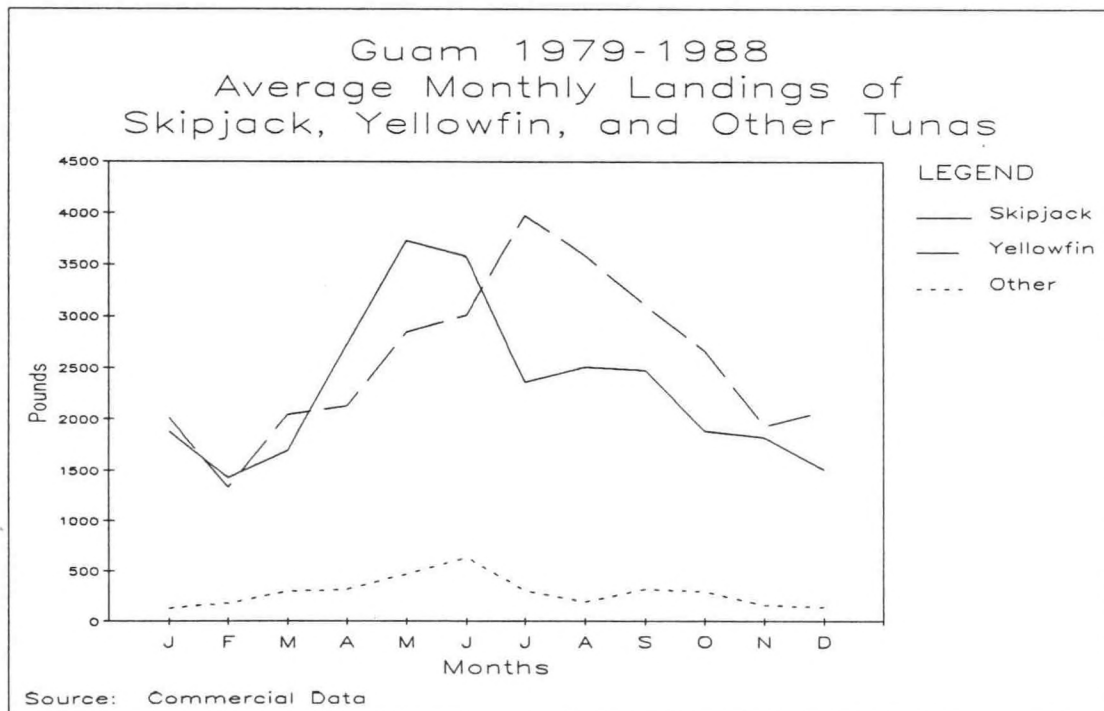


Figure IV.2.4



# IV.29

Figure IV.2.5

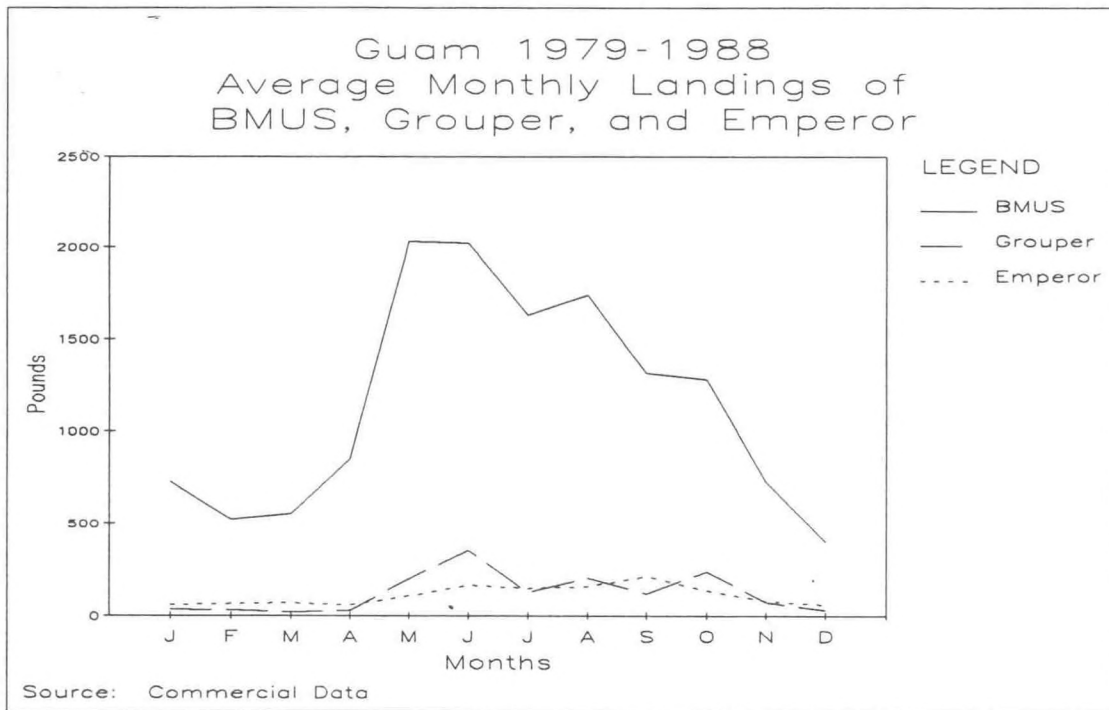
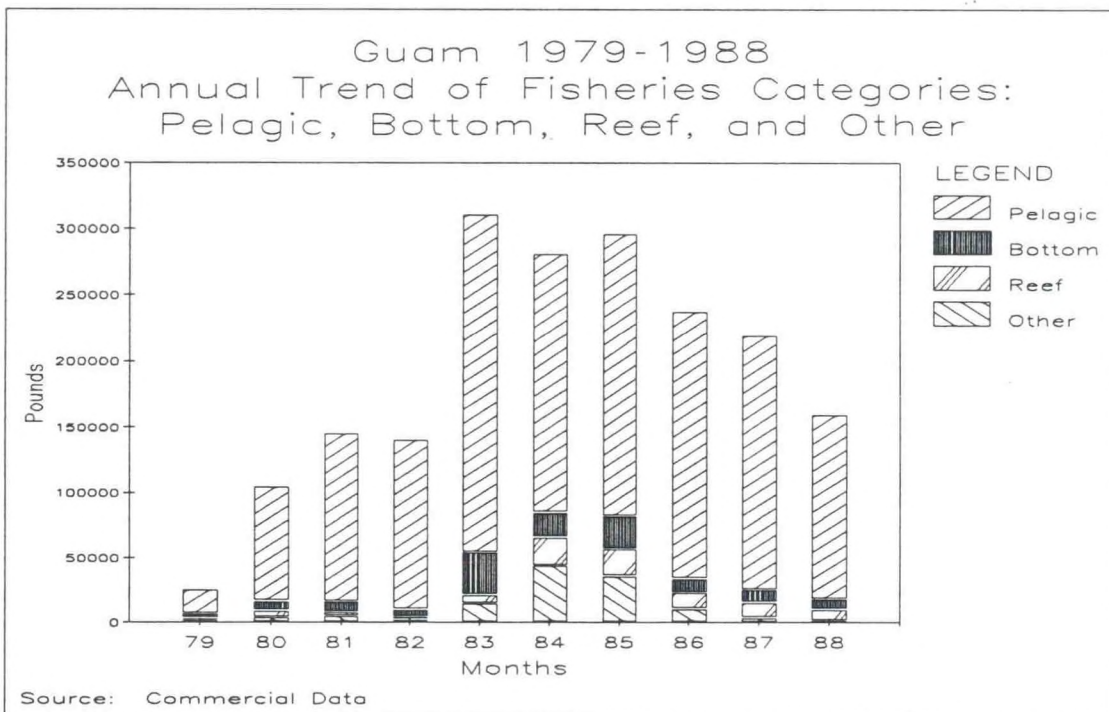


Figure IV.3.1





# IV.30

Figure IV.3.2

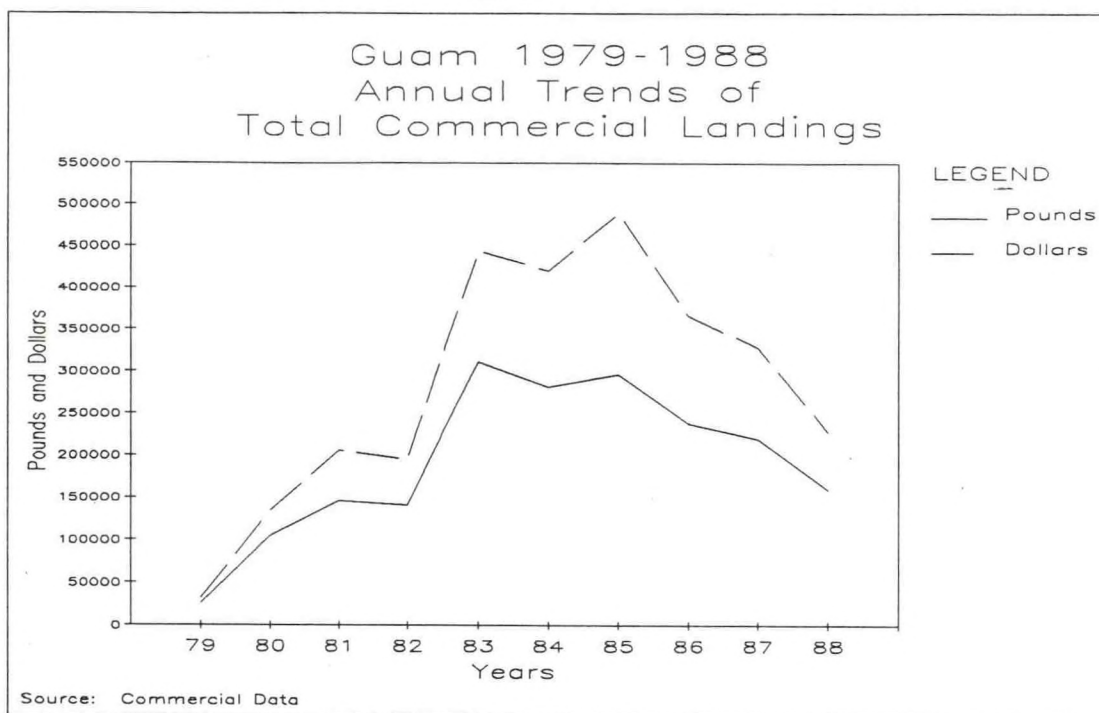


Figure IV.3.3

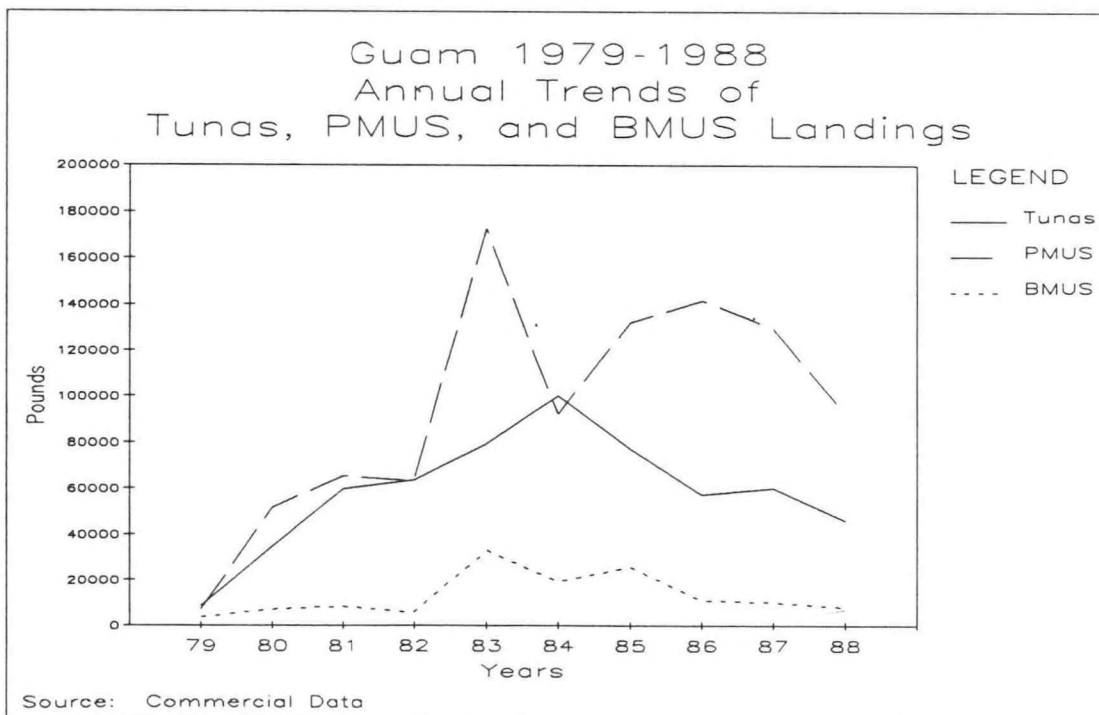


Figure IV.3.4

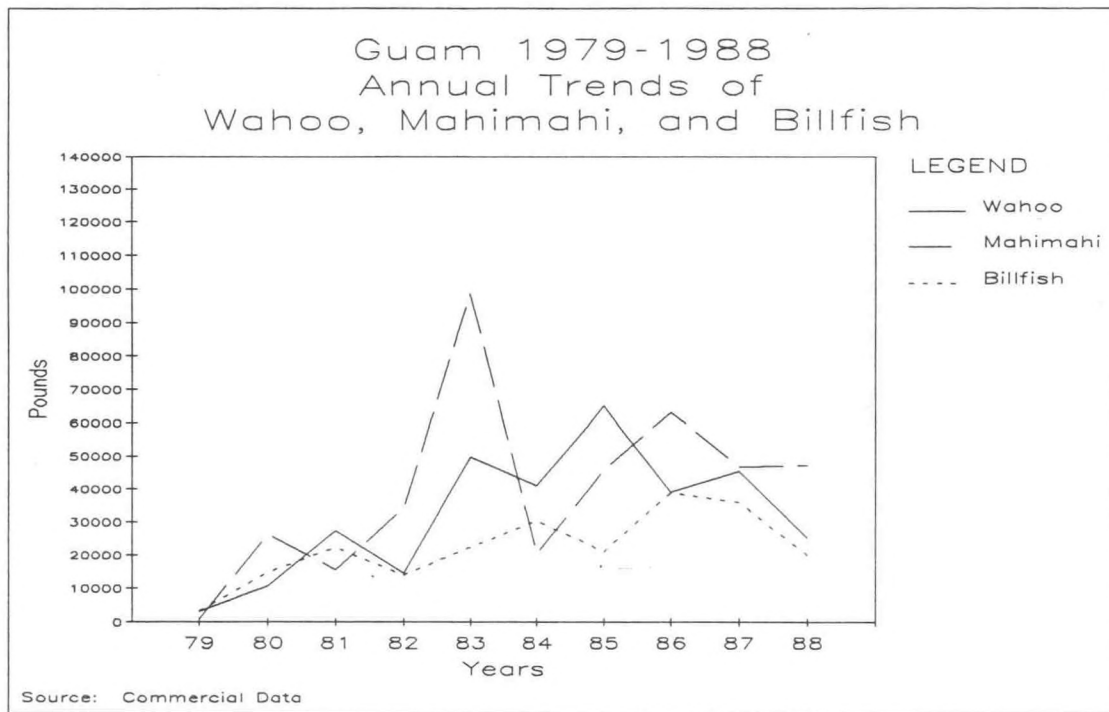
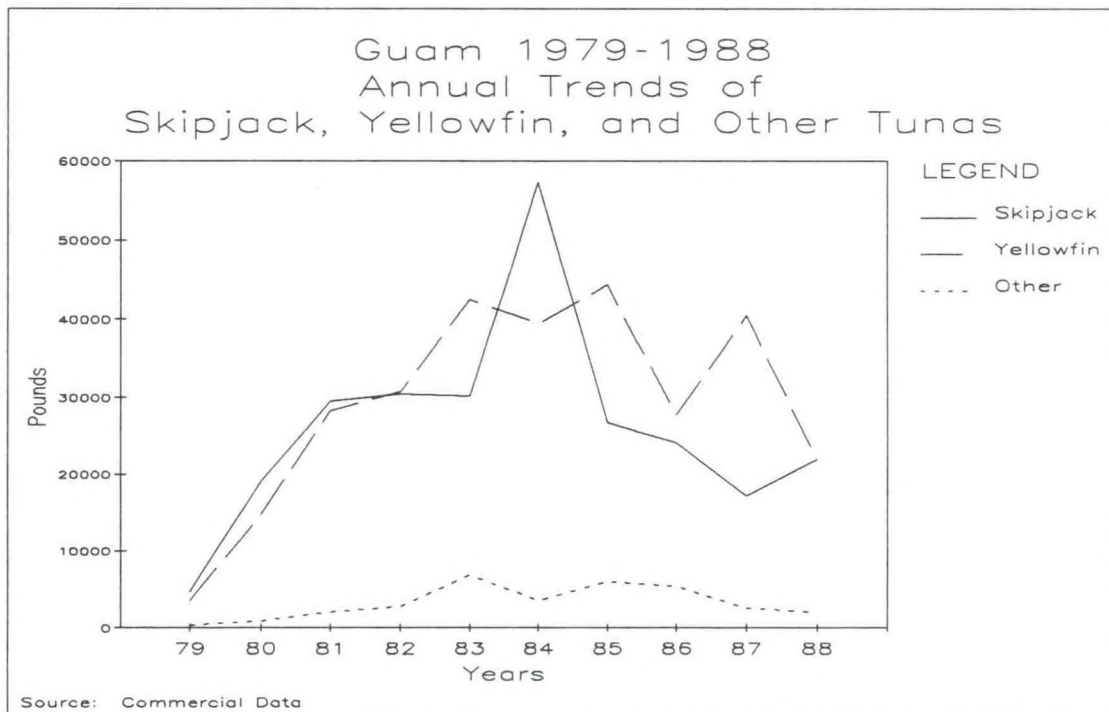


Figure IV.3.5



IV.32

Figure IV.4.1

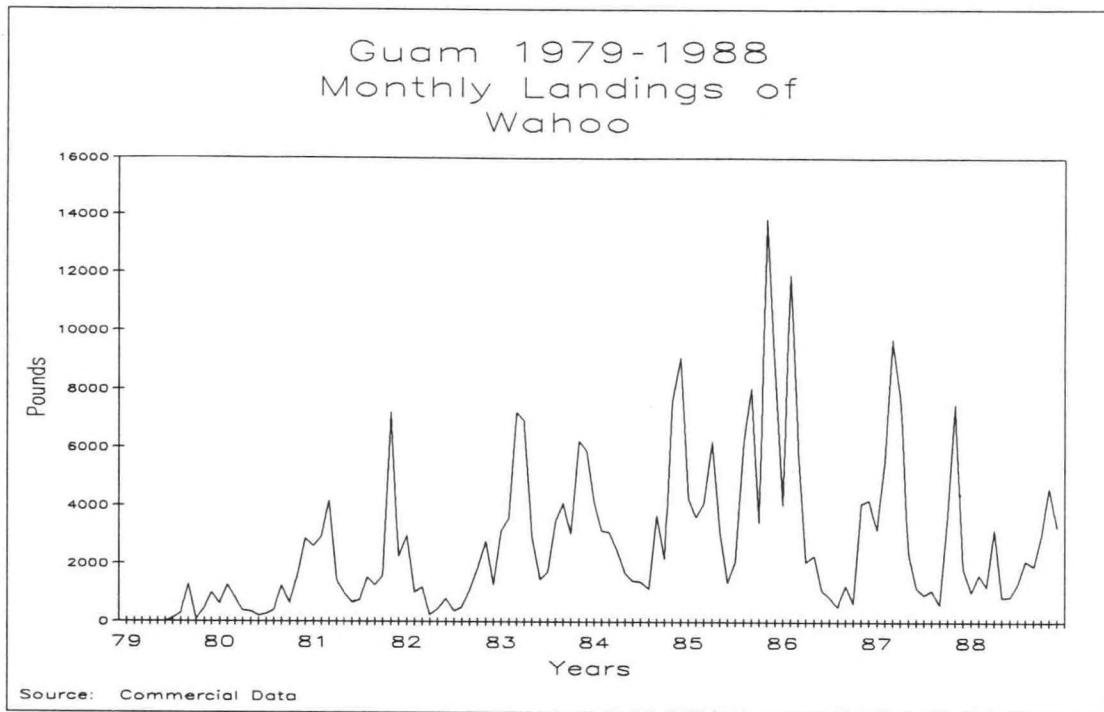
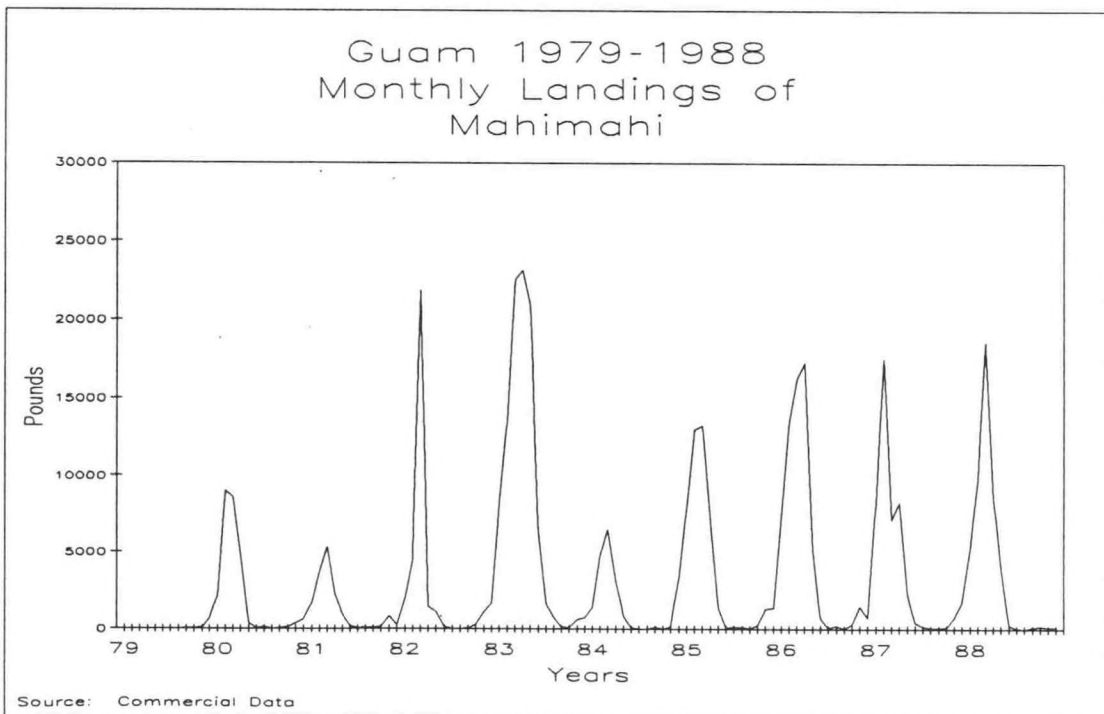


Figure IV.4.2





IV.33

Figure IV.4.3

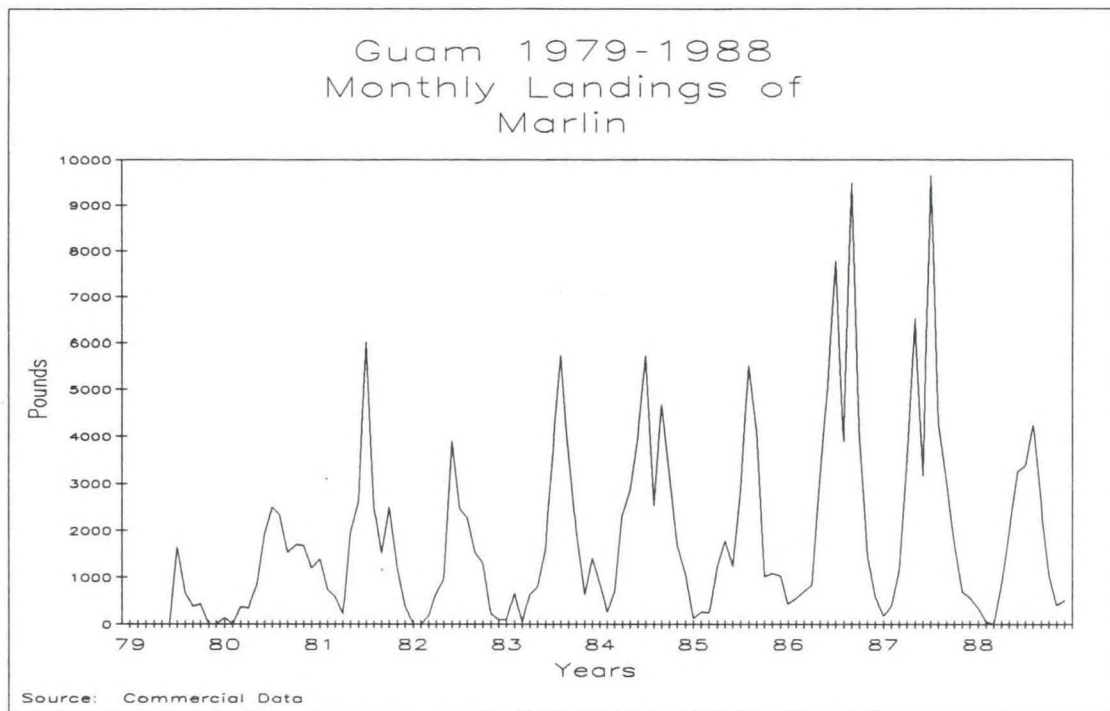


Figure IV.4.4

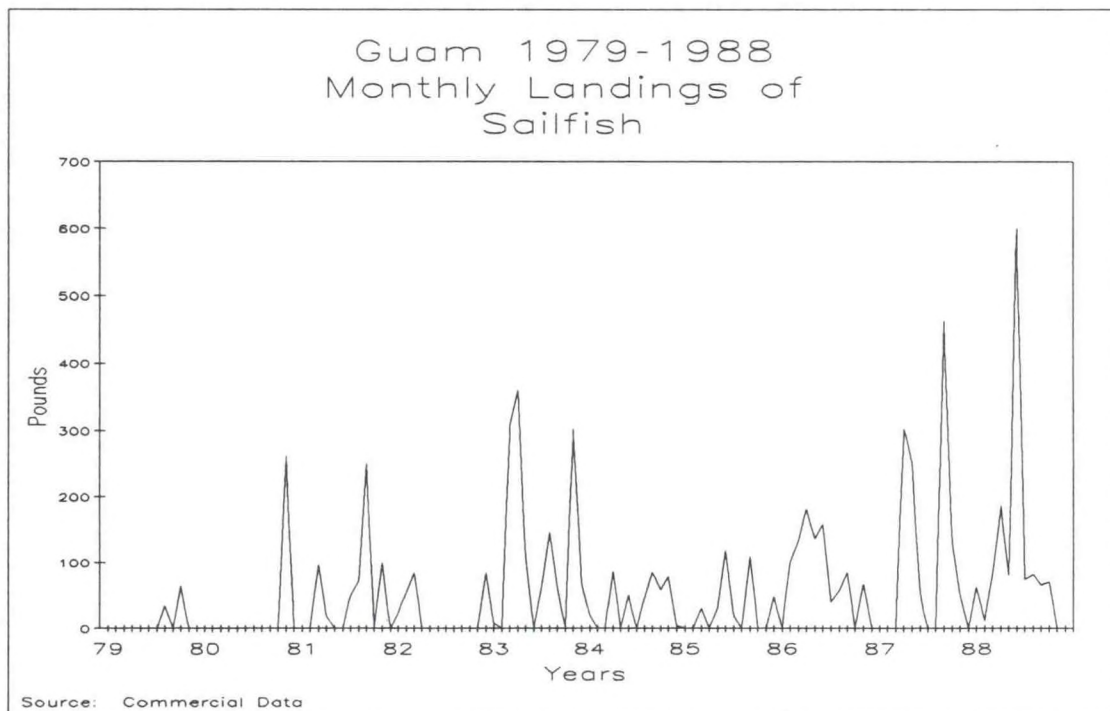


Figure IV.4.5

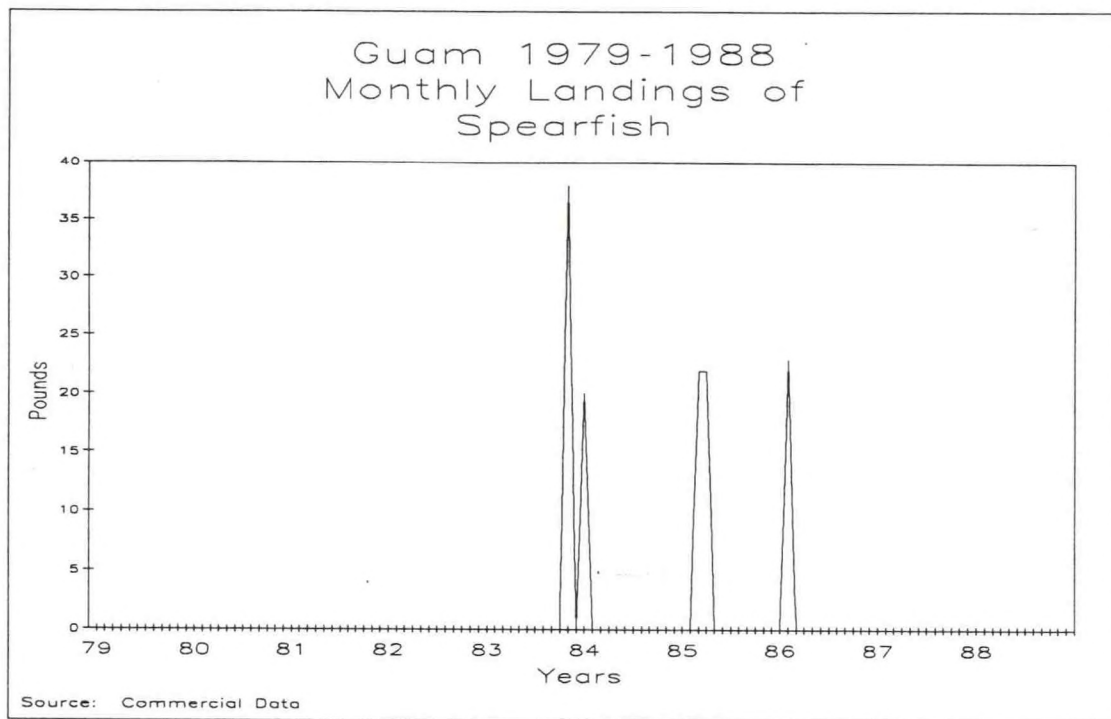
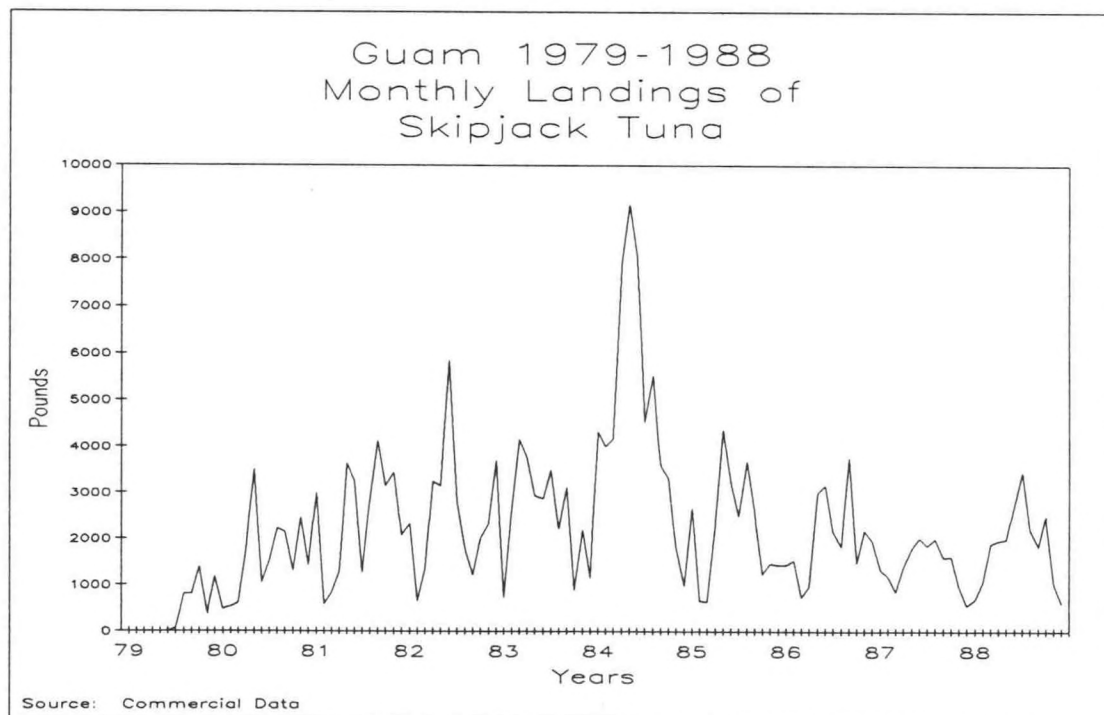


Figure IV.4.6



IV.35

Figure IV.4.7

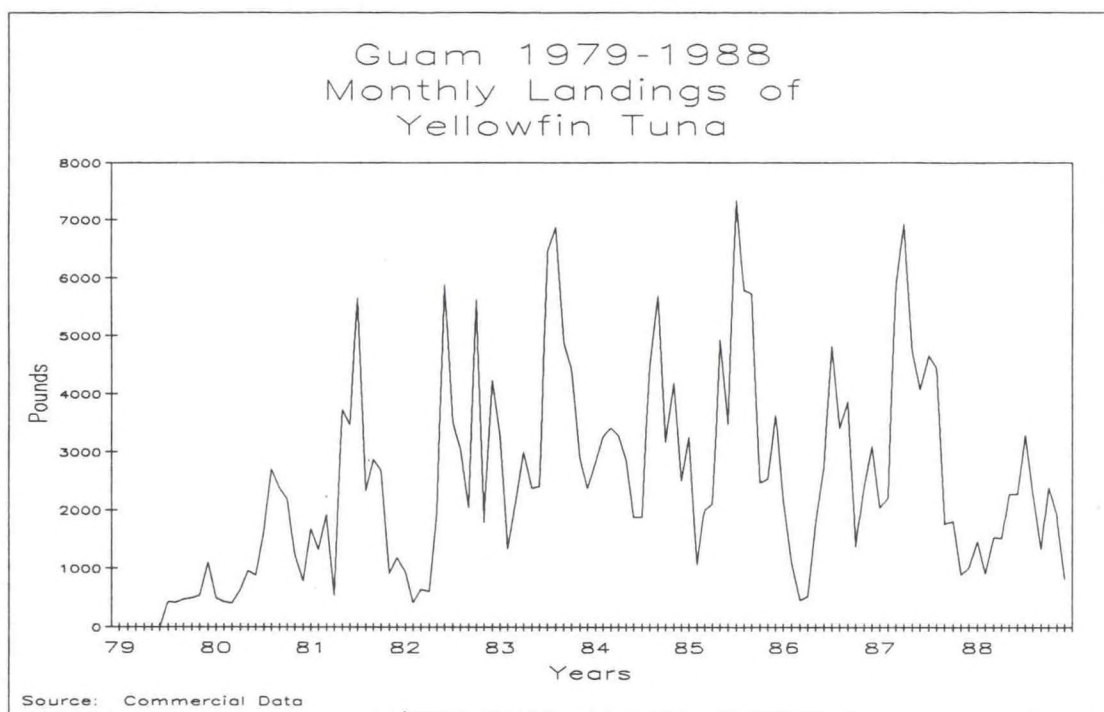


Figure IV.4.8

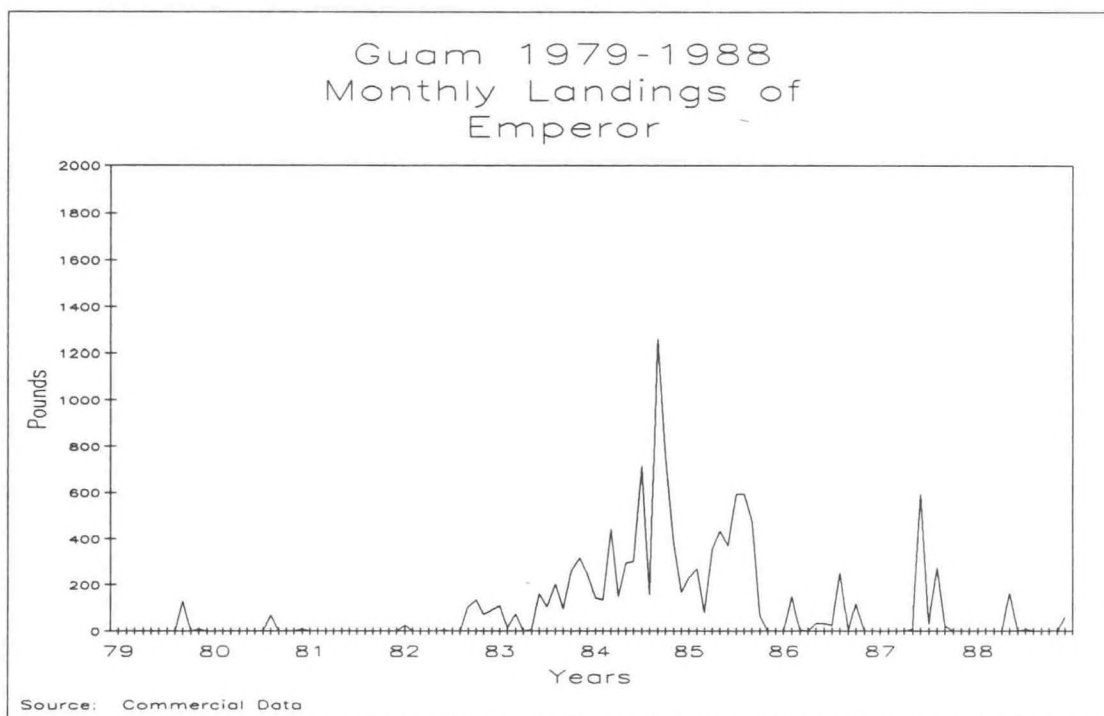
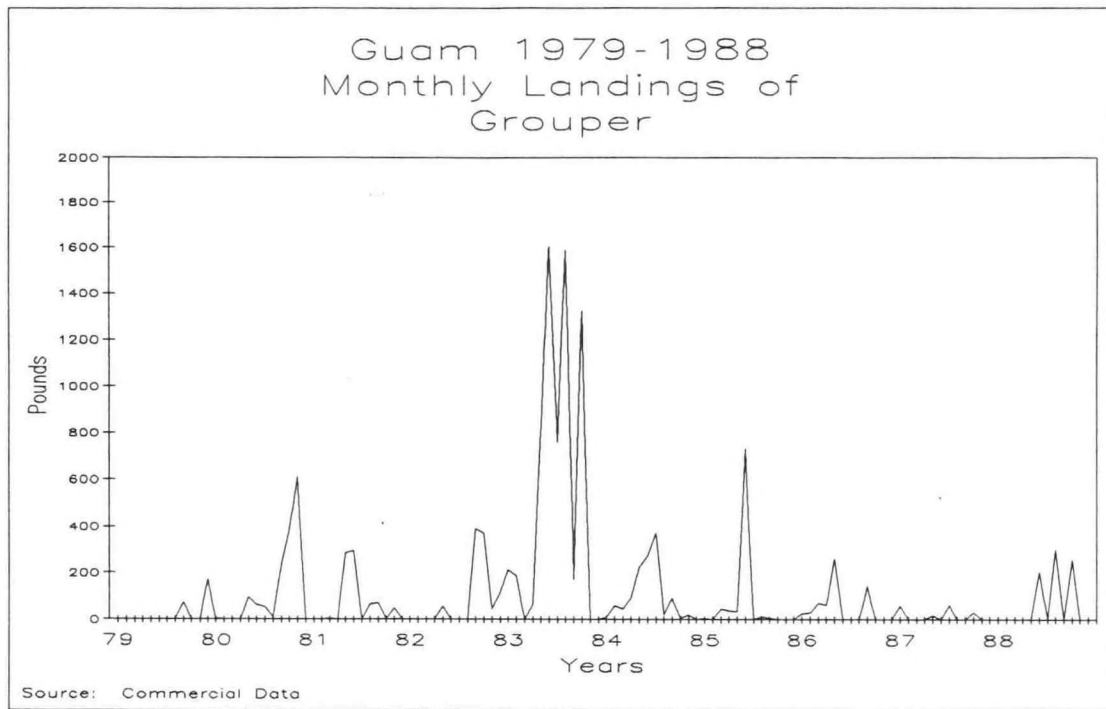




Figure IV.4.9



## IV.37

Table IV.2.1

Guam DAWR 1988 Annual  
Offshore Creel Survey Expansion Summary

| Gear          | Catch    | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV |
|---------------|----------|----|----------|----|----------|----|----------|----|----------|----|------|----|
| Trolling      | 772884.2 | 13 | 58874.0  | 7  | 12454.2  | 6  | 213487.6 | 7  | 45645.6  | 7  | 12.0 | 10 |
| Bottom fish   | 53729.4  | 19 | 10043.6  | 14 | 2605.5   | 12 | 27786.1  | 14 | 7503.7   | 13 | 4.8  | 8  |
| Atulai jig    | 13084.9  | 57 | 998.7    | 47 | 220.6    | 49 | 2454.0   | 49 | 553.7    | 51 | 13.6 | 25 |
| Spear snorkel | 16327.2  | 30 | 1309.1   | 26 | 505.3    | 21 | 3621.7   | 29 | 1378.8   | 24 | 13.8 | 40 |
| Spear scuba   | 7859.5   | 34 | 500.7    | 25 | 314.8    | 26 | 1037.9   | 28 | 708.9    | 31 | 14.8 | 59 |
| Other         | 1708.1   | 48 | 236.5    | 39 | 116.7    | 41 | 565.6    | 39 | 267.0    | 40 | 6.8  | 47 |
| Total:        | 865593.3 | 12 | 71962.7  | 6  | 13825.7  | 6  | 248952.9 | 6  | 49180.3  | 6  | 11.2 | 8  |

Table IV.2.2

Guam DAWR Annual 1988  
Offshore Creel Survey Species Composition

| Common Name             | Total all gears | % all gears | % this trolling | % this gear | % this bottom | % this gear | % this other | % this gear |
|-------------------------|-----------------|-------------|-----------------|-------------|---------------|-------------|--------------|-------------|
| Sharks                  | 6325.5          | 0.73        | 3745.4          | 0.48        | 1811.3        | 3.37        | 768.8        | 1.97        |
| Rays                    | 1584.7          | 0.18        | 0               | 0           | 1584.7        | 2.95        | 0            | 0           |
| Moray eels              | 637.0           | 0.07        | 0               | 0           | 0             | 0           | 637.0        | 1.63        |
| Conger eels             | 370.8           | 0.04        | 0               | 0           | 370.8         | 0.69        | 0            | 0           |
| Lizardfish              | 31.1            | 0           | 0               | 0           | 31.1          | 0.06        | 0            | 0           |
| Bearfish                | 39.6            | 0           | 0               | 0           | 39.6          | 0.07        | 0            | 0           |
| Needlefish              | 129.1           | 0.01        | 129.1           | 0.02        | 0             | 0           | 0            | 0           |
| Squirrelfish            | 1716.8          | 0.20        | 0               | 0           | 1259.6        | 2.34        | 457.3        | 1.17        |
| Scorpionfish            | 111.0           | 0.01        | 0               | 0           | 56.5          | 0.11        | 54.6         | 0.14        |
| Grouper                 | 7295.8          | 0.84        | 0               | 0           | 6701.9        | 12.47       | 593.9        | 1.52        |
| Flagtails               | 5.8             | 0           | 0               | 0           | 0             | 0           | 5.8          | 0.01        |
| Bigeyes                 | 40.7            | 0           | 0               | 0           | 35.9          | 0.07        | 4.8          | 0.01        |
| Cardinalfish            | 12.7            | 0           | 0               | 0           | 12.7          | 0.02        | 0            | 0           |
| False whiting           | 23.1            | 0           | 0               | 0           | 23.1          | 0.04        | 0            | 0           |
| Jacks                   | 8366.8          | 0.97        | 1398.6          | 0.18        | 6052.0        | 11.26       | 916.2        | 2.35        |
| Rainbow runner          | 11200.2         | 1.29        | 10753.2         | 1.39        | 411.1         | 0.77        | 35.8         | 0.09        |
| Bigeye scad (akule)     | 12976.1         | 1.50        | 0               | 0           | 0             | 0           | 12976.1      | 33.29       |
| Dolphinfish (mahimahi)  | 310032.1        | 35.82       | 310032.1        | 40.11       | 0             | 0           | 0            | 0           |
| Pomfret                 | 215.5           | 0.02        | 0               | 0           | 215.5         | 0.40        | 0            | 0           |
| Snappers                | 2950.5          | 0.34        | 182.2           | 0.02        | 2501.7        | 4.66        | 266.7        | 0.68        |
| Lehi (silvermouth)      | 1728.2          | 0.20        | 0               | 0           | 1728.2        | 3.22        | 0            | 0           |
| Uku (jobfish)           | 4023.2          | 0.46        | 104.2           | 0.01        | 3569.2        | 6.64        | 349.8        | 0.90        |
| Ehu (pink snapper)      | 2108.2          | 0.24        | 0               | 0           | 2108.2        | 3.92        | 0            | 0           |
| Onaga (red snapper)     | 1147.3          | 0.13        | 0               | 0           | 1147.3        | 2.14        | 0            | 0           |
| Blue lined snapper      | 1164.2          | 0.13        | 0               | 0           | 1125.3        | 2.09        | 39.0         | 0.10        |
| Yellowtail kalikali     | 1442.7          | 0.17        | 0               | 0           | 1442.7        | 2.69        | 0            | 0           |
| Opakapaka (pink snap)   | 264.6           | 0.03        | 0               | 0           | 264.6         | 0.49        | 0            | 0           |
| Yelloweye opakapaka     | 730.2           | 0.08        | 0               | 0           | 730.2         | 1.36        | 0            | 0           |
| Kalikali (pink snapper) | 66.6            | 0.01        | 0               | 0           | 66.6          | 0.12        | 0            | 0           |
| Gindai (flower snapper) | 1667.7          | 0.19        | 0               | 0           | 1667.7        | 3.10        | 0            | 0           |
| Sweetlips               | 254.9           | 0.03        | 0               | 0           | 34.1          | 0.06        | 220.8        | 0.57        |
| Emperors                | 12082.4         | 1.40        | 0               | 0           | 11799.6       | 21.96       | 282.8        | 0.73        |
| Goatfish                | 1087.8          | 0.13        | 0               | 0           | 710.4         | 1.32        | 377.4        | 0.97        |
| Sweepers                | 4.9             | 0           | 0               | 0           | 0             | 0           | 4.9          | 0.01        |
| Rudderfish              | 974.2           | 0.11        | 0               | 0           | 0             | 0           | 974.2        | 2.50        |

## IV.38

Table IV.2.2 (cont.)

| Common<br>Name        | Total all<br>gears | % all<br>gears | % this<br>trolling gear | % this<br>bottom gear | % this<br>other gear |
|-----------------------|--------------------|----------------|-------------------------|-----------------------|----------------------|
| Butterflyfish         | 2.4                | 0              | 0                       | 0                     | 2.4 0.01             |
| Angelfish             | 3.5                | 0              | 0                       | 0                     | 3.5 0.01             |
| Hawkfish              | 1.9                | 0              | 0                       | 1.9 0                 | 0 0                  |
| Mullet                | 7.8                | 0              | 0                       | 0                     | 7.8 0.02             |
| Barracuda             | 5614.9             | 0.65           | 5126.9 0.66             | 488.1 0.91            | 0 0                  |
| Wrasse                | 1649.3             | 0.19           | 0 0                     | 465.6 0.87            | 1183.8 3.04          |
| Parrotfish            | 6912.2             | 0.80           | 0 0                     | 0 0                   | 6912.2 17.73         |
| Surgeonfish and tangs | 4738.2             | 0.55           | 0 0                     | 115.4 0.21            | 4622.8 11.86         |
| Rabbitfish            | 126.1              | 0.01           | 0 0                     | 0 0                   | 126.1 0.32           |
| Tunas                 | 16.7               | 0              | 16.7 0                  | 0 0                   | 0 0                  |
| Wahoo                 | 99801.1            | 11.53          | 99801.1 12.91           | 0 0                   | 0 0                  |
| Kawakawa              | 3497.0             | 0.40           | 3497.0 0.45             | 0 0                   | 0 0                  |
| Dogtooth tuna         | 5963.8             | 0.69           | 4331.7 0.56             | 1632.1 3.04           | 0 0                  |
| Skipjack tuna         | 184837.7           | 21.35          | 184837.7 23.92          | 0 0                   | 0 0                  |
| Yellowfin tuna        | 77433.5            | 8.95           | 77315.6 10.00           | 117.9 0.22            | 0 0                  |
| Sailfish              | 1145.1             | 0.13           | 1145.1 0.15             | 0 0                   | 0 0                  |
| Blue marlin           | 68510.9            | 7.91           | 68510.9 8.86            | 0 0                   | 0 0                  |
| Shortbill spearfish   | 1957.0             | 0.23           | 1957.0 0.25             | 0 0                   | 0 0                  |
| Flounder              | 2.7                | 0              | 0 0                     | 0 0                   | 2.7 0.01             |
| Triggerfish           | 738.4              | 0.09           | 0 0                     | 738.4 1.37            | 0 0                  |
| Triplettooth puffers  | 31.7               | 0              | 0 0                     | 31.7 0.06             | 0 0                  |
| Assorted bottom fish  | 538.8              | 0.06           | 0 0                     | 538.8 1.00            | 0 0                  |
| Shallow bottom fish   | 1362.8             | 0.16           | 0 0                     | 1362.8 2.54           | 0 0                  |
| Deep bottom fish      | 735.3              | 0.08           | 0 0                     | 735.3 1.37            | 0 0                  |
| Assorted reef fish    | 3654.2             | 0.42           | 0 0                     | 0 0                   | 3654.2 9.37          |
| Mollusks              | 2356.6             | 0.27           | 0 0                     | 0 0                   | 2356.6 6.05          |
| Squid                 | 7.0                | 0              | 0 0                     | 0 0                   | 7.0 0.02             |
| Octopus               | 172.2              | 0.02           | 0 0                     | 0 0                   | 172.2 0.44           |
| Spiny lobsters        | 776.8              | 0.09           | 0 0                     | 0 0                   | 776.8 1.99           |
| Slipper lobsters      | 53.8               | 0.01           | 0 0                     | 0 0                   | 53.8 0.14            |
| Crabs                 | 131.8              | 0.02           | 0 0                     | 0 0                   | 131.8 0.34           |
| Total all species:    | 865593.3           | 100.00         | 772884.2 89.29          | 53729.4 6.21          | 38979.7 4.50         |



## IV.39

Table IV.3.1

Guam DAWR January 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV |
|---------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|----|
| Trolling      | 12727.7 | 42 | 2664.5   | 11 | 575.9    | 14 | 13555.7  | 2  | 3014.2   | 17 | 4.5  | 29 |
| Bottom fish   | 363.0   | 66 | 101.8    | 76 | 24.5     | 66 | 147.1    | 66 | 47.2     | 71 | 5.3  | 0* |
| Spear snorkel | 2092.5  | 95 | 23.8     | 95 | 11.9     | 95 | 47.5     | 95 | 23.8     | 95 | 88.1 | 0* |
| Total:        | 15183.2 | 34 | 2790.0   | 12 | 564.2    | 13 | 13750.3  | 2  | 2956.0   | 16 | 6.0  | 24 |

Table IV.3.2

Guam DAWR February 1988  
Offshore Creel Survey Expansion Summary

| Gear        | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV |
|-------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|----|
| Trolling    | 85277.1 | 14 | 6318.9   | 6  | 1470.0   | 9  | 27264.5  | 6  | 6411.7   | 9  | 13.5 | 13 |
| Bottom fish | 231.9   | 88 | 87.9     | 88 | 35.2     | 88 | 197.8    | 88 | 79.1     | 88 | 2.6  | 0* |
| Total:      | 85509.1 | 14 | 6406.8   | 5  | 1470.8   | 9  | 27462.3  | 5  | 6414.4   | 9  | 13.3 | 13 |

Table IV.3.3

Guam DAWR March 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch    | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV  |
|---------------|----------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling      | 170942.6 | 30 | 8119.7   | 32 | 1515.8   | 32 | 30384.2  | 30 | 5679.7   | 30 | 20.7 | 16  |
| Bottom fish   | 355.9    | 62 | 219.9    | 40 | 73.3     | 36 | 600.9    | 48 | 195.6    | 42 | 2.0  | 38* |
| Spear snorkel | 174.8    | 95 | 39.3     | 95 | 34.9     | 95 | 39.3     | 95 | 34.9     | 95 | 4.4  | 0*  |
| Other         | 700.6    | 95 | 43.7     | 95 | 17.5     | 95 | 131.0    | 95 | 52.4     | 95 | 16.0 | 0*  |
| Total:        | 172173.8 | 30 | 8422.5   | 31 | 1527.9   | 29 | 31155.3  | 30 | 5677.1   | 28 | 19.7 | 13  |

\* Not enough data to properly compute Coefficient of Variation (CV).

## IV.40

Table IV.3.4

Guam DAWR April 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch    | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV |
|---------------|----------|----|----------|----|----------|----|----------|----|----------|----|------|----|
| Trolling      | 103968.8 | 9  | 6249.4   | 6  | 1157.6   | 6  | 22367.4  | 10 | 4117.4   | 2  | 17.8 | 8  |
| Bottom fish   | 9696.0   | 39 | 1602.4   | 40 | 375.0    | 23 | 3972.0   | 39 | 900.8    | 18 | 5.8  | 8  |
| Spear snorkel | 21.8     | 89 | 12.0     | 89 | 20.8     | 89 | 23.9     | 89 | 41.6     | 89 | 1.8  | 0* |
| Spear scuba   | 509.6    | 89 | 52.1     | 89 | 20.8     | 89 | 52.1     | 89 | 20.8     | 89 | 9.8  | 0* |
| Total:        | 114196.2 | 11 | 7915.8   | 4  | 1204.9   | 8  | 26415.4  | 5  | 4148.5   | 4  | 15.2 | 12 |

Table IV.3.5

Guam DAWR May 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV |
|---------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|----|
| Trolling      | 71868.9 | 53 | 4690.7   | 29 | 938.1    | 24 | 14879.9  | 30 | 3021.5   | 25 | 12.6 | 31 |
| Bottom fish   | 3672.6  | 29 | 1108.8   | 31 | 242.1    | 22 | 2946.8   | 9  | 713.0    | 12 | 3.6  | 16 |
| Atulai jig    | 0       | 0  | 78.1     | 89 | 7.8      | 89 | 156.3    | 89 | 15.6     | 89 | 0    | 0* |
| Spear snorkel | 3710.1  | 68 | 417.2    | 58 | 125.4    | 50 | 1117.8   | 69 | 325.1    | 63 | 8.6  | 40 |
| Spear scuba   | 1715.1  | 71 | 76.1     | 27 | 41.7     | 43 | 147.4    | 45 | 92.3     | 58 | 25.5 | 3* |
| Total:        | 80966.7 | 50 | 6370.9   | 30 | 1079.0   | 20 | 19248.1  | 28 | 3594.7   | 19 | 10.5 | 22 |

Table IV.3.6

Guam DAWR June 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV   |
|---------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|------|
| Trolling      | 31548.1 | 40 | 2658.2   | 23 | 699.6    | 18 | 10535.1  | 20 | 2764.9   | 16 | 13.3 | 52   |
| Bottom fish   | 3852.3  | 38 | 660.9    | 21 | 218.5    | 28 | 1811.3   | 18 | 590.6    | 24 | 6.1  | 41*  |
| Atulai jig    | 228.7   | 87 | 53.2     | 87 | 13.3     | 87 | 106.4    | 87 | 26.6     | 87 | 4.3  | 0*   |
| Spear snorkel | 1136.9  | 63 | 91.6     | 56 | 61.9     | 37 | 255.2    | 53 | 206.4    | 46 | 13.7 | 108* |
| Spear scuba   | 382.5   | 42 | 78.5     | 54 | 63.3     | 53 | 134.7    | 57 | 111.6    | 56 | 6.4  | 66*  |
| Total:        | 37148.5 | 39 | 3542.5   | 18 | 834.8    | 17 | 12842.7  | 15 | 2801.5   | 20 | 10.6 | 31   |

\* Not enough data to properly compute Coefficient of Variation (CV).

## IV.41

Table IV.3.7

Guam DAWR July 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch    | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV |
|---------------|----------|----|----------|----|----------|----|----------|----|----------|----|------|----|
| Trolling      | 90521.3  | 28 | 5325.7   | 7  | 1143.5   | 5  | 18027.9  | 2  | 3891.2   | 3  | 17.4 | 22 |
| Bottom fish   | 7887.1   | 24 | 2270.4   | 21 | 518.8    | 10 | 5915.3   | 13 | 1363.2   | 7  | 3.7  | 26 |
| Spear snorkel | 584.1    | 75 | 177.3    | 66 | 77.0     | 74 | 565.1    | 67 | 249.9    | 75 | 3.6  | 0* |
| Spear scuba   | 1876.0   | 95 | 77.1     | 91 | 52.5     | 78 | 157.3    | 89 | 115.1    | 74 | 12.7 | 0* |
| Other         | 350.4    | 77 | 80.5     | 67 | 38.5     | 74 | 226.6    | 69 | 101.3    | 72 | 3.9  | 0* |
| Total:        | 101218.9 | 28 | 7931.0   | 9  | 1427.5   | 10 | 24892.1  | 1  | 4712.5   | 3  | 13.7 | 18 |

Table IV.3.8

Guam DAWR August 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV   |
|---------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|------|
| Trolling      | 79915.0 | 36 | 6306.8   | 12 | 1326.1   | 13 | 16446.4  | 19 | 4619.1   | 16 | 13.2 | 38   |
| Bottom fish   | 7422.3  | 62 | 979.5    | 43 | 283.4    | 29 | 3556.2   | 36 | 1260.7   | 33 | 5.3  | 20   |
| Atulai jig    | 116.6   | 82 | 3.3      | 82 | 6.6      | 82 | 9.9      | 82 | 19.8     | 82 | 35.3 | 0*   |
| Spear snorkel | 5381.7  | 50 | 353.6    | 14 | 92.6     | 3  | 1094.0   | 15 | 284.4    | 5  | 16.5 | 39   |
| Spear scuba   | 1512.4  | 36 | 93.6     | 46 | 73.6     | 64 | 280.6    | 60 | 238.5    | 73 | 18.3 | 73*  |
| Other         | 562.8   | 60 | 105.5    | 65 | 53.0     | 64 | 176.9    | 49 | 87.0     | 45 | 5.8  | 145* |
| Total:        | 94910.8 | 29 | 7842.3   | 11 | 1625.1   | 12 | 21564.0  | 17 | 5561.5   | 15 | 13.0 | 26   |

Table IV.3.9

Guam DAWR September 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV  |
|---------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling      | 32328.0 | 29 | 3692.7   | 30 | 692.8    | 30 | 12523.7  | 26 | 2364.0   | 27 | 8.9  | 48* |
| Bottom fish   | 5612.1  | 51 | 1033.5   | 43 | 275.4    | 39 | 3355.0   | 45 | 886.8    | 40 | 5.0  | 24* |
| Atulai jig    | 1580.2  | 88 | 57.7     | 88 | 11.5     | 88 | 230.8    | 88 | 46.2     | 88 | 27.4 | 0*  |
| Spear snorkel | 916.4   | 65 | 78.7     | 51 | 44.9     | 48 | 253.3    | 43 | 146.3    | 40 | 9.6  | 73* |
| Total:        | 40436.7 | 28 | 4862.5   | 26 | 834.8    | 28 | 16362.8  | 23 | 2901.6   | 26 | 8.3  | 30* |

\* Not enough data to properly compute Coefficient of Variation (CV).



## IV.42

Table IV.3.10

Guam DAWR October 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV  |
|---------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling      | 19165.0 | 31 | 3003.7   | 19 | 849.6    | 17 | 10655.1  | 25 | 2990.1   | 23 | 6.4  | 10  |
| Bottom fish   | 6186.5  | 25 | 974.3    | 19 | 253.0    | 25 | 2607.8   | 17 | 667.8    | 19 | 6.2  | 25* |
| Atulai jig    | 10851.8 | 47 | 763.2    | 25 | 164.9    | 38 | 1850.3   | 35 | 405.6    | 47 | 13.8 | 20  |
| Spear snorkel | 664.8   | 90 | 56.9     | 90 | 19.0     | 90 | 56.9     | 90 | 19.0     | 90 | 11.7 | 0*  |
| Total:        | 36868.2 | 27 | 4798.1   | 12 | 1035.7   | 19 | 15170.1  | 20 | 3391.7   | 23 | 7.9  | 22  |

Table IV.3.11

Guam DAWR November 1988  
Offshore Creel Survey Expansion Summary

| Gear          | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV   |
|---------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|------|
| Trolling      | 41167.3 | 19 | 4984.3   | 9  | 1103.5   | 11 | 16625.4  | 15 | 3728.4   | 19 | 8.9  | 35   |
| Bottom fish   | 4531.2  | 32 | 480.8    | 18 | 123.0    | 13 | 1199.3   | 27 | 304.9    | 23 | 10.5 | 73*  |
| Atulai jig    | 0       | 0  | 26.3     | 90 | 8.8      | 90 | 52.6     | 90 | 17.5     | 90 | 0    | 0*   |
| Spear snorkel | 176.0   | 90 | 26.3     | 90 | 8.8      | 90 | 26.3     | 90 | 8.8      | 90 | 6.7  | 0*   |
| Spear scuba   | 1092.5  | 74 | 91.6     | 12 | 45.8     | 12 | 196.1    | 30 | 98.0     | 30 | 10.8 | 108* |
| Total:        | 46967.0 | 17 | 5609.4   | 10 | 1144.7   | 11 | 18099.7  | 15 | 3795.2   | 19 | 9.4  | 33   |

Table IV.3.12

Guam DAWR December 1988  
Offshore Creel Survey Expansion Summary

| Gear        | Catch   | CV | Boat Hrs | CV | Boat Cnt | CV | Prsn Hrs | CV | Prsn Cnt | CV | Cpue | CV  |
|-------------|---------|----|----------|----|----------|----|----------|----|----------|----|------|-----|
| Trolling    | 29758.4 | 42 | 4533.5   | 18 | 921.6    | 9  | 14424.4  | 20 | 2915.8   | 15 | 6.0  | 33  |
| Bottom fish | 1142.2  | 65 | 309.4    | 61 | 139.7    | 62 | 753.6    | 60 | 369.3    | 66 | 2.9  | 62* |
| Total:      | 30900.7 | 42 | 4842.9   | 20 | 980.6    | 12 | 15178.0  | 21 | 3037.1   | 16 | 5.9  | 32  |

\* Not enough data to properly compute Coefficient of Variation (CV).

## IV.43

Table IV.4.1

Guam DAWR January 1988  
Offshore Creel Survey Species Composition

| Common Name            | Total all gears | % all gears | % this trolling | % this gear | % this bottom | % this gear | other  | % this gear |
|------------------------|-----------------|-------------|-----------------|-------------|---------------|-------------|--------|-------------|
| Sharks                 | 622.7           | 4.10        | 0               | 0           | 0             | 0           | 622.7  | 29.76       |
| Needlefish             | 63.4            | 0.42        | 63.4            | 0.50        | 0             | 0           | 0      | 0           |
| Squirrelfish           | 66.4            | 0.44        | 0               | 0           | 66.4          | 18.29       | 0      | 0           |
| Grouper                | 48.5            | 0.32        | 0               | 0           | 48.5          | 13.37       | 0      | 0           |
| Jacks                  | 994.5           | 6.55        | 0               | 0           | 125.5         | 34.59       | 868.9  | 41.53       |
| Dolphinfish (mahimahi) | 8772.2          | 57.78       | 8772.2          | 68.92       | 0             | 0           | 0      | 0           |
| Snappers               | 7.0             | 0.05        | 0               | 0           | 7.0           | 1.92        | 0      | 0           |
| Uku (jobfish)          | 169.8           | 1.12        | 0               | 0           | 0             | 0           | 169.8  | 8.12        |
| Blue lined snapper     | 17.3            | 0.11        | 0               | 0           | 17.3          | 4.77        | 0      | 0           |
| Sweetlips              | 73.6            | 0.48        | 0               | 0           | 0             | 0           | 73.6   | 3.52        |
| Emperors               | 102.0           | 0.67        | 0               | 0           | 70.9          | 19.52       | 31.1   | 1.49        |
| Goatfish               | 17.9            | 0.12        | 0               | 0           | 17.9          | 4.92        | 0      | 0           |
| Rudderfish             | 141.5           | 0.93        | 0               | 0           | 0             | 0           | 141.5  | 6.76        |
| Wrasse                 | 9.5             | 0.06        | 0               | 0           | 9.5           | 2.61        | 0      | 0           |
| Parrotfish             | 184.8           | 1.22        | 0               | 0           | 0             | 0           | 184.8  | 8.83        |
| Wahoo                  | 1098.2          | 7.23        | 1098.2          | 8.63        | 0             | 0           | 0      | 0           |
| Kawakawa               | 81.0            | 0.53        | 81.0            | 0.64        | 0             | 0           | 0      | 0           |
| Skipjack tuna          | 679.3           | 4.47        | 679.3           | 5.34        | 0             | 0           | 0      | 0           |
| Yellowfin tuna         | 513.9           | 3.38        | 513.9           | 4.04        | 0             | 0           | 0      | 0           |
| Blue marlin            | 1519.8          | 10.01       | 1519.8          | 11.94       | 0             | 0           | 0      | 0           |
| Total all species:     | 15183.2         | 100.00      | 12727.7         | 83.83       | 363.0         | 2.39        | 2092.5 | 13.78       |

Table IV.4.2

Guam DAWR February 1988  
Offshore Creel Survey Species Composition

| Common Name            | Total all gears | % all gears | % this trolling | % this gear | % this bottom | % this gear |
|------------------------|-----------------|-------------|-----------------|-------------|---------------|-------------|
| Grouper                | 70.7            | 0.08        | 0               | 0           | 70.7          | 30.49       |
| Rainbow runner         | 127.5           | 0.15        | 127.5           | 0.15        | 0             | 0           |
| Dolphinfish (mahimahi) | 70074.9         | 81.95       | 70074.9         | 82.17       | 0             | 0           |
| Uku (jobfish)          | 62.0            | 0.07        | 0               | 0           | 62.0          | 26.73       |
| Blue lined snapper     | 2.9             | 0           | 0               | 0           | 2.9           | 1.25        |
| Emperors               | 93.4            | 0.11        | 0               | 0           | 93.4          | 40.27       |
| Goatfish               | 2.9             | 0           | 0               | 0           | 2.9           | 1.25        |
| Barracuda              | 818.2           | 0.96        | 818.2           | 0.96        | 0             | 0           |
| Wahoo                  | 2954.0          | 3.45        | 2954.0          | 3.46        | 0             | 0           |
| Kawakawa               | 619.8           | 0.72        | 619.8           | 0.73        | 0             | 0           |
| Skipjack tuna          | 4509.0          | 5.27        | 4509.0          | 5.29        | 0             | 0           |
| Yellowfin tuna         | 4597.5          | 5.38        | 4597.5          | 5.39        | 0             | 0           |
| Sailfish               | 974.0           | 1.14        | 974.0           | 1.14        | 0             | 0           |
| Shortbill spearfish    | 602.1           | 0.70        | 602.1           | 0.71        | 0             | 0           |
| Total all species:     | 85509.1         | 100.00      | 85277.1         | 99.73       | 231.9         | 0.27        |

Table IV.4.3

Guam DAWR March 1988  
Offshore Creel Survey Species Composition

| Common Name            | Total all gears | % all gears | trolling | % this gear | bottom | % this gear | other | % this gear |
|------------------------|-----------------|-------------|----------|-------------|--------|-------------|-------|-------------|
| Sharks                 | 1525.9          | 0.89        | 1525.9   | 0.89        | 0      | 0           | 0     | 0           |
| Squirrelfish           | 30.5            | 0.02        | 0        | 0           | 30.5   | 8.56        | 0     | 0           |
| Grouper                | 55.5            | 0.03        | 0        | 0           | 55.5   | 15.61       | 0     | 0           |
| Jacks                  | 23.1            | 0.01        | 0        | 0           | 0      | 0           | 23.1  | 2.64        |
| Rainbow runner         | 676.6           | 0.39        | 676.6    | 0.40        | 0      | 0           | 0     | 0           |
| Dolphinfish (mahimahi) | 150481.4        | 87.40       | 150481.4 | 88.03       | 0      | 0           | 0     | 0           |
| Snappers               | 88.3            | 0.05        | 88.3     | 0.05        | 0      | 0           | 0     | 0           |
| Uku (jobfish)          | 83.6            | 0.05        | 0        | 0           | 83.6   | 23.49       | 0     | 0           |
| Yellowtail kalikali    | 141.2           | 0.08        | 0        | 0           | 141.2  | 39.67       | 0     | 0           |
| Emperors               | 21.1            | 0.01        | 0        | 0           | 12.6   | 3.55        | 8.5   | 0.97        |
| Rudderfish             | 26.2            | 0.02        | 0        | 0           | 0      | 0           | 26.2  | 2.99        |
| Barracuda              | 201.5           | 0.12        | 201.5    | 0.12        | 0      | 0           | 0     | 0           |
| Parrotfish             | 26.9            | 0.02        | 0        | 0           | 0      | 0           | 26.9  | 3.08        |
| Surgeonfish and tangs  | 90.1            | 0.05        | 0        | 0           | 0      | 0           | 90.1  | 10.29       |
| Wahoo                  | 2144.9          | 1.25        | 2144.9   | 1.25        | 0      | 0           | 0     | 0           |
| Kawakawa               | 479.9           | 0.28        | 479.9    | 0.28        | 0      | 0           | 0     | 0           |
| Dogtooth tuna          | 561.4           | 0.33        | 561.4    | 0.33        | 0      | 0           | 0     | 0           |
| Skipjack tuna          | 11178.1         | 6.49        | 11178.1  | 6.54        | 0      | 0           | 0     | 0           |
| Yellowfin tuna         | 2165.0          | 1.26        | 2165.0   | 1.27        | 0      | 0           | 0     | 0           |
| Shortbill spearfish    | 1439.6          | 0.84        | 1439.6   | 0.84        | 0      | 0           | 0     | 0           |
| Triggerfish            | 32.5            | 0.02        | 0        | 0           | 32.5   | 9.13        | 0     | 0           |
| Mollusks               | 700.6           | 0.41        | 0        | 0           | 0      | 0           | 700.6 | 80.04       |
| Total all species:     | 172173.8        | 100.00      | 170942.6 | 99.28       | 355.9  | 0.21        | 875.3 | 0.51        |



## IV.45

Table IV.4.4

Guam DAWR April 1988  
Offshore Creel Survey Species Composition

| Common Name             | Total all gears | % all gears | trolling | % this gear | bottom | % this gear | other | % this gear |
|-------------------------|-----------------|-------------|----------|-------------|--------|-------------|-------|-------------|
| Sharks                  | 54.2            | 0.05        | 0        | 0           | 54.2   | 0.56        | 0     | 0           |
| Squirrelfish            | 160.2           | 0.14        | 0        | 0           | 160.2  | 1.65        | 0     | 0           |
| Grouper                 | 1180.5          | 1.03        | 0        | 0           | 1178.2 | 12.15       | 2.3   | 0.43        |
| Bigeyes                 | 9.4             | 0.01        | 0        | 0           | 9.4    | 0.10        | 0     | 0           |
| Cardinalfish            | 14.5            | 0.01        | 0        | 0           | 14.5   | 0.15        | 0     | 0           |
| Jacks                   | 1445.5          | 1.27        | 158.5    | 0.15        | 1287.0 | 13.27       | 0     | 0           |
| Rainbow runner          | 591.7           | 0.52        | 481.8    | 0.46        | 109.9  | 1.13        | 0     | 0           |
| Dolphinfish (mahimahi)  | 61425.7         | 53.79       | 61425.7  | 59.08       | 0      | 0           | 0     | 0           |
| Snappers                | 216.2           | 0.19        | 0        | 0           | 216.2  | 2.23        | 0     | 0           |
| Lehi (silvermouth)      | 137.4           | 0.12        | 0        | 0           | 137.4  | 1.42        | 0     | 0           |
| Uku (jobfish)           | 1193.0          | 1.04        | 0        | 0           | 1193.0 | 12.30       | 0     | 0           |
| Ehu (pink snapper)      | 258.1           | 0.23        | 0        | 0           | 258.1  | 2.66        | 0     | 0           |
| Blue lined snapper      | 75.9            | 0.07        | 0        | 0           | 75.9   | 0.78        | 0     | 0           |
| Yellowtail kalikali     | 14.5            | 0.01        | 0        | 0           | 14.5   | 0.15        | 0     | 0           |
| Opakapaka (pink snap)   | 126.5           | 0.11        | 0        | 0           | 126.5  | 1.30        | 0     | 0           |
| Yelloweye opakapaka     | 54.2            | 0.05        | 0        | 0           | 54.2   | 0.56        | 0     | 0           |
| Gindai (flower snapper) | 326.5           | 0.29        | 0        | 0           | 326.5  | 3.37        | 0     | 0           |
| Emperors                | 2454.7          | 2.15        | 0        | 0           | 2454.7 | 25.32       | 0     | 0           |
| Goatfish                | 28.0            | 0.02        | 0        | 0           | 24.6   | 0.25        | 3.4   | 0.65        |
| Barracuda               | 721.2           | 0.63        | 721.2    | 0.69        | 0      | 0           | 0     | 0           |
| Wrasse                  | 40.9            | 0.04        | 0        | 0           | 40.9   | 0.42        | 0     | 0           |
| Parrotfish              | 16.1            | 0.01        | 0        | 0           | 0      | 0           | 16.1  | 3.02        |
| Surgeonfish and tangs   | 23.1            | 0.02        | 0        | 0           | 23.1   | 0.24        | 0     | 0           |
| Wahoo                   | 14138.0         | 12.38       | 14138.0  | 13.60       | 0      | 0           | 0     | 0           |
| Kawakawa                | 416.1           | 0.36        | 416.1    | 0.40        | 0      | 0           | 0     | 0           |
| Dogtooth tuna           | 851.9           | 0.75        | 851.9    | 0.82        | 0      | 0           | 0     | 0           |
| Skipjack tuna           | 16804.7         | 14.72       | 16804.7  | 16.16       | 0      | 0           | 0     | 0           |
| Yellowfin tuna          | 6862.9          | 6.01        | 6862.9   | 6.60        | 0      | 0           | 0     | 0           |
| Blue marlin             | 2108.0          | 1.85        | 2108.0   | 2.03        | 0      | 0           | 0     | 0           |
| Triggerfish             | 71.6            | 0.06        | 0        | 0           | 71.6   | 0.74        | 0     | 0           |
| Assorted bottom fish    | 491.7           | 0.43        | 0        | 0           | 491.7  | 5.07        | 0     | 0           |
| Shallow bottom fish     | 1373.8          | 1.20        | 0        | 0           | 1373.8 | 14.17       | 0     | 0           |
| Assorted reef fish      | 509.6           | 0.45        | 0        | 0           | 0      | 0           | 509.6 | 95.90       |
| Total all species:      | 114196.2        | 100.00      | 103968.8 | 91.04       | 9696.0 | 8.49        | 531.4 | 0.47        |

## IV.46

Table IV.4.5

Guam DAWR May 1988  
Offshore Creel Survey Species Composition

| Common Name             | Total all gears | % all gears | trolling | % this gear | bottom | % this gear | other  | % this gear |
|-------------------------|-----------------|-------------|----------|-------------|--------|-------------|--------|-------------|
| Sharks                  | 173.4           | 0.21        | 0        | 0           | 173.4  | 4.72        | 0      | 0           |
| Squirrelfish            | 209.1           | 0.26        | 0        | 0           | 131.8  | 3.59        | 77.3   | 1.42        |
| Scorpionfish            | 4.7             | 0.01        | 0        | 0           | 4.7    | 0.13        | 0      | 0           |
| Grouper                 | 1012.4          | 1.25        | 0        | 0           | 714.4  | 19.45       | 297.9  | 5.49        |
| Jacks                   | 290.1           | 0.36        | 230.1    | 0.32        | 0      | 0           | 60.1   | 1.11        |
| Rainbow runner          | 423.5           | 0.52        | 423.5    | 0.59        | 0      | 0           | 0      | 0           |
| Dolphinfish (mahimahi)  | 22053.8         | 27.24       | 22053.8  | 30.69       | 0      | 0           | 0      | 0           |
| Snappers                | 177.2           | 0.22        | 13.9     | 0.02        | 114.5  | 3.12        | 48.8   | 0.90        |
| Lehi (silvermouth)      | 19.9            | 0.02        | 0        | 0           | 19.9   | 0.54        | 0      | 0           |
| Uku (jobfish)           | 206.5           | 0.26        | 0        | 0           | 206.5  | 5.62        | 0      | 0           |
| Ehu (pink snapper)      | 6.0             | 0.01        | 0        | 0           | 6.0    | 0.16        | 0      | 0           |
| Blue lined snapper      | 165.8           | 0.20        | 0        | 0           | 121.6  | 3.31        | 44.2   | 0.81        |
| Opakapaka (pink snap)   | 80.4            | 0.10        | 0        | 0           | 80.4   | 2.19        | 0      | 0           |
| Yelloweye opakapaka     | 12.0            | 0.01        | 0        | 0           | 12.0   | 0.33        | 0      | 0           |
| Kalikali (pink snapper) | 28.4            | 0.04        | 0        | 0           | 28.4   | 0.77        | 0      | 0           |
| Gindai (flower snapper) | 33.1            | 0.04        | 0        | 0           | 33.1   | 0.90        | 0      | 0           |
| Sweetlips               | 32.1            | 0.04        | 0        | 0           | 0      | 0           | 32.1   | 0.59        |
| Emperors                | 1454.7          | 1.80        | 0        | 0           | 1297.4 | 35.33       | 157.3  | 2.90        |
| Goatfish                | 412.0           | 0.51        | 0        | 0           | 144.4  | 3.93        | 267.7  | 4.93        |
| Rudderfish              | 517.1           | 0.64        | 0        | 0           | 0      | 0           | 517.1  | 9.53        |
| Barracuda               | 1463.5          | 1.81        | 1343.7   | 1.87        | 119.8  | 3.26        | 0      | 0           |
| Wrasse                  | 79.1            | 0.10        | 0        | 0           | 27.3   | 0.74        | 51.9   | 0.96        |
| Parrotfish              | 2273.4          | 2.81        | 0        | 0           | 0      | 0           | 2273.4 | 41.90       |
| Surgeonfish and tangs   | 1211.7          | 1.50        | 0        | 0           | 0      | 0           | 1211.7 | 22.34       |
| Rabbitfish              | 57.2            | 0.07        | 0        | 0           | 0      | 0           | 57.2   | 1.06        |
| Wahoo                   | 5976.2          | 7.38        | 5976.2   | 8.32        | 0      | 0           | 0      | 0           |
| Kawakawa                | 146.4           | 0.18        | 146.4    | 0.20        | 0      | 0           | 0      | 0           |
| Dogtooth tuna           | 186.0           | 0.23        | 0        | 0           | 186.0  | 5.06        | 0      | 0           |
| Skipjack tuna           | 21149.2         | 26.12       | 21149.2  | 29.43       | 0      | 0           | 0      | 0           |
| Yellowfin tuna          | 8214.0          | 10.14       | 8214.0   | 11.43       | 0      | 0           | 0      | 0           |
| Blue marlin             | 12318.3         | 15.21       | 12318.3  | 17.14       | 0      | 0           | 0      | 0           |
| Triggerfish             | 112.5           | 0.14        | 0        | 0           | 112.5  | 3.06        | 0      | 0           |
| Triplettooth puffers    | 31.5            | 0.04        | 0        | 0           | 31.5   | 0.86        | 0      | 0           |
| Assorted bottom fish    | 107.2           | 0.13        | 0        | 0           | 107.2  | 2.92        | 0      | 0           |
| Assorted reef fish      | 184.3           | 0.23        | 0        | 0           | 0      | 0           | 184.3  | 3.40        |
| Mollusks                | 16.0            | 0.02        | 0        | 0           | 0      | 0           | 16.0   | 0.30        |
| Octopus                 | 70.1            | 0.09        | 0        | 0           | 0      | 0           | 70.1   | 1.29        |
| Spiny lobsters          | 46.1            | 0.06        | 0        | 0           | 0      | 0           | 46.1   | 0.85        |
| Slipper lobsters        | 12.0            | 0.01        | 0        | 0           | 0      | 0           | 12.0   | 0.22        |
| Total all species:      | 80966.7         | 100.00      | 71868.9  | 88.76       | 3672.6 | 4.54        | 5425.1 | 6.70        |

## IV.47

Table IV.4.6

Guam DAWR June 1988  
Offshore Creel Survey Species Composition

| Common Name             | Total all gears | % all gears | % this trolling | % this gear | % this bottom | % this gear | other  | % this gear |
|-------------------------|-----------------|-------------|-----------------|-------------|---------------|-------------|--------|-------------|
| Sharks                  | 2309.4          | 6.22        | 2309.4          | 7.32        | 0             | 0           | 0      | 0           |
| Squirrelfish            | 81.9            | 0.22        | 0               | 0           | 29.0          | 0.75        | 52.9   | 3.03        |
| Grouper                 | 781.0           | 2.10        | 0               | 0           | 768.5         | 19.95       | 12.5   | 0.71        |
| False whiting           | 6.7             | 0.02        | 0               | 0           | 6.7           | 0.17        | 0      | 0           |
| Jacks                   | 336.6           | 0.91        | 96.0            | 0.30        | 163.9         | 4.25        | 76.7   | 4.39        |
| Rainbow runner          | 906.9           | 2.44        | 886.2           | 2.81        | 0             | 0           | 20.7   | 1.19        |
| Bigeye scad (akule)     | 202.3           | 0.54        | 0               | 0           | 0             | 0           | 202.3  | 11.57       |
| Dolphinfish (mahimahi)  | 236.4           | 0.64        | 236.4           | 0.75        | 0             | 0           | 0      | 0           |
| Snappers                | 207.2           | 0.56        | 60.5            | 0.19        | 45.5          | 1.18        | 101.2  | 5.79        |
| Lehi (silvermouth)      | 36.5            | 0.10        | 0               | 0           | 36.5          | 0.95        | 0      | 0           |
| Uku (jobfish)           | 213.7           | 0.58        | 0               | 0           | 213.7         | 5.55        | 0      | 0           |
| Blue lined snapper      | 61.4            | 0.17        | 0               | 0           | 61.4          | 1.59        | 0      | 0           |
| Yellowtail kalikali     | 229.5           | 0.62        | 0               | 0           | 229.5         | 5.96        | 0      | 0           |
| Yelloweye opakapaka     | 206.7           | 0.56        | 0               | 0           | 206.7         | 5.37        | 0      | 0           |
| Gindai (flower snapper) | 39.5            | 0.11        | 0               | 0           | 39.5          | 1.03        | 0      | 0           |
| Emperors                | 1798.2          | 4.84        | 0               | 0           | 1798.2        | 46.68       | 0      | 0           |
| Goatfish                | 113.5           | 0.31        | 0               | 0           | 98.7          | 2.56        | 14.8   | 0.85        |
| Sweepers                | 2.3             | 0.01        | 0               | 0           | 0             | 0           | 2.3    | 0.13        |
| Rudderfish              | 10.1            | 0.03        | 0               | 0           | 0             | 0           | 10.1   | 0.58        |
| Hawkfish                | 1.8             | 0           | 0               | 0           | 1.8           | 0.05        | 0      | 0           |
| Barracuda               | 181.8           | 0.49        | 181.8           | 0.58        | 0             | 0           | 0      | 0           |
| Wrasse                  | 139.7           | 0.38        | 0               | 0           | 130.7         | 3.39        | 9.0    | 0.51        |
| Parrotfish              | 87.4            | 0.24        | 0               | 0           | 0             | 0           | 87.4   | 5.00        |
| Surgeonfish and tangs   | 198.6           | 0.53        | 0               | 0           | 0             | 0           | 198.6  | 11.36       |
| Wahoo                   | 4673.3          | 12.58       | 4673.3          | 14.81       | 0             | 0           | 0      | 0           |
| Kawakawa                | 29.1            | 0.08        | 29.1            | 0.09        | 0             | 0           | 0      | 0           |
| Dogtooth tuna           | 1236.5          | 3.33        | 1236.5          | 3.92        | 0             | 0           | 0      | 0           |
| Skipjack tuna           | 9157.4          | 24.65       | 9157.4          | 29.03       | 0             | 0           | 0      | 0           |
| Yellowfin tuna          | 4513.3          | 12.15       | 4513.3          | 14.31       | 0             | 0           | 0      | 0           |
| Blue marlin             | 8168.2          | 21.99       | 8168.2          | 25.89       | 0             | 0           | 0      | 0           |
| Triggerfish             | 21.9            | 0.06        | 0               | 0           | 21.9          | 0.57        | 0      | 0           |
| Assorted reef fish      | 959.5           | 2.58        | 0               | 0           | 0             | 0           | 959.5  | 54.89       |
| Total all species:      | 37148.5         | 100.00      | 31548.1         | 84.92       | 3852.3        | 10.37       | 1748.1 | 4.71        |



## IV.48

Table IV.4.7

Guam DAWR July 1988  
Offshore Creel Survey Species Composition

| Common Name             | Total all gears | % all gears | trolling | % this gear | bottom | % this gear | other  | % this gear |
|-------------------------|-----------------|-------------|----------|-------------|--------|-------------|--------|-------------|
| Sharks                  | 384.0           | 0.38        | 166.8    | 0.18        | 217.2  | 2.75        | 0      | 0           |
| Moray eels              | 778.7           | 0.77        | 0        | 0           | 0      | 0           | 778.7  | 27.71       |
| Squirrelfish            | 287.2           | 0.28        | 0        | 0           | 244.2  | 3.10        | 42.9   | 1.53        |
| Grouper                 | 1354.2          | 1.34        | 0        | 0           | 1225.9 | 15.54       | 128.3  | 4.56        |
| Bigeyes                 | 27.5            | 0.03        | 0        | 0           | 27.5   | 0.35        | 0      | 0           |
| False whiting           | 4.5             | 0           | 0        | 0           | 4.5    | 0.06        | 0      | 0           |
| Jacks                   | 1450.5          | 1.43        | 310.5    | 0.34        | 1126.8 | 14.29       | 13.2   | 0.47        |
| Rainbow runner          | 4435.9          | 4.38        | 4167.9   | 4.60        | 268.0  | 3.40        | 0      | 0           |
| Dolphinfish (mahimahi)  | 49.7            | 0.05        | 49.7     | 0.05        | 0      | 0           | 0      | 0           |
| Snappers                | 658.7           | 0.65        | 0        | 0           | 658.7  | 8.35        | 0      | 0           |
| Lehi (silverbmouth)     | 108.6           | 0.11        | 0        | 0           | 108.6  | 1.38        | 0      | 0           |
| Uku (jobfish)           | 373.8           | 0.37        | 0        | 0           | 373.8  | 4.74        | 0      | 0           |
| Ehu (pink snapper)      | 249.2           | 0.25        | 0        | 0           | 249.2  | 3.16        | 0      | 0           |
| Onaga (red snapper)     | 86.3            | 0.09        | 0        | 0           | 86.3   | 1.09        | 0      | 0           |
| Blue lined snapper      | 355.6           | 0.35        | 0        | 0           | 355.6  | 4.51        | 0      | 0           |
| Yellowtail kalikali     | 527.1           | 0.52        | 0        | 0           | 527.1  | 6.68        | 0      | 0           |
| Opakapaka (pink snap)   | 25.6            | 0.03        | 0        | 0           | 25.6   | 0.32        | 0      | 0           |
| Yelloweye opakapaka     | 343.7           | 0.34        | 0        | 0           | 343.7  | 4.36        | 0      | 0           |
| Gindai (flower snapper) | 199.7           | 0.20        | 0        | 0           | 199.7  | 2.53        | 0      | 0           |
| Sweetlips               | 15.6            | 0.02        | 0        | 0           | 0      | 0           | 15.6   | 0.55        |
| Emperors                | 1264.2          | 1.25        | 0        | 0           | 1196.8 | 15.17       | 67.4   | 2.40        |
| Goatfish                | 145.2           | 0.14        | 0        | 0           | 134.5  | 1.71        | 10.7   | 0.38        |
| Rudderfish              | 14.7            | 0.01        | 0        | 0           | 0      | 0           | 14.7   | 0.52        |
| Butterflyfish           | 6.4             | 0.01        | 0        | 0           | 6.4    | 0.08        | 0      | 0           |
| Barracuda               | 239.6           | 0.24        | 95.8     | 0.11        | 143.8  | 1.82        | 0      | 0           |
| Wrasse                  | 46.3            | 0.05        | 0        | 0           | 46.3   | 0.59        | 0      | 0           |
| Parrotfish              | 211.8           | 0.21        | 0        | 0           | 0      | 0           | 211.8  | 7.53        |
| Surgeonfish and tangs   | 894.7           | 0.88        | 0        | 0           | 20.8   | 0.26        | 874.0  | 31.10       |
| Rabbitfish              | 21.0            | 0.02        | 0        | 0           | 0      | 0           | 21.0   | 0.75        |
| Tunas                   | 14.2            | 0.01        | 14.2     | 0.02        | 0      | 0           | 0      | 0           |
| Wahoo                   | 4827.0          | 4.77        | 4827.0   | 5.33        | 0      | 0           | 0      | 0           |
| Kawakawa                | 1086.1          | 1.07        | 1086.1   | 1.20        | 0      | 0           | 0      | 0           |
| Dogtooth tuna           | 958.3           | 0.95        | 958.3    | 1.06        | 0      | 0           | 0      | 0           |
| Skipjack tuna           | 38707.9         | 38.24       | 38707.9  | 42.76       | 0      | 0           | 0      | 0           |
| Yellowfin tuna          | 19067.8         | 18.84       | 18951.7  | 20.94       | 116.0  | 1.47        | 0      | 0           |
| Blue marlin             | 21185.4         | 20.93       | 21185.4  | 23.40       | 0      | 0           | 0      | 0           |
| Triggerfish             | 180.2           | 0.18        | 0        | 0           | 180.2  | 2.28        | 0      | 0           |
| Assorted reef fish      | 544.4           | 0.54        | 0        | 0           | 0      | 0           | 544.4  | 19.37       |
| Mollusks                | 1.0             | 0           | 0        | 0           | 0      | 0           | 1.0    | 0.04        |
| Spiny lobsters          | 79.5            | 0.08        | 0        | 0           | 0      | 0           | 79.5   | 2.83        |
| Slipper lobsters        | 7.5             | 0.01        | 0        | 0           | 0      | 0           | 7.5    | 0.27        |
| Total all species:      | 101218.9        | 100.00      | 90521.3  | 89.43       | 7887.1 | 7.79        | 2810.5 | 2.78        |

Table IV.4.8

Guam DAWR August 1988  
Offshore Creel Survey Species Composition

| Common Name             | Total all gears | % all gears | % this trolling | % this gear | bottom | % this gear | other  | % this gear |
|-------------------------|-----------------|-------------|-----------------|-------------|--------|-------------|--------|-------------|
| Sharks                  | 284.2           | 0.30        | 0               | 0           | 284.2  | 3.83        | 0      | 0           |
| Moray eels              | 75.9            | 0.08        | 0               | 0           | 0      | 0           | 75.9   | 1.00        |
| Lizardfish              | 2.1             | 0           | 0               | 0           | 2.1    | 0.03        | 0      | 0           |
| Squirrelfish            | 100.6           | 0.11        | 0               | 0           | 53.3   | 0.72        | 47.3   | 0.62        |
| Scorpionfish            | 39.8            | 0.04        | 0               | 0           | 39.8   | 0.54        | 0      | 0           |
| Grouper                 | 389.6           | 0.41        | 0               | 0           | 331.5  | 4.47        | 58.1   | 0.77        |
| Flagtails               | 4.9             | 0.01        | 0               | 0           | 0      | 0           | 4.9    | 0.06        |
| Jacks                   | 1686.0          | 1.78        | 187.4           | 0.23        | 1422.8 | 19.17       | 75.7   | 1.00        |
| Rainbow runner          | 1391.1          | 1.47        | 1391.1          | 1.74        | 0      | 0           | 0      | 0           |
| Bigeye scad (akule)     | 176.2           | 0.19        | 0               | 0           | 0      | 0           | 176.2  | 2.33        |
| Dolphinfish (mahimahi)  | 125.7           | 0.13        | 125.7           | 0.16        | 0      | 0           | 0      | 0           |
| Snappers                | 540.9           | 0.57        | 31.1            | 0.04        | 459.5  | 6.19        | 50.3   | 0.66        |
| Lehi (silvermouth)      | 417.0           | 0.44        | 0               | 0           | 417.0  | 5.62        | 0      | 0           |
| Uku (jobfish)           | 588.7           | 0.62        | 101.3           | 0.13        | 435.6  | 5.87        | 51.8   | 0.68        |
| Ehu (pink snapper)      | 978.2           | 1.03        | 0               | 0           | 978.2  | 13.18       | 0      | 0           |
| Blue lined snapper      | 110.2           | 0.12        | 0               | 0           | 110.2  | 1.48        | 0      | 0           |
| Yellowtail kalikali     | 308.3           | 0.32        | 0               | 0           | 308.3  | 4.15        | 0      | 0           |
| Yelloweye opakapaka     | 95.6            | 0.10        | 0               | 0           | 95.6   | 1.29        | 0      | 0           |
| Gindai (flower snapper) | 608.2           | 0.64        | 0               | 0           | 608.2  | 8.19        | 0      | 0           |
| Sweetlips               | 62.4            | 0.07        | 0               | 0           | 38.5   | 0.52        | 23.9   | 0.32        |
| Emperors                | 1117.1          | 1.18        | 0               | 0           | 1117.1 | 15.05       | 0      | 0           |
| Goatfish                | 62.9            | 0.07        | 0               | 0           | 13.3   | 0.18        | 49.6   | 0.65        |
| Rudderfish              | 162.0           | 0.17        | 0               | 0           | 0      | 0           | 162.0  | 2.14        |
| Butterflyfish           | 1.8             | 0           | 0               | 0           | 0      | 0           | 1.8    | 0.02        |
| Angelfish               | 2.5             | 0           | 0               | 0           | 0      | 0           | 2.5    | 0.03        |
| Mullet                  | 6.5             | 0.01        | 0               | 0           | 0      | 0           | 6.5    | 0.09        |
| Barracuda               | 899.2           | 0.95        | 899.2           | 1.13        | 0      | 0           | 0      | 0           |
| Wrasse                  | 647.0           | 0.68        | 0               | 0           | 42.8   | 0.58        | 604.3  | 7.98        |
| Parrotfish              | 2007.6          | 2.12        | 0               | 0           | 0      | 0           | 2007.6 | 26.51       |
| Surgeonfish and tangs   | 1569.8          | 1.65        | 0               | 0           | 10.1   | 0.14        | 1559.7 | 20.59       |
| Rabbitfish              | 33.1            | 0.03        | 0               | 0           | 0      | 0           | 33.1   | 0.44        |
| Wahoo                   | 3276.3          | 3.45        | 3276.3          | 4.10        | 0      | 0           | 0      | 0           |
| Kawakawa                | 98.4            | 0.10        | 98.4            | 0.12        | 0      | 0           | 0      | 0           |
| Dogtooth tuna           | 1151.8          | 1.21        | 577.4           | 0.72        | 574.4  | 7.74        | 0      | 0           |
| Skipjack tuna           | 45488.7         | 47.93       | 45488.7         | 56.92       | 0      | 0           | 0      | 0           |
| Yellowfin tuna          | 11237.6         | 11.84       | 11237.6         | 14.06       | 0      | 0           | 0      | 0           |
| Blue marlin             | 16500.8         | 17.39       | 16500.8         | 20.65       | 0      | 0           | 0      | 0           |
| Flounder                | 2.3             | 0           | 0               | 0           | 0      | 0           | 2.3    | 0.03        |
| Triggerfish             | 79.9            | 0.08        | 0               | 0           | 79.9   | 1.08        | 0      | 0           |
| Assorted reef fish      | 658.5           | 0.69        | 0               | 0           | 0      | 0           | 658.5  | 8.70        |
| Mollusks                | 1522.2          | 1.60        | 0               | 0           | 0      | 0           | 1522.2 | 20.10       |
| Squid                   | 5.1             | 0.01        | 0               | 0           | 0      | 0           | 5.1    | 0.07        |
| Octopus                 | 63.9            | 0.07        | 0               | 0           | 0      | 0           | 63.9   | 0.84        |
| Spiny lobsters          | 230.7           | 0.24        | 0               | 0           | 0      | 0           | 230.7  | 3.05        |
| Slipper lobsters        | 4.2             | 0           | 0               | 0           | 0      | 0           | 4.2    | 0.06        |
| Crabs                   | 95.3            | 0.10        | 0               | 0           | 0      | 0           | 95.3   | 1.26        |
| Total all species:      | 94910.8         | 100.00      | 79915.0         | 84.20       | 7422.3 | 7.82        | 7573.5 | 7.98        |

## IV.50

Table IV.4.9

Guam DAWR September 1988  
Offshore Creel Survey Species Composition

| Common Name             | Total all gears | % all gears | % this trolling | % this gear | bottom  | % this gear | other  | % this gear |
|-------------------------|-----------------|-------------|-----------------|-------------|---------|-------------|--------|-------------|
| Sharks                  | 7312.3          | 0.88        | 3740.4          | 0.50        | 2784.6  | 5.10        | 787.3  | 2.24        |
| Moray eels              | 672.3           | 0.08        | 0               | 0           | 3.3     | 0.01        | 669.0  | 1.90        |
| Lizardfish              | 2.7             | 0           | 0               | 0           | 2.7     | 0           | 0      | 0           |
| Needlefish              | 155.0           | 0.02        | 155.0           | 0.02        | 0       | 0           | 0      | 0           |
| Squirrelfish            | 2240.1          | 0.27        | 0               | 0           | 1687.0  | 3.09        | 553.0  | 1.57        |
| Scorpionfish            | 97.1            | 0.01        | 0               | 0           | 45.0    | 0.08        | 52.2   | 0.15        |
| Grouper                 | 7560.7          | 0.91        | 0               | 0           | 6719.5  | 12.30       | 841.1  | 2.39        |
| Flagtails               | 5.6             | 0           | 0               | 0           | 0       | 0           | 5.6    | 0.02        |
| Bigeyes                 | 96.0            | 0.01        | 0               | 0           | 90.0    | 0.16        | 6.0    | 0.02        |
| Cardinalfish            | 13.4            | 0           | 0               | 0           | 13.4    | 0.02        | 0      | 0           |
| False whiting           | 12.0            | 0           | 0               | 0           | 12.0    | 0.02        | 0      | 0           |
| Jacks                   | 8978.1          | 1.08        | 1308.5          | 0.18        | 5458.4  | 9.99        | 2211.1 | 6.29        |
| Rainbow runner          | 9491.9          | 1.14        | 9049.6          | 1.22        | 405.9   | 0.74        | 36.4   | 0.10        |
| Bigeye scad (akule)     | 5527.2          | 0.66        | 0               | 0           | 0       | 0           | 5527.2 | 15.71       |
| Dolphinfish (mahimahi)  | 310154.9        | 37.19       | 310154.9        | 41.68       | 0       | 0           | 0      | 0           |
| Snappers                | 3037.8          | 0.36        | 187.8           | 0.03        | 2484.2  | 4.55        | 365.8  | 1.04        |
| Lehi (silvermouth)      | 1290.1          | 0.15        | 0               | 0           | 1290.1  | 2.36        | 0      | 0           |
| Uku (jobfish)           | 3735.6          | 0.45        | 100.3           | 0.01        | 3371.2  | 6.17        | 264.1  | 0.75        |
| Ehu (pink snapper)      | 2070.3          | 0.25        | 0               | 0           | 2070.3  | 3.79        | 0      | 0           |
| Onaga (red snapper)     | 742.2           | 0.09        | 0               | 0           | 742.2   | 1.36        | 0      | 0           |
| Blue lined snapper      | 1282.5          | 0.15        | 0               | 0           | 1240.9  | 2.27        | 41.5   | 0.12        |
| Yellowtail kalikali     | 1748.1          | 0.21        | 0               | 0           | 1748.1  | 3.20        | 0      | 0           |
| Opakapaka (pink snap)   | 309.2           | 0.04        | 0               | 0           | 309.2   | 0.57        | 0      | 0           |
| Yelloweye opakapaka     | 1023.3          | 0.12        | 0               | 0           | 1023.3  | 1.87        | 0      | 0           |
| Kalikali (pink snapper) | 30.1            | 0           | 0               | 0           | 30.1    | 0.06        | 0      | 0           |
| Gindai (flower snapper) | 1729.4          | 0.21        | 0               | 0           | 1729.4  | 3.16        | 0      | 0           |
| Sweetlips               | 317.7           | 0.04        | 0               | 0           | 35.9    | 0.07        | 281.7  | 0.80        |
| Emperors                | 12730.3         | 1.53        | 0               | 0           | 12388.4 | 22.67       | 341.9  | 0.97        |
| Goatfish                | 1064.6          | 0.13        | 0               | 0           | 630.9   | 1.15        | 433.7  | 1.23        |
| Sweepers                | 10.0            | 0           | 0               | 0           | 5.0     | 0.01        | 4.9    | 0.01        |
| Rudderfish              | 1288.0          | 0.15        | 0               | 0           | 0       | 0           | 1288.0 | 3.66        |
| Butterflyfish           | 9.2             | 0           | 0               | 0           | 6.7     | 0.01        | 2.5    | 0.01        |
| Angelfish               | 3.6             | 0           | 0               | 0           | 0       | 0           | 3.6    | 0.01        |
| Hawkfish                | 5.7             | 0           | 0               | 0           | 5.7     | 0.01        | 0      | 0           |
| Mullet                  | 7.5             | 0           | 0               | 0           | 0       | 0           | 7.5    | 0.02        |
| Barracuda               | 5999.9          | 0.72        | 5722.4          | 0.77        | 277.5   | 0.51        | 0      | 0           |
| Wrasse                  | 1759.0          | 0.21        | 0               | 0           | 401.2   | 0.73        | 1357.8 | 3.86        |
| Parrotfish              | 7798.9          | 0.94        | 0               | 0           | 0       | 0           | 7798.9 | 22.17       |
| Surgeonfish and tangs   | 6141.5          | 0.74        | 0               | 0           | 1213.9  | 2.22        | 4927.6 | 14.01       |
| Rabbitfish              | 131.5           | 0.02        | 0               | 0           | 0       | 0           | 131.5  | 0.37        |
| Tunas                   | 16.3            | 0           | 16.3            | 0           | 0       | 0           | 0      | 0           |
| Wahoo                   | 93435.5         | 11.20       | 93435.5         | 12.56       | 0       | 0           | 0      | 0           |
| Kawakawa                | 3577.0          | 0.43        | 3577.0          | 0.48        | 0       | 0           | 0      | 0           |
| Dogtooth tuna           | 6100.2          | 0.73        | 5177.7          | 0.70        | 922.6   | 1.69        | 0      | 0           |
| Skipjack tuna           | 173637.0        | 20.82       | 173637.0        | 23.33       | 0       | 0           | 0      | 0           |
| Yellowfin tuna          | 73126.0         | 8.77        | 73003.3         | 9.81        | 122.6   | 0.22        | 0      | 0           |
| Sailfish                | 3181.4          | 0.38        | 3181.4          | 0.43        | 0       | 0           | 0      | 0           |
| Blue marlin             | 59528.0         | 7.14        | 59528.0         | 8.00        | 0       | 0           | 0      | 0           |
| Shortbill spearfish     | 2178.0          | 0.26        | 2178.0          | 0.29        | 0       | 0           | 0      | 0           |
| Flounder                | 2.6             | 0           | 0               | 0           | 0       | 0           | 2.6    | 0.01        |
| Triggerfish             | 669.3           | 0.08        | 0               | 0           | 669.3   | 1.22        | 0      | 0           |
| Triplettooth puffers    | 33.4            | 0           | 0               | 0           | 33.4    | 0.06        | 0      | 0           |
| Assorted bottom fish    | 568.3           | 0.07        | 0               | 0           | 568.3   | 1.04        | 0      | 0           |
| Shallow bottom fish     | 1686.6          | 0.20        | 0               | 0           | 1686.6  | 3.09        | 0      | 0           |
| Deep bottom fish        | 2413.7          | 0.29        | 0               | 0           | 2413.7  | 4.42        | 0      | 0           |
| Assorted reef fish      | 3762.7          | 0.45        | 0               | 0           | 0       | 0           | 3762.7 | 10.70       |
| Mollusks                | 2380.1          | 0.29        | 0               | 0           | 0       | 0           | 2380.1 | 6.77        |
| Squid                   | 7.2             | 0           | 0               | 0           | 0       | 0           | 7.2    | 0.02        |
| Octopus                 | 183.9           | 0.02        | 0               | 0           | 0       | 0           | 183.9  | 0.52        |



## IV.51

Table IV.4.9 (cont.)

| Common Name        | Total all gears | % all gears | trolling | % this gear | bottom  | % this gear | other   | % this gear |
|--------------------|-----------------|-------------|----------|-------------|---------|-------------|---------|-------------|
| Spiny lobsters     | 719.8           | 0.09        | 0        | 0           | 0       | 0           | 719.8   | 2.05        |
| Slipper lobsters   | 47.7            | 0.01        | 0        | 0           | 0       | 0           | 47.7    | 0.14        |
| Crabs              | 134.9           | 0.02        | 0        | 0           | 0       | 0           | 134.9   | 0.38        |
| Total all species: | 833974.8        | 100.00      | 744153.3 | 89.23       | 54642.6 | 6.55        | 35179.0 | 4.22        |

Table IV.4.10

Guam DAWR October 1988  
Offshore Creel Survey Species Composition

| Common Name             | Total all gears | % all gears | trolling | % this gear | bottom | % this gear | other   | % this gear |
|-------------------------|-----------------|-------------|----------|-------------|--------|-------------|---------|-------------|
| Sharks                  | 580.2           | 1.57        | 204.9    | 1.07        | 375.3  | 6.07        | 0       | 0           |
| Conger eels             | 292.7           | 0.79        | 0        | 0           | 292.7  | 4.73        | 0       | 0           |
| Lizardfish              | 22.5            | 0.06        | 0        | 0           | 22.5   | 0.36        | 0       | 0           |
| Bearfish                | 31.3            | 0.08        | 0        | 0           | 31.3   | 0.51        | 0       | 0           |
| Squirrelfish            | 62.8            | 0.17        | 0        | 0           | 62.8   | 1.02        | 0       | 0           |
| Scorpionfish            | 7.0             | 0.02        | 0        | 0           | 7.0    | 0.11        | 0       | 0           |
| Grouper                 | 663.8           | 1.80        | 0        | 0           | 663.8  | 10.73       | 0       | 0           |
| False whiting           | 1.8             | 0           | 0        | 0           | 1.8    | 0.03        | 0       | 0           |
| Jacks                   | 1005.7          | 2.73        | 0        | 0           | 709.8  | 11.47       | 295.9   | 2.57        |
| Rainbow runner          | 273.2           | 0.74        | 273.2    | 1.43        | 0      | 0           | 0       | 0           |
| Bigeye scad (akule)     | 10758.1         | 29.18       | 0        | 0           | 0      | 0           | 10758.1 | 93.41       |
| Dolphinfish (mahimahi)  | 614.8           | 1.67        | 614.8    | 3.21        | 0      | 0           | 0       | 0           |
| Pomfret                 | 170.1           | 0.46        | 0        | 0           | 170.1  | 2.75        | 0       | 0           |
| Snappers                | 36.0            | 0.10        | 0        | 0           | 36.0   | 0.58        | 0       | 0           |
| Lehi (silvermouth)      | 745.6           | 2.02        | 0        | 0           | 745.6  | 12.05       | 0       | 0           |
| Uku (jobfish)           | 361.3           | 0.98        | 0        | 0           | 260.2  | 4.21        | 101.1   | 0.88        |
| Ehu (pink snapper)      | 281.5           | 0.76        | 0        | 0           | 281.5  | 4.55        | 0       | 0           |
| Onaga (red snapper)     | 650.5           | 1.76        | 0        | 0           | 650.5  | 10.51       | 0       | 0           |
| Blue lined snapper      | 134.1           | 0.36        | 0        | 0           | 134.1  | 2.17        | 0       | 0           |
| Yellowtail kalikali     | 39.3            | 0.11        | 0        | 0           | 39.3   | 0.63        | 0       | 0           |
| Kalikali (pink snapper) | 30.0            | 0.08        | 0        | 0           | 30.0   | 0.49        | 0       | 0           |
| Gindai (flower snapper) | 187.4           | 0.51        | 0        | 0           | 187.4  | 3.03        | 0       | 0           |
| Emperors                | 1130.9          | 3.07        | 0        | 0           | 1130.9 | 18.28       | 0       | 0           |
| Goatfish                | 60.8            | 0.16        | 0        | 0           | 60.8   | 0.98        | 0       | 0           |
| Rudderfish              | 89.4            | 0.24        | 0        | 0           | 0      | 0           | 89.4    | 0.78        |
| Barracuda               | 347.7           | 0.94        | 245.1    | 1.28        | 102.6  | 1.66        | 0       | 0           |
| Wrasse                  | 17.0            | 0.05        | 0        | 0           | 17.0   | 0.28        | 0       | 0           |
| Parrotfish              | 213.8           | 0.58        | 0        | 0           | 0      | 0           | 213.8   | 1.86        |
| Surgeonfish and tangs   | 95.8            | 0.26        | 0        | 0           | 37.5   | 0.61        | 58.3    | 0.51        |
| Wahoo                   | 7413.7          | 20.11       | 7413.7   | 38.68       | 0      | 0           | 0       | 0           |
| Kawakawa                | 92.4            | 0.25        | 92.4     | 0.48        | 0      | 0           | 0       | 0           |
| Dogtooth tuna           | 209.0           | 0.57        | 209.0    | 1.09        | 0      | 0           | 0       | 0           |
| Skipjack tuna           | 8231.3          | 22.33       | 8231.3   | 42.95       | 0      | 0           | 0       | 0           |
| Yellowfin tuna          | 434.0           | 1.18        | 434.0    | 2.26        | 0      | 0           | 0       | 0           |
| Blue marlin             | 1446.6          | 3.92        | 1446.6   | 7.55        | 0      | 0           | 0       | 0           |
| Triggerfish             | 136.1           | 0.37        | 0        | 0           | 136.1  | 2.20        | 0       | 0           |
| Total all species:      | 36868.2         | 100.00      | 19165.0  | 51.98       | 6186.5 | 16.78       | 11516.6 | 31.24       |

## IV.52

Table IV.4.11

Guam DAWR November 1988  
Offshore Creel Survey Species Composition

| Common Name            | Total all gears | % all gears | % this trolling | % this gear | bottom | % this gear | other  | % this gear |
|------------------------|-----------------|-------------|-----------------|-------------|--------|-------------|--------|-------------|
| Rays                   | 1658.3          | 3.53        | 0               | 0           | 1658.3 | 36.60       | 0      | 0           |
| Needlefish             | 52.7            | 0.11        | 52.7            | 0.13        | 0      | 0           | 0      | 0           |
| Squirrelfish           | 54.7            | 0.12        | 0               | 0           | 11.1   | 0.24        | 43.6   | 3.44        |
| Grouper                | 869.5           | 1.85        | 0               | 0           | 773.1  | 17.06       | 96.5   | 7.60        |
| Jacks                  | 88.4            | 0.19        | 0               | 0           | 65.5   | 1.45        | 22.9   | 1.80        |
| Rainbow runner         | 291.9           | 0.62        | 291.9           | 0.71        | 0      | 0           | 0      | 0           |
| Dolphinfish (mahimahi) | 2737.0          | 5.83        | 2737.0          | 6.65        | 0      | 0           | 0      | 0           |
| Snappers               | 558.8           | 1.19        | 0               | 0           | 540.1  | 11.92       | 18.7   | 1.47        |
| Uku (jobfish)          | 320.1           | 0.68        | 0               | 0           | 320.1  | 7.06        | 0      | 0           |
| Blue lined snapper     | 83.6            | 0.18        | 0               | 0           | 83.6   | 1.84        | 0      | 0           |
| Yellowtail kalikali    | 9.6             | 0.02        | 0               | 0           | 9.6    | 0.21        | 0      | 0           |
| Sweetlips              | 27.5            | 0.06        | 0               | 0           | 0      | 0           | 27.5   | 2.17        |
| Emperors               | 636.3           | 1.35        | 0               | 0           | 636.3  | 14.04       | 0      | 0           |
| Goatfish               | 92.5            | 0.20        | 0               | 0           | 92.5   | 2.04        | 0      | 0           |
| Barracuda              | 99.5            | 0.21        | 0               | 0           | 99.5   | 2.20        | 0      | 0           |
| Wrasse                 | 101.2           | 0.22        | 0               | 0           | 79.2   | 1.75        | 22.1   | 1.74        |
| Parrotfish             | 709.1           | 1.51        | 0               | 0           | 0      | 0           | 709.1  | 55.90       |
| Surgeonfish and tangs  | 84.8            | 0.18        | 0               | 0           | 0      | 0           | 84.8   | 6.68        |
| Wahoo                  | 31891.4         | 67.90       | 31891.4         | 77.47       | 0      | 0           | 0      | 0           |
| Kawakawa               | 20.3            | 0.04        | 20.3            | 0.05        | 0      | 0           | 0      | 0           |
| Dogtooth tuna          | 648.3           | 1.38        | 509.4           | 1.24        | 138.9  | 3.07        | 0      | 0           |
| Skipjack tuna          | 2724.9          | 5.80        | 2724.9          | 6.62        | 0      | 0           | 0      | 0           |
| Yellowfin tuna         | 2939.8          | 6.26        | 2939.8          | 7.14        | 0      | 0           | 0      | 0           |
| Triggerfish            | 23.5            | 0.05        | 0               | 0           | 23.5   | 0.52        | 0      | 0           |
| Assorted reef fish     | 176.0           | 0.37        | 0               | 0           | 0      | 0           | 176.0  | 13.87       |
| Spiny lobsters         | 61.0            | 0.13        | 0               | 0           | 0      | 0           | 61.0   | 4.81        |
| Slipper lobsters       | 6.5             | 0.01        | 0               | 0           | 0      | 0           | 6.5    | 0.52        |
| Total all species:     | 46967.0         | 100.00      | 41167.3         | 87.65       | 4531.2 | 9.65        | 1268.5 | 2.70        |

## IV.53

Table IV.4.12

Guam DAWR December 1988  
Offshore Creel Survey Species Composition

| Common<br>Name         | Total all<br>gears | % all<br>gears | trolling | % this<br>gear | bottom | % this<br>gear |
|------------------------|--------------------|----------------|----------|----------------|--------|----------------|
| Squirrelfish           | 3.6                | 0.01           | 0        | 0              | 3.6    | 0.31           |
| Grouper                | 173.6              | 0.56           | 0        | 0              | 173.6  | 15.20          |
| False whiting          | 15.2               | 0.05           | 0        | 0              | 15.2   | 1.33           |
| Jacks                  | 91.4               | 0.30           | 0        | 0              | 91.4   | 8.00           |
| Rainbow runner         | 1526.6             | 4.94           | 1526.6   | 5.13           | 0      | 0              |
| Dolphinfish (mahimahi) | 872.3              | 2.82           | 872.3    | 2.93           | 0      | 0              |
| Snappers               | 57.4               | 0.19           | 0        | 0              | 57.4   | 5.02           |
| Uku (jobfish)          | 223.4              | 0.72           | 0        | 0              | 223.4  | 19.56          |
| Blue lined snapper     | 10.2               | 0.03           | 0        | 0              | 10.2   | 0.89           |
| Emperors               | 486.3              | 1.57           | 0        | 0              | 486.3  | 42.58          |
| Goatfish               | 40.6               | 0.13           | 0        | 0              | 40.6   | 3.56           |
| Barracuda              | 981.4              | 3.18           | 981.4    | 3.30           | 0      | 0              |
| Wrasse                 | 40.6               | 0.13           | 0        | 0              | 40.6   | 3.56           |
| Wahoo                  | 15499.7            | 50.16          | 15499.7  | 52.09          | 0      | 0              |
| Kawakawa               | 140.2              | 0.45           | 140.2    | 0.47           | 0      | 0              |
| Skipjack tuna          | 3546.5             | 11.48          | 3546.5   | 11.92          | 0      | 0              |
| Yellowfin tuna         | 4855.0             | 15.71          | 4855.0   | 16.31          | 0      | 0              |
| Blue marlin            | 2336.6             | 7.56           | 2336.6   | 7.85           | 0      | 0              |
| Total all species:     | 30900.7            | 100.00         | 29758.4  | 96.30          | 1142.2 | 3.70           |



## IV.54

Table IV.5.1

1988 Marianas Fishing Derby  
Summary ReportsPrepared by  
Guam Division of Aquatic & Wildlife Resources

## Derby Totals

|                         | Day 1<br>Aug 19 | Day 2<br>Aug 20 | Day 3<br>Aug 21 | Derby<br>Totals |
|-------------------------|-----------------|-----------------|-----------------|-----------------|
| Number of boats         | 95.0            | 96.0            | 72.0            | 263.0           |
| Number of fishermen     | 292.0           | 311.0           | 230.0           | 833.0           |
| Ave. Men per boat       | 3.1             | 3.2             | 3.2             | 3.2             |
| Number of lines fished  | 432.0           | 412.0           | 298.0           | 1142.0          |
| Ave. Lines per boat     | 4.5             | 4.3             | 4.1             | 4.3             |
| Boat hours              | 894.0           | 818.9           | 571.7           | 2275.0          |
| Fished hours            | 862.6           | 774.7           | 519.1           | 2161.9          |
| Avg. Boat trip length   | 9.4             | 8.5             | 7.9             | 8.7             |
| Avg. Time spent fishing | 9.1             | 8.1             | 7.2             | 8.2             |
| Fisherman hours         | 2747.7          | 2652.8          | 1826.2          | 7205.5          |
| Line hours              | 3922.6          | 3324.8          | 2148.6          | 9387.2          |
| Number of fish landed   | 579.0           | 280.0           | 134.0           | 993.0           |
| Pounds landed*          | 8838.5          | 6272.7          | 2940.9          | 18052.1         |
| Ave catch per boat day  | 93.0            | 65.3            | 40.8            | 68.6            |
| Ave catch per boat hour | 9.9             | 7.6             | 5.1             | 7.9             |
| Ave catch per man hour  | 3.2             | 2.4             | 1.6             | 2.5             |
| Ave catch per line hour | 2.2             | 1.9             | 1.4             | 1.9             |

## SPECIES TOTALS

| SPECIES        | DAY 1 - AUG 19   |                 |            | DAY 2 - AUG 20   |                 |            | DAY 3 - AUG 21   |                 |            | TOTAL            |                 |            |
|----------------|------------------|-----------------|------------|------------------|-----------------|------------|------------------|-----------------|------------|------------------|-----------------|------------|
|                | NUMBER<br>CAUGHT | TOTAL<br>WT-LBS | AVE<br>WT. | NUMBER<br>CAUGHT | TOTAL<br>WT-LBS | AVE<br>WT. | NUMBER<br>CAUGHT | TOTAL<br>WT-LBS | AVE<br>WT. | NUMBER<br>CAUGHT | TOTAL<br>WT-LBS | AVE<br>WT. |
| MARLIN         | 23               | 3323.0          | 144.5      | 24               | 3454.2          | 143.9      | 11               | 1671.1          | 151.9      | 58               | 8448.0          | 145.7      |
| YELLOWFIN TUNA | 114              | 1345.2          | 11.8       | 28               | 315.3           | 11.3       | 19               | 210.3           | 11.1       | 161              | 1870.6          | 11.6       |
| WAHOO          | 32               | 595.2           | 18.6       | 25               | 386.7           | 15.5       | 15               | 269.0           | 17.9       | 72               | 1250.7          | 17.4       |
| MAHIMAH        | 3                | 9.9             | 3.3        | 1                | 9.5             | 9.5        | 1                | 7.5             | 7.5        | 5                | 26.9            | 5.4        |
| SKIPJACK TUNA  | 347              | 3278.2          | 9.4        | 162              | 1863.3          | 11.5       | 75               | 729.9           | 9.7        | 584              | 5871.7          | 10.1       |
| RAINBOW RUNNER | 40               | 164.9           | 4.1        | 17               | 60.6            | 3.6        | 6                | 19.4            | 3.2        | 63               | 244.9           | 3.9        |
| BARRACUDA      | 9                | 85.8            | 9.5        | 17               | 163.6           | 9.6        | 3                | 22.5            | 7.5        | 29               | 271.8           | 9.4        |
| KAWAKAWA       | 8                | 11.2            | 1.4        | 3                | 1.5             | 0.5        | 4                | 11.5            | 2.9        | 15               | 24.3            | 1.6        |
| DOGTUOTH TUNA  | 3                | 25.1            | 8.4        | 3                | 18.1            | 6.0        | 0                | 0               | 0          | 6                | 43.2            | 7.2        |
| TOTALS         | 579              | 8838.5          | 15.3       | 280              | 6272.7          | 22.4       | 134              | 2940.9          | 21.9       | 993              | 18052.1         | 18.2       |

\* Includes incidental catch.

## IV.55

Table IV.6.1

Guam DAWR Annual 1988  
Day Inshore Creel Survey  
Expansion Summary

| Methods       | Prsn Cnt | CV | Gear Cnt | CV | Trip Cnt | CV | Prns Hrs | CV | Gear Hrs | CV | Catch    | CV | Cpue  |
|---------------|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|-------|
| Hook & line   | 15577.0  | 11 | 15586.5  | 11 | 11564.9  | 14 | 66470.1  | 11 | 66618.7  | 11 | 22474.1  | 5  | .34   |
| Cast net      | 5978.6   | 12 | 5602.6   | 12 | 5521.7   | 12 | 17688.9  | 12 | 16585.3  | 12 | 31674.0  | 12 | 1.91  |
| Gill net      | 6414.8   | 11 | 3258.5   | 11 | 2903.6   | 12 | 26936.9  | 13 | 13714.9  | 13 | 58213.9  | 13 | 4.24  |
| Surround net  | 1583.0   | 25 | 312.3    | 25 | 312.3    | 25 | 7603.1   | 25 | 1472.5   | 25 | 6619.3   | 25 | 4.50  |
| Spear-snorkel | 902.5    | 24 | 851.3    | 24 | 515.3    | 24 | 2797.8   | 24 | 2645.9   | 24 | 16823.1  | 24 | 6.36  |
| Spear-scuba   | 0        | 0  | 0        | 0  | 0        | 0  | 0        | 0  | 0        | 0  | 0        | 0  | 0     |
| hook & gaff   | 1152.3   | 33 | 2087.6   | 33 | 804.3    | 34 | 2316.8   | 39 | 4452.3   | 40 | 4262.0   | 40 | .96   |
| Drag net      | 0        | 0  | 0        | 0  | 0        | 0  | 0        | 0  | 0        | 0  | 0        | 0  | 2.12  |
| Other         | 356.1    | 56 | 356.1    | 56 | 272.7    | 69 | 1891.5   | 52 | 1891.5   | 52 | 24516.2  | 52 | 12.96 |
| Totals        | 31964.3  | 7  | 28055.0  | 7  | 21554.7  | 7  | 124898.9 | 7  | 111223.6 | 7  | 164582.6 | 7  | 3.05  |

Table IV.6.2

Guam DAWR Annual 1988  
Night Inshore Creel Survey  
Expansion Summary

| Methods       | Prsn Cnt | CV  | Gear Cnt | CV  | Trip Cnt | CV  | Prns Hrs | CV  | Gear Hrs | CV  | Catch   | CV  | Cpue  |
|---------------|----------|-----|----------|-----|----------|-----|----------|-----|----------|-----|---------|-----|-------|
| Hook & line   | 6442.9   | 11  | 6605.9   | 11  | 4371.2   | 17  | 16295.8  | 11  | 16737.2  | 11  | 2999.0  | 5   | .18   |
| Cast net      | 63.2     | 66  | 60.4     | 69  | 55.5     | 72  | 158.9    | 75  | 122.6    | 65  | 52.3    | 65  | .43   |
| Gill net      | 3694.5   | 9   | 1448.2   | 9   | 1448.2   | 9   | 18488.9  | 9   | 7296.2   | 9   | 24775.2 | 9   | 3.40  |
| Surround net  | 64.2     | 100 | 21.4     | 100 | 21.4     | 100 | 64.2     | 100 | 21.4     | 100 | 47.2    | 100 | 2.20  |
| Spear-snorkel | 4643.0   | 26  | 4335.8   | 25  | 1872.7   | 26  | 13583.9  | 25  | 12688.9  | 25  | 26461.1 | 25  | 2.09  |
| Spear-scuba   | 786.5    | 34  | 777.5    | 34  | 308.3    | 33  | 7438.6   | 38  | 7420.7   | 38  | 5725.9  | 38  | .77   |
| Hook & gaff   | 31.3     | 82  | 52.2     | 82  | 14.9     | 82  | 284.2    | 82  | 473.6    | 82  | 261.0   | 82  | .55   |
| Drag net      | 223.7    | 93  | 428.0    | 93  | 428.0    | 93  | 581.7    | 93  | 1112.9   | 93  | 12664.0 | 93  | 11.38 |
| Other         | 1112.8   | 40  | 1112.8   | 40  | 559.2    | 40  | 7467.1   | 40  | 7467.1   | 40  | 23869.9 | 40  | 3.20  |
| Totals        | 17062.2  | 11  | 14842.3  | 10  | 8771.2   | 10  | 54604.8  | 10  | 45897.1  | 10  | 96855.5 | 10  | 2.07  |

## IV.56

Table IV.7.1

Guam DAWR 1988 Annual  
Day Inshore Creel Survey  
Species Composition

| Common Name           | Total Pounds | % SP. Comp. | Common Name         | Total Pounds | % SP. Comp. |
|-----------------------|--------------|-------------|---------------------|--------------|-------------|
| Rays                  | 665.7        | 0.40        | Herring             | 24516.2      | 14.90       |
| Milkfish              | 444.9        | 0.27        | Lizardfish          | 32.4         | 0.02        |
| Needlefish            | 23.9         | 0.01        | Halfbeak            | 1414.4       | 0.86        |
| Squirrelfish          | 1523.6       | 0.93        | Scorpionfish        | 75.7         | 0.05        |
| Grouper               | 309.6        | 0.19        | Cardinalfish        | 6362.8       | 3.87        |
| Jacks                 | 14822.0      | 9.01        | Bigeye scad (akule) | 282.9        | 0.17        |
| Ponyfishes            | 574.7        | 0.35        | Snappers            | 4831.9       | 2.94        |
| Bream                 | 49.9         | 0.03        | Moharra             | 7393.6       | 4.49        |
| Sweetlips             | 2044.6       | 1.24        | Emperors            | 9503.8       | 5.77        |
| Goatfish              | 17752.0      | 10.79       | Rudderfish          | 15159.4      | 9.21        |
| Butterflyfish         | 21.1         | 0.01        | Damselfishes        | 391.1        | 0.24        |
| Mullet                | 10034.9      | 6.10        | Barracuda           | 27.7         | 0.02        |
| Wrasse                | 809.7        | 0.49        | Parrotfish          | 209.3        | 0.13        |
| Surgeonfish and tangs | 29271.0      | 17.79       | Moorish idols       | 319.0        | 0.19        |
| Rabbitfish            | 9988.7       | 6.07        | Flounder            | 58.2         | 0.04        |
| Triggerfish           | 1289.9       | 0.78        | Filefish            | 150.3        | 0.09        |
| Octopus               | 4227.5       | 2.57        |                     |              |             |
| Total all species:    | 164582.6     | 100.00      |                     |              |             |

Table IV.7.2

Guam DAWR 1988 Annual  
Night Inshore Creel Survey  
Species Composition

| Common Name        | Total Pounds | % SP. Comp. | Common Name           | Total Pounds | % SP. Comp. |
|--------------------|--------------|-------------|-----------------------|--------------|-------------|
| Herring            | 7.5          | 0.01        | Milkfish              | 667.0        | 0.92        |
| Needlefish         | 261.9        | 0.36        | Squirrelfish          | 1173.2       | 1.62        |
| Scorpionfish       | 74.4         | 0.10        | Grouper               | 5883.5       | 8.10        |
| Jacks              | 5280.6       | 7.27        | Snappers              | 1589.1       | 2.19        |
| Bream              | 671.6        | 0.92        | Moharra               | 1243.6       | 1.71        |
| Sweetlips          | 21.7         | 0.03        | Emperors              | 6269.7       | 8.63        |
| Goatfish           | 6811.6       | 9.38        | Rudderfish            | 1905.9       | 2.62        |
| Damselfishes       | 44.1         | 0.06        | Mullet                | 9209.0       | 12.68       |
| Barracuda          | 445.9        | 0.61        | Wrasse                | 572.6        | 0.79        |
| Parrotfish         | 1000.5       | 1.38        | Surgeonfish and tangs | 22544.4      | 31.05       |
| Rabbitfish         | 6725.0       | 9.26        | Flounder              | 177.0        | 0.24        |
| Triggerfish        | 16.5         | 0.02        | Octopus               | 1.9          | 0           |
| Total all species: | 96855.5      | 100.00      |                       |              |             |



Table IV.7.3

Guam DAWR 1988 Annual  
Combined Day And Night Inshore Creel Survey  
Species Composition

| Common Name           | Total<br>Pounds | % SP.<br>Comp. | Common Name   | Total<br>Pounds | % SP.<br>Comp. |
|-----------------------|-----------------|----------------|---------------|-----------------|----------------|
| Rays                  | 665.7           | 0.23           | Herring       | 24523.7         | 8.58           |
| Milkfish              | 1111.9          | 0.39           | Lizardfish    | 32.4            | 0.01           |
| Needlefish            | 285.8           | 0.10           | Halfbeak      | 1414.4          | 0.50           |
| Squirrelfish          | 2696.7          | 0.94           | Scorpionfish  | 150.2           | 0.05           |
| Grouper               | 6193.1          | 2.17           | Bigeyes       | 13.5            | 0              |
| Cardinalfish          | 6362.8          | 2.23           | Jacks         | 20102.6         | 7.04           |
| Bigeye scad (akule)   | 282.9           | 0.10           | Ponyfishes    | 574.7           | 0.20           |
| Snappers              | 6421.0          | 2.25           | Fusilier      | 131.6           | 0.05           |
| Bream                 | 721.5           | 0.25           | Moharra       | 8637.2          | 3.02           |
| Sweetlips             | 2066.3          | 0.72           | Emperors      | 15773.5         | 5.52           |
| Goatfish              | 24563.6         | 8.60           | Rudderfish    | 17065.3         | 5.97           |
| Butterflyfish         | 21.1            | 0.01           | Damselfishes  | 435.2           | 0.15           |
| Mullet                | 19243.9         | 6.74           | Barracuda     | 473.6           | 0.17           |
| Wrasse                | 1382.3          | 0.48           | Parrotfish    | 1209.8          | 0.42           |
| Surgeonfish and tangs | 51815.4         | 18.14          | Moorish idols | 319.0           | 0.11           |
| Rabbitfish            | 16713.7         | 5.85           | Flounder      | 235.3           | 0.08           |
| Triggerfish           | 1306.4          | 0.46           | Filefish      | 150.3           | 0.05           |
| Unidentified fish     | 48356.1         | 16.93          | Octopus       | 4229.5          | 1.48           |
| Total all species:    | 261438.2        | 100.00         |               |                 |                |

## IV.58

Table IV.7.4

Guam DAWR 1988 Annual  
Combined Offshore And Inshore Creel Survey  
Species Composition

| Common Name             | Total Pounds | % SP. Comp. | Common Name             | Total Pounds | % SP. Comp. |
|-------------------------|--------------|-------------|-------------------------|--------------|-------------|
| Sharks                  | 6325.5       | 0.56        | Rays                    | 2250.3       | 0.20        |
| Herring                 | 24523.7      | 2.18        | Moray eels              | 637.0        | 0.06        |
| Conger eels             | 370.8        | 0.03        | Milkfish                | 1111.9       | 0.10        |
| Lizardfish              | 63.4         | 0.01        | Bearfish                | 39.6         | 0           |
| Needlefish              | 414.8        | 0.04        | Halfbeak                | 1414.4       | 0.13        |
| Squirrelfish            | 4413.6       | 0.39        | Scorpionfish            | 261.2        | 0.02        |
| Grouper                 | 13488.9      | 1.20        | Flagtails               | 5.8          | 0           |
| Bigeyes                 | 54.2         | 0           | Cardinalfish            | 6375.5       | 0.57        |
| False whiting           | 23.1         | 0           | Jacks                   | 28469.4      | 2.53        |
| Rainbow runner          | 11200.2      | 0.99        | Bigeye scad (akule)     | 13259.0      | 1.18        |
| Dolphinfish (mahimahi)  | 310032.1     | 27.51       | Ponyfishes              | 574.7        | 0.05        |
| Pomfret                 | 215.5        | 0.02        | Snappers                | 9371.5       | 0.83        |
| Lehi (silvermouth)      | 1728.2       | 0.15        | Uku (jobfish)           | 4023.2       | 0.36        |
| Ehu (pink snapper)      | 2108.2       | 0.19        | Onaga (red snapper)     | 1147.3       | 0.10        |
| Blue lined snapper      | 1164.2       | 0.10        | Yellowtail kalikali     | 1442.7       | 0.13        |
| Opakapaka (pink snap)   | 264.6        | 0.02        | Yelloweye opakapaka     | 730.2        | 0.06        |
| Kalikali (pink snapper) | 66.6         | 0.01        | Gindai (flower snapper) | 1667.7       | 0.15        |
| Fusilier                | 65.8         | 0.01        | Bream                   | 721.5        | 0.06        |
| Moharra                 | 8637.2       | 0.77        | Sweetlips               | 2321.2       | 0.21        |
| Emperors                | 27855.8      | 2.47        | Goatfish                | 25651.4      | 2.28        |
| Sweepers                | 4.9          | 0           | Rudderfish              | 18039.5      | 1.60        |
| Butterflyfish           | 23.5         | 0           | Angelfish               | 3.5          | 0           |
| Damselfishes            | 435.2        | 0.04        | Hawkfish                | 1.9          | 0           |
| Mullet                  | 19251.7      | 1.71        | Barracuda               | 6088.6       | 0.54        |
| Wrasse                  | 3031.7       | 0.27        | Parrotfish              | 8122.1       | 0.72        |
| Surgeonfish and tangs   | 56553.6      | 5.02        | Moorish idols           | 319.0        | 0.03        |
| Rabbitfish              | 16839.8      | 1.49        | Tunas                   | 16.7         | 0           |
| Wahoo                   | 99801.1      | 8.86        | Kawakawa                | 3497.0       | 0.31        |
| Dogtooth tuna           | 5963.8       | 0.53        | Skipjack tuna           | 184837.7     | 16.40       |
| Yellowfin tuna          | 77433.5      | 6.87        | Sailfish                | 1145.1       | 0.10        |
| Blue marlin             | 68510.9      | 6.08        | Shortbill spearfish     | 1957.0       | 0.17        |
| Flounder                | 238.0        | 0.02        | Triggerfish             | 2044.9       | 0.18        |
| Filefish                | 150.3        | 0.01        | Triplettooth puffers    | 31.7         | 0           |
| Assorted bottom fish    | 538.8        | 0.05        | Shallow bottom fish     | 1362.8       | 0.12        |
| Deep bottom fish        | 735.3        | 0.07        | Assorted reef fish      | 3654.2       | 0.32        |
| Unidentified fish       | 24178.1      | 2.15        | Mollusks                | 2356.6       | 0.21        |
| Squid                   | 7.0          | 0           | Octopus                 | 4401.7       | 0.39        |
| Spiny lobsters          | 776.8        | 0.07        | Slipper lobsters        | 53.8         | 0           |
| Crabs                   | 131.8        | 0.01        |                         |              |             |
| Total all species:      | 1127031.5    | 100.00      |                         |              |             |

Figure IV.5.1

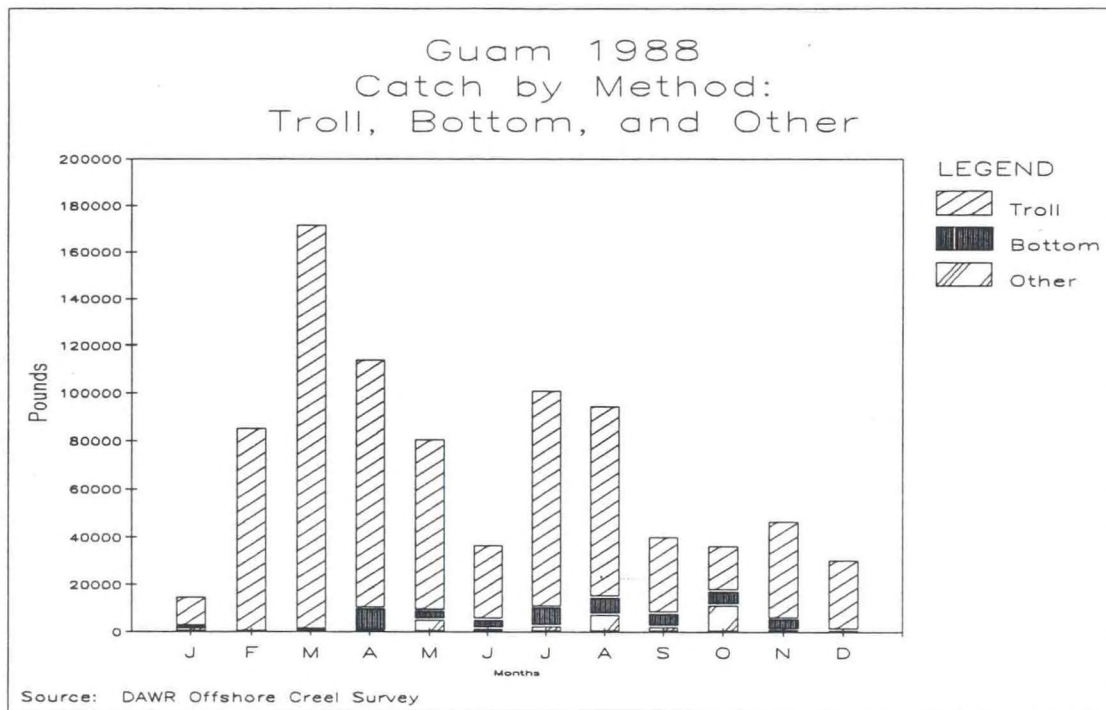
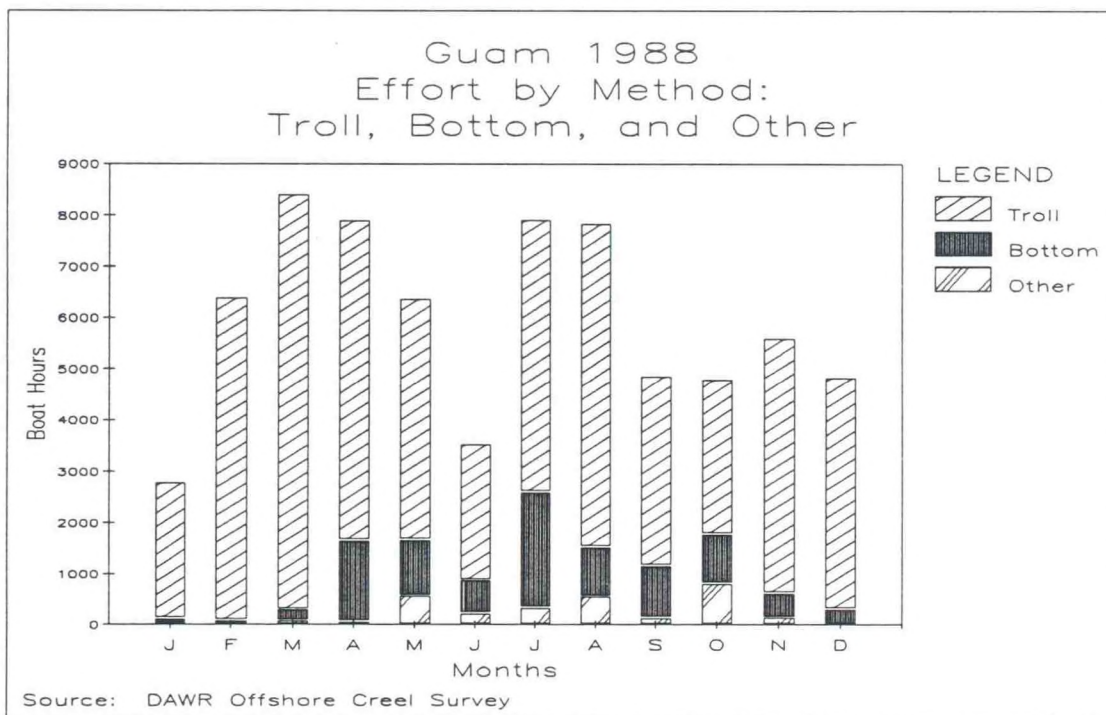


Figure IV.5.2





# IV.60

Figure IV.6.1

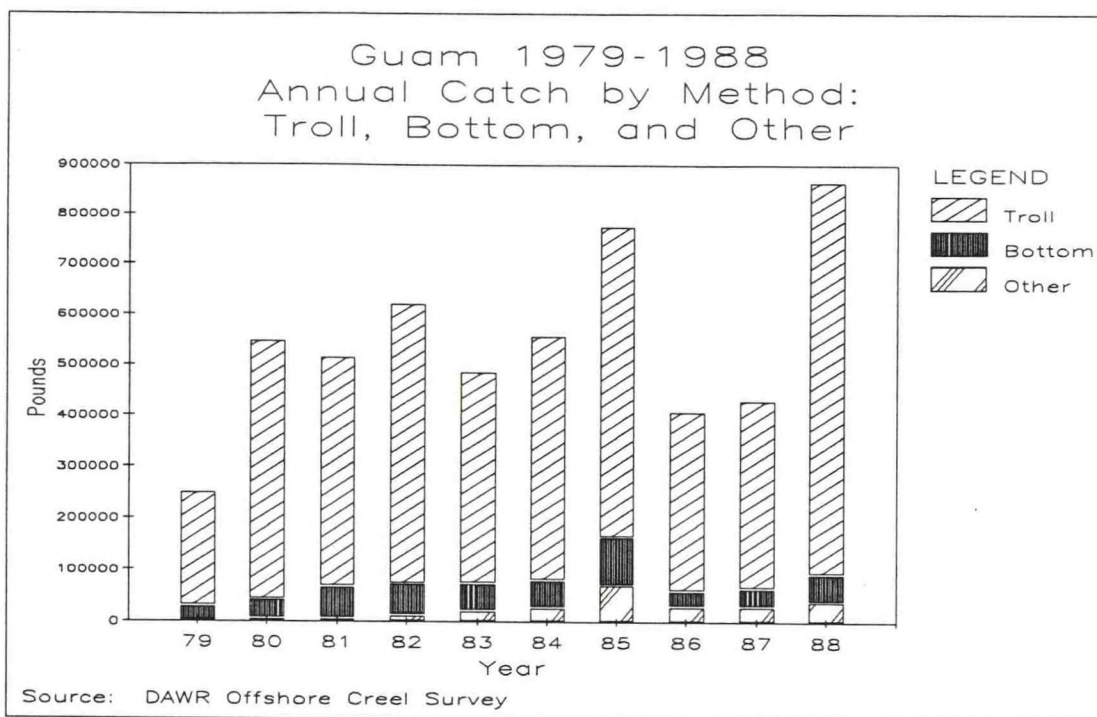
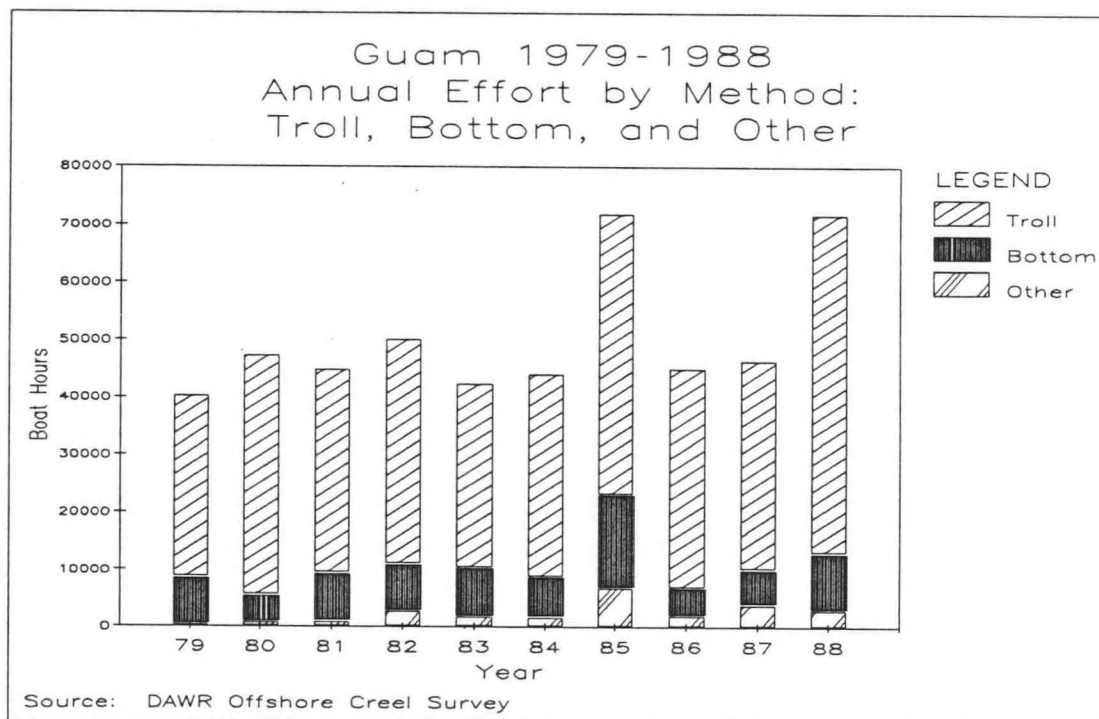


Figure IV.6.2



IV.61

Figure IV.7.1

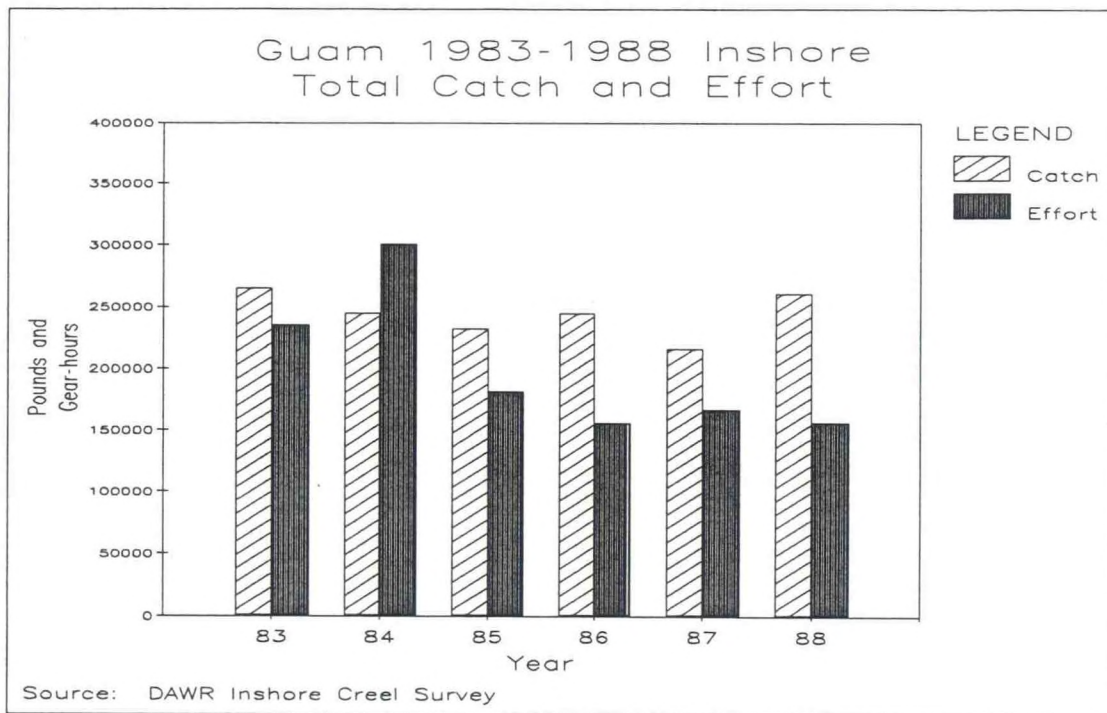
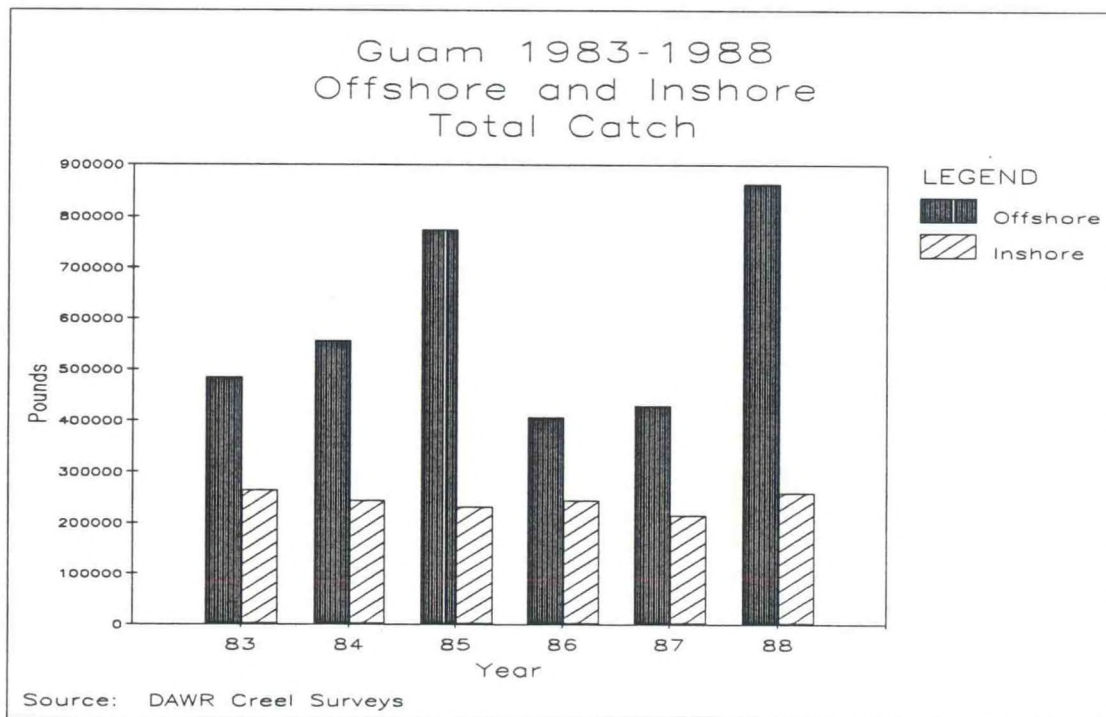
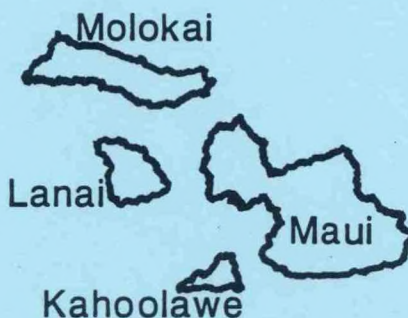


Figure IV.7.2







# State of Hawaii

**Fishery Statistics  
1988**



STATE OF HAWAII 1988 FISHERY STATISTICS

Compiled by

Division of Aquatic Resources

and the

Western Pacific Fishery Information Network

May 1990

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## STATE OF HAWAII 1988 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, 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 15,000 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 purchase of a commercial marine fishing license. There are currently about 2,500 licensed commercial fishermen in the State. Substantial subsistence and recreational fisheries, which are primarily small boat, one-day fisheries, also exist. Data provided in this document are from licensed commercial fishermen only.

### 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 recently made several improvements to the system and 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 50% in 1988.

#### 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 to the State's central data processing staff for keypunching. The use of central data processing staff instead of in-house fisheries personnel to accomplish most of the computer processing activities is a major and significant difference between the processing system in Hawaii and those in American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. 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 data base. When the data base 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 data bases were not updated. Since 1982, additional editing and data correction procedures were implemented, making data base 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 total by some small percent (refer to Volumes I and III for details). Beginning with 1987, data were processed directly from the final annual detail data bases from DAR.

#### 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 data base. 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 1988, and 26 trend and seasonality graphs, based on 1979-88 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)

- Dolphin (mahimahi)
- Wahoo
- Blue marlin
- Black marlin
- Striped marlin
- Shortbill spearfish
- Sailfish
- Swordfish
- Sharks

II. Bottomfish Management Unit Species (BMUS)

- Deep water jacks (unclassified)
- 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 (red or long tailed snapper)
- Opakapaka (pink snapper)
- Uku (gray snapper)

III. Billfish

- Billfish (unclassified)
- Blue marlin
- Black marlin
- Striped marlin
- Shortbill spearfish
- Sailfish
- Swordfish

IV. Tunas

- Tunas (unclassified)
- 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 (unclassified)  
Squirrelfish  
Trumpetfish  
Scorpionfish  
Mountain bass  
Bigeyes  
Cardinalfish  
Goatfish  
Rudderfish  
Butterflyfish  
Damsel fish  
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

V.7



Table V.1.1

## Hawaii 1988 Commercial Landings

| Species                  | Records | Pounds  | Value     | \$/lb |
|--------------------------|---------|---------|-----------|-------|
| Miscellaneous            | 479     | 11,353  | 23,571    | 2.08  |
| Sharks                   | 178     | 17,805  | 17,556    | 0.99  |
| Eels                     | 108     | 1,415   | 759       | 0.54  |
| Alfonsin                 | 6       | 49      | 66        | 1.35  |
| Bigeye scad (akule)      | 2,113   | 322,498 | 592,964   | 1.84  |
| Mackerel scad            | 2,755   | 273,873 | 438,845   | 1.60  |
| Leatherback              | 73      | 630     | 529       | 0.84  |
| Ten pounder              | 29      | 956     | 905       | 0.95  |
| Bonfish                  | 234     | 8,425   | 8,404     | 1.00  |
| Herring/sardine          | 2       | 18      | 24        | 1.33  |
| Milkfish                 | 44      | 1,462   | 2,308     | 1.58  |
| Flying fish              | 2       | 2       | 1         | 0.30  |
| Needlefish               | 224     | 5,634   | 4,466     | 0.79  |
| Halfbeaks                | 24      | 340     | 839       | 2.47  |
| Threadfin                | 230     | 4,065   | 18,479    | 4.55  |
| Mullet                   | 315     | 7,579   | 19,767    | 2.61  |
| Pomfret                  | 182     | 6,075   | 12,009    | 1.98  |
| Snake mackerel           | 20      | 660     | 174       | 0.26  |
| Jacks (misc)             | 3,084   | 97,600  | 157,870   | 1.62  |
| Amberjack                | 287     | 19,246  | 12,933    | 0.67  |
| Blue crevally            | 674     | 14,684  | 34,457    | 2.35  |
| Pig-lipped ulua          | 362     | 33,969  | 46,094    | 1.36  |
| Dobe ulua                | 100     | 3,347   | 4,854     | 1.45  |
| Paapaa ulua              | 573     | 10,141  | 21,636    | 2.13  |
| White ulua               | 369     | 33,601  | 54,183    | 1.61  |
| Black ulua               | 27      | 762     | 1,358     | 1.78  |
| Giant sea bass           | 702     | 33,522  | 78,526    | 2.34  |
| Blue spot grouper        | 116     | 1,446   | 3,435     | 2.38  |
| Snappers                 | 281     | 3,045   | 10,090    | 3.31  |
| Blue lined snapper       | 1,685   | 42,062  | 47,025    | 1.12  |
| Ehu (red snapper)        | 2,198   | 49,107  | 161,298   | 3.28  |
| Gindai (flower snapper)  | 333     | 2,611   | 7,545     | 2.89  |
| Kalekale (pink snapper)  | 1,041   | 11,297  | 24,811    | 2.20  |
| Lehi (silverjaw)         | 1,607   | 49,419  | 146,781   | 2.97  |
| Onaga (red snapper)      | 2,575   | 154,194 | 714,614   | 4.63  |
| Opakapaka (pink snapper) | 5,455   | 341,778 | 1,212,348 | 3.55  |
| Uku (gray snapper)       | 3,772   | 342,235 | 869,898   | 2.54  |
| Porgy                    | 133     | 3,958   | 5,452     | 1.38  |
| Reef jacks               | 4       | 63      | 290       | 4.60  |
| Squirrelfish             | 1,575   | 36,914  | 88,864    | 2.41  |
| Trumpetfish              | 14      | 259     | 1,757     | 6.78  |
| Scorpionfish             | 516     | 2,803   | 7,492     | 2.67  |
| Mountain bass            | 406     | 10,496  | 21,314    | 2.03  |
| Bigeyes                  | 845     | 10,434  | 19,476    | 1.87  |
| Cardinalfish             | 6       | 17      | 32        | 1.89  |

Table V.1.1 (cont.)

| Species             | Records | Pounds     | Value      | \$/lb |
|---------------------|---------|------------|------------|-------|
| Goatfish            | 2,850   | 66,522     | 149,387    | 2.25  |
| Rudderfish          | 547     | 15,350     | 10,405     | 0.68  |
| Damselfish          | 94      | 709        | 915        | 1.29  |
| Hawkfish            | 127     | 1,494      | 1,271      | 0.85  |
| Tilapia             | 21      | 3,142      | 10,241     | 3.26  |
| Wrasse              | 1,168   | 12,740     | 24,759     | 1.94  |
| Parrotfish          | 1,025   | 52,165     | 57,404     | 1.10  |
| Surgeon/tangs       | 2,668   | 56,663     | 60,848     | 1.07  |
| Flounders           | 8       | 19         | 18         | 0.97  |
| Triggerfish         | 15      | 50         | 41         | 0.83  |
| Filefish            | 53      | 313        | 226        | 0.72  |
| Pufferfish          | 4       | 62         | 375        | 6.05  |
| Rainbow runner      | 791     | 25,469     | 34,559     | 1.36  |
| Mahimahi (dolphin)  | 5,315   | 285,158    | 887,591    | 3.11  |
| Barracudas          | 850     | 18,255     | 24,404     | 1.34  |
| Wahoo               | 6,035   | 344,014    | 945,533    | 2.75  |
| Japanese mackerel   | 2       | 8          | 11         | 1.38  |
| Tunas               | 19      | 217        | 337        | 1.55  |
| Skipjack tuna       | 5,130   | 4,059,181  | 4,266,863  | 1.05  |
| Yellowfin tuna      | 13,009  | 2,395,631  | 4,489,821  | 1.87  |
| Albacore            | 298     | 55,100     | 80,942     | 1.47  |
| Bigeye tuna         | 309     | 287,877    | 1,027,163  | 3.57  |
| Kawakawa            | 689     | 15,132     | 17,013     | 1.12  |
| Billfish            | 6       | 797        | 2,210      | 2.77  |
| Broadbill swordfish | 149     | 20,653     | 57,617     | 2.79  |
| Blue marlin         | 2,698   | 580,990    | 503,651    | 0.87  |
| Black marlin        | 99      | 20,579     | 18,186     | 0.88  |
| Striped marlin      | 1,455   | 230,676    | 267,711    | 1.16  |
| Shortnose spearfish | 614     | 33,795     | 56,412     | 1.67  |
| Sailfish            | 36      | 4,470      | 5,827      | 1.30  |
| Ocean moonfish      | 53      | 14,273     | 21,589     | 1.51  |
| Spiny lobster       | 1,020   | 305,177    | 2,970,562  | 9.73  |
| Slipper lobster     | 788     | 61,516     | 554,376    | 9.01  |
| Crabs               | 358     | 27,083     | 109,478    | 4.04  |
| Shrimp (freshwater) | 4       | 46         | 300        | 6.51  |
| Shrimp (saltwater)  | 2       | 400        | 1,300      | 3.25  |
| Octopus             | 796     | 23,122     | 50,028     | 2.16  |
| Squid               | 150     | 6,452      | 10,493     | 1.63  |
| Limpets (saltwater) | 310     | 11,740     | 30,587     | 2.61  |
| Stoney corals       | 34      | 3,104      | 4,130      | 1.33  |
| Precious corals     | 7       | 203        | 3,045      | 15.00 |
| Sea urchins         | 2       | 34         | 53         | 1.56  |
| Algae               | 846     | 15,502     | 42,364     | 2.73  |
| -----               |         |            |            |       |
| ** TOTAL **         | 86,212  | 11,027,732 | 21,696,145 |       |
| -----               |         |            |            |       |

Table V.1.2

## Hawaii 1988 Commercial Landings (not sold)

| Species                  | Records | Pounds |
|--------------------------|---------|--------|
| Miscellaneous            | 9       | 48     |
| Sharks                   | 49      | 6,737  |
| Eels                     | 7       | 54     |
| Bigeye scad (akule)      | 336     | 14,286 |
| Mackerel scad            | 380     | 6,713  |
| Leatherback              | 43      | 144    |
| Ten pounder              | 3       | 15     |
| Bonefish                 | 53      | 805    |
| Milkfish                 | 10      | 77     |
| Needlefish               | 19      | 91     |
| Halfbeaks                | 2       | 4      |
| Threadfin                | 25      | 187    |
| Mullet                   | 52      | 1,103  |
| Pomfret                  | 2       | 42     |
| Snake mackerel           | 3       | 87     |
| Jacks (misc)             | 572     | 7,786  |
| Amberjack                | 437     | 23,256 |
| Blue crevally            | 51      | 500    |
| Pig-lipped ulua          | 8       | 177    |
| Dobe ulua                | 15      | 270    |
| Paapaa ulua              | 14      | 220    |
| White ulua               | 24      | 555    |
| Giant sea bass           | 36      | 352    |
| Blue spot grouper        | 3       | 9      |
| Snappers                 | 9       | 38     |
| Blue lined snapper       | 228     | 2,339  |
| Ehu (red snapper)        | 219     | 1,778  |
| Gindai (flower snapper)  | 20      | 79     |
| Kalekale (pink snapper)  | 88      | 1,067  |
| Lehi (silverjaw)         | 75      | 1,533  |
| Onaga (red snapper)      | 166     | 2,885  |
| Opakapaka (pink snapper) | 609     | 10,423 |
| Uku (gray snapper)       | 282     | 5,532  |
| Porgy                    | 21      | 230    |
| Squirrelfish             | 134     | 1,252  |
| Trumpetfish              | 8       | 531    |
| Scorpionfish             | 34      | 180    |
| Mountain bass            | 68      | 464    |
| Bigeyes                  | 106     | 666    |
| Cardinalfish             | 1       | 4      |
| Goatfish                 | 465     | 3,778  |
| Rudderfish               | 65      | 602    |
| Damselfish               | 10      | 46     |
| Hawkfish                 | 11      | 77     |
| Tilapia                  | 7       | 150    |



Table V.1.2 (cont.)

| Species             | Records       | Pounds         |
|---------------------|---------------|----------------|
| Wrasse              | 154           | 1,264          |
| Parrotfish          | 111           | 1,485          |
| Surgeon/tangs       | 347           | 3,596          |
| Triggerfish         | 15            | 200            |
| Filefish            | 6             | 22             |
| Pufferfish          | 8             | 34             |
| Rainbow runner      | 68            | 840            |
| Mahimahi (dolphin)  | 791           | 16,300         |
| Barracudas          | 126           | 1,415          |
| Wahoo               | 778           | 18,957         |
| Japanese mackerel   | 3             | 13             |
| Tunas               | 4             | 37             |
| Skipjack tuna       | 3,274         | 88,593         |
| Yellowfin tuna      | 2,343         | 98,578         |
| Albacore            | 12            | 1,405          |
| Bigeye tuna         | 72            | 11,513         |
| Kawakawa            | 884           | 10,318         |
| Frigate tuna        | 2             | 10             |
| Billfish            | 2             | 47             |
| Broadbill swordfish | 1             | 35             |
| Blue marlin         | 346           | 60,530         |
| Black marlin        | 4             | 390            |
| Striped marlin      | 260           | 16,447         |
| Shortnose spearfish | 115           | 4,141          |
| Sailfish            | 8             | 313            |
| Ocean moonfish      | 1             | 700            |
| Spiny lobster       | 327           | 27,723         |
| Slipper lobster     | 238           | 4,048          |
| Crabs               | 78            | 1,358          |
| Shrimp (saltwater)  | 2             | 500            |
| Octopus             | 266           | 5,204          |
| Squid               | 47            | 941            |
| Limpets (saltwater) | 39            | 1,539          |
| Stoney corals       | 51            | 8,955          |
| Precious corals     | 13            | 312            |
| Sea urchins         | 25            | 273            |
| Sea cucumbers       | 1             | 37             |
| Algae               | 233           | 1,059          |
| <b>** TOTAL **</b>  | <b>15,834</b> | <b>486,304</b> |

Table V.1.3

## Hawaii January 1988 Commercial Landings

| Species                  | Records | Pounds | Value   | \$/lb |
|--------------------------|---------|--------|---------|-------|
| Miscellaneous            | 52      | 1,265  | 2,537   | 2.01  |
| Sharks                   | 13      | 1,558  | 1,756   | 1.13  |
| Eels                     | 10      | 125    | 53      | 0.43  |
| Bigeye scad (akule)      | 166     | 9,299  | 25,492  | 2.74  |
| Mackerel scad            | 273     | 20,380 | 38,798  | 1.90  |
| Leatherback              | 2       | 18     | 18      | 1.00  |
| Ten pounder              | 4       | 124    | 125     | 1.01  |
| Bonfish                  | 26      | 513    | 523     | 1.02  |
| Milkfish                 | 11      | 185    | 168     | 0.91  |
| Needlefish               | 37      | 1,636  | 1,620   | 0.99  |
| Threadfin                | 21      | 332    | 1,483   | 4.47  |
| Mullet                   | 12      | 546    | 1,659   | 3.04  |
| Pomfret                  | 14      | 470    | 1,128   | 2.40  |
| Snake mackerel           | 2       | 39     | 10      | 0.25  |
| Jacks (misc)             | 202     | 4,905  | 9,388   | 1.91  |
| Amberjack                | 42      | 2,317  | 1,547   | 0.67  |
| Blue crevally            | 40      | 379    | 1,021   | 2.69  |
| Pig-lipped ulua          | 61      | 4,513  | 7,754   | 1.72  |
| Dobe ulua                | 23      | 1,390  | 1,973   | 1.42  |
| Paapaa ulua              | 48      | 977    | 2,384   | 2.44  |
| White ulua               | 10      | 631    | 1,259   | 2.00  |
| Black ulua               | 8       | 191    | 410     | 2.15  |
| Giant sea bass           | 83      | 4,336  | 10,561  | 2.44  |
| Blue spot grouper        | 7       | 51     | 125     | 2.45  |
| Snappers                 | 29      | 90     | 336     | 3.73  |
| Blue lined snapper       | 219     | 5,232  | 6,476   | 1.24  |
| Ehu (red snapper)        | 238     | 5,505  | 18,414  | 3.34  |
| Gindai (flower snapper)  | 45      | 500    | 1,471   | 2.94  |
| Kalekale (pink snapper)  | 138     | 1,961  | 4,566   | 2.33  |
| Lehi (silverjaw)         | 140     | 7,142  | 27,143  | 3.80  |
| Onaga (red snapper)      | 239     | 14,663 | 70,462  | 4.81  |
| Opakapaka (pink snapper) | 529     | 37,272 | 143,411 | 3.85  |
| Uku (gray snapper)       | 175     | 7,683  | 27,103  | 3.53  |
| Porgy                    | 6       | 52     | 154     | 2.95  |
| Squirrelfish             | 221     | 4,105  | 13,147  | 3.20  |
| Trumpetfish              | 3       | 27     | 25      | 0.93  |
| Scorpionfish             | 43      | 229    | 584     | 2.55  |
| Mountain bass            | 23      | 384    | 1,053   | 2.74  |
| Bigeyes                  | 122     | 979    | 1,853   | 1.89  |
| Cardinalfish             | 1       | 3      | 4       | 1.25  |
| Goatfish                 | 216     | 6,961  | 14,242  | 2.05  |
| Rudderfish               | 35      | 338    | 312     | 0.92  |

Table V.1.3 (cont.)

| Species               | Records      | Pounds         | Value            | \$/lb |
|-----------------------|--------------|----------------|------------------|-------|
| Damselfish            | 1            | 2              | 3                | 1.33  |
| Hawkfish              | 13           | 131            | 218              | 1.66  |
| Tilapia               | 2            | 476            | 923              | 1.94  |
| Wrasse                | 81           | 897            | 1,880            | 2.10  |
| Parrotfish            | 79           | 2,226          | 3,319            | 1.49  |
| Surgeon/tangs         | 181          | 5,162          | 4,546            | 0.88  |
| Triggerfish           | 3            | 5              | 2                | 0.40  |
| Filefish              | 4            | 14             | 6                | 0.46  |
| Rainbow runner        | 54           | 2,010          | 3,548            | 1.77  |
| Mahimahi (dolphin)    | 405          | 20,467         | 72,017           | 3.52  |
| Barracudas            | 93           | 1,187          | 1,469            | 1.24  |
| Wahoo                 | 115          | 8,949          | 34,548           | 3.86  |
| Skipjack tuna         | 334          | 307,329        | 324,582          | 1.06  |
| Yellowfin tuna        | 1,108        | 261,189        | 454,422          | 1.74  |
| Albacore              | 5            | 2,367          | 3,712            | 1.57  |
| Bigeye tuna           | 13           | 21,078         | 102,369          | 4.86  |
| Kawakawa              | 55           | 1,529          | 1,701            | 1.11  |
| Broadbill swordfish   | 1            | 98             | 372              | 3.80  |
| Blue marlin           | 108          | 27,278         | 24,536           | 0.90  |
| Black marlin          | 9            | 2,739          | 2,394            | 0.87  |
| Striped marlin        | 182          | 22,281         | 26,389           | 1.18  |
| Shortnose spearfish   | 32           | 1,940          | 4,229            | 2.18  |
| Sailfish              | 2            | 90             | 121              | 1.34  |
| Ocean moonfish        | 5            | 543            | 1,114            | 2.05  |
| Spiny lobster         | 69           | 11,540         | 124,950          | 10.83 |
| Slipper lobster       | 27           | 3,058          | 27,749           | 9.07  |
| Crabs                 | 27           | 2,270          | 8,643            | 3.81  |
| Shrimp (freshwater)   | 1            | 19             | 95               | 5.00  |
| Octopus               | 60           | 1,600          | 3,236            | 2.02  |
| Squid                 | 1            | 80             | 140              | 1.75  |
| Limpets (saltwater)   | 19           | 339            | 910              | 2.69  |
| Algae                 | 49           | 361            | 972              | 2.69  |
| <b>** SUBTOTAL **</b> | <b>6,727</b> | <b>858,560</b> | <b>1,677,661</b> |       |



Table V.1.4

## Hawaii February 1988 Commercial Landings

| Species                  | Records | Pounds | Value   | \$/lb |
|--------------------------|---------|--------|---------|-------|
| Miscellaneous            | 48      | 1,832  | 3,816   | 2.08  |
| Sharks                   | 15      | 2,277  | 2,376   | 1.04  |
| Eels                     | 17      | 147    | 45      | 0.31  |
| Alfonsin                 | 1       | 11     | 22      | 2.00  |
| Bigeye scad (akule)      | 209     | 32,202 | 70,749  | 2.20  |
| Mackerel scad            | 240     | 15,972 | 32,500  | 2.03  |
| Leatherback              | 5       | 22     | 29      | 1.30  |
| Ten pounder              | 2       | 80     | 79      | 0.99  |
| Bonfish                  | 30      | 715    | 691     | 0.97  |
| Herring/sardine          | 1       | 3      | 2       | 0.50  |
| Milkfish                 | 3       | 110    | 200     | 1.82  |
| Needlefish               | 38      | 1,026  | 900     | 0.88  |
| Threadfin                | 13      | 223    | 1,121   | 5.03  |
| Mullet                   | 8       | 233    | 635     | 2.73  |
| Pomfret                  | 22      | 371    | 690     | 1.86  |
| Jacks (misc)             | 252     | 8,305  | 13,604  | 1.64  |
| Amberjack                | 34      | 2,469  | 1,636   | 0.66  |
| Blue crevally            | 36      | 315    | 737     | 2.34  |
| Pig-lipped ulua          | 52      | 8,275  | 10,809  | 1.31  |
| Dobe ulua                | 13      | 439    | 721     | 1.64  |
| Paapaa ulua              | 68      | 1,187  | 2,974   | 2.51  |
| White ulua               | 23      | 1,161  | 2,208   | 1.90  |
| Black ulua               | 4       | 78     | 129     | 1.65  |
| Giant sea bass           | 99      | 5,166  | 13,275  | 2.57  |
| Blue spot grouper        | 14      | 83     | 174     | 2.10  |
| Snappers                 | 23      | 59     | 215     | 3.65  |
| Blue lined snapper       | 219     | 5,267  | 6,280   | 1.19  |
| Ehu (red snapper)        | 268     | 5,851  | 18,641  | 3.19  |
| Gindai (flower snapper)  | 61      | 400    | 1,145   | 2.86  |
| Kalekale (pink snapper)  | 155     | 1,916  | 4,146   | 2.16  |
| Lehi (silverjaw)         | 195     | 5,442  | 16,908  | 3.11  |
| Onaga (red snapper)      | 271     | 14,601 | 64,745  | 4.43  |
| Opakapaka (pink snapper) | 616     | 41,759 | 138,524 | 3.32  |
| Uku (gray snapper)       | 279     | 10,629 | 32,617  | 3.07  |
| Porgy                    | 17      | 263    | 618     | 2.35  |
| Squirrelfish             | 186     | 3,679  | 10,323  | 2.81  |
| Trumpetfish              | 3       | 10     | 10      | 1.03  |
| Scorpionfish             | 44      | 188    | 538     | 2.86  |
| Mountain bass            | 18      | 737    | 1,607   | 2.18  |
| Bigeyes                  | 108     | 825    | 1,317   | 1.60  |
| Goatfish                 | 294     | 9,065  | 20,469  | 2.26  |
| Rudderfish               | 54      | 826    | 712     | 0.86  |

Table V.1.4 (cont.)

| Species             | Records | Pounds  | Value     | \$/lb |
|---------------------|---------|---------|-----------|-------|
| Damselfish          | 8       | 50      | 57        | 1.15  |
| Hawkfish            | 5       | 30      | 38        | 1.26  |
| Tilapia             | 2       | 305     | 1,072     | 3.51  |
| Wrasse              | 75      | 567     | 1,036     | 1.83  |
| Parrotfish          | 100     | 3,184   | 4,821     | 1.51  |
| Surgeon/tangs       | 251     | 7,591   | 7,012     | 0.92  |
| Triggerfish         | 1       | 2       | 2         | 0.85  |
| Filefish            | 5       | 29      | 10        | 0.34  |
| Rainbow runner      | 70      | 2,452   | 3,199     | 1.30  |
| Mahimahi (dolphin)  | 866     | 40,626  | 102,494   | 2.52  |
| Barracudas          | 101     | 1,229   | 1,669     | 1.36  |
| Wahoo               | 229     | 17,006  | 60,434    | 3.55  |
| Japanese mackerel   | 1       | 6       | 9         | 1.50  |
| Tunas               | 2       | 27      | 33        | 1.22  |
| Skipjack tuna       | 447     | 227,916 | 253,915   | 1.11  |
| Yellowfin tuna      | 1,326   | 198,472 | 406,166   | 2.05  |
| Albacore            | 4       | 398     | 770       | 1.94  |
| Bigeye tuna         | 26      | 24,204  | 110,193   | 4.55  |
| Kawakawa            | 55      | 1,306   | 1,190     | 0.91  |
| Broadbill swordfish | 2       | 94      | 276       | 2.94  |
| Blue marlin         | 92      | 27,532  | 26,464    | 0.96  |
| Black marlin        | 4       | 831     | 1,055     | 1.27  |
| Striped marlin      | 337     | 32,950  | 42,915    | 1.30  |
| Shortnose spearfish | 113     | 4,031   | 5,793     | 1.44  |
| Sailfish            | 4       | 209     | 430       | 2.06  |
| Ocean moonfish      | 3       | 1,709   | 2,767     | 1.62  |
| Spiny lobster       | 145     | 24,913  | 297,956   | 11.96 |
| Slipper lobster     | 108     | 13,968  | 127,821   | 9.15  |
| Crabs               | 46      | 1,852   | 7,956     | 4.30  |
| Shrimp (freshwater) | 1       | 20      | 100       | 5.00  |
| Octopus             | 55      | 1,300   | 2,631     | 2.02  |
| Limpets (saltwater) | 17      | 481     | 1,270     | 2.64  |
| Stoney corals       | 9       | 765     | 677       | 0.88  |
| Sea urchins         | 1       | 2       | 5         | 2.50  |
| Algae               | 39      | 1,029   | 2,881     | 2.80  |
| ** SUBTOTAL **      | 8,608   | 821,305 | 1,954,053 |       |

Table V.1.5

## Hawaii March 1988 Commercial Landings

| Species                  | Records | Pounds | Value   | \$/lb |
|--------------------------|---------|--------|---------|-------|
| Miscellaneous            | 41      | 1,468  | 3,270   | 2.23  |
| Sharks                   | 16      | 1,560  | 1,754   | 1.12  |
| Eels                     | 14      | 183    | 177     | 0.96  |
| Alfonsin                 | 1       | 6      | 3       | 0.50  |
| Bigeye scad (akule)      | 232     | 51,964 | 92,220  | 1.77  |
| Mackerel scad            | 199     | 13,673 | 25,376  | 1.86  |
| Leatherback              | 10      | 106    | 103     | 0.97  |
| Ten pounder              | 4       | 102    | 98      | 0.96  |
| Bonfish                  | 25      | 638    | 511     | 0.80  |
| Milkfish                 | 1       | 3      | 2       | 0.65  |
| Needlefish               | 31      | 269    | 295     | 1.10  |
| Halfbeaks                | 2       | 7      | 5       | 0.70  |
| Threadfin                | 21      | 308    | 1,217   | 3.95  |
| Mullet                   | 77      | 1,189  | 3,104   | 2.61  |
| Pomfret                  | 19      | 880    | 1,814   | 2.06  |
| Snake mackerel           | 1       | 50     | 13      | 0.25  |
| Jacks (misc)             | 229     | 7,107  | 12,488  | 1.76  |
| Amberjack                | 48      | 3,737  | 2,587   | 0.69  |
| Blue crevally            | 66      | 769    | 1,978   | 2.57  |
| Pig-lipped ulua          | 59      | 2,519  | 5,269   | 2.09  |
| Dobe ulua                | 10      | 57     | 231     | 4.06  |
| Paapaa ulua              | 78      | 1,646  | 3,773   | 2.29  |
| White ulua               | 46      | 4,076  | 9,986   | 2.45  |
| Black ulua               | 3       | 129    | 271     | 2.10  |
| Giant sea bass           | 68      | 3,617  | 8,162   | 2.26  |
| Blue spot grouper        | 12      | 550    | 1,615   | 2.94  |
| Snappers                 | 27      | 148    | 714     | 4.83  |
| Blue lined snapper       | 195     | 6,400  | 7,709   | 1.20  |
| Ehu (red snapper)        | 228     | 4,498  | 14,465  | 3.22  |
| Gindai (flower snapper)  | 27      | 168    | 536     | 3.19  |
| Kalekale (pink snapper)  | 99      | 1,035  | 2,486   | 2.40  |
| Lehi (silverjaw)         | 167     | 3,981  | 11,864  | 2.98  |
| Onaga (red snapper)      | 214     | 14,090 | 65,694  | 4.66  |
| Opakapaka (pink snapper) | 564     | 32,346 | 112,539 | 3.48  |
| Uku (gray snapper)       | 380     | 21,256 | 63,259  | 2.98  |
| Porgy                    | 11      | 236    | 450     | 1.91  |
| Reef jacks               | 2       | 26     | 123     | 4.72  |
| Squirrelfish             | 127     | 2,911  | 6,870   | 2.36  |
| Trumpetfish              | 2       | 24     | 22      | 0.90  |
| Scorpionfish             | 46      | 221    | 689     | 3.12  |
| Mountain bass            | 39      | 837    | 1,796   | 2.15  |
| Bigeyes                  | 75      | 903    | 1,800   | 1.99  |



Table V.1.5 (cont.)

| Species             | Records | Pounds  | Value     | \$/lb |
|---------------------|---------|---------|-----------|-------|
| Goatfish            | 288     | 7,443   | 15,212    | 2.04  |
| Rudderfish          | 83      | 1,344   | 1,332     | 0.99  |
| Damselfish          | 16      | 107     | 138       | 1.29  |
| Hawkfish            | 12      | 75      | 116       | 1.54  |
| Tilapia             | 1       | 284     | 1,053     | 3.71  |
| Wrasse              | 118     | 1,067   | 2,130     | 2.00  |
| Parrotfish          | 105     | 3,970   | 6,011     | 1.51  |
| Surgeon/tangs       | 274     | 4,767   | 6,038     | 1.27  |
| Flounders           | 1       | 2       | 3         | 1.28  |
| Filefish            | 10      | 71      | 48        | 0.67  |
| Rainbow runner      | 71      | 2,242   | 3,443     | 1.54  |
| Mahimahi (dolphin)  | 778     | 41,331  | 108,731   | 2.63  |
| Barracudas          | 121     | 1,603   | 2,279     | 1.42  |
| Wahoo               | 376     | 20,782  | 75,406    | 3.63  |
| Tunas               | 2       | 67      | 213       | 3.17  |
| Skipjack tuna       | 522     | 229,745 | 362,859   | 1.58  |
| Yellowfin tuna      | 1,277   | 150,831 | 334,203   | 2.22  |
| Albacore            | 5       | 856     | 2,783     | 3.25  |
| Bigeye tuna         | 21      | 25,976  | 128,074   | 4.93  |
| Kawakawa            | 92      | 1,995   | 2,949     | 1.48  |
| Broadbill swordfish | 3       | 488     | 2,025     | 4.15  |
| Blue marlin         | 94      | 25,055  | 30,249    | 1.21  |
| Black marlin        | 3       | 449     | 583       | 1.30  |
| Striped marlin      | 150     | 19,514  | 35,020    | 1.79  |
| Shortnose spearfish | 71      | 3,841   | 7,486     | 1.95  |
| Sailfish            | 3       | 191     | 317       | 1.66  |
| Ocean moonfish      | 4       | 705     | 1,045     | 1.48  |
| Spiny lobster       | 139     | 17,977  | 192,219   | 10.69 |
| Slipper lobster     | 89      | 4,669   | 43,358    | 9.29  |
| Crabs               | 35      | 2,328   | 10,603    | 4.55  |
| Shrimp (freshwater) | 1       | 5       | 100       | 20.00 |
| Shrimp (saltwater)  | 2       | 400     | 1,300     | 3.25  |
| Octopus             | 64      | 1,861   | 3,855     | 2.07  |
| Limpets (saltwater) | 17      | 573     | 1,618     | 2.82  |
| Stoney corals       | 7       | 1,060   | 935       | 0.88  |
| Precious corals     | 7       | 203     | 3,045     | 15.00 |
| Algae               | 46      | 1,499   | 2,666     | 1.78  |
| -----               |         |         |           |       |
| ** SUBTOTAL **      | 8,424   | 761,069 | 1,856,778 |       |
| -----               |         |         |           |       |

Table V.1.6

## Hawaii April 1988 Commercial Landings

| Species                  | Records | Pounds | Value  | \$/lb |
|--------------------------|---------|--------|--------|-------|
| Miscellaneous            | 40      | 1,486  | 3,266  | 2.20  |
| Sharks                   | 12      | 1,517  | 1,638  | 1.08  |
| Eels                     | 11      | 121    | 40     | 0.33  |
| Bigeye scad (akule)      | 200     | 23,898 | 42,893 | 1.79  |
| Mackerel scad            | 169     | 9,726  | 17,387 | 1.79  |
| Leatherback              | 7       | 38     | 75     | 1.98  |
| Ten pounder              | 2       | 32     | 29     | 0.91  |
| Bonefish                 | 10      | 252    | 212    | 0.84  |
| Needlefish               | 19      | 117    | 176    | 1.50  |
| Threadfin                | 19      | 409    | 1,773  | 4.33  |
| Mullet                   | 37      | 479    | 1,283  | 2.68  |
| Pomfret                  | 16      | 579    | 1,138  | 1.96  |
| Snake mackerel           | 1       | 29     | 7      | 0.25  |
| Jacks (misc)             | 239     | 8,105  | 13,663 | 1.69  |
| Amberjack                | 24      | 1,618  | 1,187  | 0.73  |
| Blue crevally            | 73      | 1,218  | 3,568  | 2.93  |
| Pig-lipped ulua          | 42      | 2,919  | 3,399  | 1.16  |
| Dobe ulua                | 12      | 315    | 502    | 1.59  |
| Paapaa ulua              | 44      | 498    | 1,240  | 2.49  |
| White ulua               | 25      | 2,739  | 4,559  | 1.66  |
| Black ulua               | 2       | 15     | 16     | 1.06  |
| Giant sea bass           | 50      | 4,923  | 8,246  | 1.68  |
| Blue spot grouper        | 10      | 169    | 333    | 1.97  |
| Snappers                 | 15      | 86     | 384    | 4.47  |
| Blue lined snapper       | 98      | 3,414  | 3,691  | 1.08  |
| Ehu (red snapper)        | 116     | 2,902  | 9,519  | 3.28  |
| Gindai (flower snapper)  | 27      | 282    | 716    | 2.54  |
| Kalekale (pink snapper)  | 31      | 294    | 820    | 2.79  |
| Lehi (silverjaw)         | 101     | 2,230  | 6,556  | 2.94  |
| Onaga (red snapper)      | 108     | 7,040  | 39,463 | 5.61  |
| Opakapaka (pink snapper) | 325     | 18,195 | 74,632 | 4.10  |
| Uku (gray snapper)       | 336     | 34,111 | 94,977 | 2.78  |
| Porgy                    | 16      | 558    | 966    | 1.73  |
| Reef jacks               | 2       | 37     | 167    | 4.51  |
| Squirrelfish             | 105     | 1,731  | 4,507  | 2.60  |
| Trumpetfish              | 2       | 15     | 27     | 1.82  |
| Scorpionfish             | 37      | 175    | 526    | 3.01  |
| Mountain bass            | 24      | 856    | 2,012  | 2.35  |
| Bigeyes                  | 62      | 980    | 1,967  | 2.01  |
| Goatfish                 | 194     | 4,892  | 10,570 | 2.16  |
| Rudderfish               | 48      | 660    | 703    | 1.07  |
| Damselfish               | 5       | 13     | 17     | 1.34  |

Table V.1.6 (cont.)

| Species               | Records      | Pounds         | Value            | \$/lb |
|-----------------------|--------------|----------------|------------------|-------|
| Hawkfish              | 9            | 56             | 91               | 1.62  |
| Tilapia               | 1            | 306            | 1,110            | 3.63  |
| Wrasse                | 59           | 465            | 852              | 1.83  |
| Parrotfish            | 91           | 3,947          | 6,590            | 1.67  |
| Surgeon/tangs         | 224          | 3,818          | 4,844            | 1.27  |
| Flounders             | 1            | 1              | 1                | 1.00  |
| Filefish              | 5            | 15             | 19               | 1.26  |
| Rainbow runner        | 49           | 1,652          | 2,254            | 1.36  |
| Mahimahi (dolphin)    | 707          | 51,025         | 134,024          | 2.63  |
| Barracudas            | 76           | 1,110          | 1,735            | 1.56  |
| Wahoo                 | 694          | 38,113         | 103,561          | 2.72  |
| Tunas                 | 1            | 3              | 2                | 0.75  |
| Skipjack tuna         | 508          | 124,095        | 158,340          | 1.28  |
| Yellowfin tuna        | 1,204        | 198,155        | 459,736          | 2.32  |
| Albacore              | 34           | 10,421         | 18,940           | 1.82  |
| Bigeye tuna           | 31           | 25,753         | 113,689          | 4.41  |
| Kawakawa              | 60           | 1,068          | 1,379            | 1.29  |
| Broadbill swordfish   | 11           | 2,291          | 6,375            | 2.78  |
| Blue marlin           | 69           | 19,615         | 22,376           | 1.14  |
| Black marlin          | 7            | 1,485          | 1,962            | 1.32  |
| Striped marlin        | 104          | 18,125         | 30,686           | 1.69  |
| Shortnose spearfish   | 43           | 2,310          | 4,004            | 1.73  |
| Sailfish              | 1            | 150            | 304              | 2.02  |
| Ocean moonfish        | 7            | 3,933          | 5,474            | 1.39  |
| Spiny lobster         | 52           | 5,737          | 56,353           | 9.82  |
| Slipper lobster       | 21           | 560            | 5,162            | 9.22  |
| Crabs                 | 28           | 2,758          | 11,138           | 4.04  |
| Octopus               | 47           | 1,253          | 2,627            | 2.10  |
| Squid                 | 1            | 9              | 9                | 1.00  |
| Limpets (saltwater)   | 29           | 1,010          | 2,589            | 2.56  |
| Stoney corals         | 7            | 431            | 793              | 1.84  |
| Sea urchins           | 1            | 32             | 48               | 1.50  |
| Algae                 | 63           | 1,807          | 3,600            | 1.99  |
| <b>** SUBTOTAL **</b> | <b>6,961</b> | <b>661,182</b> | <b>1,519,514</b> |       |



Table V.1.7

## Hawaii May 1988 Commercial Landings

| Species                  | Records | Pounds | Value  | \$/lb |
|--------------------------|---------|--------|--------|-------|
| Miscellaneous            | 53      | 1,002  | 1,998  | 1.99  |
| Sharks                   | 13      | 1,039  | 1,285  | 1.24  |
| Eels                     | 5       | 46     | 11     | 0.24  |
| Bigeye scad (akule)      | 196     | 60,689 | 97,894 | 1.61  |
| Mackerel scad            | 183     | 11,821 | 21,941 | 1.86  |
| Leatherback              | 6       | 25     | 24     | 0.96  |
| Ten pounder              | 2       | 104    | 62     | 0.60  |
| Bonfish                  | 8       | 160    | 128    | 0.80  |
| Milkfish                 | 7       | 124    | 119    | 0.96  |
| Flying fish              | 2       | 2      | 1      | 0.30  |
| Needlefish               | 17      | 153    | 174    | 1.13  |
| Halfbeaks                | 2       | 37     | 53     | 1.44  |
| Threadfin                | 16      | 337    | 1,841  | 5.46  |
| Mullet                   | 25      | 273    | 739    | 2.71  |
| Pomfret                  | 10      | 296    | 529    | 1.79  |
| Snake mackerel           | 1       | 17     | 4      | 0.25  |
| Jacks (misc)             | 246     | 7,541  | 11,591 | 1.54  |
| Amberjack                | 20      | 1,936  | 784    | 0.41  |
| Blue crevally            | 57      | 3,814  | 8,303  | 2.18  |
| Pig-lipped ulua          | 32      | 2,538  | 3,167  | 1.25  |
| Dobe ulua                | 13      | 242    | 229    | 0.94  |
| Paapaa ulua              | 45      | 674    | 1,651  | 2.45  |
| White ulua               | 19      | 3,857  | 3,451  | 0.89  |
| Black ulua               | 2       | 20     | 45     | 2.25  |
| Giant sea bass           | 46      | 2,329  | 6,134  | 2.63  |
| Blue spot grouper        | 13      | 206    | 353    | 1.71  |
| Snappers                 | 28      | 1,516  | 5,905  | 3.90  |
| Blue lined snapper       | 111     | 3,113  | 3,303  | 1.06  |
| Ehu (red snapper)        | 107     | 2,766  | 10,156 | 3.67  |
| Gindai (flower snapper)  | 16      | 142    | 432    | 3.04  |
| Kalekale (pink snapper)  | 41      | 533    | 1,278  | 2.40  |
| Lehi (silverjaw)         | 127     | 2,475  | 7,491  | 3.03  |
| Onaga (red snapper)      | 118     | 10,982 | 52,403 | 4.77  |
| Opakapaka (pink snapper) | 368     | 20,675 | 84,674 | 4.10  |
| Uku (gray snapper)       | 386     | 40,346 | 92,659 | 2.30  |
| Porgy                    | 11      | 208    | 451    | 2.17  |
| Squirrelfish             | 141     | 2,528  | 6,858  | 2.71  |
| Scorpionfish             | 38      | 304    | 666    | 2.19  |
| Mountain bass            | 26      | 812    | 1,799  | 2.22  |
| Bigeyes                  | 75      | 1,053  | 1,962  | 1.86  |
| Cardinalfish             | 1       | 3      | 4      | 1.29  |
| Goatfish                 | 194     | 7,742  | 15,842 | 2.05  |

Table V.1.7 (cont.)

| Species             | Records | Pounds  | Value     | \$/lb |
|---------------------|---------|---------|-----------|-------|
| Rudderfish          | 44      | 6,510   | 2,754     | 0.42  |
| Damselfish          | 8       | 72      | 91        | 1.26  |
| Hawkfish            | 12      | 37      | 53        | 1.44  |
| Tilapia             | 1       | 198     | 706       | 3.57  |
| Wrasse              | 78      | 786     | 1,453     | 1.85  |
| Parrotfish          | 95      | 3,325   | 5,662     | 1.70  |
| Surgeon/tangs       | 233     | 4,035   | 4,912     | 1.22  |
| Triggerfish         | 1       | 4       | 0         | 0.10  |
| Filefish            | 9       | 48      | 23        | 0.48  |
| Rainbow runner      | 72      | 2,639   | 3,088     | 1.17  |
| Mahimahi (dolphin)  | 568     | 32,695  | 98,274    | 3.01  |
| Barracudas          | 71      | 1,336   | 1,745     | 1.31  |
| Wahoo               | 1,064   | 58,899  | 128,098   | 2.17  |
| Skipjack tuna       | 722     | 304,119 | 375,151   | 1.23  |
| Yellowfin tuna      | 1,300   | 176,450 | 334,973   | 1.90  |
| Albacore            | 10      | 6,891   | 9,612     | 1.39  |
| Bigeye tuna         | 40      | 6,981   | 19,231    | 2.75  |
| Kawakawa            | 77      | 1,438   | 1,456     | 1.01  |
| Billfish            | 1       | 59      | 59        | 1.00  |
| Broadbill swordfish | 15      | 2,718   | 6,078     | 2.24  |
| Blue marlin         | 101     | 20,929  | 17,399    | 0.83  |
| Black marlin        | 7       | 1,837   | 1,677     | 0.91  |
| Striped marlin      | 186     | 26,021  | 28,308    | 1.09  |
| Shortnose spearfish | 87      | 3,469   | 4,509     | 1.30  |
| Sailfish            | 2       | 53      | 44        | 0.82  |
| Ocean moonfish      | 3       | 548     | 750       | 1.37  |
| Spiny lobster       | 63      | 13,549  | 139,718   | 10.31 |
| Slipper lobster     | 55      | 2,896   | 25,245    | 8.72  |
| Crabs               | 21      | 4,221   | 14,441    | 3.42  |
| Octopus             | 30      | 674     | 1,405     | 2.08  |
| Squid               | 5       | 101     | 204       | 2.02  |
| Limpets (saltwater) | 32      | 1,103   | 3,163     | 2.87  |
| Stoney corals       | 5       | 493     | 1,000     | 2.03  |
| Algae               | 104     | 2,200   | 5,479     | 2.49  |
| -----               |         |         |           |       |
| ** SUBTOTAL **      | 7,949   | 881,814 | 1,685,157 |       |
| -----               |         |         |           |       |

Table V.1.8

## Hawaii June 1988 Commercial Landings

| Species                  | Records | Pounds | Value  | \$/lb |
|--------------------------|---------|--------|--------|-------|
| Miscellaneous            | 29      | 279    | 425    | 1.52  |
| Sharks                   | 12      | 1,284  | 1,189  | 0.93  |
| Eels                     | 9       | 97     | 41     | 0.42  |
| Bigeye scad (akule)      | 118     | 48,811 | 73,392 | 1.50  |
| Mackerel scad            | 106     | 6,995  | 14,339 | 2.05  |
| Leatherback              | 3       | 8      | 9      | 1.09  |
| Ten pounder              | 2       | 19     | 19     | 0.99  |
| Bonefish                 | 10      | 421    | 435    | 1.03  |
| Milkfish                 | 5       | 168    | 270    | 1.61  |
| Needlefish               | 9       | 88     | 106    | 1.21  |
| Threadfin                | 5       | 58     | 199    | 3.44  |
| Mullet                   | 8       | 164    | 440    | 2.68  |
| Pomfret                  | 10      | 557    | 580    | 1.04  |
| Snake mackerel           | 1       | 19     | 5      | 0.25  |
| Jacks (misc)             | 259     | 8,779  | 12,199 | 1.39  |
| Amberjack                | 20      | 679    | 414    | 0.61  |
| Blue crevally            | 70      | 2,577  | 5,928  | 2.30  |
| Pig-lipped ulua          | 16      | 4,842  | 3,858  | 0.80  |
| Dobe ulua                | 7       | 142    | 100    | 0.71  |
| Paapaa ulua              | 22      | 290    | 453    | 1.56  |
| White ulua               | 18      | 1,478  | 3,941  | 2.67  |
| Black ulua               | 4       | 130    | 181    | 1.39  |
| Giant sea bass           | 38      | 2,505  | 5,525  | 2.21  |
| Blue spot grouper        | 10      | 41     | 99     | 2.42  |
| Snappers                 | 18      | 101    | 325    | 3.22  |
| Blue lined snapper       | 101     | 1,934  | 1,879  | 0.97  |
| Ehu (red snapper)        | 141     | 4,763  | 14,482 | 3.04  |
| Gindai (flower snapper)  | 17      | 181    | 557    | 3.08  |
| Kalekale (pink snapper)  | 56      | 764    | 1,411  | 1.85  |
| Lehi (silverjaw)         | 74      | 1,586  | 3,614  | 2.28  |
| Onaga (red snapper)      | 131     | 8,361  | 40,788 | 4.88  |
| Opakapaka (pink snapper) | 329     | 18,617 | 67,367 | 3.62  |
| Uku (gray snapper)       | 328     | 39,308 | 81,476 | 2.07  |
| Porgy                    | 19      | 555    | 1,157  | 2.08  |
| Squirrelfish             | 136     | 2,569  | 6,088  | 2.37  |
| Scorpionfish             | 33      | 163    | 456    | 2.80  |
| Mountain bass            | 34      | 1,052  | 1,893  | 1.80  |
| Bigeyes                  | 61      | 1,079  | 2,070  | 1.92  |
| Goatfish                 | 223     | 4,364  | 10,654 | 2.44  |
| Rudderfish               | 36      | 1,063  | 705    | 0.66  |
| Damselfish               | 8       | 71     | 117    | 1.65  |
| Hawkfish                 | 10      | 50     | 57     | 1.14  |



Table V.1.8 (cont.)

| Species               | Records      | Pounds           | Value            | \$/lb |
|-----------------------|--------------|------------------|------------------|-------|
| Tilapia               | 2            | 66               | 216              | 3.27  |
| Wrasse                | 83           | 1,348            | 2,792            | 2.07  |
| Parrotfish            | 78           | 3,070            | 5,168            | 1.68  |
| Surgeon/tangs         | 196          | 3,786            | 4,239            | 1.12  |
| Flounders             | 1            | 2                | 0                | 0.08  |
| Filefish              | 6            | 26               | 33               | 1.26  |
| Rainbow runner        | 79           | 3,057            | 3,565            | 1.17  |
| Mahimahi (dolphin)    | 277          | 11,661           | 44,799           | 3.84  |
| Barracudas            | 50           | 1,361            | 2,257            | 1.66  |
| Wahoo                 | 918          | 43,452           | 94,717           | 2.18  |
| Tunas                 | 1            | 8                | 2                | 0.25  |
| Skipjack tuna         | 602          | 686,103          | 527,500          | 0.77  |
| Yellowfin tuna        | 1,321        | 239,474          | 360,004          | 1.50  |
| Albacore              | 49           | 10,831           | 10,575           | 0.98  |
| Bigeye tuna           | 29           | 14,175           | 18,203           | 1.28  |
| Kawakawa              | 58           | 1,439            | 1,194            | 0.83  |
| Billfish              | 3            | 675              | 2,025            | 3.00  |
| Broadbill swordfish   | 32           | 5,284            | 15,414           | 2.92  |
| Blue marlin           | 172          | 35,793           | 23,608           | 0.66  |
| Black marlin          | 7            | 1,152            | 937              | 0.81  |
| Striped marlin        | 126          | 21,507           | 17,801           | 0.83  |
| Shortnose spearfish   | 50           | 1,677            | 2,012            | 1.20  |
| Sailfish              | 3            | 442              | 291              | 0.66  |
| Ocean moonfish        | 4            | 978              | 1,040            | 1.06  |
| Spiny lobster         | 124          | 80,488           | 756,686          | 9.40  |
| Slipper lobster       | 123          | 13,411           | 118,760          | 8.86  |
| Crabs                 | 10           | 246              | 820              | 3.33  |
| Octopus               | 58           | 1,712            | 3,851            | 2.25  |
| Squid                 | 6            | 177              | 473              | 2.67  |
| Limpets (saltwater)   | 33           | 1,584            | 4,381            | 2.77  |
| Stoney corals         | 5            | 325              | 635              | 1.95  |
| Algae                 | 101          | 2,005            | 5,771            | 2.88  |
| <b>** SUBTOTAL **</b> | <b>7,153</b> | <b>1,354,327</b> | <b>2,389,011</b> |       |

Table V.1.9

## Hawaii July 1988 Commercial Landings

| Species                  | Records | Pounds | Value  | \$/lb |
|--------------------------|---------|--------|--------|-------|
| Miscellaneous            | 33      | 307    | 395    | 1.29  |
| Sharks                   | 20      | 1,911  | 1,851  | 0.97  |
| Eels                     | 14      | 304    | 153    | 0.50  |
| Alfonsin                 | 1       | 10     | 12     | 1.20  |
| Bigeye scad (akule)      | 102     | 7,505  | 15,558 | 2.07  |
| Mackerel scad            | 123     | 9,598  | 19,831 | 2.07  |
| Leatherback              | 5       | 53     | 65     | 1.22  |
| Ten pounder              | 1       | 69     | 69     | 0.99  |
| Bonefish                 | 14      | 931    | 834    | 0.90  |
| Milkfish                 | 5       | 198    | 316    | 1.59  |
| Needlefish               | 12      | 1,063  | 201    | 0.19  |
| Halfbeaks                | 1       | 9      | 23     | 2.60  |
| Threadfin                | 1       | 2      | 1      | 0.38  |
| Mullet                   | 28      | 688    | 1,706  | 2.48  |
| Pomfret                  | 13      | 545    | 1,150  | 2.11  |
| Snake mackerel           | 1       | 35     | 12     | 0.35  |
| Jacks (misc)             | 303     | 11,968 | 16,295 | 1.36  |
| Amberjack                | 14      | 628    | 387    | 0.62  |
| Blue crevally            | 65      | 941    | 2,315  | 2.46  |
| Pig-lipped ulua          | 9       | 3,651  | 4,085  | 1.12  |
| Dobe ulua                | 9       | 316    | 533    | 1.69  |
| Paapaa ulua              | 36      | 532    | 1,315  | 2.47  |
| White ulua               | 30      | 1,971  | 3,411  | 1.73  |
| Black ulua               | 1       | 39     | 39     | 1.00  |
| Giant sea bass           | 44      | 2,039  | 4,084  | 2.00  |
| Blue spot grouper        | 6       | 50     | 114    | 2.29  |
| Snappers                 | 21      | 416    | 429    | 1.03  |
| Blue lined snapper       | 123     | 2,745  | 2,811  | 1.02  |
| Ehu (red snapper)        | 125     | 3,174  | 10,146 | 3.20  |
| Gindai (flower snapper)  | 19      | 160    | 377    | 2.35  |
| Kalekale (pink snapper)  | 50      | 444    | 1,102  | 2.48  |
| Lehi (silverjaw)         | 71      | 1,963  | 4,683  | 2.39  |
| Onaga (red snapper)      | 222     | 15,588 | 68,668 | 4.41  |
| Opakapaka (pink snapper) | 313     | 20,659 | 75,143 | 3.64  |
| Uku (gray snapper)       | 338     | 37,607 | 88,926 | 2.36  |
| Porgy                    | 13      | 1,476  | 470    | 0.32  |
| Squirrelfish             | 113     | 5,336  | 7,528  | 1.41  |
| Scorpionfish             | 39      | 184    | 560    | 3.04  |
| Mountain bass            | 35      | 699    | 1,422  | 2.03  |
| Bigeyes                  | 75      | 1,117  | 2,055  | 1.84  |
| Goatfish                 | 233     | 5,845  | 10,581 | 1.81  |
| Rudderfish               | 63      | 1,367  | 950    | 0.70  |

Table V.1.9 (cont.)

| Species               | Records      | Pounds           | Value            | \$/lb |
|-----------------------|--------------|------------------|------------------|-------|
| Damselfish            | 11           | 65               | 60               | 0.92  |
| Hawkfish              | 12           | 803              | 284              | 0.35  |
| Tilapia               | 2            | 240              | 780              | 3.25  |
| Wrasse                | 104          | 1,231            | 2,324            | 1.89  |
| Parrotfish            | 95           | 20,745           | 5,670            | 0.27  |
| Surgeon/tangs         | 256          | 7,195            | 5,255            | 0.73  |
| Flounders             | 2            | 6                | 7                | 1.17  |
| Triggerfish           | 1            | 5                | 8                | 1.50  |
| Filefish              | 6            | 36               | 41               | 1.13  |
| Rainbow runner        | 85           | 2,904            | 3,886            | 1.34  |
| Mahimahi (dolphin)    | 188          | 8,556            | 39,510           | 4.62  |
| Barracudas            | 54           | 3,027            | 3,530            | 1.17  |
| Wahoo                 | 915          | 47,614           | 120,032          | 2.52  |
| Tunas                 | 2            | 10               | 3                | 0.30  |
| Skipjack tuna         | 460          | 536,248          | 506,310          | 0.94  |
| Yellowfin tuna        | 1,498        | 330,002          | 489,402          | 1.48  |
| Albacore              | 94           | 9,608            | 12,841           | 1.34  |
| Bigeye tuna           | 37           | 7,150            | 9,962            | 1.39  |
| Kawakawa              | 45           | 728              | 627              | 0.86  |
| Broadbill swordfish   | 29           | 6,345            | 16,739           | 2.64  |
| Blue marlin           | 282          | 68,149           | 62,623           | 0.92  |
| Black marlin          | 12           | 2,548            | 2,101            | 0.82  |
| Striped marlin        | 51           | 5,682            | 9,777            | 1.72  |
| Shortnose spearfish   | 41           | 3,572            | 6,404            | 1.79  |
| Sailfish              | 12           | 698              | 1,070            | 1.53  |
| Ocean moonfish        | 4            | 823              | 1,552            | 1.89  |
| Spiny lobster         | 99           | 62,624           | 537,717          | 8.59  |
| Slipper lobster       | 99           | 6,660            | 58,132           | 8.73  |
| Crabs                 | 14           | 503              | 1,805            | 3.59  |
| Octopus               | 76           | 2,229            | 4,969            | 2.23  |
| Squid                 | 20           | 466              | 1,210            | 2.60  |
| Limpets (saltwater)   | 42           | 2,502            | 4,347            | 1.74  |
| Algae                 | 76           | 2,387            | 8,117            | 3.40  |
| <b>** SUBTOTAL **</b> | <b>7,468</b> | <b>1,285,504</b> | <b>2,267,700</b> |       |



Table V.1.10

## Hawaii August 1988 Commercial Landings

| Species                  | Records | Pounds | Value  | \$/lb |
|--------------------------|---------|--------|--------|-------|
| Miscellaneous            | 38      | 1,270  | 2,566  | 2.02  |
| Sharks                   | 13      | 862    | 539    | 0.62  |
| Eels                     | 7       | 134    | 101    | 0.76  |
| Alfonsin                 | 1       | 10     | 12     | 1.19  |
| Bigeye scad (akule)      | 125     | 21,442 | 39,725 | 1.85  |
| Mackerel scad            | 264     | 26,593 | 47,121 | 1.77  |
| Leatherback              | 11      | 36     | 31     | 0.86  |
| Ten pounder              | 5       | 76     | 84     | 1.11  |
| Bonfish                  | 19      | 742    | 856    | 1.15  |
| Milkfish                 | 4       | 104    | 176    | 1.69  |
| Needlefish               | 15      | 154    | 180    | 1.17  |
| Halfbeaks                | 10      | 94     | 217    | 2.31  |
| Threadfin                | 1       | 2      | 9      | 4.50  |
| Mullet                   | 22      | 492    | 1,468  | 2.98  |
| Pomfret                  | 5       | 135    | 336    | 2.49  |
| Jacks (misc)             | 280     | 7,820  | 12,974 | 1.66  |
| Amberjack                | 12      | 785    | 545    | 0.69  |
| Blue crevally            | 57      | 1,307  | 3,794  | 2.90  |
| Pig-lipped ulua          | 14      | 854    | 1,299  | 1.52  |
| Dobe ulua                | 4       | 150    | 207    | 1.38  |
| Paapaa ulua              | 28      | 313    | 767    | 2.45  |
| White ulua               | 48      | 1,663  | 4,179  | 2.51  |
| Black ulua               | 2       | 82     | 168    | 2.05  |
| Giant sea bass           | 56      | 2,600  | 6,515  | 2.51  |
| Blue spot grouper        | 15      | 49     | 145    | 2.96  |
| Snappers                 | 27      | 192    | 724    | 3.77  |
| Blue lined snapper       | 115     | 2,420  | 2,365  | 0.98  |
| Ehu (red snapper)        | 167     | 4,751  | 14,977 | 3.15  |
| Gindai (flower snapper)  | 19      | 155    | 524    | 3.38  |
| Kalekale (pink snapper)  | 85      | 747    | 2,023  | 2.71  |
| Lehi (silverjaw)         | 110     | 4,305  | 12,718 | 2.95  |
| Onaga (red snapper)      | 209     | 12,537 | 56,445 | 4.50  |
| Opakapaka (pink snapper) | 384     | 19,671 | 76,140 | 3.87  |
| Uku (gray snapper)       | 312     | 29,779 | 88,733 | 2.98  |
| Porgy                    | 8       | 163    | 287    | 1.76  |
| Squirrelfish             | 118     | 2,493  | 6,699  | 2.69  |
| Scorpionfish             | 56      | 341    | 963    | 2.82  |
| Mountain bass            | 34      | 915    | 1,891  | 2.07  |
| Bigeyes                  | 70      | 1,391  | 2,553  | 1.84  |
| Goatfish                 | 288     | 5,146  | 15,254 | 2.96  |
| Rudderfish               | 28      | 679    | 677    | 1.00  |
| Damselfish               | 5       | 88     | 104    | 1.19  |

Table V.1.10 (cont.)

| Species               | Records      | Pounds         | Value            | \$/lb |
|-----------------------|--------------|----------------|------------------|-------|
| Hawkfish              | 7            | 41             | 69               | 1.68  |
| Tilapia               | 2            | 275            | 883              | 3.21  |
| Wrasse                | 118          | 1,706          | 3,508            | 2.06  |
| Parrotfish            | 101          | 4,009          | 7,279            | 1.82  |
| Surgeon/tangs         | 227          | 4,712          | 5,879            | 1.25  |
| Flounders             | 1            | 1              | 1                | 1.25  |
| Filefish              | 2            | 7              | 11               | 1.59  |
| Pufferfish            | 3            | 17             | 83               | 4.85  |
| Rainbow runner        | 74           | 2,189          | 2,659            | 1.21  |
| Mahimahi (dolphin)    | 187          | 8,403          | 38,797           | 4.62  |
| Barracudas            | 56           | 1,419          | 2,082            | 1.47  |
| Wahoo                 | 667          | 36,141         | 111,423          | 3.08  |
| Tunas                 | 6            | 60             | 48               | 0.80  |
| Skipjack tuna         | 428          | 404,857        | 418,292          | 1.03  |
| Yellowfin tuna        | 1,225        | 229,937        | 434,726          | 1.89  |
| Albacore              | 28           | 2,587          | 4,137            | 1.60  |
| Bigeye tuna           | 14           | 1,328          | 2,645            | 1.99  |
| Kawakawa              | 65           | 1,409          | 1,666            | 1.18  |
| Broadbill swordfish   | 12           | 1,008          | 3,485            | 3.46  |
| Blue marlin           | 363          | 79,424         | 71,541           | 0.90  |
| Black marlin          | 9            | 1,586          | 1,224            | 0.77  |
| Striped marlin        | 32           | 2,704          | 4,393            | 1.62  |
| Shortnose spearfish   | 43           | 1,912          | 3,771            | 1.97  |
| Sailfish              | 1            | 23             | 69               | 3.00  |
| Spiny lobster         | 111          | 46,784         | 445,917          | 9.53  |
| Slipper lobster       | 109          | 3,744          | 32,517           | 8.69  |
| Crabs                 | 30           | 1,126          | 4,230            | 3.76  |
| Octopus               | 105          | 2,919          | 6,564            | 2.25  |
| Squid                 | 51           | 1,311          | 2,814            | 2.15  |
| Limpets (saltwater)   | 39           | 1,263          | 3,862            | 3.06  |
| Algae                 | 89           | 1,280          | 3,820            | 2.98  |
| <b>** SUBTOTAL **</b> | <b>7,296</b> | <b>997,724</b> | <b>2,025,485</b> |       |

Table V.1.11

## Hawaii September 1988 Commercial Landings

| Species                  | Records | Pounds | Value  | \$/lb |
|--------------------------|---------|--------|--------|-------|
| Miscellaneous            | 35      | 763    | 1,708  | 2.24  |
| Sharks                   | 20      | 1,472  | 1,515  | 1.03  |
| Eels                     | 8       | 104    | 61     | 0.59  |
| Bigeye scad (akule)      | 232     | 15,864 | 33,509 | 2.11  |
| Mackerel scad            | 337     | 37,060 | 59,198 | 1.60  |
| Leatherback              | 12      | 282    | 137    | 0.49  |
| Ten pounder              | 2       | 52     | 68     | 1.30  |
| Bonefish                 | 31      | 621    | 632    | 1.02  |
| Milkfish                 | 6       | 191    | 337    | 1.76  |
| Needlefish               | 14      | 239    | 212    | 0.89  |
| Halfbeaks                | 4       | 72     | 178    | 2.47  |
| Threadfin                | 44      | 601    | 3,136  | 5.22  |
| Mullet                   | 41      | 694    | 1,614  | 2.33  |
| Pomfret                  | 8       | 265    | 523    | 1.97  |
| Jacks (misc)             | 286     | 9,586  | 15,665 | 1.63  |
| Amberjack                | 10      | 588    | 311    | 0.53  |
| Blue crevally            | 59      | 957    | 2,195  | 2.29  |
| Pig-lipped ulua          | 15      | 1,604  | 1,939  | 1.21  |
| Dobe ulua                | 1       | 26     | 39     | 1.50  |
| Paapaa ulua              | 31      | 557    | 1,029  | 1.85  |
| White ulua               | 68      | 4,187  | 8,284  | 1.98  |
| Giant sea bass           | 52      | 1,588  | 3,926  | 2.47  |
| Blue spot grouper        | 6       | 31     | 98     | 3.15  |
| Snappers                 | 22      | 63     | 189    | 2.99  |
| Blue lined snapper       | 123     | 2,737  | 3,356  | 1.23  |
| Ehu (red snapper)        | 169     | 2,858  | 9,272  | 3.24  |
| Gindai (flower snapper)  | 23      | 144    | 465    | 3.23  |
| Kalekale (pink snapper)  | 93      | 642    | 1,324  | 2.06  |
| Lehi (silverjaw)         | 150     | 4,845  | 13,704 | 2.83  |
| Onaga (red snapper)      | 235     | 13,351 | 58,189 | 4.36  |
| Opakapaka (pink snapper) | 482     | 26,901 | 93,738 | 3.48  |
| Uku (gray snapper)       | 319     | 26,673 | 75,371 | 2.83  |
| Porgy                    | 7       | 117    | 233    | 1.99  |
| Squirrelfish             | 111     | 3,655  | 8,161  | 2.23  |
| Trumpetfish              | 2       | 11     | 13     | 1.21  |
| Scorpionfish             | 49      | 303    | 753    | 2.48  |
| Mountain bass            | 40      | 730    | 1,725  | 2.36  |
| Bigeyes                  | 53      | 698    | 1,280  | 1.83  |
| Goatfish                 | 247     | 3,792  | 9,491  | 2.50  |
| Rudderfish               | 66      | 954    | 927    | 0.97  |
| Damselfish               | 9       | 39     | 65     | 1.67  |
| Hawkfish                 | 13      | 79     | 115    | 1.45  |



Table V.1.11 (cont.)

| Species               | Records      | Pounds         | Value            | \$/lb |
|-----------------------|--------------|----------------|------------------|-------|
| Tilapia               | 2            | 249            | 858              | 3.44  |
| Wrasse                | 114          | 1,291          | 2,564            | 1.99  |
| Parrotfish            | 82           | 2,893          | 5,180            | 1.79  |
| Surgeon/tangs         | 258          | 4,129          | 4,753            | 1.15  |
| Triggerfish           | 5            | 11             | 20               | 1.86  |
| Filefish              | 3            | 10             | 6                | 0.59  |
| Pufferfish            | 1            | 45             | 293              | 6.50  |
| Rainbow runner        | 55           | 1,800          | 2,844            | 1.58  |
| Mahimahi (dolphin)    | 211          | 10,019         | 65,973           | 6.58  |
| Barracudas            | 60           | 2,699          | 3,240            | 1.20  |
| Wahoo                 | 325          | 21,059         | 63,213           | 3.00  |
| Tunas                 | 3            | 35             | 31               | 0.89  |
| Skipjack tuna         | 260          | 329,177        | 314,283          | 0.95  |
| Yellowfin tuna        | 917          | 232,502        | 458,453          | 1.97  |
| Albacore              | 25           | 2,840          | 5,646            | 1.99  |
| Bigeye tuna           | 7            | 13,771         | 38,122           | 2.77  |
| Kawakawa              | 39           | 976            | 1,245            | 1.28  |
| Broadbill swordfish   | 3            | 117            | 321              | 2.74  |
| Blue marlin           | 368          | 76,716         | 72,987           | 0.95  |
| Black marlin          | 10           | 1,682          | 1,585            | 0.94  |
| Striped marlin        | 17           | 2,091          | 3,196            | 1.53  |
| Shortnose spearfish   | 23           | 1,750          | 3,595            | 2.05  |
| Sailfish              | 3            | 201            | 320              | 1.59  |
| Ocean moonfish        | 2            | 545            | 990              | 1.82  |
| Spiny lobster         | 79           | 19,713         | 186,900          | 9.48  |
| Slipper lobster       | 56           | 3,194          | 27,790           | 8.70  |
| Crabs                 | 57           | 5,362          | 23,881           | 4.45  |
| Octopus               | 109          | 3,796          | 8,594            | 2.26  |
| Squid                 | 27           | 1,140          | 1,691            | 1.48  |
| Limpets (saltwater)   | 16           | 972            | 2,594            | 2.67  |
| Algae                 | 88           | 1,024          | 3,090            | 3.02  |
| <b>** SUBTOTAL **</b> | <b>6,760</b> | <b>907,805</b> | <b>1,718,938</b> |       |

Table V.1.12

## Hawaii October 1988 Commercial Landings

| Species                  | Records | Pounds | Value   | \$/lb |
|--------------------------|---------|--------|---------|-------|
| Miscellaneous            | 35      | 255    | 486     | 1.91  |
| Sharks                   | 18      | 1,414  | 1,229   | 0.87  |
| Eels                     | 9       | 105    | 50      | 0.47  |
| Bigeye scad (akule)      | 202     | 9,418  | 21,089  | 2.24  |
| Mackerel scad            | 355     | 47,004 | 66,281  | 1.41  |
| Leatherback              | 7       | 29     | 27      | 0.93  |
| Ten pounder              | 2       | 32     | 32      | 0.99  |
| Bonfish                  | 22      | 743    | 833     | 1.12  |
| Milkfish                 | 1       | 233    | 463     | 1.99  |
| Needlefish               | 11      | 491    | 294     | 0.60  |
| Threadfin                | 36      | 1,021  | 2,975   | 2.91  |
| Mullet                   | 21      | 682    | 1,620   | 2.38  |
| Pomfret                  | 13      | 386    | 728     | 1.89  |
| Snake mackerel           | 3       | 96     | 36      | 0.37  |
| Jacks (misc)             | 316     | 9,533  | 13,442  | 1.41  |
| Amberjack                | 18      | 1,469  | 877     | 0.60  |
| Blue crevally            | 91      | 1,620  | 2,797   | 1.73  |
| Pig-lipped ulua          | 17      | 470    | 735     | 1.56  |
| Dobe ulua                | 4       | 145    | 140     | 0.97  |
| Paapaa ulua              | 79      | 1,598  | 2,413   | 1.51  |
| White ulua               | 46      | 9,231  | 7,831   | 0.85  |
| Black ulua               | 1       | 78     | 99      | 1.27  |
| Giant sea bass           | 62      | 2,256  | 5,672   | 2.51  |
| Blue spot grouper        | 13      | 132    | 192     | 1.45  |
| Snappers                 | 42      | 190    | 519     | 2.73  |
| Blue lined snapper       | 177     | 4,803  | 4,749   | 0.99  |
| Ehu (red snapper)        | 237     | 5,399  | 15,397  | 2.85  |
| Gindai (flower snapper)  | 24      | 176    | 493     | 2.80  |
| Kalekale (pink snapper)  | 102     | 949    | 1,669   | 1.76  |
| Lehi (silverjaw)         | 155     | 5,564  | 14,853  | 2.67  |
| Onaga (red snapper)      | 335     | 17,076 | 68,750  | 4.03  |
| Opakapaka (pink snapper) | 575     | 38,583 | 112,691 | 2.92  |
| Uku (gray snapper)       | 402     | 45,714 | 94,184  | 2.06  |
| Porgy                    | 9       | 194    | 330     | 1.70  |
| Squirrelfish             | 151     | 3,987  | 8,943   | 2.24  |
| Scorpionfish             | 56      | 251    | 671     | 2.68  |
| Mountain bass            | 64      | 1,926  | 2,937   | 1.52  |
| Bigeyes                  | 69      | 721    | 1,282   | 1.78  |
| Goatfish                 | 285     | 3,825  | 9,983   | 2.61  |
| Rudderfish               | 48      | 875    | 638     | 0.73  |
| Damselfish               | 12      | 123    | 165     | 1.34  |
| Hawkfish                 | 19      | 99     | 110     | 1.11  |

Table V.1.12 (cont.)

| Species               | Records      | Pounds           | Value            | \$/lb |
|-----------------------|--------------|------------------|------------------|-------|
| Tilapia               | 2            | 222              | 782              | 3.52  |
| Wrasse                | 155          | 1,565            | 2,462            | 1.57  |
| Parrotfish            | 76           | 2,408            | 3,623            | 1.50  |
| Surgeon/tangs         | 248          | 5,005            | 5,377            | 1.07  |
| Flounders             | 2            | 7                | 7                | 0.93  |
| Triggerfish           | 4            | 23               | 9                | 0.40  |
| Filefish              | 2            | 36               | 14               | 0.40  |
| Rainbow runner        | 79           | 1,849            | 2,281            | 1.23  |
| Mahimahi (dolphin)    | 357          | 22,323           | 64,585           | 2.89  |
| Barracudas            | 73           | 1,956            | 2,723            | 1.39  |
| Wahoo                 | 308          | 29,566           | 74,883           | 2.53  |
| Skipjack tuna         | 322          | 362,860          | 373,450          | 1.03  |
| Yellowfin tuna        | 794          | 203,984          | 325,063          | 1.59  |
| Albacore              | 24           | 3,930            | 3,653            | 0.93  |
| Bigeye tuna           | 36           | 40,927           | 105,873          | 2.59  |
| Kawakawa              | 39           | 976              | 916              | 0.94  |
| Billfish              | 2            | 63               | 126              | 2.00  |
| Broadbill swordfish   | 13           | 731              | 2,132            | 2.92  |
| Blue marlin           | 448          | 91,396           | 64,826           | 0.71  |
| Black marlin          | 11           | 2,420            | 1,772            | 0.73  |
| Striped marlin        | 45           | 13,476           | 13,266           | 0.98  |
| Shortnose spearfish   | 34           | 2,415            | 4,377            | 1.81  |
| Sailfish              | 2            | 107              | 80               | 0.75  |
| Ocean moonfish        | 5            | 1,429            | 2,215            | 1.55  |
| Spiny lobster         | 63           | 9,205            | 110,286          | 11.98 |
| Slipper lobster       | 41           | 2,224            | 24,816           | 11.16 |
| Crabs                 | 50           | 4,321            | 17,324           | 4.01  |
| Octopus               | 96           | 2,687            | 5,597            | 2.08  |
| Squid                 | 24           | 2,474            | 2,507            | 1.01  |
| Limpets (saltwater)   | 17           | 620              | 2,023            | 3.26  |
| Algae                 | 68           | 798              | 2,347            | 2.94  |
| <b>** SUBTOTAL **</b> | <b>7,584</b> | <b>1,030,899</b> | <b>1,688,098</b> |       |



Table V.1.13

## Hawaii November 1988 Commercial Landings

| Species                  | Records | Pounds | Value   | \$/lb |
|--------------------------|---------|--------|---------|-------|
| Miscellaneous            | 48      | 808    | 1,655   | 2.05  |
| Sharks                   | 13      | 1,293  | 966     | 0.75  |
| Eels                     | 3       | 44     | 19      | 0.43  |
| Alfonsin                 | 1       | 5      | 8       | 1.50  |
| Bigeye scad (akule)      | 143     | 22,115 | 41,183  | 1.86  |
| Mackerel scad            | 273     | 34,767 | 45,544  | 1.31  |
| Leatherback              | 2       | 2      | 2       | 0.88  |
| Ten pounder              | 3       | 266    | 240     | 0.90  |
| Bonfish                  | 16      | 205    | 179     | 0.87  |
| Herring/sardine          | 1       | 15     | 23      | 1.50  |
| Milkfish                 | 1       | 146    | 258     | 1.77  |
| Needlefish               | 12      | 170    | 172     | 1.01  |
| Halfbeaks                | 3       | 63     | 164     | 2.60  |
| Threadfin                | 30      | 416    | 2,488   | 5.98  |
| Mullet                   | 30      | 1,934  | 4,820   | 2.49  |
| Pomfret                  | 24      | 823    | 1,942   | 2.36  |
| Snake mackerel           | 2       | 54     | 19      | 0.35  |
| Jacks (misc)             | 210     | 6,004  | 10,228  | 1.70  |
| Amberjack                | 11      | 1,113  | 908     | 0.82  |
| Blue crevally            | 34      | 352    | 779     | 2.21  |
| Pig-lipped ulua          | 17      | 1,149  | 1,886   | 1.64  |
| Dobe ulua                | 2       | 22     | 22      | 1.00  |
| Paapaa ulua              | 43      | 661    | 1,616   | 2.44  |
| White ulua               | 11      | 1,054  | 2,061   | 1.96  |
| Giant sea bass           | 45      | 1,158  | 3,608   | 3.12  |
| Blue spot grouper        | 7       | 59     | 98      | 1.67  |
| Snappers                 | 22      | 88     | 181     | 2.06  |
| Blue lined snapper       | 90      | 1,489  | 1,599   | 1.07  |
| Ehu (red snapper)        | 164     | 2,652  | 9,801   | 3.70  |
| Gindai (flower snapper)  | 19      | 93     | 283     | 3.04  |
| Kalekale (pink snapper)  | 83      | 678    | 1,383   | 2.04  |
| Lehi (silverjaw)         | 148     | 3,934  | 11,143  | 2.83  |
| Onaga (red snapper)      | 219     | 11,803 | 54,973  | 4.66  |
| Opakapaka (pink snapper) | 399     | 26,860 | 101,528 | 3.78  |
| Uku (gray snapper)       | 216     | 20,915 | 61,872  | 2.96  |
| Porgy                    | 11      | 89     | 237     | 2.66  |
| Squirrelfish             | 88      | 1,923  | 4,606   | 2.40  |
| Trumpetfish              | 1       | 170    | 1,658   | 9.75  |
| Scorpionfish             | 36      | 195    | 425     | 2.18  |
| Mountain bass            | 40      | 841    | 2,144   | 2.55  |
| Bigeyes                  | 45      | 371    | 696     | 1.88  |
| Cardinalfish             | 4       | 11     | 24      | 2.22  |

Table V.1.13 (cont.)

| Species               | Records      | Pounds         | Value            | \$/lb |
|-----------------------|--------------|----------------|------------------|-------|
| Goatfish              | 198          | 3,455          | 7,515            | 2.17  |
| Rudderfish            | 30           | 531            | 502              | 0.94  |
| Damselfish            | 9            | 75             | 93               | 1.24  |
| Hawkfish              | 12           | 80             | 105              | 1.32  |
| Tilapia               | 3            | 271            | 953              | 3.52  |
| Wrasse                | 79           | 988            | 2,103            | 2.13  |
| Parrotfish            | 68           | 1,137          | 2,152            | 1.89  |
| Surgeon/tangs         | 176          | 3,124          | 3,903            | 1.25  |
| Filefish              | 1            | 21             | 16               | 0.77  |
| Rainbow runner        | 57           | 1,346          | 2,079            | 1.54  |
| Mahimahi (dolphin)    | 482          | 26,060         | 74,743           | 2.87  |
| Barracudas            | 39           | 536            | 746              | 1.39  |
| Wahoo                 | 230          | 10,858         | 38,619           | 3.56  |
| Skipjack tuna         | 267          | 294,912        | 330,853          | 1.12  |
| Yellowfin tuna        | 498          | 69,169         | 159,140          | 2.30  |
| Albacore              | 4            | 429            | 883              | 2.06  |
| Bigeye tuna           | 20           | 22,962         | 78,464           | 3.42  |
| Kawakawa              | 35           | 654            | 779              | 1.19  |
| Broadbill swordfish   | 12           | 617            | 1,696            | 2.75  |
| Blue marlin           | 322          | 58,925         | 46,393           | 0.79  |
| Black marlin          | 8            | 1,748          | 1,231            | 0.70  |
| Striped marlin        | 115          | 26,844         | 22,914           | 0.85  |
| Shortnose spearfish   | 28           | 1,592          | 2,548            | 1.60  |
| Sailfish              | 1            | 36             | 36               | 1.00  |
| Ocean moonfish        | 6            | 1,299          | 1,815            | 1.40  |
| Spiny lobster         | 48           | 9,735          | 95,921           | 9.85  |
| Slipper lobster       | 34           | 1,507          | 14,013           | 9.30  |
| Crabs                 | 24           | 1,463          | 6,340            | 4.33  |
| Octopus               | 48           | 1,501          | 3,333            | 2.22  |
| Squid                 | 13           | 611            | 1,231            | 2.02  |
| Limpets (saltwater)   | 17           | 281            | 830              | 2.95  |
| Stoney corals         | 1            | 30             | 90               | 3.00  |
| Algae                 | 66           | 669            | 2,160            | 3.23  |
| <b>** SUBTOTAL **</b> | <b>5,521</b> | <b>690,276</b> | <b>1,277,635</b> |       |

Table V.1.14

## Hawaii December 1988 Commercial Landings

| Species                  | Records | Pounds | Value   | \$/lb |
|--------------------------|---------|--------|---------|-------|
| Miscellaneous            | 27      | 618    | 1,449   | 2.34  |
| Sharks                   | 13      | 1,618  | 1,459   | 0.90  |
| Eels                     | 1       | 5      | 8       | 1.55  |
| Alfonsin                 | 1       | 7      | 10      | 1.39  |
| Bigeye scad (akule)      | 188     | 19,291 | 39,261  | 2.04  |
| Mackerel scad            | 233     | 40,284 | 50,529  | 1.25  |
| Leatherback              | 3       | 11     | 11      | 0.97  |
| Bonefish                 | 23      | 2,484  | 2,570   | 1.03  |
| Needlefish               | 9       | 228    | 136     | 0.59  |
| Halfbeaks                | 2       | 58     | 198     | 3.42  |
| Threadfin                | 23      | 356    | 2,236   | 6.28  |
| Mullet                   | 6       | 205    | 679     | 3.31  |
| Pomfret                  | 28      | 768    | 1,450   | 1.89  |
| Snake mackerel           | 8       | 321    | 69      | 0.21  |
| Jacks (misc)             | 262     | 7,947  | 16,333  | 2.06  |
| Amberjack                | 34      | 1,907  | 1,749   | 0.92  |
| Blue crevally            | 26      | 435    | 1,043   | 2.40  |
| Pig-lipped ulua          | 28      | 635    | 1,893   | 2.98  |
| Dobe ulua                | 2       | 103    | 158     | 1.53  |
| Paapaa ulua              | 51      | 1,208  | 2,023   | 1.67  |
| White ulua               | 25      | 1,553  | 3,013   | 1.94  |
| Giant sea bass           | 59      | 1,005  | 2,817   | 2.80  |
| Blue spot grouper        | 3       | 25     | 88      | 3.53  |
| Snappers                 | 7       | 96     | 168     | 1.75  |
| Blue lined snapper       | 114     | 2,508  | 2,808   | 1.12  |
| Ehu (red snapper)        | 238     | 3,988  | 16,029  | 4.02  |
| Gindai (flower snapper)  | 36      | 210    | 545     | 2.59  |
| Kalekale (pink snapper)  | 108     | 1,334  | 2,605   | 1.95  |
| Lehi (silverjaw)         | 169     | 5,952  | 16,105  | 2.71  |
| Onaga (red snapper)      | 274     | 14,102 | 74,035  | 5.25  |
| Opakapaka (pink snapper) | 571     | 40,240 | 131,962 | 3.28  |
| Uku (gray snapper)       | 301     | 28,214 | 68,721  | 2.44  |
| Porgy                    | 5       | 47     | 100     | 2.13  |
| Squirrelfish             | 78      | 1,997  | 5,135   | 2.57  |
| Trumpetfish              | 1       | 2      | 2       | 1.00  |
| Scorpionfish             | 39      | 249    | 660     | 2.65  |
| Mountain bass            | 29      | 707    | 1,036   | 1.47  |
| Bigeyes                  | 30      | 317    | 641     | 2.02  |
| Goatfish                 | 190     | 3,992  | 9,572   | 2.40  |
| Rudderfish               | 12      | 203    | 192     | 0.95  |
| Damselfish               | 2       | 4      | 4       | 1.06  |
| Hawkfish                 | 3       | 13     | 15      | 1.19  |



Table V.1.14 (cont.)

| Species               | Records       | Pounds            | Value             | \$/lb |
|-----------------------|---------------|-------------------|-------------------|-------|
| Tilapia               | 1             | 250               | 906               | 3.62  |
| Wrasse                | 104           | 829               | 1,656             | 2.00  |
| Parrotfish            | 55            | 1,251             | 1,928             | 1.54  |
| Surgeon/tangs         | 144           | 3,339             | 4,091             | 1.23  |
| Rainbow runner        | 46            | 1,329             | 1,714             | 1.29  |
| Mahimahi (dolphin)    | 289           | 11,992            | 43,646            | 3.64  |
| Barracudas            | 56            | 792               | 929               | 1.17  |
| Wahoo                 | 194           | 11,575            | 40,600            | 3.51  |
| Japanese mackerel     | 1             | 2                 | 2                 | 1.00  |
| Tunas                 | 2             | 7                 | 5                 | 0.72  |
| Skipjack tuna         | 258           | 251,820           | 321,327           | 1.28  |
| Yellowfin tuna        | 541           | 105,466           | 273,533           | 2.59  |
| Albacore              | 16            | 3,942             | 7,390             | 1.87  |
| Bigeye tuna           | 35            | 83,572            | 300,339           | 3.59  |
| Kawakawa              | 69            | 1,614             | 1,910             | 1.18  |
| Broadbill swordfish   | 16            | 862               | 2,706             | 3.14  |
| Blue marlin           | 279           | 50,178            | 40,649            | 0.81  |
| Black marlin          | 12            | 2,102             | 1,665             | 0.79  |
| Striped marlin        | 110           | 39,481            | 33,046            | 0.84  |
| Shortnose spearfish   | 49            | 5,286             | 7,684             | 1.45  |
| Sailfish              | 2             | 2,270             | 2,747             | 1.21  |
| Ocean moonfish        | 10            | 1,761             | 2,826             | 1.60  |
| Spiny lobster         | 28            | 2,912             | 25,940            | 8.91  |
| Slipper lobster       | 26            | 5,625             | 49,013            | 8.71  |
| Crabs                 | 16            | 633               | 2,298             | 3.63  |
| Shrimp (freshwater)   | 1             | 2                 | 5                 | 2.25  |
| Octopus               | 48            | 1,590             | 3,367             | 2.12  |
| Squid                 | 2             | 83                | 215               | 2.59  |
| Limpets (saltwater)   | 32            | 1,012             | 2,999             | 2.96  |
| Algae                 | 57            | 443               | 1,461             | 3.30  |
| <b>** SUBTOTAL **</b> | <b>5,761</b>  | <b>777,267</b>    | <b>1,636,115</b>  |       |
| <b>** TOTAL **</b>    | <b>86,212</b> | <b>11,027,732</b> | <b>21,696,145</b> |       |

Figure V.1.1

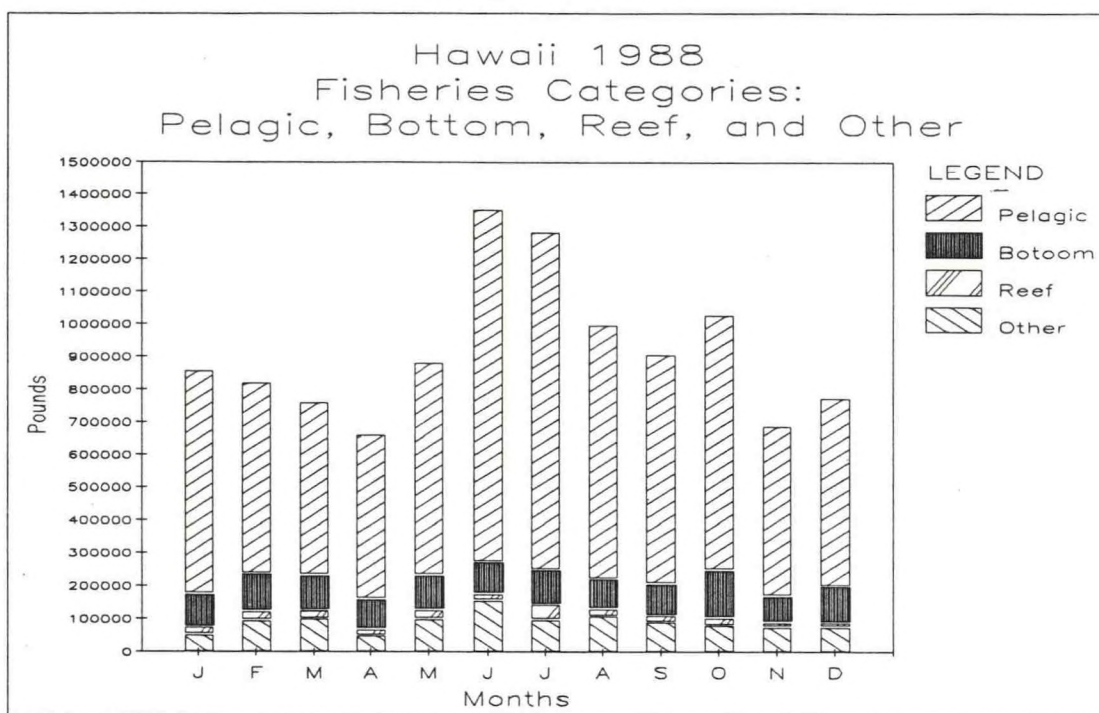
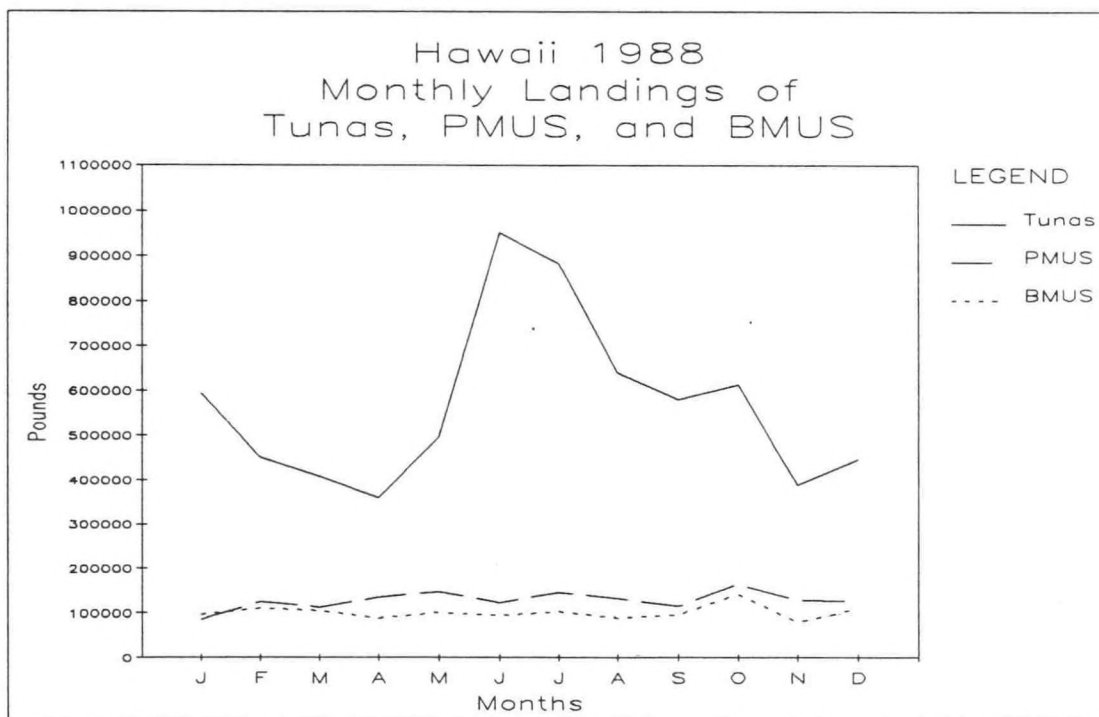


Figure V.1.2



V.37

Figure V.1.3

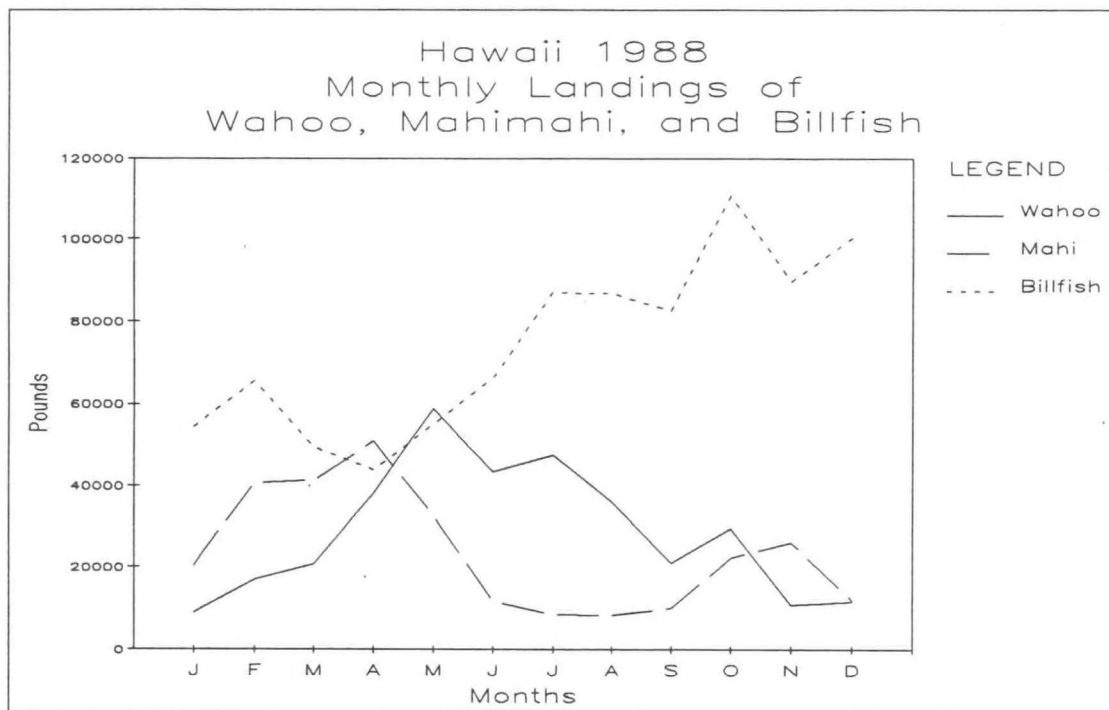


Figure V.1.4

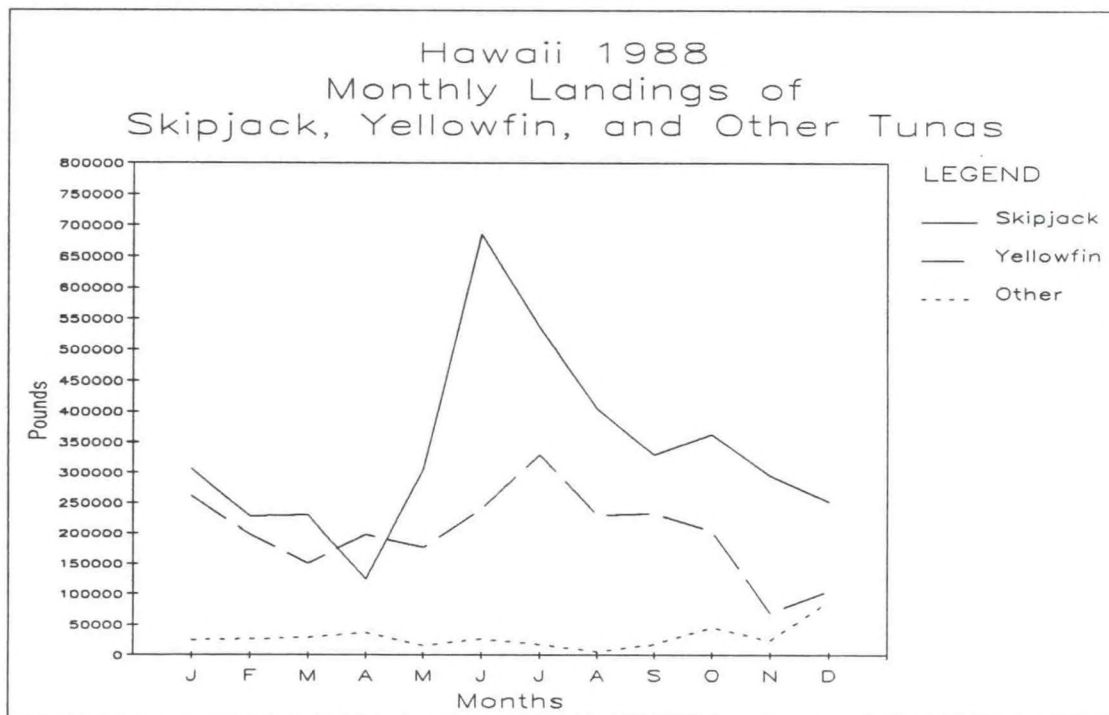




Figure V.2.1

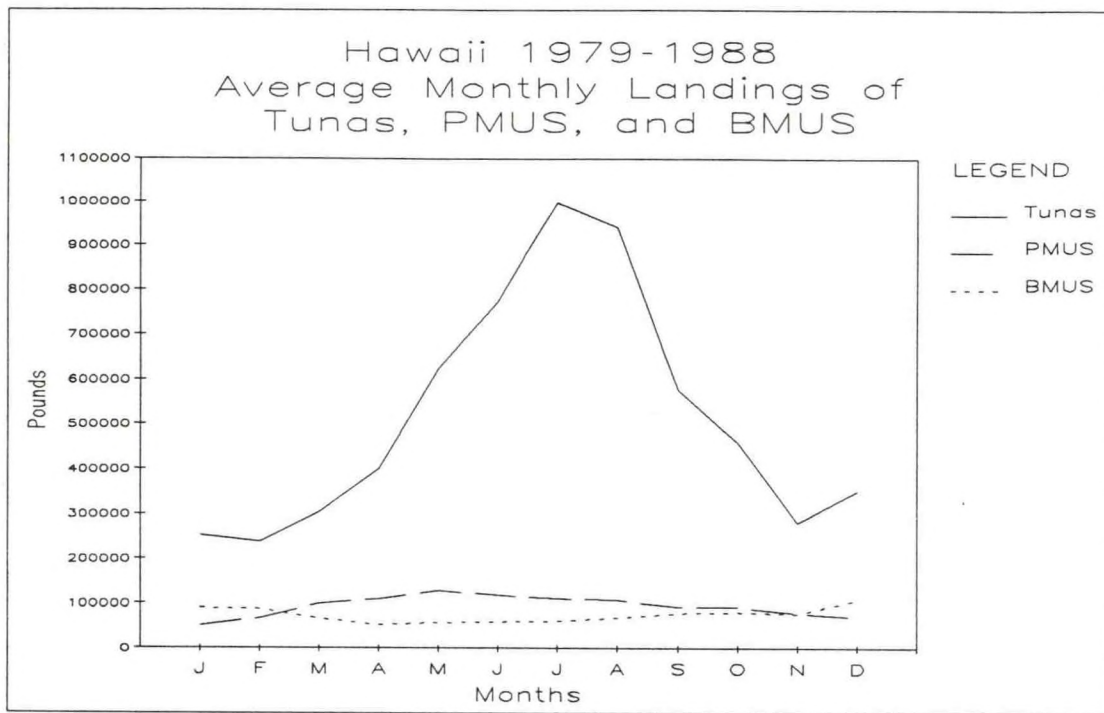
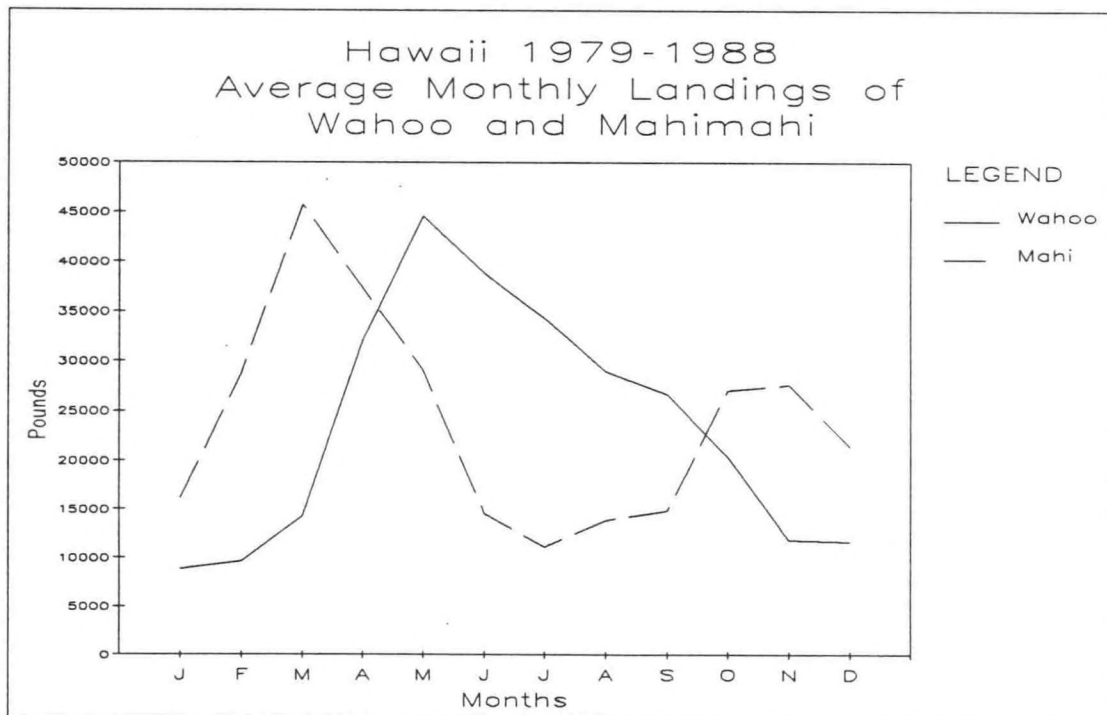


Figure V.2.2



V.39

Figure V.2.3

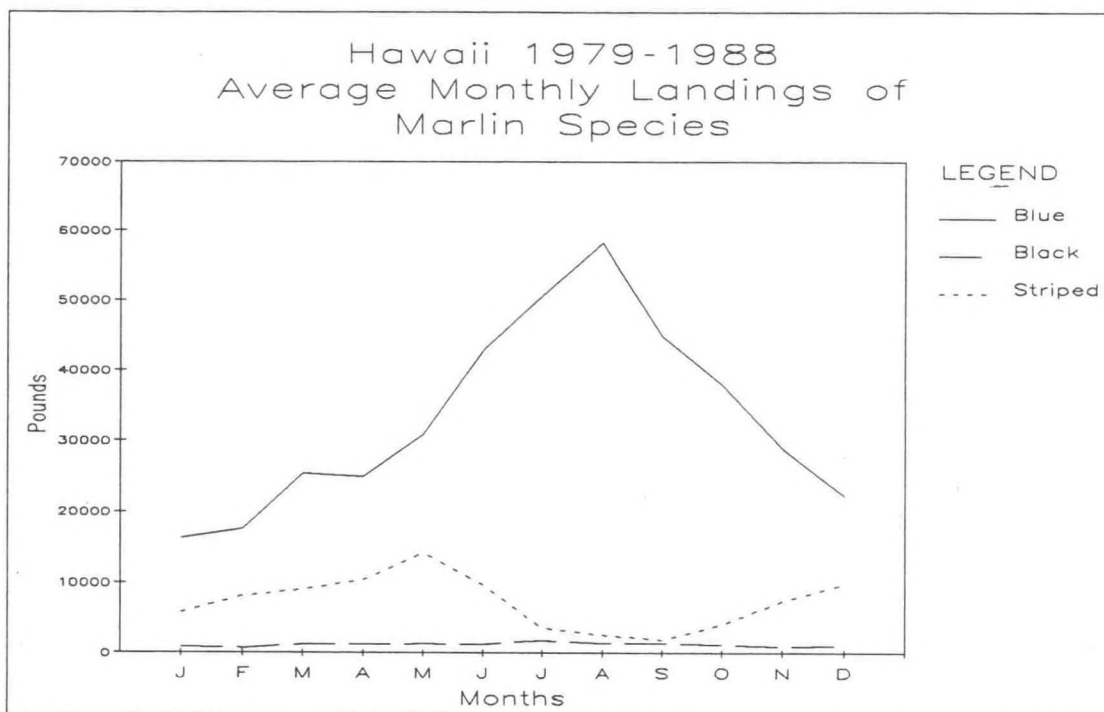


Figure V.2.4

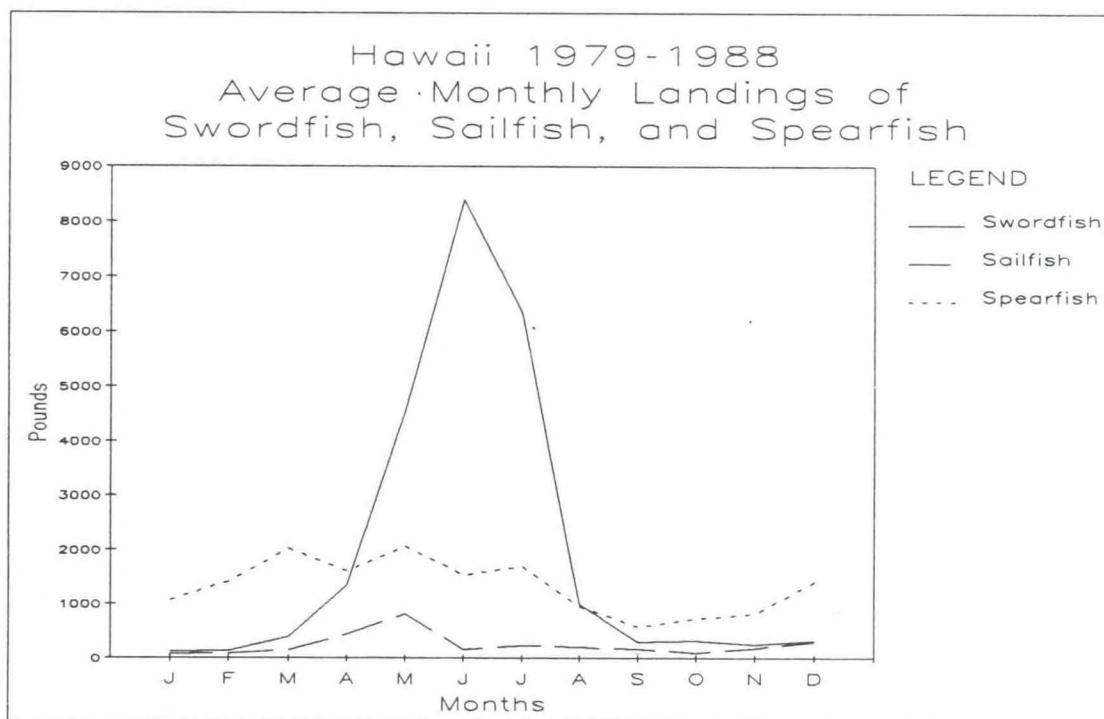


Figure V.2.5

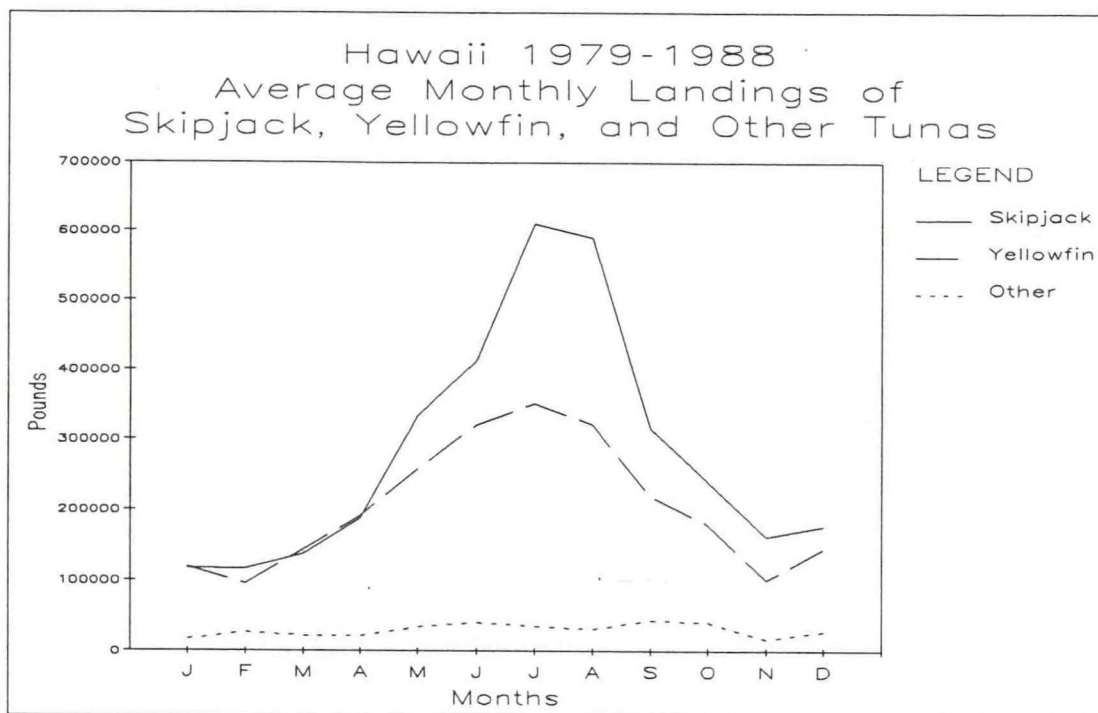
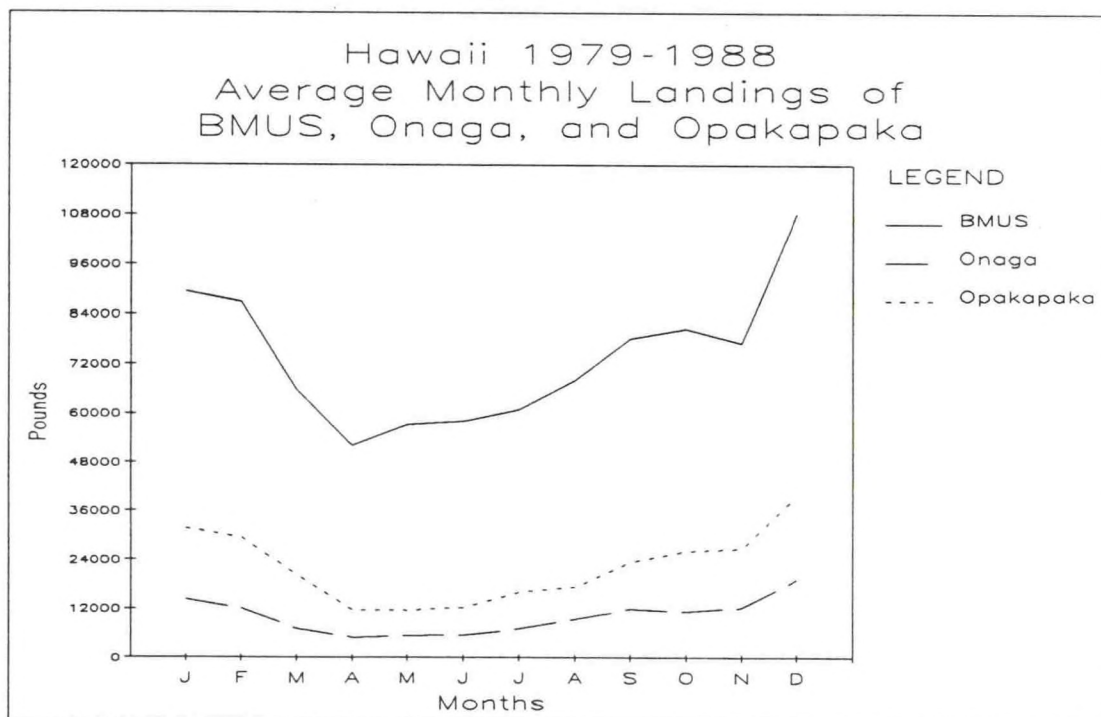


Figure V.2.6





V.41

Figure V.2.7

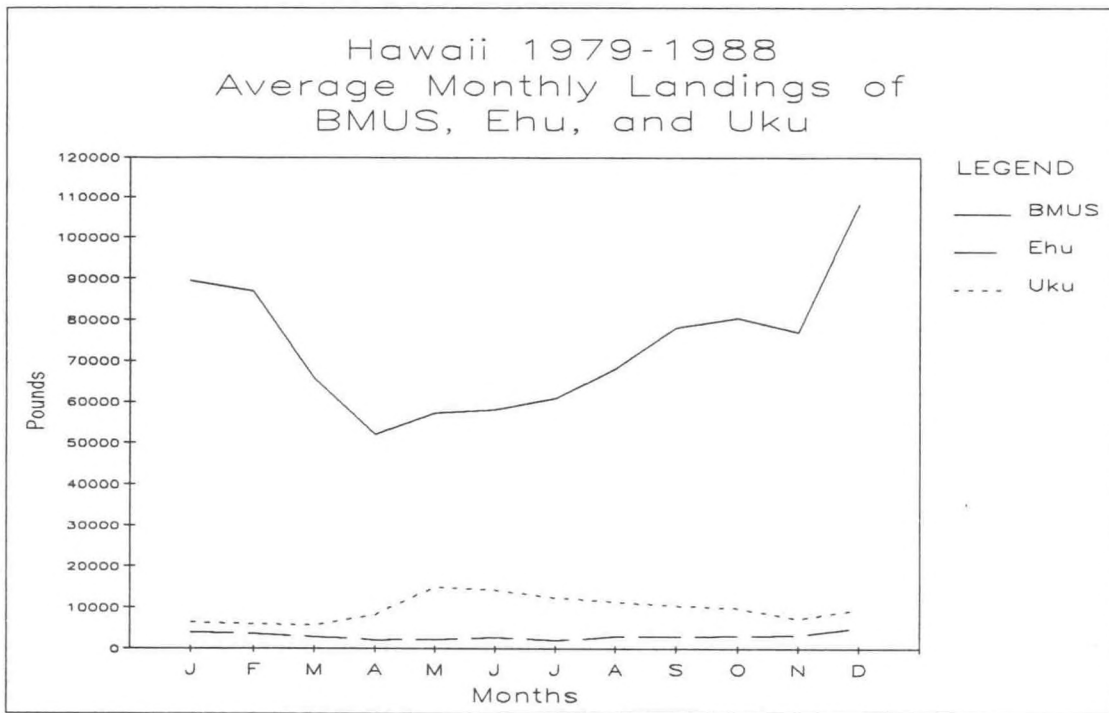


Figure V.3.1

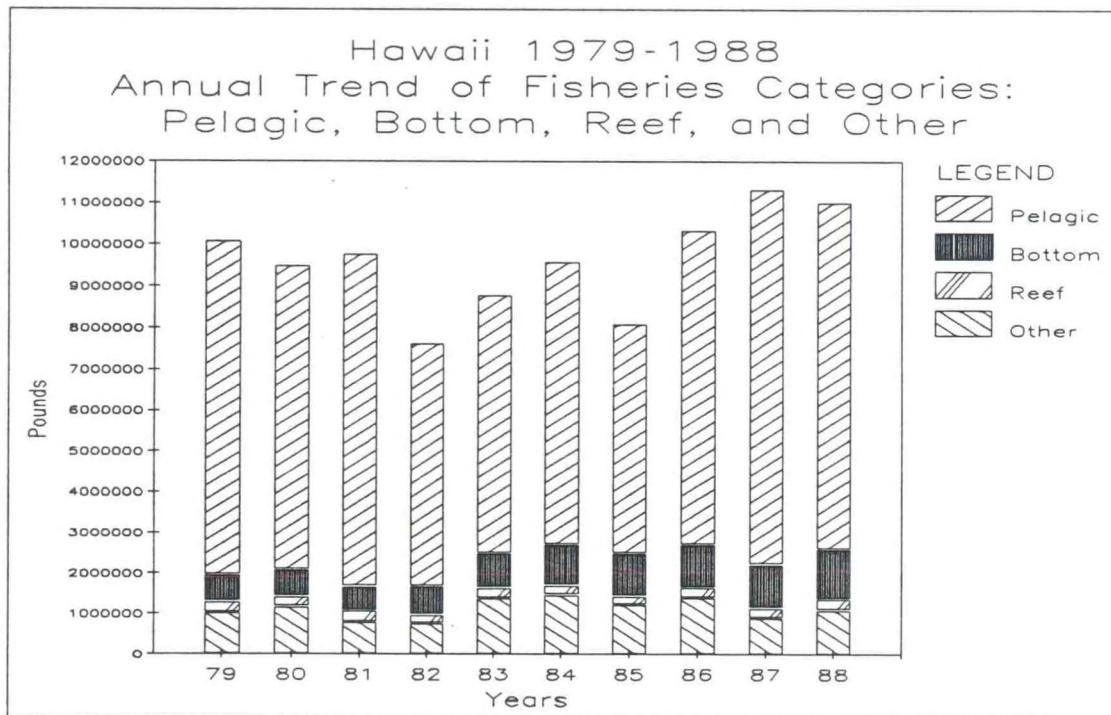


Figure V.3.2

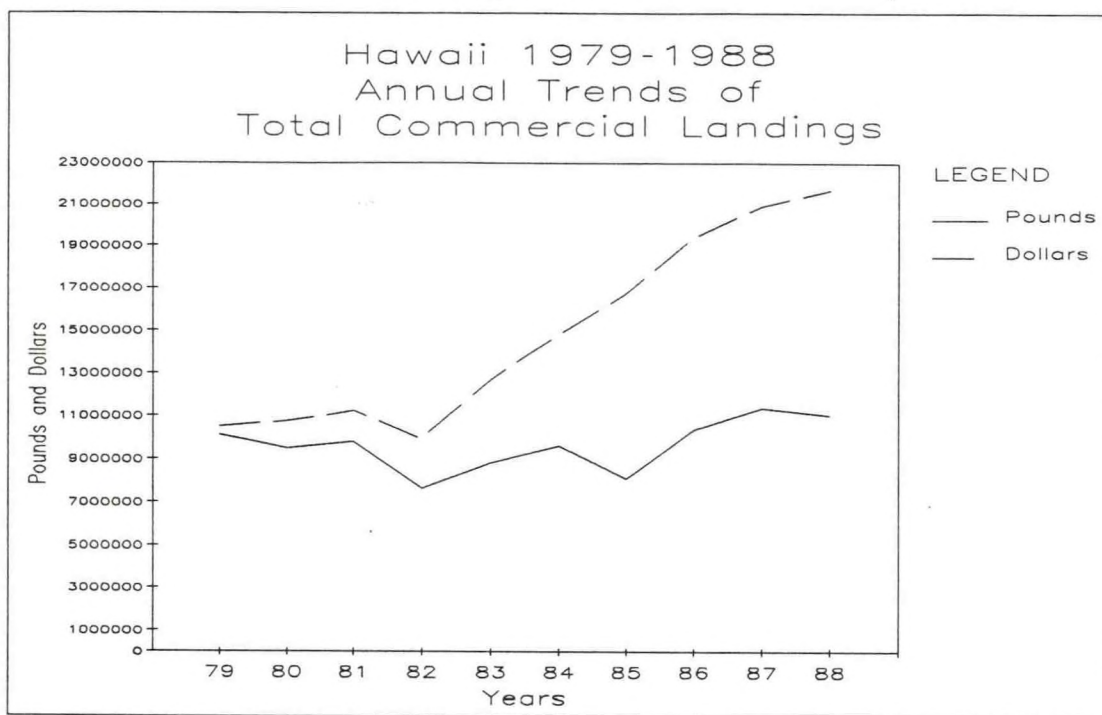


Figure V.3.3

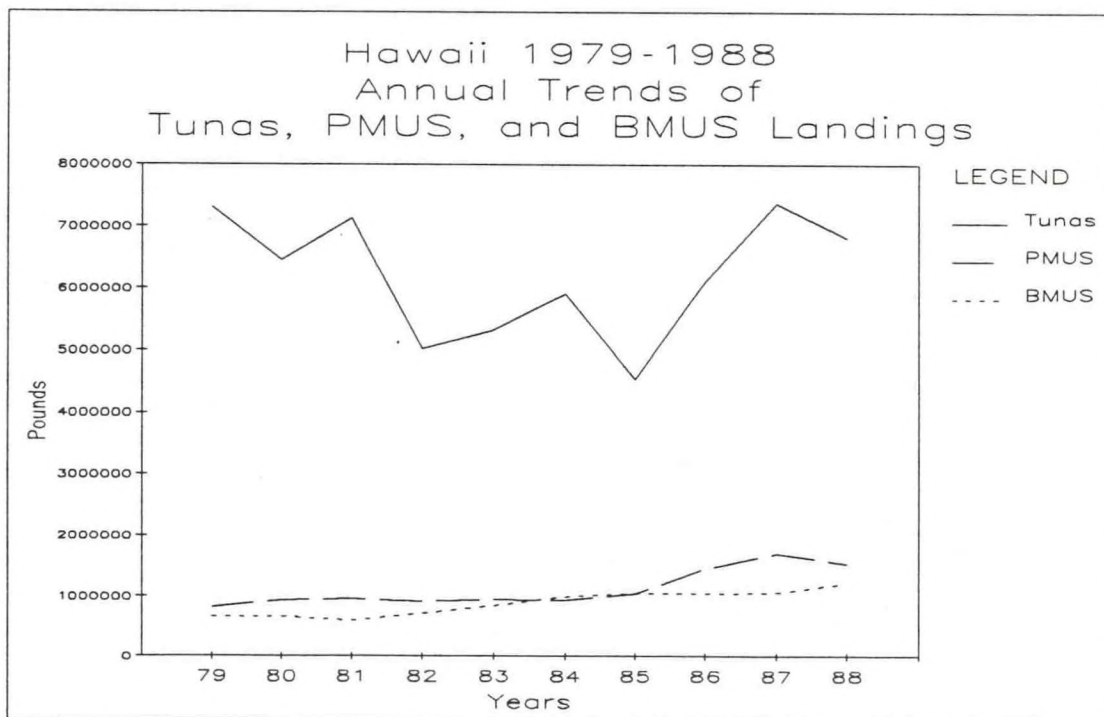


Figure V.3.4

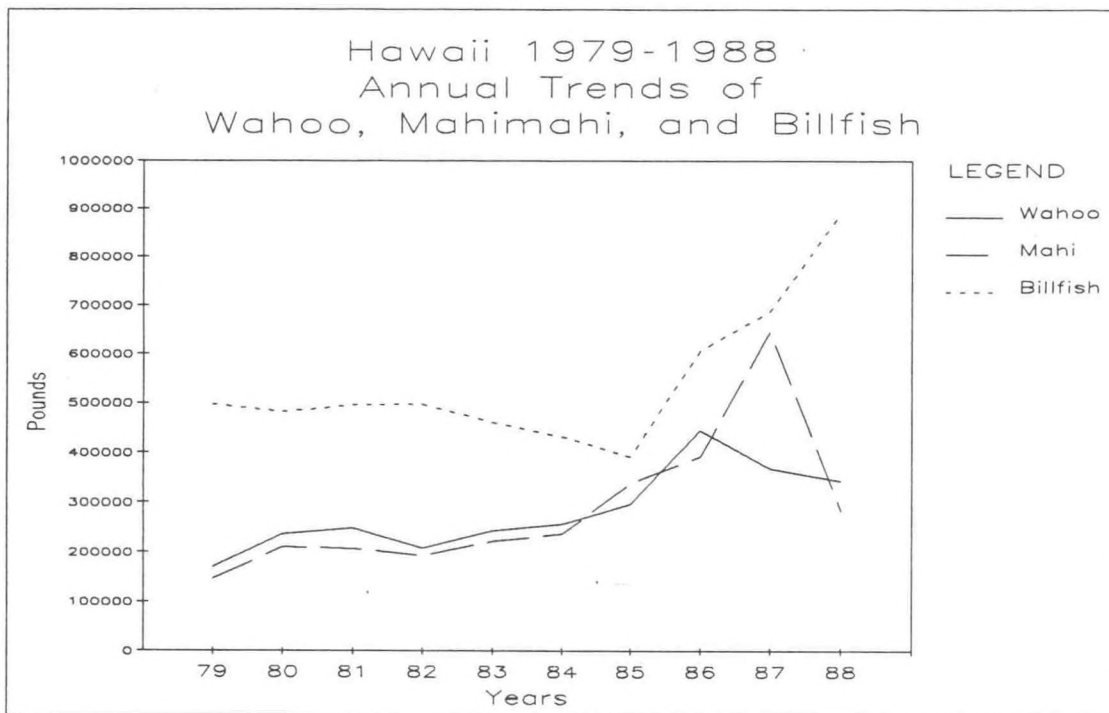
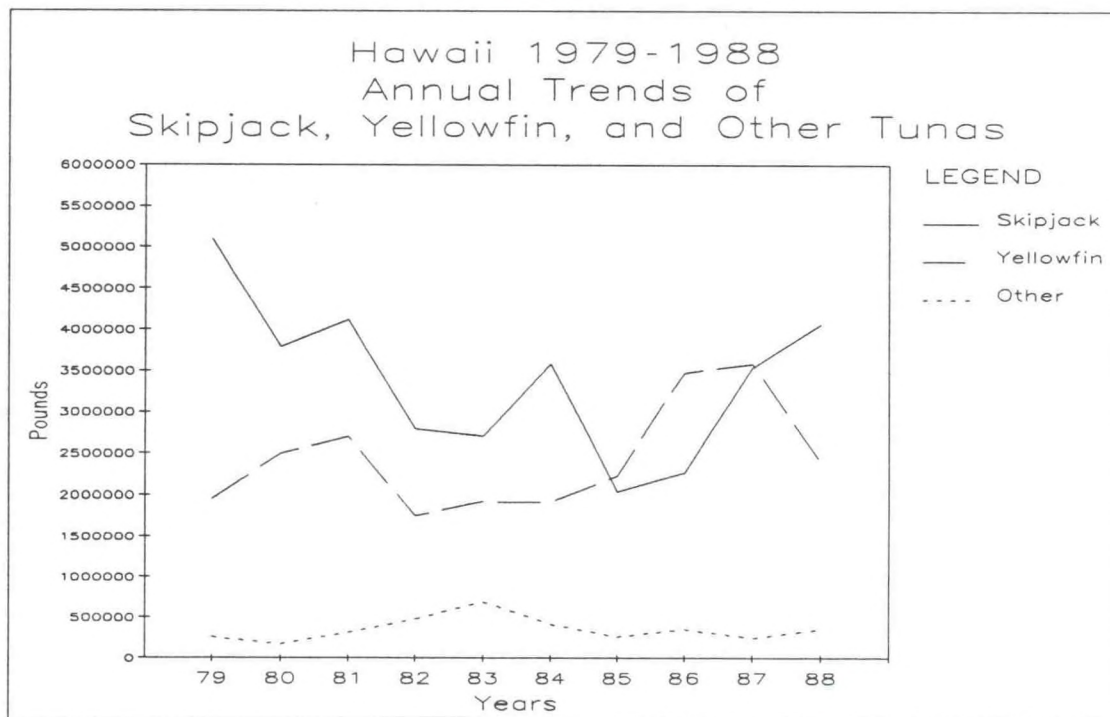


Figure V.3.5





V.44

Figure V.4.1

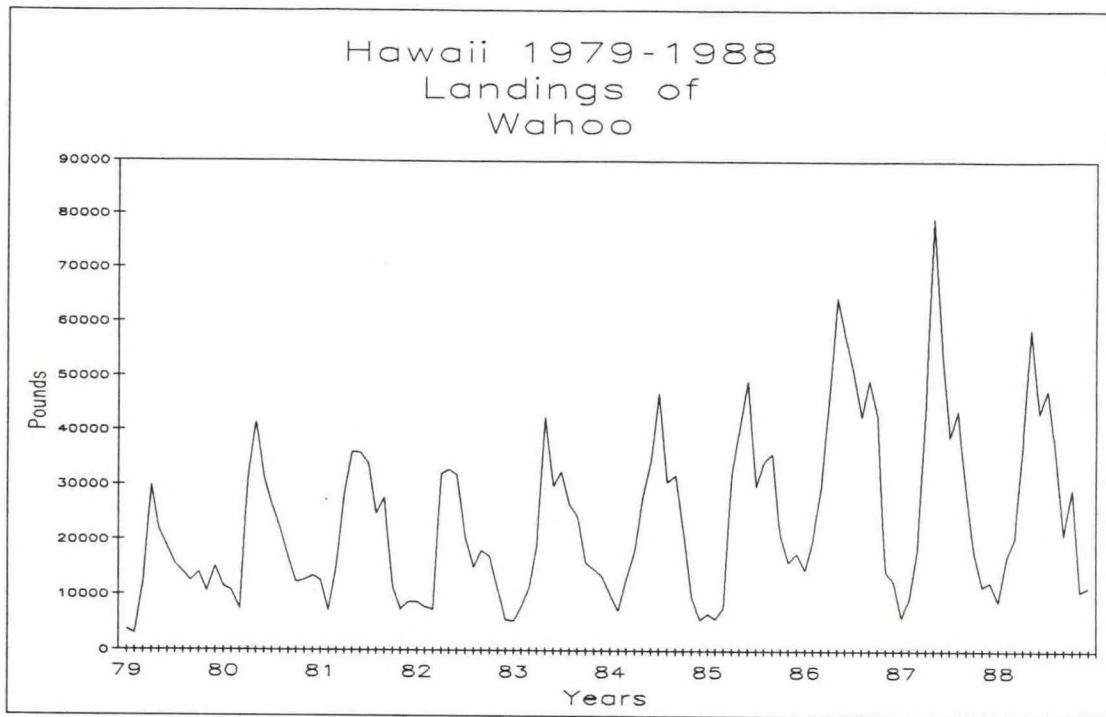
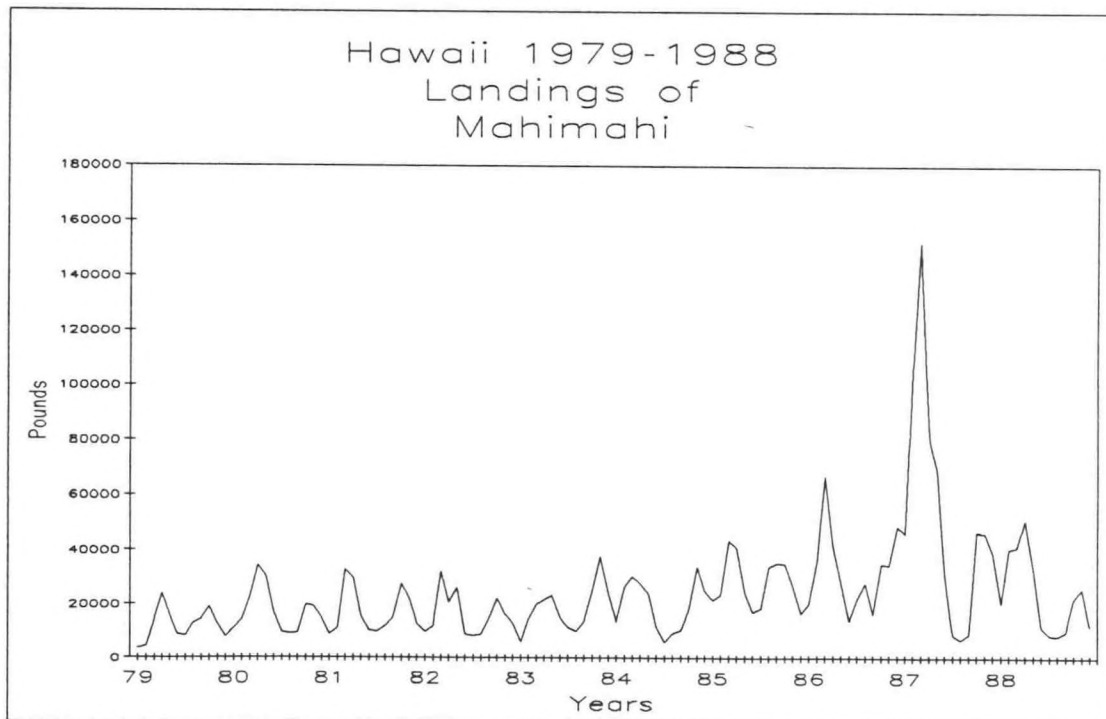


Figure V.4.2



V.45

Figure V.4.3

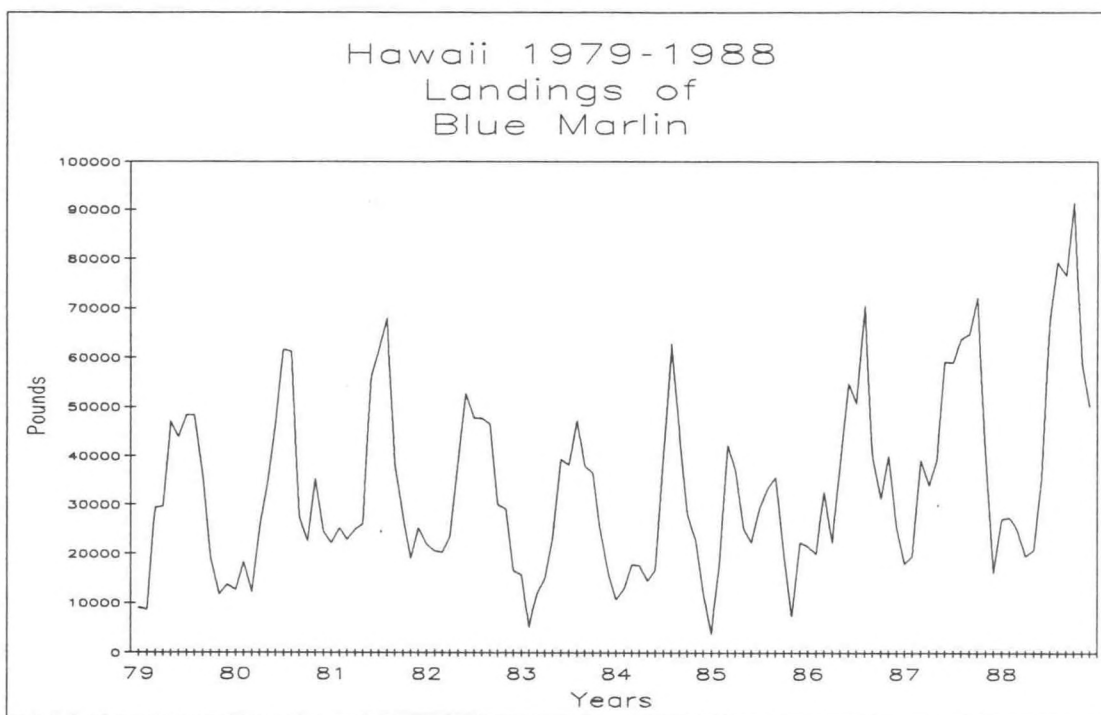
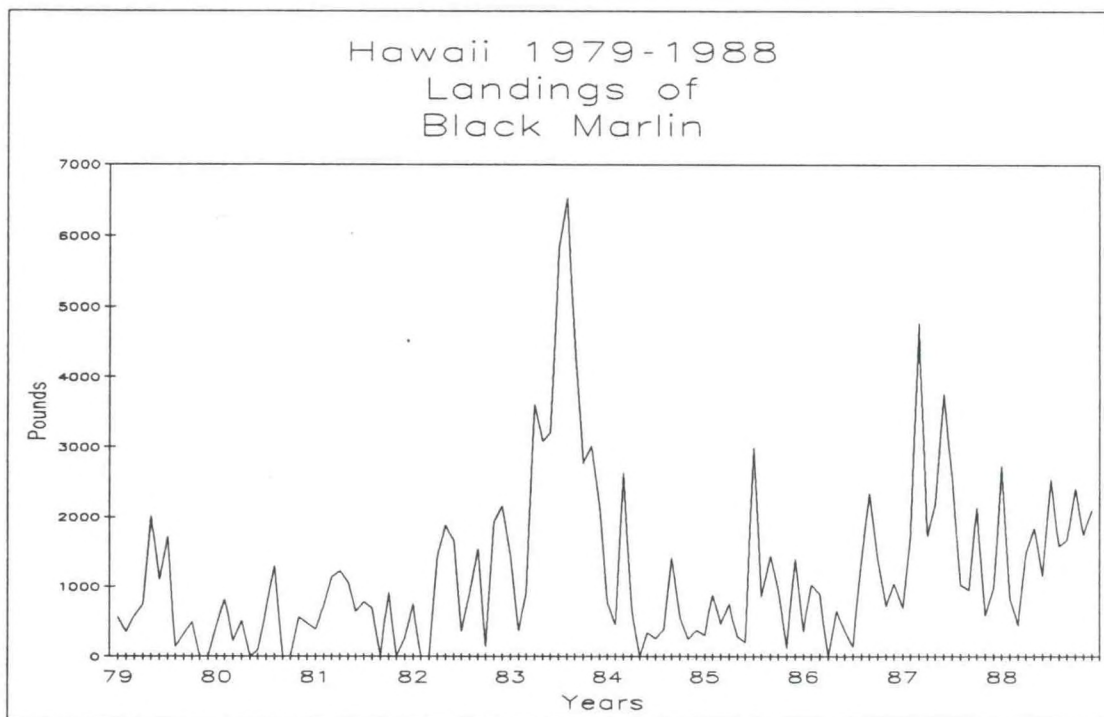


Figure V.4.4



V.46

Figure V.4.5

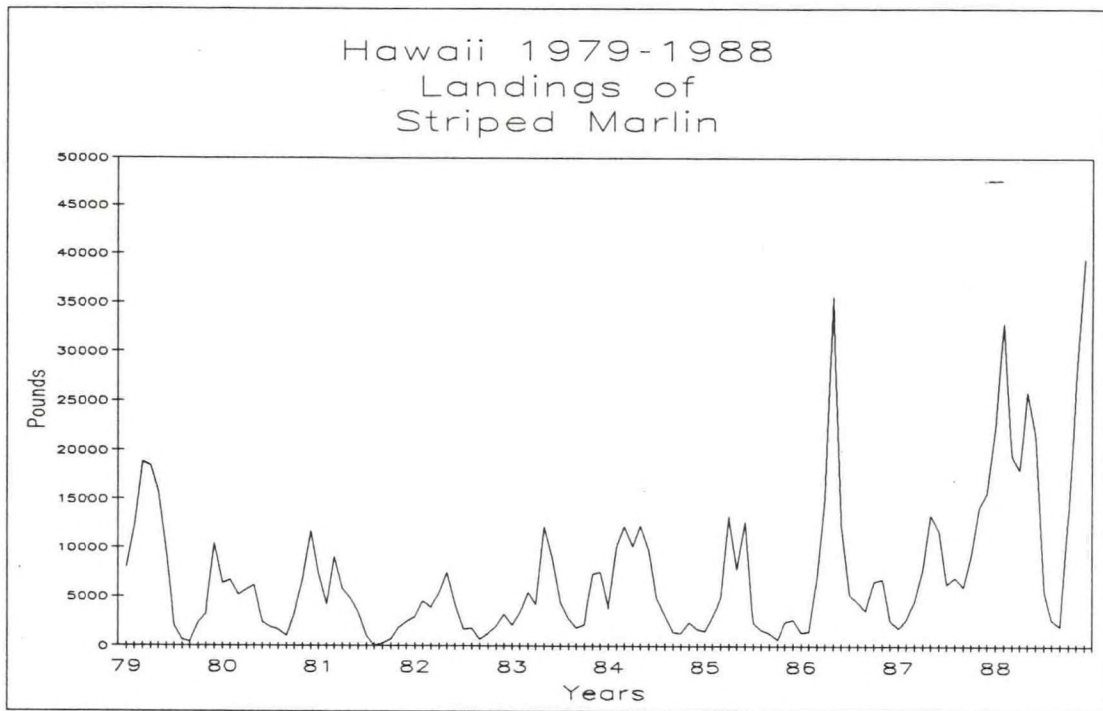
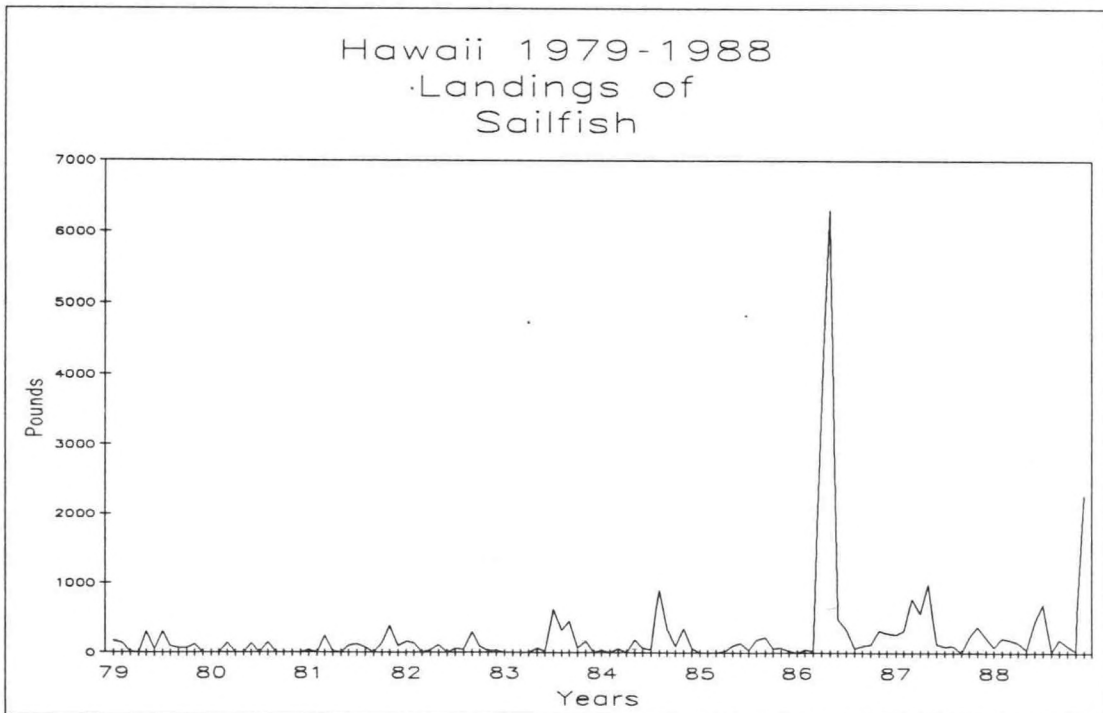


Figure V.4.6





V.47

Figure V.4.7

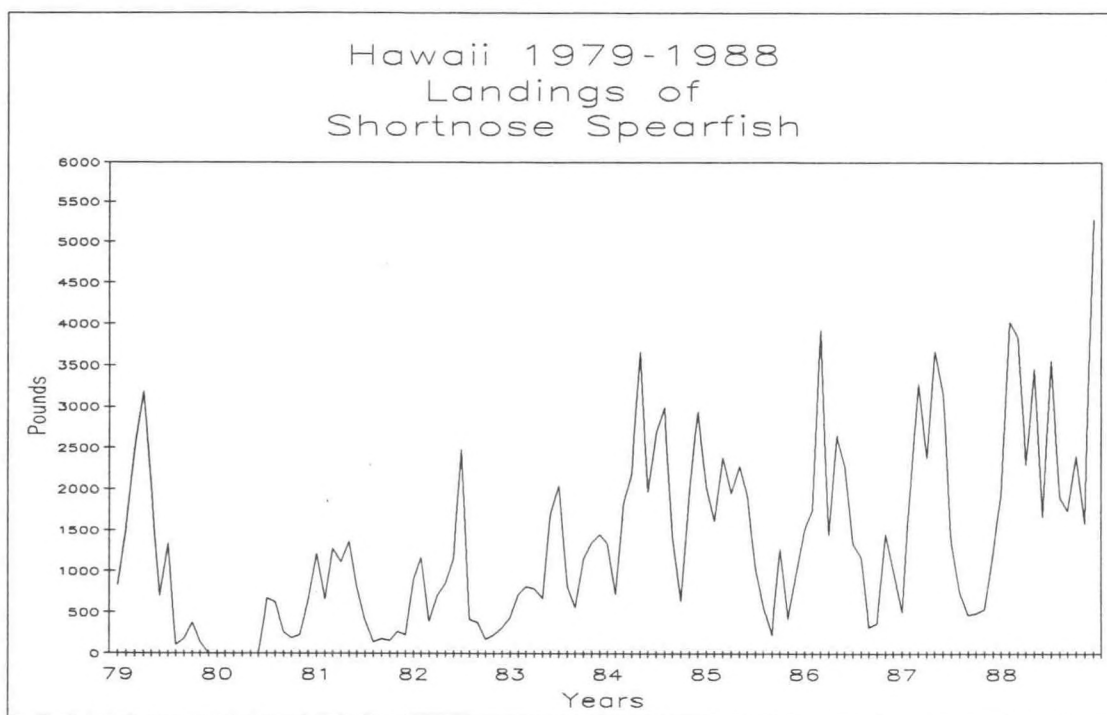
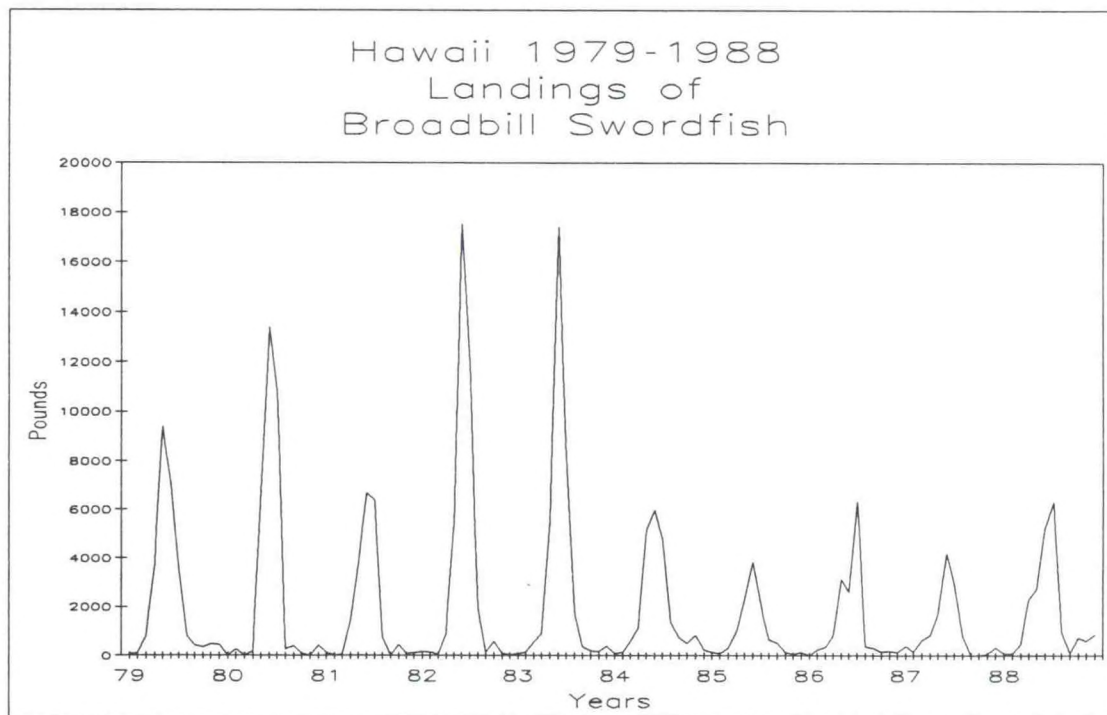


Figure V.4.8



V.48

Figure V.4.9

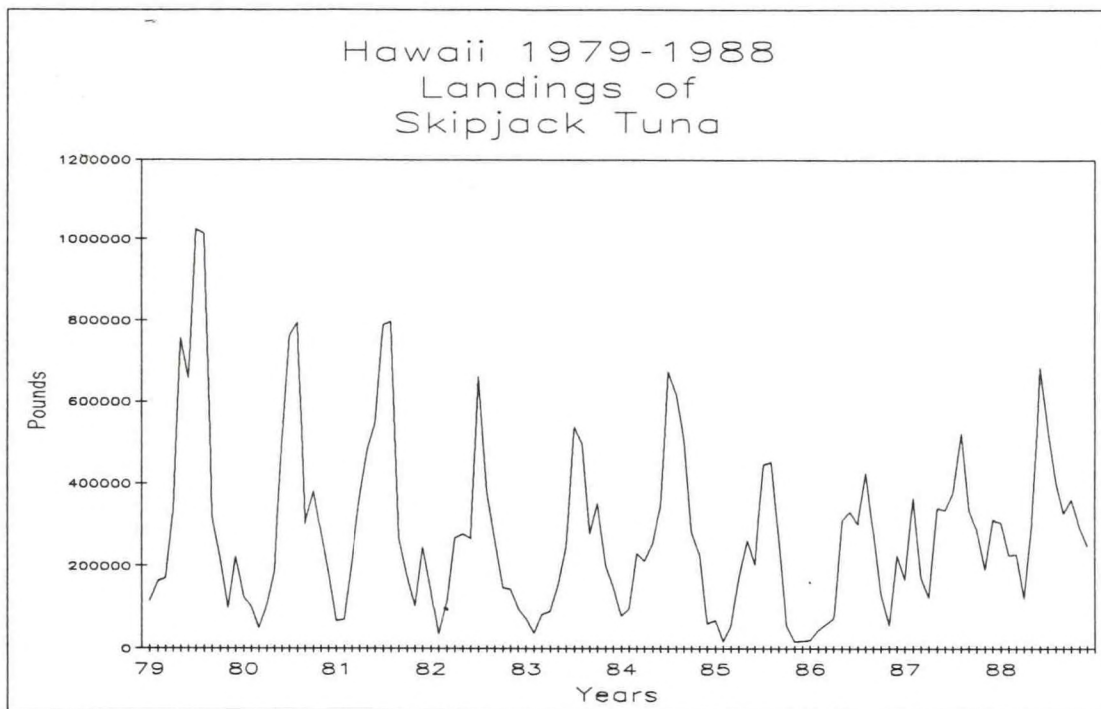


Figure V.4.10

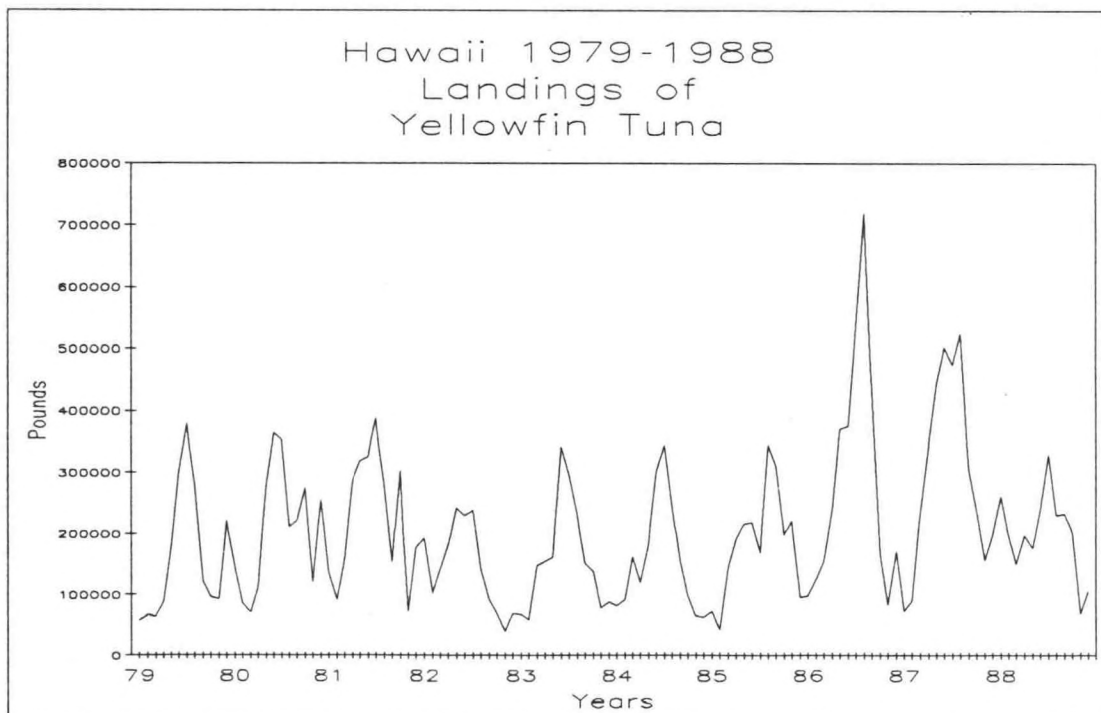


Figure V.4.11

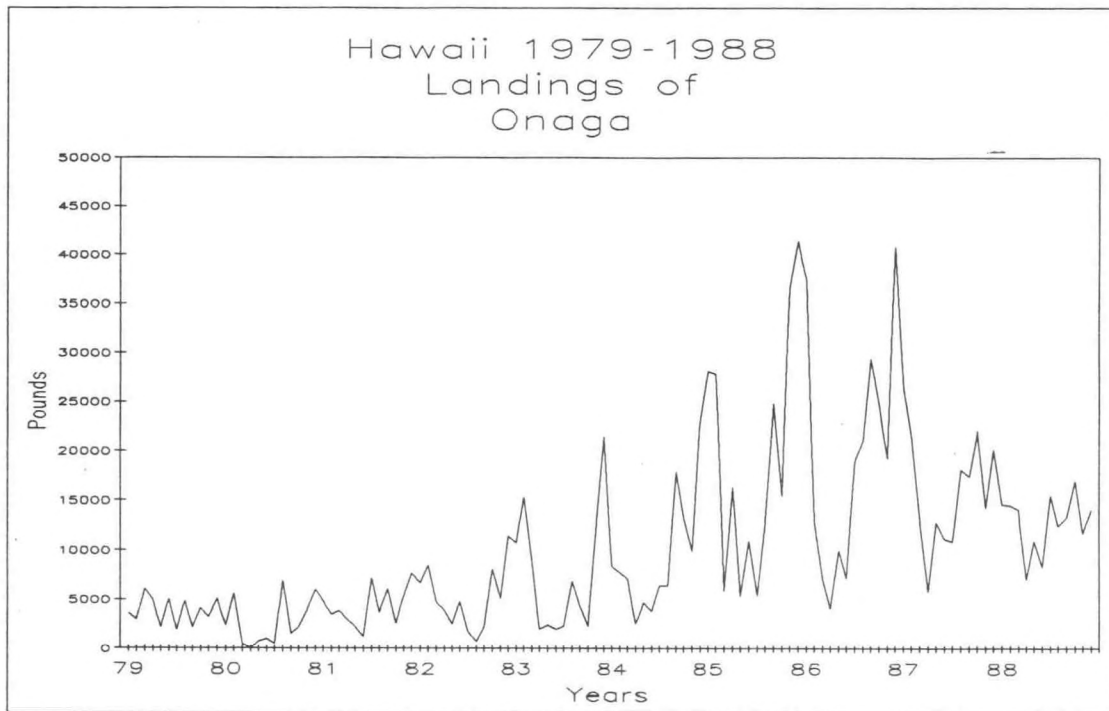
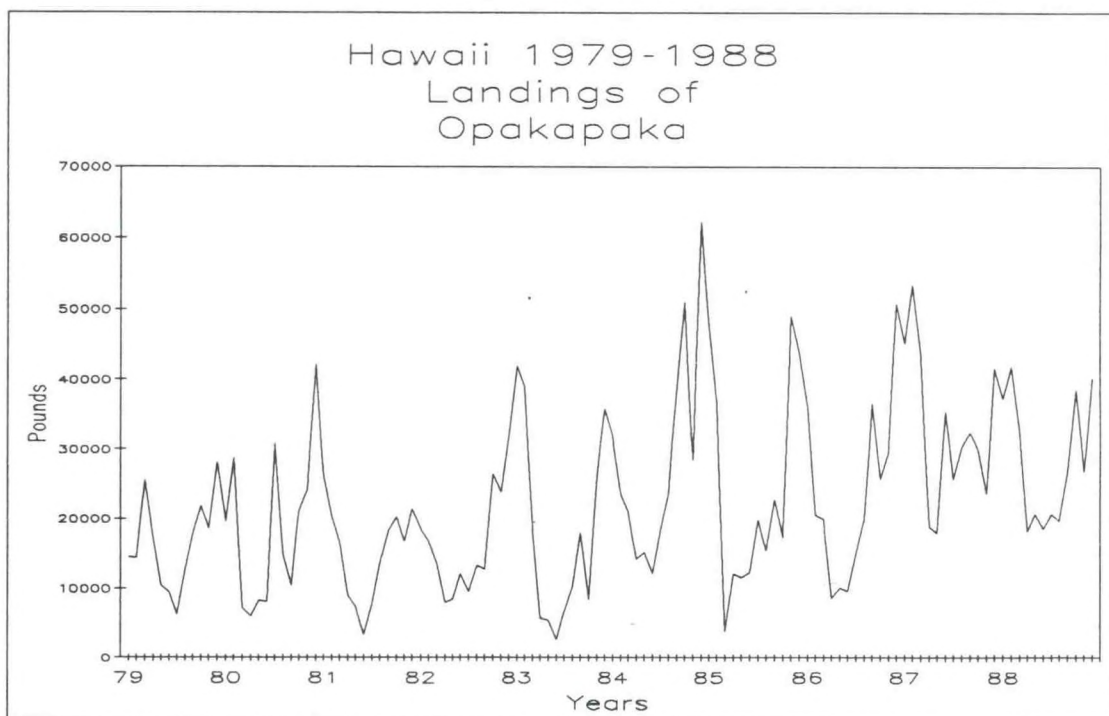


Figure V.4.12





V.50

Figure V.4.13

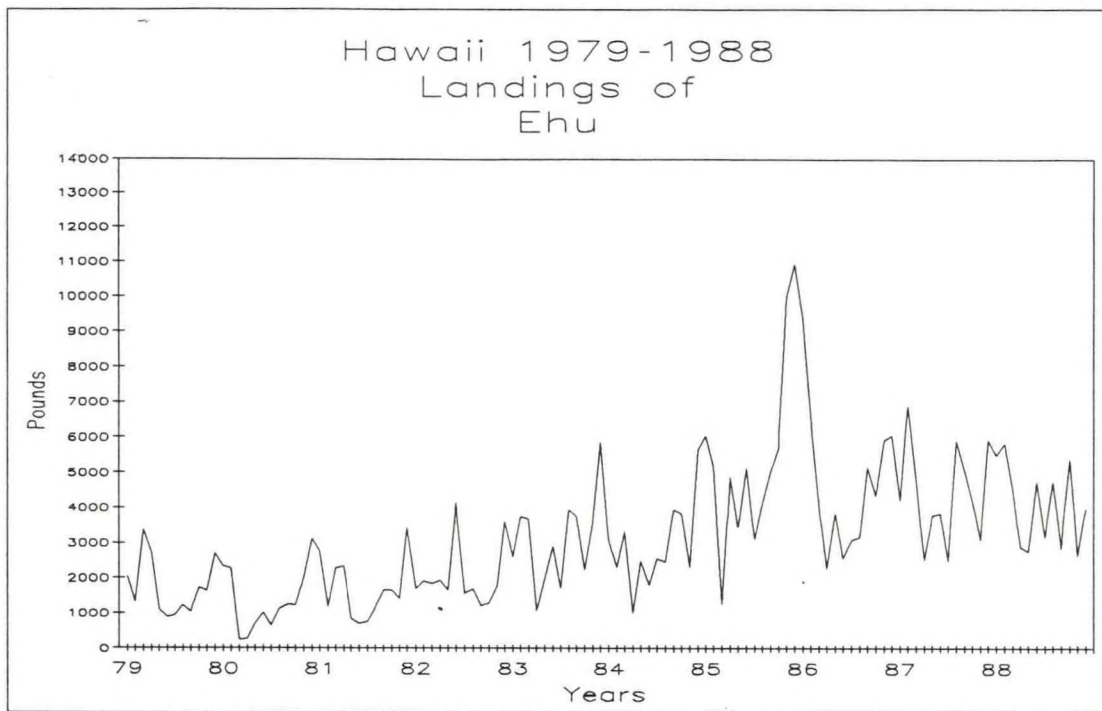


Figure V.4.14

