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MULTIVARIATE ANALYSIS OF THE FEDERAL FISHERY MANAGEMENT UNIT SPECIES FOR SPECIES IN NEED OF CONSERVATION AND MANAGEMENT IN THE AMERICAN SAMOA AND MARIANAS FISHERY ECOSYSTEM PLANS

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1 INTRODUCTION

The Magnuson Steven Act (MSA) requires the Regional Fishery Management Councils to develop fishery management plans (FMPs) for the stocks under its jurisdiction. The Western Pacific Fishery Management Council (the Council) developed five FMPs: 1) bottomfish; 2) crustacean; 3) precious corals; 4) coral reef ecosystem; and 5) pelagics. The non-pelagic FMPs are comprised of thousands of species, majority of which are from the coral reef FMP. This was due to the “currently harvested coral reef taxa” and the “potentially harvested coral reef taxa” categories. The Council in 2006 started the transition from a stock-based FMP to place-based Fishery Ecosystem Plans (FEPs) with strategies for ecosystem-based fishery management. The FEPs were approved in 2009. The re-authorization of the MSA in 2007 required all species in the FMPs to have annual catch limits (ACLs). This challenged the Council to specify ACLs for thousands of species in the FEPs, most of which are data limited.

At its 154th meeting on June 2012, the Council directed staff to conduct an analysis on all available data to determine species/stocks that are eligible for ecosystem component (EC) designation. The Council further directed staff to draft an options paper evaluating sets of alternatives to designate stocks as EC or retain these stocks under Annual Catch Limit management. The actions associated with this recommendation got delayed because of the MSA requirement to specify ACLs by the 2012 deadline.

After 4 years of ACL-based management, the Council again considered its previous recommendation. The Council directed staff to further explore and provide the Council with details in improving the ACL specification process through an omnibus amendment of the Fishery Ecosystem Plan to include re-classifying the management unit species into EC.

The Fishery Ecosystem Plan Team in April 2016 recommended the Council, in collaboration with the Pacific Island Fisheries Science Center (PIFSC), apply the following criteria, in addition to the criteria in the National Standard 1 (NS1) guidelines, to designate EC species. The criteria are as follows:

- Parsing the catch between state/territorial catch versus federal catch;
- Proportion of the catch;
- Frequency of species detected in the time series;
- Habitat association of each MUS species and habitat distribution;
- Existence of an active fishery

The FEP Team further recommended using a combination of these criteria and the analysis is conducted in a multi-dimensional statistical framework. The analysis should consider weighting the criteria and use a range of threshold levels to evaluate the species to be designated as ecosystem components.

The preliminary results were presented to the SSC and the Council at its 125th and 169th meeting, respectively. The SSC and the Pacific Island Fisheries Science Center provided several recommendations to improve the analysis and help provide guidance on the final selection of species that will be designated as EC. Some of the recommendations addressed in this iteration of the analysis are as follows:

1. Staff explore the species catch trend over time and catch:biomass ratio to identify species that are no longer targeted by the fishery but the population is still available to the fishery, or whether species have declined over time due to exploitation and should be investigated in more detail;
2. Staff explore the use of the BioSampling data (e.g. market sampling, species composition) and relevant life history information as input variables and/or information for post-hoc analysis of the species that had been selected for federal management to consider if any should be removed in consideration of productivity and life history traits;
3. Staff explore different cut-off levels based on the actual distribution of the input variables;
4. Staff test the fidelity of the groupings using other statistical tests such as PERMANOVA
5. Tabulate the on the dimensions (depth, frequency, weight, etc.) for the species to determine why the species dropped out;
6. Explore effect of changing the sequence and thresholds;
7. Staff convene an expert working group to examine the species that are filtered out to ensure that the final listing requiring Federal management includes species of social, cultural, economic, biological, and ecological importance.

The revised National Standard 1 guidelines (81 FR 71858, October 16, 2016) requires the Council to evaluate stocks whether it requires conservation and management using the 10 factors in §600.305(c)(1). In addition, §600.305(c)(2) states that in evaluating these factors, Council should consider the specific circumstances of a fishery, based on the scientific information available, to determine whether there are biological, economic, social, and/or operational concerns that can and should be addressed by Federal management. The Council developed an analytical framework that covers five of the ten factors to evaluate all the management unit species (MUS) in its archipelagic FEPs. The remainder of the factors will be considered in an expert group scoring process.

The EC analysis will support an amendment to remove species currently designated as “in need of conservation and management” and be designated as EC. Once designated as EC, these species will no longer require specification of maximum sustainable yield (MSY), optimum yield (OY), overfishing limits (OFL) and associated acceptable biological catch (ABC) and ACLs and essential fish habitat (EFH). This will simplify the fishery management process by focusing on species in need of direct active management. EC species will remain in the FEPs and continue to be monitored to determine if there is a need to bring the species back into “species in need of conservation and management”.

The Western Pacific region manages thousands of species, majority of which are coral reef ecosystem associated taxa, through four archipelagic FEPs (Appendix 11.1-11.3). In order to properly evaluate available data for each species, a multivariate analytical framework is needed to plot species based on similarities of available information and the magnitude of difference of each variables. An exploratory data analysis is a way to investigate data from multiple sources.

Some of the tools explored is non-metric multi-dimensional scaling which places samples (in this case, each species) on a map in two to three dimensions in such a way that the rank order of the distances between species agrees with the rank order of the matching dissimilarities taken from the species-to-species comparison matrix (Clarke et al. 2014). The plot would represent the relative similarities of each species based on the variables being investigated.

The objectives of this analysis are:

1. Consolidate available information for all management unit species in the FEP;
2. Develop a decision tree based on the NS1 guidelines and available data to screen species for ecosystem components;
3. Apply the filters to screen species for ecosystem components;
4. Develop threshold levels for screening species for ecosystem components;
5. Conduct the analysis in a multi-variate analytical framework;
6. Finalize the list of MUS in the American Samoa and Marianas FEPs that are in need of conservation and management under the NS1 guideline;

2 METHODS

2.1 Available Data for Analysis

The following data was used for this analysis:

1. Frequency of species in the catch time series – determines how frequent the species is caught;
2. Species level catch to the total catch – determines how much the species is targeted; calculated in mean catch and total catch; expressed in total weight and total count
3. Species level biomass data – determines species abundance;
4. Species maximum depth data – proxy for the extent the species is distributed;
5. Proportion of depth distribution in territorial and federal waters – determines whether the extent of potential distribution of species in federal and territorial waters;
6. Revenue – determines the economic value of the species caught in the fishery

2.1.1 Species-level catch

In order to designate species under ecosystem components, a comprehensive list of species was generated by the Pacific Island Regional Office in 2012 during the first year of ACL implementation.

Species level data was requested from the Pacific Island Fisheries Science Center. The catch data was requested through the Western Pacific Fishery Information Network (WPacFIN). Species level catch information was generated for all species in the WPacFIN database. Catch data is from the boat-8,l and shore-based creel surveys from American Samoa, Guam, and Commonwealth of Northern Mariana Islands. For details of the data collection, see Oram et al. (2010a, 2010b, 2010c, 2010d, 2010e, 2010f).

The species level data was expanded to estimate the total species level catch. The boat-based creel survey data expansion algorithm multiplies average CPUE (lbs/trip by gear), times the average number of trips per day at each port (trips/day by gear), times the number of days in a year (days), to estimate annual landings (in lbs) over all ports and gears. This serial multiplication and summation ("expansion") is done separately for weekdays and for weekend/holidays, since the number of boats going out fishing ("participation rates") changes when people are off work.

The shore-based creel survey data expansion algorithm multiplies average CPUE by gear (lbs/hour), times the average number of gear-hours per day for each gear type (summed over several average shifts), times the number of days in a year (summed separately for weekdays and weekends/holidays), to get a total estimated catch (in lbs) for all areas and gears annually. Estimated pounds by species can then be derived from the proportion (% weight) of each species by gear type, which comes from interview data.

For details of the fishery dependent data calculation, see Tao and Tomita 2016 (PICDR-293-IR)

The species level catch time series table was used for the species occurrence information. Each catch entry was converted to presence or absence. If there is catch data for a given year that was scored as a 1 and if none it scored a 0.

2.1.2 Species-specific maximum depth

Maximum depth was assigned to each MUS. PIFSC-Coral Reef Ecosystem Program (CREP) provided the maximum depth (m) to the species detected through visual surveys from various research: 1) Baited Remote Underwater Video; 2) Mesophotic Reef Surveys in 2014; 3) Rebreather dives by R. Pyle in 2014; and 4) Bottomfish Camera drops in the Main Hawaiian Islands. If a species has multiple maximum depth records from the 4 data sources, the deepest observed depth was used for the analysis. These data sources are limited to fin fish. The MUS list also includes invertebrates and fish species that are not detected in the surveys. The Council contracted a third-party for a web search of available values for maximum depth from published, gray literature, and online databases. If a species has different maximum depth values from the PIFSC surveys and the web search, observed maximum depth values from surveys were used.

2.1.3 Proportion of habitat in territorial and federal waters

The existing fishery data collection system in the territories is not spatially explicit. This presents challenges in terms of catch attribution whether caught in territorial (0-3nm) or federal waters (3-200nm). We used the depth profile and the extent of habitat with which the species are associated between territorial and federal waters. The PIFSC-CREP Ecospatial Information Team provided the estimates of hard and soft bottom habitat (expressed in m^2) per depth range (0-30m and 10m increment thereafter to 100m and 50m increment beyond 100m) per island (including the offshore banks). We assumed that the habitat extent is proportional to the population distribution of the species. The extent of the species distribution was cross referenced with the maximum depth information.

2.1.4 Species level biomass and abundance

The PIFSC-CREP Fish Ecology and Monitoring Team provided the species level standing stock biomass data. The data used was from the Stationary Point Count (SPC) surveys conducted in the territories and State of Hawaii. Briefly, the SPC involved 2 divers identifying fish species, estimated length, and counts each within a 7.5m radius cylinder. The two survey cylinders are adjacent to each other hence the 2 divers are approximately 15m apart. The cylinder extends from the benthos to the surface (Smith et al. 2011; Williams et al. 2011). Divers first list all observed reef fish species in the first five minutes of the survey. From the list generated, the divers sequentially count and estimates the length (to the nearest centimeter) of the fish observed within the cylinder. Fish species later encountered that were not part of the initial list are still recorded but are classified in a different observation category.

Survey sites were selected randomly within strata by depth-bins (shallow – 0 to 6m; mid-depth – 6 to 18m; and deep – 18 to 30m). This is one possible source of variation in detectability and occupancy. Other sources may include diver-related variations, habitat type, and rugosity. Details of the survey protocol are available in Ayotte et al. (2015).

Standing stock biomass was calculated using the average biomass density (in gm^{-2}) of each species per depth strata per habitat type. The biomass density is multiplied with the extent of the hardbottom habitat to get the expanded standing stock biomass (in metric tons). For details of the biomass expansion see Williams (2010).

2.1.5 Species level revenue

Revenue information was derived from the commercial receipt book database. Average price-per-pound per species (if available) was multiplied to the species level catch information. If there is no species level price-per-pound information available, the higher-level information was used (con-generics or family level information). The analysis can be done on the commercial component only based on the ratio estimated by Walker et al. (2012). Since this was just a ratio estimator based on the interview data, the results in the MVA will be similar to simply using the total species level catch.

2.2 Analytical Framework

The analytical framework follows a decision tree with varying threshold. The analysis used some of the criteria described in the National Standard 1 guidelines in developing the decision tree. Each criterion was assigned a data proxy. However, an overarching criterion was prior to applying the NS1 criteria to screen the species with information for the analysis. The final MUS list (Appendix 1) was known to be an artifact of the fishery database. For example, the coral reef taxa are classified as “currently harvested coral reef taxa” those harvested in the reef fisheries and “potentially harvested coral reef taxa” which are the rest of the species in the reef ecosystem. Most of the taxa have no information and just an artifact of the development of the species database. These species need to be removed before applying the filter criteria.

Table 1 describes the criteria and the data proxy assigned to each criterion. We used a decision tree matrix to filter species that do not need conservation and management measures

(CMMs). The decision tree is shown in Figure 1. The first level is the data availability filter. If there is no data available then it automatically falls as an ecosystem component that will be subject to further monitoring and research. The rationale is that there is no data to analyze for the stock status and therefore cannot be subject to any reasonable CMMs. A series of filter is then applied to the remaining species and a threshold (in quartiles) needs to be selected for each step. The remaining species will comprise the stock for federal fisheries management after all five filters are applied.

Table 1. National Standard 1 criteria for species in need of conservation and management measures and its respective data proxy.

National Standard 1 criteria	Data Proxy
1. Stock is an important component of the marine environment	Proportion of stock (habitat and depth as a proxy) in territorial versus federal water
2. Stock is caught by the fishery	Frequency of the species caught by the fishery over time
3. Stock is a target of a fishery	Species level catch to the total catch
4. Stock is important to commercial, recreational, or subsistence	Standing stock biomass
5. Stock is important to the Nation or to the regional economy	Revenue

The analysis is focused on determining species of management importance in the federal waters. In order to achieve this, we have to make some assumptions on the data set used and how it would relate to the NS1 criteria. The following interpretation and assumptions were made for the NS1 criteria and its respective data proxy:

1. In order for a stock to be an important component of the "federal" marine environment, the species has to be significantly present in federal waters. We used the benthic habitat area by depth and the maximum depth information for each species. The benthic habitats in the territories have no extensive shallow continental shelf but rather have a steep slope going down to great depths. Most of the shallow habitats are within 3 miles. There were several banks that occur in federal waters which are included in the area calculation. It is automatic therefore that species that have shallow depth distribution are categorized in territorial waters whereas species with wider depth distribution will be found both in territorial and federal waters.

2. In order to gauge whether the stock is caught by the fishery, we assume that it will constantly appear in the fishery database. Species caught more frequently will be recorded often and will appear consistently in the catch time series. Since there is no objective way of creating a threshold, the frequency of occurrence is divided into quartiles. Species can appear on a 30-year time series 1-25%, 25-50%, 50-75%, 75-100% of the time.

3. For a stock to be a target of a fishery, the species should make up majority of the total catch. The average species annual expanded catch was divided with the total catch of all species to determine relative contribution to the total catch then was ranked from highest

to lowest. Species that are assumed to be the target species will have the highest contribution to the total catch. The ranked list will determine their position on the quartiles similar to the frequency of occurrence.

4. For a stock to be important to commercial, recreational, or subsistence fisheries, species should have a reasonable level of biomass in order to be targeted. Biomass is used as a proxy for abundance. In order for the stock to be of fishery importance, the biomass level should be sustained. This can also be viewed as an output where conservation and management of the species should lead to a sustainable biomass level.

5. For a stock to be important to the Nation or to the regional economy, the species should have high economic value through the volume and the revenue generated from the sale of the species.

2.3 Multivariate Data Analysis

A master table of available information was generated for all the MUS species per jurisdiction. Each species was treated as a sample and the following data were treated as variables: 1) total catch; 2) mean catch; 3) total occurrence; 4) total count (individual pieces); 5) maximum depth; 6) biomass; 7) habitat proportion in federal waters; and 8) revenue.

The master table was imported to PRIMER 7, a multivariate analysis software designed to calculate similarities in samples from the variables (Clarke and Warwick 2001; Clarke et al. 2014). The quartile rank of occurrence, catch, max depth, and the depth bins were used as factors for each variable entry per species. A log(X+1) transformation was used to standardize the data since the values have several orders of magnitude difference. We used the Bray Curtis similarity to create the similarity matrix. Bray Curtis similarity index were deemed to be appropriate for ecological analysis particularly in handling abundance and biomass data (Clarke et al. 2006).

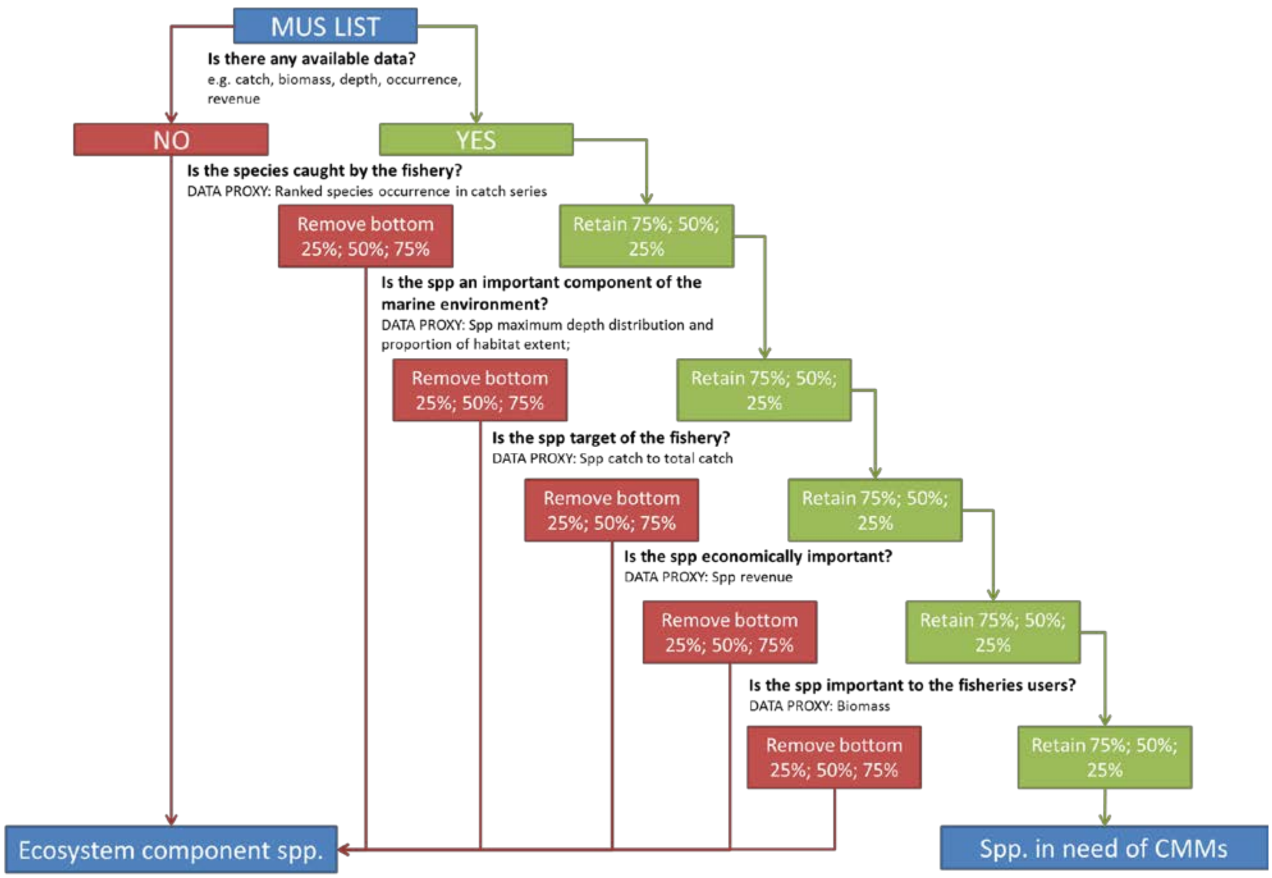


Figure 1. Decision tree for designation species as ecosystem components or species in need of CMMs

Non-metric multi-dimensional scaling (nMDS) was used to plot distances for similar species in a 2-dimensional and 3-dimensional space. Species that have similar characteristics for the 7 variables would cluster together. The *stress* value for the plots is indicative on how each point is representative of the inherent similarity /or dissimilarity with other points. The lower the stress value the better the representation in a 2-dimensional or 3-dimensional space. Stress value <0.1 corresponds to a good ordination with no real prospect of misleading interpretation (Clarke and Warwick 2001). A Shepard diagram is plotted to show the regression between the Bray-Curtis similarity and the calculated distance from the MDS (in 2-dimension and 3-dimension). The MDS analysis was set to run 25 restarts to find the lowest stress value which is a form of optimization of the final MDS plots. Pearson correlation was used to show the vectors in the MDS plot. The vector lines of the variable show the directionality of the similar sample points.

The plots show the patterns in the species relationship relative to the variables. The points that clustered together are of interest which is the species group that will be filtered through this process. The multivariate analysis is done at every filtering stage of the decision tree. At each filtering stage, a cut-off level is applied using the following intervals: 1-25%, 25-50%, 50-75% and 75-100%. Each species is assigned to their respective quarter after calculating the percentiles (0.25, 0.50, and 0.75) and the cumulative percentages for each variable used. Species is assigned with ND if there is no data for a particular variable. A final list of species is generated after all filters are applied which are candidates for species under federal fisheries management.

2.4 Permutational Multivariate Analysis of Variance (PERMANOVA)

In order to test the fidelity of the clustering, we implemented the PERMANOVA+ routine in PRIMER 7.0. (Anderson et al. 2008). PERMANOVA is basically a permutational MANOVA procedure that operates on the selected resemblance matrix (in this case Euclidian distance), and avoids unrealistic normality assumptions (Anderson 2001; McArdle and Anderson 2001) required in a parametric MANOVA. This is done by using permutation to generate null hypothesis distributions for its pseudo-F statistics. The pseudo-F statistics is constructed by the exact same way as the standard F statistics for corresponding univariate ANOVA designs. PERMANOVA tested the hypothesis of no difference in the available fishery dependent and fishery independent data. A design file was developed from the sequence in the decision tree. The test was done on a five-factor design: 1) occurrence; 2) maximum depth; 3) total catch; 4) revenue; and 5) biomass. Under each factor are the 4 quartiles.

PERMANOVA involves partitioning of the data in a 5 by 4 design but the sample sizes would vary depending on the number and types of data available for each species. A Type 1 sum of squares (sequential) was used in the analysis because we want to explore the natural order of the filtering stages. This would also ensure that all components are considered and no information is left out. Only the main effects will be included in the report since most of the interaction terms were not significant.

2.5 Addressing the SSC and PIFSC analytical recommendations

This report includes additional sections that addressed the recommendations by the SSC and PIFSC. The following are the recommendations and the analysis conducted to address the recommendations:

Table 2. List of SSC and PIFSC recommendations and actions taken to address the recommendations

SSC/PIFSC recommendations	Analytical procedure
Staff explore the species catch trend over time and catch:biomass ratio to identify species that are no longer targeted by the fishery but the population is still available to the fishery, or whether species have declined over time due to exploitation and should be investigated in more detail	Individual species level catch trends were plotted for reference during the Ecosystem Component working group evaluation. Catch to biomass information is limited. See APPENDIX 11.4-11.6
Staff explore the use of the BioSampling data (e.g. market sampling, species composition) and relevant life history information as input variables and/or information for post-hoc analysis of the species that had been selected for federal management to consider if any should be removed in consideration of productivity and life history traits;	This was considered in the Ecosystem Component Working Group evaluation. Revenue information was included as one of the filters.

<table>
<tr><td>Staff explore different cut-off levels based on the actual distribution of the input variables;</td><td>Plotted the histogram for:
#species x occurrence bins (no data, 1-year increments)
#species x catch bins (no catch, start with 100 lbs increments)
#species x depth bins (follow the existing binning)
#species x economic value bins
#species x habitat proportion bins
Aside from quartile, cumulative percentages were explored to determine if it is an appropriate cut-off metric.</td></tr>
<tr><td>Staff test the fidelity of the groupings using other statistical tests such as PERMANOVA</td><td>Included PERMANOVA analysis at each filtering stage</td></tr>
<tr><td>Tabulate the species that dropped out per filtering stage</td><td>A table was added to the appendix that summarizes the species that was removed at each filtering stage.</td></tr>
<tr><td>Explore effect of changing the sequence and thresholds;</td><td>Conducted a sequence analysis and compared the species composition and ordination plot</td></tr>
<tr><td>Staff convene an expert working group to examine the species that are filtered out to ensure that the final listing requiring Federal management includes species of social, cultural, economic, biological, and ecological importance</td><td>An Ecosystem Component Working Group was formed chaired by Dr. Craig Severance to evaluate the final list of species and conducted a scoring process to account for the remaining 5 factors described in the NS1 guidelines.</td></tr>
</table>

3 RESULTS

3.1 Addressing analytical improvements

Out of the seven recommendations provided by the SSC and PIFSC, three are operational issues that would affect the MVA. The cut-off level, grouping fidelity, and filter sequencing are addressed individually in this section. The remaining recommendations are either addressed by the EC working group (refer to the ECWG report). The recommendation on looking at the individual species catch trends is addressed via APPENDIX 11.4-11.6. Individual plots have been included as reference.

3.1.1 Exploration of cut-off methods

An essential step in the filtering process is determining the appropriate cut-off levels. The cut-off level should be derived from the distribution of the occurrence, catch, depth, revenue, and biomass data. The histogram shown in Figure 2 describes the number of species under each range of values for these five variables for American Samoa, Guam, and CNMI. In general, for catch, maximum depth and revenue, the distribution is skewed to the left where most number of species have low catch occurs at shallow depth, and has low economic value. Occurrence on the other hand, has data that spreads across the number of years with the highest number of species with a single year occurrence.

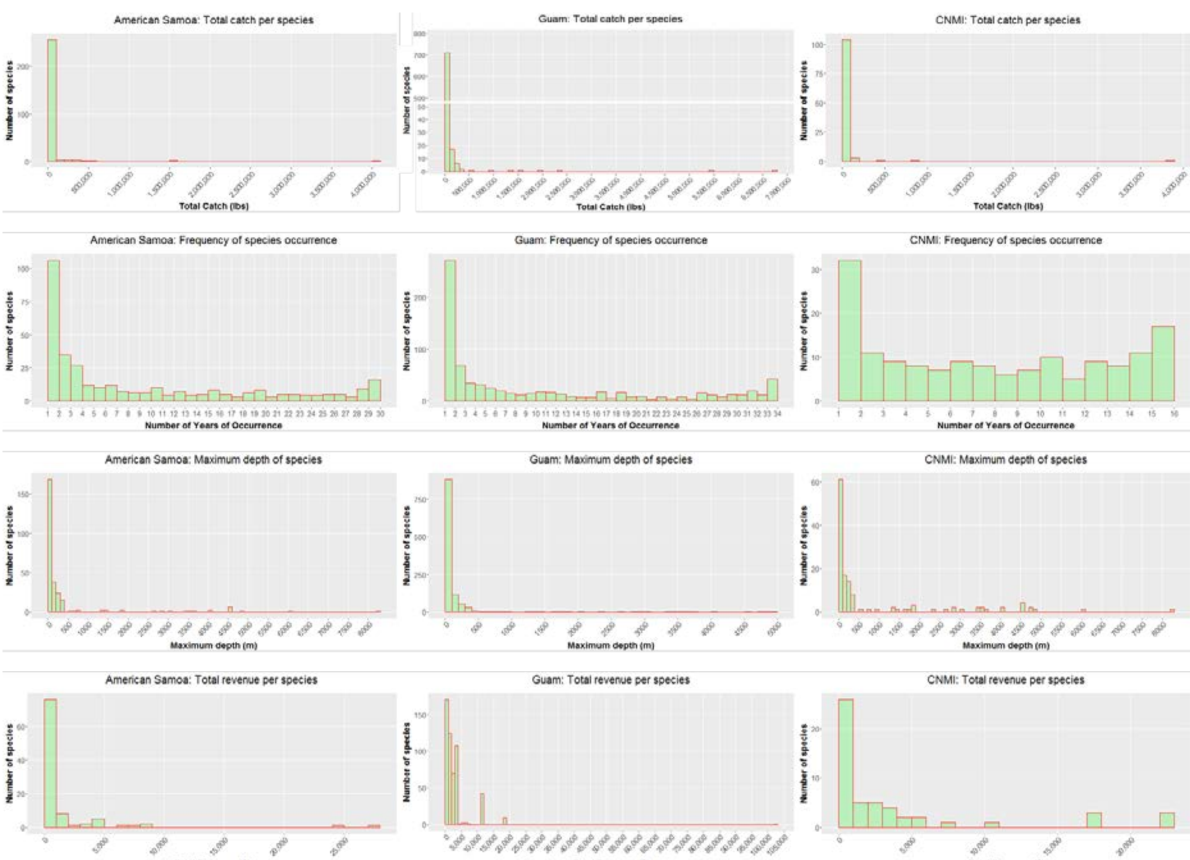


Figure 2. Histogram of catch, occurrence, maximum depth, and revenue data for American Samoa, Guam, and CNMI.

The percentiles (0.25, 0.50, and 0.75) and cumulative percentages (top 25%, upper mid 25%, lower mid 25%, and low 25%) were calculated for each variable. We compared the results of the rate of species removals using these cut-off methods. The cumulative percentages follow the same distributions as the variables where the lower 25% had the most number of species and the number taper rapidly in increasing quarters. Figure 3 shows the rate of species removal between the two cut-off methods. Using the first quarter (1-25%) of the percentile and the cumulative percentage method, the rate of species removal for the latter is higher where only one species is left after the five-stage filtering process for Guam. The cumulative percentage method eliminates all the species after the second filter in American Samoa and the fourth filter in CNMI. This will result in no species remaining under federal conservation and management. Using the percentile approach is useful for the occurrence data where the distribution is spread across the x-axis.

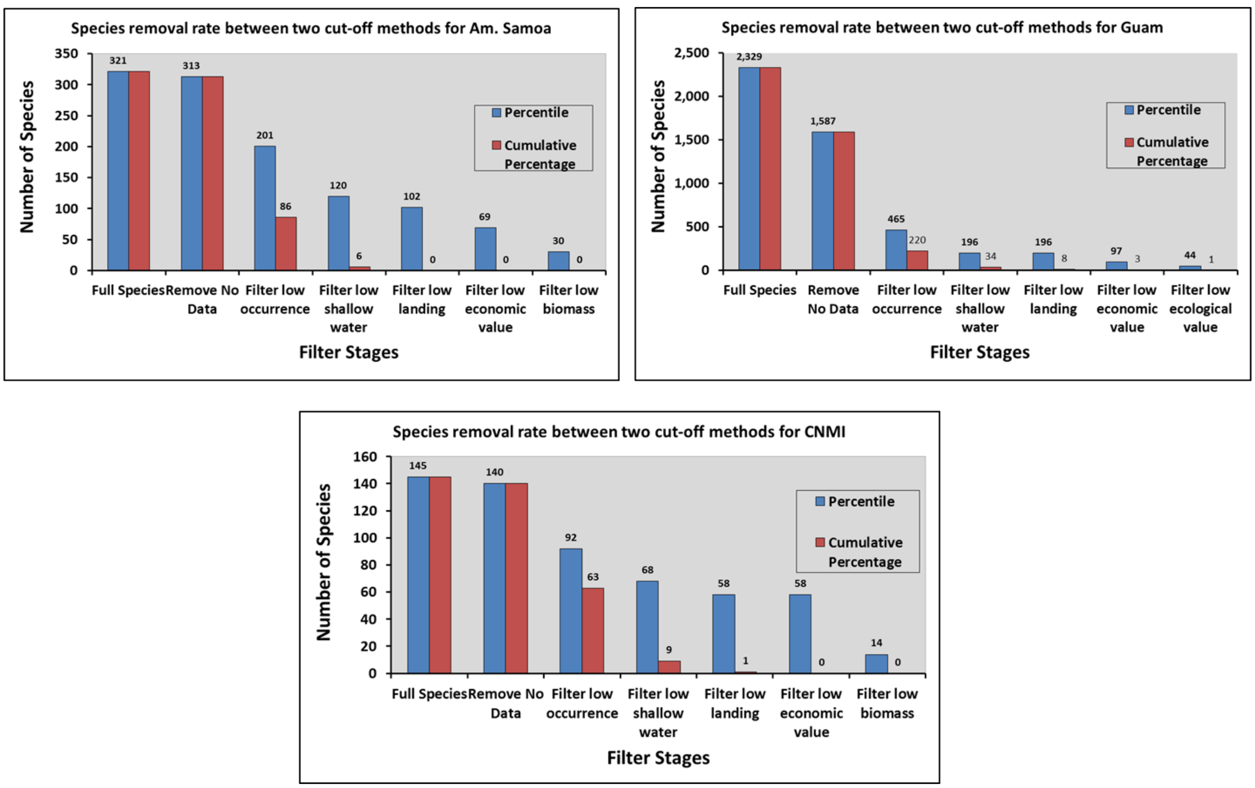


Figure 3. Rate of species removal by filtering stages at 1-25% using the percentile and the cumulative percentage cut-off approaches.

3.1.2 Sequence of filters

Two filtering sequences were tested to determine if there are differences in the outcome. The first scenario follows the decision tree sequence: occurrence, depth, catch, revenue, and biomass. The second scenario randomized the sequence to: catch, revenue, occurrence, biomass, and depth. Using the Guam data sets, we ran the MVA using the Bray-Curtis similarity index and plotted the final results using the Principal Coordinates Analysis (Gower 1966). The two-axes include an estimate of the percent variation explained by that ordination axis.

The results showed there are differences in the composition of species being removed at each filtering stages. However, there are no differences in the final outcomes when the sequence is changed. Figure 4 shows the results of the principal coordinates analysis where the left-hand graphs are results of sequence 1 filtering series and the right-hand graphs are the results of the sequence 2 series. Notice that the distribution patterns and density of the points vary between the 2 groups. The final pattern and species composition on Figure 4e and 4j showed similar species composition and patterns and the percentage variations are exactly the same where 72.5% of the total variation is explained by the variables along the x-axis (fishery dependent data sets) and 14.8% by variables along the y-axis (fishery independent data sets and revenue). Revenue information drives the third axis that is not evident in the 2-dimensional plot.

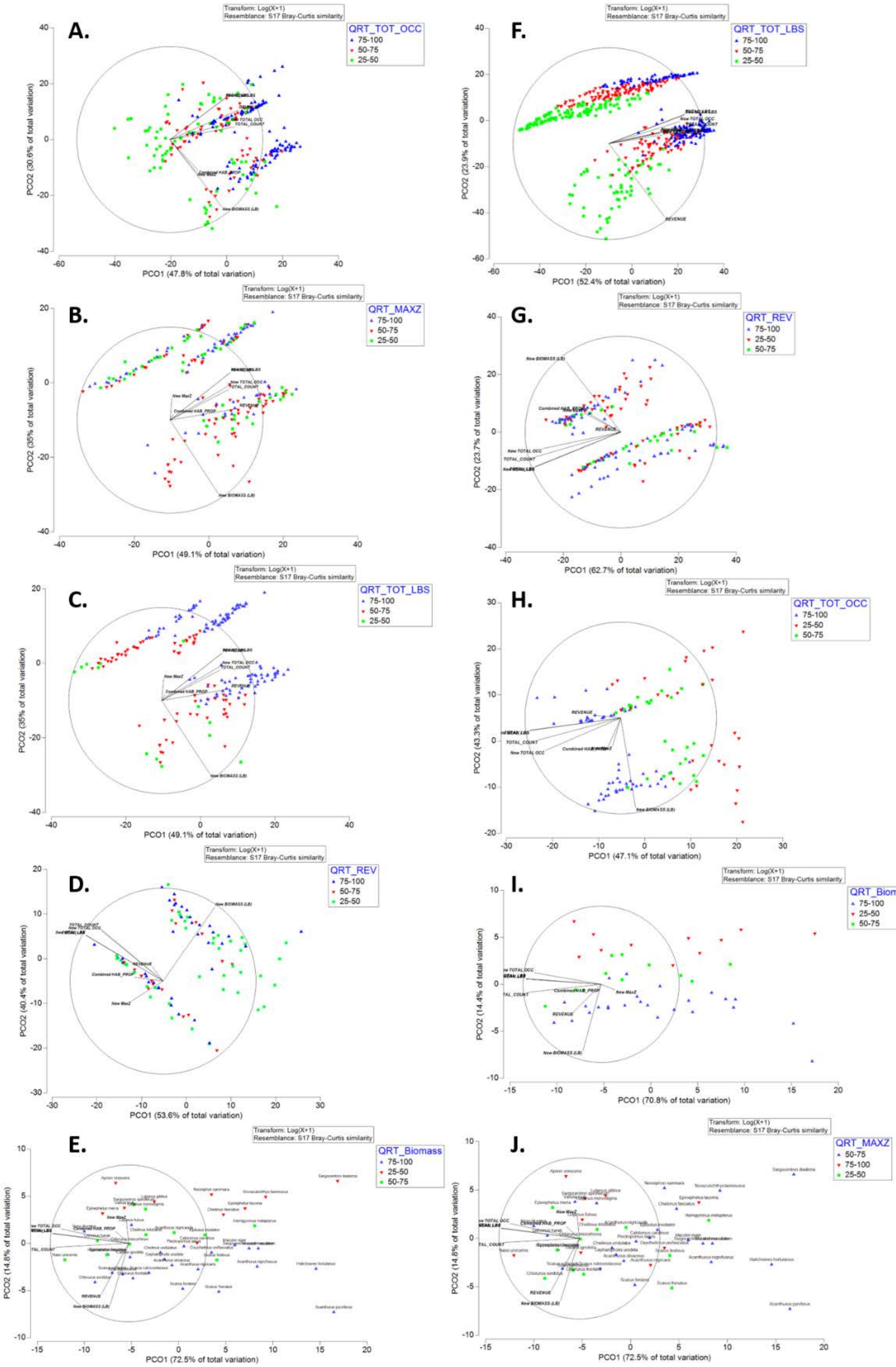


Figure 4. Principal Coordinates Ordination plots of the two filtering sequences. Plot A to E follows the occurrence, depth, catch, revenue, and biomass sequence. Plot F to J follows the catch, revenue, occurrence, biomass, and depth sequence.

4 GUAM ECOSYSTEM COMPONENT ANALYSIS

4.1 Removal of MUS species with no available data

The MUS list for Guam contains 2,329 species that are mostly coral reef associated with a large number that are invertebrates. This was an artifact of the development of the species list table of the fishery database where staff developed a complete list of species occurring in Guam anticipating these species to appear in future catch interviews (David Hamm pers. comm. December 23, 2016). The majority of these species did not have catch information. In creating the master data table, most of the species did not have any biomass and maximum depth information. In running the multivariate analysis, these species with no data appeared as a fog of data point surrounding a tight cluster of species that have actual values (Figure 5a). This is also shown in the Shepard diagram where the vertical line with 0 similarity values and a wide distance values in the 2-D MDS indicates a large number of species clouding up the 2-dimensional spaces (Figure 5b). These species were removed following the decision tree (Figure 1).

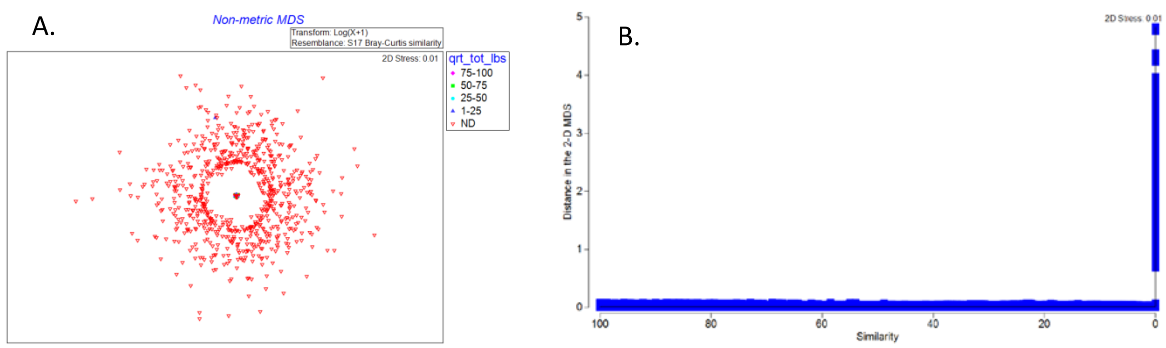


Figure 5. MDS plot (a) and Shepard diagram (b) of all MUS including species with no available data. The 3-D stress value = 0.01.

Once the species with no available data were removed, the 2-dimensional pattern of species that comprise the central core in Figure 5a can be seen more clearly. The 2-dimensional plot showed two distinct "V"-like pattern and three linear clusters on the periphery. The 2-dimensional stress value is 0.12 and the 3-dimensional stress value is 0.07 (figure not shown) indicating that this is a reliable spatial representation of the similarity of species based on the analyzed information (Figure 6a). The occurrence data are found at the two main V-clusters while species with no occurrence data are found at the outer linear cluster (Figure 6a). The species with maximum depth data are found at one of the arms of the two main V-clusters and two of the linear clusters at the periphery. The species with no maximum depth information are found in the other arms of the two main V-clusters (Figure 6b). Species with no catch data are found on three linear clusters at the periphery (Figure 6c). Species with no revenue data are found in one of the main V-cluster and one of the linear clusters (Figure 6d). Species with no biomass data are interspersed with the main V-clusters and all of the linear clusters (Figure 6e)

The vector lines showed the left direction is driven by the availability and the intensity of the fishery dependent data. The right direction is driven by the availability and intensity of the depth profile and biomass while the vertical direction is driven by revenue. The Shepard diagram showed an improvement in the correlation between the index of similarity values and the distance assignment of the species (Figure 7). There are still species that had little information as shown by the vertical line.

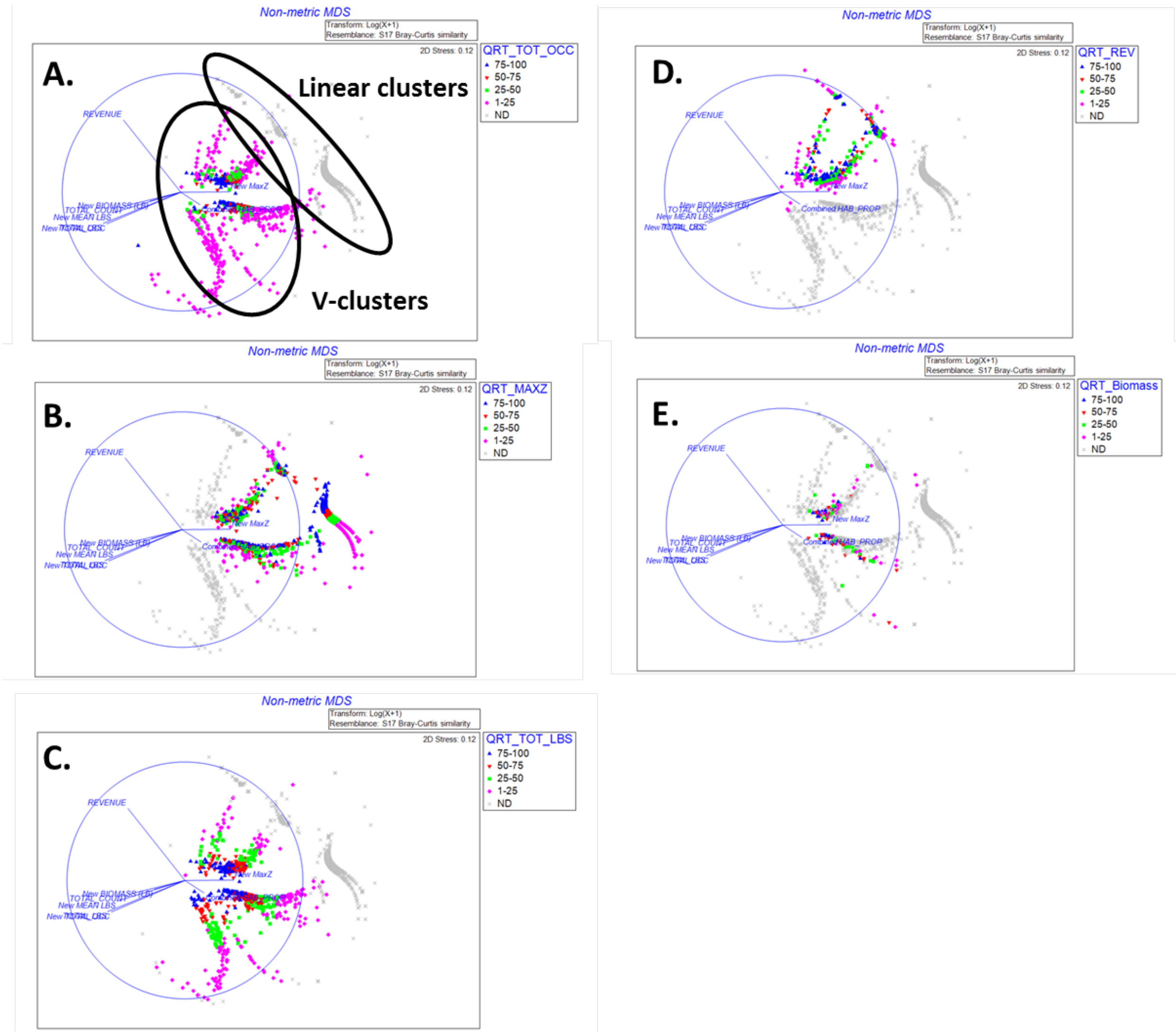


Figure 6. Two-dimensional plot with a stress value 0.12 of MUS with available data for frequency of occurrence (A). The same 2-D plot with factors using quartiles of maximum depth (B); quartiles of total catch (C); quartiles of revenue (D); and quartiles of biomass (E).

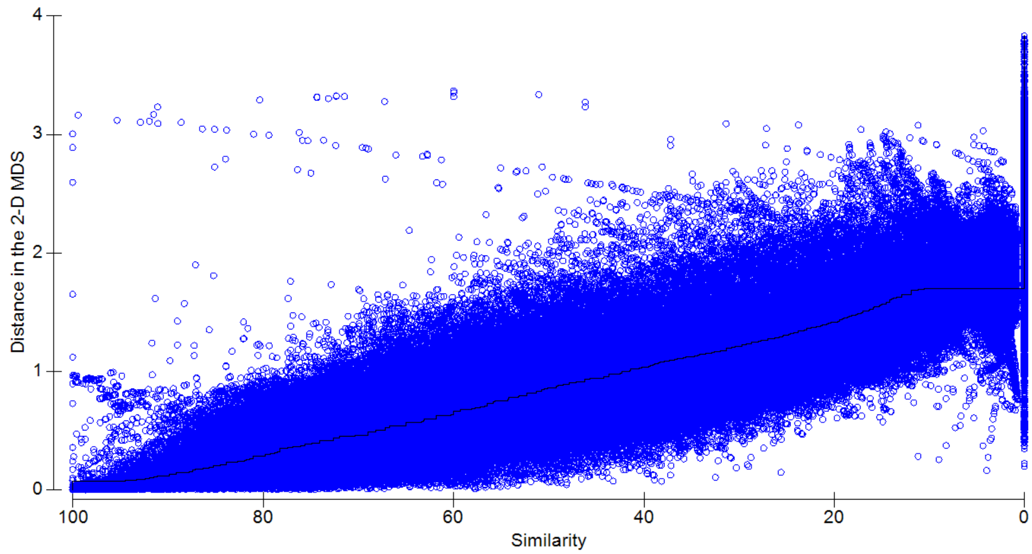


Figure 7. Shepard diagram showing the similarity values using Bray-Curtis index and the distance representation in the 2-D plot for MUS with available data.

4.2 Multivariate analysis on a 25% cut-off point

4.2.1 Delete lower quartile to remove species that are not or rarely caught by the fishery

This phase of the analysis applies the data proxy for the NS1 filters sequentially and utilizes a 25% cut-off point where the bottom 25% is removed and conversely retains the top 75%. This would remove species that are not or rarely caught by the fisheries.

Species with 0-25% frequency of being caught by the fishery were removed (Figures 8a and 8b). The 2-D and 3-D plots have stress values of 0.20 and 0.10, respectively. The nMDS plot shows 2 general clustering (Figures 8a and 8b). The vector line again separates the effect of the fishery dependent data from depth and biomass. The third dimension is driven by the revenue data. Within each cluster, one can see the general right to left directionality in the quartiles of occurrence from lower to higher occurrence. The same directionality can be seen in the 2 general clusters for the mean catch (lower proportion of catch on the right side of the cluster and increasing towards the left) (Figure 8d). The same points at the bottom cluster are characterized by species with no available depth information (Figure 8c). Half of the top and bottom cluster is characterized by species with no revenue data (Figure 8e) and all of the bottom clusters are species with no biomass information (Figure 8f). The Shepard diagrams for the 2-D and 3-D plots showed the disappearance of the vertical line and the points are tighter on the 3-D Shepard diagram due to the lower stress values (Figures 8g and 8h).

The PERMANOVA results showed the main effects to be significant (Table 3). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here. Note that the degrees of freedom for occurrence and catch was reduced to two, due to the removal of the lower quartile.

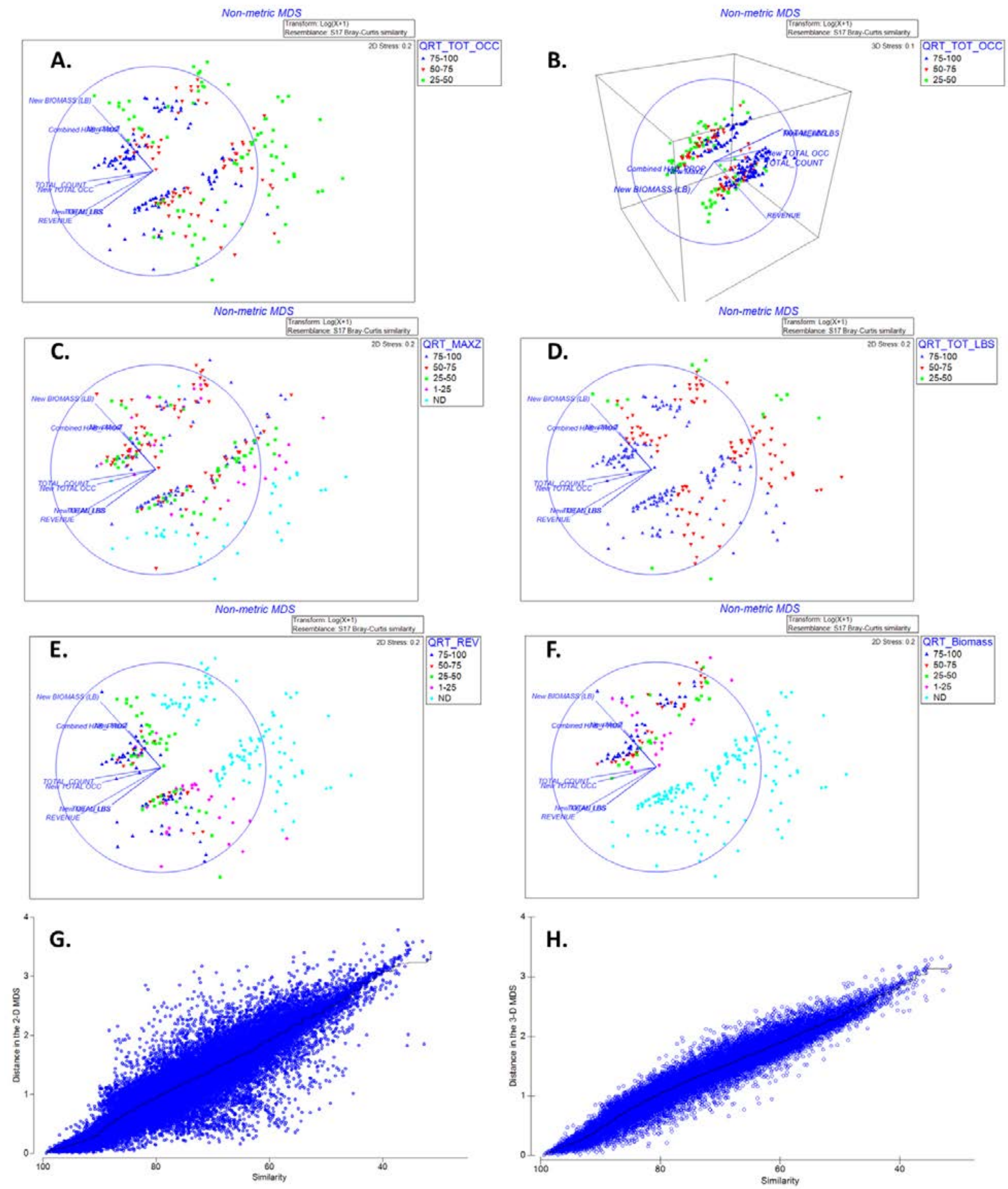


Figure 8. Two and three-dimensional plot with stress values of 0.20 and 0.10, respectively, of remaining MUS after the lower quartile of frequency of occurrence was removed (A and B). The same 2-D plots with factors using quartiles of maximum depth (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

Table 3. PERMANOVA results for the removal of species with low frequency of occurrence. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	2	27052	13526	164.06	0.001
QRT_MAXZ	4	24949	6237.4	75.657	0.001
QRT_TOT_LBS	2	11833	5916.4	71.764	0.001
QRT_TOT_REV	4	10489	2622.2	31.806	0.001
QRT_Biomass	4	27159	6789.8	82.357	0.001

4.2.2 Delete lower quartile to remove species mostly in territorial waters

The second NS1 filter was applied at this stage to remove species that are mostly in shallower depth therefore occurring mostly in territorial waters. The 2-D and 3-D plots stress values are 0.21 and 0.08, respectively. The density of the ordination plots had decreased with the removal of shallow water species and species with no depth information. There are three sets of clusters at 75% similarity running lower left to upper right direction (Figure 9a). The second clustering follows the biomass parameter. Looking at the 3-D plot, there are 4 actual clusters in which the directionality is following the revenue, biomass, depth and fishery dependent variables (Figure 9b). The frequency of occurrence (Figure 9c) and total catch plots (Figure 9d) showed low to high directionality from low left to high right for both clusters. The revenue plot (Figure 9e) showed the species with no available data comprising the points on the lower half of the 2 main clusters. The biomass plot (Figure 9f) shows the species with no available biomass data that comprise the points on the upper cluster.

The removal of shallow water species and the species with no depth information resulted in a tighter correlation plot compared to the previous filtering stage (Figures 9g and 9h). A tighter correlation between the distance assigned to the points and the similarity occur in the 3-dimensional plot.

The PERMANOVA results showed the main effects to be significant (Table 4). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here. The maximum depth degrees-of-freedom is now down to two, due to the removal of the lower quartile.

Table 4. PERMANOVA results for the removal of species in shallow waters. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	2	18406	9203.1	355.4	0.001
QRT_MAXZ	2	5856.6	2928.3	113.08	0.001
QRT_TOT_LBS	2	7628.8	3814.4	147.3	0.001
QRT_REV	4	24483	6120.8	236.37	0.001
QRT_Biomass	4	19253	4813.3	185.87	0.001

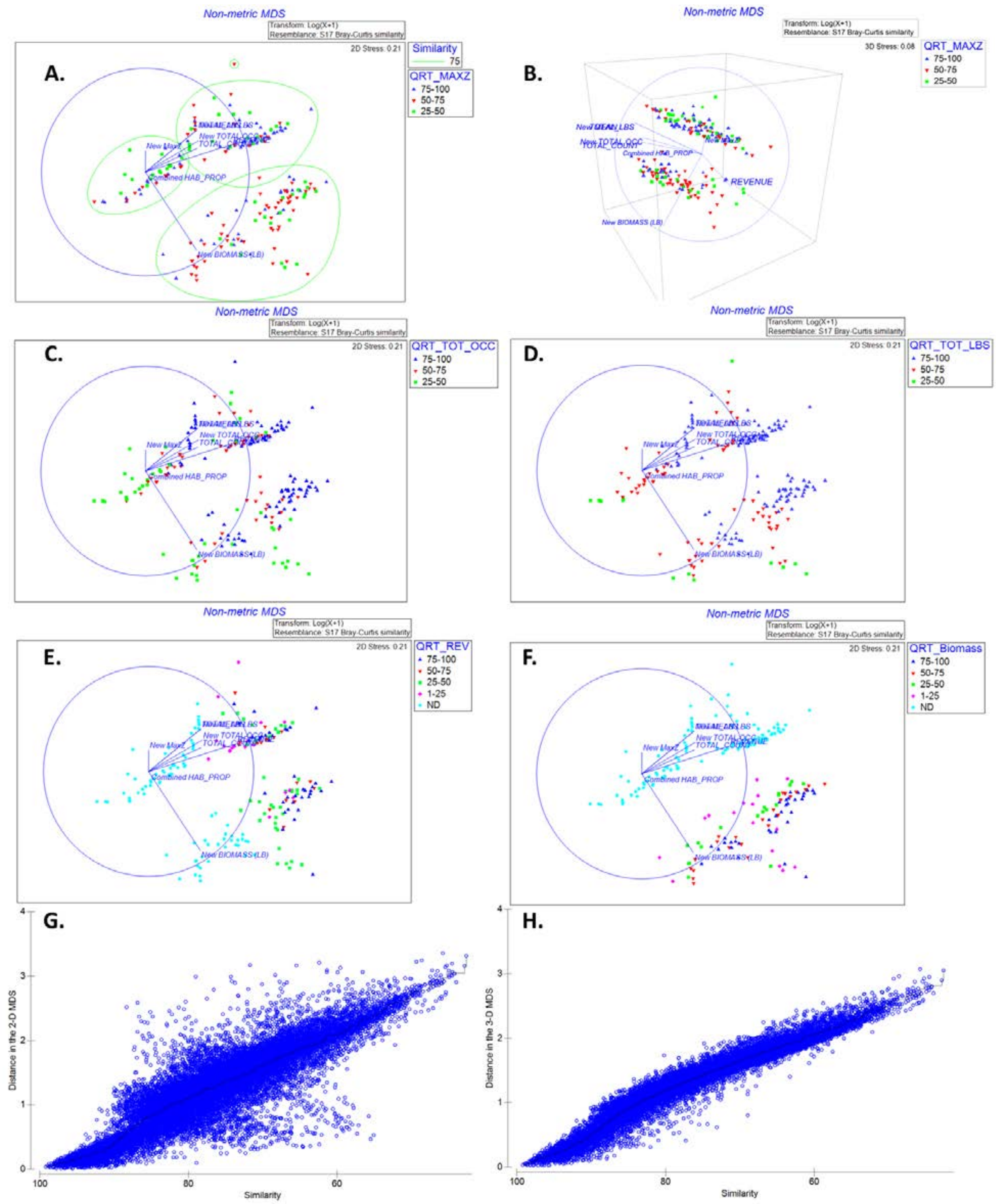


Figure 9. Two and three-dimensional plot with stress values of 0.21 and 0.08, respectively, of remaining MUS after the lower quartile of maximum depth was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

4.2.3 Delete lower quartile to remove species that are not targeted by the fishery

The third NS1 filter was applied at this stage to remove species that are not targeted by the fishery. This stage still uses the 0-25% cut-off similar to the first and second filter. The removal of lower quartile in first filter also removed species with low catch that are not targeted by the fishery. The results of the similarity matrix and the ordination plots will remain the same as the second level filtering. No PERMANOVA was conducted under this filter.

4.2.4 Delete lower quartile to remove species that have low contribution to the regional economy

The fourth NS1 filter was applied at this stage to remove species that have low contribution to the regional economy. The 2-D and 3-D stress values are 0.10 and 0.08, respectively. The removal of the lower quartile and species with no revenue information resulted in the removal of the points at the lower left section of the 2 main clusters in Figure 9e. The resulting plots have less density and reduced the number of groupings down to two as shown in the 2-dimensional plot (Figure 10a) compared to three in Figure 9a. The same pattern is seen on the 3-dimensional plot where the groupings were reduced into two rather than four groups. The fishery dependent variables follow the lower left to upper right directionality indicating the low to high gradient. The fishery independent gradients are perpendicular to the fishery dependent variables. The upper clusters are characterized by all species with no available biomass data.

The Shepard diagrams for the 2-D (Figure 10g) and 3-D (Figure 10h) plots show the tighter correlation between the assigned distance and the similarity. The density of the points is much closer and is highest at higher similarity. The two diagrams are almost similar because the stress values are close together.

The PERMANOVA results showed the main effects to be significant (Table 5). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here.

Table 5. PERMANOVA results for the removal of species with low revenue. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	2	5531.4	2765.7	132.55	0.001
QRT_MAXZ	2	2861.2	1430.6	68.566	0.001
QRT_TOT_LBS	2	2014.1	1007.1	48.266	0.001
QRT_REV	2	1454.4	727.22	34.854	0.001
QRT_Biomass	4	4967.2	1241.8	59.517	0.001

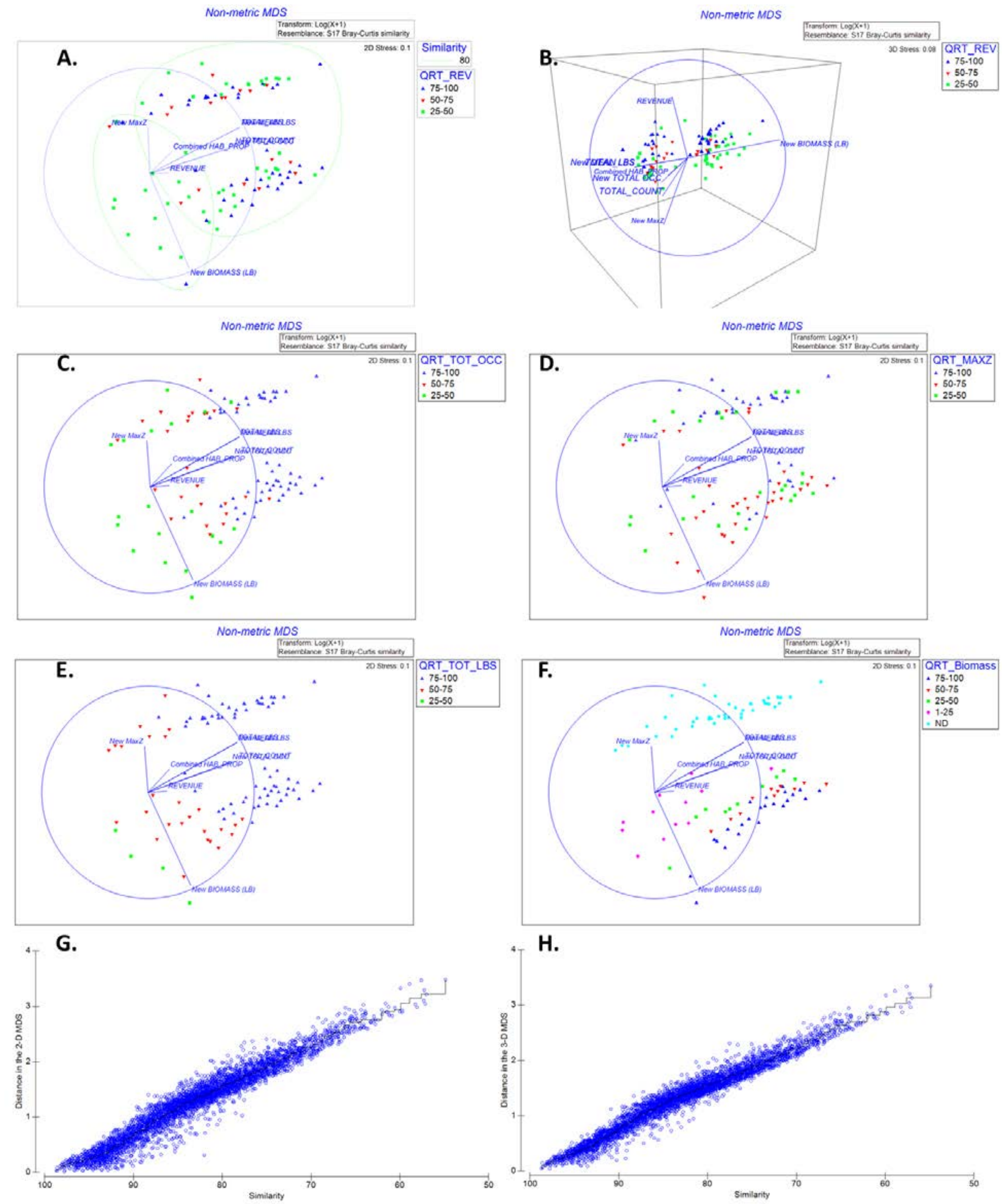


Figure 10. Two and three-dimensional plot with stress values of 0.10 and 0.08, respectively, of remaining MUS after the lower quartile of revenue was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); maximum depth (D); total catch (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

4.2.5 Delete lower quartile to remove species that have low biomass contribution

The last NS1 filter is applied at this stage to remove species that have low biomass contribution. The application of the last filter removed the points that comprise the top cluster from the previous filtering. The stress values for the 2-D and the 3-D plots are 0.09 and 0.06, respectively (Figures 11a and 11b). The application of the last filter resulted in 44 remaining species that are left for consideration for federal conservation and management. The directionality of the vector lines maintains the separation on the effects of the fishery dependent and fishery independent information. The Shepard diagram also showed tighter correlation compared to the previous four filters applied to the data (Figures 11g and 11h).

Caution needs to be made in applying this filter to the species remaining from the fourth filter. Note that the biomass information is from surveys conducted by CREP at depths of 0-30 meters. Absence of information does not mean that there is no available information but these species are found at greater depths beyond the survey depth. Application of this filter will artificially remove the deep bottomfish species which are currently being managed and stock assessments are available. The end result from applying this filter will retain species that are covered by the underwater census surveys. The SSC can choose to apply this filter or not.

Nonetheless, the PERMANOVA results showed the main effects to be significant (Table 6). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here.

Table 6. PERMANOVA results for the removal of species with low biomass. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_LBS	2	1619.8	809.89	46.043	0.001
QRT_TOT_OCC	2	218.72	109.36	6.2172	0.007
QRT_REV	2	390.76	195.38	11.108	0.002
QRT_MAXZ	2	182.99	91.496	5.2017	0.015
QRT_Biomass	2	298.88	149.44	8.4959	0.003

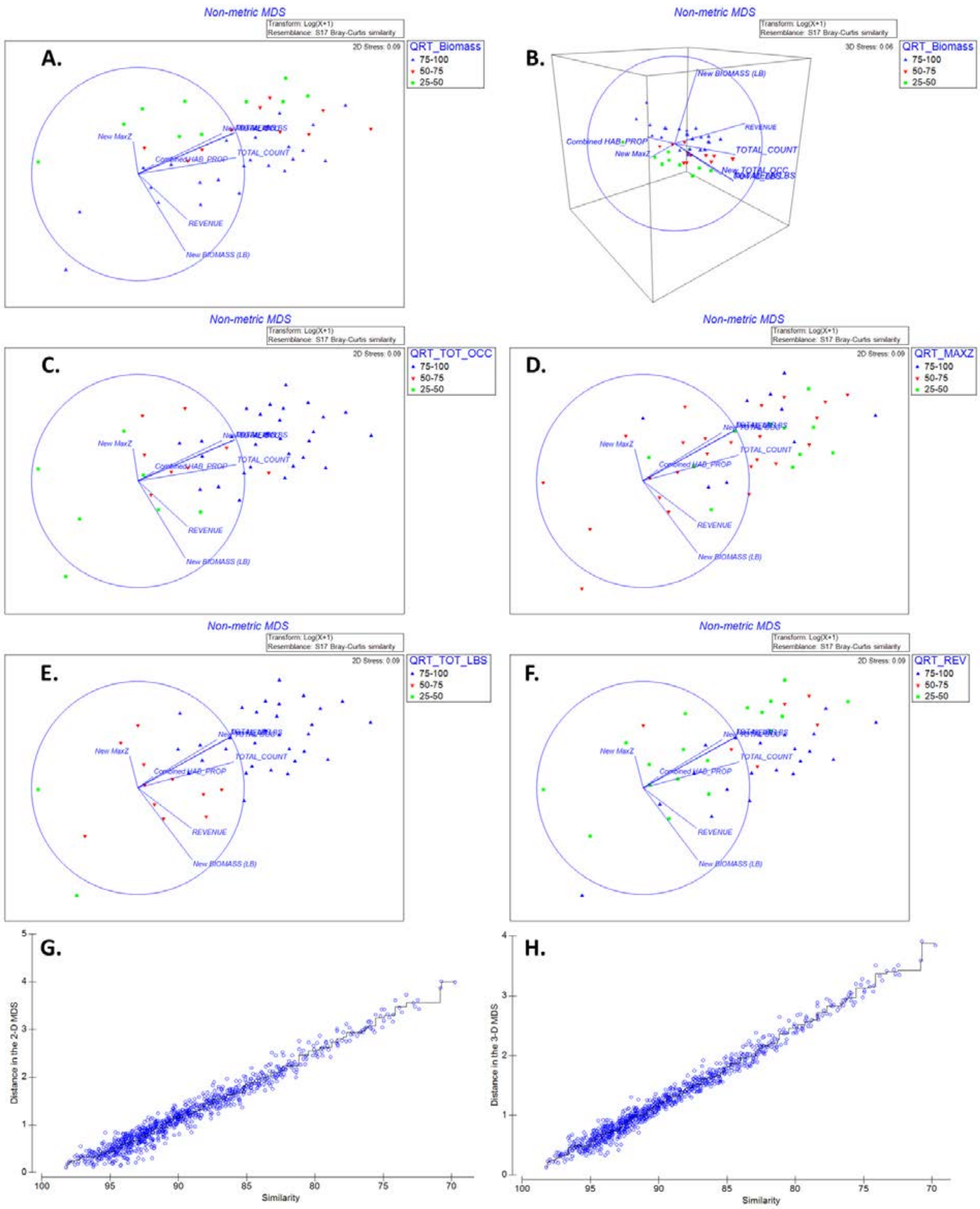


Figure 11. Two and three-dimensional plot with stress-values of 0.09 and 0.06, respectively, of remaining MUS after the lower quartile of biomass was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); maximum depth (D); total catch (E); and revenue (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

4.3 Species decline rate after the filters were applied at 25% cut-off

Figure 12 shows the number of species remaining after the different filters was applied following the decision tree. The total MUS in Guam started at 2,329 species of which 742 had no fishery dependent, biomass, revenue, and max depth information. Of the remaining 1,587 species, 1,122 were not caught or are rarely caught by the fishery. After the 2 filters were applied, only 465 species were left. Two hundred sixty-nine species were removed for those species that occurred in territorial waters and only 196 species were left after filter 3. There were no further reductions in the number of species when the catch filter was applied because all of the lower quartile species was already filtered out by the occurrence filter. Once the fourth filter was applied, 99 species were removed for having low revenue and no revenue data resulting in 97 species left for federal conservation and management. The application of the biomass filter removed 53 species leaving only 44 species under federal conservation and management. The list of candidate species to remain in federal fisheries management is found in Table 7.

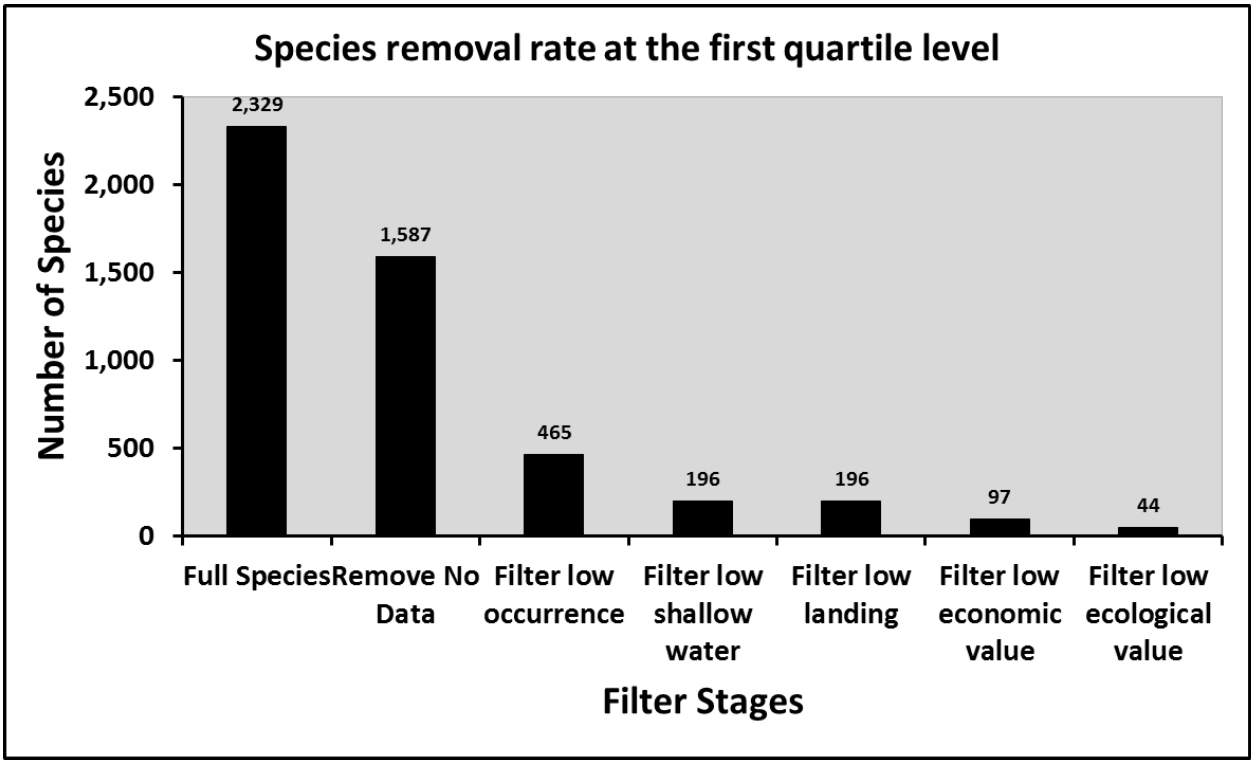


Figure 12. Number of species remaining for federal fisheries management after filters were applied at 25% cut-off.

Table 7. Candidate species for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 25% cut-off.

Scientific Name	Common Name	Family	FEP GROUP
Caranx ignobilis	Giant Trevally, Jack	Carangidae	BF Multi-species complex
Aprion virescens	Grey Snapper, Jobfish	Lutjanidae	BF Multi-species complex
Epinephelus fasciatus	Blacktip Grouper	Serranidae	BF Multi-species complex
Variola louti	Lunartail (lyretail) Grouper	Serranidae	BF Multi-species complex
Acanthurus nigricans	Whitecheek Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus nigricauda	Blackstreak Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus nigrofuscus	Brown Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus olivaceus	Orangeband Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus pyroferus	Mimic Surgeonfish	Acanthuridae	CRE-Fishes
Naso lituratus	Orangespine Unicornfish	Acanthuridae	CRE-Fishes
Naso unicornis	Bluespine Unicornfish	Acanthuridae	CRE-Fishes
Neoniphon sammara	Bloodspot Squirrelfish	Holocentridae	CRE-Fishes
Sargocentron caudimaculatum	Tailspot Squirrelfish	Holocentridae	CRE-Fishes
Sargocentron diadema	Crown Squirrelfish	Holocentridae	CRE-Fishes
Sargocentron spiniferum	Long-Jawed Squirrelfish	Holocentridae	CRE-Fishes
Cheilinus fasciatus	Red-Breasted Wrasse	Labridae	CRE-Fishes
Cheilinus trilobatus	Tripletail Wrasse	Labridae	CRE-Fishes
Cheilinus undulatus	Napoleon Wrasse	Labridae	CRE-Fishes
Epibulus insidiator	Sling-Jawed Wrasse	Labridae	CRE-Fishes
Halichoeres hortulanus	Checkerboard Wrasse	Labridae	CRE-Fishes
Hemigymnus melapterus	1/2 &1/2 Wrasse	Labridae	CRE-Fishes
Novaculichthys taeniourus	Dragon Wrasse	Labridae	CRE-Fishes
Oxycheilinus unifasciatus	Ringtail Wrasse	Labridae	CRE-Fishes
Lethrinus harak	Thumbprint Emperor	Lethrinidae	CRE-Fishes
Lutjanus fulvus	Flametail Snapper	Lutjanidae	CRE-Fishes
Lutjanus gibbus	Humpback Snapper	Lutjanidae	CRE-Fishes
Lutjanus monostigma	Onespot Snapper	Lutjanidae	CRE-Fishes
Macolor macularis	Black and White Snapper	Lutjanidae	CRE-Fishes
Macolor niger	Black Snapper	Lutjanidae	CRE-Fishes
Calotomus carolinus	Bucktooth Parrotfish	Scaridae	CRE-Fishes
Chlorurus frontalis	Tan-faced Parrotfish	Scaridae	CRE-Fishes
Chlorurus microrhinos	Steephead Parrotfish	Scaridae	CRE-Fishes
Chlorurus sordidus	Bullethead Parrotfish	Scaridae	CRE-Fishes
Hipposcarus longiceps	Parrotfish	Scaridae	CRE-Fishes
Scarus festivus	Parrotfish	Scaridae	CRE-Fishes
Scarus forsteni	Tricolor Parrotfish	Scaridae	CRE-Fishes
Scarus frenatus	Vermiculate Parrotfish	Scaridae	CRE-Fishes

Scarus psittacus	Pale Nose Parrotfish	Scaridae	CRE-Fishes
Scarus rubroviolaceus	Parrotfish	Scaridae	CRE-Fishes
Scarus schlegeli	Chevron Parrotfish	Scaridae	CRE-Fishes
Cephalopholis urodeta	Flag-tailed Grouper	Serranidae	CRE-Fishes
Epinephelus merra	Honeycomb Grouper	Serranidae	CRE-Fishes
Epinephelus tauvina	Greasy Grouper	Serranidae	CRE-Fishes
Plectropomus laevis	Saddleback Grouper	Serranidae	CRE-Fishes

4.4 Multivariate analysis on a 50% cut-off point

The results of the multivariate analysis on a 50% cut-off follows the 25% cut-off closely except more species are eliminated due to the higher threshold level. The vector relationship will likely to remain similar.

4.4.1 Delete 1-25% and 25-50% quartiles to remove species that is not or rarely caught by the fishery

The 2-D and 3-D stress values were 0.20 and 0.10, respectively. There were four general clustering of the remaining species after species with less median of frequency of occurrence were removed based on an 80 percent similarity (Figures 13a and 13b). Each cluster showed directionality from lower occurrence to higher occurrence. The majority of the species remaining have occurrence of 75-100% (Figure 13a). The pattern for occurrence is similar to the total catch pattern (Figure 13d). Despite the removal up to the median level of occurrence, the remaining species still have a broad range of depth distribution from shallow to deepwater (Figure 13c). The species with no revenue information comprise the upper 2 clusters (Figure 13e) while species with no biomass information are those that comprise the two left clusters (Figure 13f).

In comparing the Shepard diagram between the 25% (Figures 8g and 8h) and the 50% cut-off (Figures 13g and 13h), the points cluster more tightly along the correlation line in the 50% occurrence cut-off compared to the 25% cut-off. However, this may not be significant since the stress value remain the same at 0.20 and 0.10 for the 2-D and 3-D plots, respectively (Figures 13a and 13b).

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 8). There were no significant differences in the variable interactions.

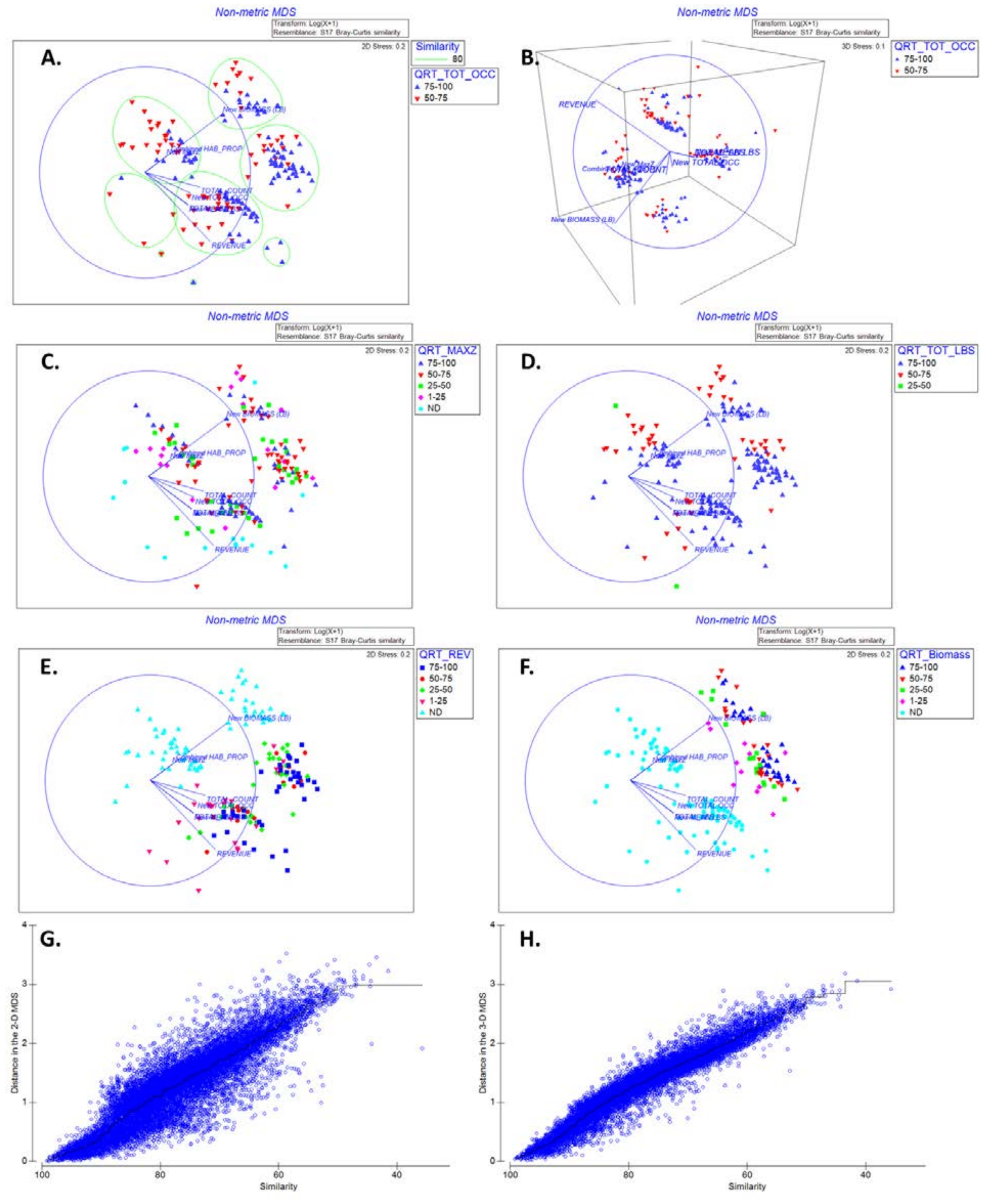


Figure 13. Two and three-dimensional plot with stress values of 0.20 and 0.10, respectively, of remaining MUS after the lower quartile to median of frequency of occurrence were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of maximum depth (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

Table 8. PERMANOVA results for the removal of species with low occurrence to median level. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	9204.6	9204.6	329	0.001
QRT_MAXZ	4	10429	2607.3	93.193	0.001
QRT_TOT_LBS	2	6256.2	3128.1	111.81	0.001
QRT_REV	4	19449	4862.1	173.79	0.001
QRT_Biomass	4	16104	4026.1	143.91	0.001

4.4.2 Delete 1-25% and 25-50% quartiles to remove species mostly in territorial waters

The 2-D and 3-D stress values are at 0.20 and 0.07, respectively. The cluster of point became less dense when the species that occur at shallower depths were removed at the median cut-off (Figures 14a and 14b). The general clustering was reduced to three at 80% similarity (Figure 14a). The 3-dimensional plot shows biomass, revenue and maximum depth drives the distribution perpendicular to the fishery dependent variables. Occupancy and total catch are still dominated by species that has 75-100% occurrence (Figure 14c). Species that have no revenue information comprise the lower left cluster and half of the right-hand cluster (Figure 14e). Species that have no biomass information comprise the lower left and upper right cluster (Figure 14f). In terms of the depth distribution, the 50% cut-off removed species that occurs from 1-50 meters.

The Shepard diagram showed a tighter cluster of points to the correlation line which can explain the 0.03 reduction in the 3-D stress value compared to the lower quartile cut-off (Figure 14h).

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 9). There were no significant differences in the variable interactions.

Table 9. PERMANOVA results for the removal of species with low quartile to median level for maximum depth. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	4243.5	4243.5	168.99	0.001
QRT_MAXZ	1	1628.4	1628.4	64.85	0.001
QRT_TOT_LBS	2	4212.9	2106.5	83.886	0.001
QRT_REV	4	10693	2673.2	106.46	0.001
QRT_Biomass	4	9309.4	2327.3	92.683	0.001

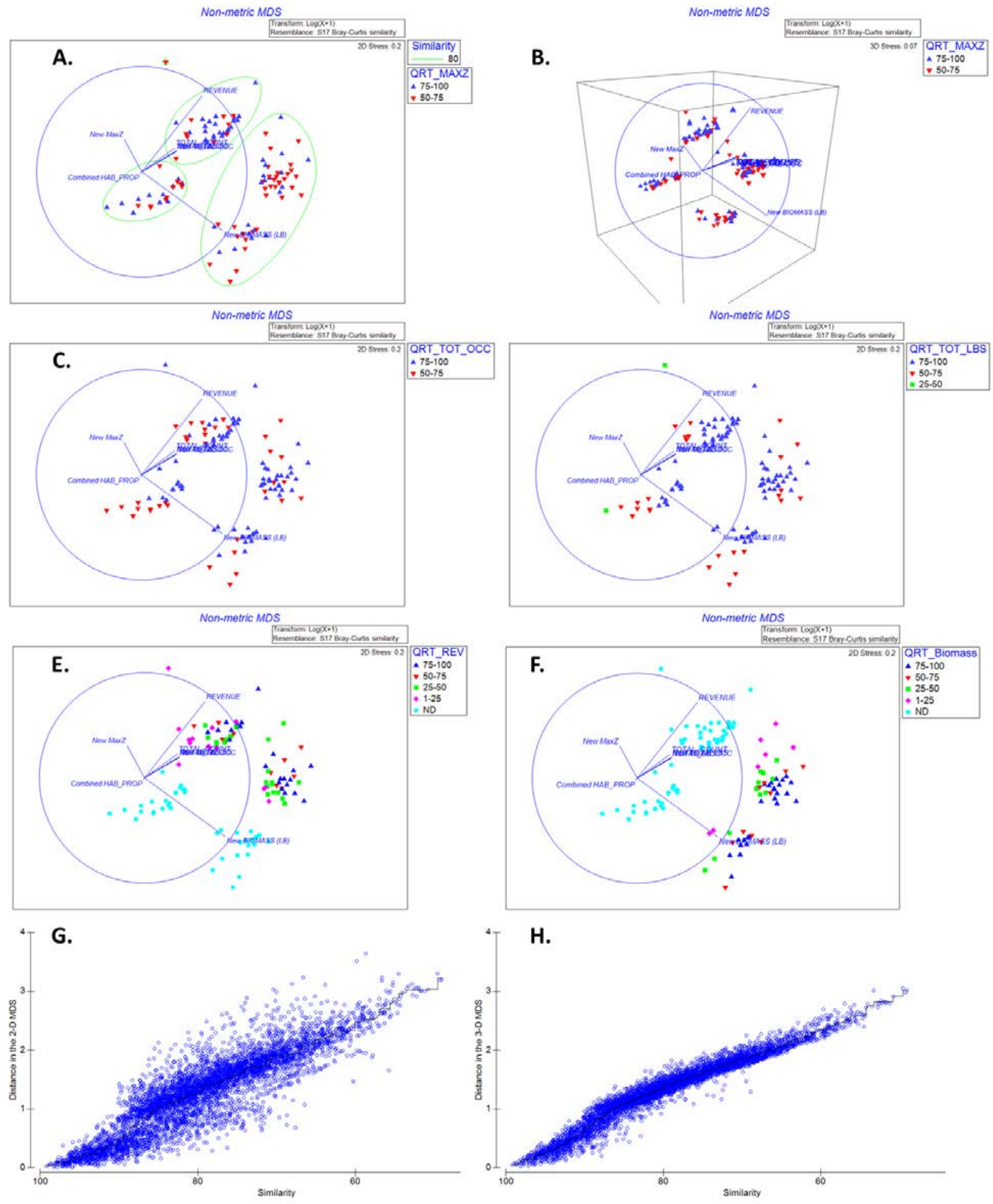


Figure 14. Two and three-dimensional plot with stress values of 0.20 and 0.07, respectively, of remaining MUS after the lower quartile to median of maximum depth were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

4.4.3 Delete 1-25% and 25-50% quartiles to remove species that are not targeted by the fishery

The cluster patterns and stress values are the same as with removal of species mostly in territorial waters in the previous section (Figures 15a-h). Only two species were removed after the third filter was applied. These two species were *Taenianotus triacanthus* and *Mulloidichthys sp*. It is expected that the PERMANOVA results will be similar to the previous filtering stage so this analysis was not done.

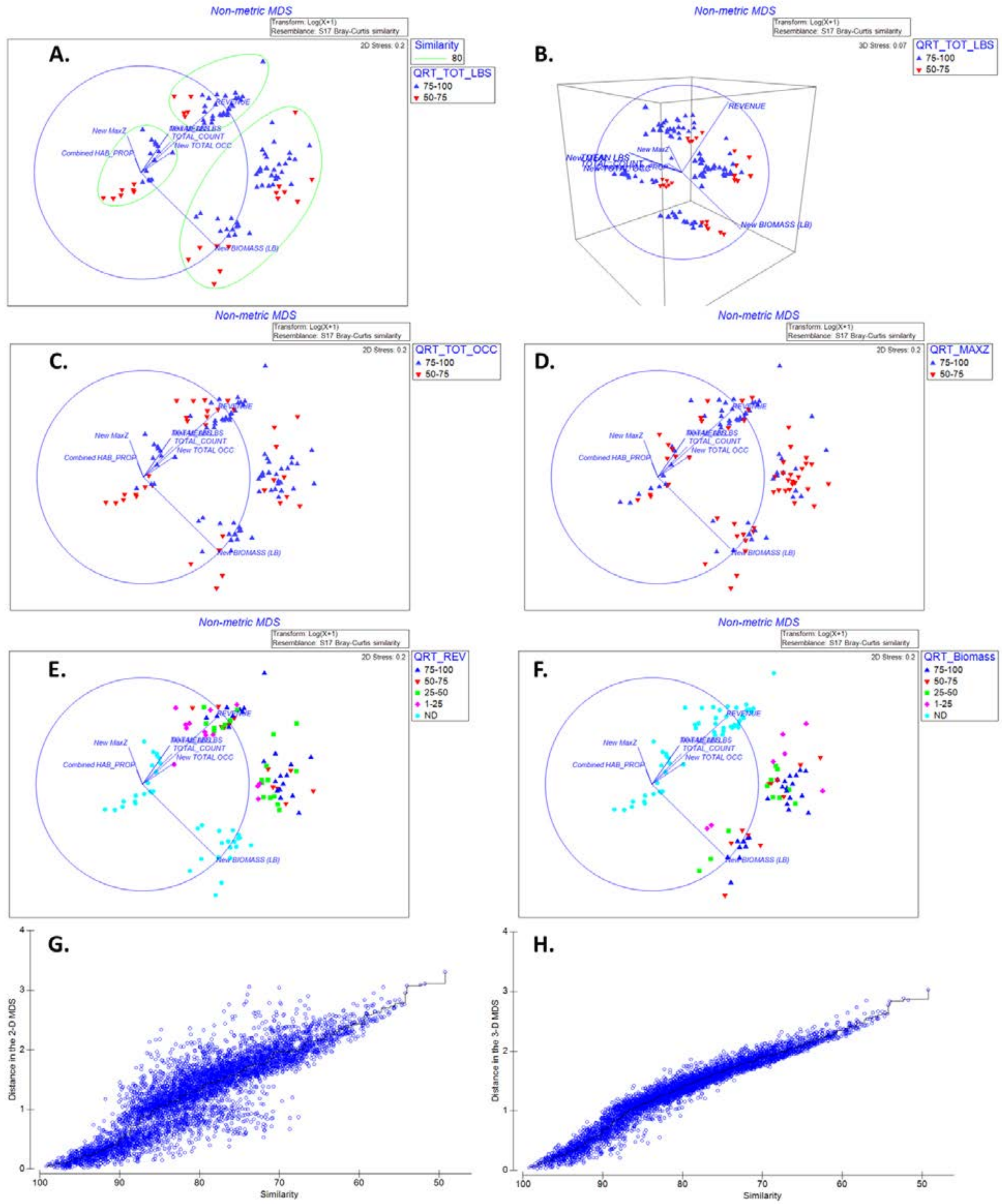


Figure 15. Two and three-dimensional plot with stress values of 0.20 and 0.07, respectively, of remaining MUS after the lower quartile to median of total catch were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); maximum depth (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

4.4.4 Delete 1-25% and 25-50% quartiles to remove species that have low contribution to the regional economy

The 2-D and 3-D stress values are 0.09 and 0.06, respectively. Species names were included in the 2-D plot because the density of points allows viewing of the species that comprise the cluster (Figure 16a). After removing the species that contribute less to the regional economy, the clustering resulted into two groups: one large clustering and one small cluster with three species (*Carangoides ferdau*, *Epinephelus tauvina*, and *Cephalopholis spiloparaea*) at 80% similarity.

Thirty-four species have economic value that is above the median. Nine species are groupers, four jack species, four snappers that are deep water species, one emperor, four barracuda species, one wrasse (*Cheilinus undulatus*), four parrotfish species, seven species of surgeon and unicorn fishes, and one species of octopus. The bigeye scad (*Selar crumenopthalmus*) is by far the species with the highest economic value for Guam due to the sheer volume of fish landed. Majority of the species are coral reef ecosystem management unit species. Five of the species are bottomfish management unit species.

The directionality of the frequency of occurrence and total catch follows the fishery dependent vector lines Figures 16c and 16e). The separation of the top group of points and the bottom points are driven by the availability of biomass data (Figure 16f). Deeper water species dominate the top group of points while the bottom group is comprised of species that occur at moderate depths (Figure 16d).

The Shepard diagram showed tighter correlation along the line compared to the previous filters (Figures 16g and 16h). The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 10). There were no significant differences in the variable interactions.

Table 10. PERMANOVA results for the removal of species with low quartile to median level for revenue. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	547.37	547.37	26.248	0.002
QRT_MAXZ	1	688.39	688.39	33.011	0.002
QRT_TOT_LBS	1	593.62	593.62	28.466	0.002
QRT_REV	1	178.12	178.12	8.5414	0.029
QRT_Biomass	4	1495	373.74	17.922	0.002

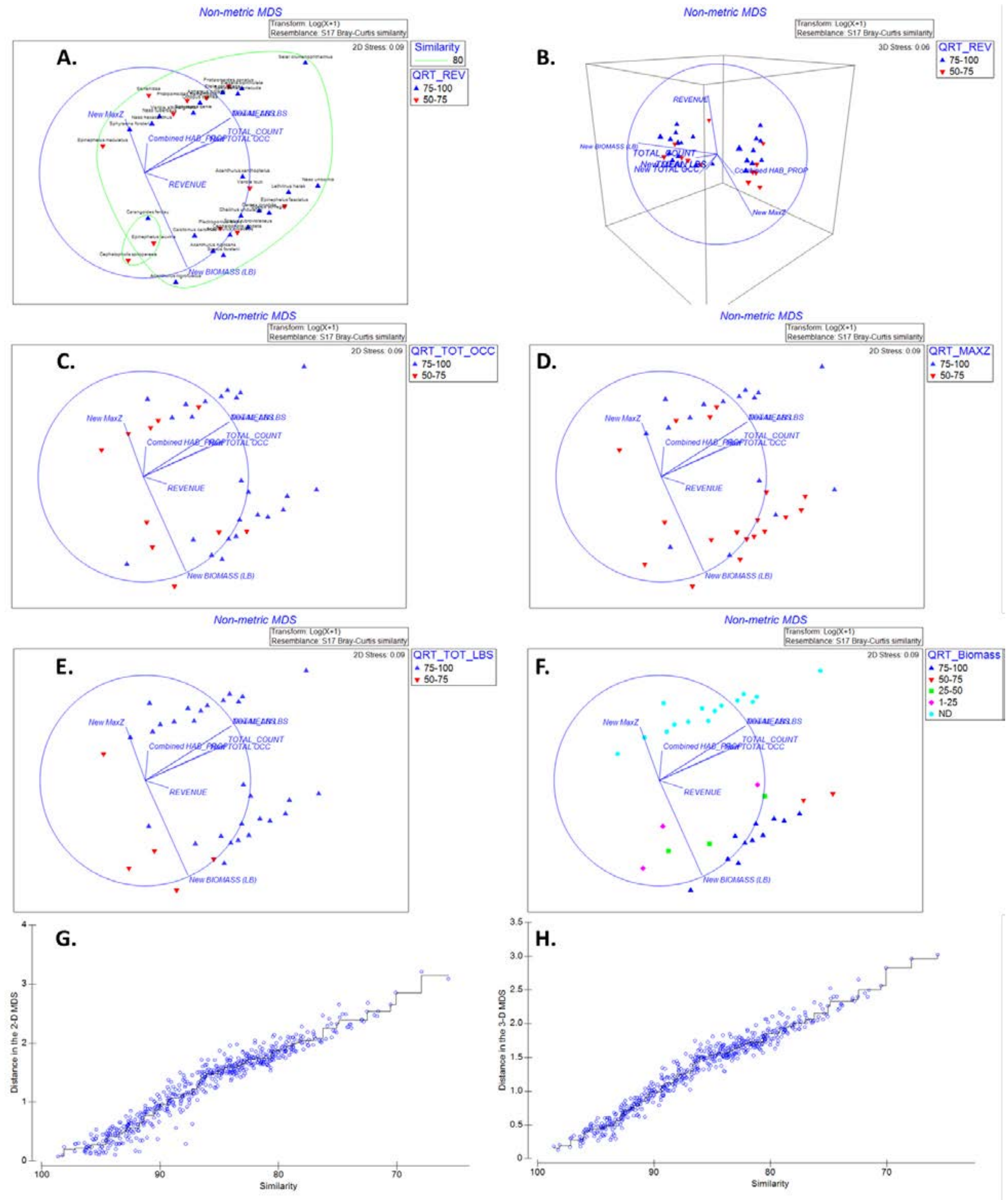


Figure 16. Two and three-dimensional plot with stress values of 0.09 and 0.06, respectively, of remaining MUS after the lower quartile to median of revenue were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); maximum depth (D); total catch (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

4.4.5 Delete 1-25% and 25-50% quartiles to remove species that have low biomass contribution

The 2-D and 3-D stress values are 0.06 and 0.03, respectively. Species names were included in the 2-D plot because the density of points allows viewing of the species that comprise the cluster (Figure 17a). After removing the species that comprise lower than the median biomass, the 2-D plot showed a single cluster at the 85% similarity level. This filter removed 20 species. Two of the remaining species, *Naso unicornis* and *Lethrinus harak*, comprise the third quartile and the remaining species comprise the 4th quartile. Two species are BMUS species, *Caranx ignobilis* and *Epinephelus fasciatus*. The Napoleon wrasse, *Cheilinus undulatus*, remains to be a species candidate for retention. This species is mostly caught by recreational spear fishing as a trophy fish.

The 2-D plots of frequency of occurrence (Figure 17c), total catch (Figure 17e), and revenue (Figure 17f) are dominated by species that comprise the 4th quartile while maximum depth (Figure 17d) is mostly at the third quartile. The Shepard diagram showed most of the points are close to the correlation line indicating that the distance assignment is indicative of the similarity values hence the stress values are low (Figures 17g and 17h).

The PERMANOVA results indicate that the differences within each of the variables tested are lower. This is partly because most of the groupings are eliminated by the filtering process. The P value for max depth and revenue are not significant (Table 11).

Table 11. PERMANOVA results for the removal of species with low quartile to median level for biomass. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	90.515	90.515	4.5505	0.038
QRT_MAXZ	1	14.96	14.96	0.75209	0.495
QRT_TOT_LBS	1	136.39	136.39	6.8566	0.012
QRT_REV	1	15.022	15.022	0.75521	0.508
QRT_Biomass	1	99.591	99.591	5.0067	0.038

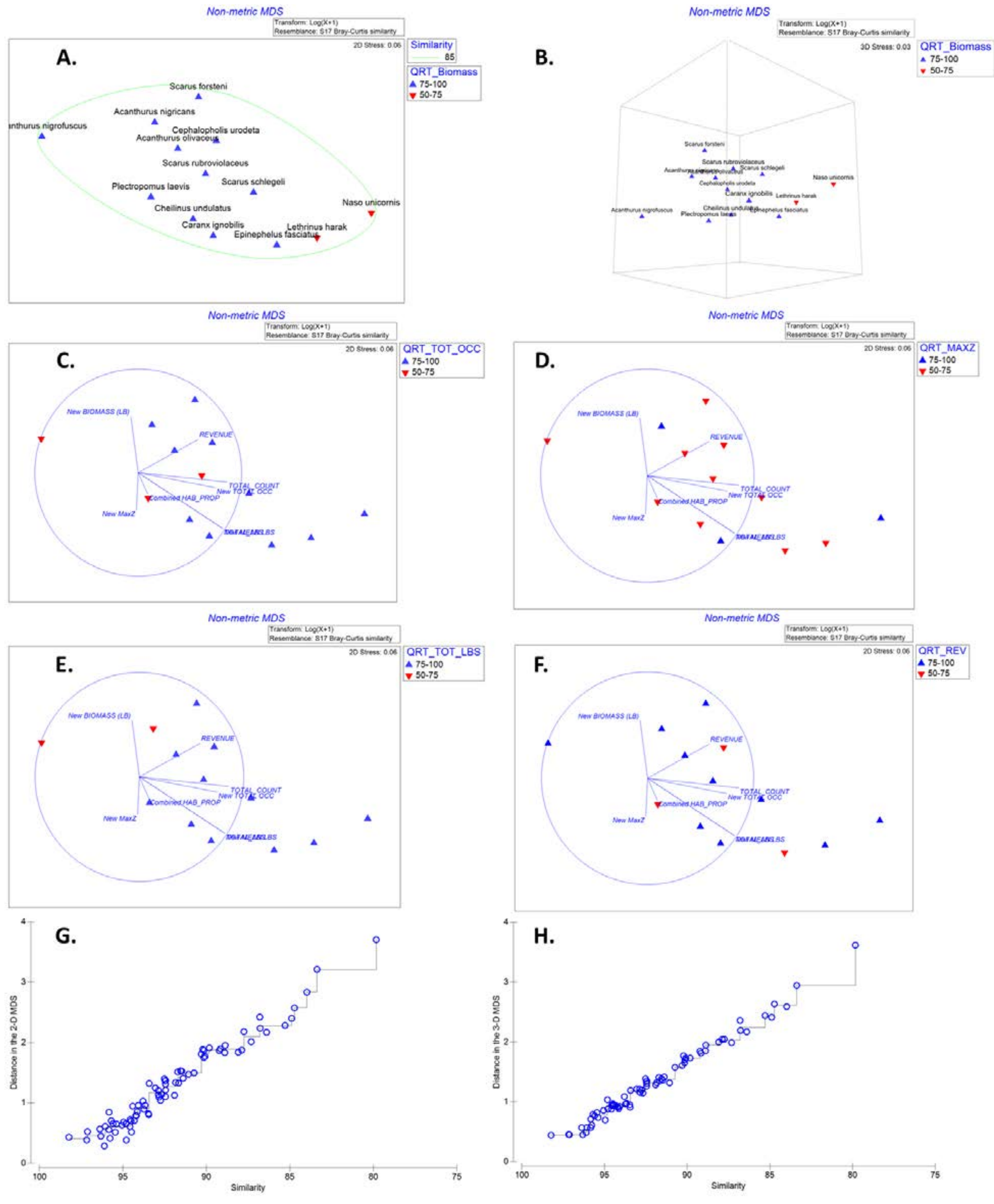


Figure 17. Two and three-dimensional plot with stress values of 0.06 and 0.03, respectively, of remaining MUS after the lower quartile to median of biomass were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); maximum depth (D); total catch (E); and revenue (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS

4.5 Species removal rate after the filters were applied at 50% cut-off

As expected, the rate of decline per filtering stage is faster with higher cut-off threshold. The frequency of occurrence filter removed 742 species retaining 465 species that are caught more than 50% of the time (Figure 18). Filter 3 removed 234 species, retaining 178 species potentially found in federal waters. Filter 4 removed 79 species that contributes less than 50% of the mean catch. This leaves 13 species that are potentially in need of federal management. The list of species is found in Table 12.

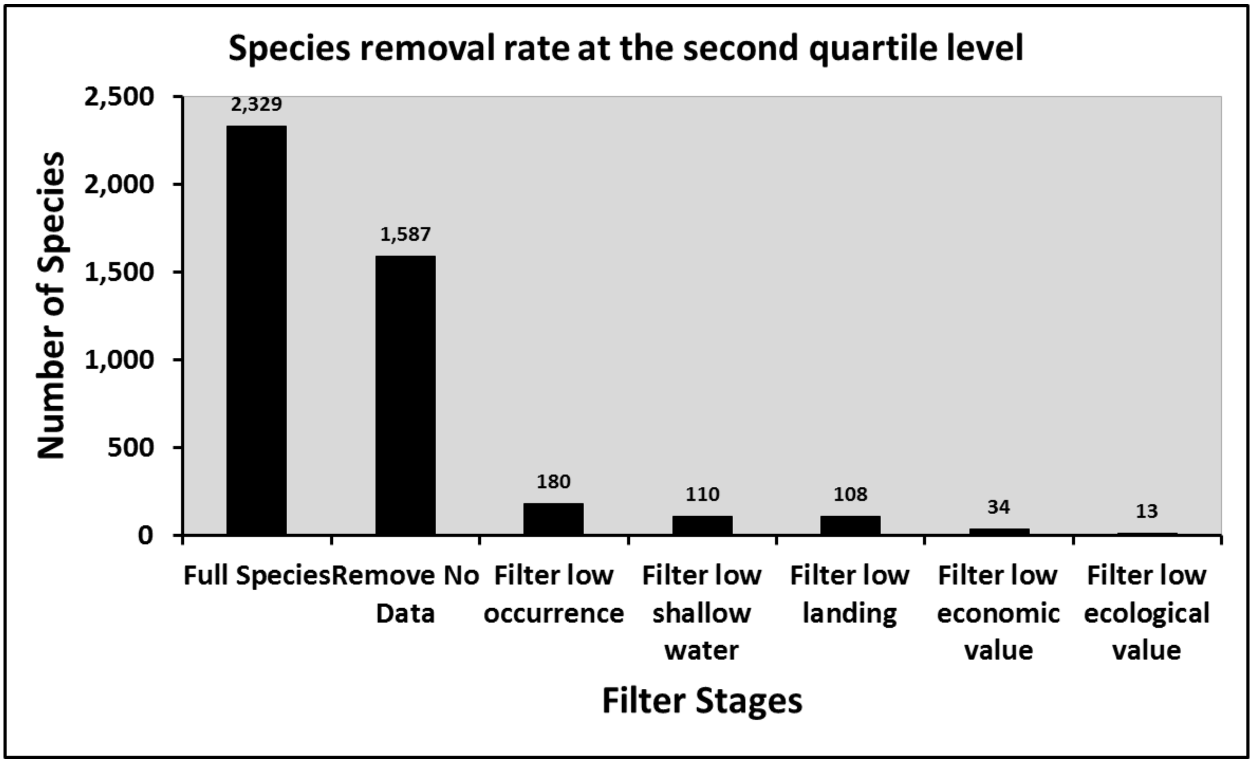


Figure 18. Number of species remaining for federal fisheries management after filters were applied at 50% cut-off.

Table 12. Candidate species for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 50% cut-off.

Scientific Name	Common Name	Family	FEP Groups
Acanthurus nigricans	Whitecheek Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus nigrofuscus	Brown Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus olivaceus	Orangeband Surgeonfish	Acanthuridae	CRE-Fishes
Caranx ignobilis	Giant Trevally, Jack	Carangidae	BF Multi-species complex
Cephalopholis urodeta	Flag-Tailed Grouper	Serranidae	CRE-Fishes
Cheilinus undulates	Napoleon Wrasse	Labridae	CRE-Fishes
Epinephelus fasciatus	Blacktip Grouper	Serranidae	BF Multi-species complex
Lethrinus harak	Thumbprint Emperor	Lethrinidae	CRE-Fishes

Naso unicornis	Bluespine Unicornfish	Acanthuridae	CRE-Fishes
Plectropomus laevis	Saddleback Grouper	Serranidae	CRE-Fishes
Scarus forsteni	Tricolor Parrotfish	Scaridae	CRE-Fishes
Scarus rubroviolaceus	Parrotfish	Scaridae	CRE-Fishes
Scarus schlegeli	Chevron Parrotfish	Scaridae	CRE-Fishes

4.6 Multivariate analysis on a 75% cut-off point

In the interest of brevity of the report, we would be presenting the series of nMDS plots at each cut-off levels. The patterns are similar to the previous cut-off levels. We will be highlighting the very specific items in this cut-off threshold that is worth mentioning particularly the levels of groupings as well as the results of PERMANOVA.

4.6.1 Delete 1-25%, 25-50%, and 50-75% quartiles to remove species that is not or rarely caught by the fishery

The 2-D and 3-D stress values are 0.17 and 0.08, respectively. Since majority of the species had been removed, the similarity value of the remaining species is high leaving only three groups at 80% similarity compared to the eight groups at the median cut-off level (Figure 19a). The main characteristic at this level of cut-off and filtering stage is the full range of values still persists for maximum depth, revenue and biomass. Species with no revenue data comprise the left cluster and half of the upper right cluster (Figure 19e). On the other hand, species with no biomass data comprise the two lower clusters (Figure 19f). The Shepard diagrams showed points around the correlation line are much tighter at this level of cut-off compared to the previous two levels (Figures 19g and 19h). The PERMANOVA results showed significant differences within variables. Frequency of occurrence was not tested due to zero degrees of freedom since only one level remained (Table 13).

Table 13. PERMANOVA results for the removal of species with low to third quartile level for frequency of occurrence. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	0	0		No test	
QRT_MAXZ	4	4653	1163.3	46.962	0.001
QRT_TOT_LBS	2	3058.8	1529.4	61.744	0.001
QRT_REV	4	9604.1	2401	96.932	0.001
QRT_Biomass	4	8709.2	2177.3	87.901	0.001

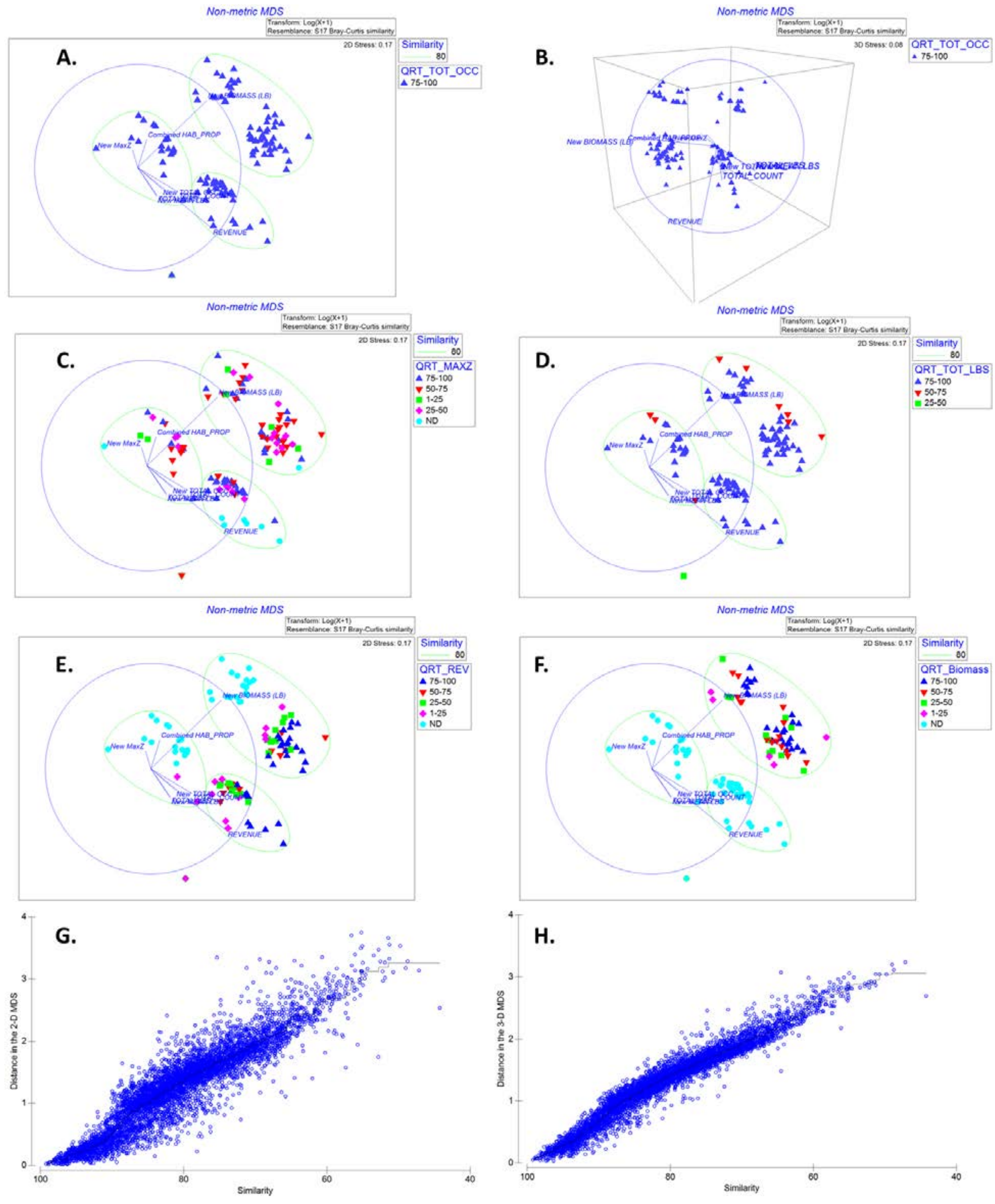


Figure 19. Two and three-dimensional plot with stress values of 0.17 and 0.08, respectively, of remaining MUS after the lower quartile to the third quartile of occurrence were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of maximum depth (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS

4.6.2 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that are mostly in territorial waters

The 2-D and 3-D stress values are 0.14 and 0.06, respectively (Figures 20a and 20b). Removal of the remaining shallow depth species had significantly reduced the species in one cluster. The vector lines still show biomass, depth and revenue being potential drivers in the distribution. Species with no revenue information comprise half of the two clusters (Figure 20e). Species with no biomass data comprise one whole cluster at the low left plot (Figure 20f). The PERMANOVA results showed significant differences within variables for total catch, revenue and biomass (Table 14). No test was conducted for occurrence and maximum depth.

Table 14. PERMANOVA results for the removal of species with low to third quartile level for maximum depth. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	0	0		No test	
QRT_MAXZ	0	0		No test	
QRT_TOT_LBS	1	986.82	986.82	45.309	0.001
QRT_REV	4	3389.6	847.41	38.908	0.001
QRT_Biomass	4	2989.6	747.41	34.317	0.001

4.6.3 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that are not targeted by the fisheries

The 2-D and 3-D stress values are 0.12 and 0.06, respectively (Figures 21a and 21b). At this cut-off level and filter stage, only one cluster remained at 80% similarity. The same pattern holds where species with no revenue and biomass data persist on the periphery of the plots (Figures 21e and 21f). The direction of the vector lines for revenue, biomass and depth remained the same. Only revenue and biomass have PERMANOVA results that are significant whereas occurrence, depth, and catch were not tested (Table 15).

Table 15. PERMANOVA results for the removal of species with low to third quartile level for total catch. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	0	0		No test	
QRT_MAXZ	0	0		No test	
QRT_TOT_LBS	0	0		No test	
QRT_REV	4	2846.2	711.55	32.67	0.001
QRT_Biomass	4	2250.7	562.69	25.835	0.001

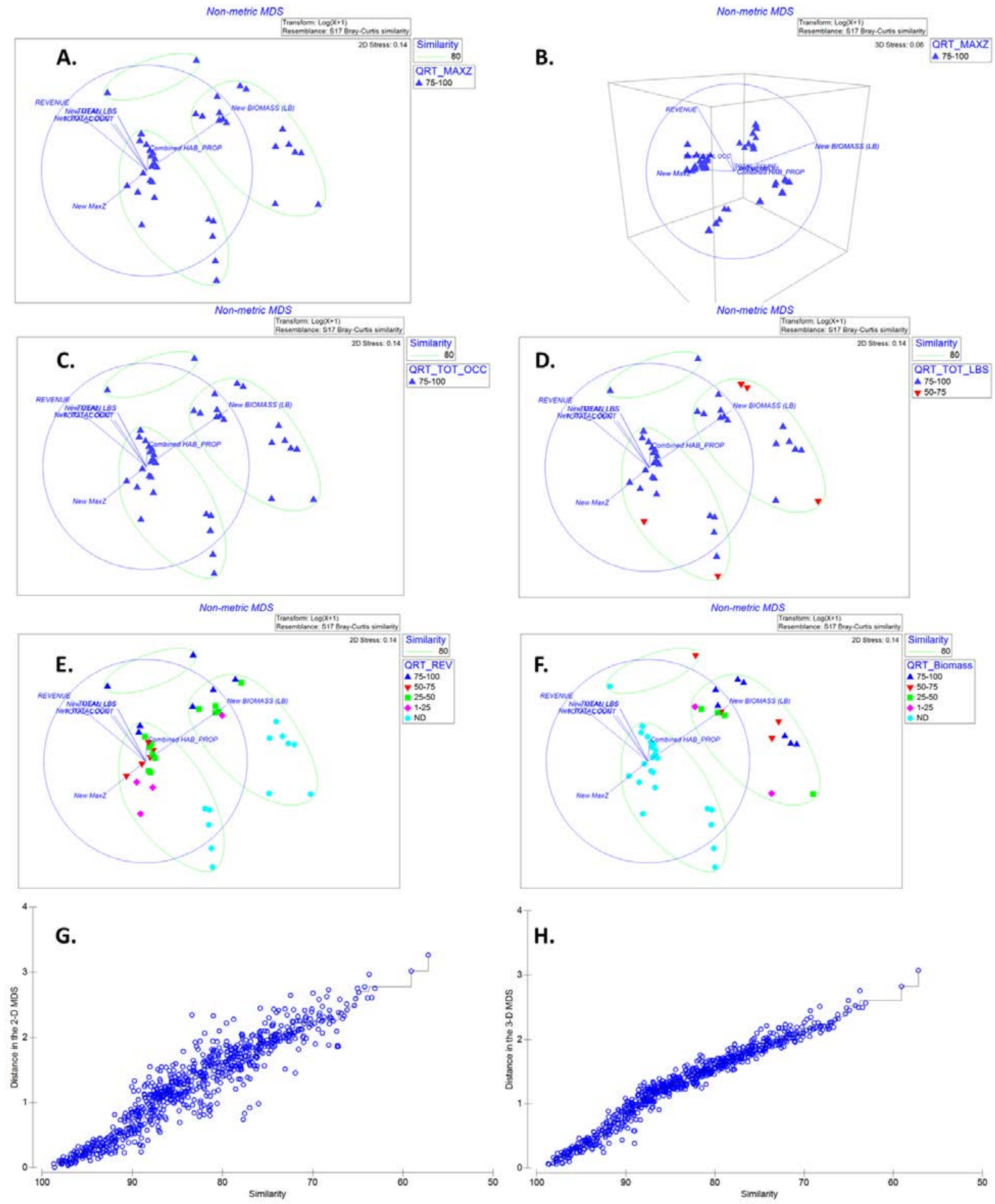


Figure 20. Two and three-dimensional plot with stress values of 0.14 and 0.06, respectively, of remaining MUS after the lower quartile to the third quartile of maximum depth were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

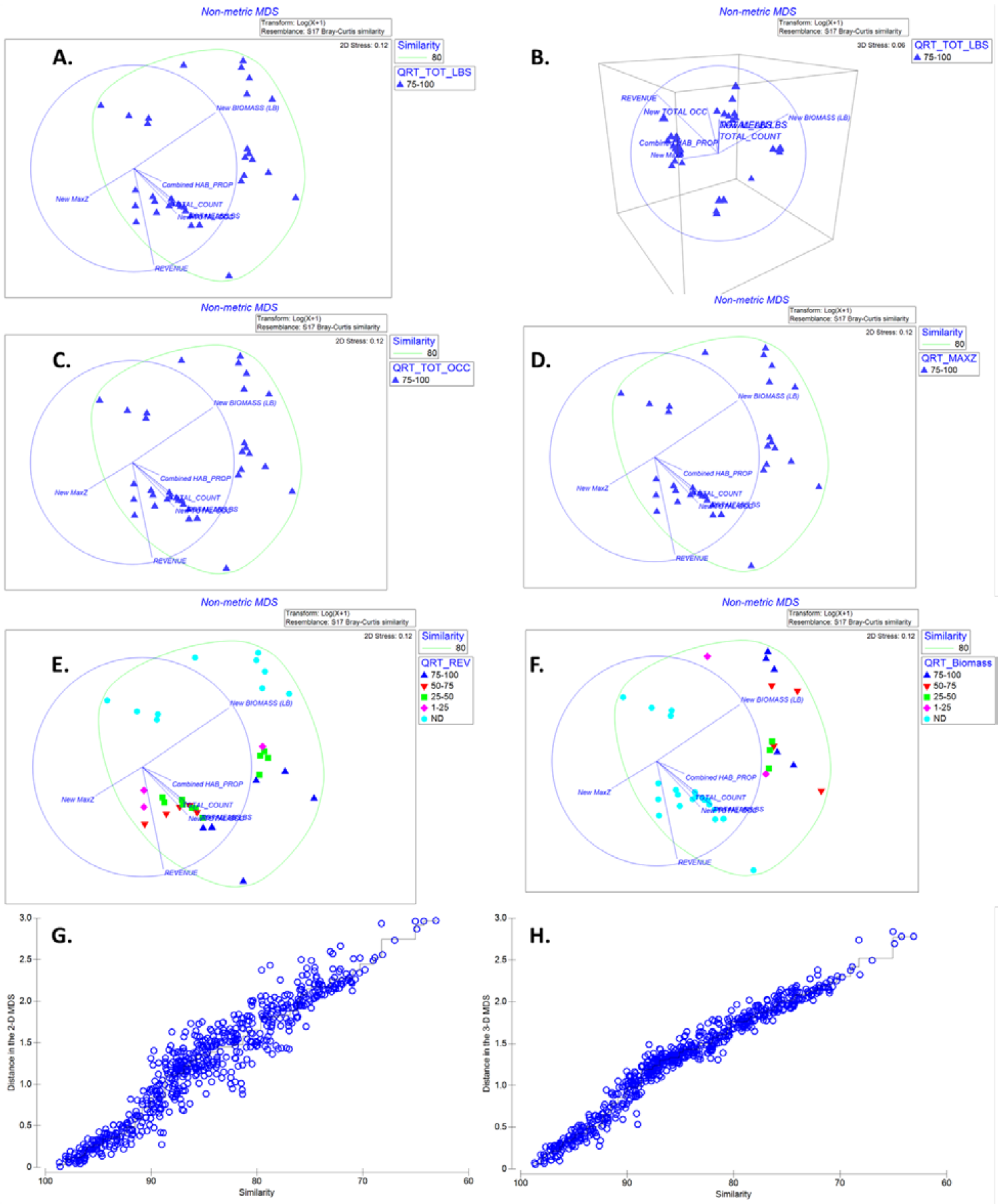


Figure 21. Two and three-dimensional plot with stress values of 0.12 and 0.06, respectively, of remaining MUS after the lower quartile to the third quartile of total catch were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of occurrence (C); maximum depth (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

4.6.4 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that have low contribution to the regional economy

Application of the fourth filter resulted in retention of 7 species, two of which are BMUS and five are CREMUS. *Selar crumenophthalmus* and *Naso unicornis* are the top CREMUS species and are separated from the rest of the species clusters. The deep-water species of *Elagatis bipinnulata*, *Sphyraena barracuda* and *Etelis coruscans* occur in one cluster (Figure 22d). All the points lie within the correlation line for the 2-D and 3-D Shepard diagrams (Figures 22g and 22h).

No PERMANOVA test was conducted on four of the main variables. Biomass remained significant (pseudo F = 4.45, df = 3, P_{perm}=0.023).

4.6.5 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that have low biomass

Applying the last filter removed six species including *Acanthurus xanthopterus*, *Naso unicornis*, *Selar crumenophthalmus*, *Elagatis bipinnulata*, *Sphyraena barracuda* and *Etelis coruscans*. One species remained which is the giant trevally, *Caranx ignobilis*. The nMDS plots were no longer shown because it will only plot one point.

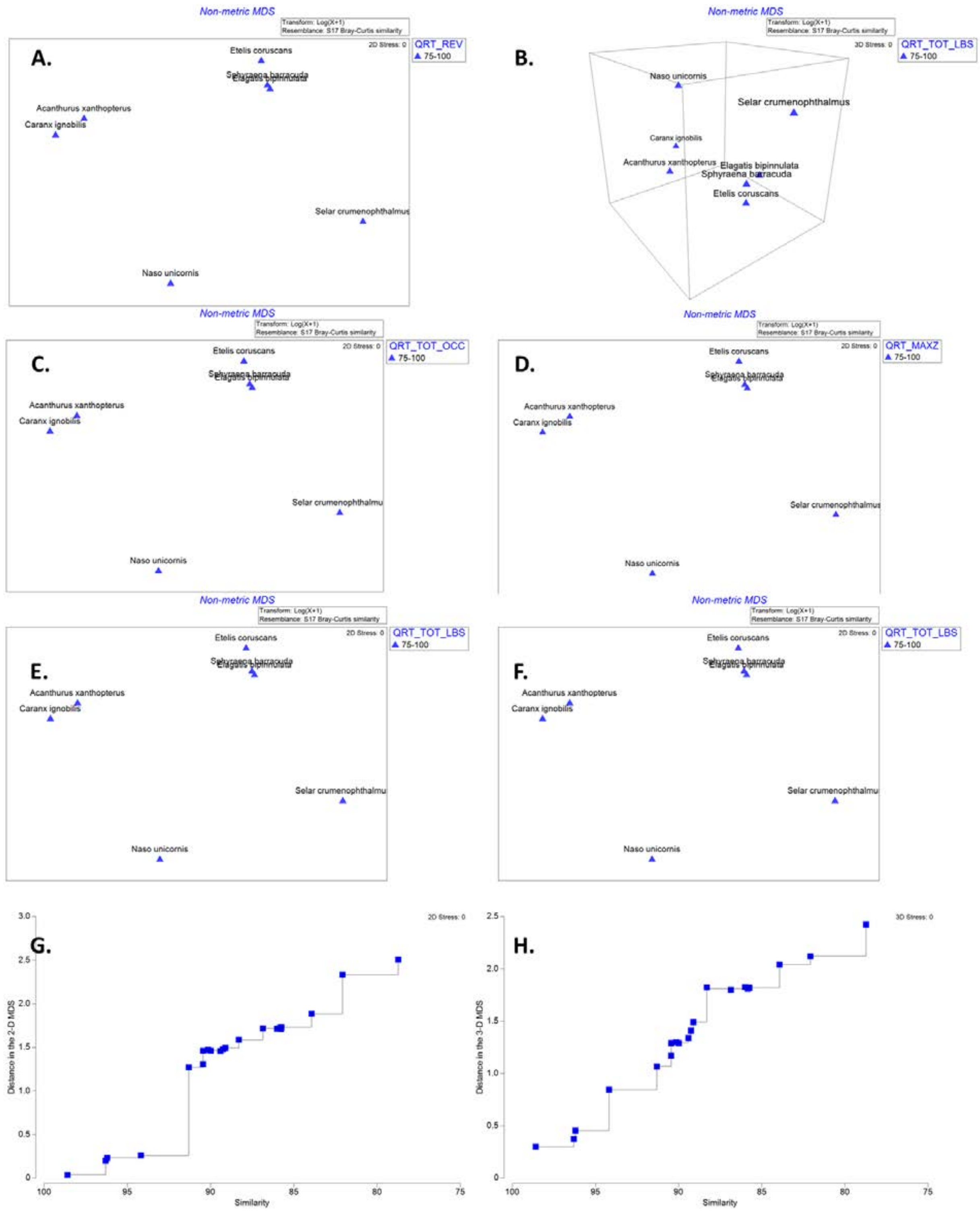


Figure 22. Two and three-dimensional plot with stress values of 0.00 and 0.00, respectively, of remaining MUS after the lower quartile to the third quartile of revenue were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

4.7 Species decline rate after the filters were applied at 75% cut-off

As expected the decline rate at 75% cut-off threshold will be higher. Figure 23 showed the relative rate of decline between the three cut-off thresholds. With a 75% cut-off, this leaves one species that is potentially in need of federal management. The list of species is found in Table 16.

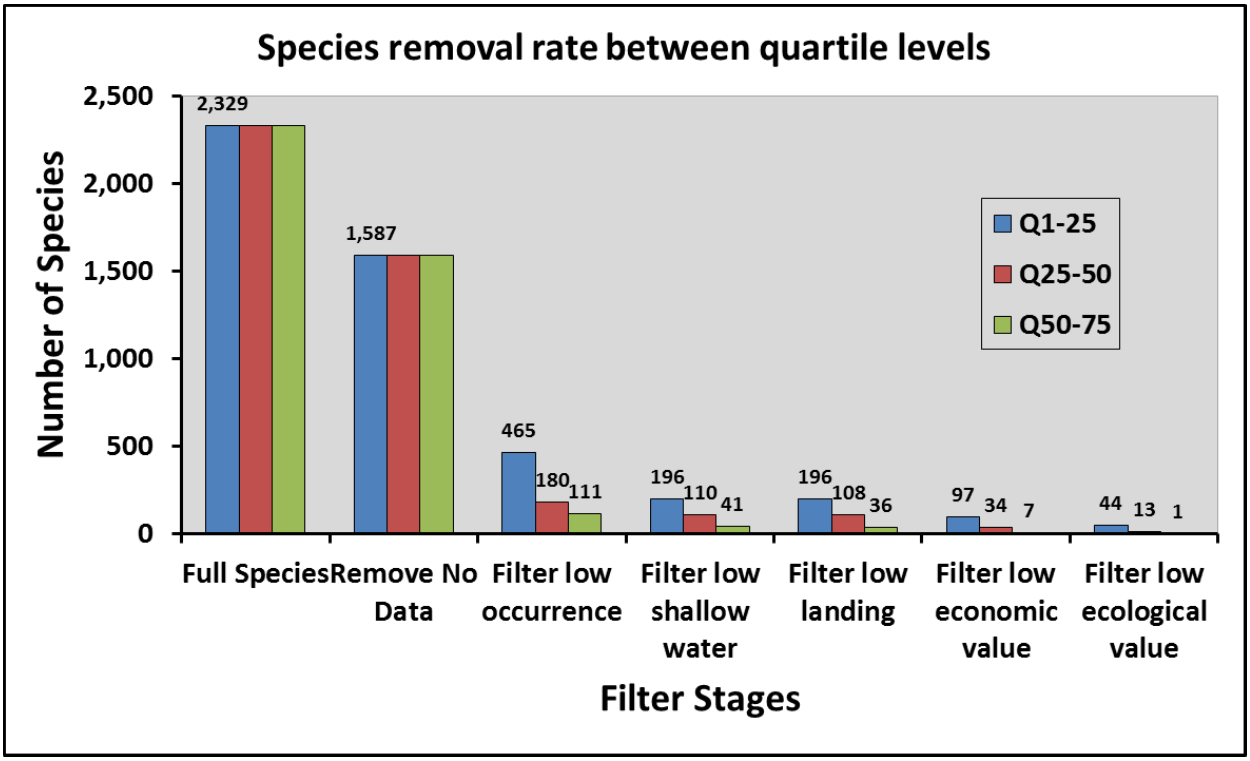


Figure 23. Number of species remaining after each filter is applied comparing the 3 cut-off thresholds.

Table 16. Candidate species for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 75% cut-off.

Scientific Name	Common Name	FAMILY	FEP GROUP
Caranx ignobilis	Giant Trevally	Carangidae	BF Multi-species complex

5 AMERICAN SAMOA ECOSYSTEM COMPONENT ANALYSIS

5.1 Removal of MUS species with no available data

The MUS list for American Samoa contains 329 species that are mostly coral reef associated including some invertebrates. The majority of these species had catch information. In creating the master data table, most of the species did not have any biomass and revenue information. The multivariate analysis resulted to species with data appearing as a single point surrounded by a scatter of species that have no data (Figure 24a). This is also shown in the Shepard diagram where the horizontal line with 20-100% similarity values and a vertical line with some points showing those with no data (Figure 24b). Species with no data were removed following the decision tree (Figure 1).

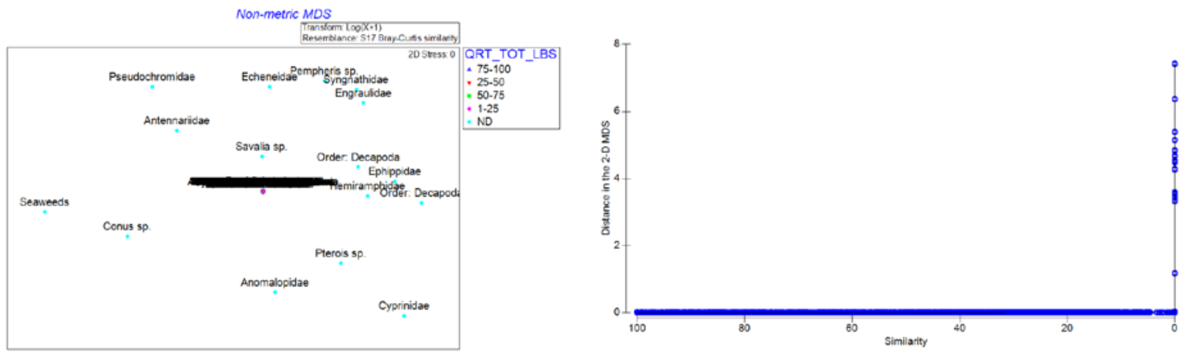


Figure 24. MDS plot (a) and Shepard diagram (b) of all MUS including species with no available data. The 3-D stress value = 0.00.

Running nMDS on remaining species after removing species with no available data resulted in a scattering of the points on 2D space with a relatively low stress value of 0.13 (Figure 24a). Ten clusters were identified using a 60% similarity threshold with large overlaps on the 2-D space for the four biggest clusters. The occurrence data follows a vertical directionality of increasing occurrence values from bottom to top (Figure 25a). Species that only had maximum depth data clustered distinctly at the lower right of the 2-dimensional plot (Figure 25b). There 2-D pattern for catch data is strongly aligned along a diagonal axis of increasing catches from the lower-right corner to the upper-left of the plot (Figure 25c). Since almost half of the species did not have revenue data, the plot shows species with no revenue data are found in all the clusters (Figure 25d). Species with no biomass data are concentrated on the clusters found on the right side and on the periphery (Figure 25e).

Orthogonal vector lines on Figure 25 are represented by catch-related information (lower-right to upper-left direction) and biomass and habitat related variables (lower-left to upper-right direction). The Shepard diagram showed an improvement in the correlation between the index of similarity values and the distance assignment of the species (Figure 26). There are still species that had little information as shown by the vertical line.

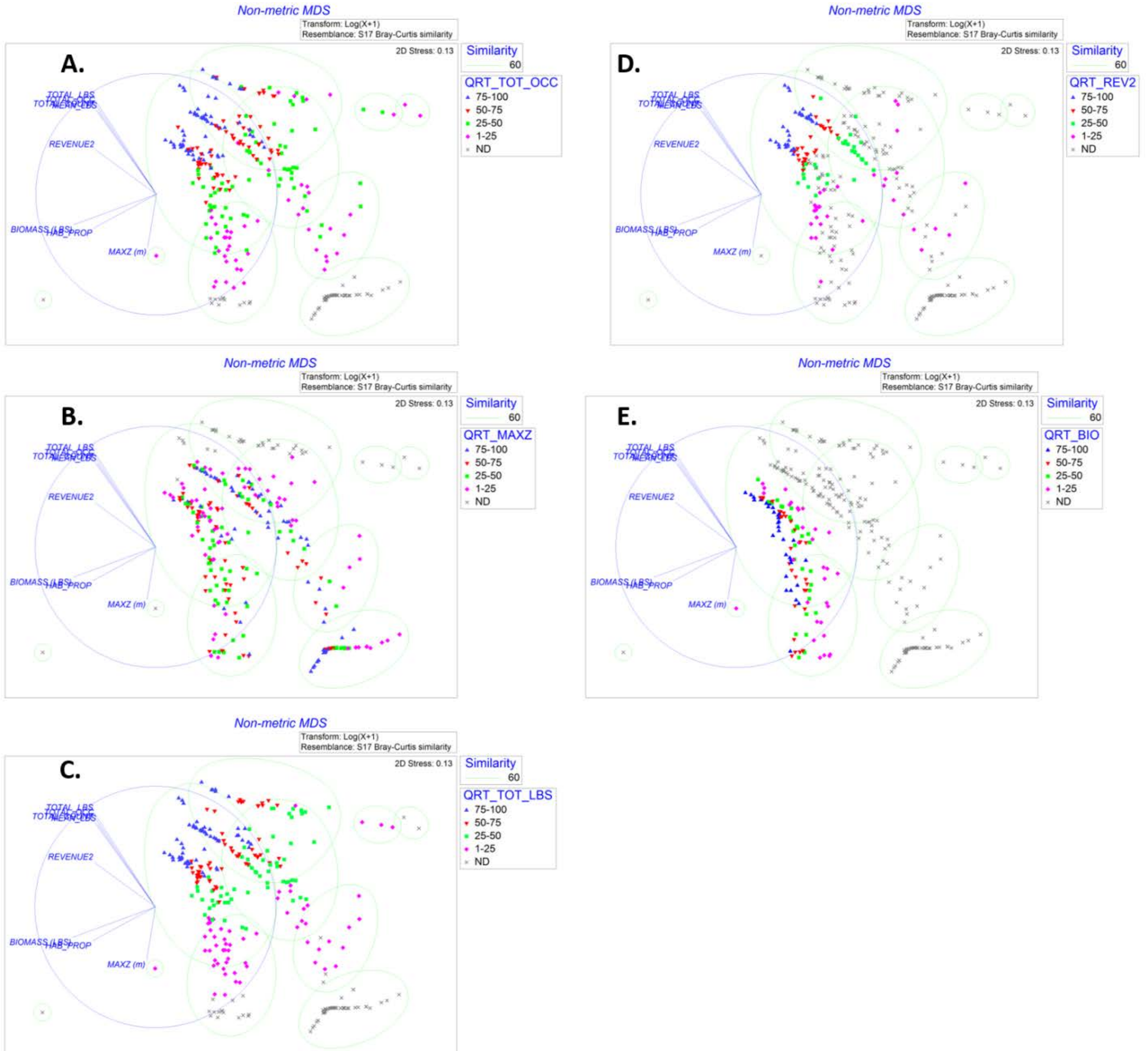


Figure 25. Two-dimensional plot with a stress value 0.13 of MUS with available data for frequency of occurrence (A). The same 2-D plot with factors using quartiles of maximum depth (B); quartiles of total catch (C); quartiles of revenue (D); and quartiles of biomass (E).

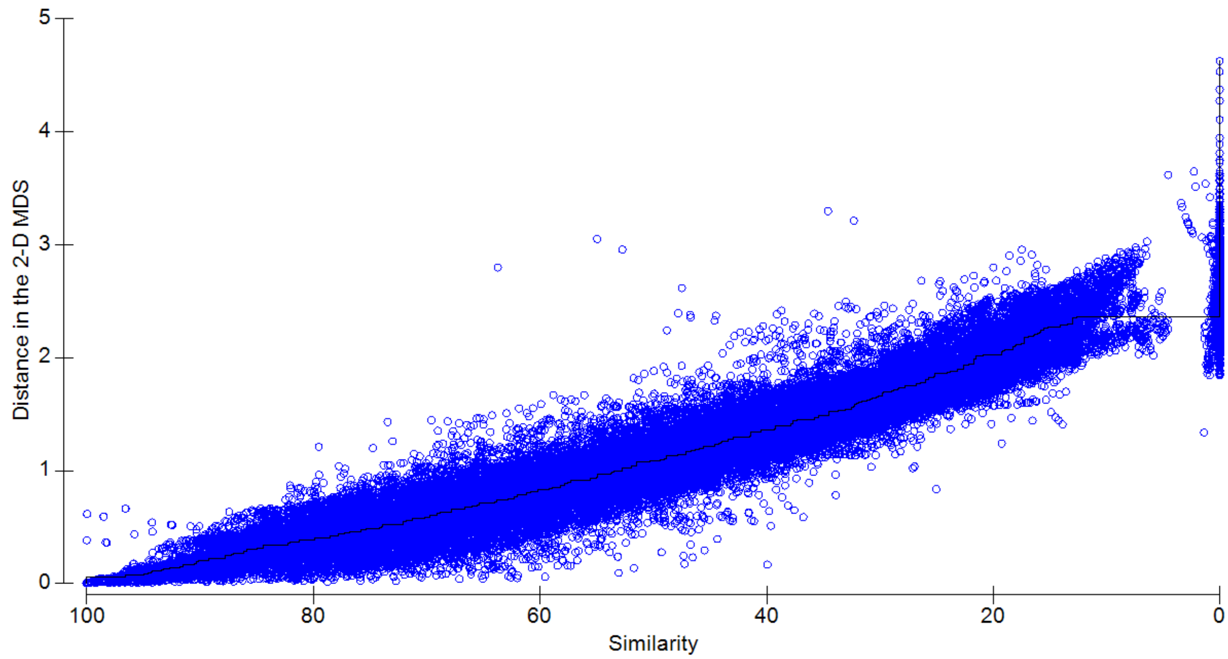


Figure 26. Shepard diagram showing the similarity values using Bray-Curtis index and the distance representation in the 2-D plot for MUS with available data.

5.2 Multivariate analysis on a 25% cut-off point

5.2.1 Delete lower quartile to remove species that are not or rarely caught by the fishery

This phase of the analysis applies the data proxy for the NS1 filters sequentially and utilizes a 25% cut-off point where the bottom 25% is removed and conversely retains the top 75%. This would remove species that are not or are rarely caught by the fisheries.

Species with 0-25% frequency of being caught by the fishery were removed (Figure 27a and 27b). The 2-D and 3-D plots have stress values of 0.16 and 0.09, respectively. The nMDS plot shows two big and two small clusters (e.g., Figure 27a). Orthogonal vector lines again are related to fishery dependent attributes (e.g., total catch) versus habitat and biomass variables. The third dimension is driven by the revenues. Fishery dependent variables follow a general right to left gradient (e.g., Figure 27a and 27d) while biomass follow a top to bottom gradient of increasing values (Figure 27e). Some points at the top cluster are characterized by species with no available depth information (Figure 27c). Half of the top and bottom cluster is characterized by species with no revenue data (Figure 27e) and all the top clusters are species with no biomass information (Figure 27f). The Shepard diagrams for the 2-D and 3-D plots showed the disappearance of the vertical line and the points are tighter on the 3-D Shepard diagram due to the lower stress values (0.09 for the 3-D versus 0.16 for the 2-D).

The PERMANOVA results showed the main effects to be significant (Table 17). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here. Note that the degrees of freedom for occurrence was reduced to two, due to the removal of the lower quartile.

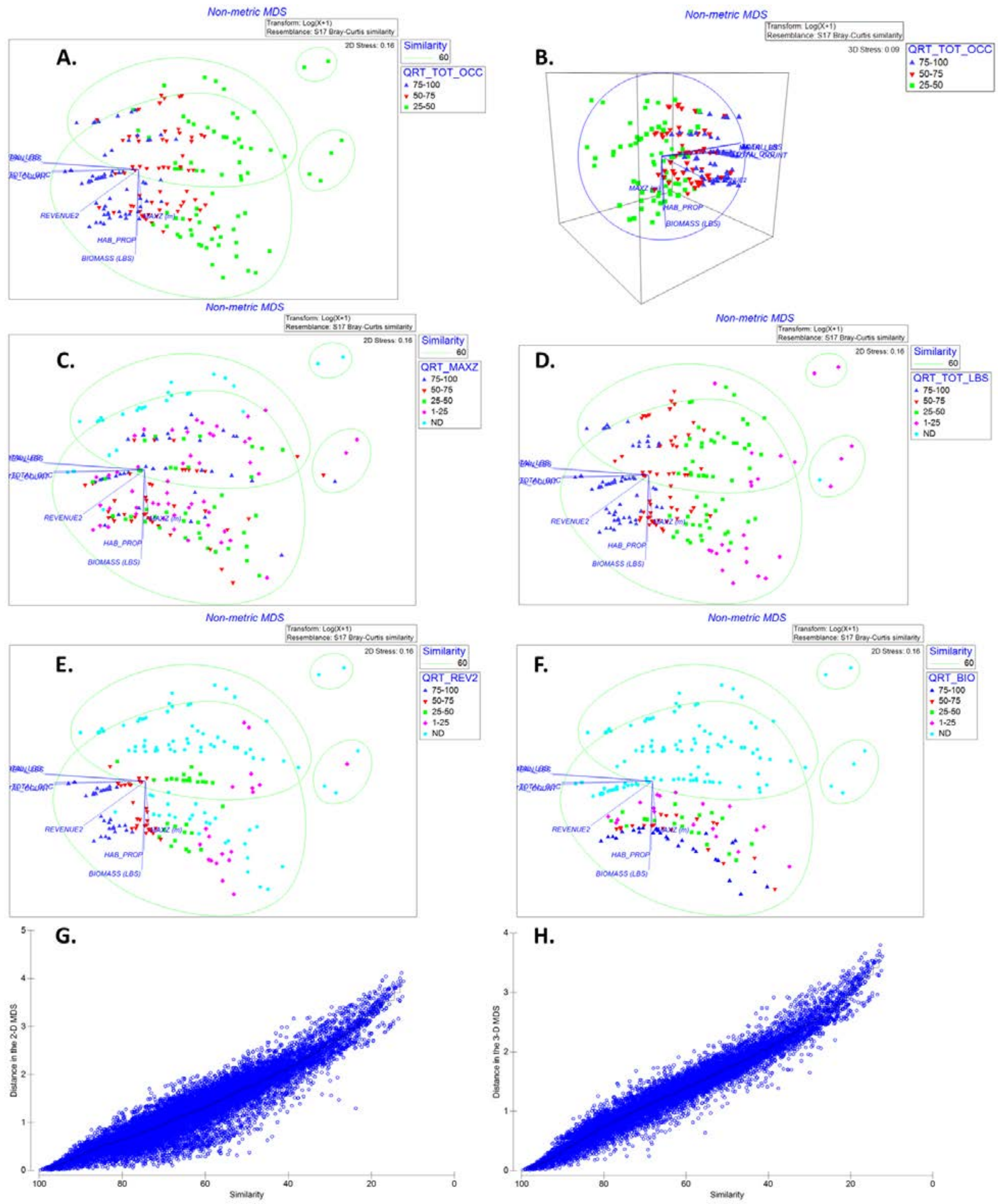


Figure 27. Two and three-dimensional plot with stress values of 0.16 and 0.09, respectively, of remaining MUS after the lower quartile of frequency of occurrence was removed (A and B). The same 2-D plots with factors using quartiles of maximum depth (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

Table 17. PERMANOVA results for the removal of species with low frequency of occurrence. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	2	54302	27151	388.34	0.001
QRT_MAXZ	4	34864	8716.1	124.67	0.001
QRT_TOT_LBS	4	26363	6590.7	94.267	0.001
QRT_REV2	4	28924	7231.1	103.43	0.001
QRT_BIO	4	30725	7681.3	109.87	0.001

5.2.2 Delete lower quartile to remove species mostly in territorial waters

The second NS1 filter was applied at this stage to remove species that are mostly in shallower depth therefore occurring mostly in territorial waters. The 2-D and 3-D plots stress values are 0.14 and 0.07, respectively. The density of the ordination plots had decreased with the removal of shallow water species and species with no depth information. There are four clusters at 70% similarity with three of the clusters overlapping each other (Figure 28a). The second clustering follows the biomass parameter. The frequency of occurrence (Figure 28c) and total catch plots (Figure 28d) showed low to high directionality from low left to high right for both clusters. The revenue plot (Figure 28e) showed the species with no available data comprising the points on the small cluster and parts of the two big clusters. The biomass plot (Figure 28f) shows the species with no available biomass data that comprise the points on the upper portion of two big clusters and on the small cluster at the periphery.

The removal of shallow water species and the species with no depth information resulted in a tighter correlation plot compared to the previous filtering stage (Figures 28g and 28h). A tighter correlation between the distance assigned to the points and the similarity occur in the 3-dimensional plot.

The PERMANOVA results showed the main effects to be significant (Table 18). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here. The maximum depth degrees-of-freedom is now down to two, due to the removal of the lower quartile.

Table 18. PERMANOVA results for the removal of species in shallow waters. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_LBS	4	40251	10063	390.67	0.001
QRT_TOT_OCC	2	2512.3	1256.1	48.767	0.001
QRT_MAXZ	2	6253.2	3126.6	121.38	0.001
QRT_REV2	4	16065	4016.2	155.92	0.001
QRT_BIO	4	17468	4367	169.54	0.001

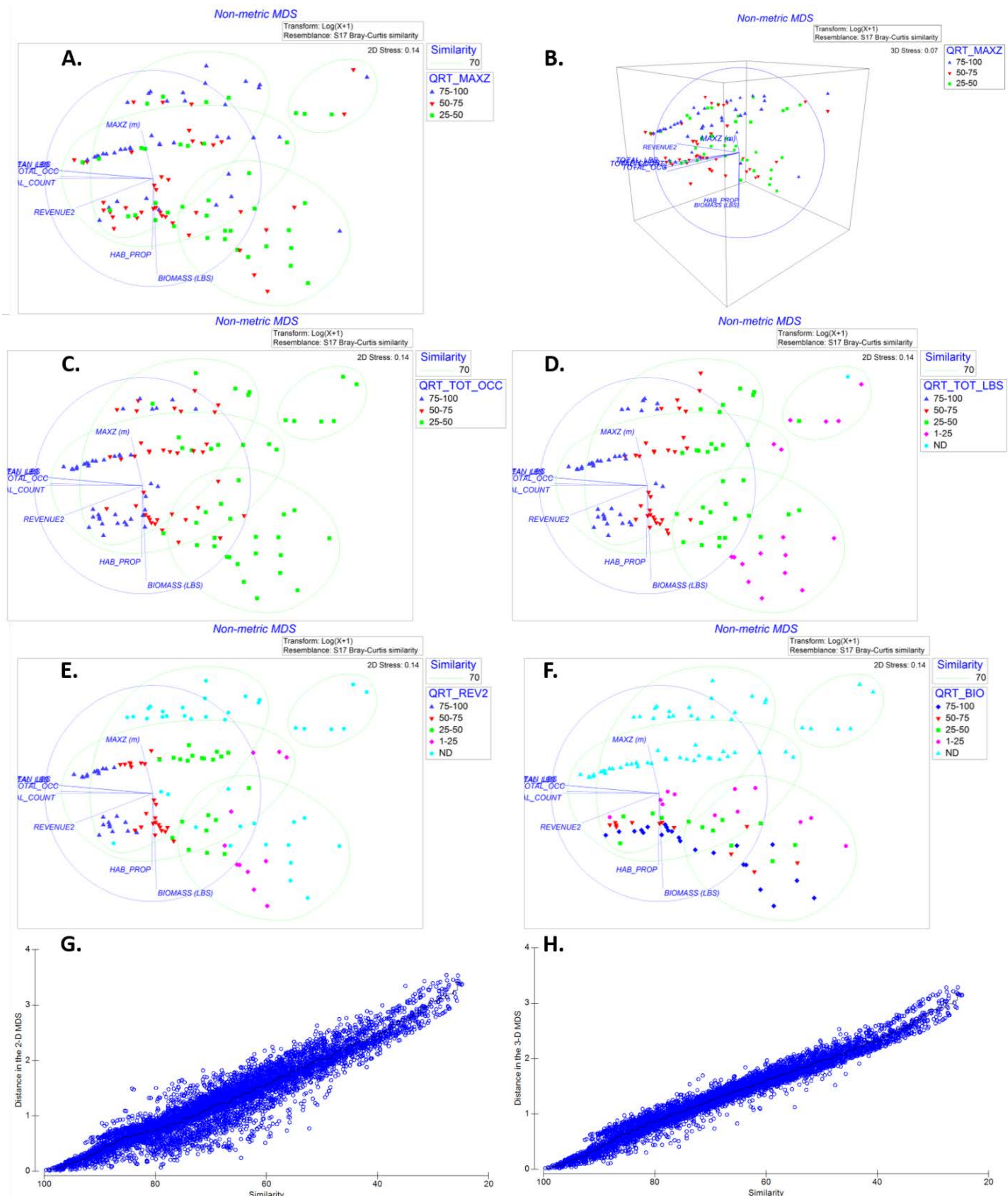


Figure 28. Two and three-dimensional plot with stress values of 0.14 and 0.07, respectively, of remaining MUS after the lower quartile of maximum depth was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.2.3 Delete lower quartile to remove species that are not targeted by the fishery

The third NS1 filter was applied at this stage to remove species that are not targeted by the fishery. This stage still uses the 0-25% cut-off similar to the first and second filter. The removal of lower quartile in first filter also removed species with low catch that are not targeted by the fishery. The 2-D and 3-D stress values are 0.17 and 0.07, respectively (Figures 29a and 29b). There were three overlapping clusters at 70% similarity in all the plots. The total catch followed a horizontal directionality from low catch on the right to higher catch towards the left (Figure 29a). The maximum depth data had a wide range of values for each cluster (Figure 29d). At this filter, both revenue and biomass had full range of values from low to high with one cluster comprising of points with no data for both revenue and biomass (Figures 29e and 29f). The 3-D Shepard diagram showed tighter points near the correlation line (Figure 29h).

The PERMANOVA results showed the main effects to be significant (Table 19). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here. The total catch degrees-of-freedom is now down to two, after removing the lower quartile.

Table 19. PERMANOVA results for the removal of species with low total catch. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_LBS	2	19146	9573.2	438.86	0.001
QRT_TOT_OCC	2	2512.3	1256.1	57.585	0.001
QRT_MAXZ	2	4544.8	2272.4	104.17	0.001
QRT_REV2	4	13678	3419.5	156.76	0.001
QRT_BIO	4	10721	2680.3	122.87	0.001

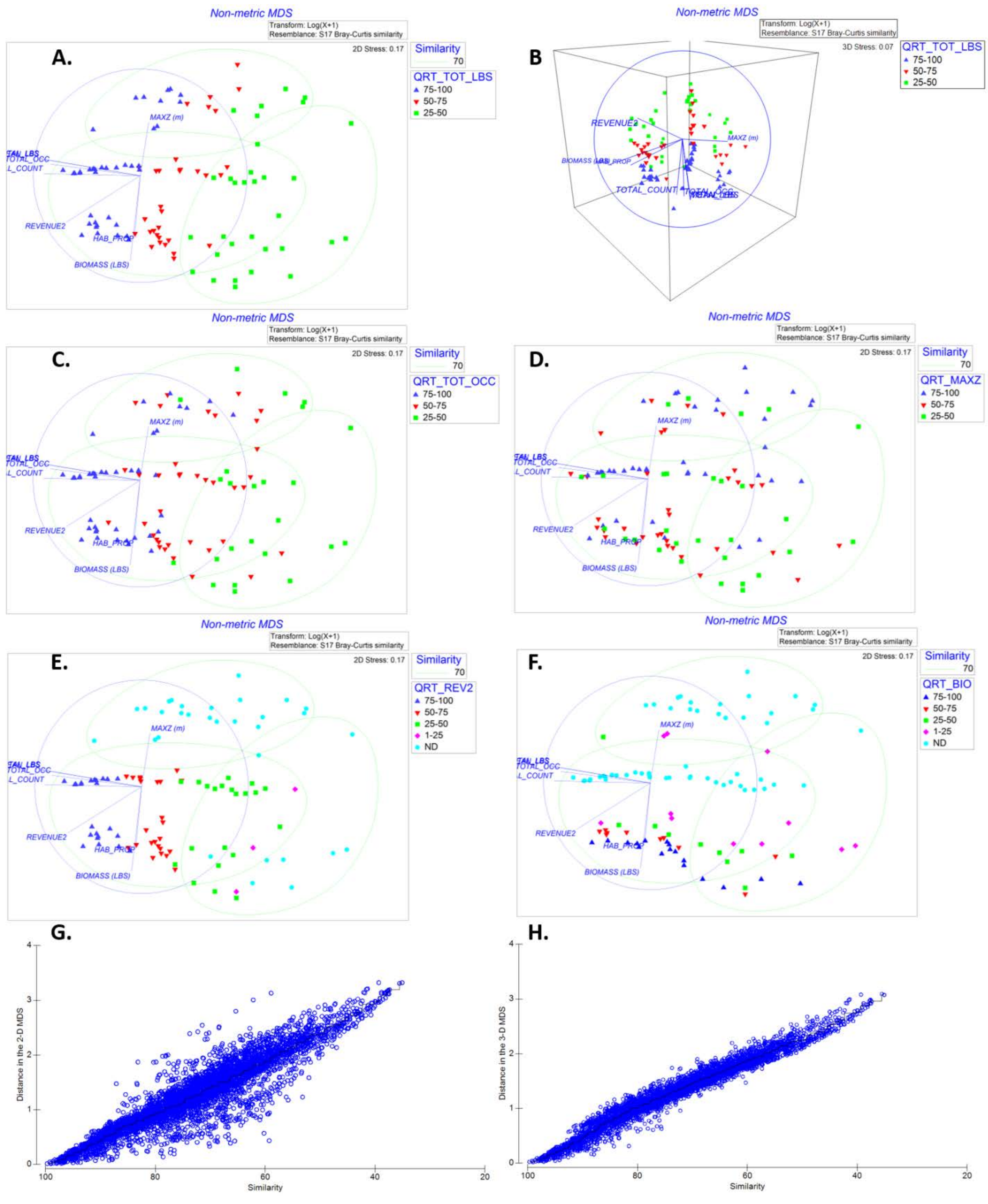


Figure 29. Two and three-dimensional plot with stress values of 0.17 and 0.07, respectively, of remaining MUS after the lower quartile of total catch was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); maximum depth (D); total catch (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.2.4 Delete lower quartile to remove species that have low contribution to the regional economy

The fourth NS1 filter was applied at this stage to remove species that have low contribution to the regional economy. The 2-D and 3-D stress values are 0.09 and 0.06, respectively. The removal of the lower quartile and species with no revenue information resulted in the removal of one cluster at the upper right Figure 29e. The resulting plots have less density and but the same number of groupings as showed in the 2-dimensional plot (Figure 30a). The 3-dimensional plot shows a clear directionality from left to right, indicating the low to high gradient, driven by fishery dependent variables (Figure 30b). The fishery independent gradients are perpendicular to the fishery dependent variables. The upper points in the two clusters are characterized by all species with no available biomass data (Figure 30f).

The Shepard diagrams for the 2-D (Figure 10g) and 3-D (Figure 10h) plots show the tighter correlation between the assigned distance and the similarity. The density of the points is much closer and is highest at higher similarity. The two diagrams are almost similar due to the stress values which are close together.

The PERMANOVA results showed the main effects to be significant (Table 20). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here.

Table 20. PERMANOVA results for the removal of species with low revenue. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_LBS	2	10297	5148.5	472.85	0.001
QRT_TOT_OCC	2	890.48	445.24	40.892	0.002
QRT_MAXZ	2	1254.2	627.09	57.593	0.001
QRT_REV2	2	1082.2	541.08	49.694	0.002
QRT_BIO	4	5642.4	1410.6	129.55	0.001

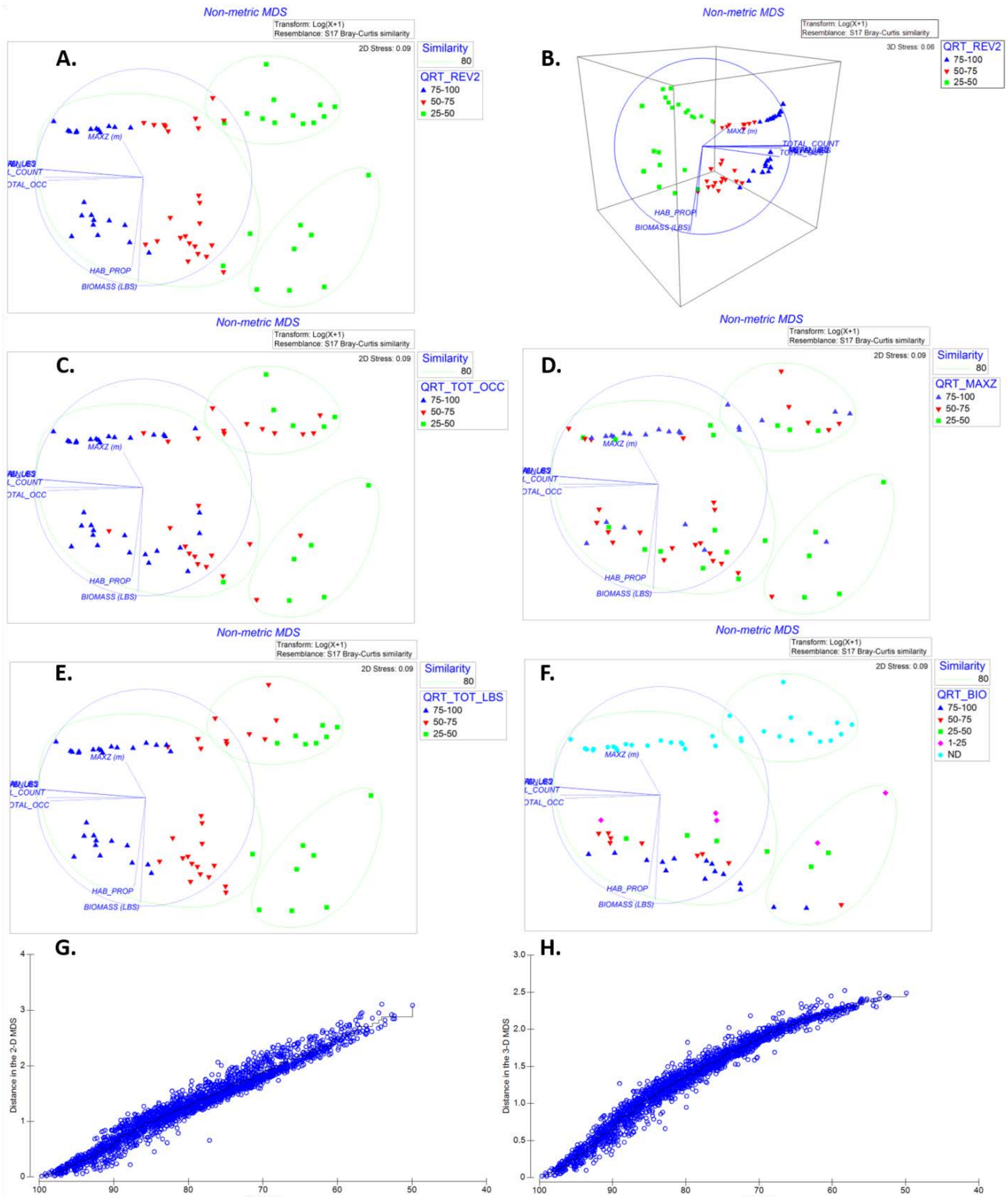


Figure 30. Two and three-dimensional plot with stress values of 0.09 and 0.06, respectively, of remaining MUS after the lower quartile of revenue was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); maximum depth (D); total catch (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.2.5 Delete lower quartile to remove species that have low biomass contribution

The last NS1 filter is applied at this stage to remove species that have low biomass contribution. The application of the last filter removed the points that comprise the top cluster from the previous filtering. The stress values for the 2-D and the 3-D plots are 0.05 and 0.04, respectively (Figures 31a and 31b). The application of the last filter resulted in 44 remaining species that are left for consideration for federal conservation and management. The directionality of the vector lines maintains the separation on the effects of the fishery dependent and fishery independent information. The Shepard diagram also showed tighter correlation compared to the previous four filters applied to the data (Figures 31g and 31h).

Caution needs to be made in applying this filter to the species remaining from the fourth filter. Note that the biomass information is from surveys conducted by CREP at depths of 0-30 meters. Absence of information does not mean that there is no available information but these species are found at greater depths beyond the survey depth. Application of this filter will artificially remove the deep bottomfish species which are currently being managed and stock assessments are available. The end result from applying this filter will retain species that are covered by the underwater census surveys. The SSC can choose to apply this filter or not.

The PERMANOVA results showed total catch, maximum depth and biomass to be significant (Table 21). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here.

Table 21. PERMANOVA results for the removal of species with low biomass. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_LBS	2	2534.6	1267.3	100.97	0.0021
QRT_TOT_OCC	2	157.36	78.68	6.2685	0.1022
QRT_MAXZ	2	244.88	122.44	9.7549	0.017
QRT_REV2	2	51.19	25.595	2.0392	0.2323
QRT_BIO	2	448.37	224.19	17.861	0.0061

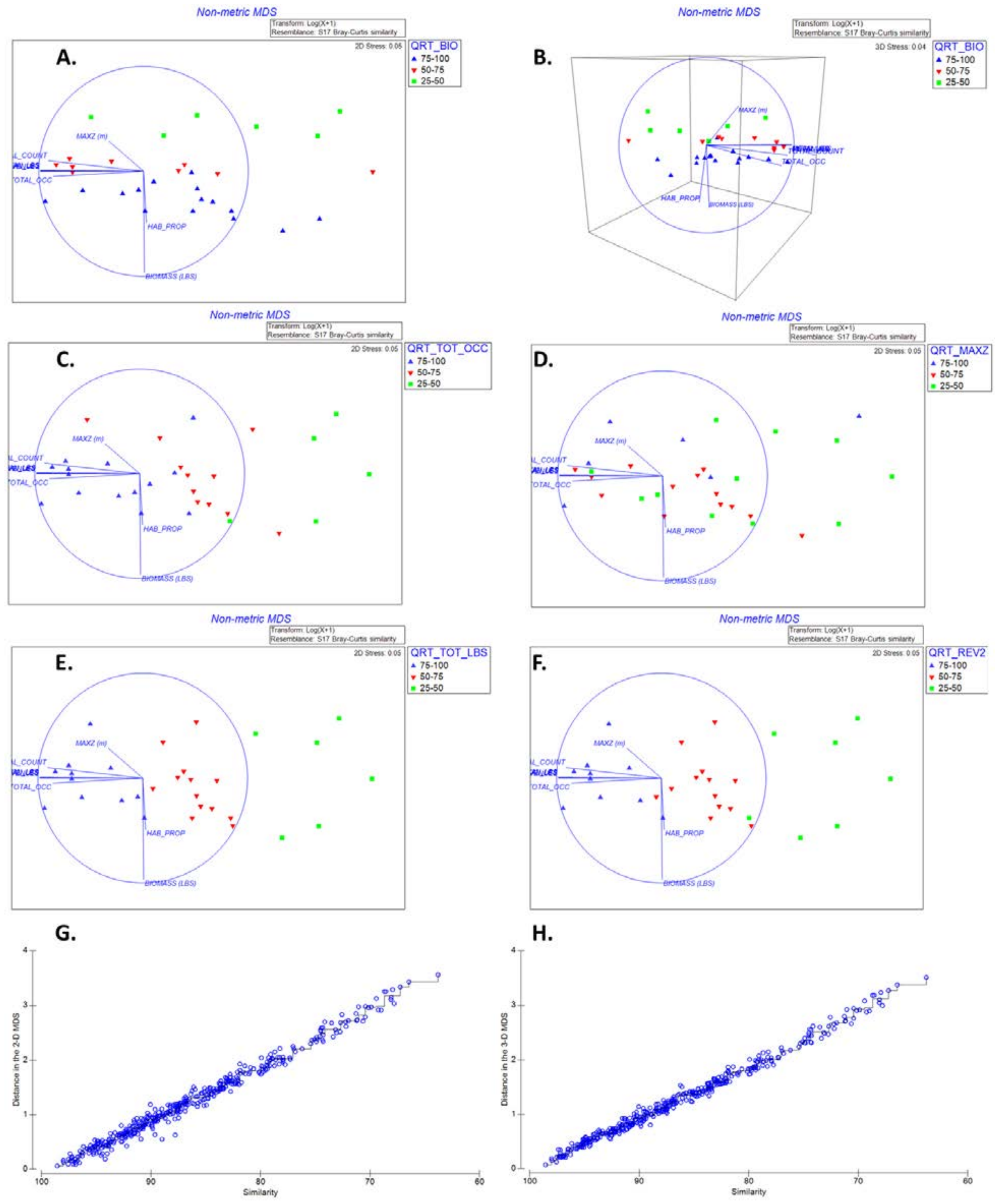


Figure 31. Two and three-dimensional plot with stress values of 0.05 and 0.04, respectively, of remaining MUS after the lower quartile of biomass was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); maximum depth (D); total catch (E); and revenue (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.3 Species decline rate after the filters were applied at 25% cut-off

Figure 32 shows the number of species remaining after the different filters was applied following the decision tree. The list of candidate species to remain in federal fisheries management is found in Table 22.

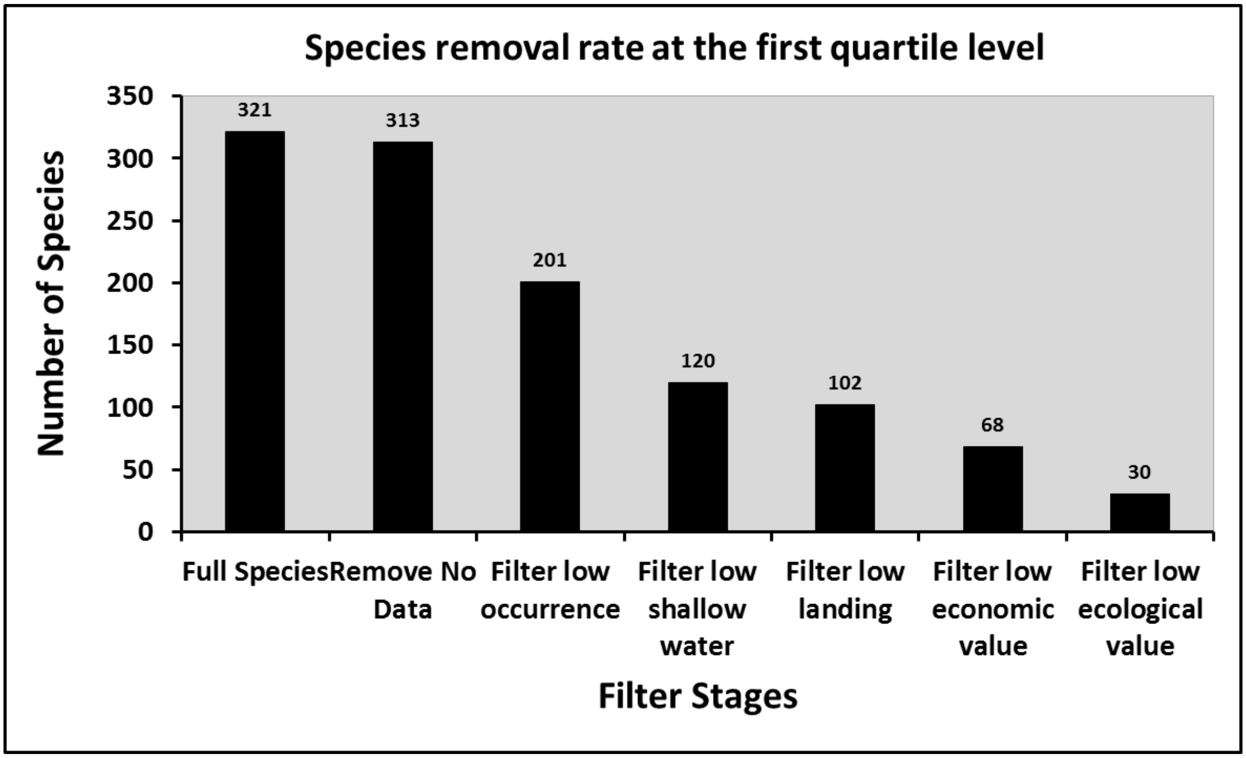


Figure 32. Number of species remaining for federal fisheries management after filters were applied at 25% cut-off.

Table 22. Candidate species for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 25% cut-off.

Scientific Name	Common Name	Family	FEP GROUP
Aprion virescens	Grey Snapper, Jobfish	Lutjanidae	BF Multi-species complex
Lutjanus kasmira	Blueline Snapper	Lutjanidae	BF Multi-species complex
Epinephelus fasciatus	Blacktip Grouper	Serranidae	BF Multi-species complex
Variola louti	Lunartail Grouper (Yellow-edge Lyretail)	Serranidae	BF Multi-species complex
Acanthurus nigricans	Whitecheek Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus nigrofuscus	Brown Surgeonfish	Acanthuridae	CRE-Fishes

Acanthurus xanthopterus	Yellowfin Surgeonfish	Acanthuridae	CRE-Fishes
Naso lituratus	Orangespine Unicornfish	Acanthuridae	CRE-Fishes
Naso unicornis	Bluespine Unicornfish	Acanthuridae	CRE-Fishes
Zebrasoma velifer	Pacific Sailfin Tang	Acanthuridae	CRE-Fishes
Caranx melampygus	Bluefin Trevally	Carangidae	CRE-Fishes
Myripristis amaena	Brick Soldierfish	Holocentridae	CRE-Fishes
Myripristis berndti	Bigscale Soldierfish	Holocentridae	CRE-Fishes
Sargocentron spiniferum	Saber Squirrelfish	Holocentridae	CRE-Fishes
Gnathodentex aureolineatus	Goldenline Bream	Lethrinidae	CRE-Fishes
Gnathodentex aureolineatus	Yellowspot Emperor	Lethrinidae	CRE-Fishes
Monotaxis grandoculis	Bigeye Emperor	Lethrinidae	CRE-Fishes
Aphareus furca	Brown Jobfish	Lutjanidae	CRE-Fishes
Lutjanus bohar	Red Snapper	Lutjanidae	CRE-Fishes
Lutjanus bohar	Twinspot/Red Snapper	Lutjanidae	CRE-Fishes
Lutjanus fulvus	Yellow-margined Snapper	Lutjanidae	CRE-Fishes
Lutjanus gibbus	Humpback Snapper	Lutjanidae	CRE-Fishes
Lutjanus monostigma	Onespot Snapper	Lutjanidae	CRE-Fishes
Macolor niger	Black Snapper	Lutjanidae	CRE-Fishes
Calotomus carolinus	Stareye Parrotfish	Scaridae	CRE-Fishes
Cephalopholis argus	Peacock Grouper	Serranidae	CRE-Fishes
Epinephelus polyphekadion	Smalltooth Grouper	Serranidae	CRE-Fishes
Epinephelus tauvina	Greasy Grouper	Serranidae	CRE-Fishes
Serranidae Family	Inshore Groupers	Serranidae	CRE-Fishes
Variola albimarginata	White-edged Lyretail	Serranidae	CRE-Fishes

5.4 Multivariate analysis on a 50% cut-off point

The results of the multivariate analysis on a 50% cut-off follows the 25% cut-off closely except more species are eliminated due to the higher threshold level. The vector relationship will likely remain similar.

5.4.1 Delete 1-25% and 25-50% quartiles to remove species that is not or rarely caught by the fishery

The 2-D and 3-D stress values were 0.17 and 0.08, respectively. There were four general clustering of the remaining species after species with less median of frequency of occurrence were removed based on an 80 percent similarity (Figures 33a and 33b). Each cluster showed directionality from lower occurrence to higher occurrence. The majority of species remaining have occurrence of 75-100% (Figure 33a). The pattern for occurrence is similar to the total catch pattern (Figure 33d). Despite the removal up to the median level of occurrence, the remaining species still have a broad range of depth distribution from shallow to deepwater (Figure 33c). The species with no revenue information comprise the upper 2 clusters (Figure 33e) while species with no biomass information are those that comprise the two left clusters (Figure 33f).

In comparing the Shepard diagram between the 25% (Figures 27g and 27h) and the 50% cut-off (Figures 33g and 33h), the points cluster more tightly along the correlation line in the 25% occurrence cut-off compared to the 50% cut-off.

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 23). There were no significant differences in the variable interactions.

Table 23. PERMANOVA results for the removal of species with low occurrence to median level. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	12322	12322	532.12	0.001
QRT_MAXZ	4	17375	4343.8	187.59	0.001
QRT_TOT_LBS	2	10067	5033.3	217.36	0.001
QRT_REV2	3	15948	5315.9	229.57	0.001
QRT_BIO	4	11822	2955.5	127.63	0.001

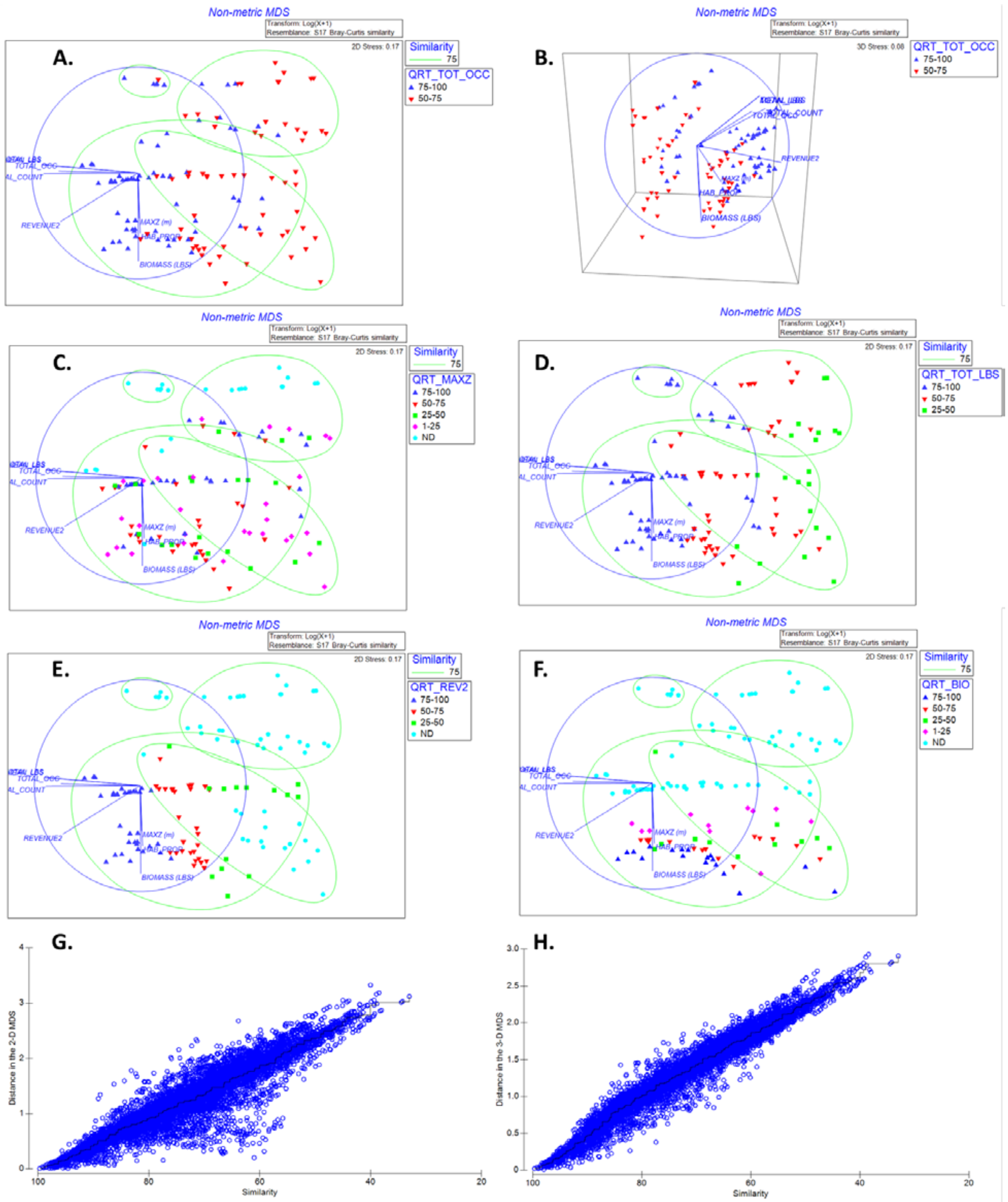


Figure 33. Two and three-dimensional plot with stress values of 0.17 and 0.08, respectively, of remaining MUS after the lower quartile to median of frequency of occurrence were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.4.2 Delete 1-25% and 25-50% quartiles to remove species mostly in territorial waters

The 2-D and 3-D stress values are at 0.16 and 0.06, respectively. The cluster of point became less dense when the species that occur at shallower depths were removed at the median cut-off (Figures 34a and 34b). The general clustering was reduced to three at 80% similarity (Figure 34a). The 3-dimensional plot shows biomass, revenue and maximum depth drives the distribution perpendicular to the fishery dependent variables. Occupancy and total catch are still dominated by species that has 75-100% occurrence (Figure 34c). Species that have no revenue information comprise the lower left cluster and half of the right-hand cluster (Figure 34e). Species that have no biomass information comprise the lower left and upper right cluster (Figure 34f). In terms of the depth distribution, the 50% cut-off removed species that occurs from 1-50 meters.

The Shepard diagram showed a tighter cluster of points to the correlation line which can explain the 0.03 reduction in the 3-D stress value compared to the lower quartile cut-off (Figures 34g and 34h).

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 24). There were no significant differences in the variable interactions.

Table 24. PERMANOVA results for the removal of species with low quartile to median level for maximum depth. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	3208.1	3208.1	193.59	0.001
QRT_MAXZ	1	2038.1	2038.1	122.98	0.001
QRT_TOT_LBS	2	2580.4	1290.2	77.853	0.001
QRT_REV2	3	7016.1	2338.7	141.12	0.001
QRT_BIO	4	3558	889.51	53.676	0.001

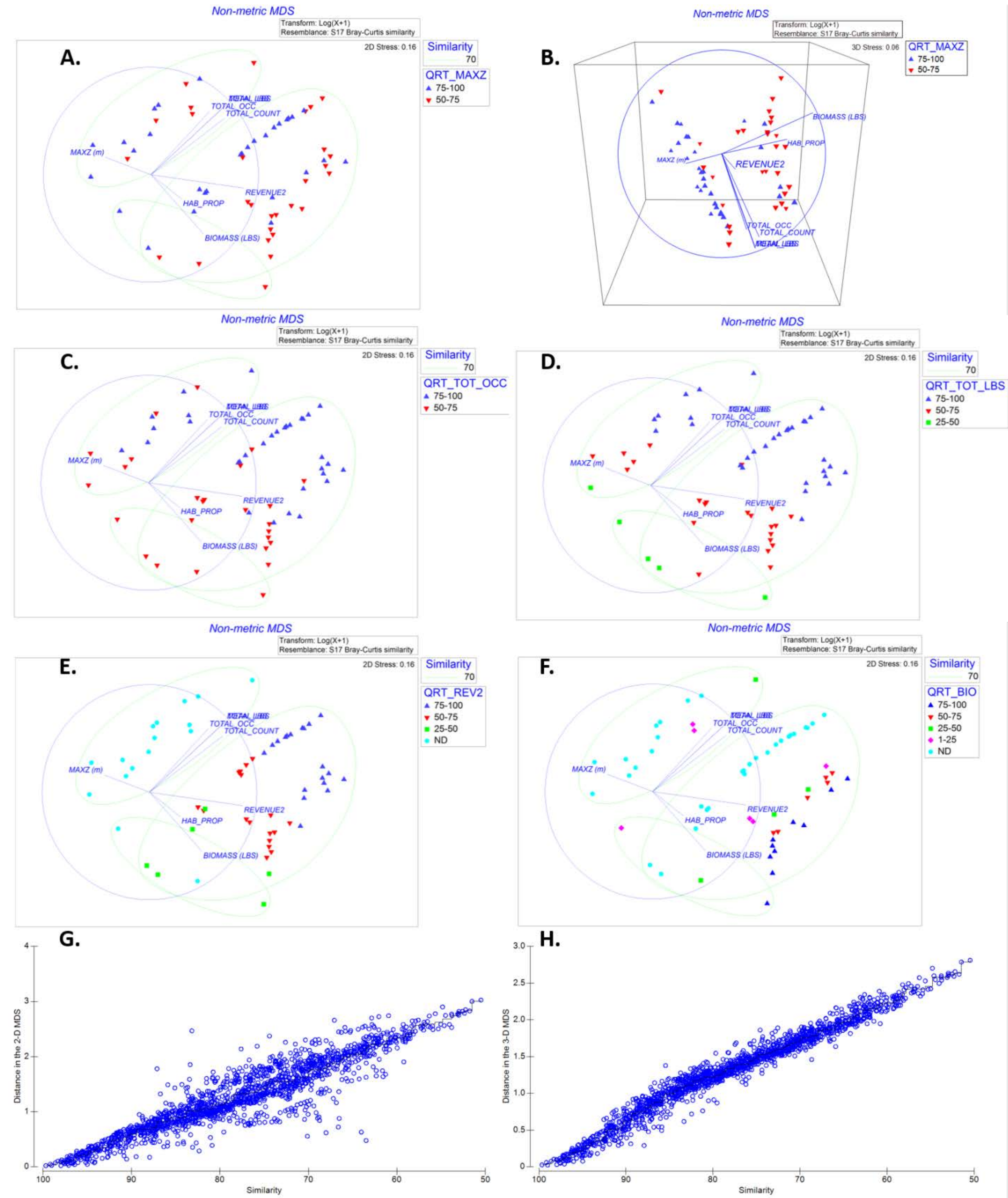


Figure 34. Two and three-dimensional plot with stress values of 0.16 and 0.06, respectively, of remaining MUS after the lower quartile to median of maximum depth were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.4.3 Delete 1-25% and 25-50% quartiles to remove species that are not targeted by the fishery

The 2-D and 3-D stress values are at 0.15 and 0.06, respectively. The cluster of point became less dense when the species that are not or rarely targeted by the fishery were removed at the median cut-off (Figures 35a and 35b). There were two clustering at 70% similarity (Figure 35a). At 80% similarity, six clusters formed, however two of these clusters had a single point while another two clusters had less than 5 points each (Figure not shown). The 3-dimensional plot shows biomass, revenue and maximum depth drives the distribution perpendicular to the fishery dependent variables. Occupancy and total catch are still dominated by species that has 50-100% occurrence (Figure 35c). Species that have no revenue information comprise the left cluster (Figure 35e) while the species that have no biomass information comprise the upper left and upper right cluster (Figure 35f).

The 3-D Shepard diagram showed a tighter cluster of points to the correlation line (Figure 35h).

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 25). The degrees of freedom for frequency, maximum depth and total catch is down to one. There were no significant differences in the variable interactions.

Table 25. PERMANOVA results for the removal of species with low quartile to median level for total catch. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	2008.9	2008.9	121.22	0.001
QRT_MAXZ	1	1813	1813	109.4	0.001
QRT_TOT_LBS	1	1498.2	1498.2	90.403	0.001
QRT_REV2	3	6367.9	2122.6	128.09	0.001
QRT_BIO	4	2677.1	669.27	40.386	0.001

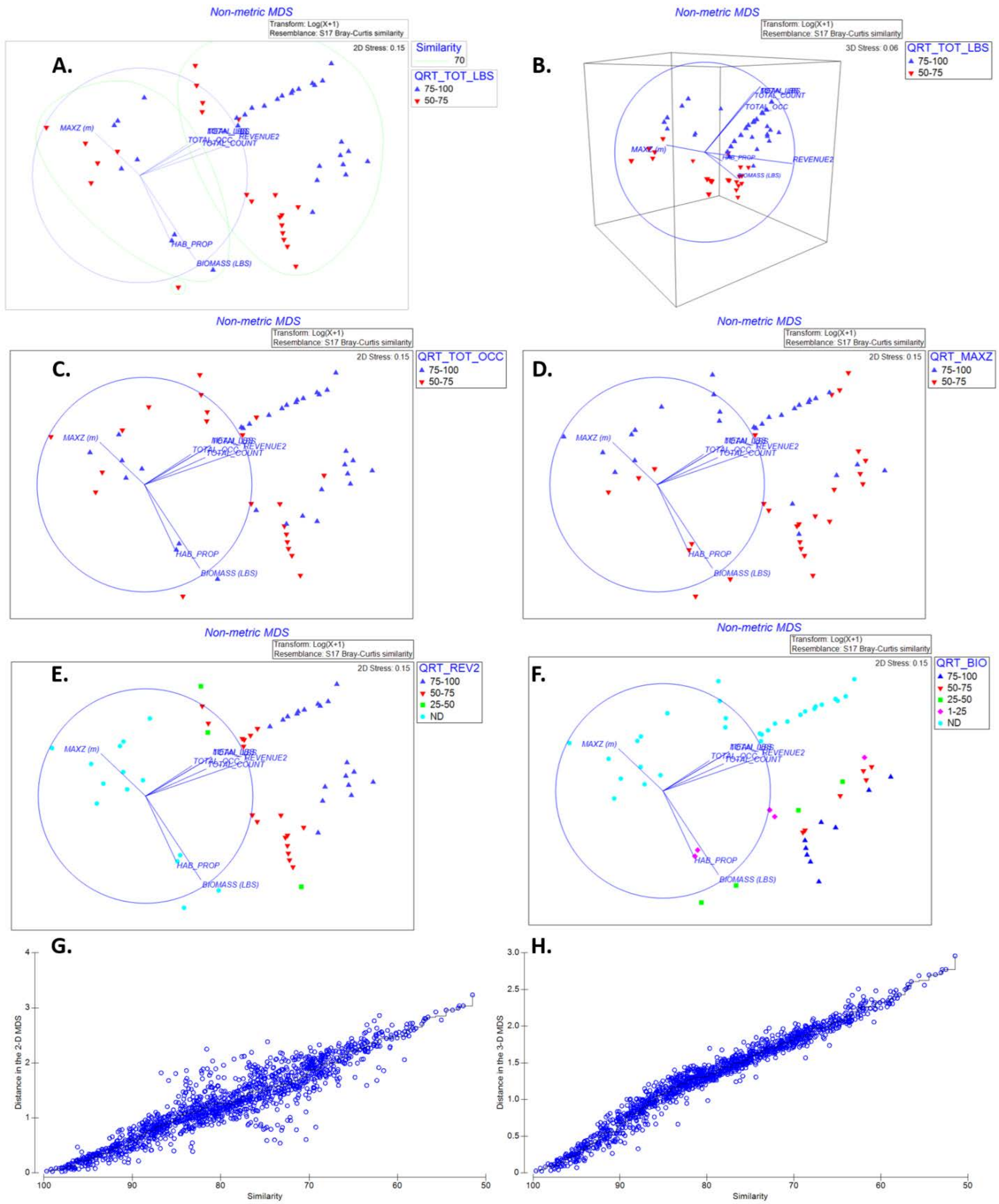


Figure 35. Two and three-dimensional plot with stress values of 0.15 and 0.06, respectively, of remaining MUS after the lower quartile to median of total catch were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); maximum depth (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.4.4 Delete 1-25% and 25-50% quartiles to remove species that have low contribution to the regional economy

The 2-D and 3-D stress values are 0.07 and 0.05, respectively (Figures 36a and 36b). Only two clusters remain after this filter was applied. The remaining species are represented by 36 species that have economic value above the median. Sixteen species are snappers, six jack species, five groupers, that are deep water species, one emperor, two soldierfish species, four species of surgeon and unicornfishes, and two species of lobster. The bigeye scad (*Selar crumenopthalmus*) is by far the species with the highest economic value for American Samoa, similar to Guam, due to the sheer volume of fish landed. Majority of the species are coral reef ecosystem management unit species while 11 of the species are bottomfish management unit species.

The directionality of the frequency of occurrence and total catch follows the fishery dependent vector lines (Figures 36c and 36e). The separation of the top group of points and the bottom points are driven by the availability of biomass data (Figure 36f). Deeper water species dominate the bottom group of points while the top group is comprised of species that occur at moderate depths (Figure 36d). The Shepard diagram showed tighter correlation along the line compared to the previous filters.

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 26). There were no significant differences in the variable interactions.

Table 26. PERMANOVA results for the removal of species with low quartile to median level for revenue. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	1284.9	1284.9	129.65	0.001
QRT_MAXZ	1	686.76	686.76	69.295	0.001
QRT_TOT_LBS	1	793.32	793.32	80.047	0.001
QRT_REV2	1	397.55	397.55	40.113	0.003
QRT_BIO	4	1441.5	360.38	36.362	0.001

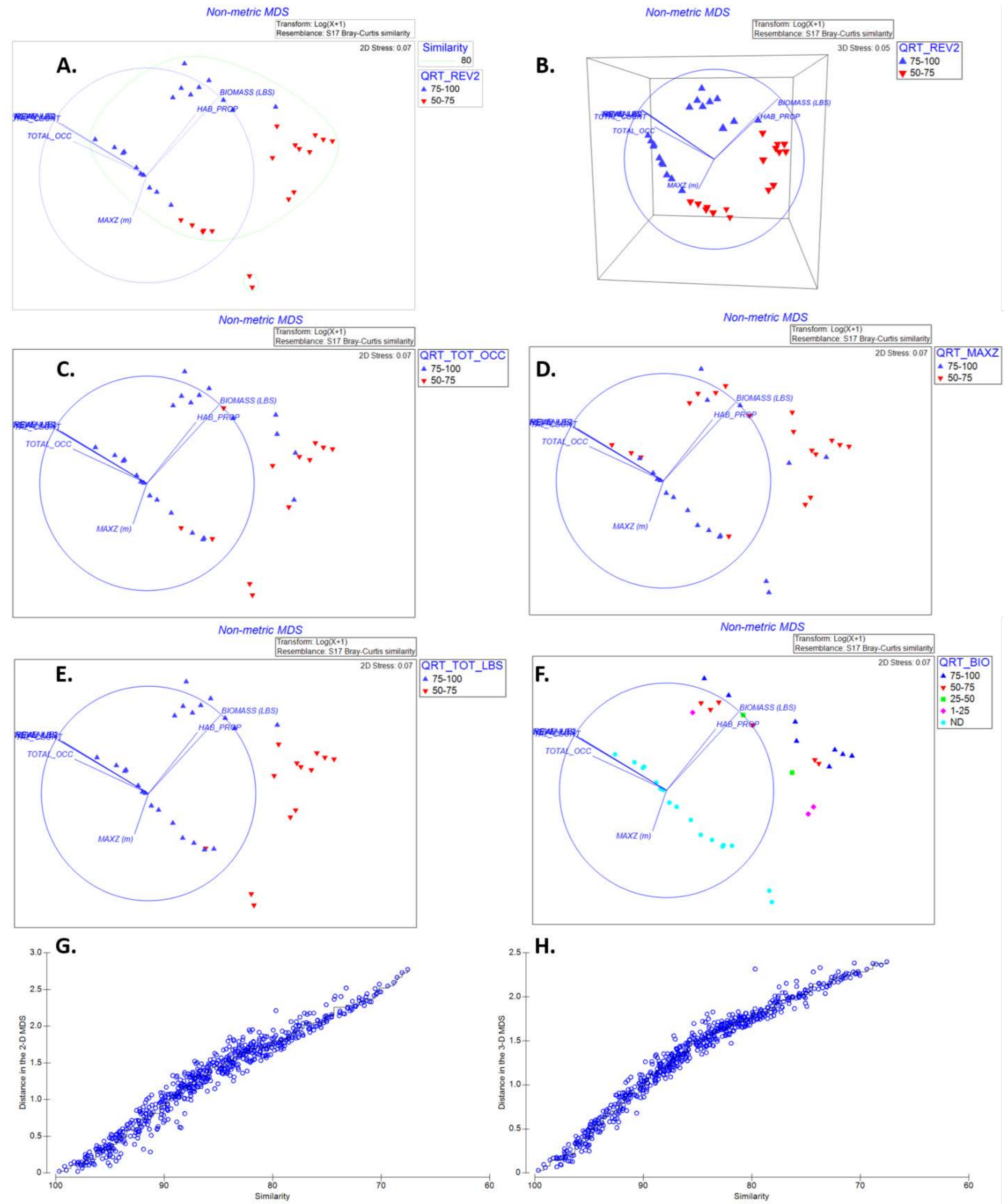


Figure 36. Two and three-dimensional plot with stress values of 0.07 and 0.05, respectively, of remaining MUS after the lower quartile to median of revenue were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); maximum depth (D); total catch (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.4.5 Delete 1-25% and 25-50% quartiles to remove species that have low biomass contribution

The 2-D and 3-D stress values are 0.04 and 0.02, respectively. Species names were included in the 2-D plot because the density of points allows viewing of the species that comprise the cluster (Figure 37a). After removing the species that comprise lower than the median biomass, the 2-D plot showed a single cluster at 85% similarity level. This filter removed 22 species resulting to 14 remaining species.

The 2-D plots of frequency of occurrence (Figure 37c) are dominated by species that comprise the 4th quartile, while maximum depth (Figure 37d) is mostly at the third quartile. The trends of total catch (Figure 37e) and revenue (Figure 37f) were very similar. The Shepard diagram showed most of the points are close to the correlation line indicating that the distance assignment is indicative of the similarity values hence the stress values are low (Figures 37g and 37h).

The PERMANOVA results indicate that the differences within each of the variables tested are lower. This is partly because most of the groupings are eliminated by the filtering process. The P value for max depth is not significant and revenue was not tested (Table 27).

Table 27. PERMANOVA results for the removal of species with low quartile to median level for biomass. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	393.41	393.41	31.343	0.006
QRT_MAXZ	1	66.052	66.052	5.2624	0.043
QRT_TOT_LBS	1	120.91	120.91	9.6333	0.022
QRT_REV2	0	0		No test	
QRT_BIO	1	77.594	77.594	6.182	0.02

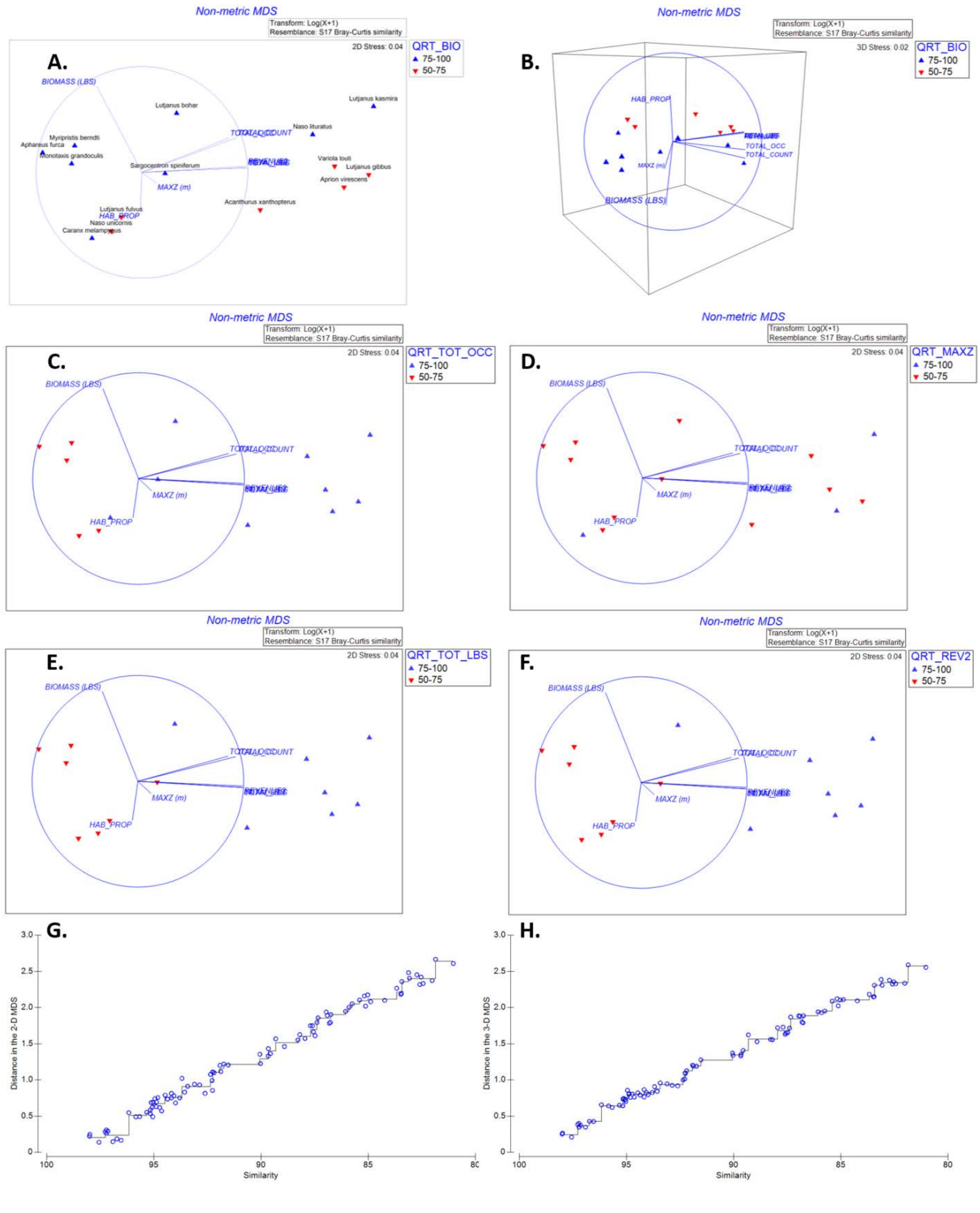


Figure 37. Two and three-dimensional plot with stress values of 0.04 and 0.02, respectively, of remaining MUS after the lower quartile to median of biomass were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); maximum depth (D); total catch (E); and revenue (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.5 Species removal rate after the filters were applied at 50% cut-off

As expected, the rate of decline per filtering stage is faster with higher cut-off threshold. This leaves 13 species that are potentially in need of federal management. The list of species is found in Table 28.

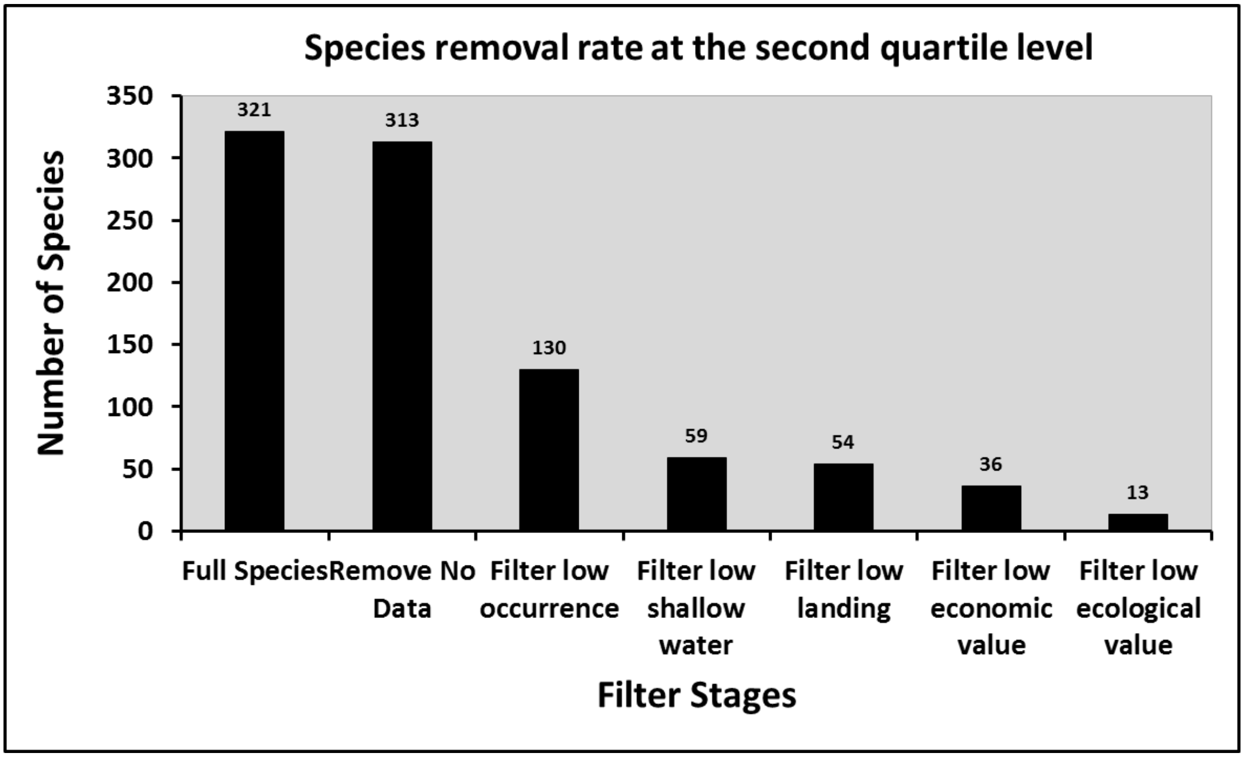


Figure 38. Number of species remaining for federal fisheries management after filters were applied at 50% cut-off.

Table 28. Candidate species for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 50% cut-off.

Scientific Name	**Common Name**	**Family**	**FEP Groups**
Acanthurus nigricans	Whitecheek Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus nigrofuscus	Brown Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus olivaceus	Orangeband Surgeonfish	Acanthuridae	CRE-Fishes
Caranx ignobilis	Giant Trevally, Jack	Carangidae	BF Multi-species complex
Cephalopholis urodeta	Flag-tailed Grouper	Serranidae	CRE-Fishes
Cheilinus undulatus	Napoleon Wrasse	Labridae	CRE-Fishes
Epinephelus fasciatus	Blacktip Grouper	Serranidae	BF Multi-species complex
Lethrinus harak	Thumbprint Emperor	Lethrinidae	CRE-Fishes
Naso unicornis	Bluespine Unicornfish	Acanthuridae	CRE-Fishes
Plectropomus laevis	Saddleback Grouper	Serranidae	CRE-Fishes
Scarus forsteni	Tricolor Parrotfish	Scaridae	CRE-Fishes

Scarus rubroviolaceus	Parrotfish	Scaridae	CRE-Fishes
Scarus schlegeli	Chevron Parrotfish	Scaridae	CRE-Fishes

5.6 Multivariate analysis on a 75% cut-off point

In the interest of conciseness of the report, we would be presenting the series of nMDS plots at each cut-off levels. The patterns are generally similar to the previous cut-off levels. We will be highlighting the very specific items in this cut-off threshold that is worth mentioning particularly the levels of groupings as well as the results of PERMANOVA.

5.6.1 Delete 1-25%, 25-50%, and 50-75% quartiles to remove species that is not or rarely caught by the fishery

The 2-D and 3-D stress values are 0.14 and 0.07, respectively. Although majority of the species had been removed, the similarity value of the residual species is the same as shown by the four clusters at 80% similarity, same number of clusters in the lower and median occurrence cut-offs (Figure 39a). The main characteristic at this level of cut-off and filtering stage is the full range of values persists for maximum depth and biomass (Figures 39c and 39f). Species with no revenue data comprise the three small clusters (Figure 39e). On the other hand, species with no biomass data comprise the two upper clusters and the top half of the big cluster (Figure 39f). The points around the correlation line are much tighter at this level of cut-off compared to the previous two levels (Figure 39g and 39f).

The PERMANOVA results showed significant differences within variables. Frequency of occurrence was not tested due to zero degrees of freedom since only one level remained (Table 29).

Table 29. PERMANOVA results for the removal of species with low to third quartile level for frequency of occurrence. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	0	0		No test	
QRT_MAXZ	4	6680.3	1670.1	94.805	0.001
QRT_TOT_LBS	2	4676.8	2338.4	132.74	0.001
QRT_REV2	3	7498.7	2499.6	141.89	0.001
QRT_BIO	4	3085.9	771.47	43.794	0.001

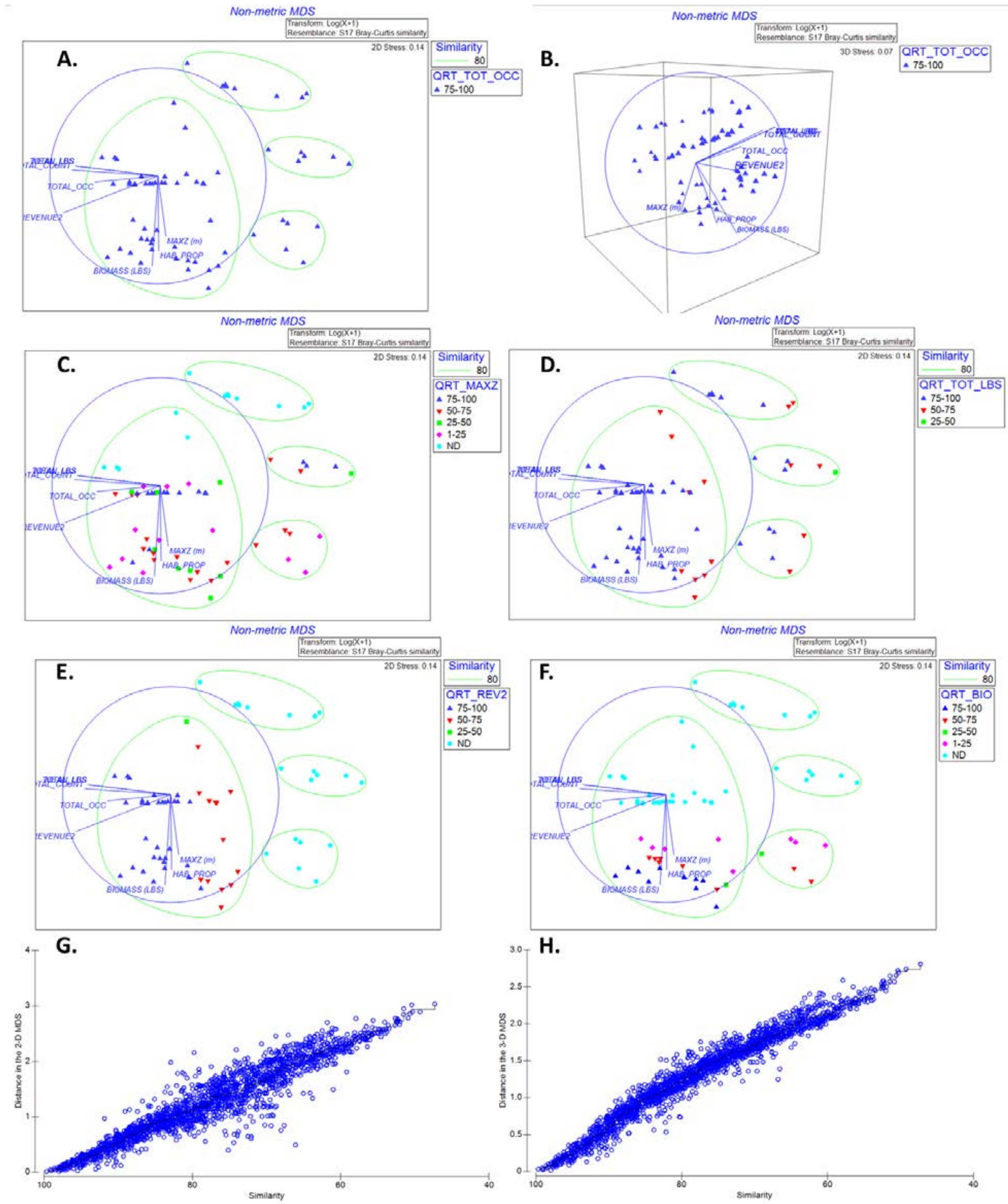


Figure 39. Two and three-dimensional plot with stress values of 0.14 and 0.07, respectively, of remaining MUS after the lower quartile to the third quartile of frequency of occurrence were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of maximum depth (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.6.2 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that are mostly in territorial waters

The 2-D and 3-D stress values are 0.01 and 0.01, respectively. Removal of the remaining shallow depth species had reduced the species into two clusters (Figure 40a). The vector lines still show biomass, depth and revenue being the main drivers in the distribution. Species with no revenue information comprise the small outer cluster (Figure 40e), while species with no biomass data comprise almost all points in both clusters (Figure 40f). The PERMANOVA results showed significant differences within variables for total catch, revenue and biomass (Table 30). No test was conducted for occurrence and maximum depth.

Table 30. PERMANOVA results for the removal of species with low to third quartile level for maximum depth. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	0	0		No test	
QRT_MAXZ	0	0		No test	
QRT_TOT_LBS	1	988.65	988.65	98.253	0.001
QRT_REV2	2	1103.1	551.54	54.813	0.001
QRT_BIO	2	261.82	130.91	13.01	0.008

5.6.3 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that are not targeted by the fisheries

The 2-D and 3-D stress values are 0.01 and 0.01, respectively (Figure 41a and 41b). At this cut-off level and filter stage, two clusters remained at 80% similarity but one cluster seem like an outlier with only 1 point and located outside and is driven by maximum depth. For revenue, the single species cluster is the only one with no data and the rest had data (Figure 41e). On the other hand, only 2 points have biomass data and the rest had no data (Figure 41f). The direction of the vector lines has changed with revenue and biomass now influencing the points along the same gradient. These two variables have PERMANOVA results that are significant whereas occurrence, depth, and catch were not tested (Table 31).

The Shepard diagram shows most points lie on the correlation line (Figures 41g and 41h).

Table 31. PERMANOVA results for the removal of species with low to third quartile level for total catch. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	0	0		No test	
QRT_MAXZ	0	0		No test	
QRT_TOT_LBS	0	0		No test	
QRT_REV2	2	822.95	411.47	47.719	0.001
QRT_BIO	2	261.82	130.91	15.182	0.006

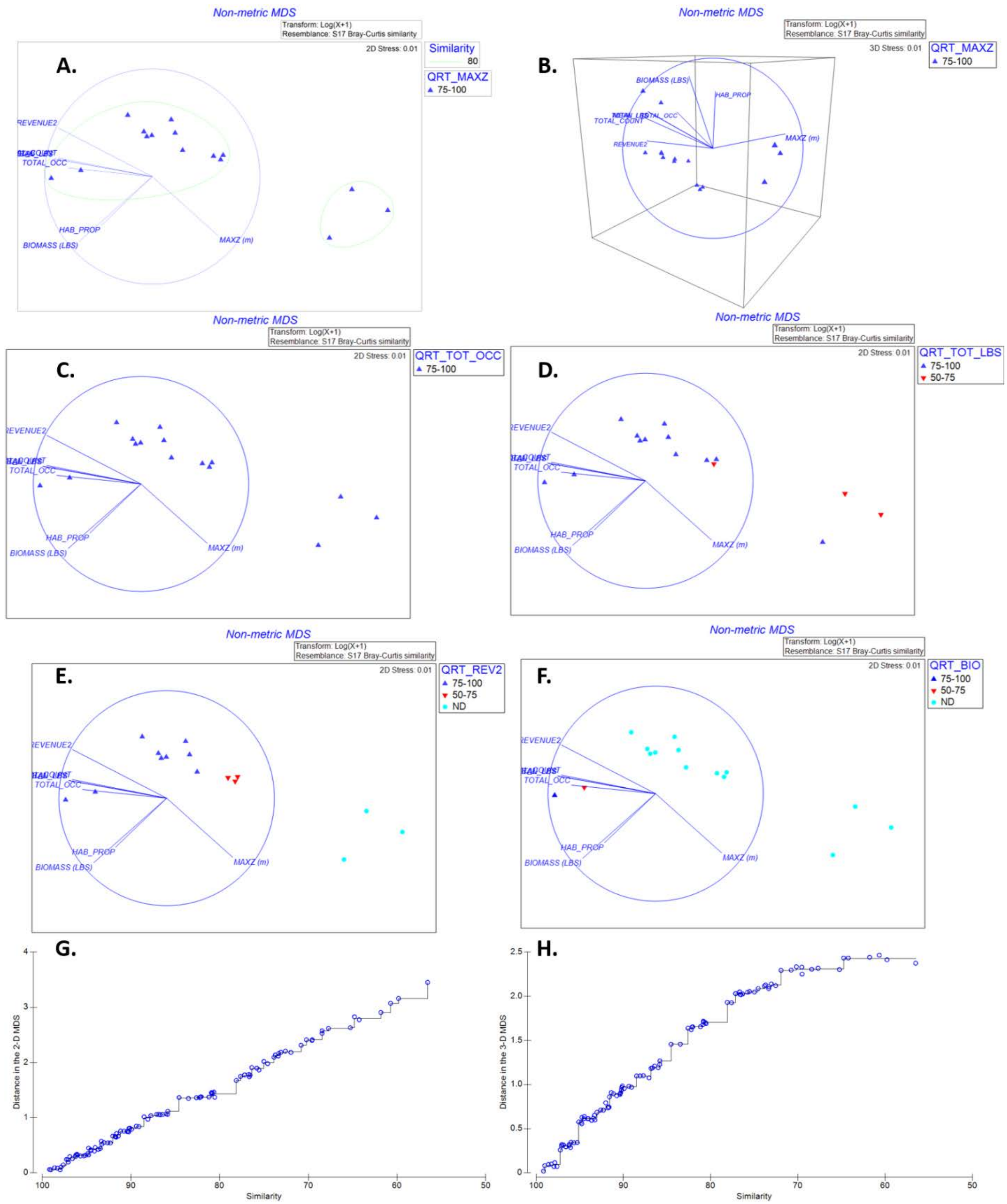


Figure 40. Two and three-dimensional plot with stress values of 0.01 and 0.01, respectively, of remaining MUS after the lower quartile to the third quartile of maximum depth were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

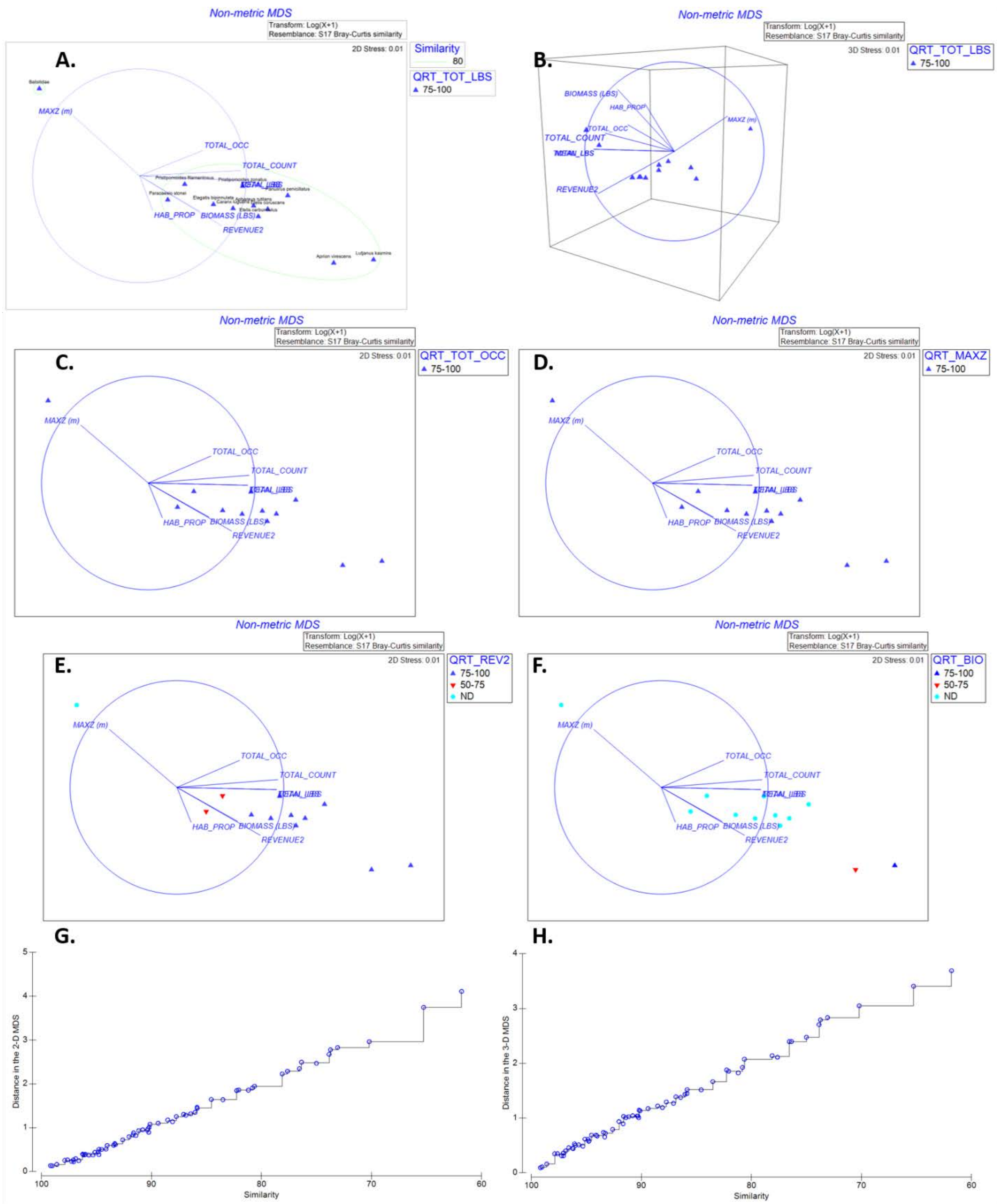


Figure 41. Two and three-dimensional plot with stress values of 0.01 and 0.01, respectively, of remaining MUS after the lower quartile to the third quartile of total catch were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of occurrence (C); maximum depth (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.6.4 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that have low contribution to the regional economy

The 2-D and 3-D stress values are 0.01 and 0.01, respectively (Figure 42a and 42b). At this cut-off level and filter stage, only one cluster remained at 80% similarity. Since only a few species are left, the points were labeled with species name because the density of points allows viewing of the species that comprise the cluster. At this cut-off, only nine species remain. The biggest contributor to the economy of American Samoa was the spiny lobster, *Panulirus penicillatus*, due to its relatively high price per pound. The remaining eight species comprised of six species of snappers and two species of jacks. Values of points within maximum depth, total catch and revenue were all within the 75-100% quartile while points in the biomass plot had mostly no data (Figures 42c, 42d, 42e, and 42f). All the points in the Shepard 2-D and 3-D diagrams are within the correlation line (Figures 42g and 42h).

No PERMANOVA test was conducted on four of the main variables. Biomass remained significant (pseudo F = 13.52, df = 2, P_{perm}=0.026).

5.6.5 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that have low biomass

Applying the last filter removed eight species including *Aphareus rutilans, Aprion virescens, Etelis carbunculus, Etelis coruscans, Pristipomoides zonatus (snappers)*; *Caranx lugubris, Elagatis bipinnulata (jacks);* and *Panulirus penicillatus (spiny lobster)*. Only one species remained which is the blueline snapper, *Lutjanus kasmira*. The nMDS plots were no longer shown because it will only plot one point.

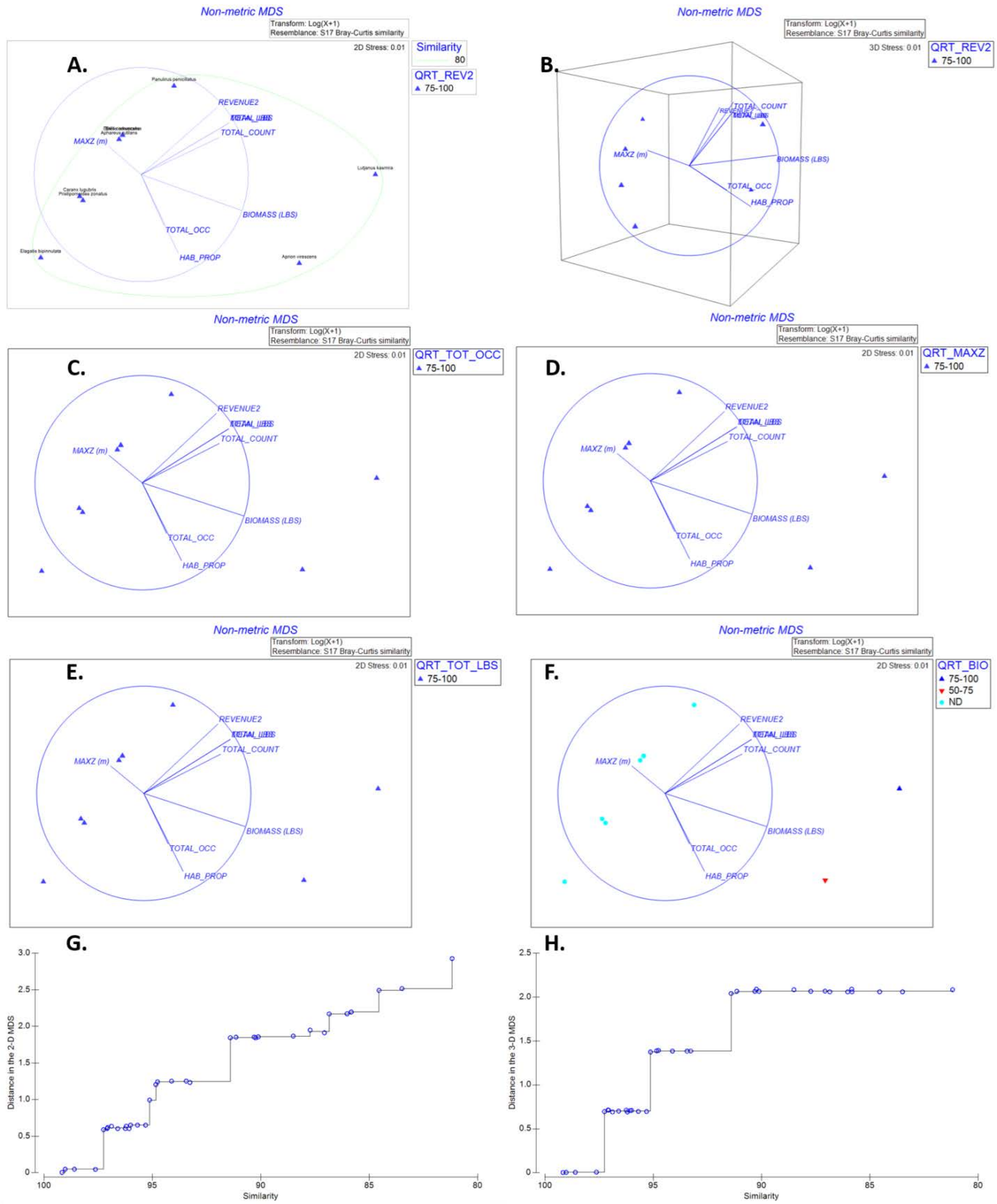


Figure 42. Two and three-dimensional plot with stress values of 0.01 and 0.01, respectively, of remaining MUS after the lower quartile to the third quartile of revenue were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

5.7 Species decline rate after the filters were applied at 75% cut-off

As expected the decline rate at 75% cut-off threshold will be higher. Figure 43 showed the relative rate of decline between the three cut-off thresholds. With a 75% cut-off, this leaves one species that is potentially in need of federal management. The list of species is found in Table 32.

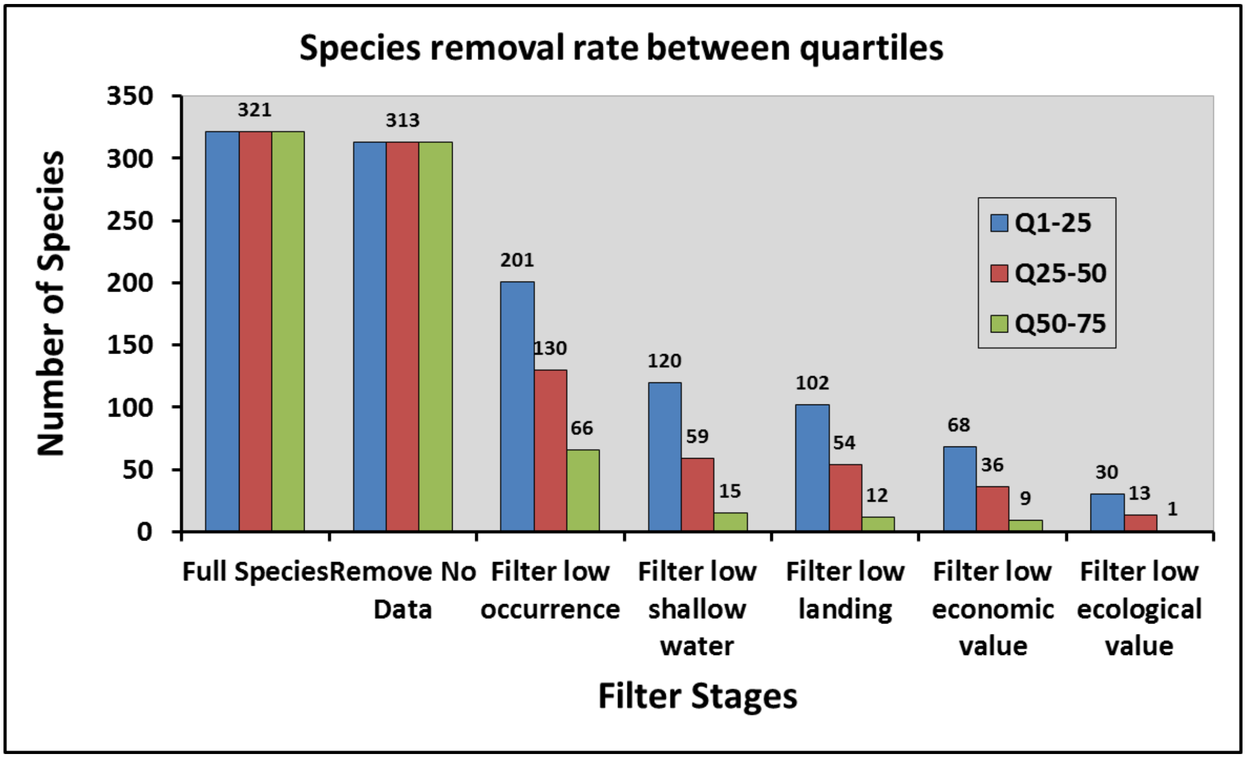


Figure 43. Number of species remaining after each filter is applied comparing the 3 cut-off thresholds.

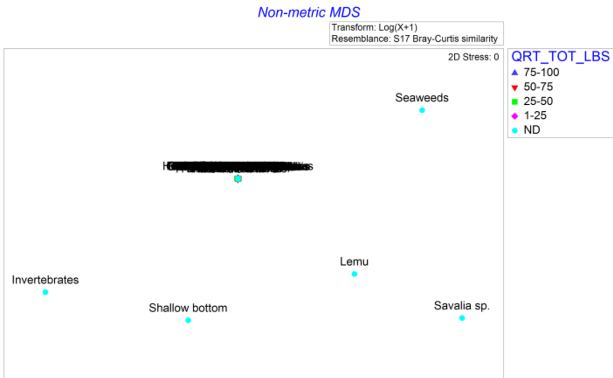
Table 32. Candidate species for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 75% cut-off.

Scientific Name	Common Name	FAMILY	FEP GROUP
Lutjanus kasmira	Blueline Snapper	Lutjanidae	BF Multi-species complex

6 COMMONWEALTH OF NORTHERN MARIANA ISLANDS ECOSYSTEM COMPONENT ANALYSIS

6.1 Removal of MUS species with no available data

The MUS list for Commonwealth of Northern Mariana Islands contains 145 species that are mostly coral reef associated and with some invertebrates. More than half of these species had catch, total occurrence and maximum depth information. In creating the master data table, most of the species did not have any revenue information but more than half had biomass data. The result of the multivariate analysis showed those species with no data as a scatter of few data points while the species that have actual values are clustered together as one point (Figure 44a). This is also shown in the Shepard diagram where the vertical line with 0 similarity values had a few points (Figure 44b) and those with similarities are formed a solid horizontal line. These species were removed following the decision tree (Figure 1).



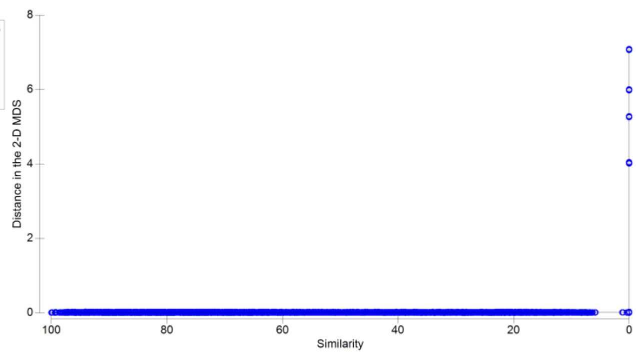


Figure 44. MDS plot (a) and Shepard diagram (b) of all MUS including species with no available data. The 3D stress value = 0.00.

Table 33. PERMANOVA results for the removal of species with no data. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	4	1.2139E+05	30348	435.86	0.001
QRT_MAXZ	4	24764	6191.1	88.915	0.001
QRT_TOT_LBS	4	23825	5956.1	85.541	0.001
QRT_REV2	3	64.74	21.58	0.30992	0.749
QRT_BIO	4	10186	2546.6	36.574	0.001

The nMDS plots after the removal species with no data are shown in Figure 45. Orthogonal vectors are maximum depth versus various fishery-dependent variables (e.g., total catch, total count, mean catch, etc.; e.g., Figure 45a). For total occurrence (Figure 45a), total catch in lbs. (Figure 45c), and revenue (Figure 45d), there is a gradient of increasing values from the lower-right to the upper-left of the plot. In contrast, maximum depth (Figure 45b) shows a perpendicular gradient of increasing values from the lower-left to the upper-right. Species with missing data for certain variables appear on the right side of the plot.

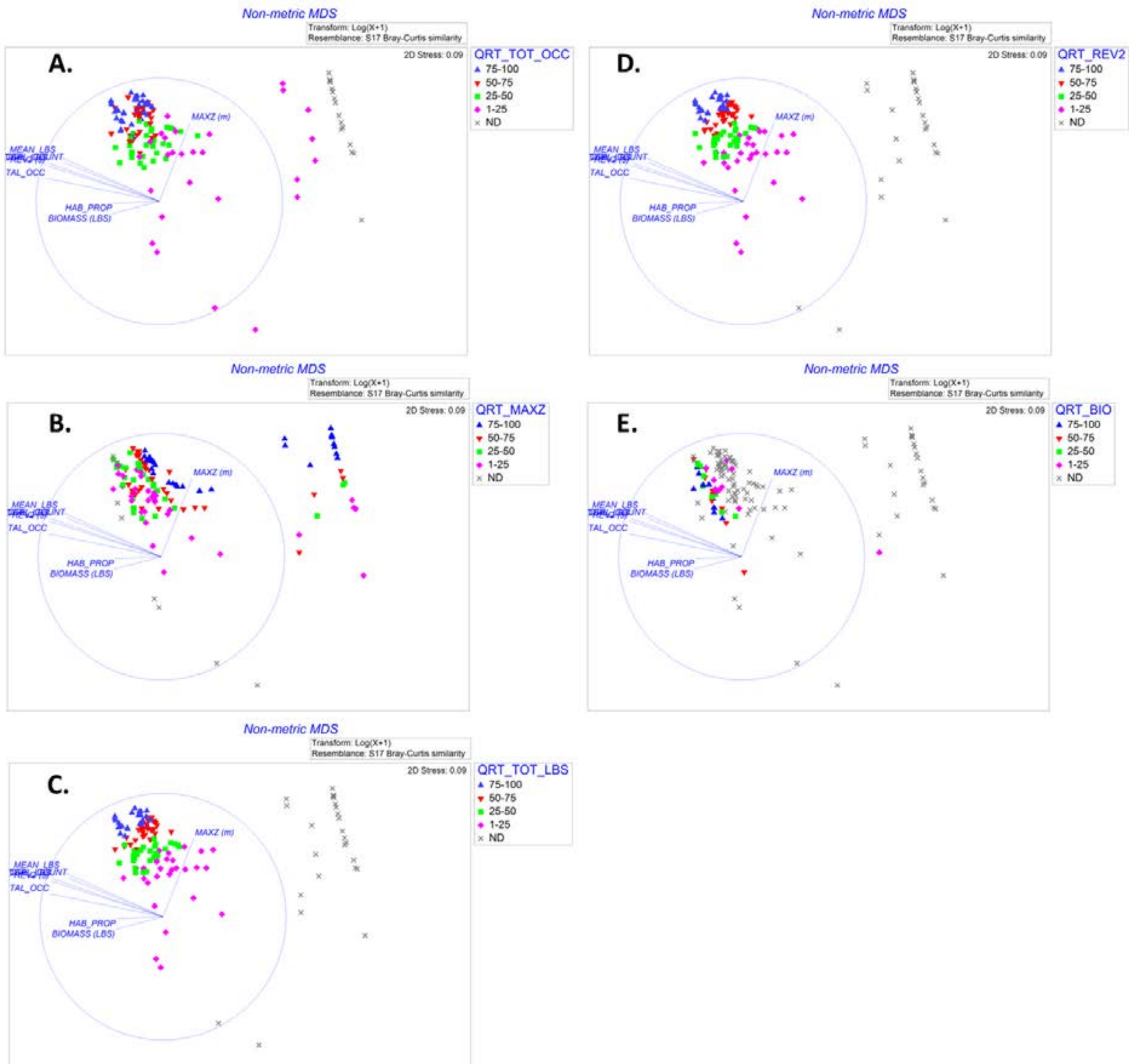


Figure 45. Two-dimensional plot with a stress-value 0.09 of MUS with available data for frequency of occurrence (A). The same 2-D plot with factors using quartiles of maximum depth (B); quartiles of total catch (C); quartiles of revenue (D); and quartiles of biomass (E).

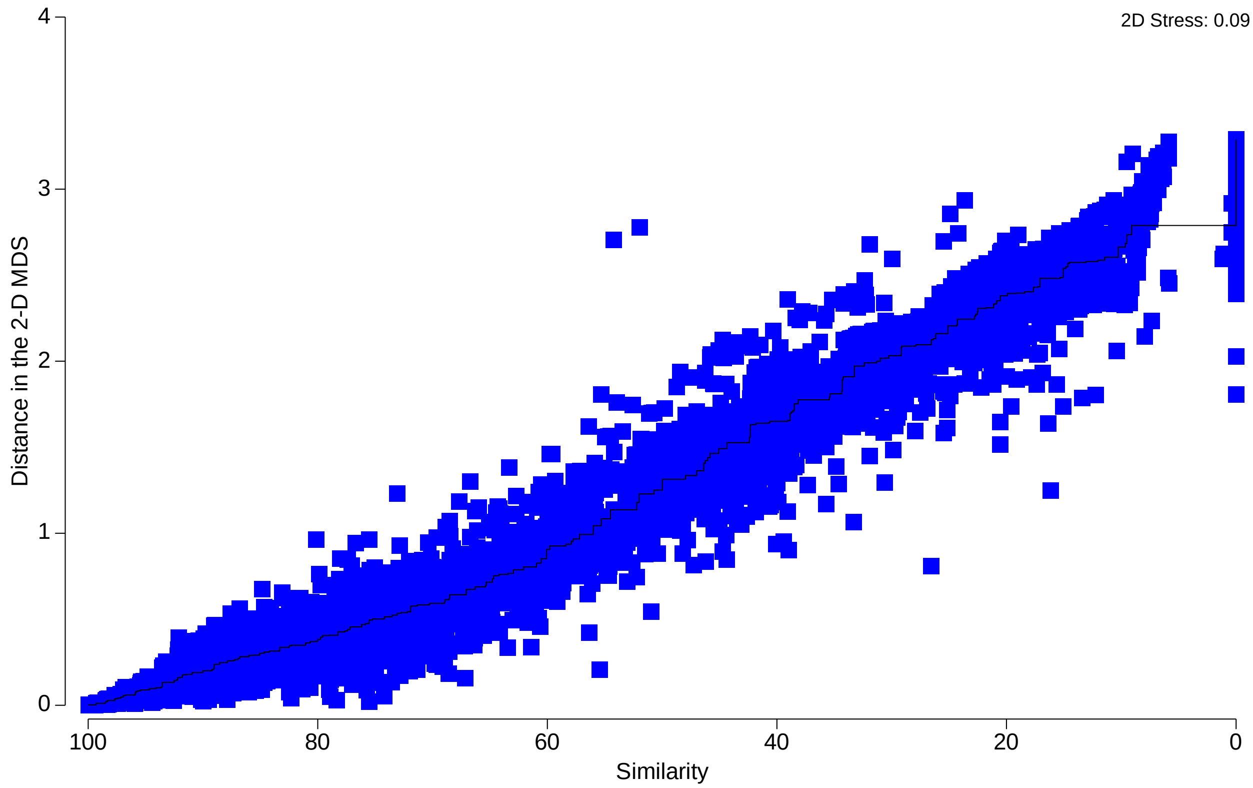


Figure 46. Shepard diagram showing the similarity values using Bray-Curtis index and the distance representation in the 2-D plot for MUS with available data.

6.1.1 Delete lower quartile to remove species that are not or rarely caught by the fishery

This phase of the analysis applies the data proxy for the NS1 filters sequentially and utilizes a 25% cut-off point where the bottom 25% is removed and conversely retains the top 75%. This would remove species that are not or rarely caught by the fisheries.

Species with 0-25% frequency of being caught by the fishery were removed (Figure 47a and 47b). The 2-D and 3D plots have stress values of 0.11 and 0.07, respectively. The nMDS plot shows 3 general clustering (Figure 47a and 47b). The vector line separates the effect of the fishery dependent data from habitat proportion and biomass. The third dimension is driven by the maximum depth data. Within each cluster, one can see the general right to left directionality in the quartiles of occurrence from lower to higher occurrence. The same directionality can be seen in the 2 general clusters for the total catch and revenue (lower proportion of catch on the left side of the cluster and increasing towards the right) (Figures 47d and 47e). A few points at the top cluster are characterized by species with no available depth information (Figure 47c). All the points at the top clusters are species with no biomass information (Figure 47f). The Shepard diagrams for the 2D and 3D plots showed the disappearance of the vertical line and the points are tighter on the 3D Shepard diagram due to the lower stress values.

The PERMANOVA results showed the main effects to be significant (Table 34). The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here. Note that the degrees of freedom for occurrence is reduced to two, due to the removal of the lower quartile.

Table 34. PERMANOVA results for the removal of species with low frequency of occurrence. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	Df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	2	7814.1	3907.1	264.45	0.001
QRT_MAXZ	4	4677.5	1169.4	79.148	0.001
QRT_TOT_LBS	3	3843.4	1281.1	86.712	0.001
QRT_REV2	3	313.7	104.57	7.0775	0.002
QRT_BIO	4	6141.4	1535.4	103.92	0.001

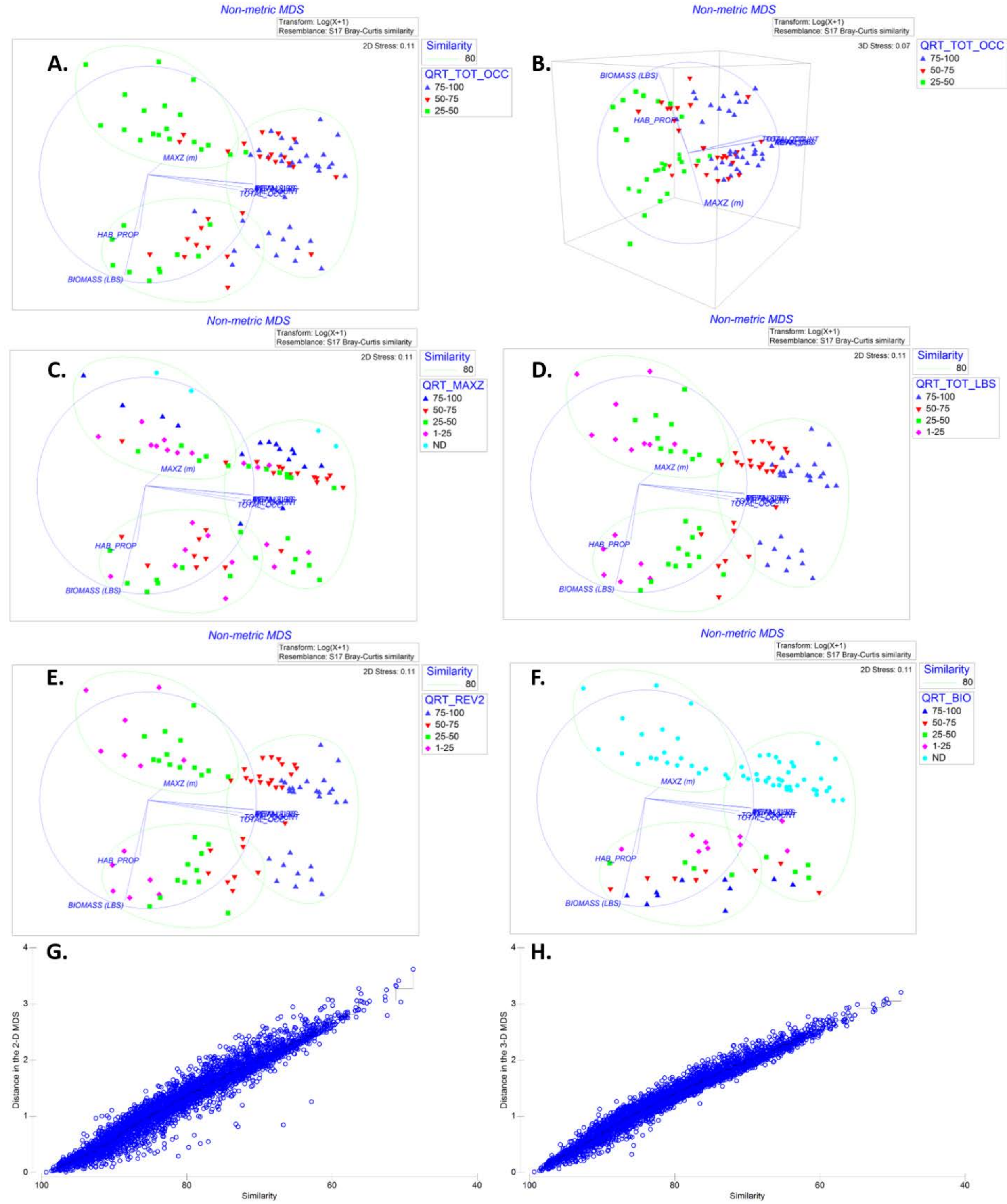


Figure 47. Two and three-dimensional plot with stress-values of 0.11 and 0.07, respectively, of remaining MUS after the lower quartile of frequency of occurrence was removed (A and B). The same 2-D plots with factors using quartiles of maximum depth (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

6.1.2 Delete lower quartile to remove species mostly in territorial waters

The second NS1 filter was applied at this stage to remove species that are mostly in shallower depth therefore occurring mostly in territorial waters. The 2-D and 3-D plots stress values are 0.09 and 0.07, respectively. The density of the ordination plots had decreased with the removal of shallow water species and species with no depth information. There are three sets of clusters at 80% similarity running lower left to upper right direction (Figure 48a). Two clustering follows the biomass parameter. Based on the 3-D plot, the directionality of the 3 clusters is following the biomass and maximum depth variables (Figure 48b). The frequency of occurrence (Figure 48c), total catch plots (Figure 48d) and revenue data (Figure 48e) showed low to high directionality from higher values on the left to low values on the right for both clusters. The biomass plot (Figure 48f) shows the species with no available biomass data that comprise the points on the upper cluster.

The removal of shallow water species and the species with no depth information resulted in a tighter correlation plot compared to the previous filtering stage (Figure 48g and 48h). A tighter correlation between the distance assigned to the points and the similarity occur in the 3-dimensional plot.

The PERMANOVA results showed the main effects to be significant (Table 35) except for revenue. The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here. The maximum depth and revenue degrees-of-freedom is now down to two, due to the removal of the lower quartile.

Table 35. PERMANOVA results for the removal of species in shallow waters. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	Df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	2	5433.7	2716.9	178.23	0.001
QRT_MAXZ	2	2508.9	1254.5	82.295	0.001
QRT_TOT_LBS	3	2786.9	928.97	60.942	0.001
QRT_REV2	2	77.258	38.629	2.5341	0.095
QRT_BIO	4	3864.2	966.04	63.374	0.001

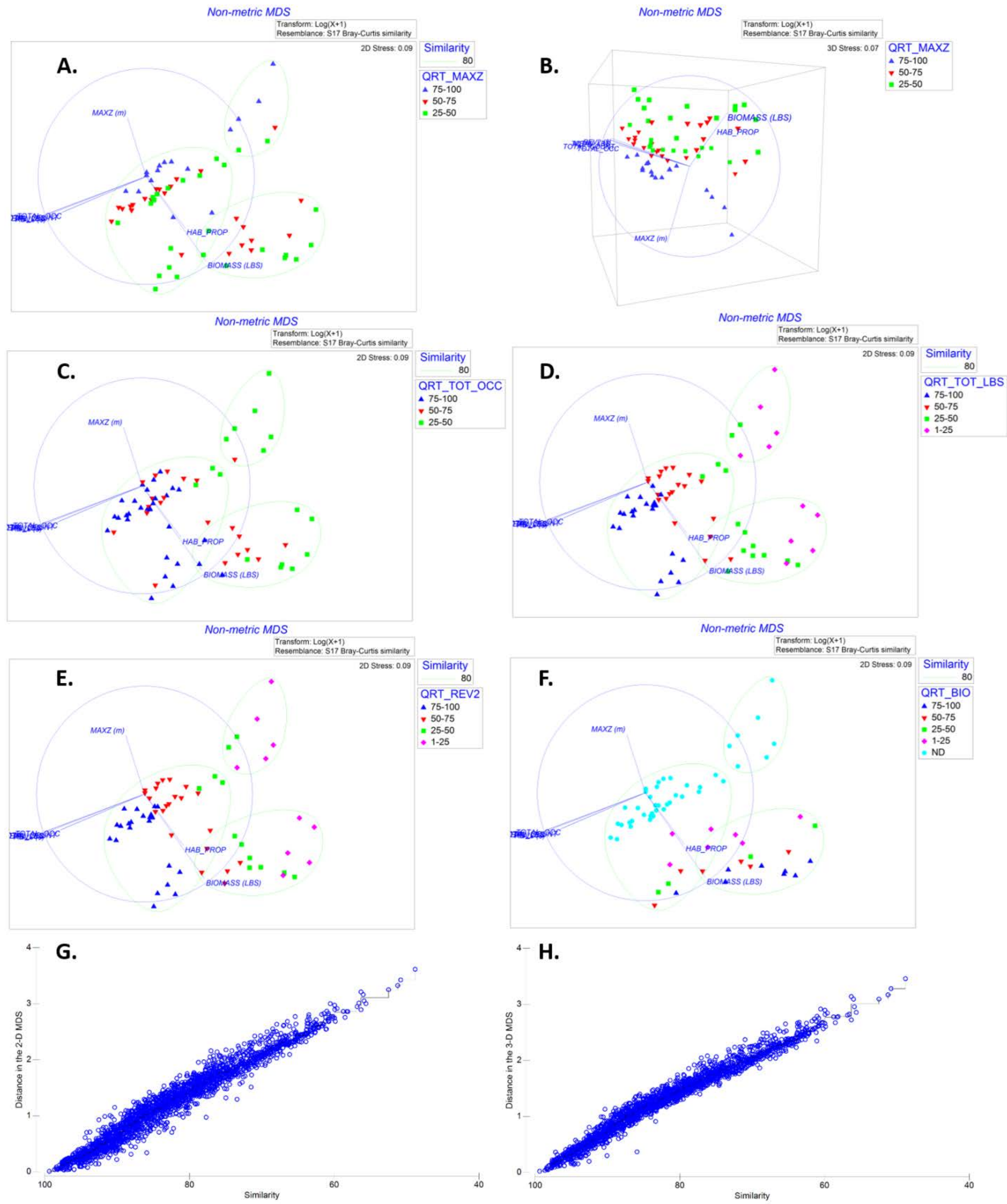


Figure 48. Two and three-dimensional plot with stress-values of 0.09 and 0.07, respectively, of remaining MUS after the lower quartile of maximum depth was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

6.1.3 Delete lower quartile to remove species that are not targeted by the fishery

The third NS1 filter was applied at this stage to remove species that are not targeted by the fishery. This stage still uses the 0-25% cut-off similar to the first and second filter. The 2-D and 3-D plots stress values are 0.10 and 0.06, respectively. The density of the ordination plots had further decreased with the removal of species that are not targeted by the fishery and the lower quartile of species with low catch. There are two sets of clusters at 80% similarity running lower right to upper left direction (Figure 49a). The two clustering follows the biomass and maximum depth parameters. The directionality of points follows the fishery dependent variables (Figure 49). Based on the 3-D plot, the directionality of the 2 clusters is following the biomass and fishery dependent variables (Figure 49b). The frequency of occurrence (Figure 49c), total catch plots (Figure 49d) and revenue data (Figure 49e) showed low to high directionality from higher values on the lower left to low values on the upper right for both clusters. The biomass plot (Figure 49f) shows the species with no available biomass data that comprise the points on the left cluster.

The removal of species not targeted by the fishery and species with low catch resulted in a tighter correlation plot compared to the previous filtering stage (Figure 49g and 49h). A tighter correlation between the distance assigned to the points and the similarity occur in the 3-dimensional plot.

The PERMANOVA results showed the main effects to be significant (Table 36) except for revenue. The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here. The degrees-of-freedom of all variable except biomass is now down to two, due to the removal of the lower quartile.

Table 36. PERMANOVA results for the removal of species with low total catch. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	2	2303.9	1151.9	81.643	0.001
QRT_MAXZ	2	1505	752.48	53.331	0.001
QRT_TOT_LBS	2	1845.7	922.86	65.407	0.001
QRT_REV2	2	74.257	37.129	2.6315	0.074
QRT_BIO	4	2456.6	614.15	43.527	0.001

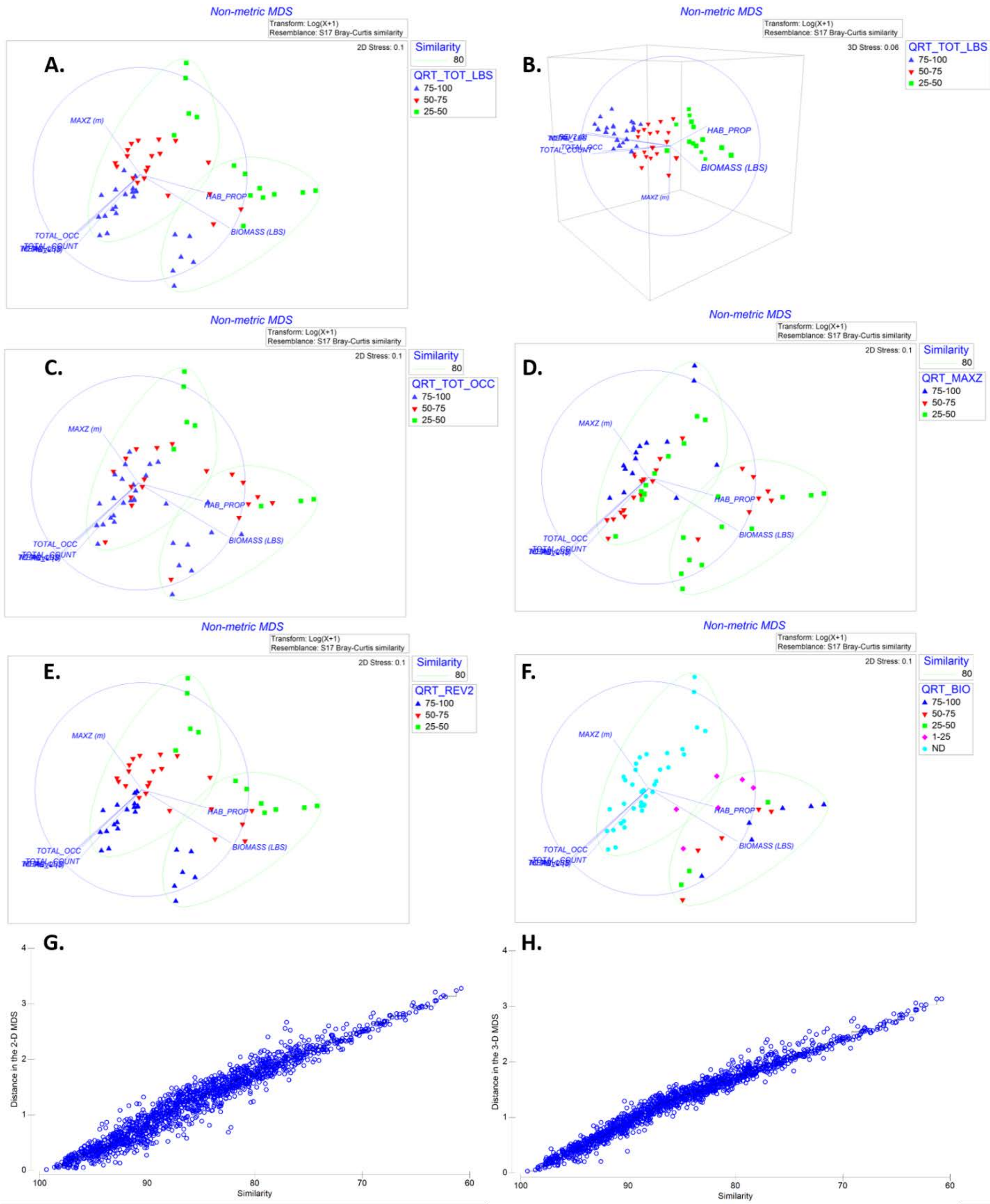


Figure 49. Two and three-dimensional plot with stress-values of 0.10 and 0.06, respectively, of remaining MUS after the lower quartile of total catch was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); maximum depth (D); total catch (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

6.1.4 Delete lower quartile to remove species that have low contribution to the regional economy

The fourth NS1 filter was applied at this stage to remove species that have low contribution to the regional economy, however, no species was further removed from the previous filter stage (i.e., removal of species which are not or rarely targeted by the fishery). The cluster patterns and stress values are the same since there were no species removed. The plots are expected to be exactly the same so they are not presented. It is expected that the PERMANOVA results will be like the previous filtering stage.

6.1.5 Delete lower quartile to remove species that have low biomass contribution

The last NS1 filter is applied at this stage to remove species that have low biomass contribution. The application of the last filter removed the points that comprise the top left cluster from the previous filtering. The stress values for the 2-D and the 3-D plots are 0.03 and 0.02, respectively (Figures 50a and 50b). The application of the last filter resulted in 14 remaining species that are left for consideration for federal conservation and management. The Shepard diagram also showed tighter correlation compared to the previous four filters applied to the data (Figures 50g and 50h).

Caution needs to be made in applying this filter to the species remaining from the fourth filter. Note that the biomass information is from surveys conducted by CREP at depths of 0-30 meters. Absence of information does not mean that there is no available information but these species maybe found at greater depths beyond the survey depth. Application of this filter will artificially remove the deep bottomfish species which are currently being managed and stock assessments are available. The end result from applying this filter will retain species that are covered by the underwater census surveys. The SSC can choose to apply this filter or not.

The PERMANOVA results showed the main effects to be significant (Table 37) except maximum depth. The fidelity of the groupings is reflected in the directionality by vectors. The interaction terms were not significant and are not reported here.

Table 37. PERMANOVA results for the removal of species with low biomass. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares.

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	2	571.19	285.59	98.246	0.001
QRT_MAXZ	1	41.919	41.919	14.42	0.2231
QRT_TOT_LBS	2	316.66	158.33	54.467	0.0015
QRT_REV2	1	22.44	22.44	7.7195	0.0015
QRT_BIO	2	95.507	47.754	16.428	0.0017

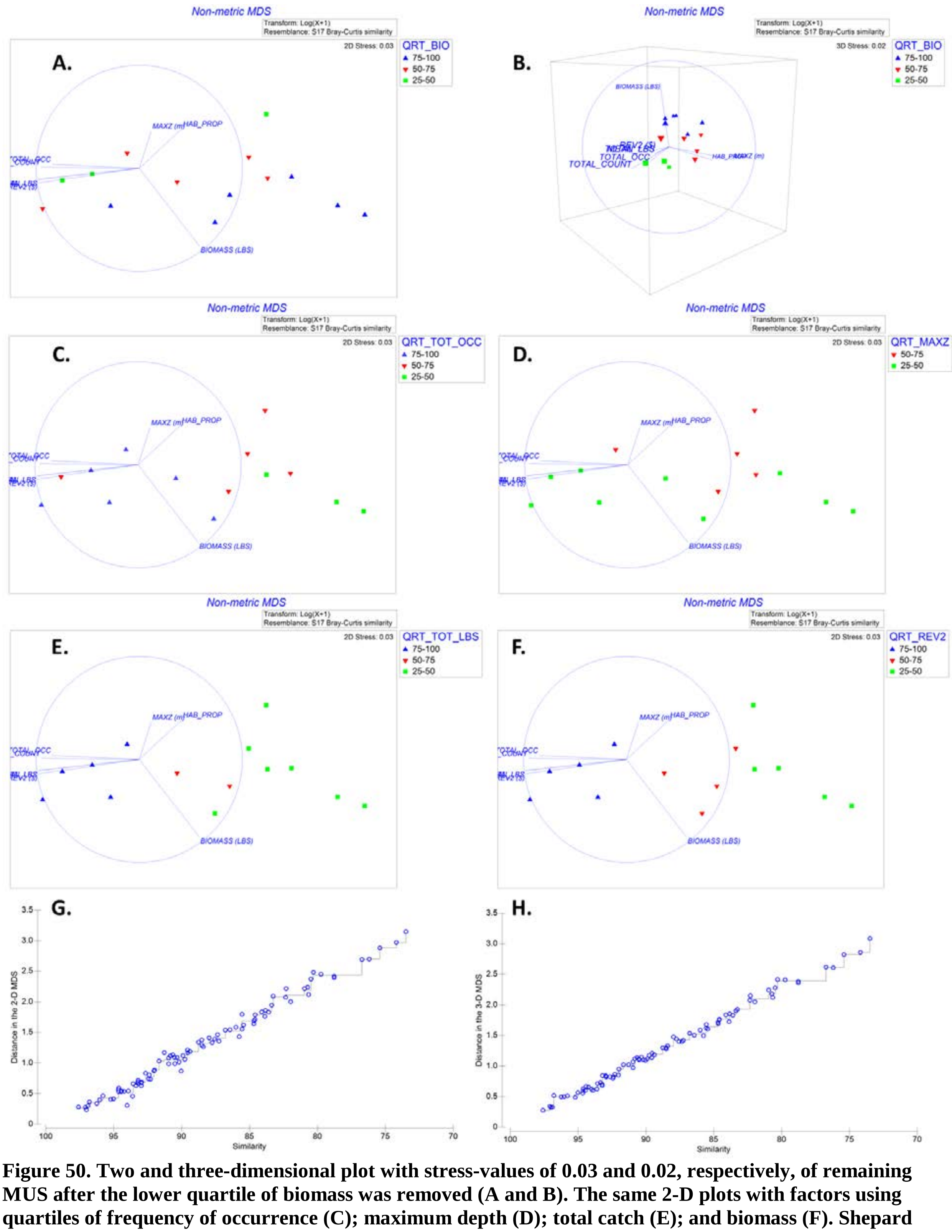


Figure 50. Two and three-dimensional plot with stress-values of 0.03 and 0.02, respectively, of remaining MUS after the lower quartile of biomass was removed (A and B). The same 2-D plots with factors using quartiles of frequency of occurrence (C); maximum depth (D); total catch (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

6.2 Species decline rate after the filters were applied at 25% cut-off

Figure 51 shows the number of species remaining after the different filters was applied following the decision tree. The total MUS in CNMI started at 145 species of which 5 had no fishery dependent, biomass, revenue, and max depth information. Of the remaining 140 species, 48 were not caught or are rarely caught by the fishery. After the 2 filters were applied, only 68 species were left. Ten species were removed from those species that occurred in territorial waters and 58 species were left after catch filter. There were no further reductions in the number of species when the revenue filter was applied because all the lower quartile species was already filtered out by the occurrence filter. Once the fifth filter was applied, 44 species were removed for having low biomass and no biomass data resulting in 14 species left for federal conservation and management. The list of candidate species to remain in federal fisheries management is found in Table 7.

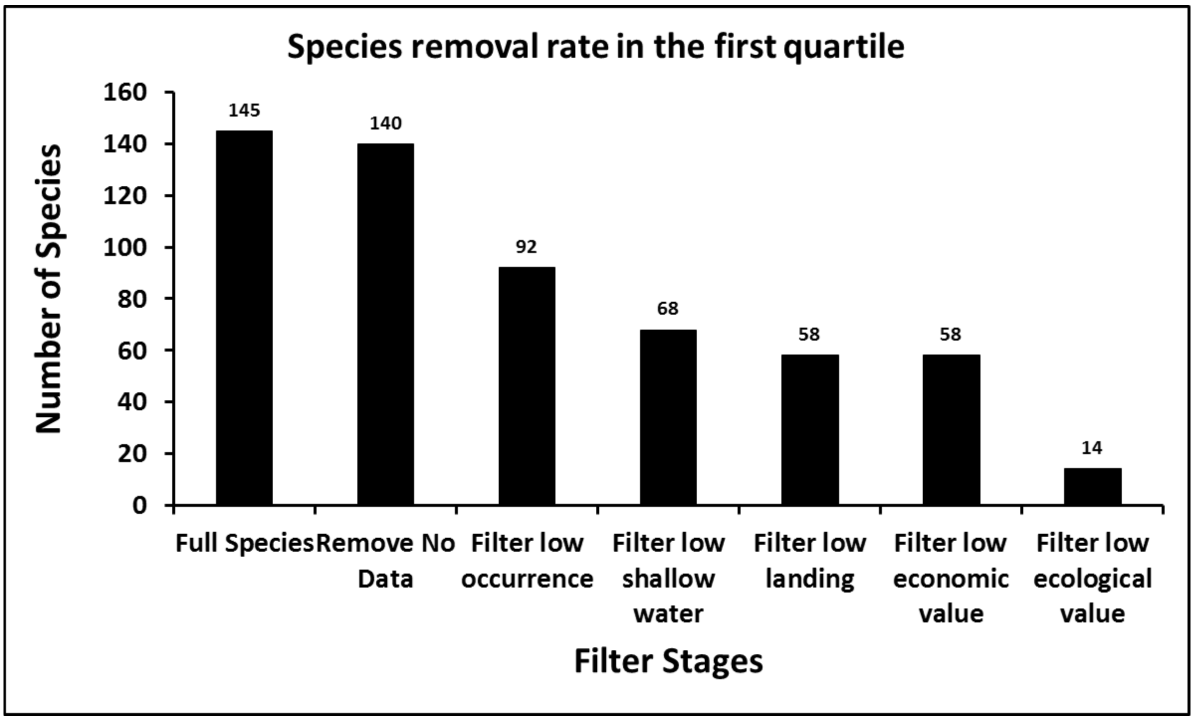


Figure 51. Number of species remaining for federal fisheries management after filters were applied at 25% cut-off.

Table 38. Candidate species for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 25% cut-off.

Scientific Name	Common Name	Family	FEP GROUP
Lethrinus rubrioperculatus	Redgill Emperor	Lethrinidae	BF Multi-species complex
Lutjanus kasmira	Blueline Snapper	Lutjanidae	BF Multi-species

			complex
Variola louti	Lunartail Grouper (Lyretail Grouper)	Serranidae	BF Multi-species complex
Acanthurus xanthopterus	Yellowfin Surgeonfish	Acanthuridae	CRE-Fishes
Naso lituratus	Orangespine Unicornfish	Acanthuridae	CRE-Fishes
Caranx melampygus	Bluefin Trevally	Carangidae	CRE-Fishes
Caranx sexfasciatus	Bigeye Trevally	Carangidae	CRE-Fishes
Decapterus macarellus	Mackerel Scad	Carangidae	CRE-Fishes
Lethrinus harak	Blackspot Emperor	Lethrinidae	CRE-Fishes
Lethrinus sp.	Emperor (mafute/misc.)	Lethrinidae	CRE-Fishes
Monotaxis grandoculis	Bigeye Emperor	Lethrinidae	CRE-Fishes
Aphareus furca	Smalltooth Jobfish	Lutjanidae	CRE-Fishes
Lutjanus bohar	Red Snapper	Lutjanidae	CRE-Fishes
Cephalopholis urodeta	Flagtail Grouper	Serranidae	CRE-Fishes

6.3 Multivariate analysis on a 50% cut-off point

The results of the multivariate analysis on a 50% cut-off follows the 25% cut-off closely except more species are eliminated due to the higher threshold level. The vector relationship will likely to remain similar.

6.3.1 Delete 1-25% and 25-50% quartiles to remove species that is not or rarely caught by the fishery

The 2-D and 3-D stress values were 0.12 and 0.07, respectively. There were three general clustering of the remaining species after species with less median of frequency of occurrence were removed based on an 80 percent similarity (Figures 52a and 52b). There was some overlap in the three clusters. Each cluster showed directionality from lower occurrence to higher occurrence. Many of the species remaining have occurrence of 75-100% (Figure 52a). The pattern for total catch is similar to the revenue pattern (Figure 52d and 52e). Despite the removal up to the median level of occurrence, the remaining species still have a broad range of depth distribution from shallow to deepwater (Figure 52c). The species with no biomass information comprise the 2 clusters on the right (Figure 52f).

In comparing the Shepard diagram between the 25% (Figure 8g and 8h) and the 50% cut-off (Figure 52g and 52h), the points cluster more tightly along the correlation line in the 50% occurrence cut-off compared to the 25% cut-off but trend is the same. However, this may not be significant since the stress value remain almost the same at 0.12 and 0.07 for the 2-D and 3-D plots, respectively.

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 39) except for revenue. There were no significant differences in the variable interactions.

Table 39. PERMANOVA results for the removal of species with low occurrence to median level. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	1009.7	1009.7	72.596	0.001
QRT_MAXZ	4	1908.5	477.11	34.303	0.001
QRT_TOT_LBS	3	2359.2	786.4	56.539	0.001
QRT_REV2	2	58.158	29.079	2.0907	0.165
QRT_BIO	4	2967.1	741.78	53.332	0.001

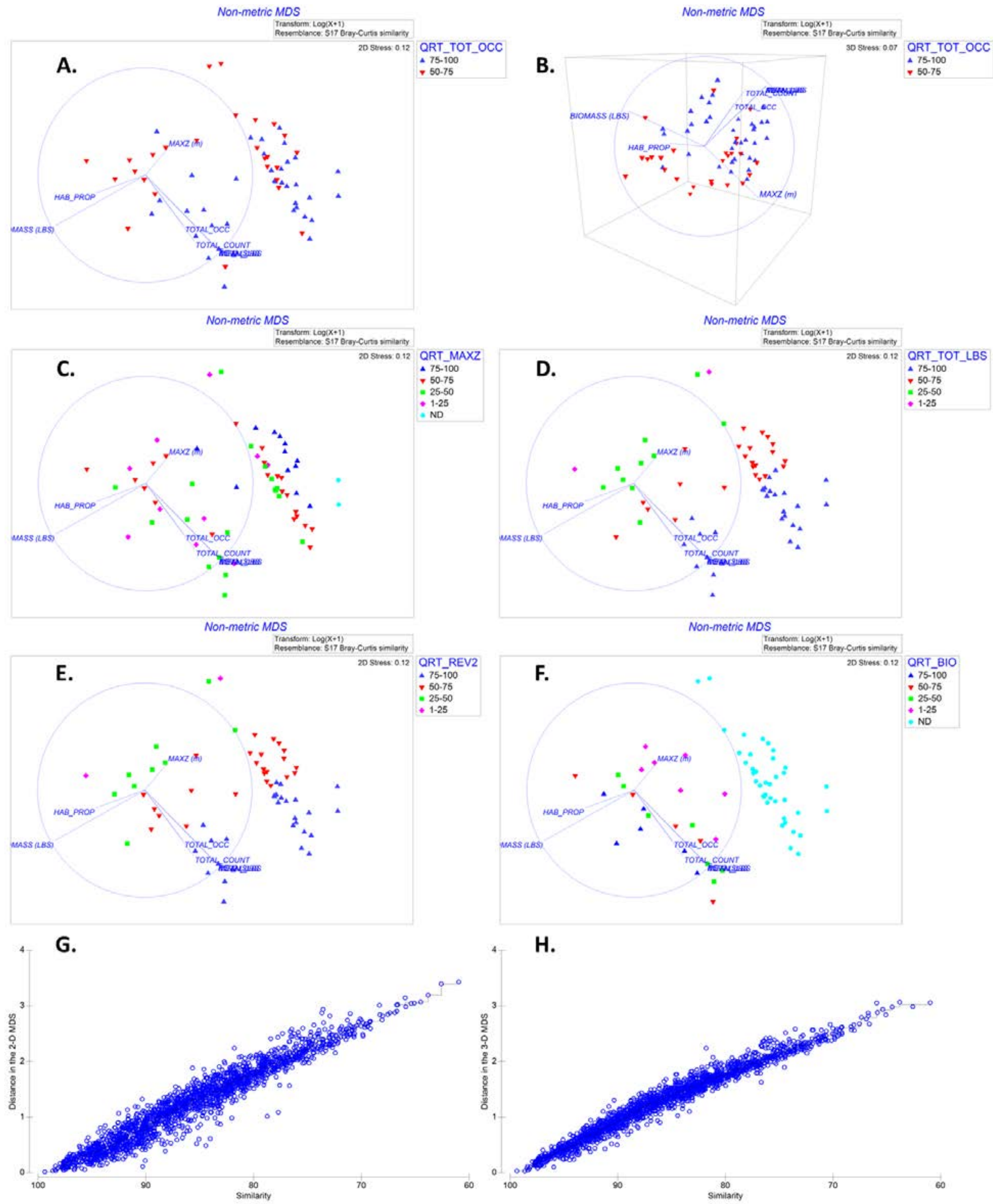


Figure 52. Two and three-dimensional plot with stress-values of 0.12 and 0.07, respectively, of remaining MUS after the lower quartile to median of frequency of occurrence were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of maximum depth (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

6.3.2 Delete 1-25% and 25-50% quartiles to remove species mostly in territorial waters

The 2-D and 3-D stress values are at 0.09 and 0.05, respectively. The cluster of point became less dense when the species that occur at shallower depths were removed at the median cut-off (Figure 53a and 53b). The general clustering was reduced to two at 80% similarity (Figure 53a). The 3-dimensional plot shows biomass and maximum depth drives the distribution perpendicular to the fishery dependent variables. Almost all the remaining species have revenue information for both clusters (Figure 53e). Species that have no biomass information comprise cluster on the right which comprises most of the data (Figure 53f). In terms of the depth distribution, the 50% cut-off removed species that occurs from 1-50 meters.

The Shepard diagram showed a tighter cluster of points to the correlation line than the 2-D Shepard diagram, which can be explained by the 0.02 reduction in the 3-D stress value compared to the lower quartile cut-off (Figures 53g and 53h).

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 40). There were no significant differences in the variable interactions.

Table 40. PERMANOVA results for the removal of species with low quartile to median level for maximum depth. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	1182.1	1182.1	80.993	0.001
QRT_MAXZ	1	528.82	528.82	36.232	0.001
QRT_TOT_LBS	3	830.64	276.88	18.97	0.001
QRT_REV2	2	83.163	41.581	2.8489	0.093
QRT_BIO	4	601.33	150.33	10.3	0.001

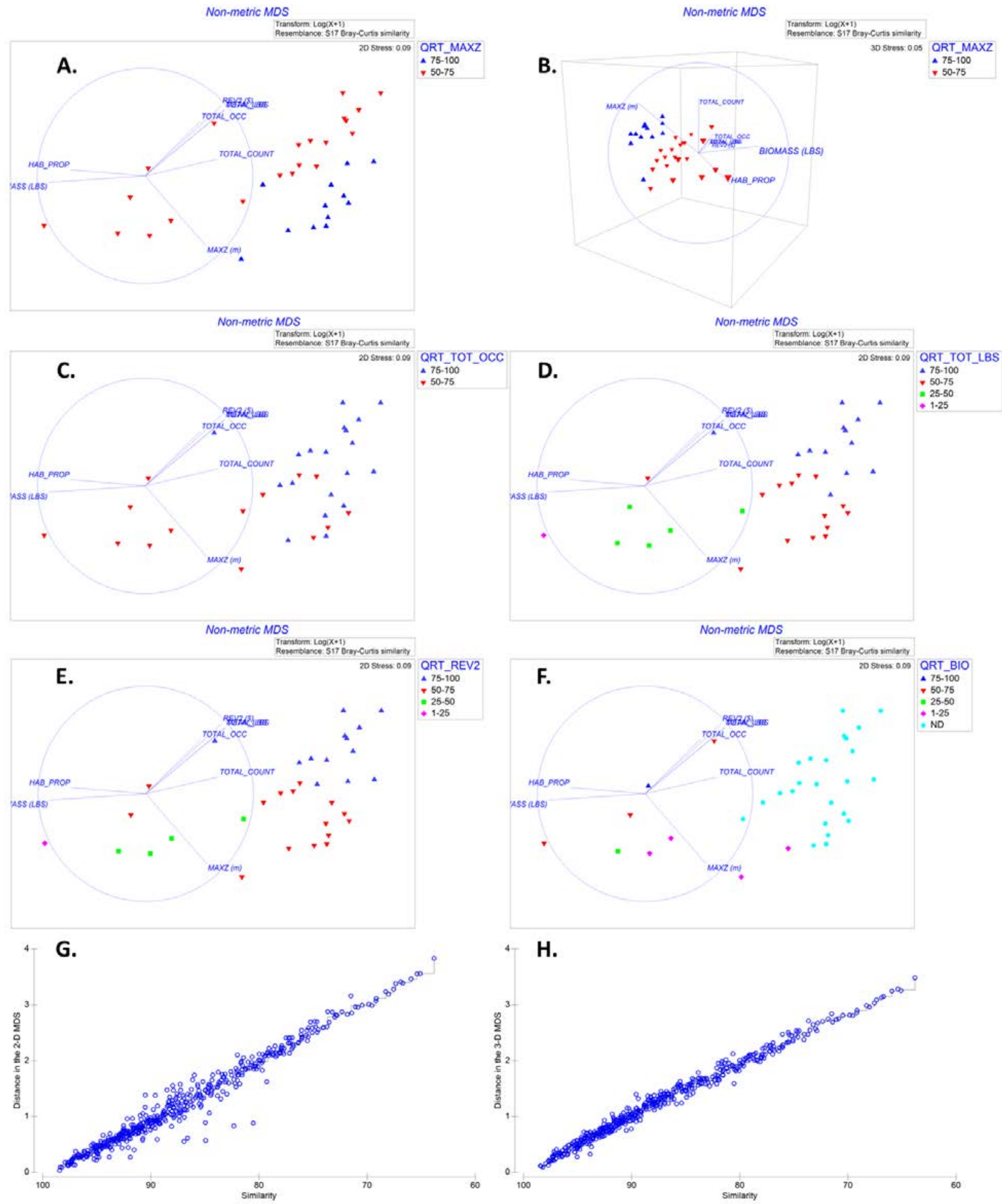


Figure 53. Two and three-dimensional plot with stress-values of 0.09 and 0.05, respectively, of remaining MUS after the lower quartile to median of maximum depth were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

6.3.3 Delete 1-25% and 25-50% quartiles to remove species that are not targeted by the fishery

The 2-D and 3-D stress values are at 0.11 and 0.05, respectively. The cluster of point became less dense when the species that were not targeted by the fishery were removed at the median cut-off. Only one cluster remains at 80% similarity (Figure 54a). The 3-dimensional plot shows maximum depth drives the distribution perpendicular to the fishery dependent variables (Figure 54b). The pattern for total catch is similar to the revenue pattern (Figure 54e). Species that have no biomass information comprise majority of the points with only 4 points that have data (Figure 54f). Except for biomass, all plots had data points that are within the 50-75 and 75-100 quartiles.

The 2-D Shepard diagram showed a scatter of points away from the correlation line starting at 80-90% similarity (Figure 54g) while the 3-D had a tighter cluster of points to the correlation line (Figure 54h).

The PERMANOVA analysis showed significant differences in the main effects between the quartile levels and the fidelity of the groupings (Table 41) except for revenue data. There were no significant differences in the variable interactions.

Table 41. PERMANOVA results for the removal of species with low quartile to median level for total catch. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	1	292.78	292.78	19.886	0.001
QRT_MAXZ	1	301.96	301.96	20.509	0.001
QRT_TOT_LBS	1	167.94	167.94	11.406	0.002
QRT_REV2	1	58.812	58.812	3.9944	0.048
QRT_BIO	3	403.94	134.65	9.145	0.004

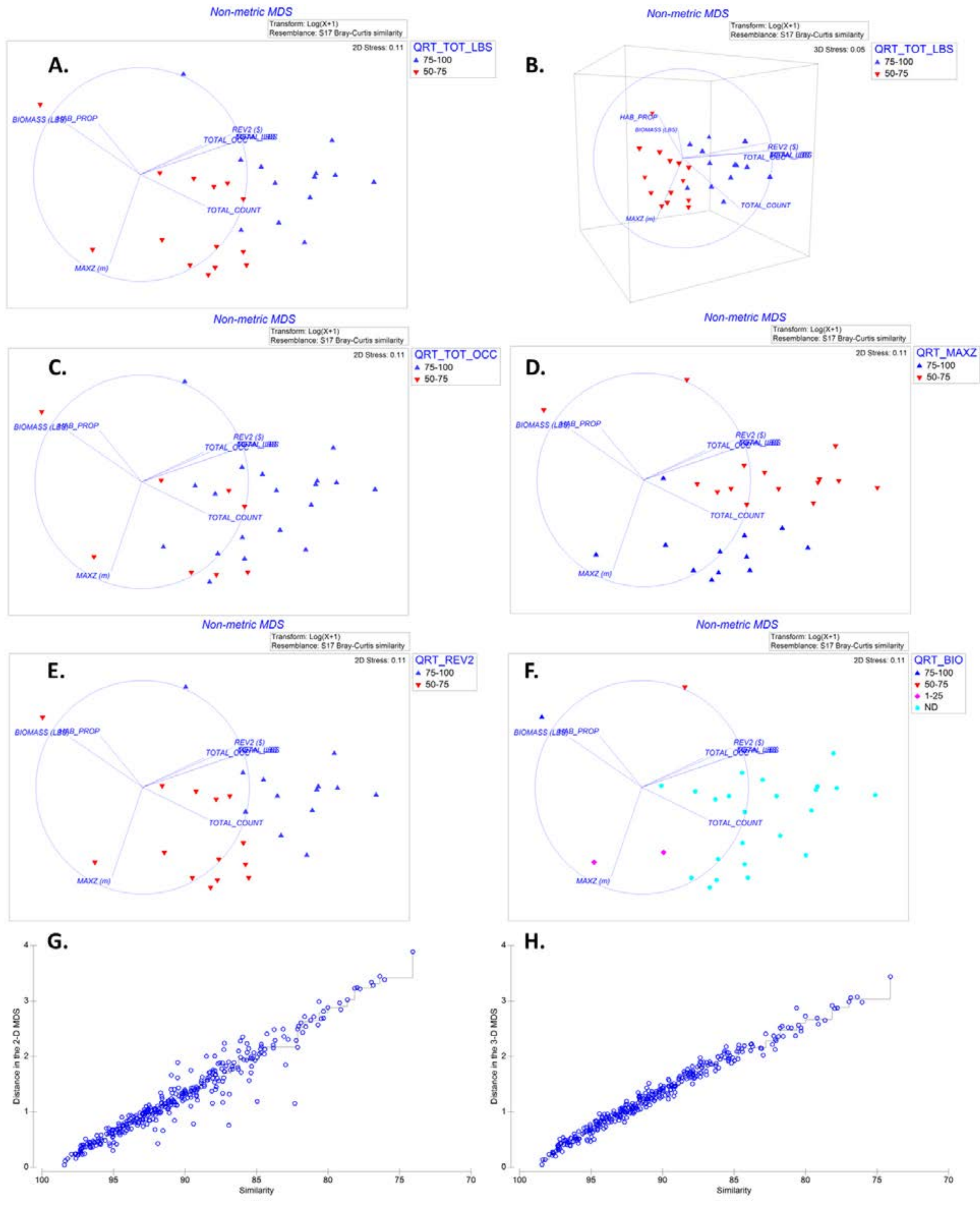


Figure 54. Two and three-dimensional plot with stress-values of 0.11 and 0.05, respectively, of remaining MUS after the lower quartile to median of total catch were removed (A and B). The same 2-D plots with the removal of the lower quartile to median level of frequency of occurrence (C); maximum depth (D); total catch (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

6.3.4 Delete 1-25% and 25-50% quartiles to remove species that have low contribution to the regional economy

The removal of species with low to median contribution to the regional economy resulted to the same number and kind of species (27 species) as with the previous filter (i.e., removal of species which are not or rarely targeted by the fishery). The cluster patterns and stress values are the same since there were no species removed after the third filter was applied. The plots were exactly the same so they are not presented. It is expected that the PERMANOVA results will be like the previous filtering stage.

6.3.5 Delete 1-25% and 25-50% quartiles to remove species that have low biomass contribution

Applying the last filter removed 25 species and retained only two species, namely, bluefin trevally, *Caranx melampygus* and the blueline snapper, *Lutjanus kasmira.* The nMDS plots were no longer shown because it will only plot two points.

6.4 Species decline rate after the filters were applied at 50% cut-off

As expected the decline rate at 50% cut-off threshold will be higher. Figure 55 showed the relative rate of decline between the three cut-off thresholds. With a 50% cut-off, this leaves two species that are potentially in need of federal management. The list of species is found in Table 43.

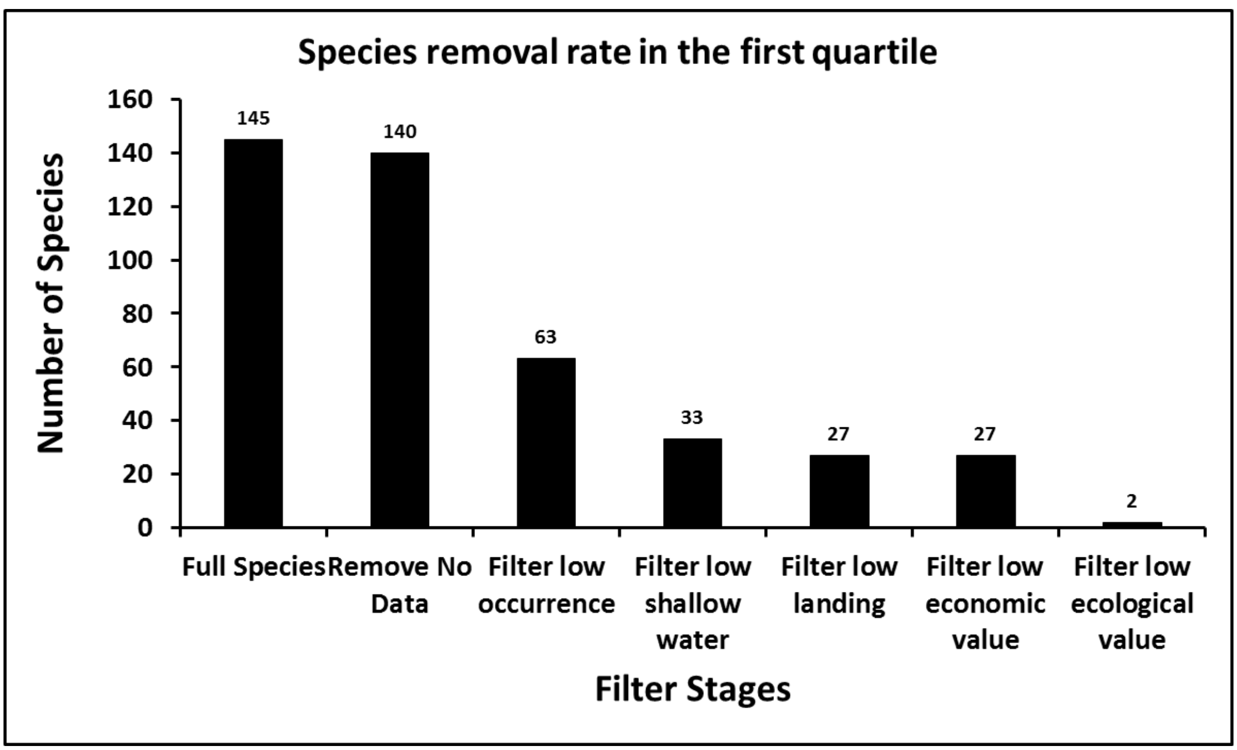


Figure 55. Number of species remaining for federal fisheries management after filters were applied at 50% cut-off.

Table 42. Candidate species for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 50% cut-off.

Scientific Name	Common Name	Family	FEP Groups
Caranx melampygus	Bluefin Trevally	Carangidae	CRE-Fishes
Lutjanus kasmira	blueline snapper	Lutjanidae	BF Multi-species complex

6.5 Multivariate analysis on a 75% cut-off point

In the interest of brevity of the report, we would be presenting the series of nMDS plots at each cut-off levels. The patterns are similar to the previous cut-off levels. We will be highlighting the very specific items in this cut-off threshold that is worth mentioning particularly the levels of groupings as well as the results of PERMANOVA.

6.5.1 Delete 1-25%, 25-50%, and 50-75% quartiles to remove species that is not or rarely caught by the fishery

The 2-D and 3-D stress values are 0.13 and 0.07, respectively. Since majority of the species had been removed, the similarity value of the remaining species is high leaving only one cluster at 80% similarity compared to the three groups at the median cut-off level (Figure 56a). The main characteristic at this level of cut-off and filtering stage is the full range of values persists for maximum depth (Figure 56c) and biomass (Figure 56f). The total catch pattern is similar to the revenue pattern (Figure 56d). Revenue data comprised of mostly the top 50% of species with high contribution to the regional economy (Figure 56e). Species with no biomass data comprise the points on the left side of cluster (Figure 56f). The points around the correlation line are much tighter at this level of cut-off compared to the previous two levels (Figures 56g and 56f).

The PERMANOVA results showed significant differences within variables. Frequency of occurrence was not tested due to zero degrees of freedom since only one level remained (Table 43).

Table 43. PERMANOVA results for the removal of species with low to third quartile level for frequency of occurrence. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	0	0		No test	
QRT_MAXZ	4	1773.5	443.38	37.245	0.001
QRT_TOT_LBS	2	666.9	333.45	28.01	0.003
QRT_REV2	2	116.76	58.38	4.904	0.041
QRT_BIO	4	636.55	159.14	13.368	0.001

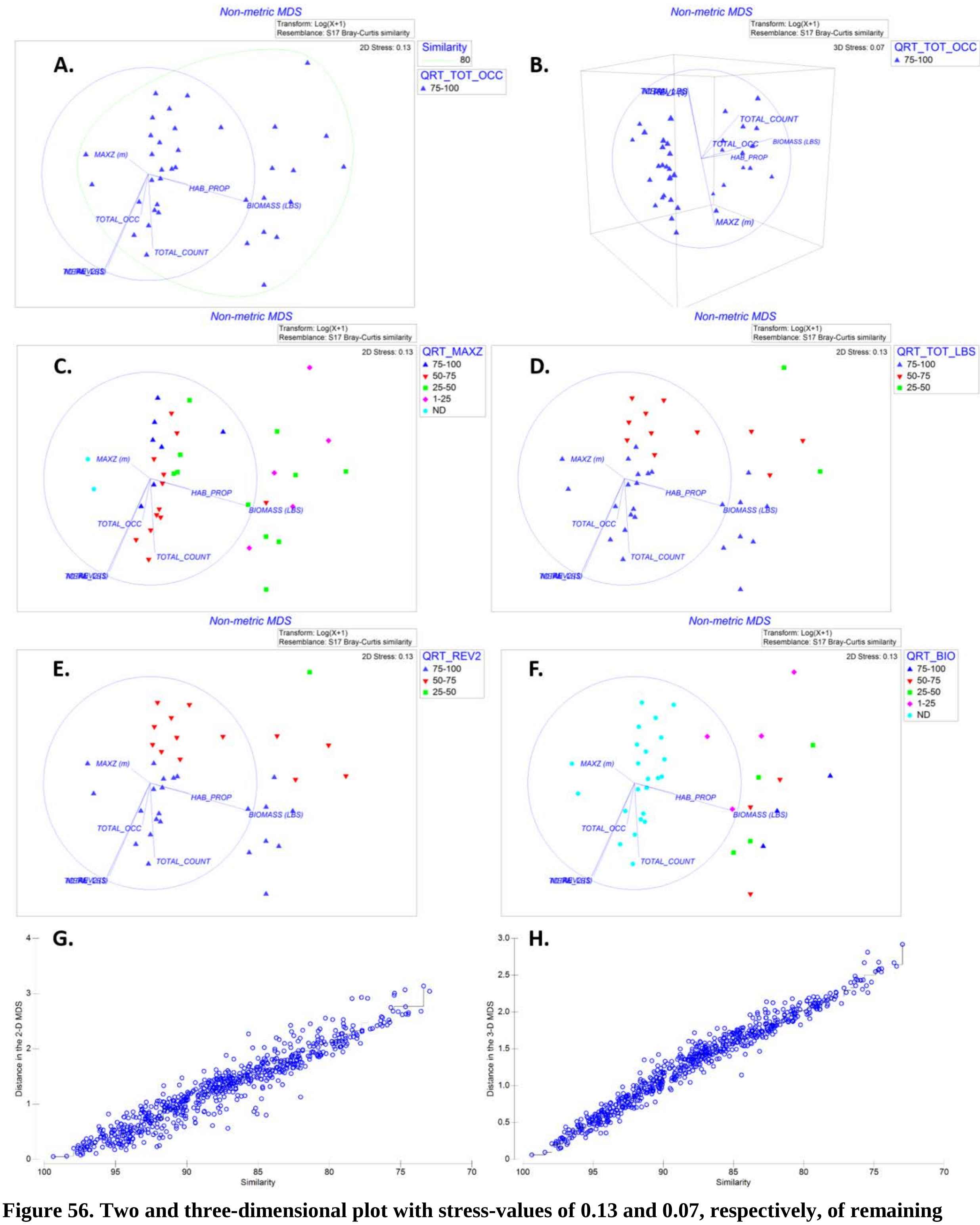


Figure 56. Two and three-dimensional plot with stress-values of 0.13 and 0.07, respectively, of remaining MUS after the lower quartile to the third quartile of occurrence were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of maximum depth (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS

6.5.2 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that are mostly in territorial waters

The 2-D and 3-D stress values are 0.01 and 0.00, respectively. Removal of the remaining shallow depth species had significantly reduced the species into one cluster with only 7 species or families remaining. The plot is presented with the name of species/family since the low density of points allow the labels to be seen clearly (Figure 57a).

The vector lines on the 3-D plot still show biomass, depth and revenue being potential drivers in the distribution (Figure 57b). Again, the pattern of total catch and revenue pattern are similar (Figures 57d and 57e). Most of the species had no biomass data except for one point (Figure 57f). The 2-D and 3-D Shepard diagrams show all points lying on the correlation line (Figure 57g and 57h).

The PERMANOVA results showed significant differences within variables for total catch only. Revenue and biomass variables had insignificant differences (Table 44). No test was conducted for occurrence and maximum depth.

Table 44. PERMANOVA results for the removal of species with low to third quartile level for maximum depth. The grouping variables are occurrence, maximum depth, catch, revenue, and biomass. The analysis utilized the sequential type 1 sum of squares

Source	df	SS	MS	Pseudo-F	P(perm)
QRT_TOT_OCC	0	0		No test	
QRT_MAXZ	0	0		No test	
QRT_TOT_LBS	1	41.812	41.812	7.7209	0.001
QRT_REV2	1	13.945	13.945	2.5751	0.115
QRT_BIO	1	33.523	33.523	6.1902	0.075

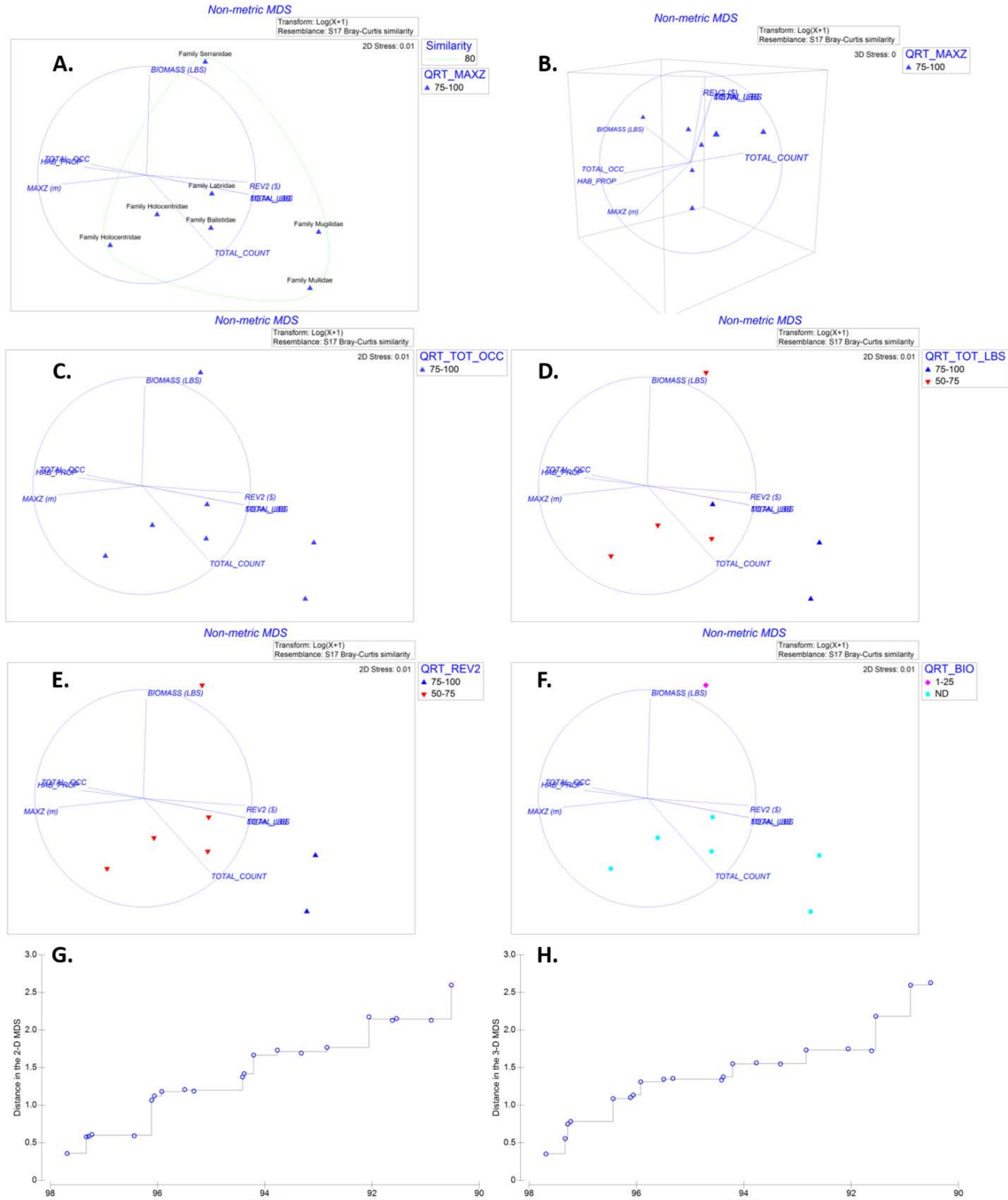


Figure 57. Two and three-dimensional plot with stress-values of 0.01 and 0.00, respectively, of remaining MUS after the lower quartile to the third quartile of maximum depth were removed (A and B). The same 2-D plots with the removal of the lower quartile to the third quartile of occurrence (C); total catch (D); revenue (E); and biomass (F). Shepard diagrams of the correlation between the distance assignments and the similarity for the 2-D (G) and 3-D (H) nMDS.

6.5.3 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that are not targeted by the fisheries

Application of the third filter resulted to the retention of only 3 species or families, namely Families Mullidae, Mugilidae and Labridae. Since only three points were left, no further analyses were done. The nMDS plots were no longer shown because it will only plot three points.

6.5.4 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that have low contribution to the regional economy

Since only three points were left, no further analyses were done because the points are not enough to run nMDS.

6.5.5 Delete 1-25%, 25-50%, 50-75% quartiles to remove species that have low biomass

Since only three points were left, no further analyses were done because the points are not enough to run nMDS.

6.6 Species decline rate after the filters were applied at 75% cut-off

As expected the decline rate at 50% cut-off threshold will be higher. Figure 58 showed the relative rate of decline between the three cut-off thresholds. With a 75% cut-off, this leaves two species that are potentially in need of federal management. The list of species is found in Table 45.

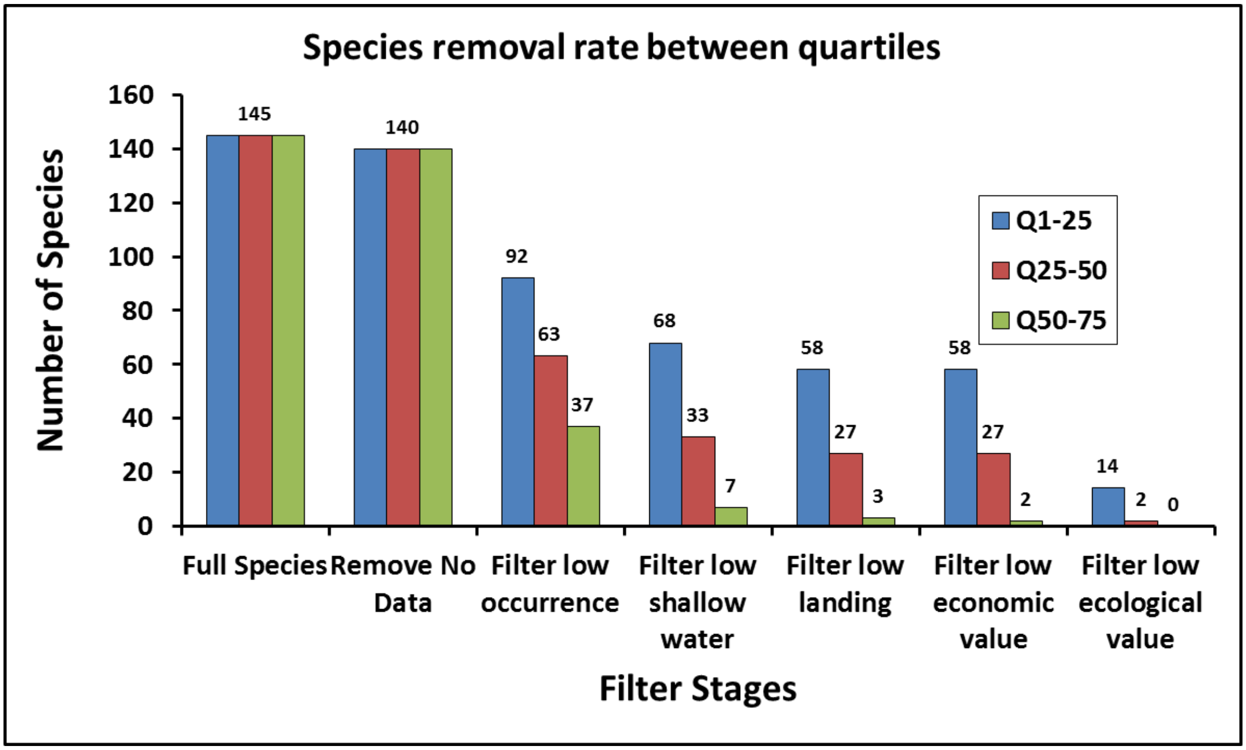


Figure 58. Number of species remaining after each filter is applied comparing the 3 cut-off thresholds.

Table 45. Candidate species/families for federal fisheries management after applying the filters for ecosystem components. This list was generated from a 75% cut-off.

Scientific Name	Common Name	Family	FEP Groups
Family Labridae	Wrasse	Labridae	CRE-Fishes
Family Mugilidae	Mullet	Mugilidae	CRE-Fishes
Family Mullidae	Goatfish (misc.)	Mullidae	CRE-Fishes

7 DISCUSSION

The 2016 National Standard 1 guideline allows designation of species as ecosystem components that would alleviate the requirements for conservation and management measures. This allows the Council to keep the species in the FEPs for monitoring purposes. The guideline provided ten criteria for Councils to consider in evaluating whether the species need conservation and management measures:

1. The stock is an important component of the marine environment;
2. The stock is caught by the fishery;
3. Whether an FMP can improve or maintain the condition of the stock;
4. The stock is a target of a fishery;
5. The stock is important to commercial, recreational, or subsistence users;
6. The fishery is important to the Nation or to the regional economy;
7. The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution;
8. The economic condition of a fishery and whether an FMP can produce more efficient utilization;
9. The needs of a developing fishery and whether an FMP can foster orderly growth;
10. The extent to which the fishery is already adequately managed by states, by state/Federal programs, or by Federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law.

The analysis utilized only five of the ten criteria (Table 1) because of the limited available information for the MUS. The data proxies for the 5 criteria are suitable for the multivariate statistical framework used in the analysis. The multi-dimensional scaling was used because it is conceptually simple. It makes few model assumptions about the form of the data or inter-relationships of the samples, and the link between the final plots and the original data is relatively transparent and easy to explain (Clarke and Warwick 2001). This is particularly useful for this exploratory data analysis since the analysis used a diverse source of data and varying level of quantity and quality of data.

The multivariate analysis presents an objective means of evaluating available information to screen the different MUS for its compliance with the NS1 factors. This analysis is considered as the “thorough analysis” described in §600.305(c)(4) of the NS1 guidelines when removing species from the FEPs. However, this provision also applies for designating ecosystem components.

The 3-dimensional stress value ranges from a minimum of 0.02 to a high of 0.14. Stress values less than 0.05 indicate an excellent representation with no prospect of mis-interpretation. Stress values between 0.1 and 0.05 correspond to a good ordination with no real prospect of a misleading interpretation. The overall ordination results are deemed reliable and the clustering of the different species represent real differences in the data properties.

More than 50% of the Guam MUS had no available data. These species compress the species with available information in the ordination plot. The same pattern exists for American Samoa and CNMI but the number of species with no data is few compared to Guam. Once removed, the MDS plots showed distinct patterns driven by the availability of catch, occurrence, biomass, and max depth distribution. The directionality of the points is driven by the magnitude of individual species information on these five variables. This is a good indicator that the removal of species at each filtering stage was conducted in an objective manner.

The cut-off threshold level dictates the number of species that will be removed. The lower the cut-off threshold results in lower number of species removed thereby retaining more species to be retained for federal management. The higher threshold removes more species retaining less for federal management. The slope of the number of species removed differs by threshold level. Using Guam as an example, the 25% cut-off threshold, there were 44 potential species that remained for federal management consideration. This comprised of four out of the 14 original bottomfish management unit species complex. All the precious coral and crustacean MUS are filtered to be ecosystem component. The remaining species are coral reef species from seven taxonomic families. This included one vulnerable species, the humphead wrasse (*Cheilinus undulatus*).

The species composition in American Samoa yields 30 species again with four of the 14 BMUS complex and the rest of the 26 are coral reef fishes from seven taxonomic families. The results for CNMI are more conservative with only 14 species remaining. Three species remain from the BMUS complex and 11 from CREMUS belonging to five taxonomic families of reef fishes.

The Ecosystem Component Expert Working Group utilized the information generated by this analysis as a starting point in reviewing the species in need of federal conservation and management. The ECEWG utilized varying levels of cut-offs per filtering stage.

At higher cut-off levels, the number of species remaining is fewer. For example in Guam, at 50% cut-off, only 12 species remained from 5 coral reef fin fish families. Two species belong to the bottomfish management unit species complex (one shallow complex and one deep water complex). At 75% only two species remained and both are coastal pelagics. For CNMI, however, higher cut-off levels resulted in the retention of the higher level grouping which was removed from the analysis. These higher level groupings (family level) are reflective of the data collection being implemented in CNMI. Most of the survey data are lumped to family level groupings and that level contains most of the catch interview information.

The analysis followed a sequential removal of species based on the decision tree. The sequential removal follows a logical framework that the species has to demonstrate being caught by the fishery (frequency of occurrence as a proxy) and the species should be caught in the federal waters (max depth as a proxy). The species should also be targeted by the fishery (proportion of the species catch to the total catch as a proxy) and must be economically important. The biomass filter represents its importance to the users. However, it was shown that the final species composition is the same regardless of the sequence of the filters.

The sequential filtering method is also considered in the implementation of the PERMANOVA routine. This analysis tested the efficacy of the groupings (and the effects of the cut-off levels). The sequential type 1 sum-of-squares was used to incorporate the ordering of the filters in the permutation. The results of the PERMANOVA tests were consistently significant across all filtering stages and at a certain level of cut-offs. The higher cut-off removes most of the groupings thus some tests were not performed.

The final species composition after all filters were applied within each cut-off level represents the species that may need federal conservation and management. This will be the preliminary list that will be considered by the ECEWG for its final evaluation.

8 CONCLUSION

The multidimensional statistical framework objectively segregated species based on available data. The analysis filtered species to the ecosystem component category following the sequential decision tree. This analysis serves as a thorough analysis of the NS1 guidelines for evaluating species in need of conservation and management by provising a quantitative framework to evaluate the management units species in the American Samoa and Marianas FEPs.

9 ACKNOWLEDGEMENT

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11 APPENDICES

11.1 MANAGEMENT UNIT SPECIES IN THE MARIANAS FISHERY ECOSYSTEM PLAN: GUAM

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Myxinidae	Hagfish	**Myxinidae**	CRE-Fishes
Eptatretus carlhubbsi	Hagfish	**Myxinidae**	CRE-Fishes
Orectolobidae	Nurse,Zebra,Carpet Sharks	**Orectolobidae**	CRE-Fishes
Nebrius ferrugineus	Nurse Shark	**Ginglymostomatidae**	CRE-Fishes
Stegostoma fasciatum	Leopard Shark	**Stegostomatidae**	CRE-Fishes
Isurus oxyrinchus	Mackerel Shark	**Lamnidae**	CRE-Fishes
Carcharodon carcharias	Great White Shark	**Lamnidae**	CRE-Fishes
Carcharhinus albimarginatus	Carcharhinidae	**Carcharhinidae**	CRE-Fishes
Carcharhinus amblyrhynchos	Carcharhinidae	**Carcharhinidae**	CRE-Fishes
Carcharhinus galapagensis	Carcharhinidae	**Carcharhinidae**	CRE-Fishes
Carcharhinus melanopterus	Carcharhinidae	**Carcharhinidae**	CRE-Fishes
Galeocerdo cuvier	Tiger Shark	**Carcharhinidae**	CRE-Fishes
Triaenodon obesus	Reef Whitetip Shark	**Carcharhinidae**	CRE-Fishes
Carcharhinus limbatus	Blackfin Shark	**Carcharhinidae**	CRE-Fishes
Negaprion acutidens	Lemon Shark	**Carcharhinidae**	CRE-Fishes
Sphyrnidae	Hammerhead shark	**Sphyrnidae**	CRE-Fishes
Sphyrna lewini	Hammerhead shark	**Sphyrnidae**	CRE-Fishes
Sphyrna mokarran	Hammerhead shark	**Sphyrnidae**	CRE-Fishes
Etmopterus pusillus	Spiny Dogfish shark	**Etmopteridae**	CRE-Fishes
Echinorhinidae	Bramble Shark	**Echinorhinidae**	CRE-Fishes
Echinorhinus brucus	Bramble Shark	**Echinorhinidae**	CRE-Fishes
Echinorhinus cookei	Bramble Shark	**Echinorhinidae**	CRE-Fishes
Rhinobatidae	Guitarfish	**Rhinobatidae**	CRE-Fishes
Rhynchobatus djiddensis	Guitarfish	**Rhinobatidae**	CRE-Fishes
Dasyatidae	Stingray	**Dasyatidae**	CRE-Fishes
Neotrygon kuhlii	Blue-Spotted Sting Ray	**Dasyatidae**	CRE-Fishes
Terapon jarbua	Crescent-Banded Grunter	**Terapontidae**	CRE-Fishes
Himantura uarnak	Leopard Ray	**Dasyatidae**	CRE-Fishes
Urogymnus asperrimus	Porcupine Ray	**Dasyatidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Himantura granulata	Wh Tail Whipray	**Dasyatidae**	CRE-Fishes
Himantura fai	Whipray	**Dasyatidae**	CRE-Fishes
Pastinachus sephen	Shortsnouted Ray	**Dasyatidae**	CRE-Fishes
Plesiobatis daviesi	Roundray	**Plesiobatidae**	CRE-Fishes
Myliobatidae	Eagle Ray	**Myliobatidae**	CRE-Fishes
Aetobatus narinari	Spotted Eagle Ray	**Myliobatidae**	CRE-Fishes
Aetomylaeus maculatus	Eagle Ray	**Myliobatidae**	CRE-Fishes
Minyichthys myersi	Myer'S Pipefish	**Syngnathidae**	CRE-Fishes
Manta birostris	Manta Ray	**Myliobatidae**	CRE-Fishes
Clupeidae	Herring,Sprat,Sardines	**Clupeidae**	CRE-Fishes
Spratelloides delicatulus	Blue Sprat	**Clupeidae**	CRE-Fishes
Dussumieria sp	Sprats	**Dussumieriidae**	CRE-Fishes
Dussumieria elopsoides	Sprat	**Dussumieriidae**	CRE-Fishes
?	Mantis Shrimp	**Odontodactylidae**	CRE-Fishes
Spratelloides gracilis	Silver Sprat	**Clupeidae**	CRE-Fishes
Amblygaster clupeoides	Blue Pilchard	**Clupeidae**	CRE-Fishes
Amblygaster sirm	Spotted Pilchard	**Clupeidae**	CRE-Fishes
Herklotsichthys quadrimaculatus	Gold Spot Herring	**Clupeidae**	CRE-Fishes
Engraulidae	Anchovies	**Engraulidae**	CRE-Fishes
Encrasicholina punctifer	Oceanic Anchovy	**Engraulidae**	CRE-Fishes
Thryssa baelama	Little Priest	**Engraulidae**	CRE-Fishes
Stolephorus pacificus	West Pacific Anchovy	**Engraulidae**	CRE-Fishes
Stolephorus indicus	Indian Anchovy	**Engraulidae**	CRE-Fishes
Encrasicholina heteroloba	Blue Anchovy	**Engraulidae**	CRE-Fishes
Encrasicholina devisi	Gold Anchovy	**Engraulidae**	CRE-Fishes
Stolephorus insularis	Gold Esurine Anchovy	**Engraulidae**	CRE-Fishes
Stolephorus apiensis	Samoan Anchovy	**Engraulidae**	CRE-Fishes
Stolephorus multibranchus	Caroline Islands Anchovy	**Engraulidae**	CRE-Fishes
Stolephorus sp.	Anchovy	**Engraulidae**	CRE-Fishes
Megalopidae	Tarpons	**Megalopidae**	CRE-Fishes
Megalops cyprinoides	Indo-Pacific Tarpon	**Megalopidae**	CRE-Fishes
Albulidae	Bonefish	**Albulidae**	CRE-Fishes
Albula glossodonta	Indo-Pacific Bonefish	**Albulidae**	CRE-Fishes
Albula argentea	Bonefish	**Albulidae**	CRE-Fishes
Anguillidae	Freshwater Eel	**Anguillidae**	CRE-Fishes
Anguilla bicolor	Freshwater Eel	**Anguillidae**	CRE-Fishes
Anguilla marmorata	Freshwater Eel	**Anguillidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Moringuidae	Worm Eel	**Moringuidae**	CRE-Fishes
Moringua microchir	Spaghetti Eel	**Moringuidae**	CRE-Fishes
Moringua javanica	Java Spaghetti Eel	**Moringuidae**	CRE-Fishes
Moringua ferruginea	Rusty Spaghetti Eel	**Moringuidae**	CRE-Fishes
Chlopsidae	False Moray Eel	**Chlopsidae**	CRE-Fishes
Kaupichthys hyoproroides	Common False Moray	**Chlopsidae**	CRE-Fishes
Kaupichthys atronasus	Bl-Nostril False Moray	**Chlopsidae**	CRE-Fishes
Kaupichthys brachychirus	Shortfin False Moray	**Chlopsidae**	CRE-Fishes
Muraenidae	Morays	**Muraenidae**	CRE-Fishes
Anarchias allardicei	Allardice'S Moray	**Muraenidae**	CRE-Fishes
Anarchias seychellensis	Seychelles Moray	**Muraenidae**	CRE-Fishes
Echidna leucotaenia	Whiteface Moray	**Muraenidae**	CRE-Fishes
Echidna nebulosa	Snowflake Moray	**Muraenidae**	CRE-Fishes
Echidna polyzona	Girdled Moray Eel	**Muraenidae**	CRE-Fishes
Echidna unicolor	Unicolor Moray	**Muraenidae**	CRE-Fishes
Enchelycore bayeri	Bayer'S Moray	**Muraenidae**	CRE-Fishes
Enchelycore bikiniensis	Bikini Atoll Moray	**Muraenidae**	CRE-Fishes
Enchelycore schismatorhynchus	White-Margined Moray	**Muraenidae**	CRE-Fishes
Enchelynassa canina	Viper Moray	**Muraenidae**	CRE-Fishes
Gymnomuraena zebra	Zebra Moray	**Muraenidae**	CRE-Fishes
Gymnothorax fuscomaculatus	Brown Spotted Moray	**Muraenidae**	CRE-Fishes
Gymnothorax marshallensis	Marshall Isles Moray	**Muraenidae**	CRE-Fishes
Gymnothorax melatremus	Dirty Yellow Moray	**Muraenidae**	CRE-Fishes
Gymnothorax pictus	Peppered Moray	**Muraenidae**	CRE-Fishes
Gymnothorax pindae	Pinda Moray	**Muraenidae**	CRE-Fishes
Gymnothorax thyrsoideus	White-Eyed Moray	**Muraenidae**	CRE-Fishes
Gymnothorax melatremus	Moray Eel	**Muraenidae**	CRE-Fishes
Gymnothorax berndti	Moray Eel	**Muraenidae**	CRE-Fishes
Gymnothorax buroensis	Buro Moray	**Muraenidae**	CRE-Fishes
Gymnothorax fimbriatus	Fimbriated Moray	**Muraenidae**	CRE-Fishes
Gymnothorax flavimarginatus	Yellow-Margined Moray	**Muraenidae**	CRE-Fishes
Gymnothorax gracilicauda	Graceful-Tailed Moray	**Muraenidae**	CRE-Fishes
Gymnothorax elegans	Moray Eel	**Muraenidae**	CRE-Fishes
Gymnothorax hepaticus	Moray Eel	**Muraenidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Gymnothorax javanicus	Giant Moray	**Muraenidae**	CRE-Fishes
Gymnothorax margaritophorus	Blotch-Necked Moray	**Muraenidae**	CRE-Fishes
Gymnothorax meleagris	Whitemouth Moray	**Muraenidae**	CRE-Fishes
Gymnothorax monostigma	1-Spot Moray	**Muraenidae**	CRE-Fishes
Gymnothorax neglectus	Moray Eel	**Muraenidae**	CRE-Fishes
Gymnothorax richardsonii	Richardson'S Moray	**Muraenidae**	CRE-Fishes
Gymnothorax rueppelliae	Yellow-Headed Moray	**Muraenidae**	CRE-Fishes
Gymnothorax undulatus	Undulated Moray	**Muraenidae**	CRE-Fishes
Gymnothorax zonipectis	Zonipectis Moray	**Muraenidae**	CRE-Fishes
Gymnothorax enigmaticus	Enigmatic Moray	**Muraenidae**	CRE-Fishes
Rhinomuraena quaesita	Ribbon Eel	**Muraenidae**	CRE-Fishes
Pseudechidna brummeri	White Ribbon Eel	**Muraenidae**	CRE-Fishes
Strophidon sathete	Giant Esturine Moray	**Muraenidae**	CRE-Fishes
Uropterygius concolor	Unicolor Snake Moray	**Muraenidae**	CRE-Fishes
Uropterygius marmoratus	Marbled Snake Moray	**Muraenidae**	CRE-Fishes
Uropterygius micropterus	Tidepool Snake Moray	**Muraenidae**	CRE-Fishes
Uropterygius macrocephalus	Lg-Headed Snake Moray	**Muraenidae**	CRE-Fishes
Uropterygius supraforatus	Moray Eel	**Muraenidae**	CRE-Fishes
Uropterygius xanthopterus	Moray Eel	**Muraenidae**	CRE-Fishes
Gymnothorax nudivomer	Yellowmouth Moray	**Muraenidae**	CRE-Fishes
Anarchias cantonensis	Canton Island Moray	**Muraenidae**	CRE-Fishes
Channomuraena vittata	Long-Jawed Moray	**Muraenidae**	CRE-Fishes
Gymnothorax monochrous	Monochrome Moray	**Muraenidae**	CRE-Fishes
Gymnothorax polyuranodon	Moray Eel	**Muraenidae**	CRE-Fishes
Uropterygius fuscoguttatus	Brown-Spotted Snake Eel	**Muraenidae**	CRE-Fishes
Uropterygius fasciolatus	Gosline'S Snake Moray	**Muraenidae**	CRE-Fishes
Uropterygius kamar	Moon Moray	**Muraenidae**	CRE-Fishes
Uropterygius polyspilus	Lg-Spotted Snake Moray	**Muraenidae**	CRE-Fishes
Scuticaria tigrina	Tiger Snake Moray	**Muraenidae**	CRE-Fishes
Enchelycore kamara	Dark-Spotted Moray	**Muraenidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Gymnothorax polyuranodon	Fiji Moray Eel	**Muraenidae**	CRE-Fishes
Synaphobranchidae	Cutthroat Eel	**Synaphobranchidae**	CRE-Fishes
Synaphobranchus sp	Cutthroat Eel	**Synaphobranchidae**	CRE-Fishes
Congridae	White,Conger,Garden Eel	**Congridae**	CRE-Fishes
Conger cinereus	White Eel	**Congridae**	CRE-Fishes
Conger oligoporus	Conger Eel	**Congridae**	CRE-Fishes
Gorgasia sp	Conger Eel	**Congridae**	CRE-Fishes
Heteroconger hassi	Conger Eel	**Congridae**	CRE-Fishes
Blachea xenobranchialis	Conger Eel	**Congridae**	CRE-Fishes
Ariosoma scheelei	Scheele'S Conger	**Congridae**	CRE-Fishes
Ariosoma fasciatum	Barred Sand Conger	**Congridae**	CRE-Fishes
Conger sp.	Conger Eel	**Congridae**	CRE-Fishes
Gorgasia preclara	Orange-Barred Garden Eel	**Congridae**	CRE-Fishes
Muraenesocidae	Pike Eels	**Muraenesocidae**	CRE-Fishes
Muraenesox cinereus	Pike Conger	**Muraenesocidae**	CRE-Fishes
Ophichthidae	Snake Eel	**Ophichthidae**	CRE-Fishes
Brachysomophis crocodilinus	Snake Eel	**Ophichthidae**	CRE-Fishes
Ophichthus polyophthalmus	Snake Eel	**Ophichthidae**	CRE-Fishes
Callechelys marmorata	Snake Eel	**Ophichthidae**	CRE-Fishes
Callechelys catostoma	Snake Eel	**Ophichthidae**	CRE-Fishes
Leiuranus semicinctus	Saddled Snake Eel	**Ophichthidae**	CRE-Fishes
Scolecenchelys laticaudata	Snake Eel	**Ophichthidae**	CRE-Fishes
Scolecenchelys macroptera	Snake Eel	**Ophichthidae**	CRE-Fishes
Myrichthys colubrinus	Banded Snake Eel	**Ophichthidae**	CRE-Fishes
Myrichthys maculosus	Spotted Snake Eel	**Ophichthidae**	CRE-Fishes
Ophichthus cephalozona	Dark-Shouldered Snake Eel	**Ophichthidae**	CRE-Fishes
Scolecenchelys gymnota	Snake Eel	**Ophichthidae**	CRE-Fishes
Muraenichthys schultzei	Snake Eel	**Ophichthidae**	CRE-Fishes
Muraenichthys sibogae	Snake Eel	**Ophichthidae**	CRE-Fishes
Echelus uropterus	Snake Eel	**Ophichthidae**	CRE-Fishes
Schismorhynchus labialis	Snake Eel	**Ophichthidae**	CRE-Fishes
Schultzidia johnstonensis	Snake Eel	**Ophichthidae**	CRE-Fishes
Schultzidia retropinnis	Snake Eel	**Ophichthidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Apterichtus klazingai	Snake Eel	**Ophichthidae**	CRE-Fishes
Cirricaecula johnsoni	Fringelip Snake Eel	**Ophichthidae**	CRE-Fishes
Leiuranus versicolor	Snake Eel	**Ophichthidae**	CRE-Fishes
Evips percinctus	Snake Eel	**Ophichthidae**	CRE-Fishes
Ichthyapus vulturis	Snake Eel	**Ophichthidae**	CRE-Fishes
Myrichthys colubrinus	Snake Eel	**Ophichthidae**	CRE-Fishes
Phaenomonas cooperae	Snake Eel	**Ophichthidae**	CRE-Fishes
Phyllophichthus xenodontus	Snake Eel	**Ophichthidae**	CRE-Fishes
Lamnostoma orientalis	Oriental Snake Eel	**Ophichthidae**	CRE-Fishes
Gonostomatidae	Bristlemouths	**Gonostomatidae**	CRE-Fishes
Diplophos sp	Bristlemouth	**Gonostomatidae**	CRE-Fishes
Gonostoma atlanticum	Bristlemouth	**Gonostomatidae**	CRE-Fishes
Sigmops ebelingi	Bristlemouth	**Gonostomatidae**	CRE-Fishes
Sternoptychidae	Hatchetfishes	**Sternoptychidae**	CRE-Fishes
Giganturidae	Telescopefish	**Giganturidae**	CRE-Fishes
Gigantura indica	Telescopefish	**Giganturidae**	CRE-Fishes
Chanidae	Milkfish	**Chanidae**	CRE-Fishes
Chanos chanos	Milkfish	**Chanidae**	CRE-Fishes
Clariidae	Air-Breath Catfish	**Clariidae**	CRE-Fishes
Clarias macrocephalus	Air-Breath Catfish	**Clariidae**	CRE-Fishes
Clarias batrachus	Air-Breath Catfish	**Clariidae**	CRE-Fishes
Plotosidae	Eel Catfishes	**Plotosidae**	CRE-Fishes
Plotosus lineatus	Striped Eel Catfish	**Plotosidae**	CRE-Fishes
Synodus binotatus	2-Spot Lizardfish	**Synodontidae**	CRE-Fishes
Saurida gracilis	Graceful Lizardfish	**Synodontidae**	CRE-Fishes
Saurida nebulosa	Nebulous Lizardfish	**Synodontidae**	CRE-Fishes
Synodus dermatogenys	Clearfin Lizardfish	**Synodontidae**	CRE-Fishes
Synodus jaculum	Blackblotch Lizardfish	**Synodontidae**	CRE-Fishes
Synodus variegatus	Variegatus Lizardfish	**Synodontidae**	CRE-Fishes
Taenianotus triacanthus	Leaf Fish	**Scorpaenidae**	CRE-Fishes
Synodontidae	Reef Lizardfish	**Synodontidae**	CRE-Fishes
Myctophidae	Lanternfishes	**Myctophidae**	CRE-Fishes
Diaphus schmidti	Lanternfish	**Myctophidae**	CRE-Fishes
Myctophum brachygnathum	Laternfish	**Myctophidae**	CRE-Fishes
Paralepididae	Barracudinas	**Paralepididae**	CRE-Fishes
Lestidium nudum	Barracudina	**Paralepididae**	CRE-Fishes
Alepisauridae	Lancetfishes	**Alepisauridae**	CRE-Fishes
Alepisaurus ferox	Lancetfish	**Alepisauridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Polymixiidae	Beardfish	**Polymixiidae**	CRE-Fishes
Polymixia japonica	Beardfish	**Polymixiidae**	CRE-Fishes
Moridae	Codlings	**Moridae**	CRE-Fishes
Physiculus sp	Codling	**Moridae**	CRE-Fishes
Bregmacerotidae	Codlets	**Bregmacerotidae**	CRE-Fishes
Bregmaceros nectabanus	Codlet	**Bregmacerotidae**	CRE-Fishes
Ophidiidae	Cusk Eel	**Ophidiidae**	CRE-Fishes
Brotula multibarbata	Reef Cusk Eel	**Ophidiidae**	CRE-Fishes
Brotula townsendi	Townsend'S Cusk Eel	**Ophidiidae**	CRE-Fishes
Bythitidae	Livebearing Brotulas	**Bythitidae**	CRE-Fishes
Brosmophyciops pautzkei	Free-Tailed Brotula	**Bythitidae**	CRE-Fishes
Dinematichthys iluocoeteoides	Bythitid	**Bythitidae**	CRE-Fishes
Microbrotula sp	Brotula	**Bythitidae**	CRE-Fishes
Carapidae	Pearlfish	**Carapidae**	CRE-Fishes
Encheliophis homei	Pearlfish	**Carapidae**	CRE-Fishes
Carapus mourlani	Pearlfish	**Carapidae**	CRE-Fishes
Encheliophis boraborensis	Pearlfish	**Carapidae**	CRE-Fishes
Encheliophis vermicularis	Pearlfish	**Carapidae**	CRE-Fishes
Encheliophis gracilis	Pearlfish	**Carapidae**	CRE-Fishes
Onuxodon fowleri	Bivalve Pearlfish	**Carapidae**	CRE-Fishes
Antennariidae	Anglerfish	**Antennariidae**	CRE-Fishes
Antennatus analis	Pigmy Frogfish	**Antennariidae**	CRE-Fishes
Antennarius biocellatus	Frogfish	**Antennariidae**	CRE-Fishes
Antennatus coccineus	Freckled Frogfish	**Antennariidae**	CRE-Fishes
Antennatus coccineus	Giant Frogfish	**Antennariidae**	CRE-Fishes
Antennatus dorehensis	Bandtail Frogfish	**Antennariidae**	CRE-Fishes
Antennarius maculatus	Sargassumfish	**Antennariidae**	CRE-Fishes
Antennatus nummifer	Spotfin Frogfish	**Antennariidae**	CRE-Fishes
Antennarius pictus	Painted Frogfish	**Antennariidae**	CRE-Fishes
Antennarius randalli	Randall'S Frogfish	**Antennariidae**	CRE-Fishes
Antennatus rosaceus	Spiney-Tufted Frogfish	**Antennariidae**	CRE-Fishes
Antennatus tuberosus	Bandfin Frogfish	**Antennariidae**	CRE-Fishes
Histrio histrio	Sargassum Fish	**Antennariidae**	CRE-Fishes
Exocoetidae	Flying Fish	**Exocoetidae**	CRE-Fishes
Cheilopogon spilopterus	Flying Fish	**Exocoetidae**	CRE-Fishes
Cheilopogon spilopterus	Flying Fish	**Exocoetidae**	CRE-Fishes
Cheilopogon unicolor	Flying Fish	**Exocoetidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Cypselurus angusticeps	Flying Fish	**Exocoetidae**	CRE-Fishes
Cypselurus poecilopterus	Flying Fish	**Exocoetidae**	CRE-Fishes
Hirundichthys speculiger	Flying Fish	**Exocoetidae**	CRE-Fishes
Parexocoetus brachypterus	Flying Fish	**Exocoetidae**	CRE-Fishes
Parexocoetus mento	Flying Fish	**Exocoetidae**	CRE-Fishes
?	Flying Fish	**Exocoetidae**	CRE-Fishes
Prognichthys sealei	Flying Fish	**Exocoetidae**	CRE-Fishes
Exocoetus volitans	Flying Fish	**Exocoetidae**	CRE-Fishes
Belonidae	Needlefish	**Belonidae**	CRE-Fishes
Ablennes hians	Barred Needlefish	**Belonidae**	CRE-Fishes
Platybelone argalus platyura	Keeled Needlefish	**Belonidae**	CRE-Fishes
Strongylura incisa	Reef Needlefish	**Belonidae**	CRE-Fishes
Tylosurus crocodilus	Houndfish	**Belonidae**	CRE-Fishes
Strongylura leiura	Littoral Needlefish	**Belonidae**	CRE-Fishes
Tylosurus acus melanotus	Keeled Houndfish	**Belonidae**	CRE-Fishes
Hemiramphidae	Halfbeak	**Hemiramphidae**	CRE-Fishes
Hemiramphus archipelagicus	Halfbeak	**Hemiramphidae**	CRE-Fishes
Hyporhamphus acutus	Halfbeak	**Hemiramphidae**	CRE-Fishes
Hyporhamphus affinis	Halfbeak	**Hemiramphidae**	CRE-Fishes
Hyporhamphus dussumieri	Halfbeak	**Hemiramphidae**	CRE-Fishes
Zenarchopterus dispar	Esturine Halfbeak	**Hemiramphidae**	CRE-Fishes
Euleptorhamphus viridis	Ribbon Halfbeak	**Hemiramphidae**	CRE-Fishes
Hemiramphus far	Halfbeak	**Hemiramphidae**	CRE-Fishes
Oxyporhamphus micropterus	Smallwing Flying Fish	**Hemiramphidae**	CRE-Fishes
Hemiramphus lutkei	Halfbeak	**Hemiramphidae**	CRE-Fishes
Atherinidae	Silverside	**Atherinidae**	CRE-Fishes
Atherion elymus	Bearded Silverside	**Atherinidae**	CRE-Fishes
Hypoatherina ovalaua	Silverside	**Atherinidae**	CRE-Fishes
Atherinomorus lacunosus	Silverside	**Atherinidae**	CRE-Fishes
Atherinomorus lacunosus	Hardyhead Silverside	**Atherinidae**	CRE-Fishes
Atherinomorus duodecimalis	Tropical Silverside	**Atherinidae**	CRE-Fishes
Atherinomorus endrachtensis	Striped Silverside	**Atherinidae**	CRE-Fishes
Hypoatherina barnesi	Silverside	**Atherinidae**	CRE-Fishes
Hypoatherina temminckii	Silverside	**Atherinidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Stenatherina panatela	Panatella Silverside	**Atherinidae**	CRE-Fishes
Isonidae	Keeled Silversides	**Isonidae**	CRE-Fishes
Iso hawaiiensis	Keeled Silverside	**Isonidae**	CRE-Fishes
Berycidae	Lantern-Eye Fish	**Berycidae**	CRE-Fishes
Beryx decadactylus	Flashlightfish	**Berycidae**	CRE-Fishes
Photoblepharon palpebratum	Flashlightfish	**Anomalopidae**	CRE-Fishes
Anomalopidae	Flashlightfish	**Anomalopidae**	CRE-Fishes
Anomalops katoptron	Flashlightfish	**Anomalopidae**	CRE-Fishes
Holocentridae	Squirrel,Soldierfishes	**Holocentridae**	CRE-Fishes
Sargocentron caudimaculatum	Tailspot Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron diadema	Crown Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron punctatissimum	Speckled Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron microstoma	Finelined Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron praslin	Dark-Striped Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron spiniferum	Long-Jawed Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron tiere	Blue-Lined Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron tiereoides	Pink Squirrelfish	**Holocentridae**	CRE-Fishes
Neoniphon argenteus	Clearfin Squirrelfish	**Holocentridae**	CRE-Fishes
Neoniphon opercularis	Blackfin Squirrlefish	**Holocentridae**	CRE-Fishes
Neoniphon sammara	Bloodspot Squirrelfish	**Holocentridae**	CRE-Fishes
Neoniphon aurolineatus	Yellowstriped Squirrelfish	**Holocentridae**	CRE-Fishes
Myripristis adusta	Bronze Soldierfish	**Holocentridae**	CRE-Fishes
Myripristis amaena	Brick Soilderfish	**Holocentridae**	CRE-Fishes
Myripristis berndti	Bigscale Soldierfish	**Holocentridae**	CRE-Fishes
Myripristis kuntee	Pearly Soldierfish	**Holocentridae**	CRE-Fishes
Myripristis murdjan	Red Soldierfish	**Holocentridae**	CRE-Fishes
Myripristis violacea	Violet Soldierfish	**Holocentridae**	CRE-Fishes
Myripristis vittata	White-Tipped Soldierfish	**Holocentridae**	CRE-Fishes
Plectrypops lima	Cardinal Squirrelfish	**Holocentridae**	CRE-Fishes
Myripristis pralinia	Scarlet Soldierfish	**Holocentridae**	CRE-Fishes
Ostichthys kaianus	Deepwater Soldierfish	**Holocentridae**	CRE-Fishes
Myripristis chryseres	Yellowfin Soldierfish	**Holocentridae**	CRE-Fishes
Myripristis woodsi	White-Spot Soldierfish	**Holocentridae**	CRE-Fishes
Sargocentron ittodai	Samurai Squirrelfish	**Holocentridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Sargocentron melanospilos	Blackspot Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron violaceum	Violet Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron dorsomaculatum	Spotfin Squirrelfish	**Holocentridae**	CRE-Fishes
Myripristis amaena	Doubletooth Soldierfish	**Holocentridae**	CRE-Fishes
Sargocentron cornutum	3-Spot Squirrelfish	**Holocentridae**	CRE-Fishes
Sargocentron lepros	Squirrelfish	**Holocentridae**	CRE-Fishes
Holocentrus adscensionis	Furcate Squirrelfish	**Holocentridae**	CRE-Fishes
Ostichthys brachygnathus	Deepwater Soldierfish	**Holocentridae**	CRE-Fishes
Subfamily Holocentrinae	Squirrelfishes	**Holocentridae**	CRE-Fishes
Subfamily Myripristinae	Soldierfishes	**Holocentridae**	CRE-Fishes
Caproidae	Boarfishes	**Caproidae**	CRE-Fishes
Antigonia malayana	Boarfish	**Caproidae**	CRE-Fishes
Aulostomidae	Trumpetfish	**Aulostomidae**	CRE-Fishes
Aulostomus chinensis	Trumpetfish	**Aulostomidae**	CRE-Fishes
Fistulariidae	Cornetfish	**Fistulariidae**	CRE-Fishes
Fistularia commersonii	Cornetfish	**Fistulariidae**	CRE-Fishes
Centriscidae	Shrimpfishes	**Centriscidae**	CRE-Fishes
Aeoliscus strigatus	Shrimpfish	**Centriscidae**	CRE-Fishes
Solenostomidae	Ghost Pipefish	**Solenostomidae**	CRE-Fishes
Solenostomus cyanopterus	Ghost Pipefish	**Solenostomidae**	CRE-Fishes
Solenostomus paradoxus	Ornate Ghost Pipefish	**Solenostomidae**	CRE-Fishes
Syngnathoides biaculeatus	Alligator Pipefish	**Syngnathidae**	CRE-Fishes
Choeroichthys sculptus	Pipefish	**Syngnathidae**	CRE-Fishes
Choeroichthys brachysoma	Pipefish	**Syngnathidae**	CRE-Fishes
Corythoichthys flavofasciatus	Network Pipefish	**Syngnathidae**	CRE-Fishes
Corythoichthys intestinalis	Reef Pipefish	**Syngnathidae**	CRE-Fishes
Corythoichthys nigripectus	Bl-Breasted Pipefish	**Syngnathidae**	CRE-Fishes
Cosmocampus darrosanus	D'Arros Pipefish	**Syngnathidae**	CRE-Fishes
Doryrhamphus excisus excisus	Bluestripe Pipefish	**Syngnathidae**	CRE-Fishes
Dunckerocampus dactyliophorus	Banded Pipefish	**Syngnathidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Hippocampus histrix	Pipefish	**Syngnathidae**	CRE-Fishes
Micrognathus pygmaeus	Pygmy Short-Nosed Pipefish	**Syngnathidae**	CRE-Fishes
Halicampus brocki	Brock'S Pipefish	**Syngnathidae**	CRE-Fishes
Halicampus mataafae	Samoan Pipefish	**Syngnathidae**	CRE-Fishes
Minyichthys myersi	Ventricose Milda	**Syngnathidae**	CRE-Fishes
Phoxocampus diacanthus	Pipefish	**Syngnathidae**	CRE-Fishes
Synodontidae	Lizardfish	**Synodontidae**	CRE-Fishes
Trachyrhamphus bicoarctatus	Double-Ended Pipefish	**Syngnathidae**	CRE-Fishes
Micrognathus andersonii	Anderson'S Shrt-Nosed Pipefish	**Syngnathidae**	CRE-Fishes
Bhanotia nuda	Pipefish	**Syngnathidae**	CRE-Fishes
Bulbonaricus brauni	Pipefish	**Syngnathidae**	CRE-Fishes
Corythoichthys haematopterus	Pipefish	**Syngnathidae**	CRE-Fishes
Corythoichthys ocellatus	Ocellated Pipefish	**Syngnathidae**	CRE-Fishes
Corythoichthys polynotatus	Many-Spotted Pipefish	**Syngnathidae**	CRE-Fishes
Corythoichthys schultzi	Guilded Pipefish	**Syngnathidae**	CRE-Fishes
Cosmocampus banneri	Roughridge Pipefish	**Syngnathidae**	CRE-Fishes
Cosmocampus maxweberi	Maxweber'S Pipefish	**Syngnathidae**	CRE-Fishes
Doryrhamphus janssi	Janss' Pipefish	**Syngnathidae**	CRE-Fishes
Doryrhamphus negrosensis	Negros Pipefish	**Syngnathidae**	CRE-Fishes
Halicampus dunckeri	Duncker'S Pipefish	**Syngnathidae**	CRE-Fishes
Halicampus nitidus	Glittering Pipefish	**Syngnathidae**	CRE-Fishes
Hippichthys cyanospilos	Pipefish	**Syngnathidae**	CRE-Fishes
Hippichthys spicifer	Pipefish	**Syngnathidae**	CRE-Fishes
Hippocampus kuda	Pipefish	**Syngnathidae**	CRE-Fishes
Microphis brachyurus	Pipefish	**Syngnathidae**	CRE-Fishes
Microphis brevidorsalis	Pipefish	**Syngnathidae**	CRE-Fishes
Microphis leiaspis	Pipefish	**Syngnathidae**	CRE-Fishes
Microphis manadensis	Pipefish	**Syngnathidae**	CRE-Fishes
Microphis retzii	Pipefish	**Syngnathidae**	CRE-Fishes
Scorpaenidae	Scorpionfish	**Scorpaenidae**	CRE-Fishes
Dendrochirus biocellatus	Scorpionfish	**Lutjanidae**	CRE-Fishes
Dendrochirus brachypterus	Scorpionfish	**Scorpaenidae**	CRE-Fishes
Pontinus macrocephalus	Lg-Headed	**Scorpaenidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
	Scorpionfish		
Pterois antennata	Spotfin Lionfish	**Scorpaenidae**	CRE-Fishes
Pterois radiata	Clearfin Lionfish	**Scorpaenidae**	CRE-Fishes
Pterois volitans	Turkeyfish	**Scorpaenidae**	CRE-Fishes
Sebastapistes cyanostigma	Yellowspotted Scorpionfish	**Scorpaenidae**	CRE-Fishes
Sebastapistes galactacma	Galactacma Scorpionfish	**Scorpaenidae**	CRE-Fishes
Sebastapistes mauritiana	Mauritius Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenodes minor	Minor Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenodes guamensis	Guam Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenodes kelloggi	Kellogg'S Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenodes parvipinnis	Coral Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenopsis oxycephala	Tassled Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenopsis diabolus	Devil Scorpionfish	**Scorpaenidae**	CRE-Fishes
Synanceia verrucosa	Stonefish	**Synanceiidae**	CRE-Fishes
Taenioides limicola	Goby	**Gobiidae**	CRE-Fishes
Scorpaenodes varipinnis	Blotchfin Scorpionfish	**Scorpaenidae**	CRE-Fishes
Sebastapistes fowleri	Pygmy Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenopsis macrochir	Flasher Scorpionfish	**Scorpaenidae**	CRE-Fishes
Sebastapistes strongia	Barchin Scorpionfish	**Scorpaenidae**	CRE-Fishes
Parascorpaena mossambica	Mozambique Scorpionfish	**Scorpaenidae**	CRE-Fishes
Dendrochirus zebra	Zebra Lionfish	**Scorpaenidae**	CRE-Fishes
Rhinopias frondosa	Weedy Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenodes hirsutus	Hairy Scorpionfish	**Scorpaenidae**	CRE-Fishes
Inimicus didactylus	Spiny Devilfish	**Synanceiidae**	CRE-Fishes
Pontinus sp	Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenopsis sp	Scorpionfish	**Scorpaenidae**	CRE-Fishes
Parascorpaena mcadamsi	Mcadam'S Scorpionfish	**Scorpaenidae**	CRE-Fishes
Scorpaenopsis papuensis	Papuan Scorpionfish	**Scorpaenidae**	CRE-Fishes
Tetrarogidae	Waspfishes	**Tetrarogidae**	CRE-Fishes
Tetraroge barbata	Mangrove Waspfish	**Tetrarogidae**	CRE-Fishes
Pontinus tentacularis	Scopionfish	**Scorpaenidae**	CRE-Fishes
Aploactinidae	Velvetfishes	**Aploactinidae**	CRE-Fishes
Cocotropus larvatus	Velvetfish	**Aploactinidae**	CRE-Fishes
Triglidae	Gurnards	**Triglidae**	CRE-Fishes
Pterygotrigla sp	Gurnard	**Triglidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Pterygotrigla multiocellata	Ocellated Gurnard	**Triglidae**	CRE-Fishes
Caracanthidae	Coral Crouchers	**Caracanthidae**	CRE-Fishes
Caracanthus maculatus	Velvetfish	**Caracanthidae**	CRE-Fishes
Caracanthus unipinna	Velvetfish	**Caracanthidae**	CRE-Fishes
Platycephalidae	Flathead	**Platycephalidae**	CRE-Fishes
Sunagocia otaitensis	Fringlip Flathead	**Platycephalidae**	CRE-Fishes
Sunagocia arenicola	Broadhead Flathead	**Platycephalidae**	CRE-Fishes
Thysanophrys chiltonae	Longsnout Flathead	**Platycephalidae**	CRE-Fishes
Cymbacephalus beauforti	Flathead	**Platycephalidae**	CRE-Fishes
Rogadius welanderi	Flathead	**Platycephalidae**	CRE-Fishes
Dactylopteridae	Flying Gurnard	**Dactylopteridae**	CRE-Fishes
Dactyloptena orientalis	Flying Gurnard	**Dactylopteridae**	CRE-Fishes
Dactyloptena peterseni	Flying Gurnard	**Dactylopteridae**	CRE-Fishes
Pegasidae	Dragonfish	**Pegasidae**	CRE-Fishes
Eurypegasus draconis	Dragon Fish	**Pegasidae**	CRE-Fishes
Ambassidae	Glass Perch	**Ambassidae**	CRE-Fishes
Ambassis buruensis	Glassie	**Ambassidae**	CRE-Fishes
Ambassis interrupta	Glassie	**Ambassidae**	CRE-Fishes
Serranidae	Sea Basses,Groupers	**Serranidae**	CRE-Fishes
Aethaloperca rogaa	Red-Flushed Grouper	**Serranidae**	CRE-Fishes
Epinephelus retouti	Truncated Grouper	**Serranidae**	CRE-Fishes
Cephalopholis sp.	Grouper	**Serranidae**	CRE-Fishes
Cephalopholis spiloparaea	Pygmy Grouper	**Serranidae**	CRE-Fishes
Cephalopholis argus	Peacock Grouper	**Serranidae**	CRE-Fishes
Cephalopholis aurantia	Orange Grouper	**Serranidae**	CRE-Fishes
Cephalopholis igarashiensis	Ybanded Grouper	**Serranidae**	CRE-Fishes
Cephalopholis leopardus	Leopard Grouper	**Serranidae**	CRE-Fishes
Cephalopholis boenak	Brownbarred Grouper	**Serranidae**	CRE-Fishes
Cephalopholis sonnerati	Tomato Grouper	**Serranidae**	CRE-Fishes
Cephalopholis sexmaculata	6-Banded Grouper	**Serranidae**	CRE-Fishes
Cephalopholis urodeta	Flag-Tailed Grouper	**Serranidae**	CRE-Fishes
Cromileptes altivelis	Grouper	**Serranidae**	CRE-Fishes
Epinephelus morrhua	Grouper	**Serranidae**	CRE-Fishes
Epinephelus howlandi	Grouper	**Serranidae**	CRE-Fishes
Epinephelus fasciatus	blacktip grouper	**Serranidae**	BF Multi-species complex

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Epinephelus fuscoguttatus	Blotchy Grouper	**Serranidae**	CRE-Fishes
Epinephelus hexagonatus	Hexagon Grouper	**Serranidae**	CRE-Fishes
Epinephelus lanceolatus	Giant Grouper	**Serranidae**	CRE-Fishes
Epinephelus maculatus	Highfin Grouper	**Serranidae**	CRE-Fishes
Epinephelus socialis	Tidepool Grouper	**Serranidae**	CRE-Fishes
Epinephelus merra	Honeycomb Grouper	**Serranidae**	CRE-Fishes
Epinephelus polyphekadion	Marbled Grouper	**Serranidae**	CRE-Fishes
Epinephelus tauvina	Greasy Grouper	**Serranidae**	CRE-Fishes
Cephalopholis polleni	Harlequin Grouper	**Serranidae**	CRE-Fishes
Hyporthodus septemfasciatus	7-Banded Grouper	**Serranidae**	CRE-Fishes
Plectropomus laevis	Saddleback Grouper	**Serranidae**	CRE-Fishes
Plectropomus areolatus	Squaretail Grouper	**Serranidae**	CRE-Fishes
Saloptia powelli	Powell'S Grouper	**Serranidae**	CRE-Fishes
Variola louti	lunartail (lyretail) grouper	**Serranidae**	BF Multi-species complex
Epinephelus miliaris	Grouper	**Serranidae**	CRE-Fishes
Gracila albomarginata	Wh-Margined Grouper	**Serranidae**	CRE-Fishes
Variola albimarginata	Whmargin Lyretail Grouper	**Serranidae**	CRE-Fishes
Cephalopholis miniata	Coral Grouper	**Serranidae**	CRE-Fishes
Epinephelus cyanopodus	Grouper	**Serranidae**	CRE-Fishes
Epinephelus coeruleopunctatus	Orange Grouper	**Serranidae**	CRE-Fishes
Epinephelus chlorostigma	Brown-Spotted Grouper	**Serranidae**	CRE-Fishes
Epinephelus melanostigma	Bl-Spot Honeycomb Grouper	**Serranidae**	CRE-Fishes
Epinephelus malabaricus	Malabar Grouper	**Serranidae**	CRE-Fishes
Epinephelus ongus	Wavy-Lined Grouper	**Serranidae**	CRE-Fishes
Epinephelus spilotoceps	4-Saddle Grouper	**Serranidae**	CRE-Fishes
Epinephelus retouti	Grouper	**Serranidae**	CRE-Fishes
Plectropomus leopardus	Leopard Coral Trout	**Serranidae**	CRE-Fishes
Plectropomus oligacanthus	Blue-Lined Coral Trout	**Serranidae**	CRE-Fishes
Anyperodon leucogrammicus	Grouper	**Serranidae**	CRE-Fishes
Epinephelus corallicola	Grouper	**Serranidae**	CRE-Fishes
Epinephelus macrospilos	Grouper	**Serranidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Cephalopholis cyanostigma	Grouper	**Serranidae**	CRE-Fishes
Epinephelus coioides	Orange Spot Grouper	**Serranidae**	CRE-Fishes
Pseudanthias cooperi	Red-Bar Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias pascalus	Purple Queen	**Serranidae**	CRE-Fishes
Pseudanthias pleurotaenia	Sq-Spot Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias sp	Fairy Basslet	**Serranidae**	CRE-Fishes
Odontanthias borbonius	Fairy Basslet	**Serranidae**	CRE-Fishes
Odontanthias katayamai	Fairy Basslet	**Serranidae**	CRE-Fishes
Plectranthias kamii	Basslet	**Serranidae**	CRE-Fishes
Plectranthias nanus	Pygmy Basslet	**Serranidae**	CRE-Fishes
Selenanthias myersi	Basslet	**Serranidae**	CRE-Fishes
Pseudanthias bartlettorum	Bartlet'S Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias bicolor	Bicolor Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias dispar	Peach Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias lori	Lori'S Anthias	**Serranidae**	CRE-Fishes
Pseudanthias randalli	Randall'S Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias tuka	Y Striped Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias smithvanizi	Smithvaniz' Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias ventralis	L-Finned Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias huchtii	Fairy Basslet	**Serranidae**	CRE-Fishes
Pseudanthias squamipinnis	Fairy Basslet	**Serranidae**	CRE-Fishes
Luzonichthys waitei	Magenta Slender Basslet	**Serranidae**	CRE-Fishes
Luzonichthys whitleyi	Whitley'S Slender Basslet	**Serranidae**	CRE-Fishes
Plectranthias longimanus	Long-Finned Basslet	**Serranidae**	CRE-Fishes
Plectranthias winniensis	Basslet	**Serranidae**	CRE-Fishes
Plectranthias fourmanoiri	Fourmanoir'S Basslet	**Serranidae**	CRE-Fishes
Serranocirrhitus latus	Hawkfish Anthias	**Serranidae**	CRE-Fishes
Rabaulichthys sp	Fairy Basslet	**Serranidae**	CRE-Fishes
Plectranthias rubrifasciatus	Basslet	**Serranidae**	CRE-Fishes
Liopropoma lunulatum	Swissguard Basslet	**Serranidae**	CRE-Fishes
Liopropoma mitratum	Swissguard Basslet	**Serranidae**	CRE-Fishes
Liopropoma	Swissguard Basslet	**Serranidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
multilineatum			
Liopropoma pallidum	Pallid Basslet	**Serranidae**	CRE-Fishes
Liopropoma susumi	Pinstripe Basslet	**Serranidae**	CRE-Fishes
Liopropoma tonstrinum	Redstripe Basslet	**Serranidae**	CRE-Fishes
Liopropoma maculatum	Swissguard Basslet	**Serranidae**	CRE-Fishes
Subfamily Grammistinae	Soapfish	**Serranidae**	CRE-Fishes
Belonoperca chabanaudi	Soapfish	**Serranidae**	CRE-Fishes
Grammistes sexlineatus	Yellowstripe Soapfish	**Serranidae**	CRE-Fishes
Grammistops ocellatus	Ocellate Soapfish	**Serranidae**	CRE-Fishes
Pogonoperca punctata	Spotted Soapfish	**Serranidae**	CRE-Fishes
Callanthiidae	Goldies	**Callanthiidae**	CRE-Fishes
Grammatorcynus sp.	Goldies	**Callanthiidae**	CRE-Fishes
Grammatorcynus sp.	Goldies	**Callanthiidae**	CRE-Fishes
Pseudochromidae	Dottybacks	**Pseudochromidae**	CRE-Fishes
Pseudochromis cyanotaenia	Surge Dottyback	**Pseudochromidae**	CRE-Fishes
Pseudochromis fuscus	Dusky Dottyback	**Pseudochromidae**	CRE-Fishes
Pseudochromis marshallensis	Marshall Is Dottyback	**Pseudochromidae**	CRE-Fishes
Manonichthys polynemus	Long-Finned Dottyback	**Pseudochromidae**	CRE-Fishes
Pictichromis porphyrea	Magenta Dottyback	**Pseudochromidae**	CRE-Fishes
Pseudoplesiops revellei	Revelle'S Basslet	**Pseudochromidae**	CRE-Fishes
Pseudoplesiops rosae	Rose Island Basslet	**Pseudochromidae**	CRE-Fishes
Pseudoplesiops typus	Hidden Basslet	**Pseudochromidae**	CRE-Fishes
Pseudoplesiops sp	Basslet	**Pseudochromidae**	CRE-Fishes
Lubbockichthys multisquamatus	Robust Dottyback	**Pseudochromidae**	CRE-Fishes
Belonepterygion fasciolatum	Spiney Basslets	**Subfamily Acanthoclininae**	CRE-Fishes
Acanthoplesiops hiatti	Hiatt'S Basslet	**Plesiopidae**	CRE-Fishes
Subfamily Grammistinae	Soapfishes	**Serranidae**	CRE-Fishes
Aporops bilinearis	2-Lined Soapfish	**Serranidae**	CRE-Fishes
Pseudogramma polyacantha	Soapfish	**Serranidae**	CRE-Fishes
Pseudogramma sp	Soapfish	**Serranidae**	CRE-Fishes
Plesiopidae	Longfins	**Plesiopidae**	CRE-Fishes
Calloplesiops altivelis	Longfin	**Plesiopidae**	CRE-Fishes
Plesiops coeruleolineatus	Red-Tipped Longfin	**Plesiopidae**	CRE-Fishes
Plesiops corallicola	Bluegill Longfin	**Plesiopidae**	CRE-Fishes
Pseudochromis	Dottyback	**Pseudochromidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
tapeinosoma			
Plesiops oxycephalus	Sharp-Nosed Longfin	**Plesiopidae**	CRE-Fishes
Tetraodontidae	Smooth Puffers	**Tetraodontidae**	CRE-Fishes
Terapontidae	Thornfishes	**Terapontidae**	CRE-Fishes
Kuhliidae	Flagtails	**Kuhliidae**	CRE-Fishes
Kuhlia mugil	Barred Flagtail	**Kuhliidae**	CRE-Fishes
Kuhlia rupestris	River Flagtail	**Kuhliidae**	CRE-Fishes
Kuhlia marginata	Dark-Margined Flagtail	**Kuhliidae**	CRE-Fishes
Priacanthidae	Bigeyes	**Priacanthidae**	CRE-Fishes
Heteropriacanthus cruentatus	Glasseye	**Priacanthidae**	CRE-Fishes
Priacanthus hamrur	Goggle-Eye	**Priacanthidae**	CRE-Fishes
Pristigenys meyeri	Bigeye	**Priacanthidae**	CRE-Fishes
Cookeolus japonicus	Bulleye	**Priacanthidae**	CRE-Fishes
Priacanthus alalaua	Bigeye	**Priacanthidae**	CRE-Fishes
Heteropriacanthus cruentatus	Deepwater Glasseye	**Priacanthidae**	CRE-Fishes
Apogonidae	Cardinalfishes	**Apogonidae**	CRE-Fishes
Ostorhinchus angustatus	Broad-Striped Cardinalfish	**Apogonidae**	CRE-Fishes
Nectamia bandanensis	Bigeye Cardinalfish	**Apogonidae**	CRE-Fishes
Apogon coccineus	Cryptic Cardinalfish	**Apogonidae**	CRE-Fishes
Pristiapogon exostigma	Eyeshadow Cardinalfish	**Apogonidae**	CRE-Fishes
Pristiapogon fraenatus	Bridled Cardinalfish	**Apogonidae**	CRE-Fishes
Nectamia fusca	Guam Cardinalfish	**Apogonidae**	CRE-Fishes
Pristiapogon kallopterus	Iridescent Cardinalfish	**Apogonidae**	CRE-Fishes
Fibramia lateralis	Inshore Cardinalfish	**Apogonidae**	CRE-Fishes
Zoramia leptacantha	Bluestreak Cardinalfish	**Apogonidae**	CRE-Fishes
Pristiapogon taeniopterus	Bandfin Cardinalfish	**Apogonidae**	CRE-Fishes
Ostorhinchus nigrofasciatus	Black-Striped Cardinalfish	**Apogonidae**	CRE-Fishes
Ostorhinchus novemfasciatus	7-Lined Cardinalfish	**Apogonidae**	CRE-Fishes
Ostorhinchus taeniophorus	Bandfin Cardinalfish	**Apogonidae**	CRE-Fishes
Nectamia savayensis	Gray Cardinalfish	**Apogonidae**	CRE-Fishes
Pristicon trimaculatus	3-Spot Cardinalfish	**Apogonidae**	CRE-Fishes
Apogon sp.	Cardinalfish	**Apogonidae**	CRE-Fishes
Apogonichthys ocellatus	Ocellated Cardinalfish	**Apogonidae**	CRE-Fishes

Correct Scientific Name	Common Name	Correct Family Name	FEP GROUP
Taeniamia biguttata	Twinspot Cardinalfish	**Apogonidae**	CRE-Fishes
Taeniamia fucata	Orange-Lined Cardinalfish	**Apogonidae**	CRE-Fishes
Cheilodipterus singapurensis	Truncate Cardinalfish	**Apogonidae**	CRE-Fishes
Cheilodipterus macrodon	Lg-Toothed Cardinalfish	**Apogonidae**	CRE-Fishes
Cheilodipterus quinquelineatus	5-Lined Cardinalfish	**Apogonidae**	CRE-Fishes
Fowleria punctulata	Spotcheek Cardinalfish	**Apogonidae**	CRE-Fishes
Fowleria marmorata	Marbled Cardinalfish	**Apogonidae**	CRE-Fishes
Fowleria variegata	Variegated Cardinalfish	**Apogonidae**	CRE-Fishes
Pseudamiops gracilicauda	Cardinalfish	**Apogonidae**	CRE-Fishes
Siphamia tubifer	Cardinalfish	**Apogonidae**	CRE-Fishes
Siphamia fistulosa	Cardinalfish	**Apogonidae**	CRE-Fishes
Sphaeramia orbicularis	Cardinalfish	**Apogonidae**	CRE-Fishes
Sphaeramia nematoptera	Cardinalfish	**Apogonidae**	CRE-Fishes
Fibramia amboinensis	Cardinalfish	**Apogonidae**	CRE-Fishes
Ostorhinchus compressus	Ohcre-Striped Cardinalfish	**Apogonidae**	CRE-Fishes
Ostorhinchus dispar	Redspot Cardinalfish	**Apogonidae**	CRE-Fishes
Apogon doryssa	Longspine Cardinalfish	**Apogonidae**	CRE-Fishes
Zapogon evermanni	Evermann'S Cardinalfish	**Apogonidae**	CRE-Fishes
Zoramia gilberti	Gilbert'S Cardinalfish	**Apogonidae**	CRE-Fishes
Zoramia fragilis	Cardinalfish	**Apogonidae**	CRE-Fishes
Zoramia perlita	Pearly Cardinalfish	**Apogonidae**	CRE-Fishes
Fibramia thermalis	Sangi Cardinalfish	**Apogonidae**	CRE-Fishes
Apogonichthys perdix	Perdix Cardinalfish	**Apogonidae**	CRE-Fishes
Taeniamia zosterophora	Blackbelted Cardinalfish	**Apogonidae**	CRE-Fishes
Cheilodipterus isostigmus	Cardinalfish	**Apogonidae**	CRE-Fishes
Gymnapogon urospilotus	Cardinalfish	**Apogonidae**	CRE-Fishes
Pseudamia amblyuroptera	Cardinalfish	**Apogonidae**	CRE-Fishes
Pseudamia gelatinosa	Cardinalfish	**Apogonidae**	CRE-Fishes
Pseudamia hayashii	Cardinalfish	**Apogonidae**	CRE-Fishes
Verulux cypselurus	Cardinalfish	**Apogonidae**	CRE-Fishes
Rhabdamia gracilis	Cardinalfish	**Apogonidae**	CRE-Fishes
Foa brachygramma	Bay Cardinalfish	**Apogonidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Foa sp.	Cardinalfish	**Apogonidae**	CRE-Fishes
Jaydia ellioti	Elliot'S Cardinalfish	**Apogonidae**	CRE-Fishes
Ostorhinchus sealei	Seale'S Cardinalfish	**Apogonidae**	CRE-Fishes
Apogonichthyoides melas	Black Cardinalfish	**Apogonidae**	CRE-Fishes
Cheilodipterus artus	Lined Cardinalfish	**Apogonidae**	CRE-Fishes
Siphamia fuscolineata	Cardinalfish	**Apogonidae**	CRE-Fishes
Gymnapogon philippinus	Philippine Cardinalfish	**Apogonidae**	CRE-Fishes
Pseudamia zonata	Cardinalfish	**Apogonidae**	CRE-Fishes
?	Cardinalfish	**Apogonidae**	CRE-Fishes
Apogonichthyoides nigripinnis	Cardinalfish	**Apogonidae**	CRE-Fishes
Ostorhinchus notatus	Cardinalfish	**Apogonidae**	CRE-Fishes
Pristicon rhodopterus	Cardinalfish	**Apogonidae**	CRE-Fishes
Cheilodipterus intermedius	Intermediate Cardinalfish	**Apogonidae**	CRE-Fishes
Fowleria vaiulae	Cardinalfish	**Apogonidae**	CRE-Fishes
Ostorhinchus hartzfeldii	Hartzfeld's cardinalfish	**Apogonidae**	CRE-Fishes
Sillaginidae	Sillagos	**Sillaginidae**	CRE-Fishes
Sillago sihama	Cardinalfish	**Sillaginidae**	CRE-Fishes
Malacanthidae	Tilefishes	**Malacanthidae**	CRE-Fishes
Hoplolatilus cuniculus	Tilefish	**Malacanthidae**	CRE-Fishes
Hoplolatilus fronticinctus	Tilefish	**Malacanthidae**	CRE-Fishes
Hoplolatilus starcki	Tilefish	**Malacanthidae**	CRE-Fishes
Malacanthus brevirostris	Quakerfish	**Malacanthidae**	CRE-Fishes
Malacanthus latovittatus	Striped Blanquillo	**Malacanthidae**	CRE-Fishes
Echeneidae	Diskfishes	**Echeneidae**	CRE-Fishes
Phtheirichthys lineatus	Slender Suckerfish	**Echeneidae**	CRE-Fishes
Remora remora	Remora	**Echeneidae**	CRE-Fishes
Remora osteochir	Remora	**Echeneidae**	CRE-Fishes
Echeneis naucrates	Remora	**Echeneidae**	CRE-Fishes
Carangidae	Jack (misc)	**Carangidae**	CRE-Fishes
Alectis ciliaris	Pennantfish/threadfin	**Carangidae**	CRE-Fishes
Alectis indica	Malabar Trevally	**Carangidae**	CRE-Fishes
Carangoides orthogrammus	Goldspot trevally	**Carangidae**	CRE-Fishes
Caranx ignobilis	giant trevally, jack	**Carangidae**	BF Multi-species complex
Caranx lugubris	black trevally, jack	**Carangidae**	BF Multi-species complex
Caranx melampygus	Bluefin trevally	**Carangidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Caranx sexfasciatus	Bigeye trevally	**Carangidae**	CRE-Fishes
Decapterus macarellus	Mackerel scad	**Carangidae**	CRE-Fishes
Elagatis bipinnulata	Rainbow runner	**Carangidae**	CRE-Fishes
Gnathanodon speciosus	Golden trevally	**Carangidae**	CRE-Fishes
Scomberoides lysan	Leatherback	**Carangidae**	CRE-Fishes
Selar crumenophthalmus	Atulai	**Carangidae**	CRE-Fishes
Seriola dumerili	amberjack	**Carangidae**	BF Multi-species complex
Seriola rivoliana	Almaco jack	**Carangidae**	CRE-Fishes
Trachinotus baillonii	Small spotted pompano	**Carangidae**	CRE-Fishes
Trachinotus blochii	Silver or Snubnose pompano	**Carangidae**	CRE-Fishes
Uraspis helvola	Kingfish	**Carangidae**	CRE-Fishes
Carangoides coeruleopinnatus	Blue kingfish trevally	**Carangidae**	CRE-Fishes
Tribe Carangini		**Carangidae**	CRE-Fishes
Decapterus maruadsi	Round scad	**Carangidae**	CRE-Fishes
Carangoides ferdau	Bar jack	**Carangidae**	CRE-Fishes
Decapterus macrosoma	Mackerel scad	**Carangidae**	CRE-Fishes
Carangoides plagiotaenia	Barcheek trevally	**Carangidae**	CRE-Fishes
Carangoides talamparoides	Jacks (misc)	**Carangidae**	CRE-Fishes
Atule mate	Atulai	**Carangidae**	CRE-Fishes
Selar boops	Atulai	**Carangidae**	CRE-Fishes
Caranx papuensis	Brassy trevally	**Carangidae**	CRE-Fishes
Caranx sp.	Trevally	**Carangidae**	CRE-Fishes
Decapterus russelli	Round scad	**Carangidae**	CRE-Fishes
Carangoides dinema	Shadow kingfish	**Carangidae**	CRE-Fishes
Ulua mentalis	Mandibular kingfish	**Carangidae**	CRE-Fishes
Carangoides fulvoguttatus	Yellow dotted trevally	**Carangidae**	CRE-Fishes
Uraspis uraspis	Whitemouth trevally	**Carangidae**	CRE-Fishes
Naucrates ductor	Pilotfish	**Carangidae**	CRE-Fishes
Uraspis secunda	Deep trevally	**Carangidae**	CRE-Fishes
Carangoides coeruleopinnatus	Trevally	**Carangidae**	CRE-Fishes
Carangoides hedlandensis	Headnotch trevally	**Carangidae**	CRE-Fishes
Megalaspis cordyla	Torpedo scad	**Carangidae**	CRE-Fishes
?	Elagatis, Scomberoides	**Carangidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Leiognathidae	Ponyfishes	**Leiognathidae**	CRE-Fishes
Leiognathus equulus	Common Slipmouth	**Leiognathidae**	CRE-Fishes
Gazza achlamys	Lg-Toothed Ponyfish	**Leiognathidae**	CRE-Fishes
Equulites stercorarius	Oblong Slipmouth	**Leiognathidae**	CRE-Fishes
Equulites elongatus	Slipmouth	**Leiognathidae**	CRE-Fishes
Leiognathus longispinis	Slipmouth	**Leiognathidae**	CRE-Fishes
Photopectoralis bindus	Slipmouth	**Leiognathidae**	CRE-Fishes
Secutor ruconius	Pugnose Soapy	**Leiognathidae**	CRE-Fishes
Gazza minuta	Toothed Ponyfish	**Leiognathidae**	CRE-Fishes
Emmelichthyidae	Bonnet Mouths	**Emmelichthyidae**	CRE-Fishes
Emmelichthys karnellai	Bonnetmouth	**Emmelichthyidae**	CRE-Fishes
Erythrocles scintillans	Bonnetmouth	**Emmelichthyidae**	CRE-Fishes
Lutjanidae	Snappers	**Lutjanidae**	CRE-Fishes
Aphareus furca	Silvermouth/Jobfish	**Lutjanidae**	CRE-Fishes
Aphareus rutilans	red snapper, silvermouth (lehi)	**Lutjanidae**	BF Multi-species complex
Aprion virescens	grey snapper, jobfish	**Lutjanidae**	BF Multi-species complex
Etelis carbunculus	red snapper (ehu)	**Lutjanidae**	BF Multi-species complex
Etelis coruscans	red snapper (onaga)	**Lutjanidae**	BF Multi-species complex
Lutjanus argentimaculatus	River Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus bohar	Red Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus fulvus	Flametail Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus gibbus	Humpback Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus kasmira	blueline snapper	**Lutjanidae**	BF Multi-species complex
Lutjanus rivulatus	Scribbled Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus monostigma	Onespot Snapper	**Lutjanidae**	CRE-Fishes
Macolor niger	Black Snapper	**Lutjanidae**	CRE-Fishes
Paracaesio sordida	Fusilier	**Lutjanidae**	CRE-Fishes
Paracaesio xanthura	Yellowtail Fusilier	**Lutjanidae**	CRE-Fishes
Pristipomoides auricilla	yellowtail snapper	**Lutjanidae**	BF Multi-species complex
Pristipomoides filamentosus	pink snapper (paka)	**Lutjanidae**	BF Multi-species complex
Pristipomoides flavipinnis	yelloweye snapper	**Lutjanidae**	BF Multi-species complex
Pristipomoides sieboldii	pink snapper (kalekale)	**Lutjanidae**	BF Multi-species

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
			complex
Pristipomoides zonatus	snapper (gindai)	**Lutjanidae**	BF Multi-species complex
Randallichthys filamentosus	Deepwater Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus biguttatus	Two-Spot Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus decussatus	Checkered Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus ehrenbergii	Blackspot Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus malabaricus	Malabar Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus semicinctus	1/2-Barred Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus vitta	One-Lined Snapper	**Lutjanidae**	CRE-Fishes
Symphorichthys spilurus	Sailfin Snapper	**Lutjanidae**	CRE-Fishes
Macolor macularis	Bl And Wh Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus sebae	Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus boutton	Snapper	**Lutjanidae**	CRE-Fishes
Lutjanus fulviflamma	Snapper	**Lutjanidae**	CRE-Fishes
Caesionidae	Fusilier	**Caesionidae**	CRE-Fishes
Caesio caerulaurea	Scissor-Tailed Fusilier	**Caesionidae**	CRE-Fishes
Caesio teres	Yellowback Caesio	**Caesionidae**	CRE-Fishes
Pterocaesio marri	Twinstripe Fusilier	**Caesionidae**	CRE-Fishes
Pterocaesio tile	Bluestreak Fusilier	**Caesionidae**	CRE-Fishes
Caesio cuning	Fusilier	**Caesionidae**	CRE-Fishes
Caesio lunaris	Lunar Fusilier	**Caesionidae**	CRE-Fishes
Pterocaesio lativittata	Yellowstreak Fusilier	**Caesionidae**	CRE-Fishes
Pterocaesio trilineata	3-Striped Fusilier	**Caesionidae**	CRE-Fishes
Pterocaesio pisang	Ruddy Fusilier	**Caesionidae**	CRE-Fishes
Gymnocaesio gymnoptera	Fusilier	**Caesionidae**	CRE-Fishes
Pterocaesio tessellata	Mosaic Fusilier	**Caesionidae**	CRE-Fishes
Symphysanodontidae	Sympysanodon	**Symphysanodontidae**	CRE-Fishes
Symphysanodon typus	Symphysanid	**Symphysanodontidae**	CRE-Fishes
Nemipteridae	Threadfin Breams	**Nemipteridae**	CRE-Fishes
Scolopsis lineata	Bl And Wh Spinecheek	**Nemipteridae**	CRE-Fishes
Scolopsis bilineata	2 Line Spinecheek	**Nemipteridae**	CRE-Fishes
Scolopsis margaritifera	Margarite'S Spinecheek	**Nemipteridae**	CRE-Fishes
Scolopsis affinis	Spinecheek	**Nemipteridae**	CRE-Fishes
Scolopsis trilineata	3 Line Spinecheek	**Nemipteridae**	CRE-Fishes
Scolopsis ciliata	Ciliate Spinecheek	**Nemipteridae**	CRE-Fishes
Scolopsis taenioptera	Spinecheek	**Nemipteridae**	CRE-Fishes
Scolopsis xenochroa	Spinecheek	**Nemipteridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Nemipterus hexodon	Butterfly Bream	**Nemipteridae**	CRE-Fishes
Nemipterus peronii	Notched Butterfly Bream	**Nemipteridae**	CRE-Fishes
Nemipterus peronii	Butterfly Bream	**Nemipteridae**	CRE-Fishes
Nemipterus furcosus	Forktail Bream	**Nemipteridae**	CRE-Fishes
Lobotidae	Tripletails	**Lobotidae**	CRE-Fishes
Lobotes surinamensis	Triplefin	**Lobotidae**	CRE-Fishes
Gerreidae	Mojarras	**Gerreidae**	CRE-Fishes
Gerres longirostris	Common Mojarra	**Gerreidae**	CRE-Fishes
Gerres erythrourus	Deep-Bodied Mojarra	**Gerreidae**	CRE-Fishes
Gerres oblongus	Oblong Mojarra	**Gerreidae**	CRE-Fishes
Gerres filamentosus	Filamentous Mojarra	**Gerreidae**	CRE-Fishes
Gerres oyena	Oyena Mojarra	**Gerreidae**	CRE-Fishes
Gerres filamentosus	Mojarra	**Gerreidae**	CRE-Fishes
Haemulidae	Sweetlips	**Haemulidae**	CRE-Fishes
Diagramma pictum	Slatey Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus vittatus	Oriental Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus gibbosus	Gibbus Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus picus	Spotted Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus obscurus	Giant Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus chrysotaenia	Celebes Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus chaetodonoides	Harlequin Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus lessonii	Lined Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus lineatus	Goldman'S Sweetlips	**Haemulidae**	CRE-Fishes
Plectorhinchus albovittatus	2-Lined Sweetlips	**Haemulidae**	CRE-Fishes
Pomadasys kaakan	Common Javelinefish	**Haemulidae**	CRE-Fishes
Plectorhinchus flavomaculatus	Sweetlip	**Haemulidae**	CRE-Fishes
Plectorhinchus sp	Sweetlip	**Haemulidae**	CRE-Fishes
Lethrinidae	Emperors	**Lethrinidae**	CRE-Fishes
Gnathodentex aureolineatus	Yellow-Spot Emperor	**Lethrinidae**	CRE-Fishes
Gymnocranius griseus	Grey Bream	**Lethrinidae**	CRE-Fishes
Lethrinus harak	Thumbprint Emperor	**Lethrinidae**	CRE-Fishes
Lethrinus atkinsoni	Yellowtail Emperor	**Lethrinidae**	CRE-Fishes
Lethrinus olivaceus	Longface Emperor	**Lethrinidae**	CRE-Fishes
Lethrinus ornatus	Ornate Emperor	**Lethrinidae**	CRE-Fishes
Lethrinus obsoletus	Orange-Striped	**Lethrinidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
	Emperor		
Lethrinus rubrioperculatus	redgill emperor	**Lethrinidae**	BF Multi-species complex
Lethrinus semicinctus	Black-Blotch Emperor	**Lethrinidae**	CRE-Fishes
Lethrinus xanthochilus	Yellowlip Emperor	**Lethrinidae**	CRE-Fishes
Monotaxis grandoculis	Bigeye Emperor	**Lethrinidae**	CRE-Fishes
Gymnocranius euanus	Japanese Bream	**Lethrinidae**	CRE-Fishes
Lethrinus erythracanthus	Orange-Spotted Emperor	**Lethrinidae**	CRE-Fishes
Wattsia mossambica	Large-Eye Bream	**Lethrinidae**	CRE-Fishes
Gymnocranius sp.	Stout Emperor	**Lethrinidae**	CRE-Fishes
Lethrinus microdon	Smtoothed Emperor	**Lethrinidae**	CRE-Fishes
Lethrinus amboinensis	ambon emperor	**Lethrinidae**	BF Multi-species complex
Lethrinus genivittatus	Longspine Emperor	**Lethrinidae**	CRE-Fishes
Lethrinus lentjan	Pinkear Emperor	**Lethrinidae**	CRE-Fishes
Gymnocranius microdon	Blue-Spotted Bream	**Lethrinidae**	CRE-Fishes
Lethrinus erythropterus	Longfin Emperor	**Lethrinidae**	CRE-Fishes
Gymnocranius grandoculis	Blue-Lined Bream	**Lethrinidae**	CRE-Fishes
Lethrinus variegatus	Slender Emperor	**Lethrinidae**	CRE-Fishes
Nemipteridae	Breams	**Nemipteridae**	CRE-Fishes
Pentapodus caninus	Smalltooth Whiptail	**Nemipteridae**	CRE-Fishes
Pentapodus trivittatus	3-Striped Whiptail	**Nemipteridae**	CRE-Fishes
Mullidae	Goatfishes	**Mullidae**	CRE-Fishes
Mulloidichthys flavolineatus	Yellowstriped Goatfish	**Mullidae**	CRE-Fishes
Mulloidichthys pfluegeri	Orange Goatfish	**Mullidae**	CRE-Fishes
Mulloidichthys vanicolensis	Yellowfin Goatfish	**Mullidae**	CRE-Fishes
Parupeneus barberinus	Dash And Dot Goatfish	**Mullidae**	CRE-Fishes
Parupeneus trifasciatus	Doublebar goatfish	**Mullidae**	CRE-Fishes
Parupeneus cyclostomus	Yellow Goatfish	**Mullidae**	CRE-Fishes
Parupeneus heptacanthus	Redspot Goatfish	**Mullidae**	CRE-Fishes
Parupeneus pleurostigma	Sidespot Goatfish	**Mullidae**	CRE-Fishes
Parupeneus ciliatus	White-Lined Goatfish	**Mullidae**	CRE-Fishes
Parupeneus multifasciatus	Multibarred Goatfish	**Mullidae**	CRE-Fishes
Upeneus taeniopterus	Band-Tailed Goatfish	**Mullidae**	CRE-Fishes
Upeneus vittatus	Yellowbanded Goatfish	**Mullidae**	CRE-Fishes
Parupeneus indicus	Indian Goatfish	**Mullidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Upeneus tragula	Blackstriped Goatfish	**Mullidae**	CRE-Fishes
Parupeneus barberinoides	Bicolor goatfish	**Mullidae**	CRE-Fishes
Parupeneus sp	Goatfish	**Mullidae**	CRE-Fishes
Upeneus taeniopterus	Goatfish	**Mullidae**	CRE-Fishes
Mulloidichthys sp	Juvenile Goatfish	**Mullidae**	CRE-Fishes
Monodactylidae	Monos	**Monodactylidae**	CRE-Fishes
Monodactylus argenteus	Mono	**Monodactylidae**	CRE-Fishes
Pempheridae	Sweepers	**Pempheridae**	CRE-Fishes
Pempheris oualensis	Bronze Sweeper	**Pempheridae**	CRE-Fishes
Parapriacanthus ransonneti	Sandperch	**Pempheridae**	CRE-Fishes
Toxotidae	Archerfishes	**Toxotidae**	CRE-Fishes
Toxotidae	Banded Archerfish	**Toxotidae**	CRE-Fishes
Kyphosidae	Rudderfish	**Kyphosidae**	CRE-Fishes
Kyphosus cinerascens	Highfin Rudderfish	**Kyphosidae**	CRE-Fishes
Kyphosus vaigiensis	Lowfin Rudderfish	**Kyphosidae**	CRE-Fishes
Kyphosus bigibbus	Insular Rudderfish	**Kyphosidae**	CRE-Fishes
Ephippidae	Batfish	**Ephippidae**	CRE-Fishes
Platax orbicularis	Batfish	**Ephippidae**	CRE-Fishes
Platax pinnatus	Pinnate Spadefish	**Ephippidae**	CRE-Fishes
Platax teira	Longfin Spadefish	**Ephippidae**	CRE-Fishes
Scatophagidae	Scats	**Scatophagidae**	CRE-Fishes
Scatophagus argus	Scat	**Scatophagidae**	CRE-Fishes
Chaetodontidae	Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon auriga	Threadfin Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon bennetti	Bennetts Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon citrinellus	Speckled Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon ephippium	Saddleback Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon flavocoronatus	Ylw-Crn Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon kleinii	Kleins Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon lineolatus	Lined Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon lunula	Racoon Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon melannotus	Black-Back Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon mertensii	Mertens Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon modestus	Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon ornatissimus	Ornate Butterflyfish	**Chaetodontidae**	CRE-Fishes

Correct Scientific Name	Common Name	Correct Family Name	FEP GROUP
Chaetodon punctatofasciatus	Spotbnded Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon quadrimaculatus	4-Spotted Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon reticulatus	Retculted Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon lunulatus	Redfinned Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon ulietensis	Pac Dblsddl Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon unimaculatus	Teardrop Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon vagabundus	Vagabond Butterflyfish	**Chaetodontidae**	CRE-Fishes
Forcipiger flavissimus	Longnosed Butterflyfish	**Chaetodontidae**	CRE-Fishes
Forcipiger longirostris	Big Longnose Butterflyfish	**Chaetodontidae**	CRE-Fishes
Hemitaurichthys polylepis	Pyrimid Butterflyfish	**Chaetodontidae**	CRE-Fishes
Hemitaurichthys thompsoni	Butterflyfish	**Chaetodontidae**	CRE-Fishes
Heniochus acuminatus	Longfinned Bannerfish	**Chaetodontidae**	CRE-Fishes
Heniochus chrysostomus	Pennant Bannerfish	**Chaetodontidae**	CRE-Fishes
Heniochus monoceros	Masked Bannerfish	**Chaetodontidae**	CRE-Fishes
Heniochus singularius	Singular Butterflyfish	**Chaetodontidae**	CRE-Fishes
Heniochus varius	Humphead Bannerfish	**Chaetodontidae**	CRE-Fishes
Chaetodon trifascialis	Chevron Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon baronessa	E Triangular Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon burgessi	Burgess' Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon meyeri	Meyer'S Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon ocellicaudus	Spot-Tail Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon octofasciatus	8-Banded Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon oxycephalus	Spot-Nape Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon rafflesii	Latticed Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon semeion	Dotted Butterflyfish	**Chaetodontidae**	CRE-Fishes
Chaetodon speculum	Oval-Spot Butterflyfish	**Chaetodontidae**	CRE-Fishes
Coradion chrysozonus	Orangebanded Coralfish	**Chaetodontidae**	CRE-Fishes
Chaetodon tinkeri	Tinker'S Butterflyfish	**Chaetodontidae**	CRE-Fishes
Heniochus diphreutes	Bannerfish	**Chaetodontidae**	CRE-Fishes
Pomacanthidae	Angelfishes	**Pomacanthidae**	CRE-Fishes
Apolemichthys trimaculatus	Flagfin Anglefish	**Pomacanthidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Centropyge bicolor	Bicolor Angelfish	**Pomacanthidae**	CRE-Fishes
Centropyge bispinosa	Dusky Angelfish	**Pomacanthidae**	CRE-Fishes
Centropyge colini	Colin'S Angelfish	**Pomacanthidae**	CRE-Fishes
Centropyge flavissima	Lemonpeel Anglefish	**Pomacanthidae**	CRE-Fishes
Centropyge heraldi	Herald'S Anglefish	**Pomacanthidae**	CRE-Fishes
Centropyge loriculus	Flame Anglefish	**Pomacanthidae**	CRE-Fishes
Paracentropyge multifasciata	Multibarred Angelfish	**Pomacanthidae**	CRE-Fishes
Centropyge nigriocella	Black-Spot Anglefish	**Pomacanthidae**	CRE-Fishes
Centropyge shepardi	Shepard'S Anglefish	**Pomacanthidae**	CRE-Fishes
Centropyge vrolikii	Pearlscale Anglefish	**Pomacanthidae**	CRE-Fishes
Genicanthus bellus	Ornate Angelfish	**Pomacanthidae**	CRE-Fishes
Genicanthus watanabei	Watanabe'S Angelfish	**Pomacanthidae**	CRE-Fishes
Pomacanthus imperator	Emperor Anglefish	**Pomacanthidae**	CRE-Fishes
Pygoplites diacanthus	Regal Anglefish	**Pomacanthidae**	CRE-Fishes
Centropyge fisheri	White-Tail Angelfish	**Pomacanthidae**	CRE-Fishes
Centropyge multicolor	Multicolor Angelfish	**Pomacanthidae**	CRE-Fishes
Centropyge tibicen	Keyhole Angelfish	**Pomacanthidae**	CRE-Fishes
Chaetodontoplus mesoleucus	Vermiculated Angelfish	**Pomacanthidae**	CRE-Fishes
Genicanthus melanospilos	Black-Spot Angelfish	**Pomacanthidae**	CRE-Fishes
Pomacanthus navarchus	Blue-Girdled Angelfish	**Pomacanthidae**	CRE-Fishes
Pomacanthus sexstriatus	6-Banded Angelfish	**Pomacanthidae**	CRE-Fishes
Pomacanthus xanthometopon	Blue-Faced Angelfish	**Pomacanthidae**	CRE-Fishes
Pomacanthus semicirculatus	Semicircle Angelfish	**Pomacanthidae**	CRE-Fishes
Apolemichthys xanthopunctatus	Angelfish	**Pomacanthidae**	CRE-Fishes
Apolemichthys griffisi	Angelfish	**Pomacanthidae**	CRE-Fishes
Centropyge nox	Midnight Angelfish	**Pomacanthidae**	CRE-Fishes
Centropyge aurantia	Golden Angelfish	**Pomacanthidae**	CRE-Fishes
Pentacerotidae	Armourheads	**Pentacerotidae**	CRE-Fishes
Pentaceros wheeleri	Amourhead	**Pentacerotidae**	CRE-Fishes
Cichlidae	Cichlids	**Cichlidae**	CRE-Fishes
Oreochromis mossambicus	Tilapia	**Cichlidae**	CRE-Fishes
Coptodon zillii	Tilapia	**Cichlidae**	CRE-Fishes
Cichla ocellaris	Peacock Bass	**Cichlidae**	CRE-Fishes
Oplegnathidae	Knifejaws	**Oplegnathidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Oplegnathus punctatus	Spotted Knifejaw	**Oplegnathidae**	CRE-Fishes
Pomacentridae	Damselfishes	**Pomacentridae**	CRE-Fishes
Abudefduf septemfasciatus	Banded Sergeant	**Pomacentridae**	CRE-Fishes
Abudefduf sexfasciatus	Scis-Tail Sgt Major	**Pomacentridae**	CRE-Fishes
Abudefduf sordidus	Black Spot Sergeant	**Pomacentridae**	CRE-Fishes
Abudefduf vaigiensis	Sergeant-Major	**Pomacentridae**	CRE-Fishes
Amblyglyphidodon aureus	Damselfish	**Pomacentridae**	CRE-Fishes
Amblyglyphidodon curacao	Staghorn Damsel	**Pomacentridae**	CRE-Fishes
Amphiprion chrysopterus	Org-Fin Anemonefish	**Pomacentridae**	CRE-Fishes
Amphiprion clarkii	Clark'S Anemonefish	**Pomacentridae**	CRE-Fishes
Amphiprion melanopus	Dusky Anemonefish	**Pomacentridae**	CRE-Fishes
Amphiprion perideraion	Pink Anemonfish	**Pomacentridae**	CRE-Fishes
Chromis acares	Midget Chromis	**Pomacentridae**	CRE-Fishes
Chromis agilis	Bronze Reef Chromis	**Pomacentridae**	CRE-Fishes
Chromis amboinensis	Ambon Chromis	**Pomacentridae**	CRE-Fishes
Chromis analis	Yellow Chromis	**Pomacentridae**	CRE-Fishes
Chromis atripectoralis	Black-Axil Chromis	**Pomacentridae**	CRE-Fishes
Chromis viridis	Blue-Green Chromis	**Pomacentridae**	CRE-Fishes
Chromis elerae	Twin-Spot Chromis	**Pomacentridae**	CRE-Fishes
Chromis lepidolepis	Scaly Chromis	**Pomacentridae**	CRE-Fishes
Chromis margaritifer	Bicolor Chromis	**Pomacentridae**	CRE-Fishes
Chromis vanderbilti	Vanderbilt'S Chromis	**Pomacentridae**	CRE-Fishes
Chromis xanthura	Black Chromis	**Pomacentridae**	CRE-Fishes
Chromis alpha	Yel-Speckled Chromis	**Pomacentridae**	CRE-Fishes
Chrysiptera biocellata	2-Spot Demoiselle	**Pomacentridae**	CRE-Fishes
Chrysiptera caeruleolineata	Blue-Line Demoiselle	**Pomacentridae**	CRE-Fishes
Chrysiptera glauca	Gray Demoiselle	**Pomacentridae**	CRE-Fishes
Chrysiptera brownriggii	Surge Demoiselle	**Pomacentridae**	CRE-Fishes
Chrysiptera traceyi	Tracey'S Demoiselle	**Pomacentridae**	CRE-Fishes
Dascyllus aruanus	Humbug Dascyllus	**Pomacentridae**	CRE-Fishes
Dascyllus reticulatus	Reticulated Dascyllus	**Pomacentridae**	CRE-Fishes
Dascyllus trimaculatus	3-Spot Dascyllus	**Pomacentridae**	CRE-Fishes
Dischistodus perspicillatus	White Damsel	**Pomacentridae**	CRE-Fishes
Plectroglyphidodon dickii	Dick'S Damsel	**Pomacentridae**	CRE-Fishes
Plectroglyphidodon imparipennis	Bright-Eye Damsel	**Pomacentridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Plectroglyphidodon johnstonianus	Johnston Isle Damsel	**Pomacentridae**	CRE-Fishes
Plectroglyphidodon lacrymatus	Jewel Damsel	**Pomacentridae**	CRE-Fishes
Plectroglyphidodon leucozonus	White-Band Damsel	**Pomacentridae**	CRE-Fishes
Plectroglyphidodon phoenixensis	Phoenix Isle Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus amboinensis	Ambon Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus pavo	Sapphire Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus vaiuli	Princess Damsel	**Pomacentridae**	CRE-Fishes
Pomachromis guamensis	Guam Damsel	**Pomacentridae**	CRE-Fishes
Stegastes albifasciatus	White-Bar Gregory	**Pomacentridae**	CRE-Fishes
Stegastes fasciolatus	Pacific Gregory	**Pomacentridae**	CRE-Fishes
Stegastes lividus	Farmerfish	**Pomacentridae**	CRE-Fishes
Stegastes nigricans	Dusky Farmerfish	**Pomacentridae**	CRE-Fishes
Neopomacentrus violascens	Violet Demoiselle	**Pomacentridae**	CRE-Fishes
Lepidozygus tapeinosoma	Fusilier Damsel	**Pomacentridae**	CRE-Fishes
Chromis ternatensis	Ternate Chromis	**Pomacentridae**	CRE-Fishes
Abudefduf lorenzi	Blackspot Sergeant	**Pomacentridae**	CRE-Fishes
Abudefduf notatus	Yellowtail Sergeant	**Pomacentridae**	CRE-Fishes
Amblyglyphidodon leucogaster	White-Belly Damsel	**Pomacentridae**	CRE-Fishes
Amblyglyphidodon ternatensis	Ternate Damsel	**Pomacentridae**	CRE-Fishes
Chromis atripes	Dark-Fin Chromis	**Pomacentridae**	CRE-Fishes
Chromis lineata	Lined Chromis	**Pomacentridae**	CRE-Fishes
Chromis retrofasciata	Black-Bar Chromis	**Pomacentridae**	CRE-Fishes
Chromis weberi	Weber'S Chromis	**Pomacentridae**	CRE-Fishes
Chromis xanthochira	Yel-Axil Chromis	**Pomacentridae**	CRE-Fishes
Chromis caudalis	Blue-Axil Chromis	**Pomacentridae**	CRE-Fishes
Chromis delta	Deep Reef Chromis	**Pomacentridae**	CRE-Fishes
Chrysiptera cyanea	Blue Devil	**Pomacentridae**	CRE-Fishes
Chrysiptera rex	King Demoiselle	**Pomacentridae**	CRE-Fishes
Chrysiptera talboti	Talbot'S Demoiselle	**Pomacentridae**	CRE-Fishes
Dascyllus melanurus	Black-Tail Dascyllus	**Pomacentridae**	CRE-Fishes
Dischistodus chrysopoecilus	White-Spot Damsel	**Pomacentridae**	CRE-Fishes
Dischistodus melanotus	Black-Vent Damsel	**Pomacentridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Hemiglyphidodon plagiometopon	Damselfish	**Pomacentridae**	CRE-Fishes
Neopomacentrus nemurus	Coral Demoiselle	**Pomacentridae**	CRE-Fishes
Neopomacentrus taeniurus	Freshwater Demoiselle	**Pomacentridae**	CRE-Fishes
Neoglyphidodon melas	Royal Damsel	**Pomacentridae**	CRE-Fishes
Neoglyphidodon nigroris	Yellowfin Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus bankanensis	Speckled Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus burroughi	Burrough'S Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus coelestis	Neon Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus emarginatus	Outer Reef Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus grammorhynchus	Blue-Spot Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus brachialis	Charcoal Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus philippinus	Philappine Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus reidi	Reid'S Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus chrysurus	White-Tail Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus simsiang	Blueback Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus nagasakiensis	Nagasaki Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus adelus	Damselfish	**Pomacentridae**	CRE-Fishes
Pomachromis exilis	Slender Reef-Damsel	**Pomacentridae**	CRE-Fishes
Cheiloprion labiatus	Minstrel Fish	**Pomacentridae**	CRE-Fishes
Chrysiptera oxycephala	Blue-Spot Demoiselle	**Pomacentridae**	CRE-Fishes
Chrysiptera unimaculata	1-Spot Demoiselle	**Pomacentridae**	CRE-Fishes
Pomacentrus moluccensis	Lemon Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus nigromanus	Black-Axil Damsel	**Pomacentridae**	CRE-Fishes
Pomacentrus auriventris	Goldbelly Damsel	**Pomacentridae**	CRE-Fishes
Amphiprion frenatus	Tomato Anemonefish	**Pomacentridae**	CRE-Fishes
Amphiprion ocellaris	False Clown Anemonefish	**Pomacentridae**	CRE-Fishes
Amphiprion tricinctus	3-Banded Anemonefish	**Pomacentridae**	CRE-Fishes
Cirrhitidae	Hawkfish	**Cirrhitidae**	CRE-Fishes
Amblycirrhitus bimacula	2-Spot Hawkfish	**Cirrhitidae**	CRE-Fishes
Cirrhitichthys falco	Falco'S Hawkfish	**Cirrhitidae**	CRE-Fishes
Cirrhitichthys oxycephalus	Pixy Hawkfish	**Cirrhitidae**	CRE-Fishes
Cirrhitus pinnulatus	Stocky Hawkfish	**Cirrhitidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Neocirrhites armatus	Flame Hawkfish	**Cirrhitidae**	CRE-Fishes
Oxycirrhites typus	Longnose Hawkfish	**Cirrhitidae**	CRE-Fishes
Paracirrhites arcatus	Arc-Eyed Hawkfish	**Cirrhitidae**	CRE-Fishes
Paracirrhites forsteri	Freckeled Hawkfish	**Cirrhitidae**	CRE-Fishes
Paracirrhites hemistictus	Whitespot Hawkfish	**Cirrhitidae**	CRE-Fishes
Isocirrhitus sexfasciatus	6-Band Hawkfish	**Cirrhitidae**	CRE-Fishes
Cirrhitichthys aprinus	Threadfin Hawkfish	**Cirrhitidae**	CRE-Fishes
Cyprinocirrhites polyactis	Swallowtail Hawkfish	**Cirrhitidae**	CRE-Fishes
Mugilidae	Mullets	**Mugilidae**	CRE-Fishes
Moolgarda engeli	Engel'S Mullet	**Mugilidae**	CRE-Fishes
Crenimugil crenilabis	Fringelip Mullet	**Mugilidae**	CRE-Fishes
Ellochelon vaigiensis	Yellowtail Mullet	**Mugilidae**	CRE-Fishes
Mugil cephalus	Gray Mullet	**Mugilidae**	CRE-Fishes
Neomyxus leuciscus	Acute-Jawed Mullet	**Mugilidae**	CRE-Fishes
Moolgarda seheli	Bluespot Mullet	**Mugilidae**	CRE-Fishes
Chelon macrolepis	Ceram Mullet	**Mugilidae**	CRE-Fishes
Chelon melinopterus	Giantscale Mullet	**Mugilidae**	CRE-Fishes
Oedalechilus labiosus	Foldlip Mullet	**Mugilidae**	CRE-Fishes
Crenimugil heterocheilos	Mullet	**Mugilidae**	CRE-Fishes
Sphyraenidae	Barracudas	**Sphyraenidae**	CRE-Fishes
Sphyraena barracuda	Great Barracuda	**Sphyraenidae**	CRE-Fishes
Sphyraena obtusata	Pygmy Barracuda	**Sphyraenidae**	CRE-Fishes
Sphyraena forsteri	Blackspot Barracuda	**Sphyraenidae**	CRE-Fishes
Sphyraena acutipinnis	Sharpfin Barracuda	**Sphyraenidae**	CRE-Fishes
Sphyraena qenie	Blackfin Barracuda	**Sphyraenidae**	CRE-Fishes
Sphyraena putnamae	Slender Barracuda	**Sphyraenidae**	CRE-Fishes
Sphyraena novaehollandiae	Arrow Barracuda	**Sphyraenidae**	CRE-Fishes
Sphyraena flavicauda	Yellowtail Barracuda	**Sphyraenidae**	CRE-Fishes
Polynemidae	Threadfins	**Polynemidae**	CRE-Fishes
Polydactylus sexfilis	6 Feeler Threadfin	**Polynemidae**	CRE-Fishes
Labridae	Wrasse	**Labridae**	CRE-Fishes
Anampses caeruleopunctatus	Chiseltooth Wrasse	**Labridae**	CRE-Fishes
Anampses meleagrides	Yellowtail Wrasse	**Labridae**	CRE-Fishes
Anampses twistii	Yellowbreasted Wrasse	**Labridae**	CRE-Fishes
Bodianus anthioides	Lyretail Hogfish	**Labridae**	CRE-Fishes
Bodianus axillaris	Axilspot Hogfish	**Labridae**	CRE-Fishes
Oxycheilinus arenatus	Arenatus Wrasse	**Labridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Oxycheilinus celebicus	Celebes Wrasse	**Labridae**	CRE-Fishes
Cheilinus chlorourus	Floral Wrasse	**Labridae**	CRE-Fishes
Cheilinus fasciatus	Red-Breasted Wrasse	**Labridae**	CRE-Fishes
Cheilinus oxycephalus	Snooty Wrasse	**Labridae**	CRE-Fishes
Oxycheilinus unifasciatus	Ringtail Wrasse	**Labridae**	CRE-Fishes
Cheilinus trilobatus	Tripletail Wrasse	**Labridae**	CRE-Fishes
Cheilinus undulatus	Napoleon wrasse	**Labridae**	CRE-Fishes
Oxycheilinus orientalis	Oriental Wrasse	**Labridae**	CRE-Fishes
Cheilio inermis	Cigar Wrasse	**Labridae**	CRE-Fishes
Choerodon anchorago	Yel-Cheeked Tuskfish	**Labridae**	CRE-Fishes
Cirrhilabrus katherinae	Wrasse	**Labridae**	CRE-Fishes
Coris aygula	Clown Coris	**Labridae**	CRE-Fishes
Coris gaimard	Yellowtailed Coris	**Labridae**	CRE-Fishes
Cymolutes praetextatus	Knife Razorfish	**Labridae**	CRE-Fishes
Epibulus insidiator	Sling-Jawed Wrasse	**Labridae**	CRE-Fishes
Gomphosus varius	Bird Wrasse	**Labridae**	CRE-Fishes
Halichoeres biocellatus	2-Spotted Wrasse	**Labridae**	CRE-Fishes
Halichoeres zeylonicus	Wrasse	**Labridae**	CRE-Fishes
Halichoeres hortulanus	Checkerboard Wrasse	**Labridae**	CRE-Fishes
Halichoeres margaritaceus	Weedy Surge Wrasse	**Labridae**	CRE-Fishes
Halichoeres marginatus	Dusky Wrasse	**Labridae**	CRE-Fishes
Halichoeres melasmapomus	Black-Ear Wrasse	**Labridae**	CRE-Fishes
Halichoeres trimaculatus	3-Spot Wrasse	**Labridae**	CRE-Fishes
Hemigymnus fasciatus	Striped Clown Wrasse	**Labridae**	CRE-Fishes
Hemigymnus melapterus	1/2 &1/2 Wrasse	**Labridae**	CRE-Fishes
Hologymnosus doliatus	Ring Wrasse	**Labridae**	CRE-Fishes
Labrichthys unilineatus	Tubelip Wrasse	**Labridae**	CRE-Fishes
Labroides bicolor	Bicolor Cleaner Wrasse	**Labridae**	CRE-Fishes
Labroides pectoralis	Black-Spot Cleaner Wrasse	**Labridae**	CRE-Fishes
Labropsis micronesica	Micronesian Wrasse	**Labridae**	CRE-Fishes
Labropsis xanthonota	Wedge-Tailed Wrasse	**Labridae**	CRE-Fishes
Macropharyngodon meleagris	Leopard Wrasse	**Labridae**	CRE-Fishes
Novaculoides macrolepidotus	Seagrass Razorfish	**Labridae**	CRE-Fishes
Novaculichthys taeniourus	Dragon Wrasse	**Labridae**	CRE-Fishes
Bodianus tanyokidus	Hogfish	**Labridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Pseudocheilinus evanidus	Striated Wrasse	**Labridae**	CRE-Fishes
Pseudocheilinus hexataenia	6 Line Wrasse	**Labridae**	CRE-Fishes
Pseudocheilinus octotaenia	8 Line Wrasse	**Labridae**	CRE-Fishes
Pseudocheilinus tetrataenia	4 Line Wrasse	**Labridae**	CRE-Fishes
Pseudojuloides atavai	Polynesian Wrasse	**Labridae**	CRE-Fishes
Pseudojuloides cerasinus	Smalltail Wrasse	**Labridae**	CRE-Fishes
Pteragogus cryptus	Wrasse	**Labridae**	CRE-Fishes
Stethojulis bandanensis	Red-Shoulder Wrasse	**Labridae**	CRE-Fishes
Stethojulis strigiventer	Wrasse	**Labridae**	CRE-Fishes
Thalassoma amblycephalum	2 Tone Wrasse	**Labridae**	CRE-Fishes
Thalassoma trilobatum	Xmas Wrasse	**Labridae**	CRE-Fishes
Thalassoma hardwicke	6 Bar Wrasse	**Labridae**	CRE-Fishes
Thalassoma lutescens	Sunset Wrasse	**Labridae**	CRE-Fishes
Thalassoma purpureum	Surge Wrasse	**Labridae**	CRE-Fishes
Thalassoma quinquevittatum	5-Stripe Surge Wrasse	**Labridae**	CRE-Fishes
Wetmorella nigropinnata	Bl-Spot Pygmy Wrasse	**Labridae**	CRE-Fishes
Iniistius pavo	Blue Razorfish	**Labridae**	CRE-Fishes
Iniistius aneitensis	Yellowblotch Razorfish	**Labridae**	CRE-Fishes
Labridae	Jansen'S Wrasse	**Labridae**	CRE-Fishes
Oxycheilinus digramma	Bandcheek Wrasse	**Labridae**	CRE-Fishes
Oxycheilinus bimaculatus	2-Spot Wrasse	**Labridae**	CRE-Fishes
Polylepion russelli	Wrasse	**Labridae**	CRE-Fishes
Labroides dimidiatus	Bluestreak Cleaner Wrasse	**Labridae**	CRE-Fishes
Pseudodax moluccanus	Chiseltooth Wrasse	**Labridae**	CRE-Fishes
Anampses melanurus	Wrasse	**Labridae**	CRE-Fishes
Bodianus diana	Diana'S Hogfish	**Labridae**	CRE-Fishes
Bodianus loxozonus	Blackfin Hogfish	**Labridae**	CRE-Fishes
Bodianus mesothorax	Mesothorax Hogfish	**Labridae**	CRE-Fishes
Cirrhilabrus cyanopleura	Wrasse	**Labridae**	CRE-Fishes
Cirrhilabrus exquisitus	Exquisite Wrasse	**Labridae**	CRE-Fishes
Cirrhilabrus luteovittatus	Yellowband Wrasse	**Labridae**	CRE-Fishes
Coris batuensis	Dapple Coris	**Labridae**	CRE-Fishes
Epibulus sp	Sling-Jawed Wrasse	**Labridae**	CRE-Fishes
Halichoeres chloropterus	Drab Wrasse	**Labridae**	CRE-Fishes
Halichoeres chrysus	Canary Wrasse	**Labridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Halichoeres melanurus	Pinstriped Wrasse	**Labridae**	CRE-Fishes
Halichoeres richmondi	Richmond'S Wrasse	**Labridae**	CRE-Fishes
Halichoeres scapularis	Zigzag Wrasse	**Labridae**	CRE-Fishes
Halichoeres sp.	Wrasse	**Labridae**	CRE-Fishes
Labropsis alleni	Allen'S Wrasse	**Labridae**	CRE-Fishes
Macropharyngodon negrosensis	Negros Wrasse	**Labridae**	CRE-Fishes
Pseudocheilinus sp	Line Wrasse	**Labridae**	CRE-Fishes
Pseudocoris yamashiroi	Yamashiro'S Wrasse	**Labridae**	CRE-Fishes
Thalassoma lunare	Crescent Wrasse	**Labridae**	CRE-Fishes
Bodianus bimaculatus	2-Spot Slender Hogfish	**Labridae**	CRE-Fishes
Wetmorella albofasciata	Wh-Barred Pygmy Wrasse	**Labridae**	CRE-Fishes
Xiphocheilus sp	Wrasse	**Labridae**	CRE-Fishes
Cymolutes torquatus	Finescale Razorfish	**Labridae**	CRE-Fishes
Paracheilinus bellae	Wrasse	**Labridae**	CRE-Fishes
Paracheilinus sp	Wrasse	**Labridae**	CRE-Fishes
Pseudocheilinops ataenia	Wrasse	**Labridae**	CRE-Fishes
Pteragogus guttatus	Wrasse	**Labridae**	CRE-Fishes
Anampses geographicus	Geographic Wrasse	**Labridae**	CRE-Fishes
Halichoeres prosopeion	Wrasse	**Labridae**	CRE-Fishes
Stethojulis trilineata	Wrasse	**Labridae**	CRE-Fishes
Diproctacanthus xanthurus	Wandering Cleaner Wrasse	**Labridae**	CRE-Fishes
Iniistius celebicus	Celebe'S Razorfish	**Labridae**	CRE-Fishes
Iniistius geisha	Razorfish	**Labridae**	CRE-Fishes
Hologymnosus annulatus	Wrasse	**Labridae**	CRE-Fishes
Halichoeres leucurus	Wrasse	**Labridae**	CRE-Fishes
Cirrhilabrus balteatus	Wrasse	**Labridae**	CRE-Fishes
Cirrhilabrus johnsoni	Johnson'S Wrasse	**Labridae**	CRE-Fishes
Cirrhilabrus rhomboidalis	Rhomboid Wrasse	**Labridae**	CRE-Fishes
Iniistius melanopus	Yellowpatch Razorfish	**Labridae**	CRE-Fishes
Cirrhilabrus rubrimarginatus	Red-Margined Wrasse	**Labridae**	CRE-Fishes
Halichoeres ornatissimus	Ornate Wrasse	**Labridae**	CRE-Fishes
Halichoeres papilionaceus	Shwartz Wrasse	**Labridae**	CRE-Fishes
Choerodon fasciatus	Harlequin Tuskfish	**Labridae**	CRE-Fishes
Coris dorsomacula	Pale-Barred Coris	**Labridae**	CRE-Fishes
Halichoeres	Seagrass Wrasse	**Labridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
papilionaceus			
Pseudocoris aurantiofasciata	Rust-Banded Wrasse	**Labridae**	CRE-Fishes
Pseudocoris heteroptera	Torpedo Wrasse	**Labridae**	CRE-Fishes
Halichoeres nigrescens	Wrasse	**Labridae**	CRE-Fishes
Scaridae	Parrotfishes	**Scaridae**	CRE-Fishes
Bolbometopon muricatum	Bumphead parrotfish	**Scaridae**	CRE-Fishes
Calotomus carolinus	Bucktooth Parrotfish	**Scaridae**	CRE-Fishes
Cetoscarus bicolor	Bicolor Parrotfish	**Scaridae**	CRE-Fishes
Hipposcarus longiceps	Parrotfish	**Scaridae**	CRE-Fishes
Leptoscarus vaigiensis	Seagrass Parrotfish	**Scaridae**	CRE-Fishes
Scarus altipinnis	Fil-Finned Parrotfish	**Scaridae**	CRE-Fishes
Scarus frenatus	Vermiculate Parrotfish	**Scaridae**	CRE-Fishes
Chlorurus frontalis	Tan-Faced Parrotfish	**Scaridae**	CRE-Fishes
Scarus ghobban	Blue-Barred Parrotfish	**Scaridae**	CRE-Fishes
Chlorurus microrhinos	Steephead Parrotfish	**Scaridae**	CRE-Fishes
Scarus globiceps	Parrotfish	**Scaridae**	CRE-Fishes
Scarus oviceps	Parrotfish	**Scaridae**	CRE-Fishes
Scarus psittacus	Pale Nose Parrotfish	**Scaridae**	CRE-Fishes
Scarus rubroviolaceus	Parrotfish	**Scaridae**	CRE-Fishes
Scarus schlegeli	Chevron Parrotfish	**Scaridae**	CRE-Fishes
Chlorurus sordidus	Bullethead Parrotfish	**Scaridae**	CRE-Fishes
Scarus forsteni	Tricolor Parrotfish	**Scaridae**	CRE-Fishes
Scarus sp.	Parrotfish	**Scaridae**	CRE-Fishes
Scarus festivus	Parrotfish	**Scaridae**	CRE-Fishes
Calotomus spinidens	Spineytooth Parrotfish	**Scaridae**	CRE-Fishes
Scarus xanthopleura	Parrotfish	**Scaridae**	CRE-Fishes
Chlorurus bleekeri	Parrotfish	**Scaridae**	CRE-Fishes
Scarus dimidiatus	Parrotfish	**Scaridae**	CRE-Fishes
Scarus hypselopterus	Java Parrotfish	**Scaridae**	CRE-Fishes
Scarus prasiognathos	Greenthroat Parrotfish	**Scaridae**	CRE-Fishes
Scarus quoyi	Parrotfish	**Scaridae**	CRE-Fishes
Scarus rivulatus	Parrotfish	**Siganidae**	CRE-Fishes
Scarus spinus	Parrotfish	**Scaridae**	CRE-Fishes
Scarus chameleon	Parrotfish	**Scaridae**	CRE-Fishes
Chlorurus bowersi	Parrotfish	**Scaridae**	CRE-Fishes
Scarus niger	Black Parrotfish	**Scaridae**	CRE-Fishes
Chlorurus sp.	Parrotfish	**Scaridae**	CRE-Fishes
Scarus flavipectoralis	Yellowfin Parrotfish	**Scaridae**	CRE-Fishes
Scarus tricolor	Tricolor Parrotfish	**Scaridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Opistognathidae	Jawfishes	**Opistognathidae**	CRE-Fishes
Opistognathus sp	Variable Jawfish	**Opistognathidae**	CRE-Fishes
Opistognathus sp	Wass' Jawfish	**Opistognathidae**	CRE-Fishes
Champsodontidae	Gapers	**Champsodontidae**	CRE-Fishes
Champsodon vorax	Gaper	**Champsodontidae**	CRE-Fishes
Percophidae	Duckbills	**Percophidae**	CRE-Fishes
Chrionema squamiceps	Duckbill	**Percophidae**	CRE-Fishes
Pinguipedidae	Sand Perch	**Pinguipedidae**	CRE-Fishes
Parapercis millepunctata	Blk-Dotted Sandperch	**Pinguipedidae**	CRE-Fishes
Parapercis clathrata	Latticed Sandperch	**Pinguipedidae**	CRE-Fishes
Parapercis cylindrica	Cylindrical Sandperch	**Pinguipedidae**	CRE-Fishes
Parapercis xanthozona	Blotchlip Sandperch	**Pinguipedidae**	CRE-Fishes
Parapercis multiplicata	Red-Barred Sandperch	**Pinguipedidae**	CRE-Fishes
Parapercis tetracantha	Black-Banded Sandperch	**Pinguipedidae**	CRE-Fishes
Trichonotidae	Sand Divers	**Trichonotidae**	CRE-Fishes
Trichonotus sp	Micronesian Sand-Diver	**Trichonotidae**	CRE-Fishes
Creediidae	Sand Burrowers	**Creediidae**	CRE-Fishes
Chalixodytes tauensis	Saddled Sandburrower	**Creediidae**	CRE-Fishes
Limnichthys nitidus	Sand Burrower	**Creediidae**	CRE-Fishes
Uranoscopidae	Stargazers	**Uranoscopidae**	CRE-Fishes
Uranoscopus sp	Stargazer	**Uranoscopidae**	CRE-Fishes
Tripterygiidae	Triplefins	**Tripterygiidae**	CRE-Fishes
Enneapterygius hemimelas	Triplefin	**Tripterygiidae**	CRE-Fishes
Enneapterygius minutus	Triplefin	**Tripterygiidae**	CRE-Fishes
Enneapterygius nanus	Triplefin	**Tripterygiidae**	CRE-Fishes
Helcogramma capidata	Triplefin	**Tripterygiidae**	CRE-Fishes
Helcogramma chica	Triplefin	**Tripterygiidae**	CRE-Fishes
Helcogramma hudsoni	Triplefin	**Tripterygiidae**	CRE-Fishes
Norfolkia brachylepis	Triplefin	**Tripterygiidae**	CRE-Fishes
Ceratobregma helenae	Triplefin	**Tripterygiidae**	CRE-Fishes
Ucla xenogrammus	Longjaw Triplefin	**Tripterygiidae**	CRE-Fishes
Blenniidae	Blennies	**Blenniidae**	CRE-Fishes
Alticus arnoldorum	Blenny	**Blenniidae**	CRE-Fishes
Aspidontus taeniatus	Cleaner Mimic	**Blenniidae**	CRE-Fishes
Cirripectes fuscoguttatus	Spotted Blenny	**Blenniidae**	CRE-Fishes
Cirripectes quagga	Squiggly Blenny	**Blenniidae**	CRE-Fishes
Cirripectes polyzona	Barred Blenny	**Blenniidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Cirripectes variolosus	Red-Speckled Blenny	**Blenniidae**	CRE-Fishes
Ecsenius bicolor	Blenny	**Blenniidae**	CRE-Fishes
Ecsenius opsifrontalis	Blenny	**Blenniidae**	CRE-Fishes
Enchelyurus kraussii	Blenny	**Blenniidae**	CRE-Fishes
Entomacrodus decussatus	Blenny	**Blenniidae**	CRE-Fishes
Entomacrodus niuafoouensis	Blenny	**Blenniidae**	CRE-Fishes
Entomacrodus sealei	Blenny	**Blenniidae**	CRE-Fishes
Entomacrodus striatus	Blenny	**Blenniidae**	CRE-Fishes
Entomacrodus thalassinus	Blenny	**Blenniidae**	CRE-Fishes
Exallias brevis	Blenny	**Blenniidae**	CRE-Fishes
Blenniella chrysospilos	Blenny	**Blenniidae**	CRE-Fishes
Blenniella cyanostigma	Blenny	**Blenniidae**	CRE-Fishes
Istiblennius edentulus	Blenny	**Blenniidae**	CRE-Fishes
Istiblennius lineatus	Blenny	**Blenniidae**	CRE-Fishes
Blenniella periophthalmus	Blenny	**Blenniidae**	CRE-Fishes
Blenniella gibbifrons	Blenny	**Blenniidae**	CRE-Fishes
Meiacanthus atrodorsalis	Poison-Fang Blenny	**Blenniidae**	CRE-Fishes
Omobranchus rotundiceps	Blenny	**Blenniidae**	CRE-Fishes
Parenchelyurus hepburni	Blenny	**Blenniidae**	CRE-Fishes
Petroscirtes mitratus	Blenny	**Blenniidae**	CRE-Fishes
Petroscirtes xestus	Blenny	**Blenniidae**	CRE-Fishes
Plagiotremus laudandus	Blenny	**Blenniidae**	CRE-Fishes
Plagiotremus rhinorhynchos	Red Sabbertooth Blenny	**Blenniidae**	CRE-Fishes
Plagiotremus tapeinosoma	Blenny	**Blenniidae**	CRE-Fishes
Praealticus poptae	Blenny	**Blenniidae**	CRE-Fishes
Praealticus natalis	Blenny	**Blenniidae**	CRE-Fishes
Meiacanthus anema	Poison-Fang Blenny	**Blenniidae**	CRE-Fishes
Rhabdoblennius rhabdotrachelus	Blenny	**Blenniidae**	CRE-Fishes
Rhabdoblennius snowi	Blenny	**Blenniidae**	CRE-Fishes
Salarias fasciatus	Spotted Rock Blenny	**Blenniidae**	CRE-Fishes
Stanulus seychellensis	Blenny	**Blenniidae**	CRE-Fishes
Xiphasia matsubarai	Blenny	**Blenniidae**	CRE-Fishes
Blenniella paula	Bluedash rockskipper	**Blenniidae**	CRE-Fishes
Atrosalarias holomelas	Blenny	**blenniidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Entomacrodus stellifer	Blenny	**Blenniidae**	CRE-Fishes
Cirripectes castaneus	Chestnut Blenny	**Blenniidae**	CRE-Fishes
Cirripectes perustus	Blenny	**Blenniidae**	CRE-Fishes
Cirripectes stigmaticus	Red-Streaked Blenny	**Blenniidae**	CRE-Fishes
Ecsenius sellifer	Blenny	**Blenniidae**	CRE-Fishes
Ecsenius yaeyamaensis	Blenny	**Blenniidae**	CRE-Fishes
Entomacrodus caudofasciatus	Blenny	**Blenniidae**	CRE-Fishes
Entomacrodus cymatobiotus	Blenny	**Blenniidae**	CRE-Fishes
Glyptoparus delicatulus	Blenny	**Blenniidae**	CRE-Fishes
Rhabdoblennius nitidus	Barred-chin blenny	**Blenniidae**	CRE-Fishes
Litobranchus fowleri	Blenny	**Blenniidae**	CRE-Fishes
Nannosalarias nativitatis	Combtooth Blenny	**Blenniidae**	CRE-Fishes
Salarias alboguttatus	White-spotted blenny	**Blenniidae**	CRE-Fishes
Salarias segmentatus	Blenny	**Blenniidae**	CRE-Fishes
Salarias luctuosus	Blenny	**Blenniidae**	CRE-Fishes
Omox biporos	Blenny	**Blenniidae**	CRE-Fishes
Aspidontus dussumieri	Lance Blenny	**Blenniidae**	CRE-Fishes
Meiacanthus ditrema	1-Stripe Poison-Fang Blenny	**Blenniidae**	CRE-Fishes
Meiacanthus grammistes	Striped Poison-Fang Blenny	**Blenniidae**	CRE-Fishes
Petroscirtes breviceps	Blenny	**Blenniidae**	CRE-Fishes
Petroscirtes thepassii	Blenny	**Blenniidae**	CRE-Fishes
Petroscirtes variabilis	Blenny	**Blenniidae**	CRE-Fishes
Omobranchus obliquus	Mangrove Blenny	**Blenniidae**	CRE-Fishes
Ecsenius bandanus	Banda Clown Blenny	**Blenniidae**	CRE-Fishes
Istiblennius bellus	Beautiful Rockskipper	**Blenniidae**	CRE-Fishes
Istiblennius dussumieri	Streaky Rockskipper	**Blenniidae**	CRE-Fishes
Blenniella interrupta	Interrupted Rockskipper	**Blenniidae**	CRE-Fishes
Schindleriidae	Schindleriid	**Schindleriidae**	CRE-Fishes
Schindleria praematura	Schindleriid	**Schindleriidae**	CRE-Fishes
Eleotridae	Sleepers	**Eleotridae**	CRE-Fishes
Eleotris fusca	Gudgeon	**Eleotridae**	CRE-Fishes
Butis amboinensis	Gudgeon	**Eleotridae**	CRE-Fishes
Calumia godeffroyi	Sleeper	**Eleotridae**	CRE-Fishes
Giuris margaritacea	Sleeper	**Eleotridae**	CRE-Fishes
Ophiocara porocephala	Sleeper	**Eleotridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Oxyeleotris lineolata	Sleeper	**Eleotridae**	CRE-Fishes
Gobiidae	Goby	**Gobiidae**	CRE-Fishes
Amblyeleotris fasciata	Goby	**Gobiidae**	CRE-Fishes
Amblyeleotris fontanesii	Goby	**Gobiidae**	CRE-Fishes
Amblyeleotris guttata	Goby	**Gobiidae**	CRE-Fishes
Amblyeleotris periophthalma	Prawn Goby	**Gobiidae**	CRE-Fishes
Amblyeleotris steinitzi	Brown-Barred Goby	**Gobiidae**	CRE-Fishes
Amblyeleotris randalli	Goby	**Gobiidae**	CRE-Fishes
Amblyeleotris wheeleri	Bluespotted Goby	**Gobiidae**	CRE-Fishes
Cryptocentroides insignis	Goby	**Gobiidae**	CRE-Fishes
Cryptocentrus cinctus	Goby	**Gobiidae**	CRE-Fishes
Cryptocentrus strigilliceps	Goby	**Gobiidae**	CRE-Fishes
Cryptocentrus caeruleomaculatus	Goby	**Gobiidae**	CRE-Fishes
Cryptocentrus leptocephalus	Goby	**Gobiidae**	CRE-Fishes
Cryptocentrus strigilliceps	Goby	**Gobiidae**	CRE-Fishes
Cryptocentrus sp.	Goby	**Gobiidae**	CRE-Fishes
Ctenogobiops aurocingulus	Goby	**Gobiidae**	CRE-Fishes
Ctenogobiops feroculus	Goby	**Gobiidae**	CRE-Fishes
Ctenogobiops pomastictus	Goby	**Gobiidae**	CRE-Fishes
Ctenogobiops tangaroai	Long-Finned Prwn Goby	**Gobiidae**	CRE-Fishes
Lotilia graciliosa	Goby	**Gobiidae**	CRE-Fishes
Mahidolia mystacina	Goby	**Gobiidae**	CRE-Fishes
Vanderhorstia ambanoro	Goby	**Gobiidae**	CRE-Fishes
Vanderhorstia ornatissima	Goby	**Gobiidae**	CRE-Fishes
Amblygobius decussatus	Goby	**Gobiidae**	CRE-Fishes
Koumansetta hectori	Goby	**Gobiidae**	CRE-Fishes
Amblygobius nocturnus	Goby	**Gobiidae**	CRE-Fishes
Amblygobius phalaena	Goby	**Gobiidae**	CRE-Fishes
Koumansetta rainfordi	Goby	**Gobiidae**	CRE-Fishes
Oplopomops diacanthus	Goby	**Gobiidae**	CRE-Fishes
Oplopomus oplopomus	Goby	**Gobiidae**	CRE-Fishes
Signigobius biocellatus	Goby	**Gobiidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Silhouettea sp	Goby	**Gobiidae**	CRE-Fishes
Valenciennea muralis	Glass Goby	**Gobiidae**	CRE-Fishes
Valenciennea puellaris	Goby	**Gobiidae**	CRE-Fishes
Valenciennea sexguttata	Goby	**Gobiidae**	CRE-Fishes
Valenciennea strigata	Goby	**Gobiidae**	CRE-Fishes
Valenciennea sp	Goby	**Gobiidae**	CRE-Fishes
Gobius bontii	Goby	**Gobiidae**	CRE-Fishes
Asterropteryx ensifera	Goby	**Gobiidae**	CRE-Fishes
Asterropteryx semipunctata	Bluespotted goby	**Gobiidae**	CRE-Fishes
Austrolethops wardi	Goby	**Gobiidae**	CRE-Fishes
Awaous grammepomus	Goby	**Gobiidae**	CRE-Fishes
Awaous guamensis	Goby	**Gobiidae**	CRE-Fishes
Bathygobius cocosensis	Goby	**Gobiidae**	CRE-Fishes
Bathygobius cotticeps	Goby	**Gobiidae**	CRE-Fishes
Bathygobius fuscus	Goby	**Gobiidae**	CRE-Fishes
Bryaninops amplus	Goby	**Gobiidae**	CRE-Fishes
Bryaninops erythrops	Goby	**Gobiidae**	CRE-Fishes
Bryaninops natans	Goby	**Gobiidae**	CRE-Fishes
Bryaninops ridens	Goby	**Gobiidae**	CRE-Fishes
Bryaninops yongei	Goby	**Gobiidae**	CRE-Fishes
Cabillus tongarevae	Goby	**Gobiidae**	CRE-Fishes
Callogobius bauchotae	Goby	**Gobiidae**	CRE-Fishes
Callogobius centrolepis	Goby	**Gobiidae**	CRE-Fishes
Callogobius hasseltii	Goby	**Gobiidae**	CRE-Fishes
Callogobius maculipinnis	Goby	**Gobiidae**	CRE-Fishes
Callogobius okinawae	Goby	**Gobiidae**	CRE-Fishes
Callogobius plumatus	Goby	**Gobiidae**	CRE-Fishes
Callogobius sclateri	Goby	**Gobiidae**	CRE-Fishes
Callogobius sp.	Goby	**Gobiidae**	CRE-Fishes
Cristatogobius sp	Goby	**Gobiidae**	CRE-Fishes
Eviota afelei	Kawakawa	**Gobiidae**	CRE-Fishes
Eviota albolineata	Herring	**Gobiidae**	CRE-Fishes
Eviota bifasciata	Goby	**Gobiidae**	CRE-Fishes
Eviota cometa	Goby	**Gobiidae**	CRE-Fishes
Eviota distigma	Goby	**Gobiidae**	CRE-Fishes
Eviota fasciola	Goby	**Gobiidae**	CRE-Fishes
Eviota herrei	Goby	**Gobiidae**	CRE-Fishes
Eviota infulata	Goby	**Gobiidae**	CRE-Fishes
Eviota lachdeberei	Goby	**Gobiidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Eviota latifasciata	Goby	**Gobiidae**	CRE-Fishes
Eviota melasma	Goby	**Gobiidae**	CRE-Fishes
Eviota nebulosa	Goby	**Gobiidae**	CRE-Fishes
Eviota pellucida	Goby	**Gobiidae**	CRE-Fishes
Eviota prasina	Goby	**Gobiidae**	CRE-Fishes
Eviota prasites	Goby	**Gobiidae**	CRE-Fishes
Eviota punctulata	Goby	**Gobiidae**	CRE-Fishes
Eviota queenslandica	Goby	**Gobiidae**	CRE-Fishes
Eviota sebreei	Goby	**Gobiidae**	CRE-Fishes
Eviota saipanensis	Goby	**Gobiidae**	CRE-Fishes
Eviota sigillata	Goby	**Gobiidae**	CRE-Fishes
Eviota smaragdus	Goby	**Gobiidae**	CRE-Fishes
Eviota sparsa	Goby	**Gobiidae**	CRE-Fishes
Eviota storthynx	Goby	**Gobiidae**	CRE-Fishes
Eviota zonura	Goby	**Gobiidae**	CRE-Fishes
Eviota sp.	Goby	**Gobiidae**	CRE-Fishes
Exyrias belissimus	Goby	**Gobiidae**	CRE-Fishes
Exyrias puntang	Goby	**Gobiidae**	CRE-Fishes
Fusigobius longispinus	Goby	**Gobiidae**	CRE-Fishes
Fusigobius neophytus	Goby	**Gobiidae**	CRE-Fishes
Fusigobius signipinnis	Goby	**Gobiidae**	CRE-Fishes
Gladiogobius ensifer	Goby	**Gobiidae**	CRE-Fishes
Psammogobius biocellatus	Goby	**Gobiidae**	CRE-Fishes
Glossogobius celebius	Goby	**Gobiidae**	CRE-Fishes
Glossogobius giuris	Goby	**Gobiidae**	CRE-Fishes
Gnatholepis anjerensis	Goby	**Gobiidae**	CRE-Fishes
Gnatholepis cauerensis	Goby	**Gobiidae**	CRE-Fishes
Gnatholepis sp	Goby	**Gobiidae**	CRE-Fishes
Gobiodon albofasciatus	Goby	**Gobiidae**	CRE-Fishes
Gobiodon citrinus	Goby	**Gobiidae**	CRE-Fishes
Gnatholepis cauerensis	Eyebar goby	**Gobiidae**	CRE-Fishes
Gobiodon okinawae	Goby	**Gobiidae**	CRE-Fishes
Gobiodon quinquestrigatus	Goby	**Gobiidae**	CRE-Fishes
Gobiodon rivulatus	Goby	**Gobiidae**	CRE-Fishes
Gobiopsis bravoi	Goby	**Gobiidae**	CRE-Fishes
Heterelеotris sp	Goby	**Gobiidae**	CRE-Fishes
Istigobius decoratus	Goby	**Gobiidae**	CRE-Fishes
Istigobius ornatus	Goby	**Gobiidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Istigobius rigilius	Goby	**Gobiidae**	CRE-Fishes
Istigobius spence	Goby	**Gobiidae**	CRE-Fishes
Kelloggella cardinalis	Goby	**Gobiidae**	CRE-Fishes
Kelloggella quindecimfasciata	Goby	**Gobiidae**	CRE-Fishes
Macrodontogobius wilburi	Goby	**Gobiidae**	CRE-Fishes
Mugilogobius tagala	Goby	**Gobiidae**	CRE-Fishes
?	Goby	**Gobiidae**	CRE-Fishes
Opua nephodes	Goby	**Gobiidae**	CRE-Fishes
Oxyurichthys guibei	Goby	**Gobiidae**	CRE-Fishes
Oxyurichthys microlepis	Goby	**Gobiidae**	CRE-Fishes
Oxyurichthys ophthalmonema	Goby	**Gobiidae**	CRE-Fishes
Oxyurichthys papuensis	Goby	**Gobiidae**	CRE-Fishes
Oxyurichthys tentacularis	Goby	**Gobiidae**	CRE-Fishes
Pandaka sp	Goby	**Gobiidae**	CRE-Fishes
Palutrus pruinosa	Goby	**Gobiidae**	CRE-Fishes
Palutrus reticularis	Goby	**Gobiidae**	CRE-Fishes
Paragobiodon echinocephalus	Goby	**Gobiidae**	CRE-Fishes
Paragobiodon lacunicolus	Goby	**Gobiidae**	CRE-Fishes
Paragobiodon melanosomus	Goby	**Gobiidae**	CRE-Fishes
Paragobiodon modestus	Goby	**Gobiidae**	CRE-Fishes
Paragobiodon xanthosoma	Goby	**Gobiidae**	CRE-Fishes
Periophthalmus argentilineatus	Goby	**Gobiidae**	CRE-Fishes
Periophthalmus kalolo	Goby	**Gobiidae**	CRE-Fishes
Pleurosicya bilobata	Goby	**Gobiidae**	CRE-Fishes
Pleurosicya muscarum	Goby	**Gobiidae**	CRE-Fishes
Priolepis cincta	Goby	**Gobiidae**	CRE-Fishes
Priolepis farcimen	Goby	**Gobiidae**	CRE-Fishes
Priolepis inhaca	Goby	**Gobiidae**	CRE-Fishes
Priolepis semidoliata	Goby	**Gobiidae**	CRE-Fishes
Pseudogobius javanicus	Goby	**Gobiidae**	CRE-Fishes
Redigobius bikolanus	Goby	**Gobiidae**	CRE-Fishes
Redigobius bikolanus	Goby	**Gobiidae**	CRE-Fishes
Redigobius tambujon	Goby	**Gobiidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Smilosicyopus leprurus	Goby	**Gobiidae**	CRE-Fishes
Sicyopus zosterophorus	Goby	**Gobiidae**	CRE-Fishes
Sicyopus sp	Goby	**Gobiidae**	CRE-Fishes
Sicyopterus macrostetholepis	Goby	**Gobiidae**	CRE-Fishes
Sicyopterus micrurus	Goby	**Gobiidae**	CRE-Fishes
Sicyopterus sp	Goby	**Gobiidae**	CRE-Fishes
Stenogobius genivittatus	Goby	**Gobiidae**	CRE-Fishes
Stenogobius sp	Goby	**Gobiidae**	CRE-Fishes
Stiphodon elegans	Goby	**Gobiidae**	CRE-Fishes
Stiphodon sp	Goby	**Gobiidae**	CRE-Fishes
Taeniurops meyeni	Giant Reef Ray	**Dasyatidae**	CRE-Fishes
Trimma caesiura	Goby	**Gobiidae**	CRE-Fishes
Trimma naudei	Goby	**Gobiidae**	CRE-Fishes
Trimma okinawae	Goby	**Gobiidae**	CRE-Fishes
Trimma taylori	Goby	**Gobiidae**	CRE-Fishes
Trimma tevegae	Goby	**Gobiidae**	CRE-Fishes
Trimma sp.	Goby	**Gobiidae**	CRE-Fishes
Trimma sp.	Goby	**Gobiidae**	CRE-Fishes
Trimmatom eviotops	Goby	**Gobiidae**	CRE-Fishes
Tomiyamichthys lanceolatus	Goby	**Gobiidae**	CRE-Fishes
Amblygobius sp	Goby	**Gobiidae**	CRE-Fishes
Valenciennea parva	Parva Goby	**Gobiidae**	CRE-Fishes
Pleurosicya carolinensis	Caroline Ghost Goby	**Gobiidae**	CRE-Fishes
Pleurosicya coerulea	Blue Coral Ghost Goby	**Gobiidae**	CRE-Fishes
Pleurosicya fringilla	Fringed Ghost Goby	**Gobiidae**	CRE-Fishes
Pleurosicya micheli	Michael'S Ghost Goby	**Gobiidae**	CRE-Fishes
Pleurosicya mossambica	Common Ghost Goby	**Gobiidae**	CRE-Fishes
Pleurosicya plicata	Plicata Ghost Goby	**Gobiidae**	CRE-Fishes
Amblygobius linki	Link's goby	**Gobiidae**	CRE-Fishes
Kraemeriidae	Sand Darts	**Kraemeriidae**	CRE-Fishes
Kraemeria bryani	Sand Dart	**Kraemeriidae**	CRE-Fishes
Kraemeria cunicularia	Sand Dart	**Kraemeriidae**	CRE-Fishes
Kraemeria samoensis	Sand Dart	**Kraemeriidae**	CRE-Fishes
Xenisthmidae	Flathead Wriggler	**Xenisthmidae**	CRE-Fishes
Allomicrodesmus dorotheae	Dorothea'S Wriggler	**Xenisthmidae**	CRE-Fishes
Xenisthmus polyzonatus	Barred Wriggler	**Xenisthmidae**	CRE-Fishes
Xenisthmus sp.	Wriggler	**Xenisthmidae**	CRE-Fishes

Correct Scientific Name	Common Name	Correct Family Name	FEP GROUP
Microdesmidae	Wormfish	**Microdesmidae**	CRE-Fishes
Gunnellichthys monostigma	Wormfish	**Microdesmidae**	CRE-Fishes
Gunnellichthys pleurotaenia	Onestripe Wormfish	**Microdesmidae**	CRE-Fishes
Nemateleotris helfrichi	Helfrichs' Dartfish	**Microdesmidae**	CRE-Fishes
Nemateleotris magnifica	Fire Dartfish	**Microdesmidae**	CRE-Fishes
Ptereleotris evides	Blackfin Dartfish	**Microdesmidae**	CRE-Fishes
Ptereleotris heteroptera	Spot-Tail Dartfish	**Microdesmidae**	CRE-Fishes
Ptereleotris microlepis	Pearly Dartfish	**Microdesmidae**	CRE-Fishes
Ptereleotris zebra	Zebra Dartfish	**Microdesmidae**	CRE-Fishes
Ptereleotris lineopinnis	Dartfish	**Microdesmidae**	CRE-Fishes
Nemateleotris decora	Decorated Dartfish	**Microdesmidae**	CRE-Fishes
Gunnellichthys viridescens	Wormfish	**Microdesmidae**	CRE-Fishes
Paragunnellichthys seychellensis	Seychelle'S Wormfish	**Microdesmidae**	CRE-Fishes
Parioglossus formosus	Beautiful Hover Goby	**Microdesmidae**	CRE-Fishes
Parioglossus lineatus	Lined Hover Goby	**Microdesmidae**	CRE-Fishes
Parioglossus nudus	Naked Hover Goby	**Microdesmidae**	CRE-Fishes
Parioglossus palustris	Palustris Hover Goby	**Microdesmidae**	CRE-Fishes
Parioglossus rainfordi	Rainford'S Hover Goby	**Microdesmidae**	CRE-Fishes
Parioglossus raoi	Rao'S Hover Goby	**Microdesmidae**	CRE-Fishes
Parioglossus taeniatus	Taeniatus Hover Goby	**Microdesmidae**	CRE-Fishes
Parioglossus verticalis	Vertical Hover Goby	**Microdesmidae**	CRE-Fishes
Ptereleotris hanae	Filament Dartfish	**Microdesmidae**	CRE-Fishes
Acanthuridae	Surgeonfishes/tangs	**Acanthuridae**	CRE-Fishes
Acanthurus achilles	Achilles tang	**Acanthuridae**	CRE-Fishes
Acanthurus dussumieri	Eye-striped surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus nigricans	Whitecheek surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus guttatus	Whitespotted surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus leucopareius	Palelipped surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus lineatus	Blue-banded surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus blochii	Ringtail surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus nigricauda	Blackstreak surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus nigrofuscus	Brown surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus nigroris	Bluelined surgeonfish	**Acanthuridae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Acanthurus olivaceus	Orangeband surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus pyroferus	Mimic surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus thompsoni	Thomson's surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus triostegus	Convict tang	**Acanthuridae**	CRE-Fishes
Acanthurus xanthopterus	Yellowfin surgeonfish	**Acanthuridae**	CRE-Fishes
Ctenochaetus binotatus	Twospot bristletooth	**Acanthuridae**	CRE-Fishes
Ctenochaetus hawaiiensis	Black surgeonfish	**Acanthuridae**	CRE-Fishes
Ctenochaetus striatus	Striped bristletooth	**Acanthuridae**	CRE-Fishes
Naso annulatus	Whitemargin unicornfish	**Acanthuridae**	CRE-Fishes
Naso brachycentron	Humpback unicornfish	**Acanthuridae**	CRE-Fishes
Naso brevirostris	Spotted unicornfish	**Acanthuridae**	CRE-Fishes
Naso hexacanthus	Black tongue unicornfish	**Acanthuridae**	CRE-Fishes
Naso lituratus	Orangespine unicornfish	**Acanthuridae**	CRE-Fishes
Naso tuberosus	Humpnose unicornish	**Acanthuridae**	CRE-Fishes
Naso unicornis	Bluespine unicornfish	**Acanthuridae**	CRE-Fishes
Naso vlamingii	Bignose unicornfish	**Acanthuridae**	CRE-Fishes
Paracanthurus hepatus	Hepatus tang	**Acanthuridae**	CRE-Fishes
Zebrasoma flavescens	Yellow tang	**Acanthuridae**	CRE-Fishes
Zebrasoma scopas	Brown tang	**Acanthuridae**	CRE-Fishes
Zebrasoma velifer	Pacific sailfin tang	**Acanthuridae**	CRE-Fishes
Ctenochaetus strigosus	Yellow-eyed bristletooth	**Acanthuridae**	CRE-Fishes
Acanthurus bariene	Bariene's surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus mata	Elongate surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus chronixis	Chronixis surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus maculiceps	White-Freckled surgeonfish	**Acanthuridae**	CRE-Fishes
Ctenochaetus marginatus	Blue-spotted Bristletooth	**Acanthuridae**	CRE-Fishes
Ctenochaetus tominiensis	Tomini's surgeonfish	**Acanthuridae**	CRE-Fishes
Naso lopezi	Naso tang	**Acanthuridae**	CRE-Fishes
Acanthurus leucocheilus	Whitebar surgeonfish	**Acanthuridae**	CRE-Fishes
Acanthurus nubilus	Surgeonfish	**Acanthuridae**	CRE-Fishes
Naso caesius	Gray unicornfish	**Acanthuridae**	CRE-Fishes
Naso thynnoides	Barred unicornfish	**Acanthuridae**	CRE-Fishes
Zanclidae	Moorish Idols	**Zanclidae**	CRE-Fishes
Zanclus cornutus	Moorish Idol	**Zanclidae**	CRE-Fishes

Correct Scientific Name	Common Name	Correct Family Name	FEP GROUP
Siganidae	Rabbitfish	**Siganidae**	CRE-Fishes
Siganus argenteus	Fork-Tail Rabbitfish	**Siganidae**	CRE-Fishes
Siganus doliatus	Pencil-Streaked Rabbitfish	**Siganidae**	CRE-Fishes
Siganus fuscescens	Fuscescens Rabbitfish	**Siganidae**	CRE-Fishes
Siganus punctatus	Gold-Spotted Rabbitfish	**Siganidae**	CRE-Fishes
Siganus spinus	Scribbled Rabbitfish	**Siganidae**	CRE-Fishes
Siganus vermiculatus	Vermiculated Rabbitfish	**Siganidae**	CRE-Fishes
Siganus canaliculatus	Seagrass Rabbitfish	**Siganidae**	CRE-Fishes
Siganus corallinus	Coral Rabbitfish	**Siganidae**	CRE-Fishes
Siganus guttatus	Golden Rabbitfish	**Siganidae**	CRE-Fishes
Siganus puellus	Masked Rabbitfish	**Siganidae**	CRE-Fishes
Siganus lineatus	Lined Rabbitfish	**Siganidae**	CRE-Fishes
Siganus vulpinus	Rabbitfish	**Siganidae**	CRE-Fishes
Siganus canaliculatus	White-Spotted Rabbitfish	**Siganidae**	CRE-Fishes
Siganus punctatissimus	Peppered Rabbitfish	**Siganidae**	CRE-Fishes
Siganus randalli	Randal'S Rabbitfish	**Siganidae**	CRE-Fishes
Siganus argenteus	Manahak (Forktail Rabbitfish)	**Siganidae**	CRE-Fishes
Siganus argenteus	Manahak	**Siganidae**	CRE-Fishes
Grammatorcynus bilineatus	2-Lined Mackerel	**Scombridae**	CRE-Fishes
Rastrelliger kanagurta	Striped Mackerel	**Scombridae**	CRE-Fishes
Scomberomorus commerson	Narrow-Barred King Mackerel	**Scombridae**	CRE-Fishes
Rastrelliger brachysoma	Mackerel	**Scombridae**	CRE-Fishes
Istiophoridae	Billfishes	**Istiophoridae**	CRE-Fishes
Nomeidae	Man-Of-War Fish	**Nomeidae**	CRE-Fishes
Psenes cyanophrys	Freckeled Driftfish	**Nomeidae**	CRE-Fishes
Gobiesocidae	Clingfish	**Gobiesocidae**	CRE-Fishes
Lepadichthys caritus	Clingfish	**Gobiesocidae**	CRE-Fishes
Lepadichthys minor	Clingfish	**Gobiesocidae**	CRE-Fishes
Liobranchia stria	Clingfish	**Gobiesocidae**	CRE-Fishes
Callionymidae	Dragonets	**Callionymidae**	CRE-Fishes
Callionymus enneactis	Mangrove Dragonet	**Callionymidae**	CRE-Fishes
Callionymus simplicicornis	Simple-Spined Dragonet	**Callionymidae**	CRE-Fishes
Diplogrammus	Dragonet	**Callionymidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
goramensis			
Synchiropus circularis	Cirlcled Dragonet	**Callionymidae**	CRE-Fishes
Neosynchiropus ocellatus	Ocellated Dragonet	**Callionymidae**	CRE-Fishes
Synchiropus splendidus	Mandarin Fish	**Callionymidae**	CRE-Fishes
Anaora tentaculata	Dragonet	**Callionymidae**	CRE-Fishes
Callionymus delicatulus	Delicate Dragonet	**Callionymidae**	CRE-Fishes
Syngnathidae	Pipefish, Seahorse	**Syngnathidae**	CRE-Fishes
Synchiropus sp.	Dragonet	**Callionymidae**	CRE-Fishes
Synchiropus laddi	Ladd'S Dragonet	**Callionymidae**	CRE-Fishes
Bothidae	Flounders	**Bothidae**	CRE-Fishes
Bothus mancus	Peacock Flounder	**Bothidae**	CRE-Fishes
Bothus pantherinus	Leopard Flounder	**Bothidae**	CRE-Fishes
Asterorhombus intermedius	Flounder	**Bothidae**	CRE-Fishes
Engyprosopon sp.	Flounder	**Bothidae**	CRE-Fishes
Asterorhombus intermedius	Intermediate Flounder	**Bothidae**	CRE-Fishes
Samaridae	Righteye Flounders	**Samaridae**	CRE-Fishes
Samariscus triocellatus	3 Spot Flounder	**Samaridae**	CRE-Fishes
Soleidae	Soles	**Soleidae**	CRE-Fishes
Soleichthys heterorhinos	Banded Sole	**Soleidae**	CRE-Fishes
Aseraggodes melanostictus	Black Spotted Sole	**Soleidae**	CRE-Fishes
Aseraggodes xenicus	Smith'S Sole	**Soleidae**	CRE-Fishes
Aseraggodes whitakeri	Whitaker'S Sole	**Soleidae**	CRE-Fishes
Pardachirus pavoninus	Peacock Sole	**Soleidae**	CRE-Fishes
Triacanthodidae	Spikefishes	**Triacanthodidae**	CRE-Fishes
Halimochirurgus alcocki	Spikefish	**Triacanthodidae**	CRE-Fishes
Balistidae	Triggerfishes	**Balistidae**	CRE-Fishes
Balistapus undulatus	Undulate Triggerfish	**Balistidae**	CRE-Fishes
Balistoides conspicillum	Clown Triggerfish	**Balistidae**	CRE-Fishes
Balistoides viridescens	Titan Triggerfish	**Balistidae**	CRE-Fishes
Canthidermis maculata	Rough Triggerfish	**Balistidae**	CRE-Fishes
Melichthys niger	Black Triggerfish	**Balistidae**	CRE-Fishes
Melichthys vidua	Pinktail Triggerfish	**Balistidae**	CRE-Fishes
Odonus niger	Redtooth Triggerfish	**Balistidae**	CRE-Fishes
Pseudobalistes flavimarginatus	Ymargin Triggerfish	**Balistidae**	CRE-Fishes
Pseudobalistes fuscus	Blue Triggerfish	**Balistidae**	CRE-Fishes
Rhinecanthus aculeatus	Picassofish	**Balistidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Rhinecanthus rectangulus	Wedge Picassofish	**Balistidae**	CRE-Fishes
Sufflamen bursa	Scythe Triggerfish	**Balistidae**	CRE-Fishes
Sufflamen chrysopterum	Halfmoon Triggerfish	**Balistidae**	CRE-Fishes
Sufflamen fraenatum	Bridle Triggerfish	**Balistidae**	CRE-Fishes
Xanthichthys auromarginatus	Guilded Triggerfish	**Balistidae**	CRE-Fishes
Xanthichthys caeruleolineatus	Bluelined Triggerfish	**Balistidae**	CRE-Fishes
Xenobalistes tumidipectoris	Triggerfish	**Balistidae**	CRE-Fishes
Abalistes stellatus	Starry Triggerfish	**Balistidae**	CRE-Fishes
Rhinecanthus verrucosus	Blackbelly Picassofish	**Balistidae**	CRE-Fishes
Xanthichthys mento	Crosshatch Triggerfish	**Balistidae**	CRE-Fishes
Monacanthidae	Filefishes	**Monacanthidae**	CRE-Fishes
Aluterus scriptus	Filefish	**Monacanthidae**	CRE-Fishes
Amanses scopas	Filefish	**Monacanthidae**	CRE-Fishes
Cantherhines dumerilii	Gray Leatherjacket	**Monacanthidae**	CRE-Fishes
Cantherhines pardalis	Honeycomb Filefish	**Monacanthidae**	CRE-Fishes
Oxymonacanthus longirostris	Longnose Filefish	**Monacanthidae**	CRE-Fishes
Paraluteres prionurus	Blacksaddle Mimic	**Monacanthidae**	CRE-Fishes
Pervagor janthinosoma	Blackbar Filefish	**Monacanthidae**	CRE-Fishes
Aluterus monoceros	Unicorn Filefish	**Monacanthidae**	CRE-Fishes
Brachaluteres taylori	Taylor'S Inflator Filefish	**Monacanthidae**	CRE-Fishes
Paramonacanthus cryptodon	Filefish	**Monacanthidae**	CRE-Fishes
Paramonacanthus japonicus	Filefish	**Monacanthidae**	CRE-Fishes
Pervagor aspricaudus	Orangetail Filefish	**Monacanthidae**	CRE-Fishes
Pervagor melanocephalus	Blackheaded Filefish	**Monacanthidae**	CRE-Fishes
Pervagor nigrolineatus	Blacklined Filefish	**Monacanthidae**	CRE-Fishes
Cantherhines fronticinctus	Specktacled Filefish	**Monacanthidae**	CRE-Fishes
Acreichthys tomentosus	Seagrass Filefish	**Monacanthidae**	CRE-Fishes
Pervagor alternans	Yelloweye Filefish	**Monacanthidae**	CRE-Fishes
Pseudalutarius nasicornis	Rhino Leatherjacket	**Monacanthidae**	CRE-Fishes
Rudarius minutus	Minute Filefish	**Monacanthidae**	CRE-Fishes
Ostraciidae	Boxfish, Cowfish	**Ostraciidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Lactoria cornuta	Longhorn Cowfish	**Ostraciidae**	CRE-Fishes
Lactoria diaphana	Spiny Cowfish	**Ostraciidae**	CRE-Fishes
Ostracion cubicus	Cube Trunkfish	**Ostraciidae**	CRE-Fishes
Ostracion meleagris	Spotted Trunkfish	**Ostraciidae**	CRE-Fishes
Lactoria fornasini	Thornback Cowfish	**Ostraciidae**	CRE-Fishes
Ostracion solorensis	Reticulate Boxfish	**Ostraciidae**	CRE-Fishes
Rhynchostracion nasus	Smallnose Boxfish	**Ostraciidae**	CRE-Fishes
Ostracion rhinorhynchos	Largenose Boxfish	**Ostraciidae**	CRE-Fishes
Triodontidae	Tripletooth Puffers	**Triodontidae**	CRE-Fishes
Triodon macropterus	3 Tooth Puffer	**Triodontidae**	CRE-Fishes
Triodon macropterus	3 Tooth Puffer	**Triodontidae**	CRE-Fishes
Arothron hispidus	Brown Puffer	**Tetraodontidae**	CRE-Fishes
Arothron manilensis	Puffer	**Tetraodontidae**	CRE-Fishes
Arothron mappa	Puffer	**Tetraodontidae**	CRE-Fishes
Arothron meleagris	White-Spot Puffer	**Tetraodontidae**	CRE-Fishes
Arothron nigropunctatus	Black-Spotted Puffer	**Tetraodontidae**	CRE-Fishes
Arothron stellatus	Star Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster amboinensis	Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster bennetti	Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster coronata	Sharp Back Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster epilampra	Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster janthinoptera	Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster leoparda	Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster solandri	Sharpnose Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster valentini	Saddle Shpns Puffer	**Tetraodontidae**	CRE-Fishes
Canthigaster compressa	Puffer	**Tetraodontidae**	CRE-Fishes
Amblyrhynchotes honckenii	Evileye Puffer	**Tetraodontidae**	CRE-Fishes
Lagocephalus lagocephalus	Oceanic Blaasop	**Tetraodontidae**	CRE-Fishes
Lagocephalus sceleratus	Silverstripe Blaasop	**Tetraodontidae**	CRE-Fishes
Canthigaster ocellicincta	Circle-Barred Toby	**Tetraodontidae**	CRE-Fishes
Canthigaster papua	Papuan Toby	**Tetraodontidae**	CRE-Fishes
Diodontidae	Porcupinefish	**Diodontidae**	CRE-Fishes
Diodon hystrix	Porcupinefish	**Diodontidae**	CRE-Fishes
Diodon liturosus	Porcupinefish	**Diodontidae**	CRE-Fishes
Diodon eydouxii	Porcupinefish	**Diodontidae**	CRE-Fishes
Molidae	Ocean Sunfishes	**Molidae**	CRE-Fishes

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Masturus lanceolatus	Sharptail Sunfish	**Molidae**	CRE-Fishes
Ranzania laevis	Trunkfish	**Molidae**	CRE-Fishes
Synchiropus morrisoni	Morrison'S Dragonet	**Callionymidae**	CRE-Fishes
#N/A	ASSORTED BOTTOMFISH	**#N/A**	CRE-Fishes
#N/A	SHALLOW BOTTOMFISH	**#N/A**	CRE-Fishes
?	Shallow Snappers	**Lutjanidae**	CRE-Fishes
#N/A	ASSORTED REEF FISH	**#N/A**	CRE-Fishes
Class Mollusca	Mollusca	**Multiple families**	CRE-Invertebrates
Order Archaeogastropoda	Diotocardia	**Multiple families**	CRE-Invertebrates
Trochidae	Top Shells	**Trochidae**	CRE-Invertebrates
Trochus niloticus	Top Shell	**Tegulidae**	CRE-Invertebrates
Tectus pyramis	Pyramid Top	**Trochidae**	CRE-Invertebrates
Trochus radiatus	Radiate Top	**Trochidae**	CRE-Invertebrates
Turbinidae	Turban Shell	**Turbinidae**	CRE-Invertebrates
Turbo setosus	Rough Turbin	**Turbinidae**	CRE-Invertebrates
Turbo argyrostomus	Silver-Mouth Turbin	**Turbinidae**	CRE-Invertebrates
Turbo petholatus	Tapestry Turbin	**Turbinidae**	CRE-Invertebrates
Neritidae	Nerites	**Neritidae**	CRE-Invertebrates
Nerita plicata	Plicate Nerite	**Neritidae**	CRE-Invertebrates
Nerita polita	Polished Nerite	**Neritidae**	CRE-Invertebrates
Nerita albicilla	Ox-Palate Nerite	**Neritidae**	CRE-Invertebrates
Nerita signata	Reticulate Nerite	**Neritidae**	CRE-Invertebrates
Littorinidae	Periwinkles	**Littorinidae**	CRE-Invertebrates
Littoraria undulata	Undulate Periwinkle	**Littorinidae**	CRE-Invertebrates
Littorina scabra	Scabra Periwinkle	**Littorinidae**	CRE-Invertebrates
Cerithiidae	Turret,Worm-Shells	**Cerithiidae**	CRE-Invertebrates
Cerithium nodulosum	Giant Knobbed Certh	**Cerithiidae**	CRE-Invertebrates
Clypeomorus bifasciata	Morus Certh	**Cerithiidae**	CRE-Invertebrates
Rhinoclavis aspera	Rough Vertigus	**Cerithiidae**	CRE-Invertebrates
Cerithium columna	Column Certh	**Cerithiidae**	CRE-Invertebrates
Rhinoclavis sinensis	Obelisk Vertigus	**Cerithiidae**	CRE-Invertebrates
Strombidae	True Conchs	**Strombidae**	CRE-Invertebrates
Strombus mutabilis	Mutable Conch	**Strombidae**	CRE-Invertebrates
Strombus luhuanus	Red-Lip Conch	**Strombidae**	CRE-Invertebrates
Strombus gibberulus	Gibbose Conch	**Strombidae**	CRE-Invertebrates
Strombus microurceus	Micro Conch	**Strombidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Strombus dentatus	Samar Conch	**Strombidae**	CRE-Invertebrates
Strombus fragilis	Fragile Conch	**Strombidae**	CRE-Invertebrates
Strombus lentiginosus	Silver-Lip Conch	**Strombidae**	CRE-Invertebrates
Terebellum terebellum	Terebellum Conch	**Strombidae**	CRE-Invertebrates
Strombus haemastoma	Lavender-Mouth Conch	**Strombidae**	CRE-Invertebrates
Strombus sinuatus	Laciniate Conch	**Strombidae**	CRE-Invertebrates
Sinustrombus taurus	Bull Conch	**Strombidae**	CRE-Invertebrates
Strombus plicatus	Pretty Conch	**Strombidae**	CRE-Invertebrates
Lambis sp.	Spider Conch	**Strombidae**	CRE-Invertebrates
Lambis lambis	Common Spider Conch	**Strombidae**	CRE-Invertebrates
Harpago chiragra	Chiragra Spider Conch	**Strombidae**	CRE-Invertebrates
Lambis truncata	Giant Spider Conch	**Strombidae**	CRE-Invertebrates
Lambis scorpius	Scorpio Conch	**Strombidae**	CRE-Invertebrates
Lambis crocata	Ormouth Spider Conch	**Strombidae**	CRE-Invertebrates
Cypraeidae	Cowrys	**Cypraeidae**	CRE-Invertebrates
Cypraea moneta	Money Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea caputserpentis	Snake'S Head Cowry	**Cypraeidae**	CRE-Invertebrates
Monetaria annulus	Gold-Ringer Cowry	**Cypraeidae**	CRE-Invertebrates
Lyncina lynx	Lynx Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea mappa	Map Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea eglantina	Eglantine Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea isabella	Isabelle Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea erosa	Eroded Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea poraria	Porus Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea carneola	Carnelian Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea helvola	Honey Cowry	**Cypraeidae**	CRE-Invertebrates
Staphylaea staphylaea	Grape Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea cylindrica	Sowerby'S Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea punctata	Punctata Cowry	**Cypraeidae**	CRE-Invertebrates
Cribrarula cribraria	Sieve Cowry	**Cypraeidae**	CRE-Invertebrates
Mauritia maculifera	Reticulated Cowry	**Cypraeidae**	CRE-Invertebrates
Mauritia depressa	Depressed Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea tigris	Tiger Cowry	**Cypraeidae**	CRE-Invertebrates
Lyncina vitellus	Pacific Deer Cowry	**Cypraeidae**	CRE-Invertebrates
Talparia talpa	Mole Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea clandestina	Clandestine Cowry	**Cypraeidae**	CRE-Invertebrates
Staphylaea nucleus	Nuclear Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea microdon	Microdon Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea stolida	Stolid Cowry	**Cypraeidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Cypraea mauritiana	Humpback Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea arabica	Arabian Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea ventriculus	Ventral Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea teres	Teres Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea scurra	Jester Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea hirundo	Swallow Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea labrolineata	Lined-Lip Cowry	**Cypraeidae**	CRE-Invertebrates
Pustularia cicercula	Chick-Pea Cowry	**Cypraeidae**	CRE-Invertebrates
Pustularia bistrinotata	Bistro Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea argus	Eyed Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea ziczac	Undulating Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea globulus	Globular Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea mariae	Marie'S Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea beckii	Beck'S Cowry	**Cypraeidae**	CRE-Invertebrates
Lyncina aurantium	Golden Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea chinensis	Chinese Cowry	**Cypraeidae**	CRE-Invertebrates
Cypraea limacina	Limacina Cowry	**Cypraeidae**	CRE-Invertebrates
Palmadusta humphreyii	Humphrey'S Cowry	**Cypraeidae**	CRE-Invertebrates
Cryptocypraea dillwyni	Dillwyn'S Cowry	**Cypraeidae**	CRE-Invertebrates
Ovulidae	Egg Shells	**Ovulidae**	CRE-Invertebrates
Calpurnus verrucosus	Umbilicate Ovula	**Ovulidae**	CRE-Invertebrates
Prionovolva fruticum	Fruit Ovula	**Ovulidae**	CRE-Invertebrates
Ovula ovum	Common Egg Cowry	**Ovulidae**	CRE-Invertebrates
Naticidae	Moon Shells	**Naticidae**	CRE-Invertebrates
Mammilla mammata	Breast-Shaped Moon	**Naticidae**	CRE-Invertebrates
Polinices tumidus	Pear-Shaped Moon	**Naticidae**	CRE-Invertebrates
Tonnidae	Tun Shells	**Tonnidae**	CRE-Invertebrates
Tonna perdix	Partridge Tun	**Tonnidae**	CRE-Invertebrates
Malea pomum	Apple Tun	**Tonnidae**	CRE-Invertebrates
Cassidae	Helmet Shells	**Cassidae**	CRE-Invertebrates
Cassis cornuta	Horned Helmet	**Cassidae**	CRE-Invertebrates
Casmaria erinaceus	Vibex Bonnet	**Cassidae**	CRE-Invertebrates
Casmaria ponderosa	Heavy Bonnet	**Cassidae**	CRE-Invertebrates
Ranellidae	Tritons	**Ranellidae**	CRE-Invertebrates
Monoplex aquatilis	Aquatile Hairy Triton	Ranellidae	CRE-Invertebrates
Monoplex nicobaricus	Nicobar Hairy Triton	Ranellidae	CRE-Invertebrates
Monoplex gemmatus	Jeweled Triton	Ranellidae	CRE-Invertebrates
Gutturnium muricinum	Short-Neck Triton	Ranellidae	CRE-Invertebrates
Septa rubecula	Red Triton	Ranellidae	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Cymatium hepaticum	Liver Triton	Ranellidae	CRE-Invertebrates
Gyrineum roseum	Rosy Gyre Triton	Ranellidae	CRE-Invertebrates
Distorsio anus	Anal Triton	**Personidae**	CRE-Invertebrates
Monoplex pilearis	Common Hairy Triton	Ranellidae	CRE-Invertebrates
Gyrineum pusillum	Purple Gyre Triton	Ranellidae	CRE-Invertebrates
Charonia tritonis	Triton Trumpet	Ranellidae	CRE-Invertebrates
Cymatium lotorium	Black-Spotted Triton	Ranellidae	CRE-Invertebrates
Ranularia pyrum	Pear Triton	Ranellidae	CRE-Invertebrates
Gelagna succincta	Clandestine Triton	Ranellidae	CRE-Invertebrates
Monoplex vespaceus	Dwarf Hairy Triton	Ranellidae	CRE-Invertebrates
Turritriton labiosus	Wide-Lipped Triton	Ranellidae	CRE-Invertebrates
Bursidae	Frog Shells	**Bursidae**	CRE-Invertebrates
Bursa bufonia	Warty Frog Shell	**Bursidae**	CRE-Invertebrates
Bursa cruentata	Blood-Stain Frog Shell	**Bursidae**	CRE-Invertebrates
Bursa granularis	Granulate Frog Shell	**Bursidae**	CRE-Invertebrates
Bursa mammata	Udder Frog Shell	**Bursidae**	CRE-Invertebrates
Bursa rhodostoma	Wine-Mth Frog Shell	**Bursidae**	CRE-Invertebrates
Bursa bubo	Giant Frog Shell	**Bursidae**	CRE-Invertebrates
Bursa rubeta	Ruddy Frog Shell	**Bursidae**	CRE-Invertebrates
Tutufa (Tutufa) bufo	Red-Mth Frog Shell	**Bursidae**	CRE-Invertebrates
Bursa lamarcki	Lamarck'S Frog Shell	**Bursidae**	CRE-Invertebrates
Muricidae	Murex Shells	**Muricidae**	CRE-Invertebrates
Chicoreus brunneus	Burnt Murex	**Muricidae**	CRE-Invertebrates
Vitularia miliaris	Spotted Vitularia	**Muricidae**	CRE-Invertebrates
Chicoreus triquetra	Triquetra Murex	**Muricidae**	CRE-Invertebrates
Naquetia trigonula	Tragonula Murex	**Muricidae**	CRE-Invertebrates
Chicomurex laciniatus	Lacy Murex	**Muricidae**	CRE-Invertebrates
Homalocantha anatomica	Anatomical Murex	**Muricidae**	CRE-Invertebrates
Pterynotus laqueatus	Fluted Murex	**Muricidae**	CRE-Invertebrates
Pterynotus tripterus	3-Winged Murex	**Muricidae**	CRE-Invertebrates
Marchia martinetana	Fenestrate Murex	**Muricidae**	CRE-Invertebrates
Pterynotus elongatus	Club Murex	**Muricidae**	CRE-Invertebrates
Marchia bipinnata	Pinnacle Murex	**Muricidae**	CRE-Invertebrates
Chicoreus ramosus	Ramose Murex	**Muricidae**	CRE-Invertebrates
?	Bionic Rock Shell	**Muricidae**	CRE-Invertebrates
Menathais tuberosa	Tuberose Rock Shell	**Muricidae**	CRE-Invertebrates
Mancinella armigera	Belligerent Rock Shell	**Muricidae**	CRE-Invertebrates
Purpura persica	Perssian Purpura	**Muricidae**	CRE-Invertebrates
Nassa francolina	Francolina Jopas	**Muricidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Drupa ricinus	Prickley Pacific Drupe	**Muricidae**	CRE-Invertebrates
Drupa morum	Purple Pacific Drupe	**Muricidae**	CRE-Invertebrates
Drupa grossularia	Digitate Pacific Drupe	**Muricidae**	CRE-Invertebrates
Drupa elegans	Elegant Pacific Drupe	**Muricidae**	CRE-Invertebrates
Drupa rubusidaeus	Strawberry Drupe	**Muricidae**	CRE-Invertebrates
Drupa clathrata	Clatherate Drupe	**Muricidae**	CRE-Invertebrates
Subfamily Coralliophilinae	Coral Shells	**Muricidae**	CRE-Invertebrates
Coralliophila violacea	Violet Coral Shell	**Muricidae**	CRE-Invertebrates
Coralliophila erosa	Eroded Coral Shell	**Muricidae**	CRE-Invertebrates
Quoyula madreporarum	Quoy'S Coral Shell	**Muricidae**	CRE-Invertebrates
Rapa rapa	Rapa Snail	**Muricidae**	CRE-Invertebrates
Buccinidae	Goblets,Dwarf Tritons	**Buccinidae**	CRE-Invertebrates
Cantharus undosus	Waved Goblet	**Buccinidae**	CRE-Invertebrates
Cantharus fumosus	Smoky Goblet	**Buccinidae**	CRE-Invertebrates
Clivipollia pulchra	Beautiful Goblet	**Buccinidae**	CRE-Invertebrates
Pollia fragaria	Strawberry Goblet	**Buccinidae**	CRE-Invertebrates
Colubraria nitidula	Shiny Dwarf Triton	**Colubrariidae**	CRE-Invertebrates
Colubraria tortuosa	Twisted Dwarf Triton	**Colubrariidae**	CRE-Invertebrates
Colubraria muricata	Maculated Dwarf Triton	**Colubrariidae**	CRE-Invertebrates
Fasciolariidae	Spindles	**Fasciolariidae**	CRE-Invertebrates
Latirus nodatus	Nobby Spindle	**Fasciolariidae**	CRE-Invertebrates
Leucozonia rudis	Spindle	**Fasciolariidae**	CRE-Invertebrates
Nassariidae	Nassa Mud Snails	**Nassariidae**	CRE-Invertebrates
Nassarius papillosus	Pimpled Basket	**Nassariidae**	CRE-Invertebrates
Nassarius margaritiferus	Margarite Nassa	**Nassariidae**	CRE-Invertebrates
Nassarius graniferus	Granulated Nassa	**Nassariidae**	CRE-Invertebrates
Olividae	Olive Shells	**Olividae**	CRE-Invertebrates
Oliva annulata	Amethyst Olive	**Olividae**	CRE-Invertebrates
Oliva miniacea	Red-Mth Olive	**Olividae**	CRE-Invertebrates
Oliva carneola	Carnelian Olive	**Olividae**	CRE-Invertebrates
Oliva paxillus	Peg Olive	**Olividae**	CRE-Invertebrates
Turbinellidae	Vases	**Turbinellidae**	CRE-Invertebrates
Vasum turbinellum	Common Pacific Vase	**Turbinellidae**	CRE-Invertebrates
Vasum ceramicum	Ceramic Vase	**Turbinellidae**	CRE-Invertebrates
Mitridae	Miter Shells	**Mitridae**	CRE-Invertebrates
Mitra stictica	Pontifical Miter	**Mitridae**	CRE-Invertebrates
Mitra mitra	Episcopal Miter	**Mitridae**	CRE-Invertebrates
Imbricaria olivaeformis	Olive-Shaped Miter	**Mitridae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Imbricaria punctata	Bonelike Miter	**Mitridae**	CRE-Invertebrates
Imbricaria conularis	Cone-Like Miter	**Mitridae**	CRE-Invertebrates
Mitra ferruginea	Rusty Miter	**Mitridae**	CRE-Invertebrates
Vexillum unifasciatum	Decorated Miter	**Costellariidae**	CRE-Invertebrates
Domiporta filaris	File Miter	**Mitridae**	CRE-Invertebrates
Vexillum exasperatum	Roughened Miter	**Costellariidae**	CRE-Invertebrates
Vexillum crocatum	Saffron Miter	**Costellariidae**	CRE-Invertebrates
Vexillum semifasciatum	Half-Banded Miter	**Costellariidae**	CRE-Invertebrates
Vexillum cancellarioides	Cancellaria Miter	**Costellariidae**	CRE-Invertebrates
Mitra papalis	Papal Miter	**Mitridae**	CRE-Invertebrates
Neocancilla clathrus	Clathrus Miter	**Mitridae**	CRE-Invertebrates
Vexillum patriarchale	Patriarchal Miter	**Costellariidae**	CRE-Invertebrates
Mitra tuberosa	Bumpy Miter	**Costellariidae**	CRE-Invertebrates
Mitra bernhardina	Bernhard'S Miter	**Mitridae**	CRE-Invertebrates
Mitra incompta	Tesselate Miter	**Mitridae**	CRE-Invertebrates
Mitra coffea	Coffee Miter	**Mitridae**	CRE-Invertebrates
Mitra cardinalis	Cardinal Miter	**Mitridae**	CRE-Invertebrates
Mitra fraga	Strawberry Miter	**Mitridae**	CRE-Invertebrates
Mitra cucumerina	Kettle Miter	**Mitridae**	CRE-Invertebrates
Mitra chrysalis	Chrysalis Miter	**Mitridae**	CRE-Invertebrates
Mitra rubritincta	Red-Painted Miter	**Mitridae**	CRE-Invertebrates
Mitra chrysostoma	Gold-Mth Miter	**Mitridae**	CRE-Invertebrates
Domiporta granatina	Flecked Miter	**Mitridae**	CRE-Invertebrates
Mitra imperialis	Imperial Miter	**Mitridae**	CRE-Invertebrates
Mitra contracta	Contracted Miter	**Mitridae**	CRE-Invertebrates
Mitra acuminata	Acuminate Miter	**Mitridae**	CRE-Invertebrates
Sabricola casta	Chaste Miter	**Mitridae**	CRE-Invertebrates
Neocancilla papilio	Butterfly Miter	**Mitridae**	CRE-Invertebrates
Pterygia scabricula	Rough Miter	**Mitridae**	CRE-Invertebrates
Vexillum speciosum	Specious Miter	**Costellariidae**	CRE-Invertebrates
Pterygia crenulata	Crenulate Miter	**Mitridae**	CRE-Invertebrates
Pterygia nucea	Nut Miter	**Mitridae**	CRE-Invertebrates
Vexillum turben	Turbin Miter	**Costellariidae**	CRE-Invertebrates
Pterygia fenestrata	Fenestrate Miter	**Mitridae**	CRE-Invertebrates
Harpidae	Harp Shells	**Harpidae**	CRE-Invertebrates
Harpa amouretta	Little Love Harp	**Harpidae**	CRE-Invertebrates
Harpa major	Major Harp	**Harpidae**	CRE-Invertebrates
Harpa harpa	True Harp	**Harpidae**	CRE-Invertebrates
Conidae	Cone Shells	**Conidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Conus pulicarius	Flea-Bite Cone	**Conidae**	CRE-Invertebrates
Conus coronatus	Crowned Cone	**Conidae**	CRE-Invertebrates
Conus ebraeus	Hebrew Cone	**Conidae**	CRE-Invertebrates
Conus chaldaeus	Chaldean Cone	**Conidae**	CRE-Invertebrates
Conus sponsalis	Marriage Cone	**Conidae**	CRE-Invertebrates
Conus distans	Distantly-Lined Cone	**Conidae**	CRE-Invertebrates
Conus flavidus	Pacific Yellow Cone	**Conidae**	CRE-Invertebrates
Conus frigidus	Frigid Cone	**Conidae**	CRE-Invertebrates
Conus lividus	Livid Cone	**Conidae**	CRE-Invertebrates
Conus miles	Soldier Cone	**Conidae**	CRE-Invertebrates
Conus rattus	Rat Cone	**Conidae**	CRE-Invertebrates
Conus catus	Cat Cone	**Conidae**	CRE-Invertebrates
Conus sanguinolentus	Blood-Stained Cone	**Conidae**	CRE-Invertebrates
Conus muriculatus	Muricate Cone	**Conidae**	CRE-Invertebrates
Conus moreleti	Morelet'S Cone	**Conidae**	CRE-Invertebrates
Conus eburneus	Ivory Cone	**Conidae**	CRE-Invertebrates
Conus litteratus	Lettered Cone	**Conidae**	CRE-Invertebrates
Conus leopardus	Leopard Cone	**Conidae**	CRE-Invertebrates
Conus miliaris	1000-Spot Cone	**Conidae**	CRE-Invertebrates
Conus musicus	Music Cone	**Conidae**	CRE-Invertebrates
Conus vexillum	Flag Cone	**Conidae**	CRE-Invertebrates
Conus capitaneus	Captain Cone	**Conidae**	CRE-Invertebrates
Conus mustelinus	Weasel Cone	**Conidae**	CRE-Invertebrates
Conus tessulatus	Checkered Cone	**Conidae**	CRE-Invertebrates
Conus generalis	General Cone	**Conidae**	CRE-Invertebrates
Conus imperialis	Imperial Cone	**Conidae**	CRE-Invertebrates
Conus bandanus	Banded Marble-Cone	**Conidae**	CRE-Invertebrates
Conus striatus	Striated Cone	**Conidae**	CRE-Invertebrates
Conus vitulinus	Calf Cone	**Conidae**	CRE-Invertebrates
Conus striatellus	Striatellus Cone	**Conidae**	CRE-Invertebrates
Conus litoglyphus	Lithography Cone	**Conidae**	CRE-Invertebrates
Conus arenatus	Sand-Dusted Cone	**Conidae**	CRE-Invertebrates
Conus textile	Textile Cone	**Conidae**	CRE-Invertebrates
Conus obscurus	Obscure Cone	**Conidae**	CRE-Invertebrates
Conus glans	Acorn Cone	**Conidae**	CRE-Invertebrates
Conus terebra	Terebra Cone	**Conidae**	CRE-Invertebrates
Conus coffeae	Leaden Cone	**Conidae**	CRE-Invertebrates
Conus luteus	Luteus Cone	**Conidae**	CRE-Invertebrates
Conus pertusus	Pertusus Cone	**Conidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Conus varius	Varius Cone	**Conidae**	CRE-Invertebrates
Conus geographus	Geography Cone	**Conidae**	CRE-Invertebrates
Conus tulipa	Tulip Cone	**Conidae**	CRE-Invertebrates
Conus aulicus	Princely Cone	**Conidae**	CRE-Invertebrates
Conus legatus	Ambassador Cone	**Conidae**	CRE-Invertebrates
Conus episcopatus	Episcopus Cone	**Conidae**	CRE-Invertebrates
Conus magnificus	Dignified Cone	**Conidae**	CRE-Invertebrates
Conus retifer	Netted Cone	**Conidae**	CRE-Invertebrates
Conus aureus	Aureus Cone	**Conidae**	CRE-Invertebrates
Conus auricomus	Gold-Leaf Cone	**Conidae**	CRE-Invertebrates
Conus cylindraceus	Cylindrical Cone	**Conidae**	CRE-Invertebrates
Conus bullatus	Bubble Cone	**Conidae**	CRE-Invertebrates
Conus daucus	Comma Cone	**Conidae**	CRE-Invertebrates
Terebridae	Auger Shells	**Terebridae**	CRE-Invertebrates
Terebra maculata	Marlinspike Auger	**Terebridae**	CRE-Invertebrates
Terebra dimidiata	Dimidiate Auger	**Terebridae**	CRE-Invertebrates
Terebra subulata	Subulate Auger	**Terebridae**	CRE-Invertebrates
Terebra crenulata	Crenulated Auger	**Terebridae**	CRE-Invertebrates
Terebra affinis	Similar Auger	**Terebridae**	CRE-Invertebrates
Terebra nebulosa	Cloud Auger	**Terebridae**	CRE-Invertebrates
Terebra babylonia	Babylonian Auger	**Terebridae**	CRE-Invertebrates
Hastula penicillata	Pencil Auger	**Terebridae**	CRE-Invertebrates
Hastula lanceata	Lance Auger	**Terebridae**	CRE-Invertebrates
Terebra cerethina	Certhlike Auger	**Terebridae**	CRE-Invertebrates
Terebra funiculata	Funnel Auger	**Terebridae**	CRE-Invertebrates
Terebra undulata	Undulate Auger	**Terebridae**	CRE-Invertebrates
Terebra guttata	Spotted Auger	**Terebridae**	CRE-Invertebrates
Terebra felina	Tiger Auger	**Terebridae**	CRE-Invertebrates
Terebra chlorata	Short Auger	**Terebridae**	CRE-Invertebrates
Terebra argus	Eyed Auger	**Terebridae**	CRE-Invertebrates
Terebra areolata	Fly-Spotted Auger	**Terebridae**	CRE-Invertebrates
Atlantidae	heteropods	**Atlantidae**	CRE-Invertebrates
Atlanta peronii	Peron'S Sea Butterfly	**Atlantidae**	CRE-Invertebrates
Janthinidae	Pelagic Snails	**Janthinidae**	CRE-Invertebrates
Janthina janthina	Janthina Snail	**Janthinidae**	CRE-Invertebrates
Pyramidellidae	Pyram Shells	**Pyramidellidae**	CRE-Invertebrates
Pyramidella sulcata	Sulcate Pyram	**Pyramidellidae**	CRE-Invertebrates
Acteonidae	Bubble Shells,Sea Hares	**Acteonidae**	CRE-Invertebrates
Milda ventricosa	Ventricose Milda	**Pyramidellidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Otopleura auriscati	Cat'S Ear Otopleura	**Pyramidellidae**	CRE-Invertebrates
Pupa solidula	Solid Pupa	**Acteonidae**	CRE-Invertebrates
Bullidae	Bubble Shells	**Bullidae**	CRE-Invertebrates
Bulla ampulla	Ampule Bubble	**Bullidae**	CRE-Invertebrates
Bullina lineata	Lined Bubble	**Bullidae**	CRE-Invertebrates
Hydatina physis	Gr-Lined Paber Bubble	**Aplustridae**	CRE-Invertebrates
Atys naucum	Wh Pacific Atys	**Haminoeidae**	CRE-Invertebrates
Micromelo undatus	Mini Lined-Bubble	**Bullidae**	CRE-Invertebrates
Ellobiidae	Melampus Shells	**Ellobiidae**	CRE-Invertebrates
Melampus luteus	Yellow Melampus	**Ellobiidae**	CRE-Invertebrates
Chitonidae	Chitons	**Chitonidae**	CRE-Invertebrates
Acanthopleura spinosa	Spiney Chiton	**Chitonidae**	CRE-Invertebrates
Arcidae	Ark Shells	**Arcidae**	CRE-Invertebrates
Arca ventricosa	Ventricose Ark	**Arcidae**	CRE-Invertebrates
Arca navicularis	Indo-Pacific Ark	**Arcidae**	CRE-Invertebrates
Anadara antiquata	Antique Ark	**Arcidae**	CRE-Invertebrates
Barbatia amygdalumtotsum	Almond Ark	**Arcidae**	CRE-Invertebrates
Cavoliniidae	Sea Butterflies	**Cavoliniidae**	CRE-Invertebrates
Cavolinia globulosa	Sea Butterfly	**Cavoliniidae**	CRE-Invertebrates
Cavolinia tridentata	3-Toothed Cavoline	**Cavoliniidae**	CRE-Invertebrates
Cavolinia uncinata	Unicate Cavoline	**Cavoliniidae**	CRE-Invertebrates
Diacria trispinosa	3-Spined Cavoline	**Cavoliniidae**	CRE-Invertebrates
Cuvierina columnella	Cigar Pteropod	**Cuvierinidae**	CRE-Invertebrates
Clio pyramidata	Irregular Urchins	**Cliidae**	CRE-Invertebrates
Clio cuspidata	Pyramid Clio	**Cliidae**	CRE-Invertebrates
Superfamily Doridoidea	Dorid Nudibranchs	**Dorididae**	CRE-Invertebrates
Hexabranchus sanguineus	Spanish Dancer	**Hexabranchidae**	CRE-Invertebrates
Class Bivalvia	Bivalves	**Multiple families**	CRE-Invertebrates
Mytilidae	Mussels	**Mytilidae**	CRE-Invertebrates
Septifer bilocularis	Box Mussel	**Mytilidae**	CRE-Invertebrates
Pinnidae	Pen Shells	**Pinnidae**	CRE-Invertebrates
Pinna bicolor	Bicolor Pen Shell	**Pinnidae**	CRE-Invertebrates
Pinna saccata	Baggy Pen Shell	**Pinnidae**	CRE-Invertebrates
Pteriidae	Pearl Oysters	**Pteriidae**	CRE-Invertebrates
Pinctada margaritifera	Pearl Oyster	**Pteriidae**	CRE-Invertebrates
Pteriidae	Tree Oysters	**Pteriidae**	CRE-Invertebrates
Isognomon ephippium	Saddle Tree Oyster	**Pteriidae**	CRE-Invertebrates
Pectinidae	Scallops	**Pectinidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Laevichlamys squamosa	Squamose Scallop	**Pectinidae**	CRE-Invertebrates
Excellichlamys spectabilis	Spectacular Scallop	**Pectinidae**	CRE-Invertebrates
Laevichlamys cuneata	Cook'S Scallop	**Pectinidae**	CRE-Invertebrates
Gloripallium speciosum	Speciosus Scallop	**Pectinidae**	CRE-Invertebrates
Semipallium tigris	Tiger Scallop	**Pectinidae**	CRE-Invertebrates
Mirapecten mirificus	Miraculous Scallop	**Pectinidae**	CRE-Invertebrates
Ostreidae	True Oysters	**Ostreidae**	CRE-Invertebrates
Crassostrea mordax	Mangrove Oyster	**Ostreidae**	CRE-Invertebrates
Crassostrea gigas	Giant Oyster	**Ostreidae**	CRE-Invertebrates
Spondylidae	Thorny Oysters	**Spondylidae**	CRE-Invertebrates
Spondylus squamosus	Ducal Thorny Oyster	**Spondylidae**	CRE-Invertebrates
Limidae	Limas	**Limidae**	CRE-Invertebrates
Limaria fragilis	Fragile Lima	**Limidae**	CRE-Invertebrates
Lima vulgaris	Indo-Pac Spiny Lima	**Limidae**	CRE-Invertebrates
Lucinidae	Lucinas	**Lucinidae**	CRE-Invertebrates
Codakia punctata	Punctate Lucina	**Lucinidae**	CRE-Invertebrates
Chamidae	Jewel Boxes	**Chamidae**	CRE-Invertebrates
Chama lazarus	Lazarus Jewel Box	**Chamidae**	CRE-Invertebrates
Carditidae	Carditid Clams	**Carditidae**	CRE-Invertebrates
Cardita variegata	Varitated Cardita	**Carditidae**	CRE-Invertebrates
Fragum fragum	Pac Strawberry Cockle	**Carditidae**	CRE-Invertebrates
Trachycardium angulatum	Angulate Cockle	**Carditidae**	CRE-Invertebrates
Subfamily: Tridacninae	Giant Clams	**Cardiidae**	CRE-Invertebrates
Hippopus hippopus	Giant Clam	**Cardiidae**	CRE-Invertebrates
Tridacna crocea	Giant Clam	**Cardiidae**	CRE-Invertebrates
Tridacna derasa	Lagoon Giant Clam	**Cardiidae**	CRE-Invertebrates
Tridacna gigas	Giant Clam	**Cardiidae**	CRE-Invertebrates
Tridacna maxima	Common Giant Clam	**Cardiidae**	CRE-Invertebrates
Tridacna squamosa	Fluted Giant Clam	**Cardiidae**	CRE-Invertebrates
Tellinidae	Tellin Clams	**Tellinidae**	CRE-Invertebrates
Asaphis deflorata	Gaudy Sand Clam	**Psammobiidae**	CRE-Invertebrates
Tellina linguafelis	Cat'S Tongue Tellin	**Tellinidae**	CRE-Invertebrates
Tellina scobinata	Rasp Tellin	**Tellinidae**	CRE-Invertebrates
Serratina capsoides	Box-Like Tellin	**Tellinidae**	CRE-Invertebrates
Tellina remies	Remie'S Tellin	**Tellinidae**	CRE-Invertebrates
Asaphis violascens	Pacific Sand Clam	**Psammobiidae**	CRE-Invertebrates
Veneridae	Venus Shells	**Veneridae**	CRE-Invertebrates
Periglypta reticulata	Reticulate Venus	**Veneridae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Periglypta crispata	Crispate Venus	**Veneridae**	CRE-Invertebrates
Periglypta puerpera	Youthful Venus	**Veneridae**	CRE-Invertebrates
Lioconcha castrensis	Camp Pitar Venus	**Veneridae**	CRE-Invertebrates
Lioconcha ornata	Ornate Pitar Venus	**Veneridae**	CRE-Invertebrates
Lioconcha hieroglyphica	Hieroglyphic Venus	**Veneridae**	CRE-Invertebrates
Gafrarium tumidum	Tumid Venus	**Veneridae**	CRE-Invertebrates
Nautilidae	Nautilus	**Nautilidae**	CRE-Invertebrates
Nautilus pompilius	Chambered Nautilus	**Nautilidae**	CRE-Invertebrates
Metasepia pfefferi	Flamboyant Cuttlefish	**Sepiolidae**	CRE-Invertebrates
Sepia sp.	Cuttlefish	**Sepiidae**	CRE-Invertebrates
Sepia latimanus	Broadclub Cuttlefish	**Sepiidae**	CRE-Invertebrates
Order Teuthida	Squids	**Multiple families**	CRE-Invertebrates
Sepioteuthis lessoniana	Bigfin Reef Squid	**Loliginidae**	CRE-Invertebrates
Octopodidae	Octopus	**Octopodidae**	CRE-Invertebrates
Octopus sp	Octopus	**Octopodidae**	CRE-Invertebrates
Octopus teuthoides	Elongate Octopus	**Octopodidae**	CRE-Invertebrates
Octopus sp	Pelagic Octopus	**Opisthoteuthidae**	CRE-Invertebrates
Octopus sp	Long-Armed Octopus	**Octopodidae**	CRE-Invertebrates
Octopus luteus	Red Octopus	**Octopodidae**	CRE-Invertebrates
Octopus cyanea	Common Octopus	**Octopodidae**	CRE-Invertebrates
Callistoctopus ornatus	Ornate Octopus	**Octopodidae**	CRE-Invertebrates
Argonautidae	Paper Nautiluses	**Argonautidae**	CRE-Invertebrates
Argonauta hians	Brown Paper Nautilus	**Argonautidae**	CRE-Invertebrates
Argonauta argo	Common Paper Nautilus	**Argonautidae**	CRE-Invertebrates
Argonauta nodosa	Nodose Paper Nautilus	**Argonautidae**	CRE-Invertebrates
Argonauta nouryi	Noury'S Paper Nautilus	**Argonautidae**	CRE-Invertebrates
Argonauta nouryi	Gruner'S Paper Nautilus	**Argonautidae**	CRE-Invertebrates
Lithoglyptidae	Barnacles	**Lithoglyptidae**	CRE-Invertebrates
Balanus sp.	Acorn Barnacle	**Balanidae**	CRE-Invertebrates
Tetraclitella divisa	Acorn Barnacle	**Tetraclitidae**	CRE-Invertebrates
Order: Stomatopoda	Mantis Shrimps	**Multiple families**	CRE-Invertebrates
Bathysquillidae	Mantis Shrimp	**Bathysquillidae**	CRE-Invertebrates
Eurysquillidae	Mantis Shrimp	**Eurysquillidae**	CRE-Invertebrates
Gonodactylidae	Mantis Shrimp	**Gonodactylidae**	CRE-Invertebrates
Gonodactylellus affinis	Mantis Shrimp	**Gonodactylidae**	CRE-Invertebrates
Gonodactylus chiragra	Mantis Shrimp	**Gonodactylidae**	CRE-Invertebrates
Gonodactylaceus mutatus	Mantis Shrimp	**Gonodactylidae**	CRE-Invertebrates
Gonodactylus platysoma	Mantis Shrimp	**Gonodactylidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Gonodactylus smithii	Mantis Shrimp	**Gonodactylidae**	CRE-Invertebrates
Hemisquillidae	Mantis Shrimp	**Hemisquillidae**	CRE-Invertebrates
Odontodactylidae	Mantis Shrimp	**Odontodactylidae**	CRE-Invertebrates
Odontodactylus brevirostris	Mantis Shrimp	**Odontodactylidae**	CRE-Invertebrates
Odontodactylus scyllarus	Mantis Shrimp	**Odontodactylidae**	CRE-Invertebrates
Protosquillidae	Mantis Shrimp	**Protosquillidae**	CRE-Invertebrates
Pseudosquillidae	Mantis Shrimp	**Pseudosquillidae**	CRE-Invertebrates
Pseudosquilla ciliata	Mantis Shrimp	**Pseudosquillidae**	CRE-Invertebrates
Squillidae	Mantis Shrimp	**Squillidae**	CRE-Invertebrates
Squillidae	Mantis Shrimp	**Squillidae**	CRE-Invertebrates
Squillidae	Mantis Shrimp	**Squillidae**	CRE-Invertebrates
Oratosquilla oratoria	Mantis Shrimp	**Squillidae**	CRE-Invertebrates
Lysiosquillidae	Mantis Shrimp	**Lysiosquillidae**	CRE-Invertebrates
Nannosquillidae	Mantis Shrimp	**Nannosquillidae**	CRE-Invertebrates
Hyperiidae	Hyperid Amphipods	**Hyperiidae**	CRE-Invertebrates
Phronimidae	Phronimids	**Phronimidae**	CRE-Invertebrates
Lycaeidae	Lycaeids	**Lycaeidae**	CRE-Invertebrates
Platyscelidae	Platyscelids	**Platyscelidae**	CRE-Invertebrates
Anchylomera	Anchylomerids	**Phrosinidae**	CRE-Invertebrates
Order Decapoda	Decapod Crustaceans	**Multiple families**	CRE-Invertebrates
Penaeidae	Panaeid Prawns	**Penaeidae**	CRE-Invertebrates
Metapenaeopsis sp	Penaeid Prawn	**Penaeidae**	CRE-Invertebrates
Metapenaeopsis sp	Penaeid Prawn	**Penaeidae**	CRE-Invertebrates
Metapenaeopsis sp	Penaeid Prawn	**Penaeidae**	CRE-Invertebrates
Heteropenaeus sp	Deepwater Shrimps	**Penaeidae**	CRE-Invertebrates
Penaeus monodon	Penaeid Prawn	**Penaeidae**	CRE-Invertebrates
Penaeus latisulcatus	Penaeid Prawn	**Penaeidae**	CRE-Invertebrates
Palaemonidae	Palaemonid Shrimp	**Palaemonidae**	CRE-Invertebrates
Leander plumosus	Palaemonid Shrimp	**Palaemonidae**	CRE-Invertebrates
Urocaridella antonbruunii	Palaemonid Shrimp	**Palaemonidae**	CRE-Invertebrates
Palaemonidae	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Dasycaris zanzibarica	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Laomenes amboinensis	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Periclimenes brevicarpalis	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Laomenes ceratophthalmus	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Ancylomenes holthuisi	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Periclimenes imperator	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Periclimenes inornatus	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Cuapetes kororensis	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Periclimenes ornatus	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Periclimenes psamathe	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Periclimenes soror	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Cuapetes tenuipes	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Periclimenes venustus	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Pliopontonia furtiva	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Pontonides unciger	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Stegopontonia commensalis	Commensal Shrimp	**Palaemonidae**	CRE-Invertebrates
Stenopodidae	Cleaner Shrimp	**Stenopodidae**	CRE-Invertebrates
Stenopus hispidus	Banded Coral Shrimp	**Stenopodidae**	CRE-Invertebrates
Hippolytidae	Hump-Backed Shrimp	**Hippolytidae**	CRE-Invertebrates
Parhippolyte misticia	Hump-Backed Shrimp	**Barbouriidae**	CRE-Invertebrates
Thor amboinensis	Ambonian Shrimp	**Hippolytidae**	CRE-Invertebrates
Palaemonidae	Bbee And Harlequin Shrimp	**Palaemonidae**	CRE-Invertebrates
Gnathophylloides mineri	Bumblebee Shrimp	**Palaemonidae**	CRE-Invertebrates
Gnathophyllum americanum	Bumblebee Shrimp	**Palaemonidae**	CRE-Invertebrates
Hymenocera picta	Harlequin Shrimp	**Hymenoceridae**	CRE-Invertebrates
Rhynchocinetidae	Hinge-Beaked Prawns	**Rhynchocinetidae**	CRE-Invertebrates
Cinetorhynchus hiatti	Hingebeak Prawn	**Rhynchocinetidae**	CRE-Invertebrates
Alpheidae	Snapping Shrimp	**Alpheidae**	CRE-Invertebrates
Alpheus bellulus	Snapping Shrimp	**Alpheidae**	CRE-Invertebrates
Alpheus paracrinitus	Snapping Shrimp	**Alpheidae**	CRE-Invertebrates
Synalpheus carinatus	Snapping Shrimp	**Alpheidae**	CRE-Invertebrates
Heterocarpus sp	deepwater shrimp	**Pandalidae**	Crustacean
Pandalus sp	deepwater shrimp	**Pandalidae**	Crustacean
Pandalidae	deepwater shrimp	**Pandalidae**	Crustacean
Pandalidae	deepwater shrimp	**Pandalidae**	Crustacean
Solenoceridae	Solenocerids	**Solenoceridae**	CRE-Invertebrates
Nephropidae	Soft Lobsters	**Nephropidae**	CRE-Invertebrates
Enoplometopus debelius	Soft Lobster	**Enoplometopidae**	CRE-Invertebrates
Enoplometopus occidentalis	Hairy Lobster	**Enoplometopidae**	CRE-Invertebrates
Enoplometopus holthuisi	Soft Lobster	**Enoplometopidae**	CRE-Invertebrates
Panulirus sp	Painted Crayfish	**Palinuridae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Panulirus homarus	Painted Crayfish	**Palinuridae**	CRE-Invertebrates
Panulirus longipes	Painted Crayfish	**Palinuridae**	CRE-Invertebrates
Panulirus marginatus	spiny lobster	**Palinuridae**	Crustacean
Panulirus ornatus	Painted Crayfish	**Palinuridae**	CRE-Invertebrates
Panulirus penicillatus	spiny lobster	**Palinuridae**	Crustacean
Panulirus versicolor	Painted Crayfish	**Palinuridae**	CRE-Invertebrates
Palinurellus wieneckii	Mole Lobster	**Palinuridae**	CRE-Invertebrates
Panulirus femoristriga	Painted Crayfish	**Palinuridae**	CRE-Invertebrates
Ibacus sp	Slipper Lobster	**Scyllaridae**	CRE-Invertebrates
Justitia longimana	Long-Handed Lobster	**Palinuridae**	CRE-Invertebrates
Arctides regalis	Slipper Lobster	**Scyllaridae**	CRE-Invertebrates
Scyllaridae	slipper lobster	**Scyllaridae**	Crustacean
Scyllaridae	slipper lobster	**Scyllaridae**	Crustacean
Diogenidae	Marine Hermit Crabs	**Diogenidae**	CRE-Invertebrates
Dardanus sp.	Marine Hermit Crab	**Diogenidae**	CRE-Invertebrates
Dardanus gemmatus	Marine Hermit Crab	**Diogenidae**	CRE-Invertebrates
Dardanus pedunculatus	Marine Hermit Crab	**Diogenidae**	CRE-Invertebrates
Dardanus megistos	Marine Hermit Crab	**Diogenidae**	CRE-Invertebrates
Lithodidae	Lithodids	**Lithodidae**	CRE-Invertebrates
Paguridae	Soldier Hermit Crab	**Paguridae**	CRE-Invertebrates
Paguritta gracilipes	Coral Hermit Crab	**Paguridae**	CRE-Invertebrates
Paguritta harmsi	Coral Hermit Crab	**Paguridae**	CRE-Invertebrates
Galatheidae	Squat Lobsters	**Galatheidae**	CRE-Invertebrates
Porcellanidae	Porcellanid Crabs	**Porcellanidae**	CRE-Invertebrates
Petrolisthes lamarckii	Porcelain Crab	**Porcellanidae**	CRE-Invertebrates
?	Mole Crab	**Hippidae**	CRE-Invertebrates
Infraorder: Brachyura	True Crabs	**Multiple families**	CRE-Invertebrates
Homolidae	Homolids	**Homolidae**	CRE-Invertebrates
Ranina ranina	Kona crab	**Raninidae**	Crustacean
Lyreidus tridentatus	3-Toothed Frog Crab	**Raninidae**	CRE-Invertebrates
Dorippe frascone	Dorippid Crab	**Dorippidae**	CRE-Invertebrates
Dromiidae	Sponge Crabs	**Dromiidae**	CRE-Invertebrates
Dromia dormia	Sponge Crab	**Dromiidae**	CRE-Invertebrates
Calappidae	Box Crabs	**Calappidae**	CRE-Invertebrates
Calappa bicornis	Box Crab	**Calappidae**	CRE-Invertebrates
Calappa calappa	Box Crab	**Calappidae**	CRE-Invertebrates
Calappa hepatica	Box Crab	**Calappidae**	CRE-Invertebrates
Cycloes granulosa	Box Crab	**Calappidae**	CRE-Invertebrates
Mursia spinimanus	Box Crab	**Calappidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Majidae	Spider Crabs	**Majidae**	CRE-Invertebrates
Achaeus japonicus	Spider Crab	**Inachidae**	CRE-Invertebrates
Camposcia retusa	Decorator Crab	**Inachidae**	CRE-Invertebrates
Parthenopidae	Elbow Crabs	**Parthenopidae**	CRE-Invertebrates
Daldorfia horrida	Elbow Crab	**Parthenopidae**	CRE-Invertebrates
Rhinolambrus longispinus	Elbow Crab	**Parthenopidae**	CRE-Invertebrates
Cancridae	Cancrids	**Cancridae**	CRE-Invertebrates
Portunidae	Swimming Crabs	**Portunidae**	CRE-Invertebrates
Charybdis erythrodactyla	Red-Legged Sw Crab	**Portunidae**	CRE-Invertebrates
Charybdis (Charybdis) hawaiensis	Red Sw Crab	**Portunidae**	CRE-Invertebrates
Lupocyclus quinquedentatus	Swimming Crab	**Portunidae**	CRE-Invertebrates
Portunus sanguinolentus	Swimming Crab	**Portunidae**	CRE-Invertebrates
Portunus pelagicus	Blue Swimming Crab	**Portunidae**	CRE-Invertebrates
Podophthalmus vigil	Long-Eyed Swimming Crab	**Portunidae**	CRE-Invertebrates
Scylla serrata	Mangrove Crab	**Portunidae**	CRE-Invertebrates
Thalamita crenata	Swimming Crab	**Portunidae**	CRE-Invertebrates
?	Portunid Crab	**Portunidae**	CRE-Invertebrates
?	Portunid Crab	**Portunidae**	CRE-Invertebrates
Xanthidae	Dark-Finger Coral Crabs	**Xanthidae**	CRE-Invertebrates
Carpilius convexus	7-11 Crab	**Carpiliidae**	CRE-Invertebrates
Carpilius maculatus	7-11 Crab	**Carpiliidae**	CRE-Invertebrates
Etisus splendidus	Red-Reef Crab	**Xanthidae**	CRE-Invertebrates
Zosimus aeneus	Shallow Reef Crab	**Xanthidae**	CRE-Invertebrates
Eriphia sebana	Redeye Crab	**Xanthidae**	CRE-Invertebrates
Etisus dentatus	Red-Reef Crab	**Xanthidae**	CRE-Invertebrates
Etisus utilis	Brown-Reef Crab	**Xanthidae**	CRE-Invertebrates
#N/A	Xanthid Crab	**Xanthidae**	CRE-Invertebrates
#N/A	Xanthid Crab	**Xanthidae**	CRE-Invertebrates
#N/A	Xanthid Crab	**Xanthidae**	CRE-Invertebrates
Gecarcinidae	Gecarcinids	**Gecarcinidae**	CRE-Invertebrates
Grapsidae	Shore Crabs	**Grapsidae**	CRE-Invertebrates
Grapsus albolineatus	Shore Crab	**Grapsidae**	CRE-Invertebrates
Grapsus tenuicrustatus	Shore Crab	**Grapsidae**	CRE-Invertebrates
Plagusia depressa	Shore Crab	**Plagusiidae**	CRE-Invertebrates
Percnon planissimum	Flat Rock Crab	**Percnidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Zebrida adamsii	Urchin Crab	**Pilumnidae**	CRE-Invertebrates
Ocypodidae	Ocypodids	**Ocypodidae**	CRE-Invertebrates
Macrophthalmus telescopicus	Telescope-Eye Crab	**Macrophthalmidae**	CRE-Invertebrates
Ocypode ceratophthalma	Large Ghost Crab	**Ocypodidae**	CRE-Invertebrates
Ocypode cordimana	Ghost Crab	**Ocypodidae**	CRE-Invertebrates
Ocypode saratan	Ghost Crab	**Ocypodidae**	CRE-Invertebrates
Cryptochiridae	Hapalocarcinids	**Cryptochiridae**	CRE-Invertebrates
Class Crinoidea	Crinoids	**Multiple families**	CRE-Invertebrates
Class Asteroidea	Starfish	**Multiple families**	CRE-Invertebrates
Astropectinidae	Starfish	**Astropectinidae**	CRE-Invertebrates
Oreasteridae	Starfish	**Oreasteridae**	CRE-Invertebrates
Ophidiaster confertus	Orange Starfish	**Ophidiasteridae**	CRE-Invertebrates
Asteropseidae	Starfish	**Asteropseidae**	CRE-Invertebrates
Asterinidae	Starfish	**Asterinidae**	CRE-Invertebrates
Acanthaster planci	Crown-Of-Thorns	**Acanthasteridae**	CRE-Invertebrates
Mithrodia bradleyi	Spiney-Armed Starfish	**Mithrodiidae**	CRE-Invertebrates
Echinasteridae	Reef Starfish	**Echinasteridae**	CRE-Invertebrates
Sphaerasteridae	Starfish	**Sphaerasteridae**	CRE-Invertebrates
Class Ophiuroidea	Basket,Brittle, Serpentstars	**Multiple families**	CRE-Invertebrates
Class Echinoidea	Sea Urchins	**Multiple families**	CRE-Invertebrates
Cidaridae	Cidarians	**Cidaridae**	CRE-Invertebrates
Echinothuriidae	Sea Urchins	**Echinothuriidae**	CRE-Invertebrates
Diadematidae	Sea Urchins	**Diadematidae**	CRE-Invertebrates
Diadema savignyi	Longspine Urchin	**Diadematidae**	CRE-Invertebrates
Diadema setosum	Longspine Urchin	**Diadematidae**	CRE-Invertebrates
Echinothrix diadema	Longspine Urchin	**Diadematidae**	CRE-Invertebrates
Echinothrix calamaris	Longspine Urchin	**Diadematidae**	CRE-Invertebrates
Temnopleuridae	Sea Urchins	**Temnopleuridae**	CRE-Invertebrates
Toxopneustidae	Shortspine Urchins	**Toxopneustidae**	CRE-Invertebrates
Tripneustes gratilla	Shortspine Urchin	**Toxopneustidae**	CRE-Invertebrates
Toxopneustes pileolus	Flower Urchin	**Toxopneustidae**	CRE-Invertebrates
Pseudoboletia maculata	Common Urchin	**Toxopneustidae**	CRE-Invertebrates
Echinometridae	Sea Urchins	**Echinometridae**	CRE-Invertebrates
Heterocentrotus mammillatus	Slate Pencil Urchin	**Echinometridae**	CRE-Invertebrates
Class Echinoidea	Sea Urchins	**Multiple families**	CRE-Invertebrates
Clypeasteridae		**Clypeasteridae**	CRE-Invertebrates
Brissidae	Irregular Urchins	**Brissidae**	CRE-Invertebrates

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Class Holothuroidea	Sea Cucumbers	**Multiple families**	CRE-Invertebrates
Stichopodidae	Sea Cucumbers	**Stichopodidae**	CRE-Invertebrates
Stichopus chloronotus	Greenfish	**Stichopodidae**	CRE-Invertebrates
Stichopus horrens	Sea Cucumber	**Stichopodidae**	CRE-Invertebrates
Stichopus noctivagus	Sea Cucumber	**Stichopodidae**	CRE-Invertebrates
Stichopus variegatus	Curryfish	**Stichopodidae**	CRE-Invertebrates
Stichopus sp	Sea Cucumber	**Stichopodidae**	CRE-Invertebrates
Holothuriidae	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Holothuria atra	Lollyfish	**Holothuriidae**	CRE-Invertebrates
Holothuria edulis	Pinkfish	**Holothuriidae**	CRE-Invertebrates
Holothuria fuscogilva	White Teatfish	**Holothuriidae**	CRE-Invertebrates
Holothuria fuscopunctata	Elephant'S Trunkfish	**Holothuriidae**	CRE-Invertebrates
Holothuria hilla	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Holothuria impatiens	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Holothuria leucospilota	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Holothuria sp	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Actinopyga lecanora	Stonefish	**Holothuriidae**	CRE-Invertebrates
Actinopyga miliaris	Blackfish	**Holothuriidae**	CRE-Invertebrates
Actinopyga obesa	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Actinopyga sp.	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Cucumariidae	Sea Cucumbers	**Cucumariidae**	CRE-Invertebrates
Phyllophoridae	Sea Cucumbers	**Phyllophoridae**	CRE-Invertebrates
Synaptidae	Sea Cucumbers	**Synaptidae**	CRE-Invertebrates
Synapta maculata	Sea Cucumber	**Synaptidae**	CRE-Invertebrates
Synaptidae	Sea Cucumber	**Synaptidae**	CRE-Invertebrates
Synapta sp	Sea Cucumber	**Synaptidae**	CRE-Invertebrates
Bohadschia argus	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Pearsonothuria graeffei	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Bohadschia marmorata	Brown Sandfish	**Holothuriidae**	CRE-Invertebrates
Bohadschia paradoxa	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Bohadschia sp.	Sea Cucumber	**Holothuriidae**	CRE-Invertebrates
Thelenota ananas	Prickly Redfish	**Stichopodidae**	CRE-Invertebrates
Thelenota anax	Amberfish	**Stichopodidae**	CRE-Invertebrates
Thelenota sp.	Sea Cucumber	**Stichopodidae**	CRE-Invertebrates
Enteromorpha clathrata	Algae	**Ulvaceae**	CRE-Algae
Caulerpaceae	Algae	**Caulerpaceae**	CRE-Algae
Caulerpa racemosa	Algae	**Caulerpaceae**	CRE-Algae
Sargassum polycystum	Algae	**Sargassaceae**	CRE-Algae
Turbinaria ornata	Algae	**Sargassaceae**	CRE-Algae

Correct Scientific Name	**Common Name**	**Correct Family Name**	**FEP GROUP**
Division: Anthophyta	Algae	**Multiple families**	CRE-Algae
Halodule uninervis	Algae	**Cymodoceaceae**	CRE-Algae
Cephea sp	Jellyfish	**Cepheidae**	CRE-Invertebrates
Callogorgia gilberti	Gold Coral	**Primnoidae**	Precious corals
Corallium laauense	Pink coral	**Coralliidae**	Precious corals
Corallium regale	Pink coral	**Coralliidae**	Precious corals
Antipathes dichotoma	Black Coral	**Antipathidae**	Precious corals
Narella sp.	Gold Coral	**Primnoidae**	Precious corals
Acanella sp.	Bamboo coral	**Isididae**	Precious corals
Savalia sp.	Gold Coral	**Parazoanthidae**	Precious corals
Lepidisis olapa	Bamboo coral	**Isididae**	Precious corals
Callogorgia gilberti	Gold Coral	**Primnoidae**	Precious corals
Corallium secundum	Pink coral	**Coralliidae**	Precious corals
Antipathes grandis	Black Coral	**Antipathidae**	Precious corals
Myriopathes ulex	Black Coral	**Antipathidae**	Precious corals

11.2 MANAGEMENT UNIT SPECIES IN THE MARIANAS FISHERY ECOSYSTEM PLAN: COMMONWEALTH OF NORTHERN MARIANA ISLANDS

Correct Scientific Name	Common Name	FAMILY	FEP GROUP
Aphareus rutilans	red snapper, silvermouth (lehi)	Lutjanidae	BF Multi-species complex
Aprion virescens	grey snapper, jobfish	Lutjanidae	BF Multi-species complex
Caranx ignobilis	giant trevally, jack	Carangidae	BF Multi-species complex
Caranx lugubris	black trevally, jack	Carangidae	BF Multi-species complex
Epinephelus fasciatus	blacktip grouper	Serranidae	BF Multi-species complex
Variola louti	lunartail grouper (lyretail grouper)	Serranidae	BF Multi-species complex
Etelis carbunculus	red snapper (ehu)	Lutjanidae	BF Multi-species complex
Etelis coruscans	red snapper (onaga)	Lutjanidae	BF Multi-species complex
Lethrinus amboinensis	ambon emperor	Lethrinidae	BF Multi-species complex
Lethrinus rubrioperculatus	redgill emperor	Lethrinidae	BF Multi-species complex
Lutjanus kasmira	blueline snapper	Lutjanidae	BF Multi-species complex
Pristipomoides auricilla	yellowtail snapper	Lutjanidae	BF Multi-species complex
Pristipomoides filamentosus	pink snapper (paka)	Lutjanidae	BF Multi-species complex
Pristipomoides flavipinnis	yelloweye snapper	Lutjanidae	BF Multi-species complex
Pristipomoides sieboldii	pink snapper (kalekale)	Lutjanidae	BF Multi-species complex
Pristipomoides zonatus	flower snapper (gindai)	Lutjanidae	BF Multi-species complex
Seriola dumerili	amberjack	Carangidae	BF Multi-species complex
Heterocarpus sp.	deepwater shrimp (saltwater shrimp)	Pandalidae	Crustacean
Panulirus marginatus	spiny lobster	Palinuridae	Crustacean
Panulirus penicillatus	spiny lobster	Palinuridae	Crustacean

Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Family Scyllaridae	slipper lobster	Scyllaridae	Crustacean
Ranina ranina	kona crab	Raninidae	Crustacean
Antipathes dichotoma	Black Coral	Antipathidae	Precious corals
Antipathes grandis	Black Coral	Antipathidae	Precious corals
Myriopathes ulex	Black Coral	Myriopathidae	Precious corals
Corallium secundum	Pink coral	Coralliidae	Precious corals
Corallium regale	Pink coral	Coralliidae	Precious corals
Corallium laauense	Pink coral	Coralliidae	Precious corals
Lepidisis olapa	Bamboo coral	Isididae	Precious corals
Acanella sp.	Bamboo coral	Isididae	Precious corals
Savalia sp.	Gold Coral	Parazoanthidae	Precious corals
Callogorgia gilberti	Gold Coral	Primnoidae	Precious corals
Narella sp.	Gold Coral	Primnoidae	Precious corals
Calyptrophora sp.	Gold Coral	Primnoidae	Precious corals
Monotaxis grandoculis	Bigeye Emperor	Lethrinidae	CRE-Fishes
Lethrinus harak	Blackspot Emperor	Lethrinidae	CRE-Fishes
Lethrinus sp.	Emperor (mafute/misc.)	Lethrinidae	CRE-Fishes
Lutjanus fulvus	Flametail Emperor	Lutjanidae	CRE-Fishes
Lethrinus olivaceus	Longnose Emperor	Lethrinidae	CRE-Fishes
Lethrinus erythracanthus	Orangefin Emperor	Lethrinidae	CRE-Fishes
Lethrinus ornatus	Ornate Emperor	Lethrinidae	CRE-Fishes
Gymnocranius sp.	Stout Emperor	Lethrinidae	CRE-Fishes
Lethrinus xanthochilus	Yellowlips Emperor	Lethrinidae	CRE-Fishes
Gnathodentex aureolineatus	Yellowspot emperor	Lethrinidae	CRE-Fishes
Lethrinus obsoletus	Yellowstripe Emperor	Lethrinidae	CRE-Fishes
Lethrinus atkinsoni	Yellowtail Emperor	Lethrinidae	CRE-Fishes
Caranx sexfasciatus	Bigeye Trevally	Carangidae	CRE-Fishes
Caranx melampygus	Bluefin Trevally	Carangidae	CRE-Fishes
Caranx papuensis	Brassy Trevally	Carangidae	CRE-Fishes
Caranx sp. (juvenile)	EE: Juvenile Jacks	Carangidae	CRE-Fishes
Caranx sp.	Jacks (misc.)	Carangidae	CRE-Fishes
Scomberoides lysan	Leatherback	Carangidae	CRE-Fishes
Decapterus macarellus	Mackerel Scad	Carangidae	CRE-Fishes
Elagatis bipinnulata	Rainbow Runner	Carangidae	CRE-Fishes
Trachinotus baillonii	Small-spotted pompano	Carangidae	CRE-Fishes
Trachinotus blochii	Snubnose pompano	Carangidae	CRE-Fishes

Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Carangoides orthogrammus	Yellow Spotted Trevally	Carangidae	CRE-Fishes
Acanthurus lineatus	Bluebanded Surgeonfish	Acanthuridae	CRE-Fishes
Acanthurus nigroris	Bluelined Surgeon	Acanthuridae	CRE-Fishes
Naso unicornis	Bluespine Unicornfish	Acanthuridae	CRE-Fishes
Acanthurus triostegus	Convict Tang	Acanthuridae	CRE-Fishes
Naso lituratus	Orangespine Unicornfish	Acanthuridae	CRE-Fishes
Acanthurus sp.	Surgeonfish (misc.)	Acanthuridae	CRE-Fishes
Naso sp.	Unicornfish (misc.)	Acanthuridae	CRE-Fishes
Acanthurus xanthopterus	Yellowfin Surgeonfish	Acanthuridae	CRE-Fishes
Selar crumenophthalmus	Bigeye Scad	Carangidae	CRE-Fishes
Epinephelus corallicola	Coral Grouper	Serranidae	CRE-Fishes
Cephalopholis urodeta	Flagtail Grouper	Serranidae	CRE-Fishes
Family Serranidae	Grouper (misc.)	Serranidae	CRE-Fishes
Epinephelus maculatus	Highfin Grouper	Serranidae	CRE-Fishes
Epinephelus merra	Honeycomb Grouper	Serranidae	CRE-Fishes
Epinephelus polyphekadion	Marbled Grouper	Serranidae	CRE-Fishes
Cephalopholis argus	Peacock Grouper	Serranidae	CRE-Fishes
Saloptia powelli	Pink Grouper	Serranidae	CRE-Fishes
Plectropomus laevis	Saddleback Grouper	Serranidae	CRE-Fishes
Cephalopholis sonnerati	Tomato Grouper	Serranidae	CRE-Fishes
Variola albimarginata	White Lyretail Grouper	Serranidae	CRE-Fishes
Cephalopholis igarashiensis	Yellow Banded Grouper	Serranidae	CRE-Fishes
Family Lutjanidae	Snapper (misc. shallow)	Lutjanidae	CRE-Fishes
Lutjanus gibbus	Humpback Snapper	Lutjanidae	CRE-Fishes
Lutjanus monostigma	Onespot Snapper	Lutjanidae	CRE-Fishes
Lutjanus bohar	Red Snapper	Lutjanidae	CRE-Fishes
Aphareus furca	Smalltooth Jobfish	Lutjanidae	CRE-Fishes
Parupeneus barberinus	Dash & Dot Goatfish	Mullidae	CRE-Fishes
Family Mullidae	Goatfish (juvenile-misc)	Mullidae	CRE-Fishes
Family Mullidae	Goatfish (misc.)	Mullidae	CRE-Fishes

Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Parupeneus pleurostigma	Sidespot Goatfish	Mullidae	CRE-Fishes
Parupeneus trifasciatus	Two-barred Goatfish	Mullidae	CRE-Fishes
Mulloidichthys flavolineatus	Yellowstripe Goatfish	Mullidae	CRE-Fishes
Scarus sp.	Parrotfish (misc.)	Scaridae	CRE-Fishes
Leptoscarus vaigiensis	Seagrass Parrotfish	Scaridae	CRE-Fishes
Octopus sp.	Octopus	Octopodidae	CRE-Invertebrates
Order Teuthida	Squid	Order Teuthida	CRE-Invertebrates
Trochus sp.	Trochus	Trochidae	CRE-Invertebrates
Class Bivalvia	Clam/bivalve	Class Bivalvia	CRE-Invertebrates
Family Mugilidae	Mullet	Mugilidae	CRE-Fishes
Siganus sp.	Rabbitfish (hitting)	Siganidae	CRE-Fishes
Siganus punctatus	Rabbitfish (h.feda)	Siganidae	CRE-Fishes
Siganus sp.	Rabbitfish (menahac)	Siganidae	CRE-Fishes
Siganus spinus	Rabbitfish (sesjun)	Siganidae	CRE-Fishes
Bulbometopon muricatum	Bumphead parrotfish	Scaridae	CRE-Fishes
Cheilinus undulatus	Napoleon wrasse	Labridae	CRE-Fishes
Family Carcharhinidae	Reef sharks (misc)	Carcharhinidae	CRE-Fishes
Sphyrna lewini	Hammerhead shark	Sphyrnidae	CRE-Fishes
Family Pomacanthidae	Angelfish	Pomacanthidae	CRE-Fishes
Family Chaetodontidae	Butterflyfish	Chaetodontidae	CRE-Fishes
Heteropriacanthus cruentatus	Bigeye/glasseye	Priacanthidae	CRE-Fishes
Iniistius pavo	Blue Razorfish	Labridae	CRE-Fishes
Iniistius celebicus	Bronzespot Razorfish	Labridae	CRE-Fishes
Family Apogonidae	Cardinal Misc.	Apogonidae	CRE-Fishes
Fistularia commersonii	Cornetfish	Fistulariidae	CRE-Fishes
Family Pomacentridae	Damselfish	Pomacentridae	CRE-Fishes
Family Monacanthidae	Filefish (misc)	Monacanthidae	CRE-Fishes
Bothus sp.	Flounder (misc)	Bothidae	CRE-Fishes
Family Caesionidae	Fusilier (misc.)	Caesionidae	CRE-Fishes
Priacanthus hamrur	Goggle-eye	Priacanthidae	CRE-Fishes
Family Synodontidae	Lizardfish misc.	Synodontidae	CRE-Fishes
Chanos chanos	Milkfish	Chanidae	CRE-Fishes
Gerres sp.	Mojarra	Gerreidae	CRE-Fishes
Gymnothorax eurostus	Moray eel	Muraenidae	CRE-Fishes
Family Belonidae	Needlefish	Belonidae	CRE-Fishes

Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Rhinecanthus aculeatus	Picasso Trigger	Balistidae	CRE-Fishes
Family Tetraodontidae	Pufferfish	Tetraodontidae	CRE-Fishes
	Razorfish (misc)	Labridae	CRE-Fishes
Family Scorpaenidae	Scorpionfishes	Scorpaenidae	CRE-Fishes
Plectorhinchus picus	Sweetlips	Haemulidae	CRE-Fishes
Family Balistidae	Triggerfish (misc.)	Balistidae	CRE-Fishes
Aulostomus chinensis	Trumpetfish	Aulostomidae	CRE-Fishes
Rhinecanthus rectangulus	Wedge Trigger	Balistidae	CRE-Fishes
Family Holocentridae	Squirrelfish	Holocentridae	CRE-Fishes
Family Holocentridae	Soldierfish (misc.)	Holocentridae	CRE-Fishes
Family Labridae	Wrasse	Labridae	CRE-Fishes
Cheilinus trilobatus	Tripletail Wrasse	Labridae	CRE-Fishes
Kyphosus sp.	Rudderfish (guilli)	Kyphosidae	CRE-Fishes
Kyphosus cinerascens	Highfin Rudderfish Silver	Kyphosidae	CRE-Fishes
Kyphosus sp.	Highfin Rudderfish Brown	Kyphosidae	CRE-Fishes
	Bottomfish (misc)		CRE-Fishes
	Reef fish (misc)		CRE-Fishes
	Shallow bottom		CRE-Fishes
	Crabs (misc)	infraorder Brachyura	Crustacean
Birgus latro	Coconut Crab	Diogenidae	Crustacean
	Invertebrates		CRE-Invertebrates
Family Cucumariidae	Sea Cucumber	Cucumariidae	CRE-Invertebrates
	Seaweeds		CRE-Algae
	Lemu		CRE-Algae

11.3 MANAGEMENT UNIT SPECIES IN THE AMERICAN SAMOA FISHERY ECOSYSTEM PLAN

Correct Scientific Name	Common Name	FAMILY	FEP GROUP
Aphareus rutilans	red snapper, silvermouth (lehi) (silverjaw jobfish)	**Lutjanidae**	**BF Multi-species complex**
Aprion virescens	grey snapper, jobfish	**Lutjanidae**	**BF Multi-species complex**
Caranx ignobilis	giant trevally, jack	**Carangidae**	**BF Multi-species complex**
Caranx lugubris	black trevally, jack	**Carangidae**	**BF Multi-species complex**
Epinephelus fasciatus	blacktip grouper	**Serranidae**	**BF Multi-species complex**
Variola louti	lunartail grouper (yellow edge lyretail)	**Serranidae**	**BF Multi-species complex**
Etelis carbunculus	red snapper	**Lutjanidae**	**BF Multi-species complex**
Etelis coruscans	longtail snapper	**Lutjanidae**	**BF Multi-species complex**
Lethrinus amboinensis	ambon emperor	**Lethrinidae**	**BF Multi-species complex**
Lethrinus rubrioperculatus	redgill emperor	**Lethrinidae**	**BF Multi-species complex**
Lutjanus kasmira	blueline snapper	**Lutjanidae**	**BF Multi-species complex**
Pristipomoides auricilla	yellowtail snapper (goldflag jobfish)	**Lutjanidae**	**BF Multi-species complex**
Pristipomoides filamentosus	pink snapper (paka)	**Lutjanidae**	**BF Multi-species complex**
Pristipomoides flavipinnis	yelloweye snapper	**Lutjanidae**	**BF Multi-species complex**
Pristipomoides sieboldii	pink snapper (kalekale)	**Lutjanidae**	**BF Multi-species complex**
Pristipomoides zonatus	flower snapper (gindai)	**Lutjanidae**	**BF Multi-species complex**
Seriola dumerili	amberjack	**Carangidae**	**BF Multi-species complex**
Panulirus marginatus	spiny lobster	**Palinuridae**	**Crustacean**
Panulirus penicillatus	spiny lobster	**Palinuridae**	**Crustacean**
Scyllaridae	Slipper lobster	**Scyllaridae**	**Crustacean**

Correct Scientific Name	Common Name	FAMILY	FEP GROUP
Ranina ranina	Kona crab	**Raninidae**	**Crustacean**
Antipathes dichotoma	Black Coral	**Antipathidae**	**Precious corals**
Antipathes grandis	Black Coral	**Antipathidae**	**Precious corals**
Myriopathes ulex	Black Coral	**Myriopathidae**	**Precious corals**
Corallium secundum	Pink coral	**Coralliidae**	**Precious corals**
Corallium regale	Pink coral	**Coralliidae**	**Precious corals**
Corallium laauense	Pink coral	**Coralliidae**	**Precious corals**
Lepidisis olapa	Bamboo coral	**Isididae**	**Precious corals**
Acanella sp.	Bamboo coral	**Isididae**	**Precious corals**
Savalia sp.	Gold Coral	**Parazoanthidae**	**Precious corals**
Callogorgia gilberti	Gold Coral	**Primnoidae**	**Precious corals**
Narella sp.	Gold Coral	**Primnoidae**	**Precious corals**
Calyptrophora sp.	Gold Coral	**Primnoidae**	**Precious corals**
Acanthurus achilles	Achilles tang	**Acanthuridae**	**CRE-Fishes**
Naso thynnoides	Barred unicornfish	**Acanthuridae**	**CRE-Fishes**
Naso vlamingii	Bignose unicornfish	**Acanthuridae**	**CRE-Fishes**
Naso hexacanthus	Black tongue unicornfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus nigricauda	Blackstreak surgeonfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus lineatus	Blue-banded surgeonfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus nigroris	Bluelined surgeonfish	**Acanthuridae**	**CRE-Fishes**
Naso unicornis	Bluespine unicornfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus nigrofuscus	Brown surgeonfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus triostegus	Convict tang	**Acanthuridae**	**CRE-Fishes**
Acanthurus mata	Elongate surgeonfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus dussumieri	Eye-striped surgeonfish	**Acanthuridae**	**CRE-Fishes**
Naso caesius	Gray unicornfish	**Acanthuridae**	**CRE-Fishes**
Naso brachycentron	Humpback unicornfish	**Acanthuridae**	**CRE-Fishes**
Naso tuberosus	Humpnose unicornish	**Acanthuridae**	**CRE-Fishes**
Acanthurus pyroferus	Mimic surgeonfish	**Acanthuridae**	**CRE-Fishes**
Naso sp.	Naso tang	**Acanthuridae**	**CRE-Fishes**
Naso lituratus	Orangespine unicornfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus olivaceus	Orange-spot surgeonfish	**Acanthuridae**	**CRE-Fishes**
Zebrasoma velifer	Pacific sailfin tang	**Acanthuridae**	**CRE-Fishes**
Acanthurus blochii	Ringtail surgeonfish	**Acanthuridae**	**CRE-Fishes**
Naso brevirostris	Spotted unicornfish	**Acanthuridae**	**CRE-Fishes**
Ctenochaetus striatus	Striped bristletooth	**Acanthuridae**	**CRE-Fishes**
Acanthurus sp.	Surgeonfishes/tangs	**Acanthuridae**	**CRE-Fishes**

Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Ctenochaetus binotatus	Twospot bristletooth	**Acanthuridae**	**CRE-Fishes**
Naso sp.	Unicornfishes (misc)	**Acanthuridae**	**CRE-Fishes**
Acanthurus leucopareius	Whitebar surgeonfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus nigricans	Whitecheek surgeonfish	**Acanthuridae**	**CRE-Fishes**
Naso annulatus	Whitemargin unicornfish	**Acanthuridae**	**CRE-Fishes**
Acanthurus guttatus	Whitespotted surgeonfish	**Acanthuridae**	**CRE-Fishes**
Ctenochaetus strigosus	Yellow-eyed bristletooth	**Acanthuridae**	**CRE-Fishes**
Acanthurus xanthopterus	Yellowfin surgeonfish	**Acanthuridae**	**CRE-Fishes**
Lutjanidae	Inshore snappers	**Lutjanidae**	**CRE-Fishes**
Aphareus furca	Brown jobfish	**Lutjanidae**	**CRE-Fishes**
Etelis radiosus	Scarlet snapper	**Lutjanidae**	**CRE-Fishes**
Lutjanus bohar	Red snapper	**Lutjanidae**	**CRE-Fishes**
Lutjanus bohar	Twinspot/red snapper	**Lutjanidae**	**CRE-Fishes**
Lutjanus fulvus	Yellow margined snapper	**Lutjanidae**	**CRE-Fishes**
Lutjanus gibbus	Humpback snapper	**Lutjanidae**	**CRE-Fishes**
Lutjanus monostigma	Onespot snapper	**Lutjanidae**	**CRE-Fishes**
Lutjanus rufolineatus	Rufous snapper	**Lutjanidae**	**CRE-Fishes**
Lutjanus sanguineus	Blood snapper	**Lutjanidae**	**CRE-Fishes**
Lutjanus timoriensis	Timor snapper	**Lutjanidae**	**CRE-Fishes**
Macolor niger	Black snapper	**Lutjanidae**	**CRE-Fishes**
Paracaesio kusakarii	Kusakar's snapper	**Lutjanidae**	**CRE-Fishes**
Paracaesio stonei	Stone's snapper	**Lutjanidae**	**CRE-Fishes**
Pristipomoides multidens	Multidens snapper	**Lutjanidae**	**CRE-Fishes**
Selar crumenophthalmus	Bigeye scad	**Carangidae**	**CRE-Fishes**
Anodontia (Anodontia) edentula	Mangrove clam	**Lucinidae**	**CRE-Invertebrates**
Atrina rigida	Pen shell clam	**Pinnidae**	**CRE-Invertebrates**
Plebidonax deltoides	Pipi clam	**Donacidae**	**CRE-Invertebrates**
Order: Teuthida	Squid	**Order: Teuthida**	**CRE-Invertebrates**
Class Bivalvia	Clams (misc)	**Class Bivalvia**	**CRE-Invertebrates**
Conus sp.	Cone snail	**Conidae**	**CRE-Invertebrates**
Octopus cyanea	Octopus (cyanea)	**Octopodidae**	**CRE-**

Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
			Invertebrates
Callistoctopus ornatus	Octopus (ornatus)	**Octopodidae**	**CRE-Invertebrates**
Octopus sp.	Octopus	**Octopodidae**	**CRE-Invertebrates**
Tridacna sp.	Giant clam	**Cardiidae**	**CRE-Invertebrates**
Trochus sp.	Turban snail	**Trochidae**	**CRE-Invertebrates**
Turbo sp.	Green snails	**Turbinidae**	**CRE-Invertebrates**
Carangoides coeruleopinnatus	Blue kingfish trevally	**Carangidae**	**CRE-Fishes**
Carangoides orthogrammus	Goldspot trevally	**Carangidae**	**CRE-Fishes**
Carangoides sp.	Trevally (misc)	**Carangidae**	**CRE-Fishes**
Caranx sp.	Jacks (misc)	**Carangidae**	**CRE-Fishes**
Caranx melampygus	Bluefin trevally	**Carangidae**	**CRE-Fishes**
Caranx papuensis	Brassy trevally	**Carangidae**	**CRE-Fishes**
Caranx sexfasciatus	Bigeye trevally	**Carangidae**	**CRE-Fishes**
Elagatis bipinnulata	Rainbow runner	**Carangidae**	**CRE-Fishes**
Scomberoides lysan	Leatherback	**Carangidae**	**CRE-Fishes**
Trachinotus blochii	Snubnose pompano	**Carangidae**	**CRE-Fishes**
Uraspis secunda	Whitemouth trevally	**Carangidae**	**CRE-Fishes**
Decapterus sp.	Mackerel scad (opelu)	**Carangidae**	**CRE-Fishes**
Lethrinidae	Emperors (misc)	**Lethrinidae**	**CRE-Fishes**
Gnathodentex aureolineatus	Goldenline bream	**Lethrinidae**	**CRE-Fishes**
Gnathodentex aureolineatus	Yellowspot emperor	**Lethrinidae**	**CRE-Fishes**
Gymnocranius grandoculis	Blueline bream	**Lethrinidae**	**CRE-Fishes**
Lethrinus erythracanthus	Orangespot emperor	**Lethrinidae**	**CRE-Fishes**
Lethrinus microdon	Longnose emperor	**Lethrinidae**	**CRE-Fishes**
Monotaxis grandoculis	Bigeye emperor	**Lethrinidae**	**CRE-Fishes**
Lethrinus miniatus	Sweetlip emperor	**Lethrinidae**	**CRE-Fishes**
Calotomus carolinus	Stareye parrotfish	**Scaridae**	**CRE-Fishes**
Hipposcarus longiceps	Longnose parrotfish	**Scaridae**	**CRE-Fishes**
Scarus schlegeli	Yellowband parrotfish	**Scaridae**	**CRE-Fishes**
Scarus sp.	Parrotfishes (misc)	**Scaridae**	**CRE-Fishes**

Correct Scientific Name	Common Name	FAMILY	FEP GROUP
Serranidae	Inshore groupers	**Serranidae**	**CRE-Fishes**
Hyporthodus octofasciatus	Eightbar grouper	**Serranidae**	**CRE-Fishes**
Epinephelus lanceolatus	Giant grouper	**Serranidae**	**CRE-Fishes**
Cephalopholis aurantia	Golden hind	**Serranidae**	**CRE-Fishes**
Epinephelus tauvina	Greasy grouper	**Serranidae**	**CRE-Fishes**
Epinephelus sp.	Groupers (misc)	**Serranidae**	**CRE-Fishes**
Epinephelus hexagonatus	Hexagon grouper	**Serranidae**	**CRE-Fishes**
Epinephelus merra	Honeycomb grouper	**Serranidae**	**CRE-Fishes**
Epinephelus longispinis	Longspine grouper	**Serranidae**	**CRE-Fishes**
Epinephelus miliaris	Netfin grouper	**Serranidae**	**CRE-Fishes**
Epinephelus melanostigma	One-bloch grouper	**Serranidae**	**CRE-Fishes**
Cephalopholis argus	Peacock grouper	**Serranidae**	**CRE-Fishes**
Cephalopholis spiloparaea	Pygmy grouper	**Serranidae**	**CRE-Fishes**
Plectropomus laevis	Saddleback grouper	**Serranidae**	**CRE-Fishes**
Cephalopholis sexmaculata	Six-banded grouper	**Serranidae**	**CRE-Fishes**
Anyperodon leucogrammicus	Slender grouper	**Serranidae**	**CRE-Fishes**
Epinephelus polyphekadion	Smalltooth grouper	**Serranidae**	**CRE-Fishes**
Epinephelus maculatus	Spotted grouper	**Serranidae**	**CRE-Fishes**
Plectropomus areolatus	Squaretail grouper	**Serranidae**	**CRE-Fishes**
Epinephelus morrhua	Striped grouper	**Serranidae**	**CRE-Fishes**
Cephalopholis sonnerati	Tomato grouper	**Serranidae**	**CRE-Fishes**
Cephalopholis igarashiensis	Ybanded grouper	**Serranidae**	**CRE-Fishes**
Epinephelus timorensis	Yellowspot grouper	**Serranidae**	**CRE-Fishes**
Plectropomus leopardus	Leopard coral trout	**Serranidae**	**CRE-Fishes**
Saloptia powelli	Powell's grouper	**Serranidae**	**CRE-Fishes**
Variola albimarginata	White-edged lyretail	**Serranidae**	**CRE-Fishes**
Myripristis berndti	Bigscale soldierfish	**Holocentridae**	**CRE-Fishes**
Neoniphon opercularis	Blackfin squirrelfish	**Holocentridae**	**CRE-Fishes**

Correct Scientific Name	Common Name	FAMILY	FEP GROUP
Sargocentron melanospilos	Blackspot squirrelfish	**Holocentridae**	**CRE-Fishes**
Myripristis murdjan	Blotcheye soldierfish	**Holocentridae**	**CRE-Fishes**
Sargocentron tiere	Bluelined squirrelfish	**Holocentridae**	**CRE-Fishes**
Myripristis amaena	Brick soldierfish	**Holocentridae**	**CRE-Fishes**
Myripristis adusta	Bronze soldierfish	**Holocentridae**	**CRE-Fishes**
Sargocentron diadema	Crown squirrelfish	**Holocentridae**	**CRE-Fishes**
Myripristis hexagona	Double tooth soldierfish	**Holocentridae**	**CRE-Fishes**
Sargocentron microstoma	Filelined squirrelfish	**Holocentridae**	**CRE-Fishes**
Sargocentron xantherythrum	Hawaiian squirrelfish	**Holocentridae**	**CRE-Fishes**
Myripristis kuntee	Pearly soldierfish	**Holocentridae**	**CRE-Fishes**
Sargocentron punctatissimum	Peppered squirrelfish	**Holocentridae**	**CRE-Fishes**
Sargocentron tiereoides	Pink squirrelfish	**Holocentridae**	**CRE-Fishes**
Sargocentron spiniferum	Saber squirrelfish	**Holocentridae**	**CRE-Fishes**
Neoniphon sammara	Sammara squirrelfish	**Holocentridae**	**CRE-Fishes**
Myripristis pralinia	Scarlet soldierfish	**Holocentridae**	**CRE-Fishes**
Sargocentron sp.	Squirrelfish	**Holocentridae**	**CRE-Fishes**
Sargocentron caudimaculatum	Tailspot squirrelfish	**Holocentridae**	**CRE-Fishes**
Myripristis violacea	Violet soldierfish	**Holocentridae**	**CRE-Fishes**
Sargocentron violaceum	Violet squirrelfish	**Holocentridae**	**CRE-Fishes**
Myripristis vittata	Whitetip soldierfish	**Holocentridae**	**CRE-Fishes**
Myripristis chryseres	Yellowfin soldierfish	**Holocentridae**	**CRE-Fishes**
Neoniphon aurolineatus	Yellowstriped squirrelfish	**Holocentridae**	**CRE-Fishes**
Mugil cephalus	Mullets	**Mugilidae**	**CRE-Fishes**
Crenimugil crenilabis	Fringelip mullet	**Mugilidae**	**CRE-Fishes**
Ellochelon vaigiensis	Diamond scale mullet	**Mugilidae**	**CRE-Fishes**
Neomyxus leuciscus	False mullet	**Mugilidae**	**CRE-Fishes**
Order: Decapoda	Crabs	**Order: Decapoda**	**CRE-Invertebrates**
Grapsidae	Grapsid crab	**Grapsidae**	**CRE-Invertebrates**
Ocypode ceratophthalmus	Pa'a crab	**Ocypodidae**	**CRE-Invertebrates**

Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Carpilius maculatus	Seven-11 crab	**Carpiliidae**	**CRE-Invertebrates**
Order: Decapoda	Small crab	**Order: Decapoda**	**CRE-Invertebrates**
Scylla serrata	Mangrove crab	**Portunidae**	**CRE-Invertebrates**
Parasesarma erythodactylum	Large red crab	**Sesarmidae**	**CRE-Invertebrates**
Coenobita clypeatus	Hermit crab	**Coenobitidae**	**CRE-Invertebrates**
Bulbometopon muricatum	Bulbometopon muricatum	**Scaridae**	**CRE-Fishes**
Cheilinus undulatus	Cheilius undulatus	**Labridae**	**CRE-Fishes**
Carcharhinidae	Reef sharks (misc)	**Carcharhinidae**	**CRE-Fishes**
Carcharhinus albimarginatus	Silvertip shark	**Carcharhinidae**	**CRE-Fishes**
Carcharhinus amblyrhynchos	Grey reef shark	**Carcharhinidae**	**CRE-Fishes**
Carcharhinus galapagensis	Galapagos shark	**Carcharhinidae**	**CRE-Fishes**
Carcharhinus melanopterus	Blacktip reef shark	**Carcharhinidae**	**CRE-Fishes**
Triaenodon obesus	White tip reef shark	**Carcharhinidae**	**CRE-Fishes**
Sphyrnidae	Hammerhead shark	**Sphyrnidae**	**CRE-Fishes**
NA	Invertebrates (misc)		**CRE-Invertebrates**
Diadema sp.	Sea urchins (misc)	**Diadematidae**	**CRE-Invertebrates**
Echinothrix diadema	Black sea urchin	**Diadematidae**	**CRE-Invertebrates**
Salmacis sp.	White sea urchin	**Temnopleuridae**	**CRE-Invertebrates**
Holothuria (Halodeima) atra	Cubed loli	**Holothuriidae**	**CRE-Invertebrates**
Bohadschia argus	Cubed leapord sea cucumber	**Holothuriidae**	**CRE-Invertebrates**
Actinopyga mauritiana	Surf redfish	**Holothuriidae**	**CRE-Invertebrates**
Cucumariidae	Sea cucumber (misc)	**Cucumariidae**	**CRE-Invertebrates**
Cucumariidae	Sea cucumber - gau	**Cucumariidae**	**CRE-Invertebrates**
Cucumariidae	Sea cucumber gonads	**Cucumariidae**	**CRE-**

Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
			Invertebrates
Bohadschia argus	Leapord sea cucumber	**Holothuriidae**	**CRE-Invertebrates**
Holothuria (Halodeima) atra	Loli	**Holothuriidae**	**CRE-Invertebrates**
Exocoetidae	Flyingfish	**Exocoetidae**	**CRE-Fishes**
Fistularia commersonii	Cornetfish	**Fistulariidae**	**CRE-Fishes**
Gerreidae	Mojarras	**Gerreidae**	**CRE-Fishes**
Gobiidae	Gobies	**Gobiidae**	**CRE-Fishes**
Plectorhinchus sp.	Sweetlips	**Haemulidae**	**CRE-Fishes**
Hemiramphidae	Halfbeaks	**Hemiramphidae**	**CRE-Fishes**
Kuhliidae	Flagtails	**Kuhliidae**	**CRE-Fishes**
Kuhlia mugil	Barred flagtail	**Kuhliidae**	**CRE-Fishes**
Kuhlia sp.	Mountain bass	**Kuhliidae**	**CRE-Fishes**
Leiognathidae	Ponyfish	**Leiognathidae**	**CRE-Fishes**
Malacanthus sp.	Tilefishes	**Malacanthidae**	**CRE-Fishes**
Masturus lanceolatus	Sunfish	**Molidae**	**CRE-Fishes**
Monacanthidae	Filefishes	**Monacanthidae**	**CRE-Fishes**
Monodactylus argenteus	Silver batfish	**Monodactylidae**	**CRE-Fishes**
Gymnothorax sp.	Moray eels	**Muraenidae**	**CRE-Fishes**
Enchelycore pardalis	Dragon eel	**Muraenidae**	**CRE-Fishes**
Gymnothorax flavimarginatus	Yellowmargin moray eel	**Muraenidae**	**CRE-Fishes**
Gymnothorax javanicus	Giant moray eel	**Muraenidae**	**CRE-Fishes**
Gymnothorax moringa	Spotted moray eels	**Muraenidae**	**CRE-Fishes**
Gymnothorax undulatus	Undulated moray eel	**Muraenidae**	**CRE-Fishes**
Batoidea	Rays	**Batoidea**	**CRE-Fishes**
Aetobatus narinari	Eagle ray	**Myliobatidae**	**CRE-Fishes**
Scolopsis monogramma	Monogram monocle bream	**Nemipteridae**	**CRE-Fishes**
Pempheris sp.	Nurse shark	**Pempheridae**	**CRE-Fishes**
Pempheridae	Sweepers	**Pempheridae**	**CRE-Fishes**
Cyprinidae	Prettyfins	**Cyprinidae**	**CRE-Fishes**
Polynemus sp.	Threadfin	**Polynemidae**	**CRE-Fishes**
Centropyge flavissima	Angelfishes	**Pomacanthidae**	**CRE-Fishes**
Pomacanthus imperator	Emperor angelfish	**Pomacanthidae**	**CRE-Fishes**

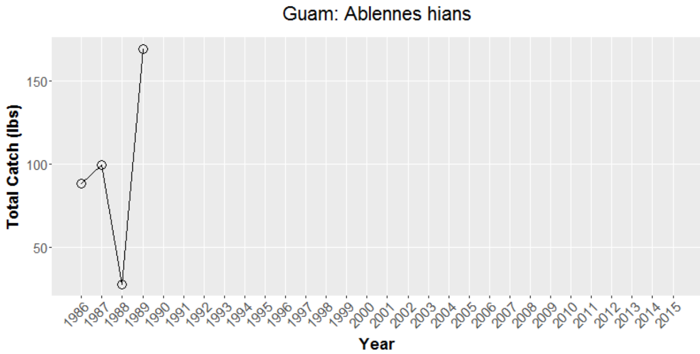
Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Abudefduf septemfasciatus	Banded sergeant	**Pomacentridae**	**CRE-Fishes**
Abudefduf sp.	Sergeant major	**Pomacentridae**	**CRE-Fishes**
Dascyllus trimaculatus	Damselfish	**Pomacentridae**	**CRE-Fishes**
Priacanthidae	Bigeyes	**Priacanthidae**	**CRE-Fishes**
Heteropriacanthus cruentatus	Glasseye	**Priacanthidae**	**CRE-Fishes**
Priacanthus blochii	Paeony bulleye	**Priacanthidae**	**CRE-Fishes**
Priacanthus hamrur	Moontail bullseye	**Priacanthidae**	**CRE-Fishes**
Priacanthus sp.	Bigeye squirrelfish	**Priacanthidae**	**CRE-Fishes**
Pseudochromidae	Dottybacks	**Pseudochromidae**	**CRE-Fishes**
Scorpaenidae	Scorpionfishes	**Scorpaenidae**	**CRE-Fishes**
Pterois sp.	Lionfish	**Scorpaenidae**	**CRE-Fishes**
Synanceia sp.	Stonefish	**Synanceiidae**	**CRE-Fishes**
Sphyraenidae	Small barracuda	**Sphyraenidae**	**CRE-Fishes**
Sphyraena barracuda	Great barracuda	**Sphyraenidae**	**CRE-Fishes**
Sphyraena forsteri	Bigeye barracuda	**Sphyraenidae**	**CRE-Fishes**
Sphyraena helleri	Heller's barracuda	**Sphyraenidae**	**CRE-Fishes**
Sphyraena qenie	Blackfin barracuda	**Sphyraenidae**	**CRE-Fishes**
Sphyraena sp.	Barracudas (misc)	**Sphyraenidae**	**CRE-Fishes**
Syngnathidae	Seahorses	**Syngnathidae**	**CRE-Fishes**
Synodontidae	Lizardfish	**Synodontidae**	**CRE-Fishes**
Terapon jarbua	Terapon perch	**Terapontidae**	**CRE-Fishes**
Zanclus cornutus	Moorish Idol	**Zanclidae**	**CRE-Fishes**
Anguilla marmorata	Freshwater eel	**Anguillidae**	**CRE-Fishes**
Anomalopidae	Flashlightfishes	**Anomalopidae**	**CRE-Fishes**
Antennariidae	Frogfishes	**Antennariidae**	**CRE-Fishes**
Apogonidae	Cardinalfish	**Apogonidae**	**CRE-Fishes**
Hypoatherina temminckii	Silversides	**Atherinidae**	**CRE-Fishes**
Aulostomus chinensis	Trumpetfish	**Aulostomidae**	**CRE-Fishes**
Balistidae	Triggerfish	**Balistidae**	**CRE-Fishes**
Balistapus undulatus	Orangestripe triggerfish	**Balistidae**	**CRE-Fishes**
Balistoides conspicillum	Clown triggerfish	**Balistidae**	**CRE-Fishes**
Balistoides viridescens	Titan triggerfish	**Balistidae**	**CRE-Fishes**
Belonidae	Needlefish	**Belonidae**	**CRE-Fishes**
Blenniidae	Blennies	**Blenniidae**	**CRE-Fishes**
Asterorhombus	Angler flatfish	**Bothidae**	**CRE-Fishes**

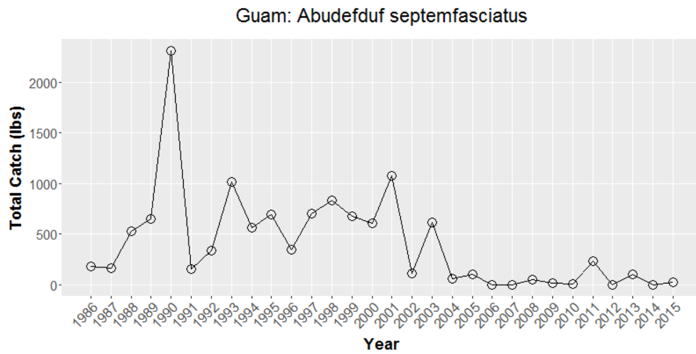
Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
cocosensis			
Caesio caerulaurea	Gold banded fusilier	**Caesionidae**	**CRE-Fishes**
Caracanthus maculatus	Coral crouchers	**Scorpaenidae**	**CRE-Fishes**
Chaetodon sp.	Butterflyfishes (misc)	**Chaetodontidae**	**CRE-Fishes**
Chaetodon auriga	Butterflyfish (auriga)	**Chaetodontidae**	**CRE-Fishes**
Chaetodon ephippium	Saddleback butterflyfish	**Chaetodontidae**	**CRE-Fishes**
Chaetodon lunula	Racoon butterflyfish	**Chaetodontidae**	**CRE-Fishes**
Chaetodon melannotus	Butterflyfish (melanotic)	**Chaetodontidae**	**CRE-Fishes**
Chanos chanos	Milkfish	**Chanidae**	**CRE-Fishes**
Coptodon zillii	Tilapia	**Cichlidae**	**CRE-Fishes**
Amblycirrhitus bimacula	Two spotted hawkfish	**Cirrhitidae**	**CRE-Fishes**
Cirrhitus pinnulatus	Stocky hawkfish	**Cirrhitidae**	**CRE-Fishes**
Neocirrhites armatus	Flame hawkfish	**Cirrhitidae**	**CRE-Fishes**
Clupeidae	Herrings	**Clupeidae**	**CRE-Fishes**
Conger cinereus	White eel	**Congridae**	**CRE-Fishes**
Conger sp.	Conger eels	**Congridae**	**CRE-Fishes**
Diodon sp.	Porcupinefish	**Diodontidae**	**CRE-Fishes**
Echeneidae	Remoras	**Echeneidae**	**CRE-Fishes**
Engraulidae	Anchovies	**Engraulidae**	**CRE-Fishes**
Ephippidae	Batfishes	**Ephippidae**	**CRE-Fishes**
NA	Bottomfish (misc)		**CRE-Fishes**
NA	Reef fish (misc)		**CRE-Fishes**
Oxycheilinus arenatus	Arenatus wrasse	**Labridae**	**CRE-Fishes**
Oxycheilinus digramma	Bandcheck wrasse	**Labridae**	**CRE-Fishes**
Hemigymnus fasciatus	Barred thicklip	**Labridae**	**CRE-Fishes**
Gomphosus varius	Bird wrasse	**Labridae**	**CRE-Fishes**
Hemigymnus melapterus	Blackeye thicklip	**Labridae**	**CRE-Fishes**
Halichoeres hortulanus	Checkerboard wrasse	**Labridae**	**CRE-Fishes**
Cheilinus sp.	Cheilinus wrasse (misc)	**Labridae**	**CRE-Fishes**
Thalassoma trilobatum	Christmas wrasse	**Labridae**	**CRE-Fishes**
Cheilio inermis	Cigar wrasse	**Labridae**	**CRE-Fishes**
Thalassoma quinquevittatum	Red ribbon wrasse	**Labridae**	**CRE-Fishes**
Novaculichthys taeniourus	Rockmover wrasse	**Labridae**	**CRE-Fishes**

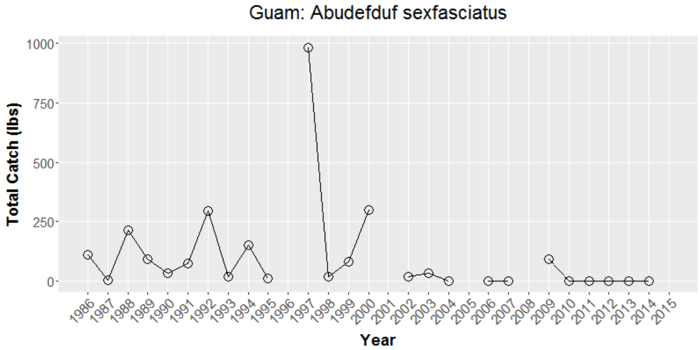
Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Thalassoma lutescens	Sunset wrasse	**Labridae**	**CRE-Fishes**
Thalassoma purpureum	Surge wrasse	**Labridae**	**CRE-Fishes**
Cheilinus trilobatus	Triple tail wrasse	**Labridae**	**CRE-Fishes**
Halichoeres margaritaceus	Weedy surge wrasse	**Labridae**	**CRE-Fishes**
Iniistius aneitensis	Whitepatch wrasse	**Labridae**	**CRE-Fishes**
Labridae	Wrasses (misc)	**Labridae**	**CRE-Fishes**
Cheilinus chlorourus	Floral wrasse	**Labridae**	**CRE-Fishes**
Cheilinus fasciatus	Harlequin tuskfish	**Labridae**	**CRE-Fishes**
Kyphosus bigibbus	Rudderfish (biggibus)	**Kyphosidae**	**CRE-Fishes**
Kyphosus cinerascens	Rudderfish (cinerascens)	**Kyphosidae**	**CRE-Fishes**
Kyphosus cornelii	Western drummer	**Kyphosidae**	**CRE-Fishes**
Kyphosus sp.	Rudderfish	**Kyphosidae**	**CRE-Fishes**
Kyphosus vaigiensis	Lowfin drummer	**Kyphosidae**	**CRE-Fishes**
Mullidae	Goatfish (misc)	**Mullidae**	**CRE-Fishes**
Mulloidichthys flavolineatus	Yellowstripe goatfish	**Mullidae**	**CRE-Fishes**
Mulloidichthys pfluegeri	Orange goatfish	**Mullidae**	**CRE-Fishes**
Mulloidichthys sp.	Yellow goatfishes	**Mullidae**	**CRE-Fishes**
Mulloidichthys vanicolensis	Yellowfin goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus barberinus	Dash-and-dot goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus trifasciatus	Doublebar goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus ciliatus	White-lined goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus cyclostomus	Yellowsaddle goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus heptacanthus	Redspot goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus indicus	Indian goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus insularis	Parupenus insularis	**Mullidae**	**CRE-Fishes**
Parupeneus multifasciatus	Multi-barred goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus pleurostigma	Side spot goatfish	**Mullidae**	**CRE-Fishes**
Parupeneus sp.	Banded goatfish (misc)	**Mullidae**	**CRE-Fishes**
Siganidae	Rabbitfish	**Siganidae**	**CRE-Fishes**
Siganus argenteus	Forktail rabbitfish	**Siganidae**	**CRE-Fishes**

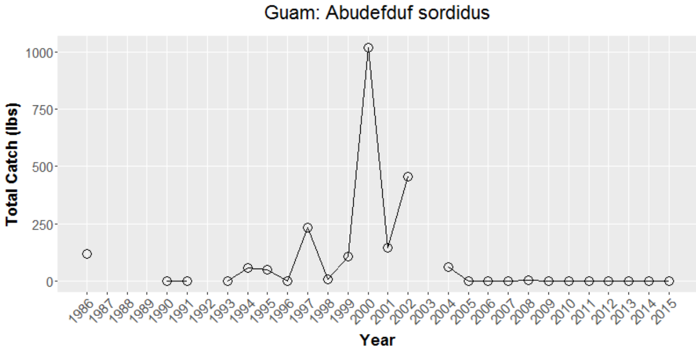
Correct Scientific Name	**Common Name**	**FAMILY**	**FEP GROUP**
Siganus spinus	Scribbled rabbitfish	**Siganidae**	**CRE-Fishes**
NA	Red algae	**Division: Rhodophyta**	**CRE-Algae**
NA	Seaweeds		**CRE-Algae**

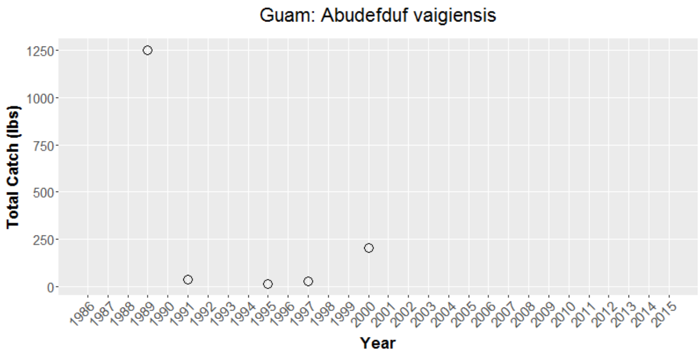
11.4 TIME SERIES CHARTS OF TOTAL CATCH PER MANAGEMENT UNIT SPECIES IN GUAM

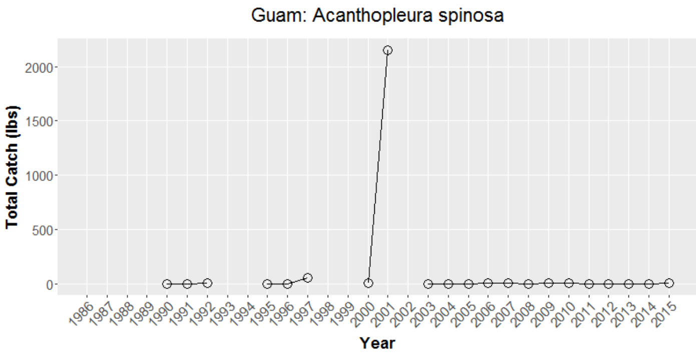


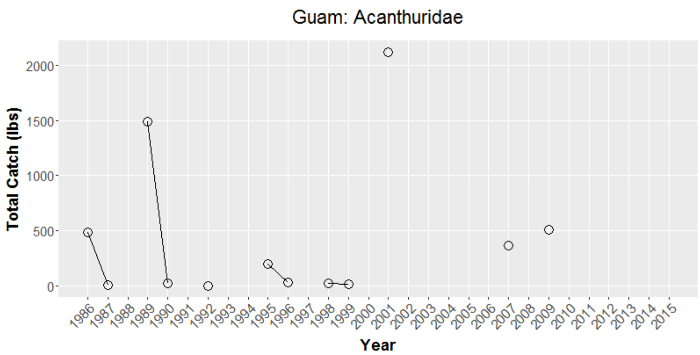


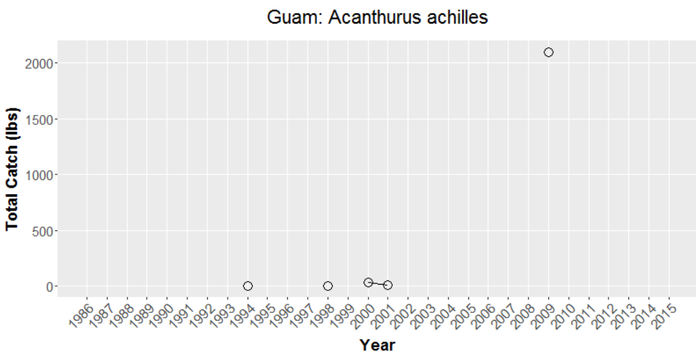




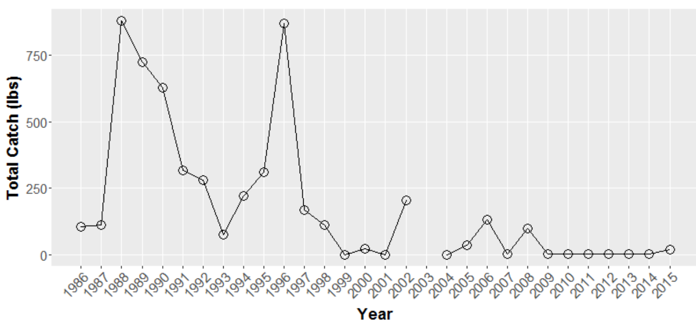




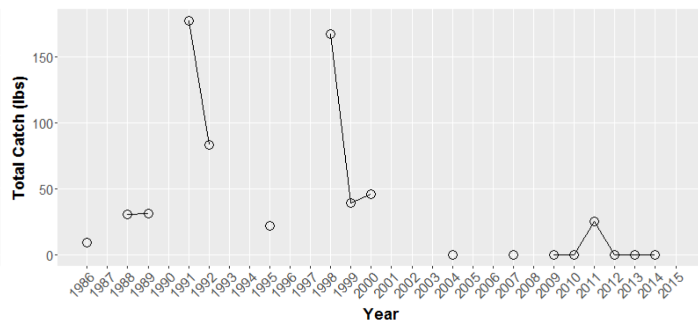




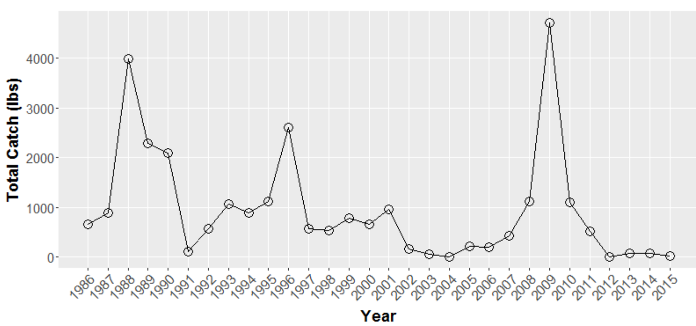
Guam: Acanthurus blochii



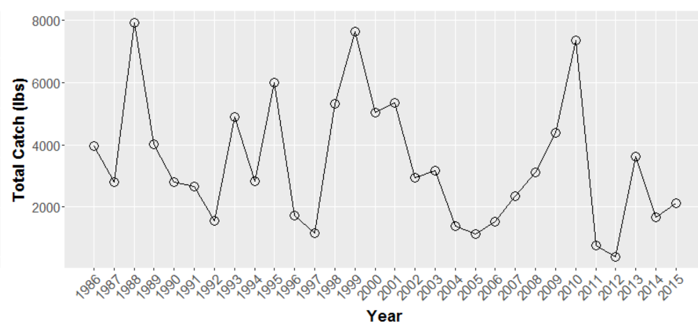
Guam: Acanthurus dussumieri



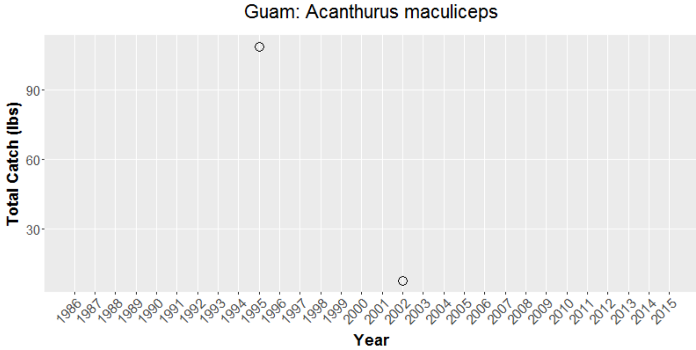
Guam: Acanthurus guttatus



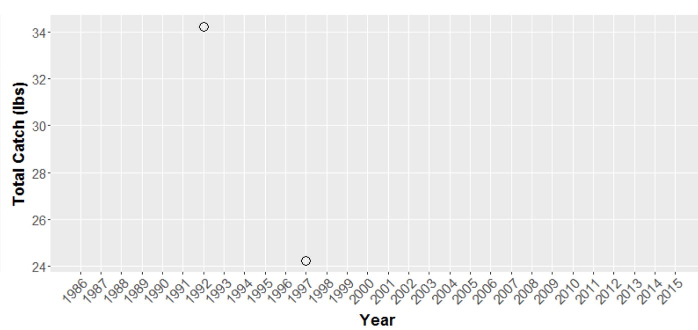
Guam: Acanthurus lineatus



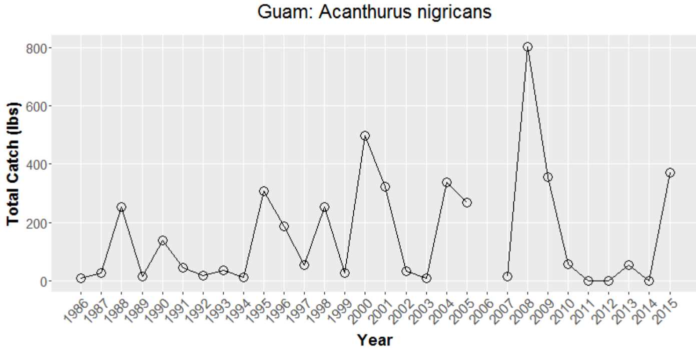
Guam: Acanthurus maculiceps



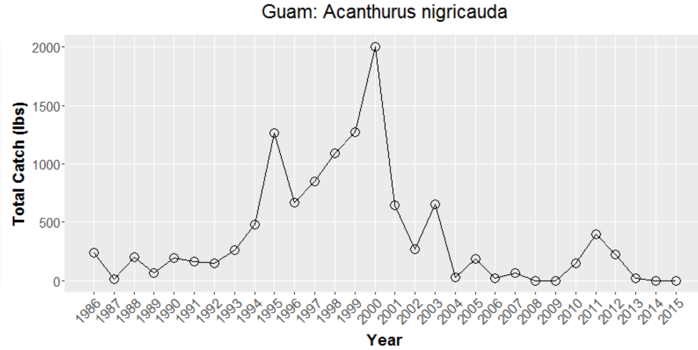
Guam: Acanthurus mata



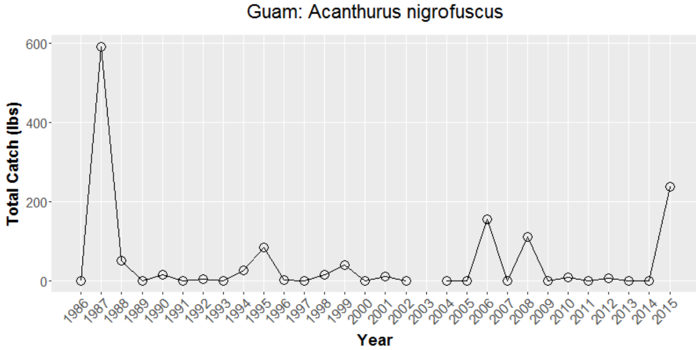
Guam: Acanthurus nigricans



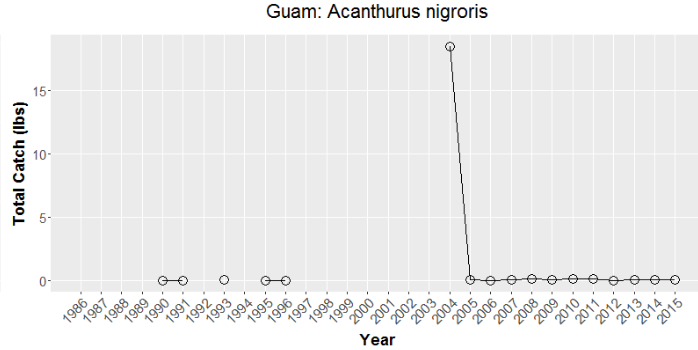
Guam: Acanthurus nigricauda



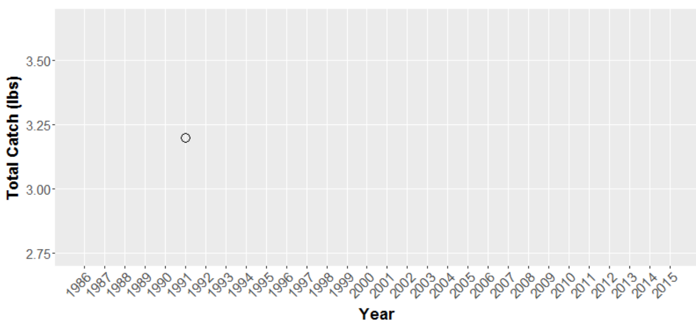
Guam: Acanthurus nigrofuscus



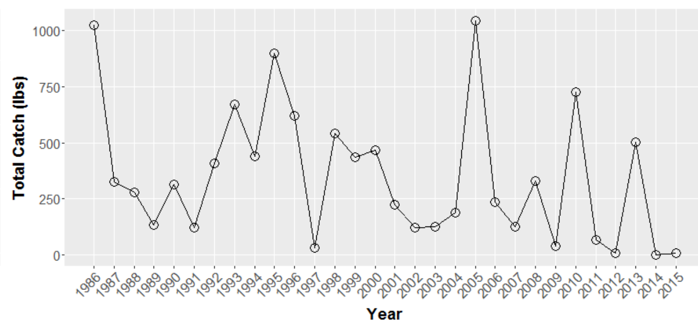
Guam: Acanthurus nigroris



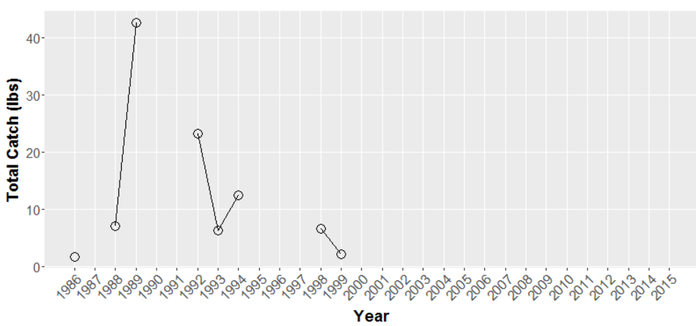
Guam: Acanthurus nubilus



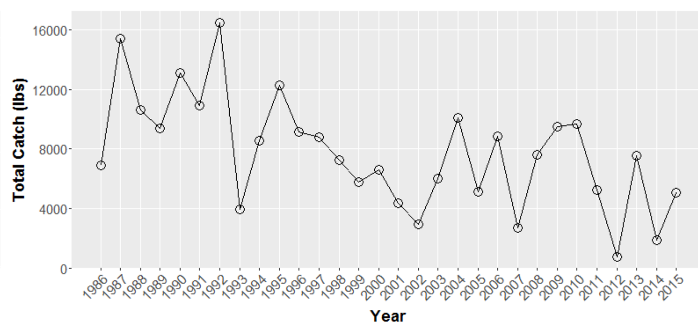
Guam: Acanthurus olivaceus



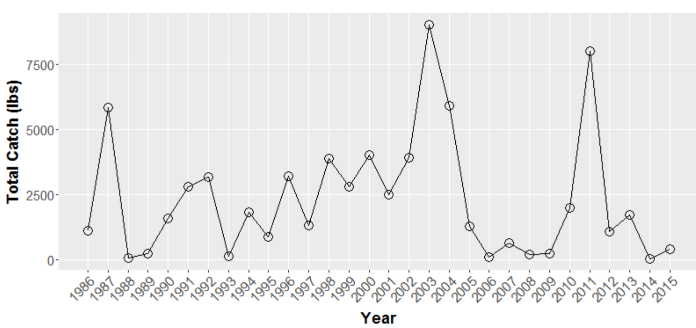
Guam: Acanthurus pyroferus



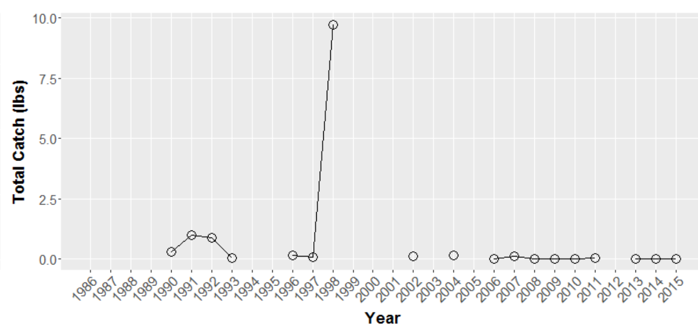
Guam: Acanthurus triostegus



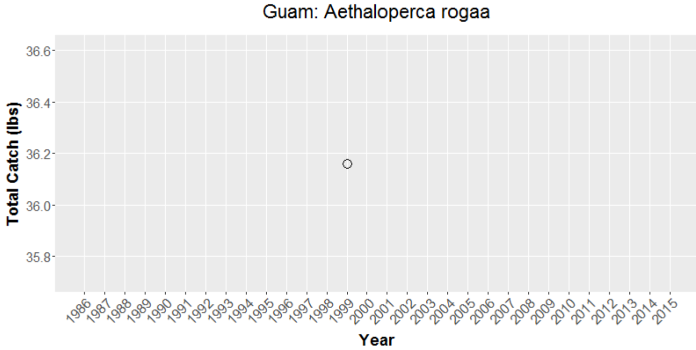
Guam: Acanthurus xanthopterus



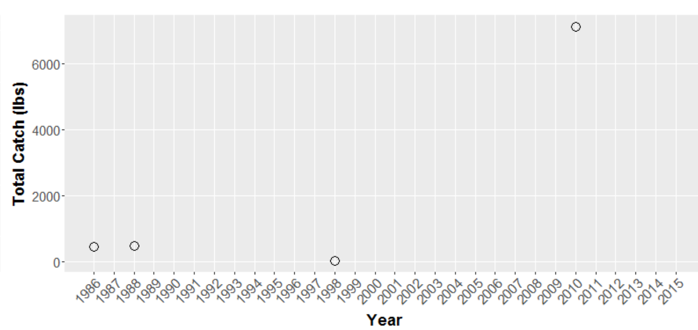
Guam: Actinopyga obesa



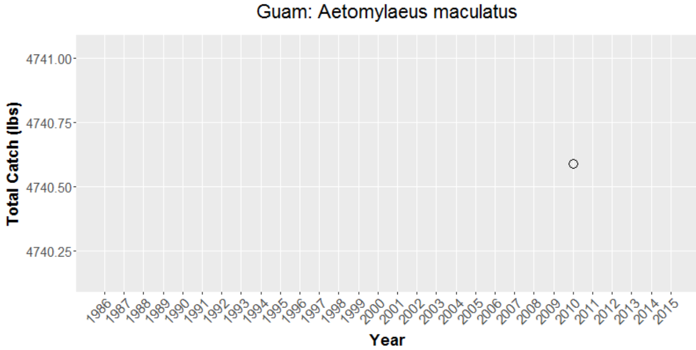
Guam: Aethaloperca rogaa



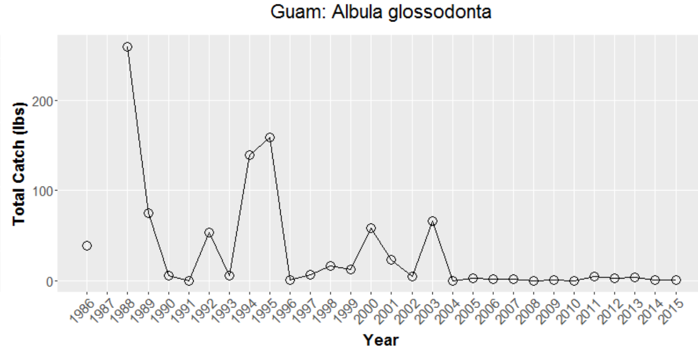
Guam: Aetobatus narinari

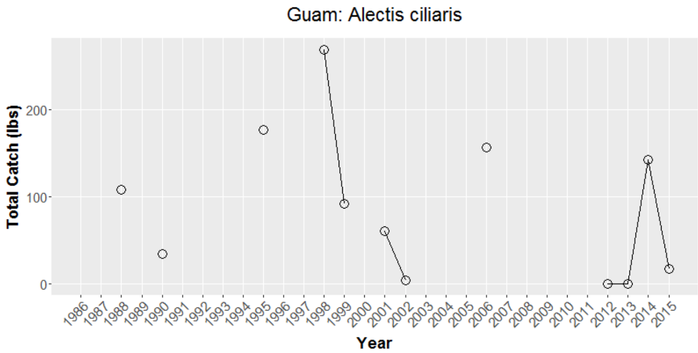


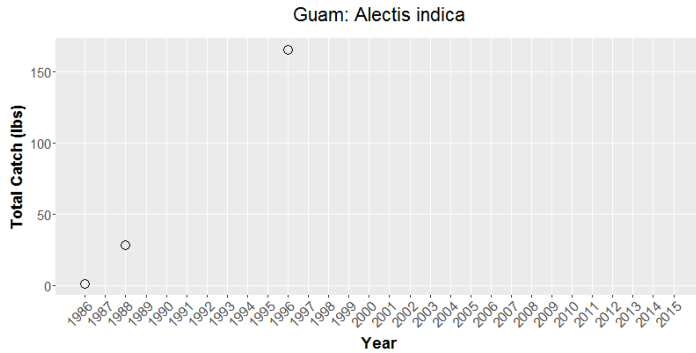
Guam: Aetomylaeus maculatus

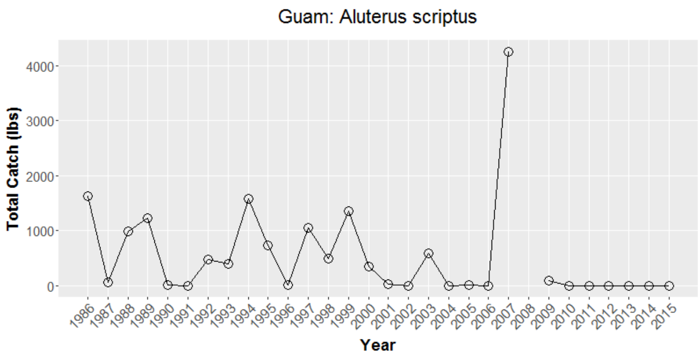


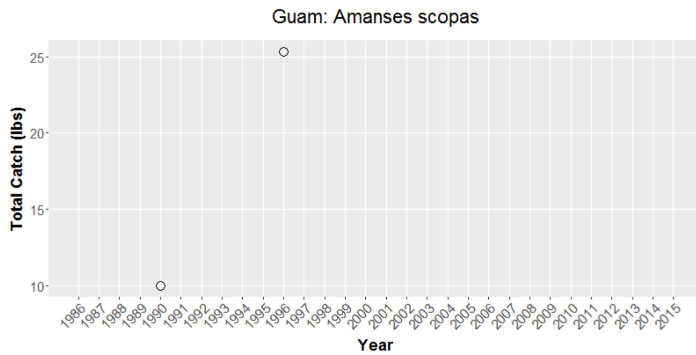
Guam: Albula glossodonta

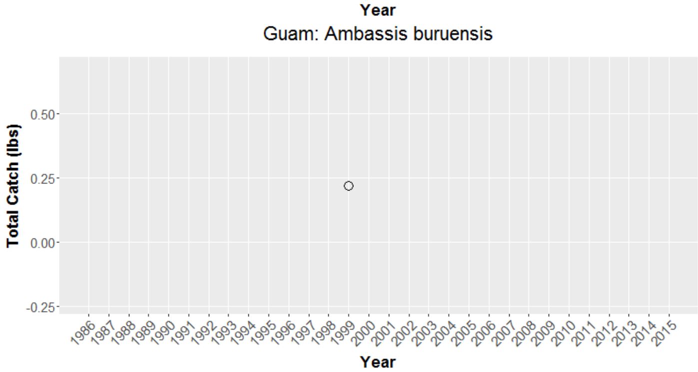


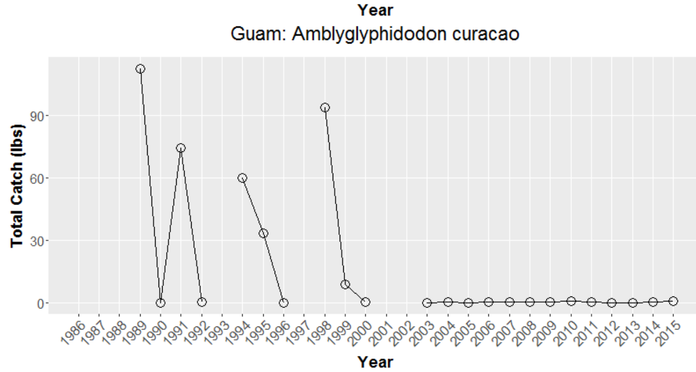

Guam: Alectis ciliaris
Total Catch (lbs)
Year

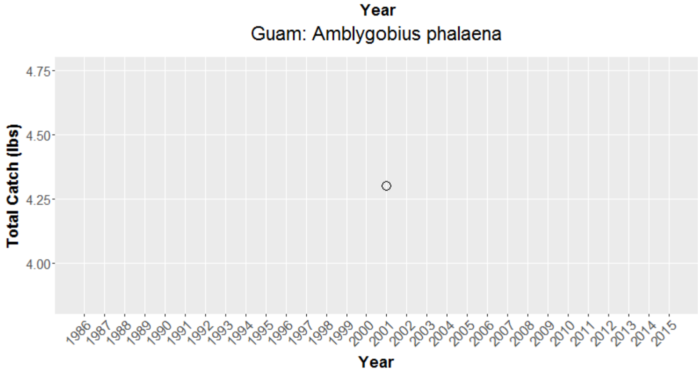

Guam: Alectis indica
Total Catch (lbs)
Year

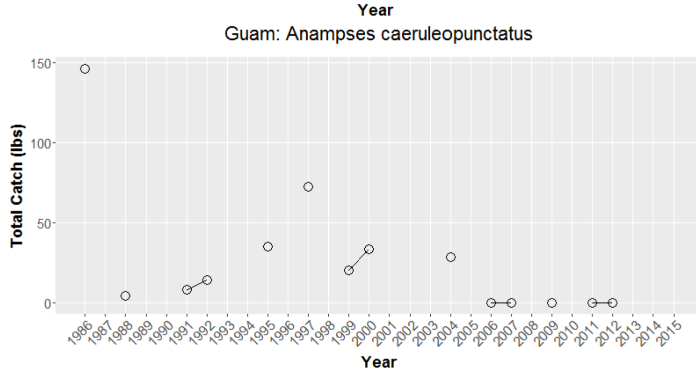

Guam: Aluterus scriptus
Total Catch (lbs)
Year

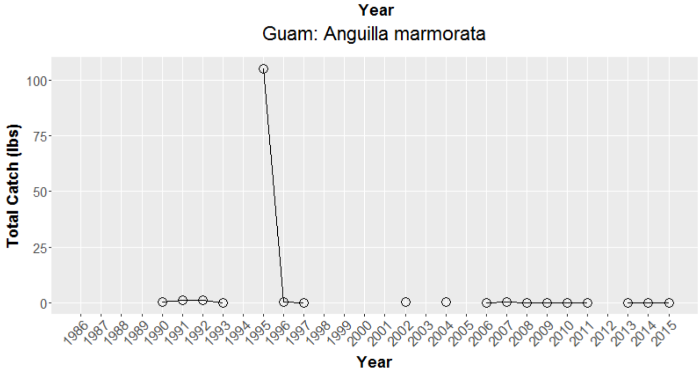

Guam: Amanses scopas
Total Catch (lbs)
Year

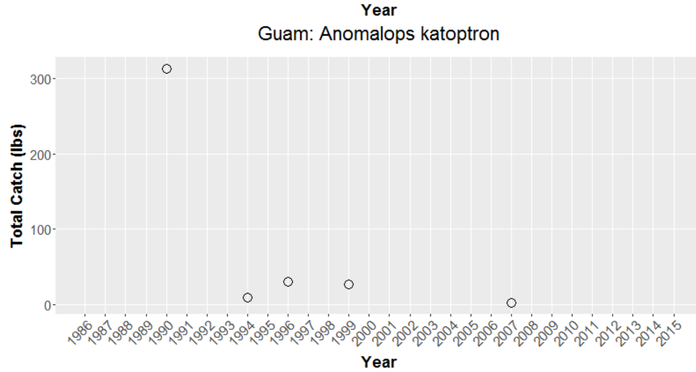

Guam: Ambassis buruensis
Total Catch (lbs)
Year


Guam: Amblyglyphidodon curacao
Total Catch (lbs)
Year


Guam: Amblygobius phalaena
Total Catch (lbs)
Year


Guam: Anampses caeruleopunctatus
Total Catch (lbs)
Year


Guam: Anguilla marmorata
Total Catch (lbs)
Year


Guam: Anomalops katoptron
Total Catch (lbs)
Year

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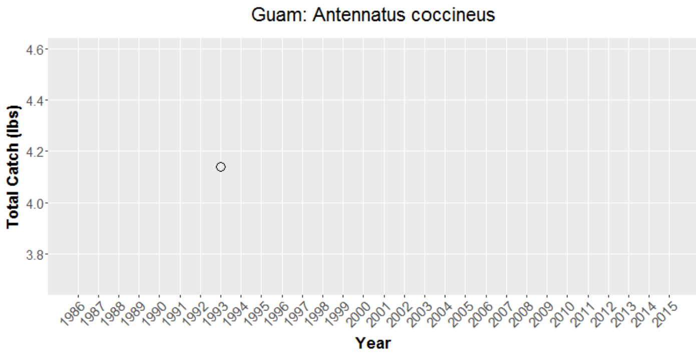
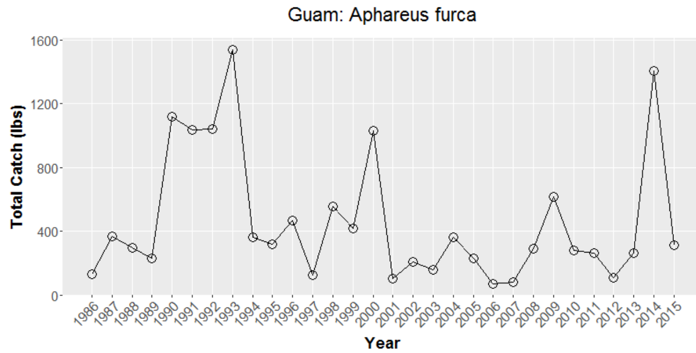
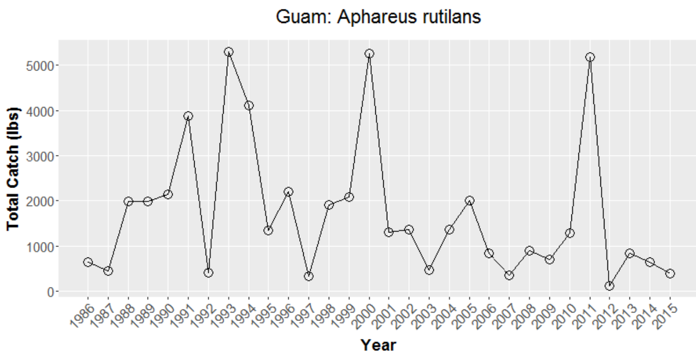
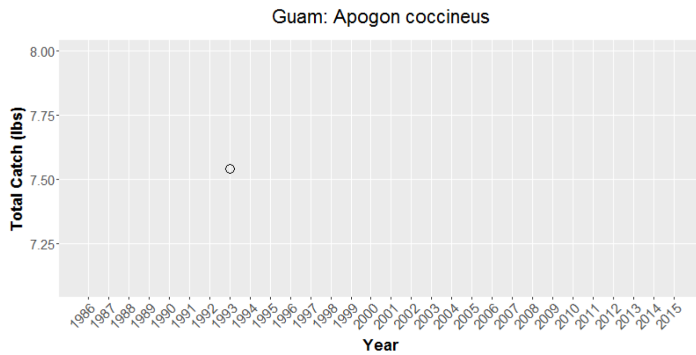
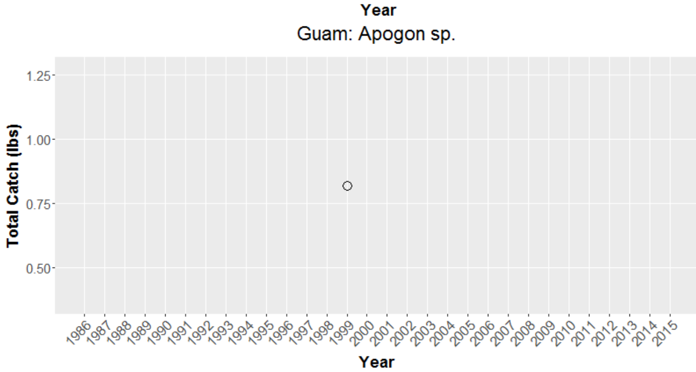
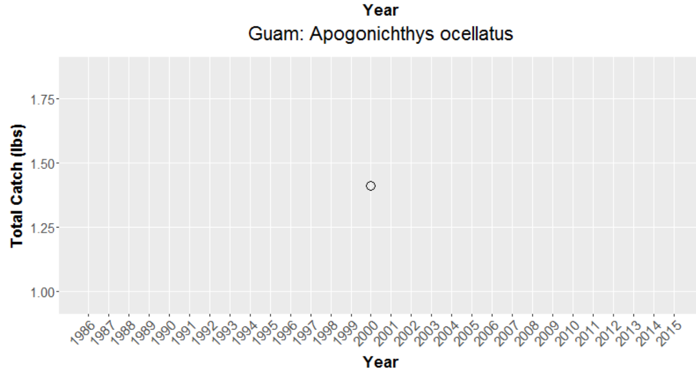


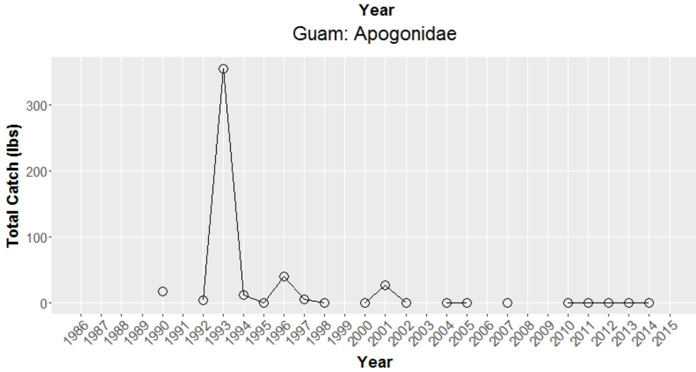


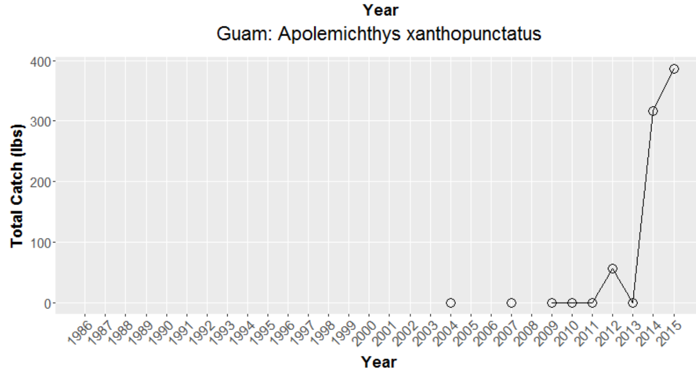


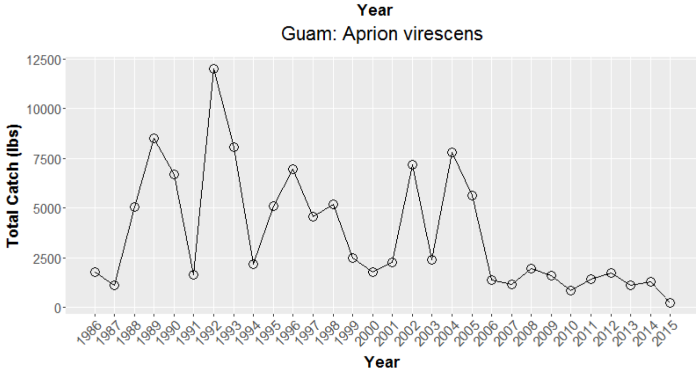


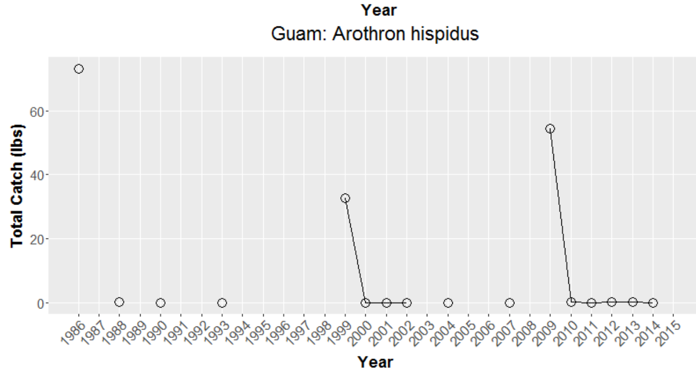


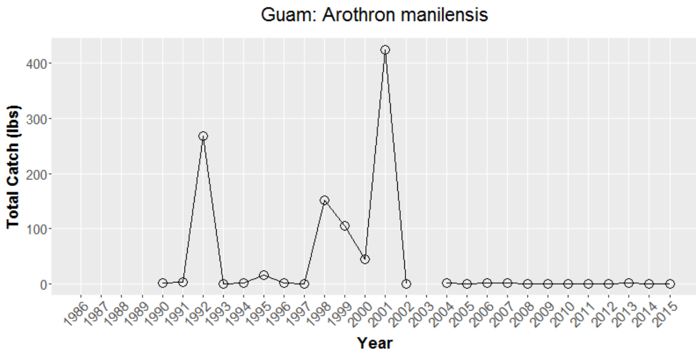


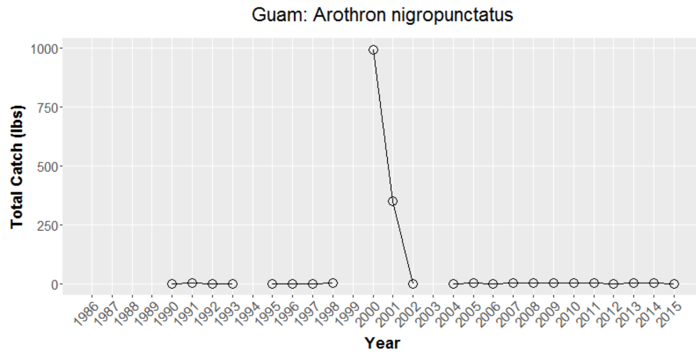


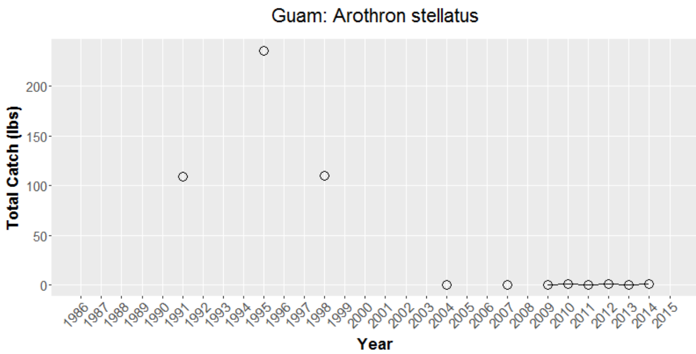


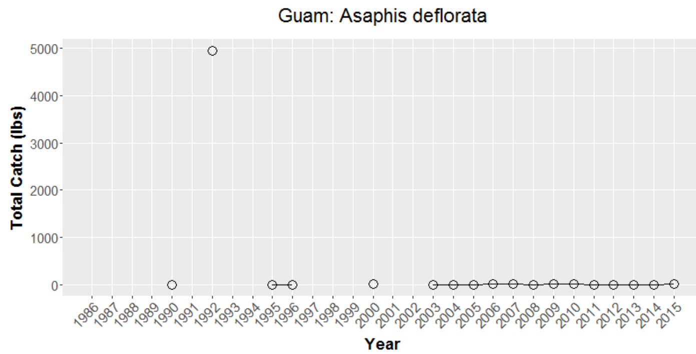


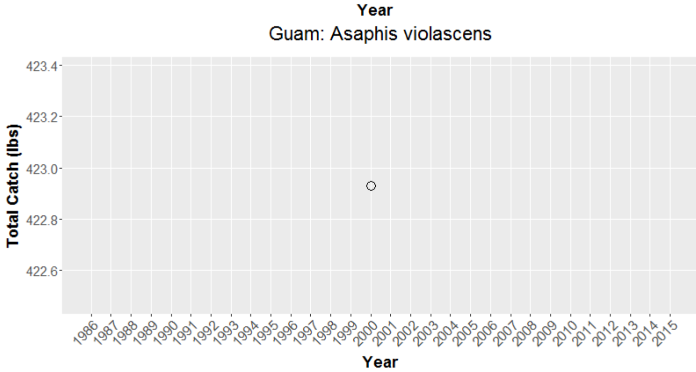


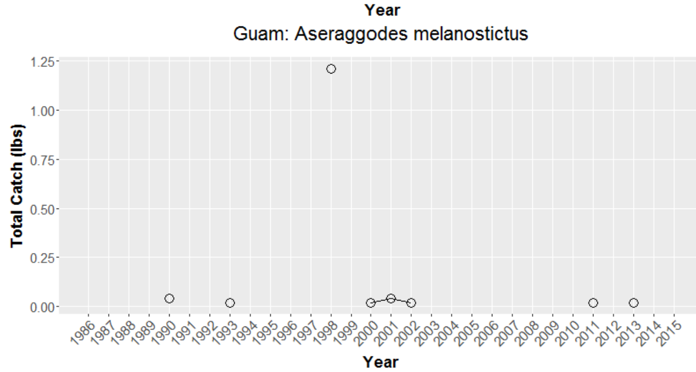

Guam: Arothron manilensis
Total Catch (lbs)
0
100
200
300
400
Year

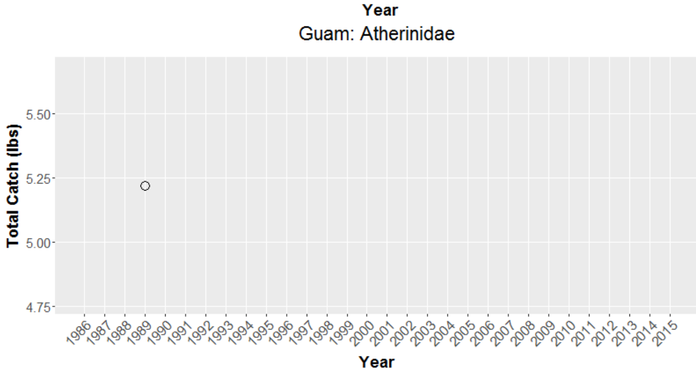

Guam: Arothron nigropunctatus
Total Catch (lbs)
0
250
500
750
1000
Year

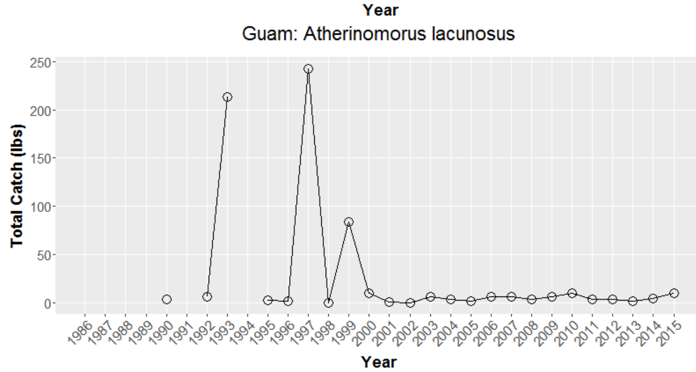

Guam: Arothron stellatus
Total Catch (lbs)
0
50
100
150
200
Year

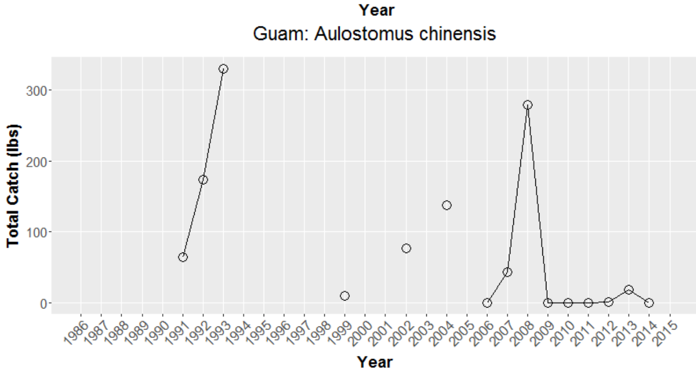

Guam: Asaphis deflorata
Total Catch (lbs)
0
1000
2000
3000
4000
5000
Year

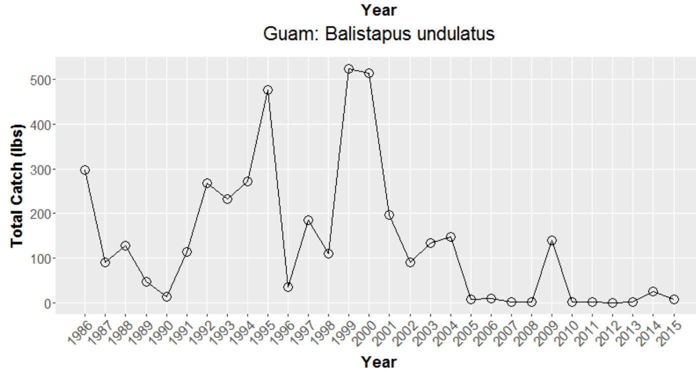

Guam: Asaphis violascens
Total Catch (lbs)
422.6
422.8
423.0
423.2
423.4
Year


Guam: Aseraggodes melanostictus
Total Catch (lbs)
0.00
0.25
0.50
0.75
1.00
1.25
Year

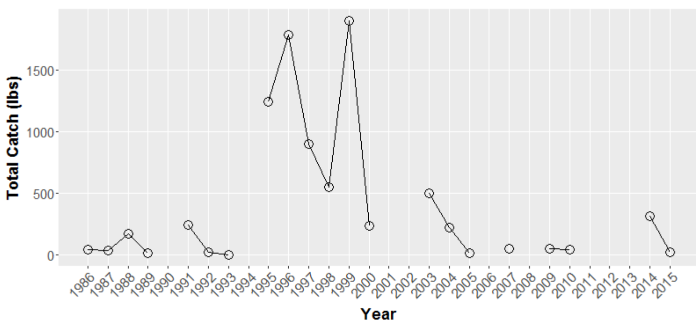

Guam: Atherinidae
Total Catch (lbs)
4.75
5.00
5.25
5.50
Year


Guam: Atherinomorus lacunosus
Total Catch (lbs)
0
50
100
150
200
250
Year

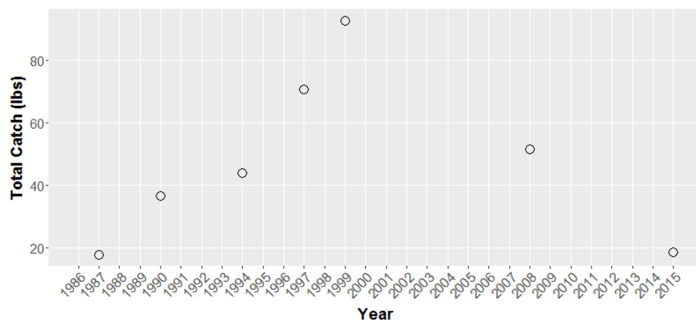

Guam: Aulostomus chinensis
Total Catch (lbs)
0
100
200
300
Year


Guam: Balistapus undulatus
Total Catch (lbs)
0
100
200
300
400
500
Year

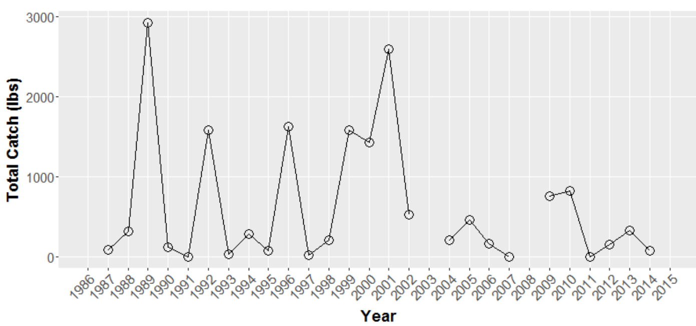
Guam: Balistidae



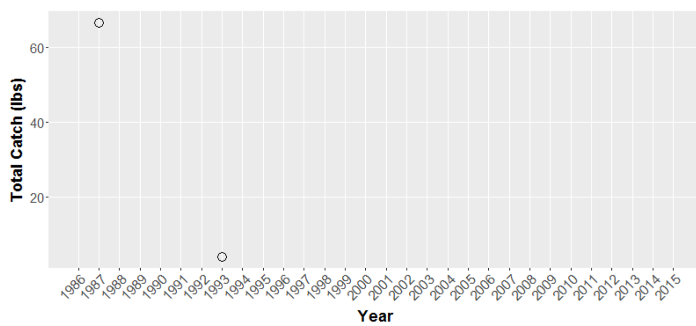
Guam: Balistoides conspicillum



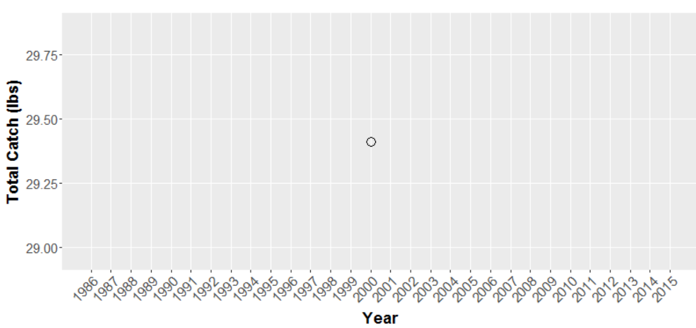
Guam: Balistoides viridescens



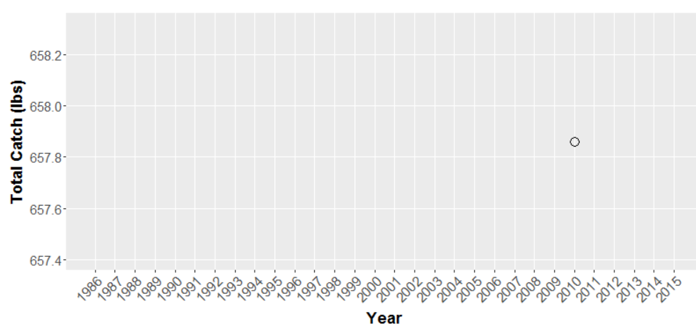
Guam: Belonidae



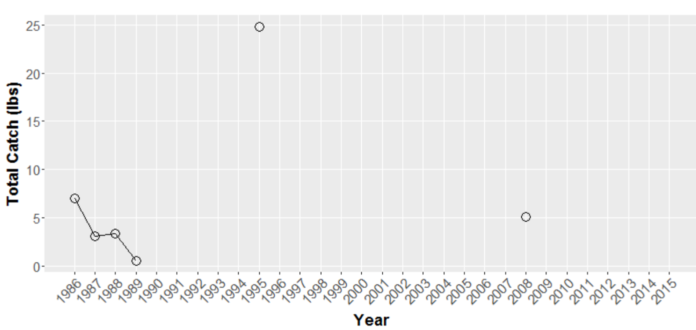
Guam: Beryx decadactylus



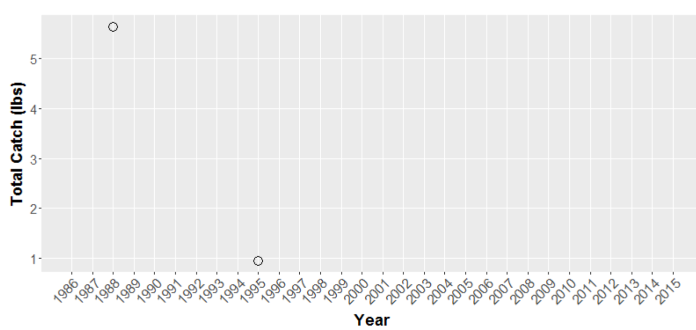
Guam: Blenniella interrupta



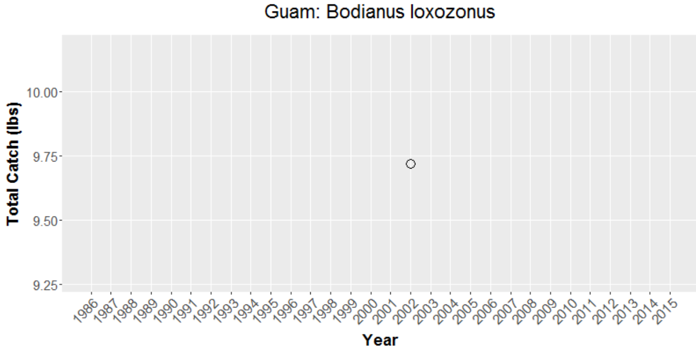
Guam: Blenniidae



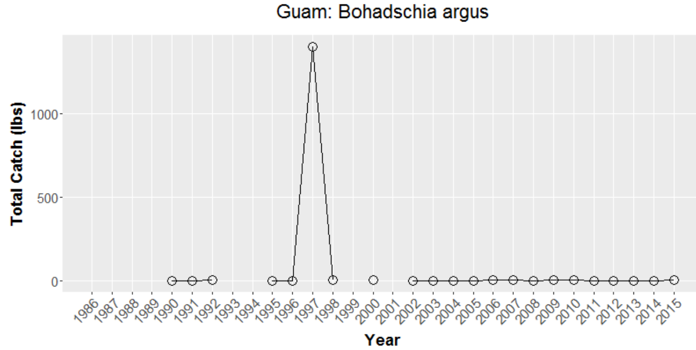
Guam: Bodianus axillaris



Guam: Bodianus loxozonus



Guam: Bohadschia argus



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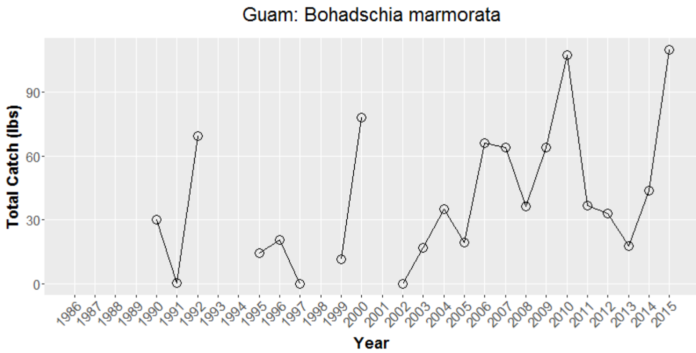
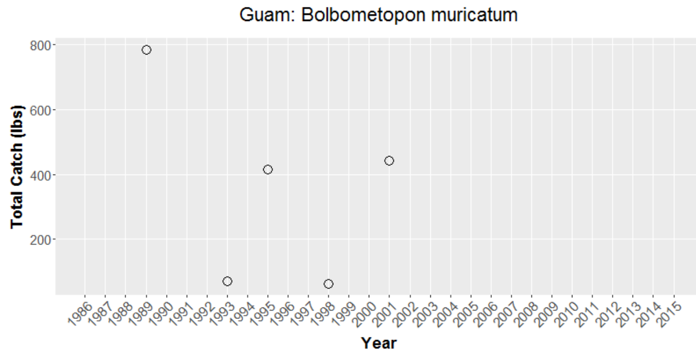
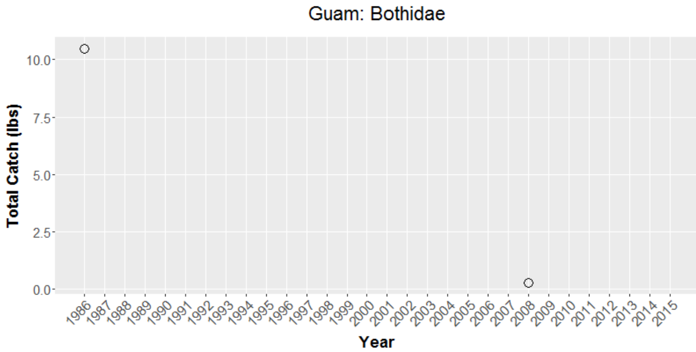
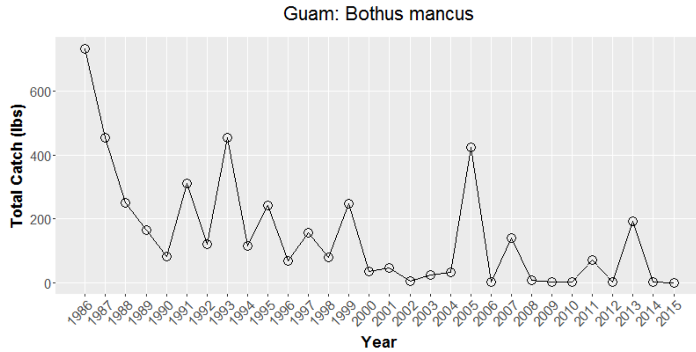
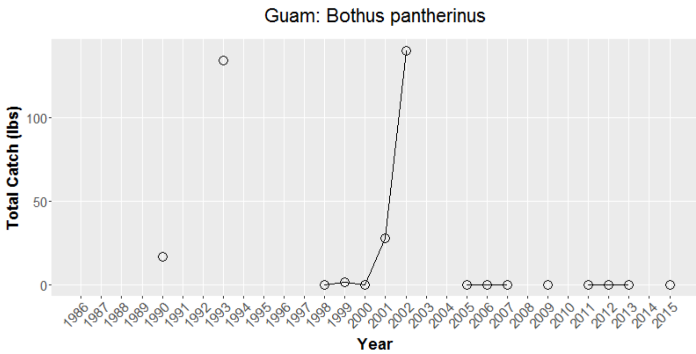
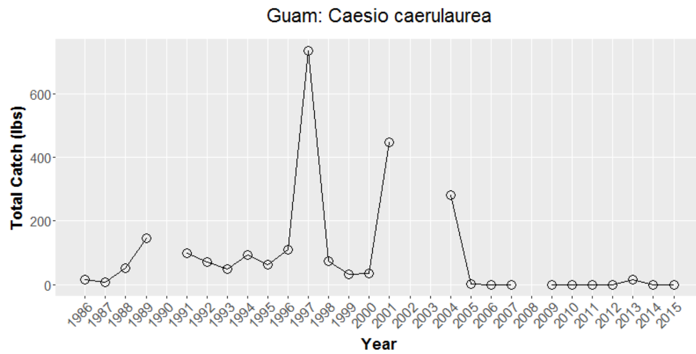


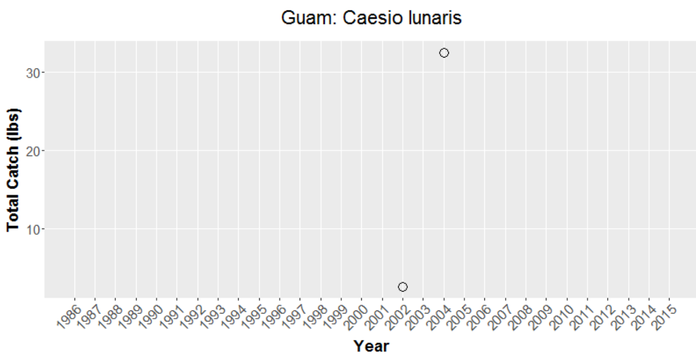


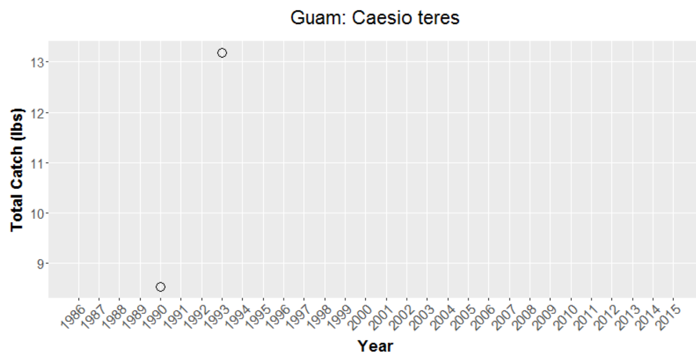


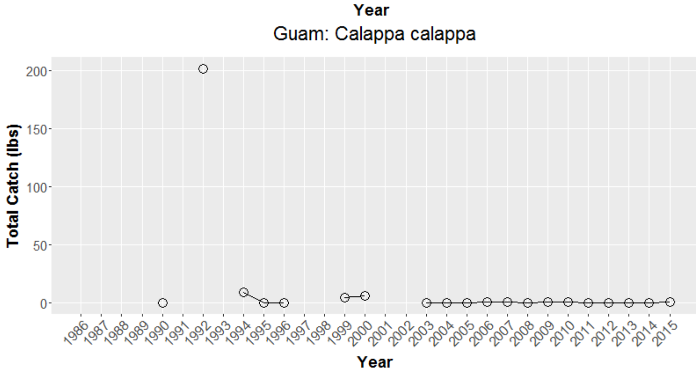


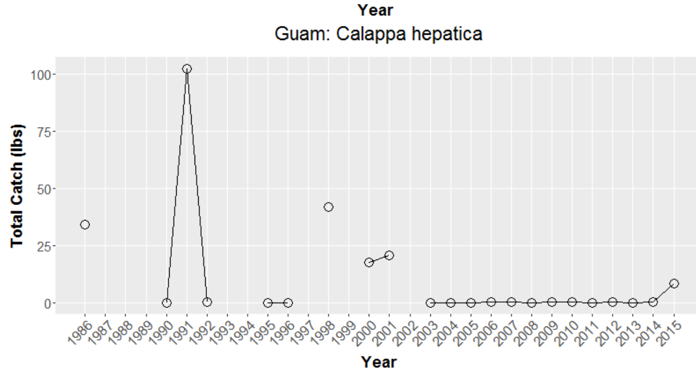




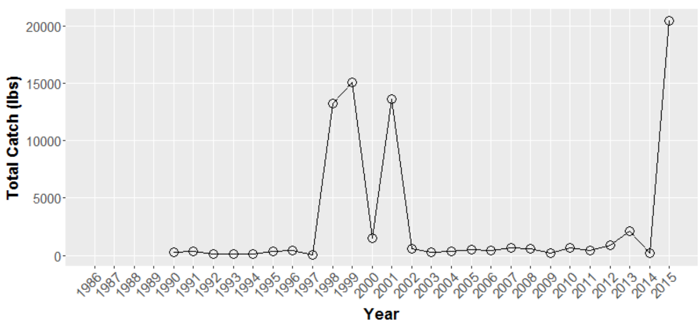




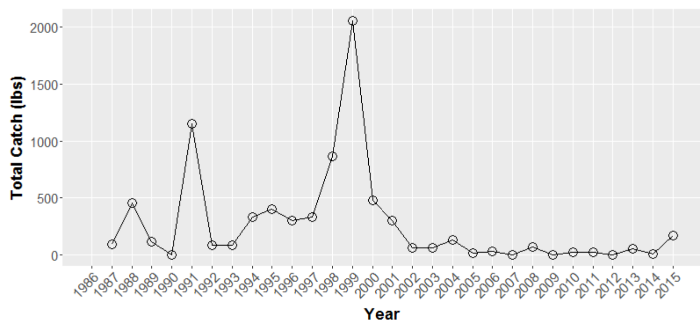




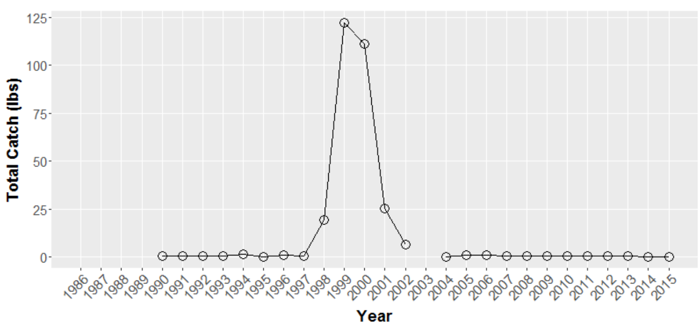
Guam: Callistoctopus ornatus



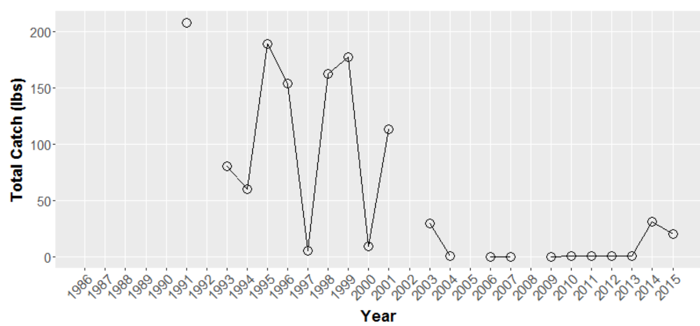
Guam: Calotomus carolinus



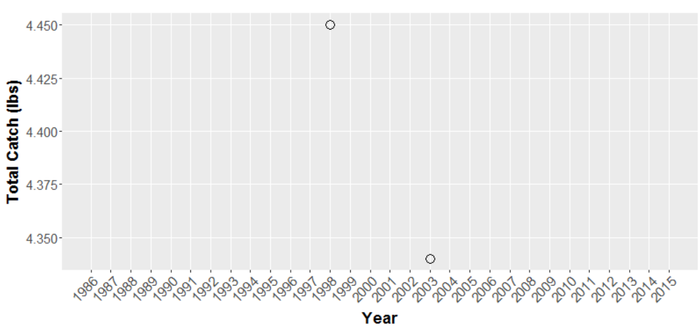
Guam: Calotomus spinidens



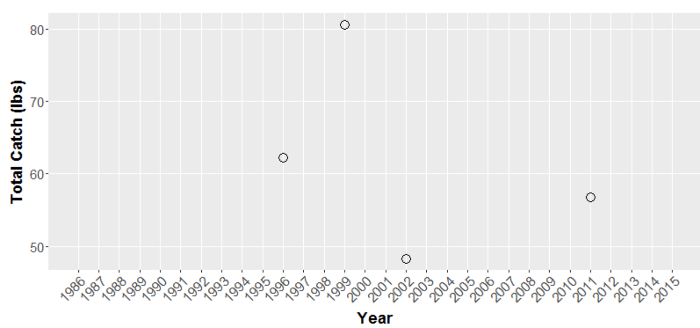
Guam: Cantherhines dumerilii



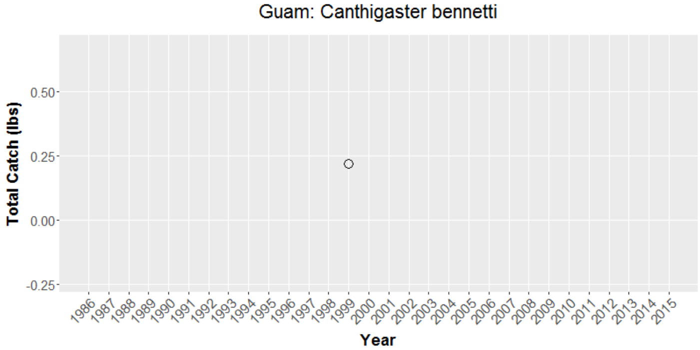
Guam: Cantherhines pardalis



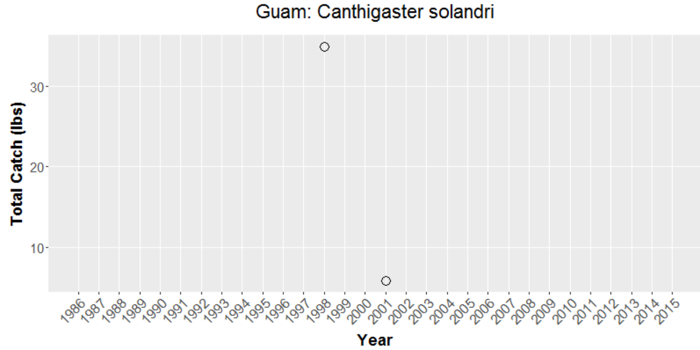
Guam: Canthidermis maculata



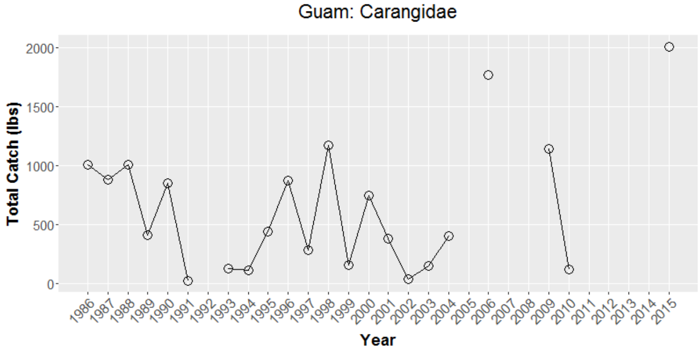
Guam: Canthigaster bennetti



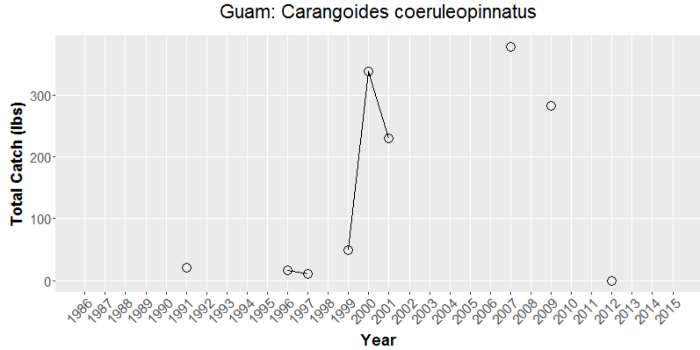
Guam: Canthigaster solandri

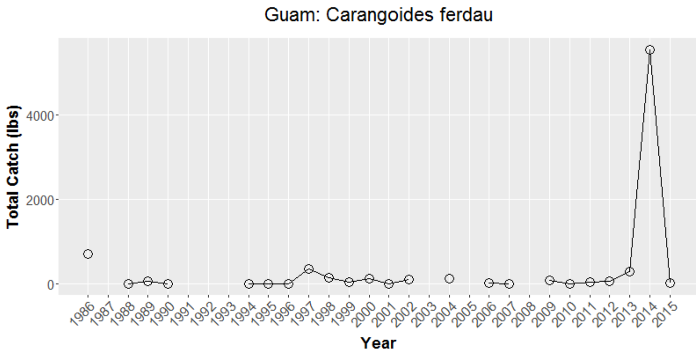


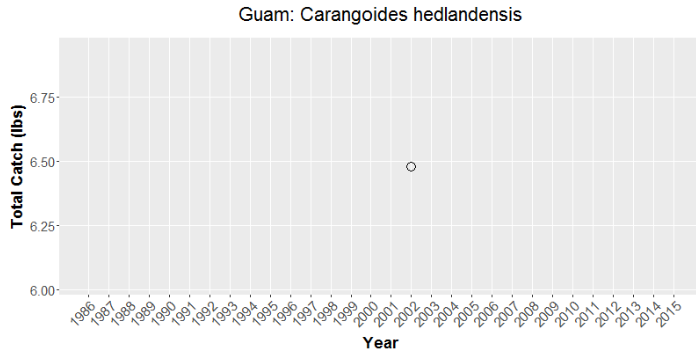
Guam: Carangidae

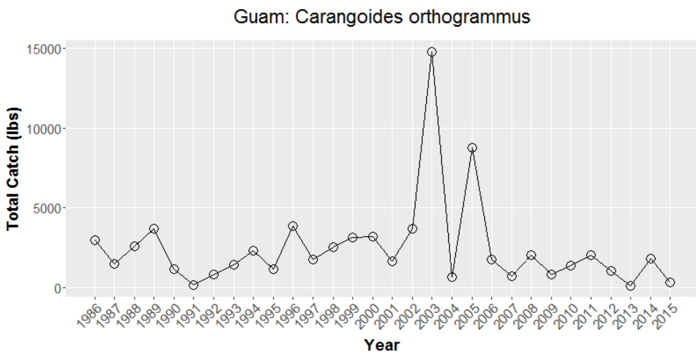


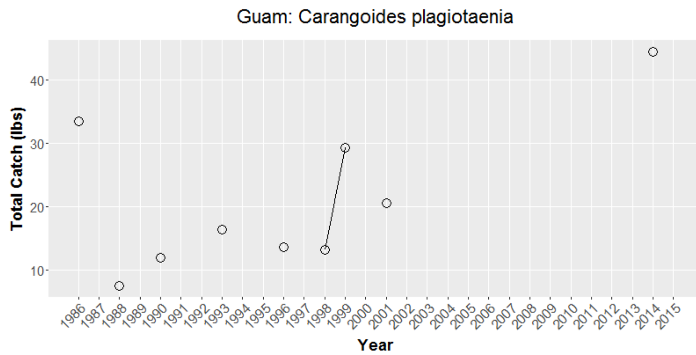
Guam: Carangoides coeruleopinnatus

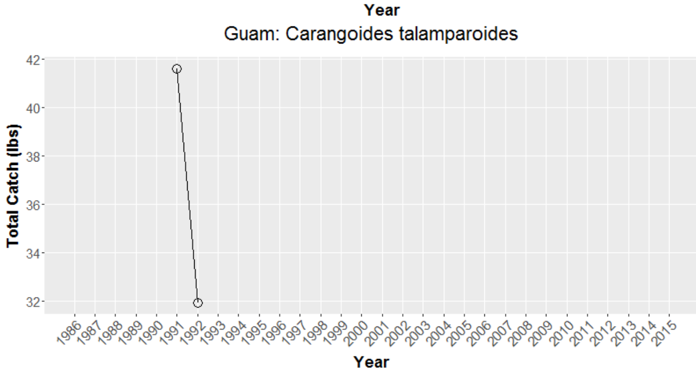


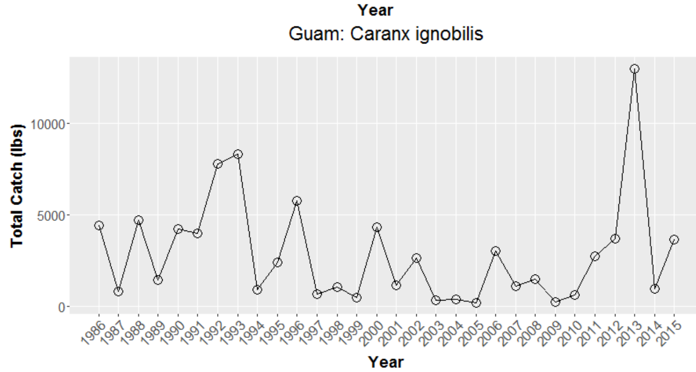

Guam: Carangoides ferdau
Total Catch (lbs)
Year

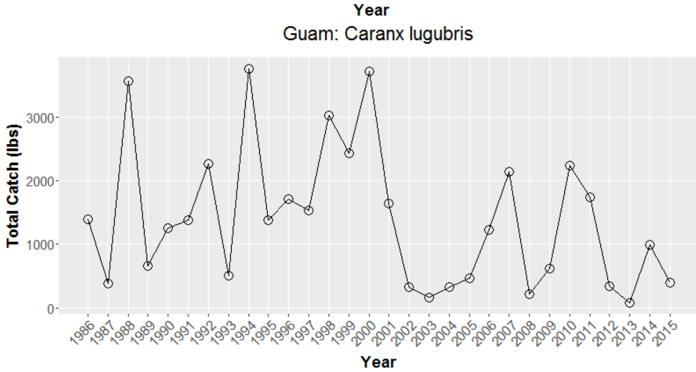

Guam: Carangoides hedlandensis
Total Catch (lbs)
Year

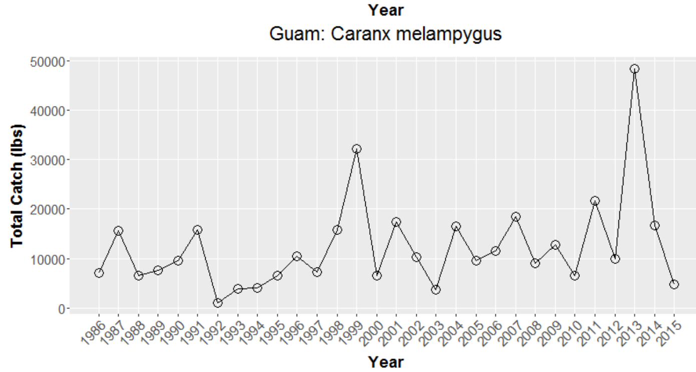

Guam: Carangoides orthogrammus
Total Catch (lbs)
Year

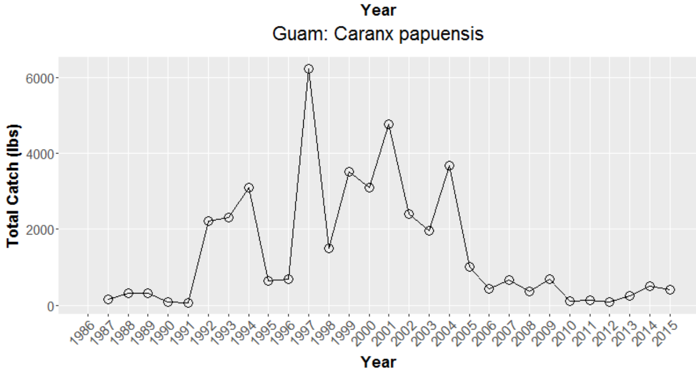

Guam: Carangoides plagiotaenia
Total Catch (lbs)
Year

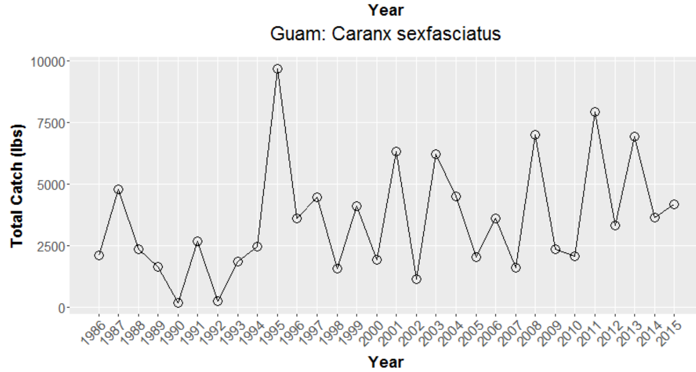

Guam: Carangoides talamparoides
Total Catch (lbs)
Year

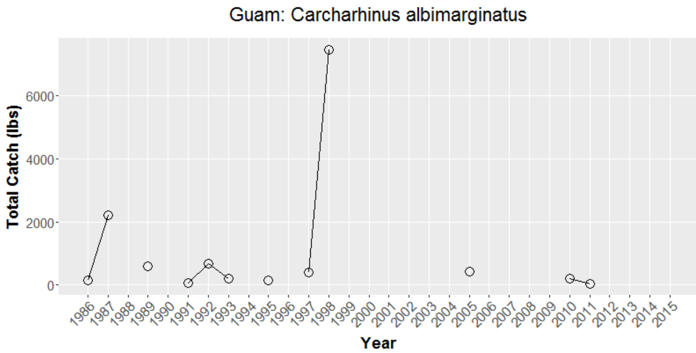

Guam: Caranx ignobilis
Total Catch (lbs)
Year

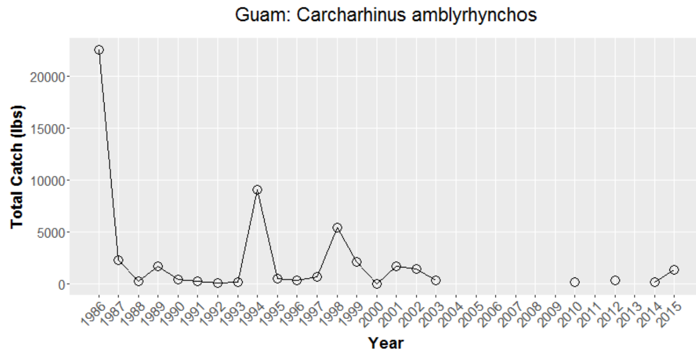

Guam: Caranx lugubris
Total Catch (lbs)
Year

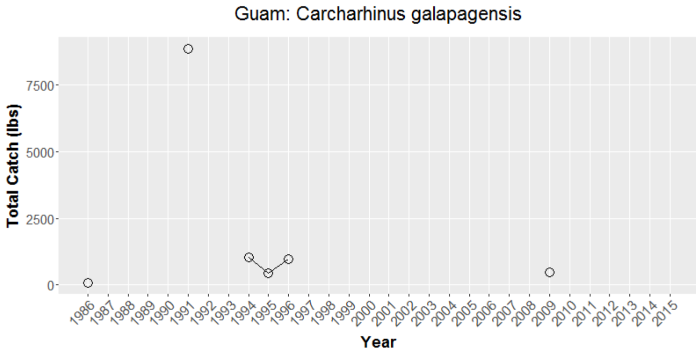

Guam: Caranx melampygus
Total Catch (lbs)
Year

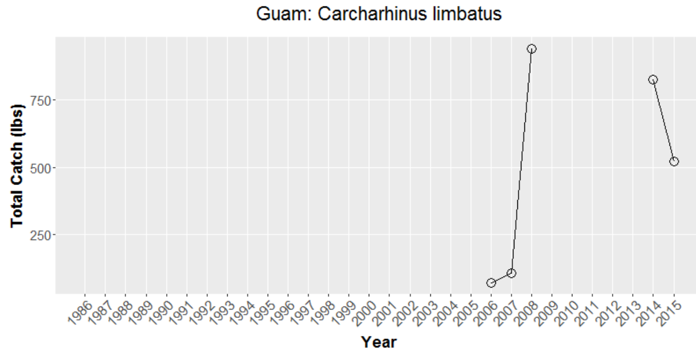

Guam: Caranx papuensis
Total Catch (lbs)
Year

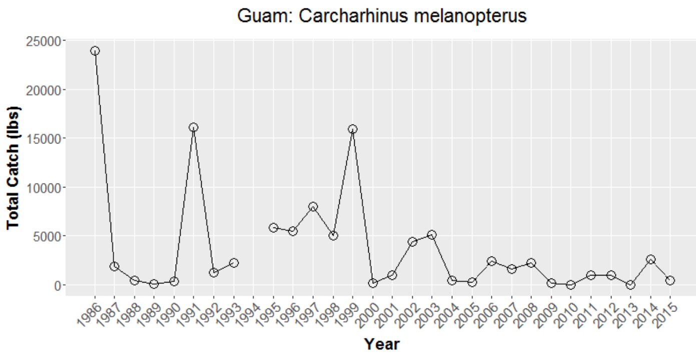

Guam: Caranx sexfasciatus
Total Catch (lbs)
Year

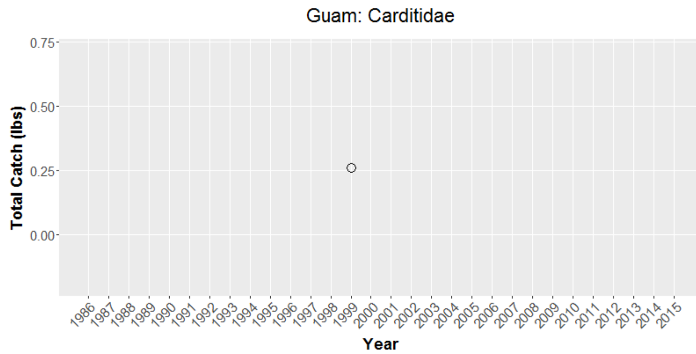

Guam: Carcharhinus albimarginatus
Total Catch (lbs)
0
2000
4000
6000
Year

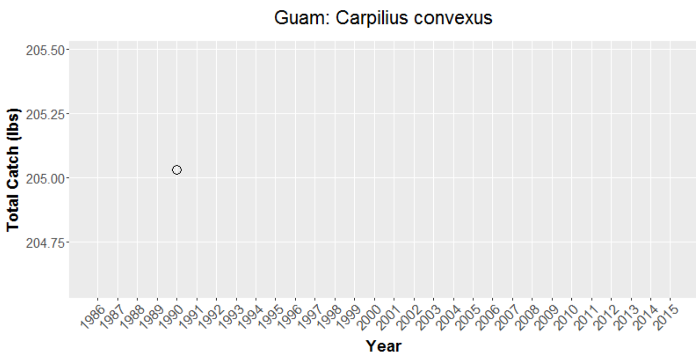

Guam: Carcharhinus amblyrhynchos
Total Catch (lbs)
0
5000
10000
15000
20000
Year

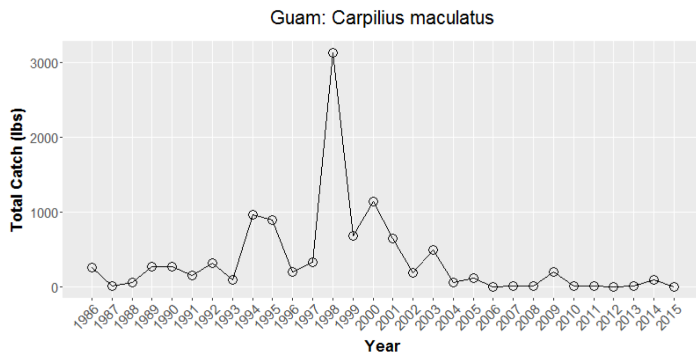

Guam: Carcharhinus galapagensis
Total Catch (lbs)
0
2500
5000
7500
Year

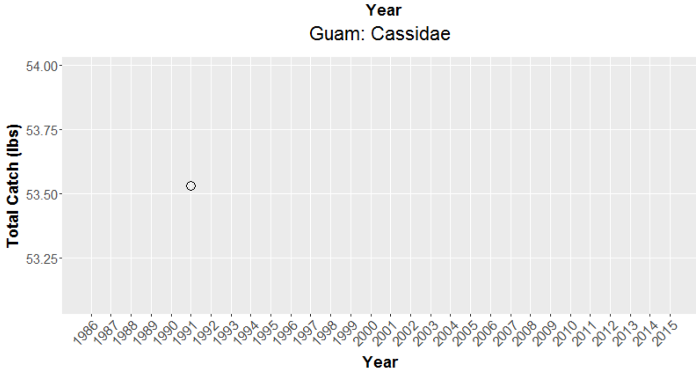

Guam: Carcharhinus limbatus
Total Catch (lbs)
250
500
750
Year

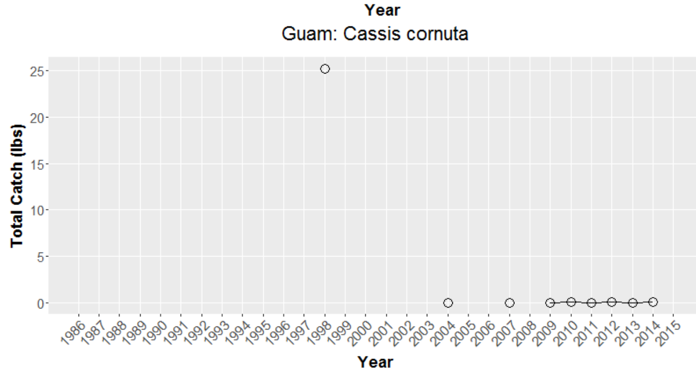

Guam: Carcharhinus melanopterus
Total Catch (lbs)
0
5000
10000
15000
20000
25000
Year


Guam: Carditidae
Total Catch (lbs)
0.00
0.25
0.50
0.75
Year


Guam: Carpilius convexus
Total Catch (lbs)
204.75
205.00
205.25
205.50
Year


Guam: Carpilius maculatus
Total Catch (lbs)
0
1000
2000
3000
Year


Guam: Cassidae
Total Catch (lbs)
53.25
53.50
53.75
54.00
Year


Guam: Cassis cornuta
Total Catch (lbs)
0
5
10
15
20
25
Year

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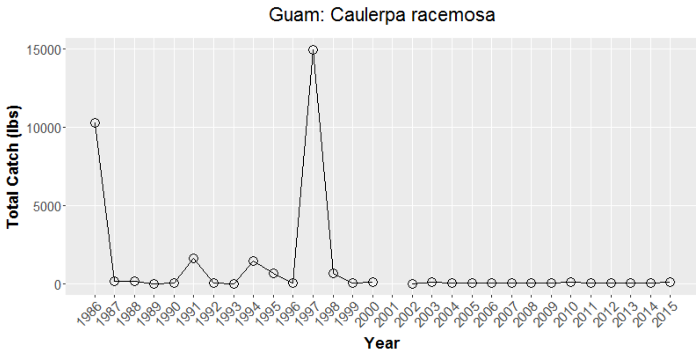
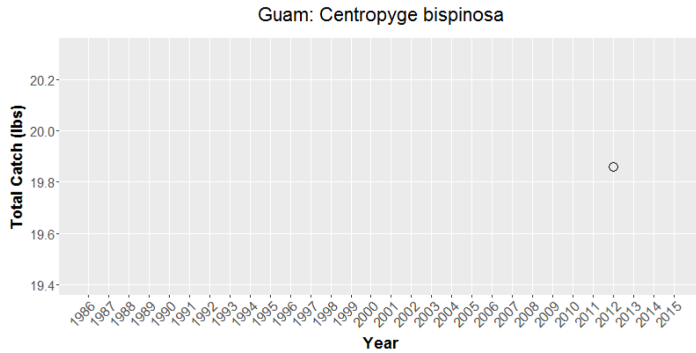
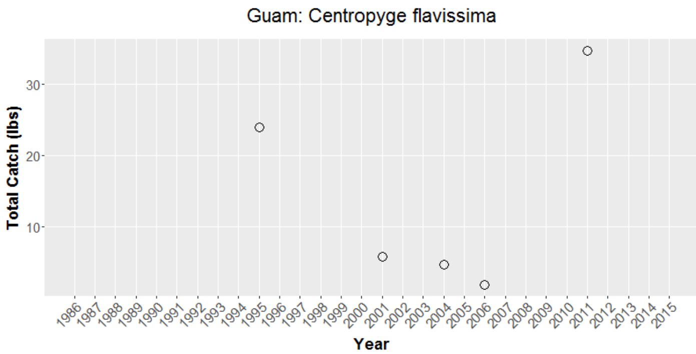
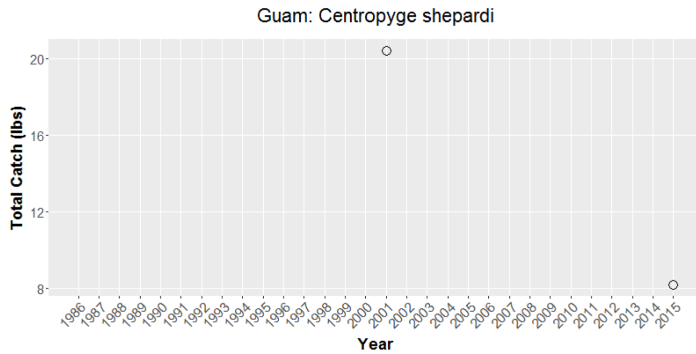
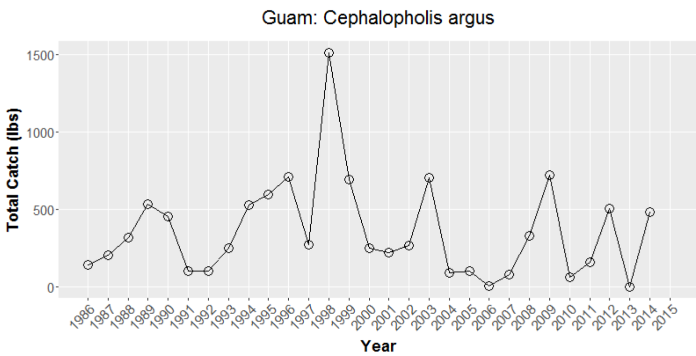
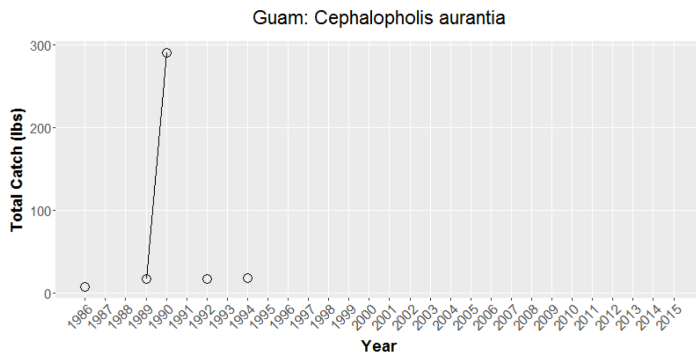


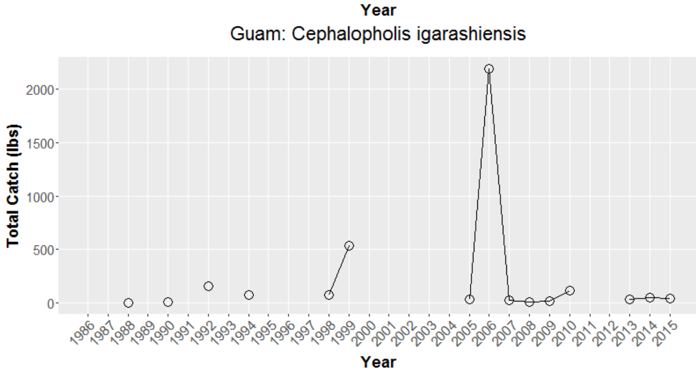


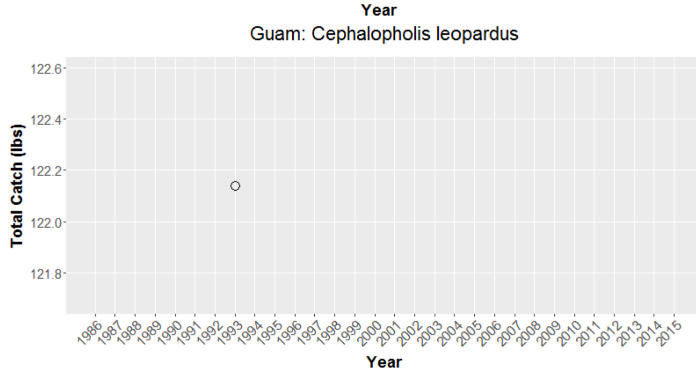


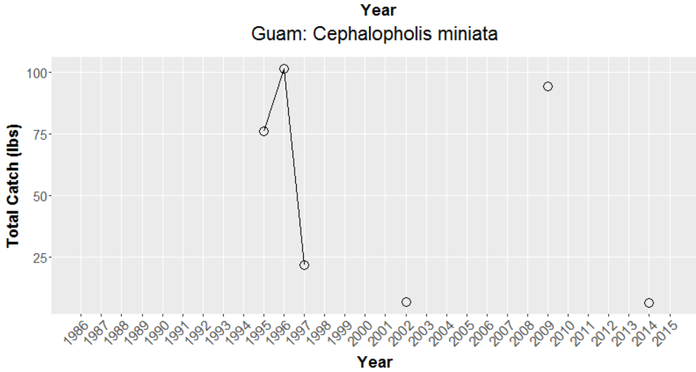


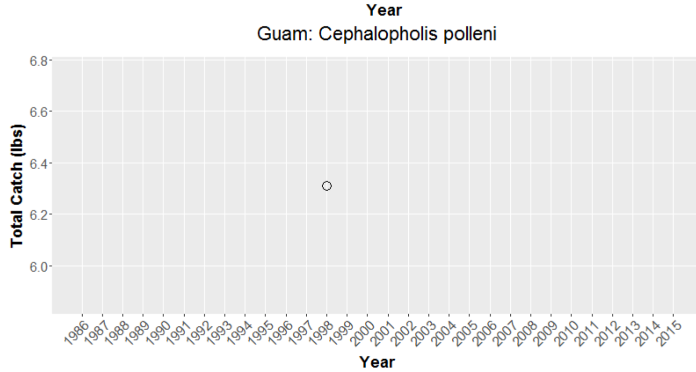


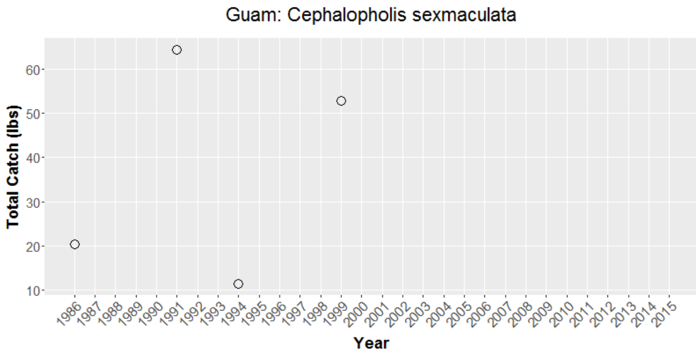


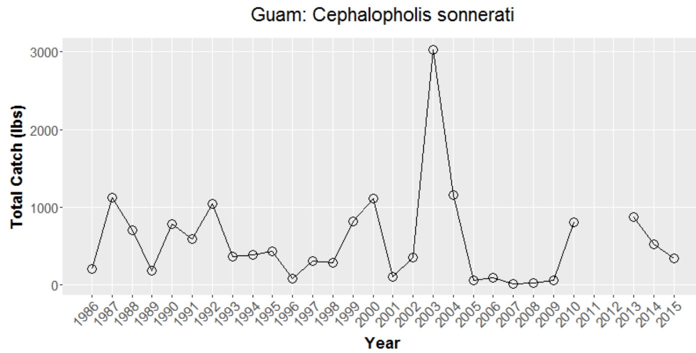


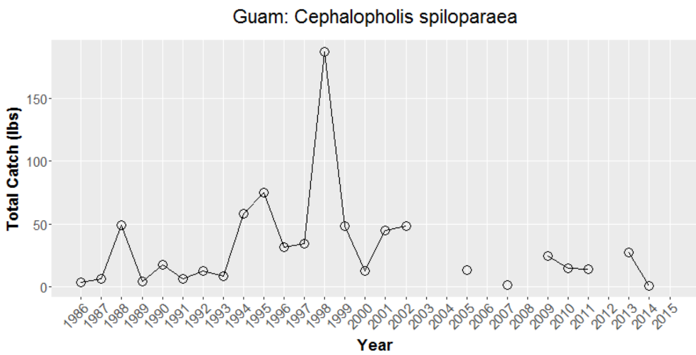


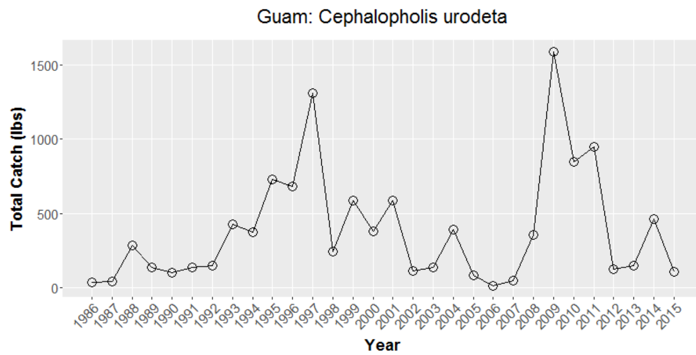


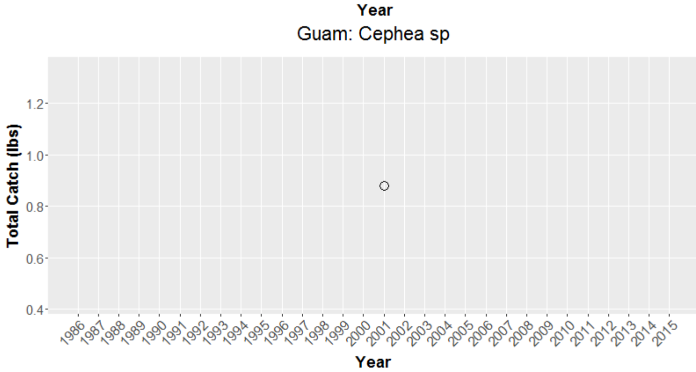


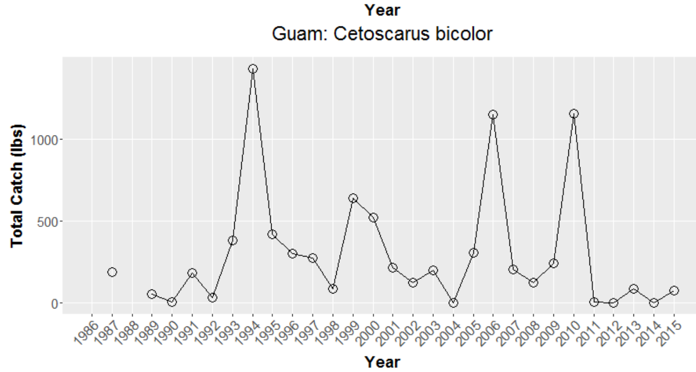

Guam: Cephalopholis sexmaculata
Total Catch (lbs)
Year

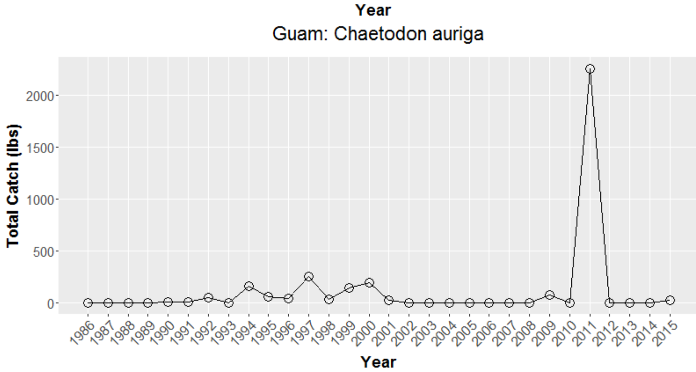

Guam: Cephalopholis sonnerati
Total Catch (lbs)
Year

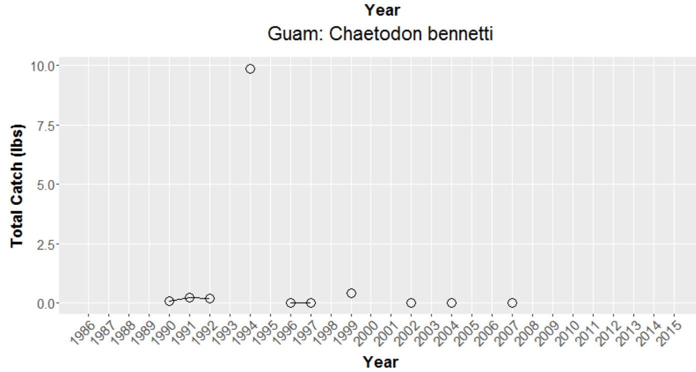

Guam: Cephalopholis spiloparaea
Total Catch (lbs)
Year

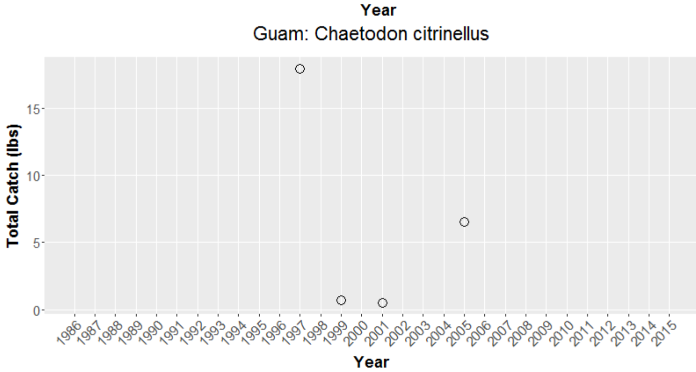

Guam: Cephalopholis urodeta
Total Catch (lbs)
Year

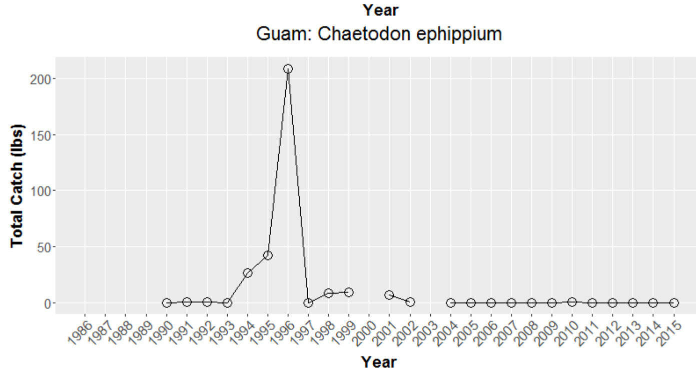

Guam: Cephea sp
Total Catch (lbs)
Year


Guam: Cetoscarus bicolor
Total Catch (lbs)
Year

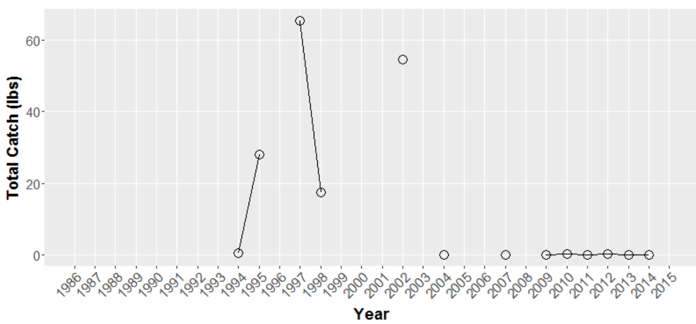

Guam: Chaetodon auriga
Total Catch (lbs)
Year


Guam: Chaetodon bennetti
Total Catch (lbs)
Year

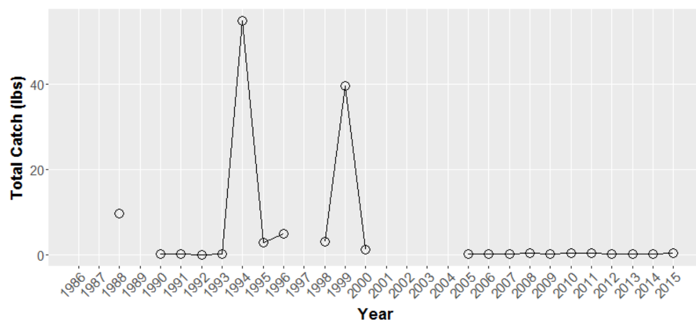

Guam: Chaetodon citrinellus
Total Catch (lbs)
Year


Guam: Chaetodon ephippium
Total Catch (lbs)
Year

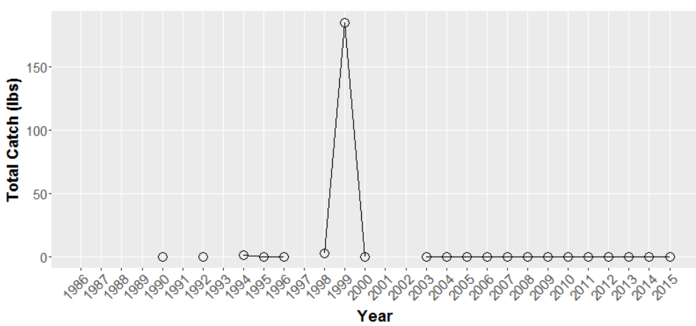
Guam: Chaetodon lineolatus



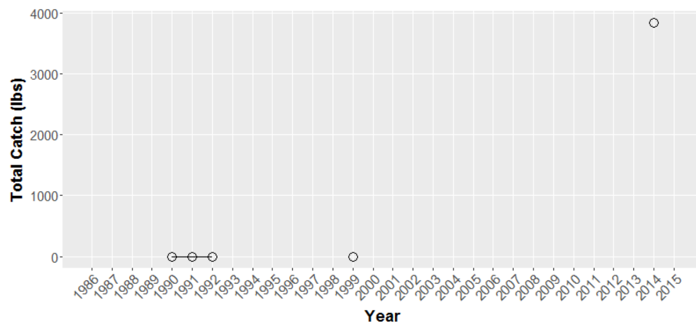
Guam: Chaetodon lunula



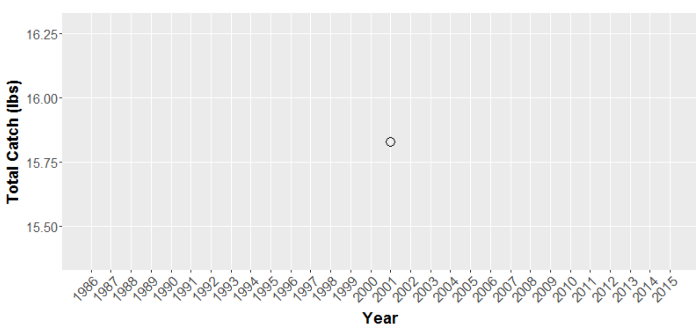
Guam: Chaetodon lunulatus



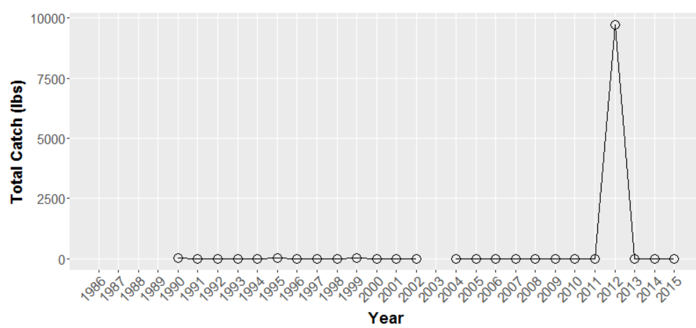
Guam: Chaetodon melannotus



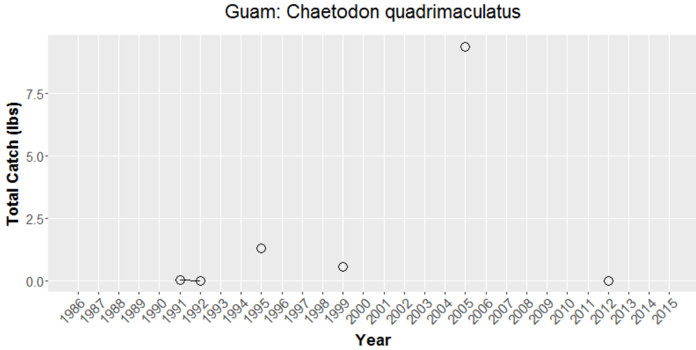
Guam: Chaetodon mertensii



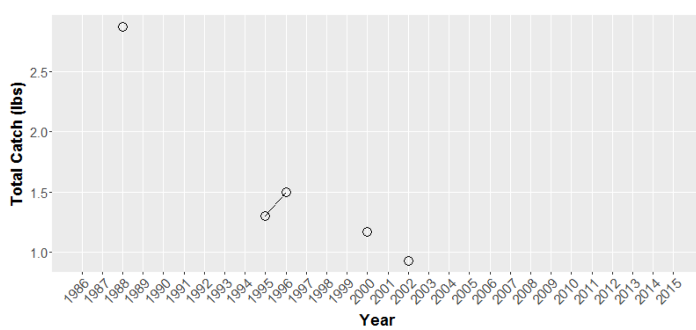
Guam: Chaetodon ornatissimus



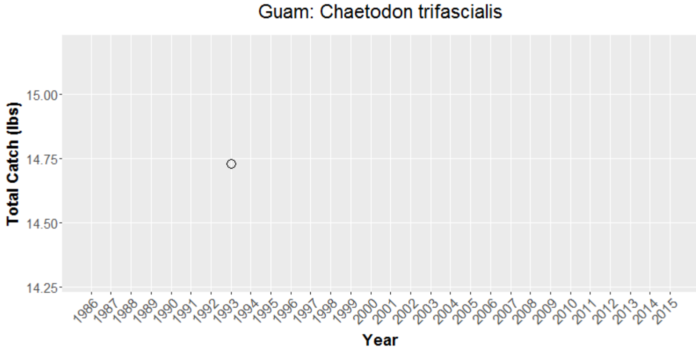
Guam: Chaetodon quadrimaculatus



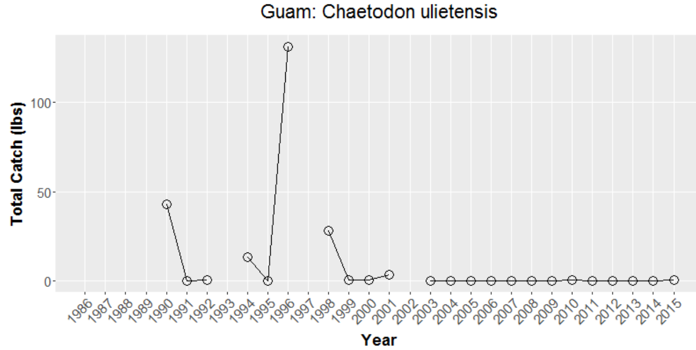
Guam: Chaetodon reticulatus



Guam: Chaetodon trifascialis



Guam: Chaetodon ulietensis



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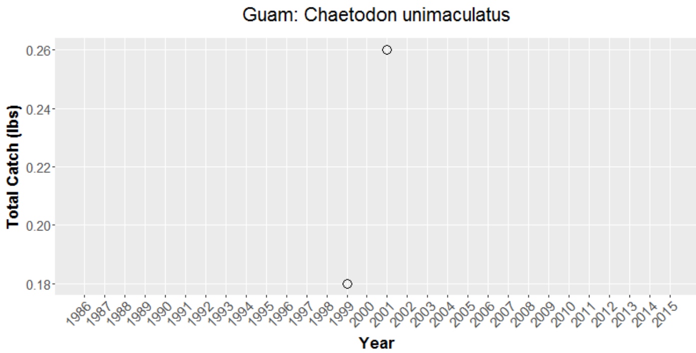
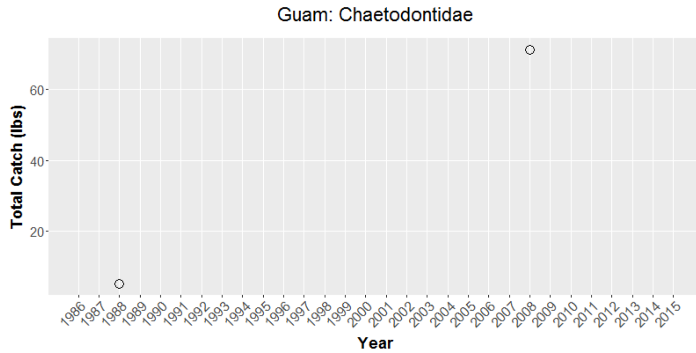
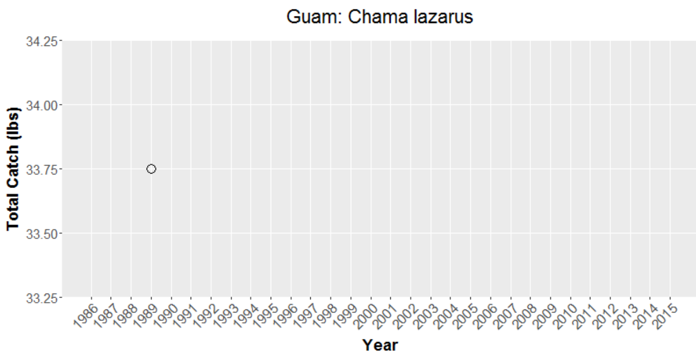
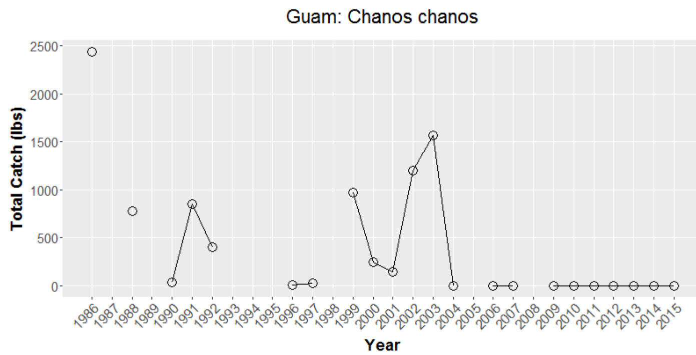
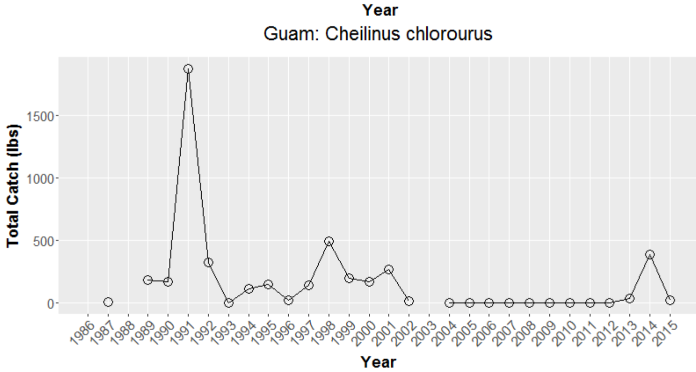
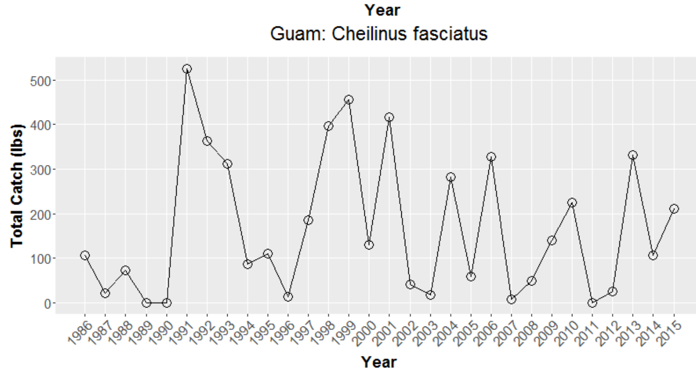


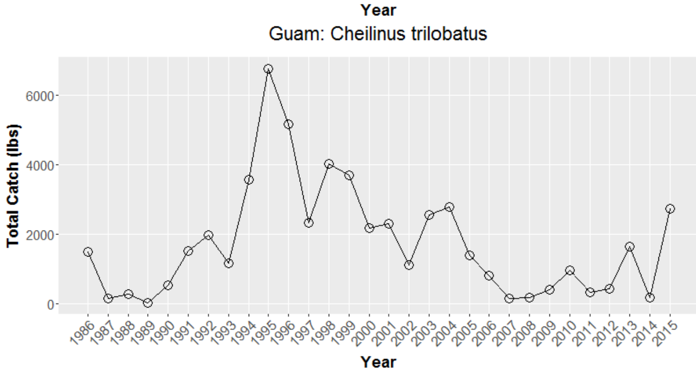


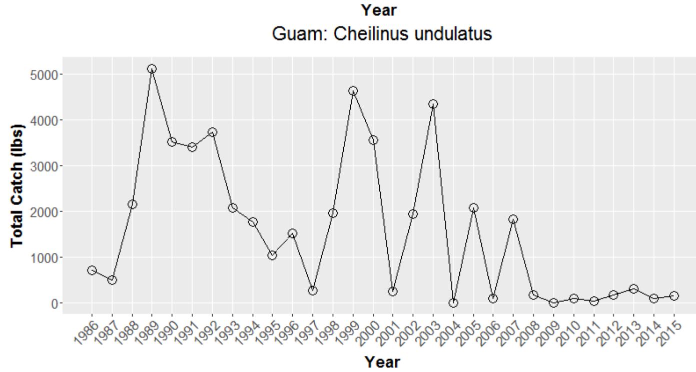


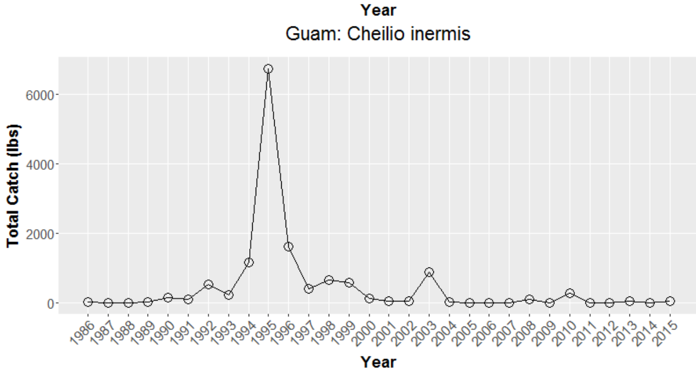


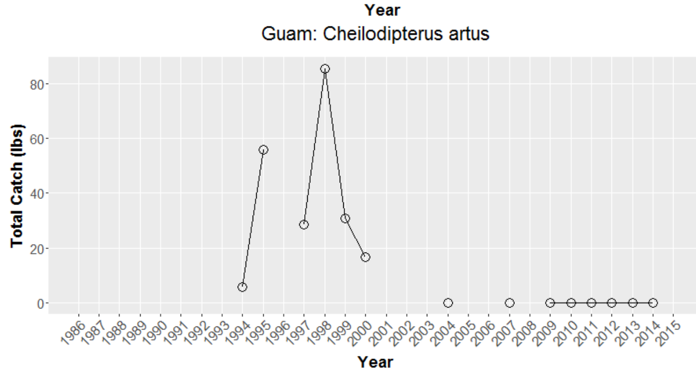


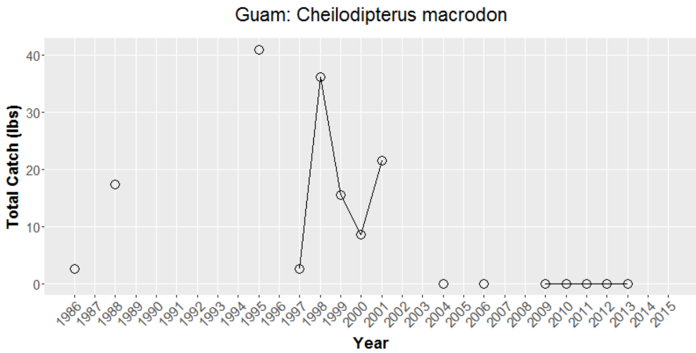


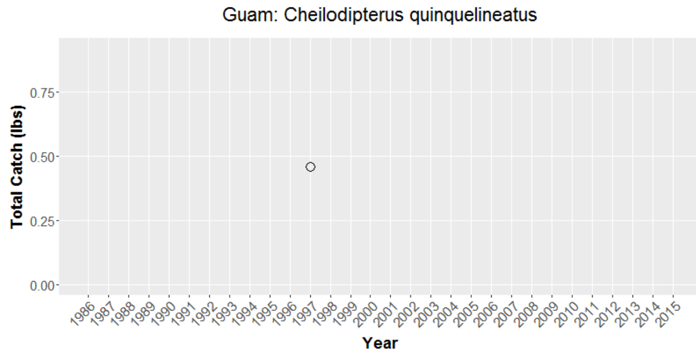


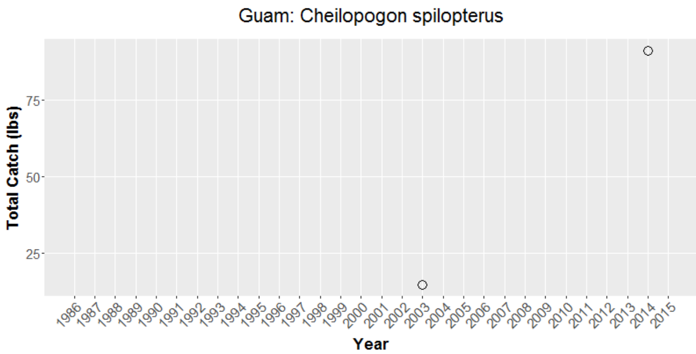


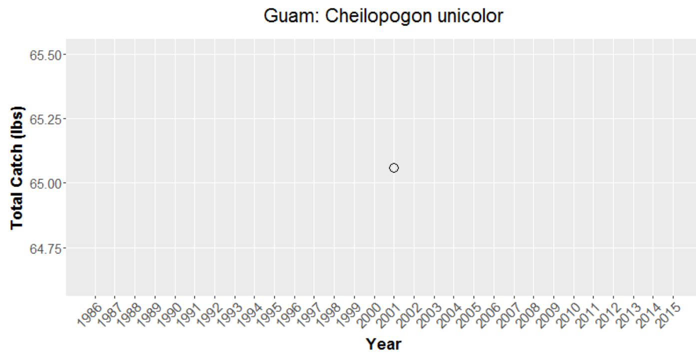


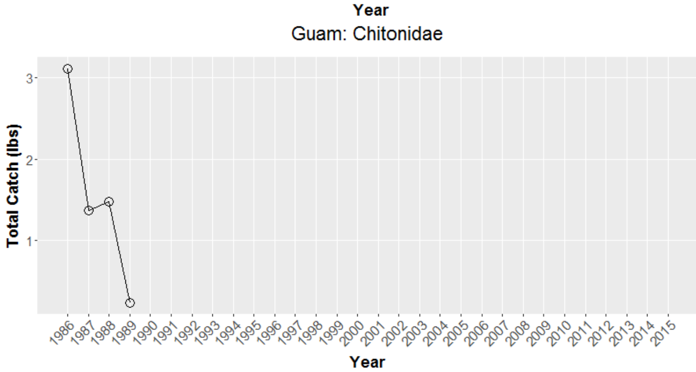


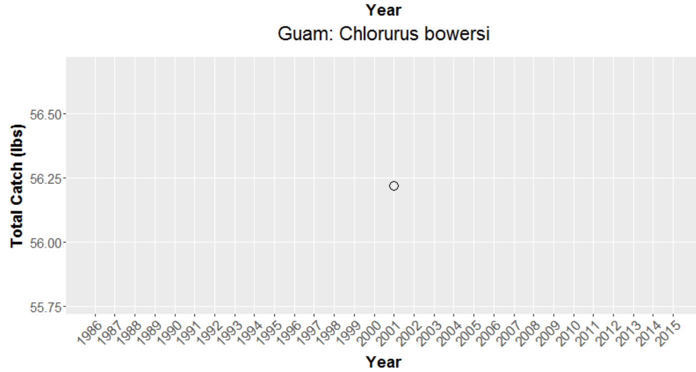

Guam: Cheilodipterus macrodon
Total Catch (lbs)
Year

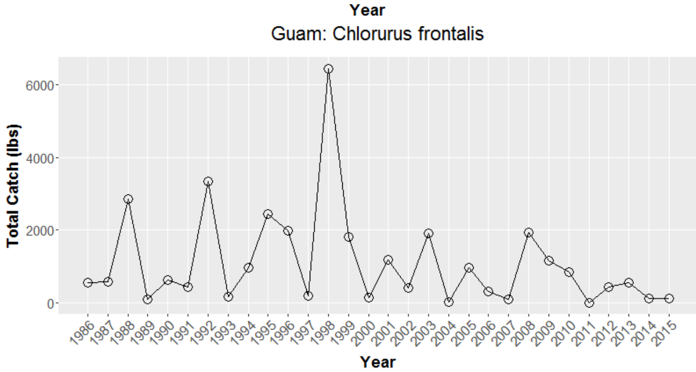

Guam: Cheilodipterus quinquelineatus
Total Catch (lbs)
Year

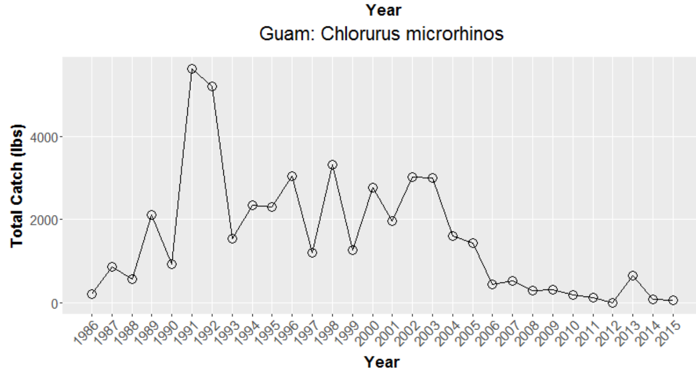

Guam: Cheilopogon spilopterus
Total Catch (lbs)
Year

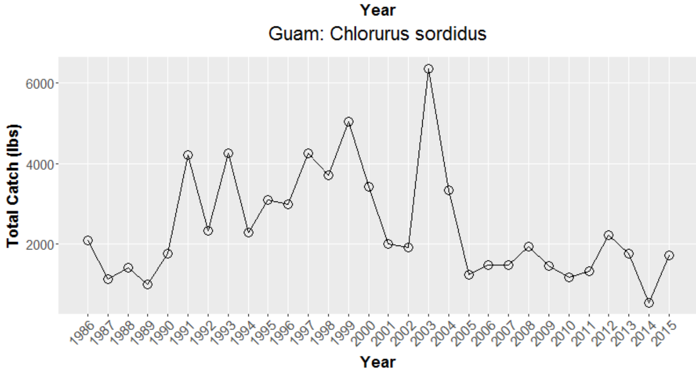

Guam: Cheilopogon unicolor
Total Catch (lbs)
Year

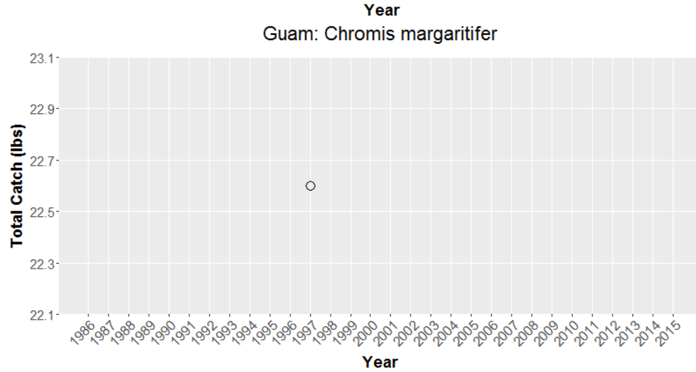

Guam: Chitonidae
Total Catch (lbs)
Year

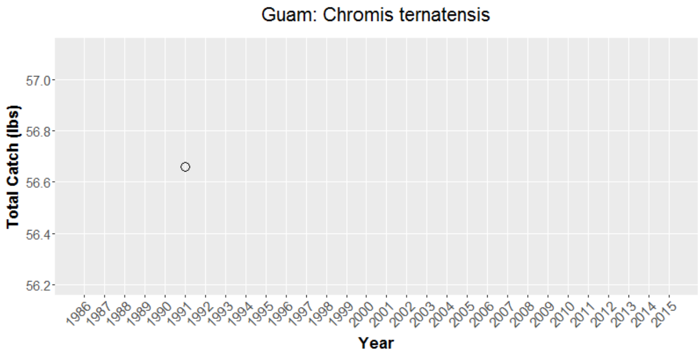

Guam: Chlorurus bowersi
Total Catch (lbs)
Year

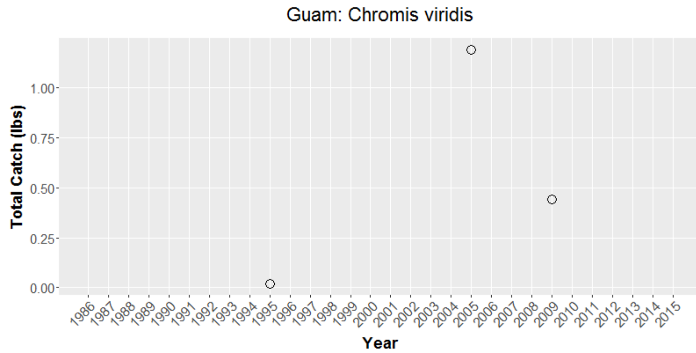

Guam: Chlorurus frontalis
Total Catch (lbs)
Year

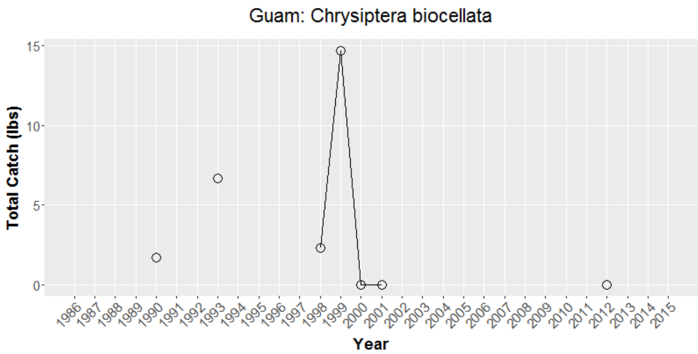

Guam: Chlorurus microrhinos
Total Catch (lbs)
Year

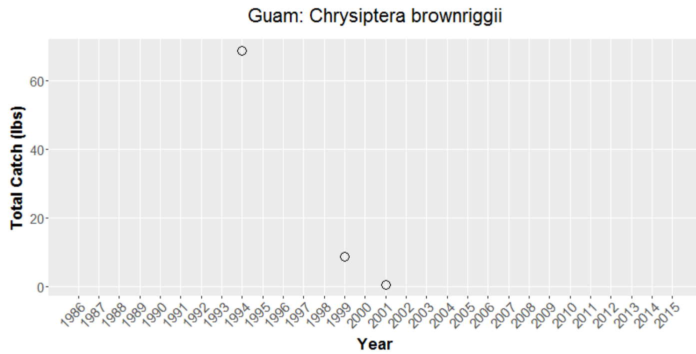

Guam: Chlorurus sordidus
Total Catch (lbs)
Year

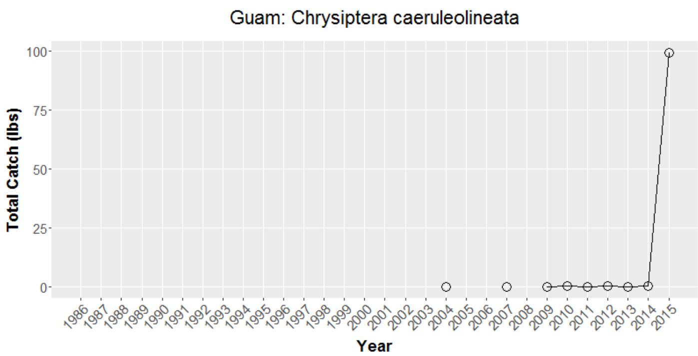

Guam: Chromis margaritifer
Total Catch (lbs)
Year

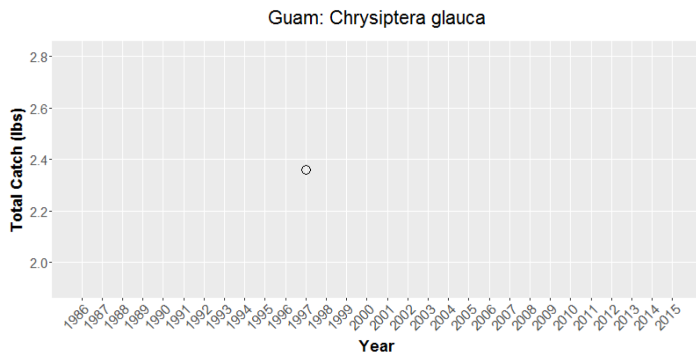

Guam: Chromis ternatensis
Total Catch (lbs)
57.0
56.8
56.6
56.4
56.2
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

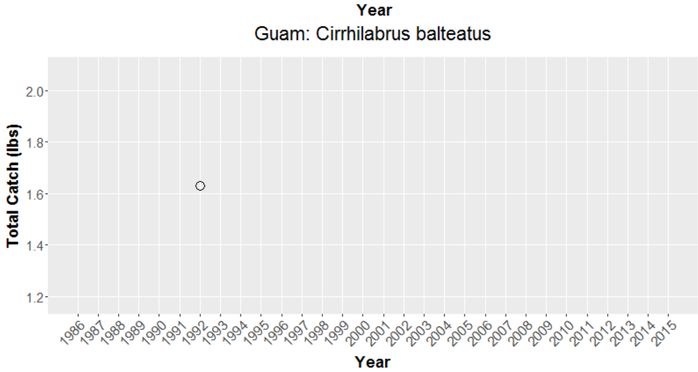

Guam: Chromis viridis
Total Catch (lbs)
1.00
0.75
0.50
0.25
0.00
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

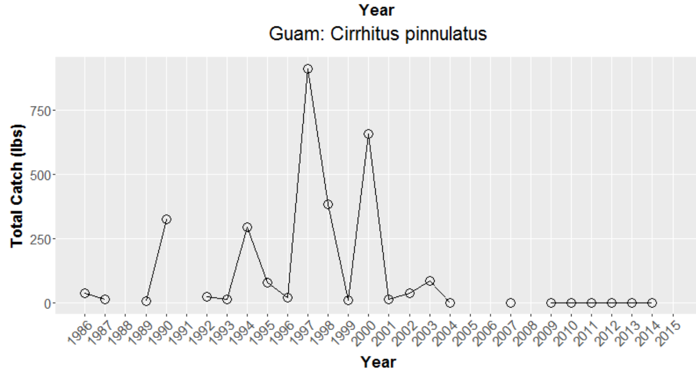

Guam: Chrysiptera biocellata
Total Catch (lbs)
15
10
5
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

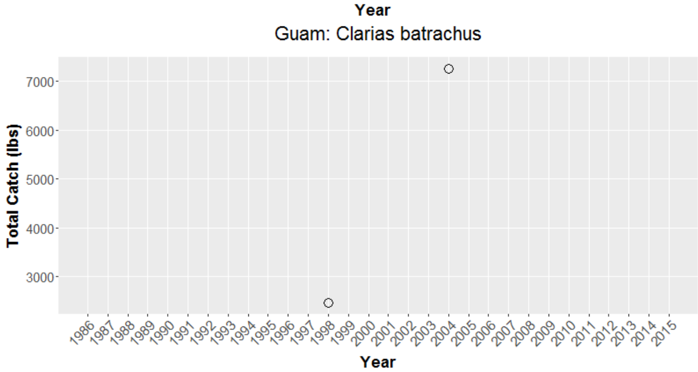

Guam: Chrysiptera brownriggii
Total Catch (lbs)
60
40
20
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

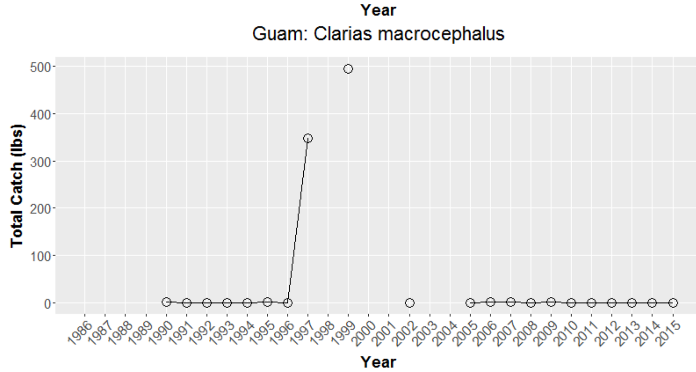

Guam: Chrysiptera caeruleolineata
Total Catch (lbs)
100
75
50
25
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


Guam: Chrysiptera glauca
Total Catch (lbs)
2.8
2.6
2.4
2.2
2.0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


Guam: Cirrhilabrus balteatus
Total Catch (lbs)
2.0
1.8
1.6
1.4
1.2
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


Guam: Cirrhitus pinnulatus
Total Catch (lbs)
750
500
250
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


Guam: Clarias batrachus
Total Catch (lbs)
7000
6000
5000
4000
3000
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


Guam: Clarias macrocephalus
Total Catch (lbs)
500
400
300
200
100
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

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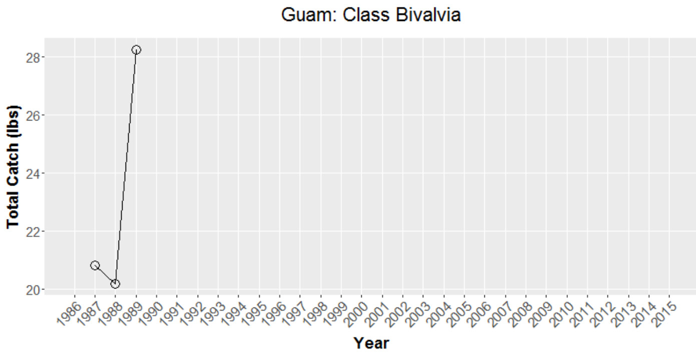

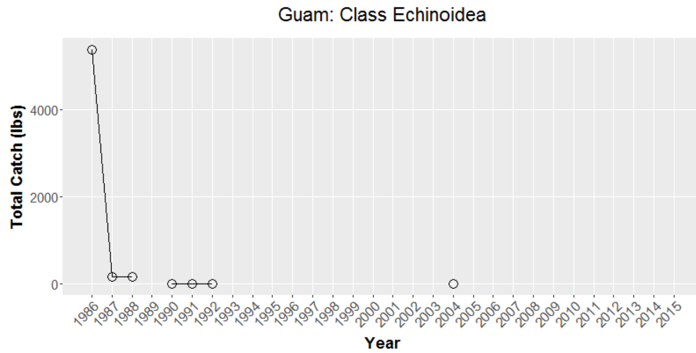

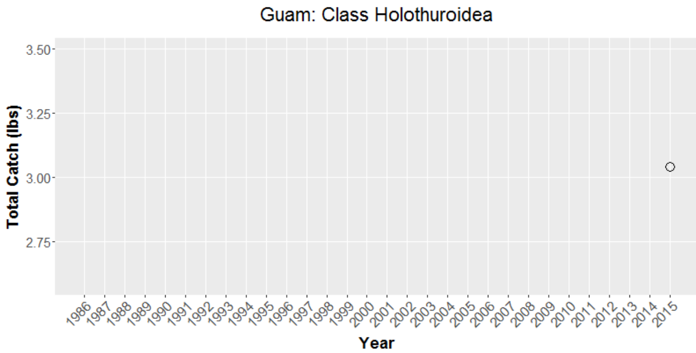

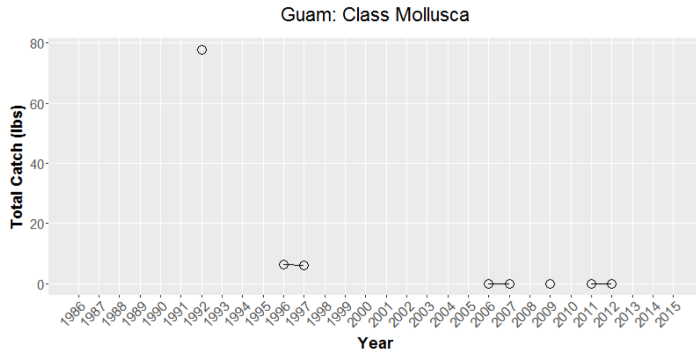

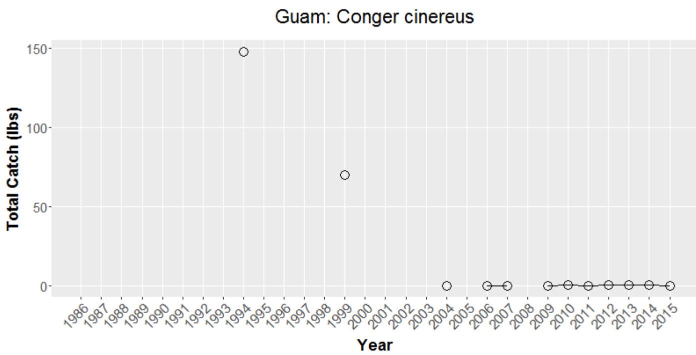

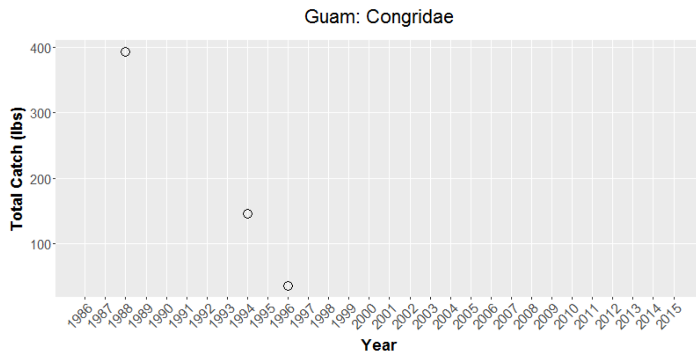

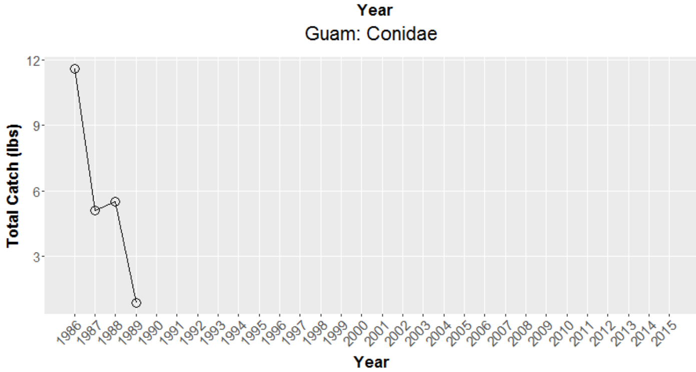

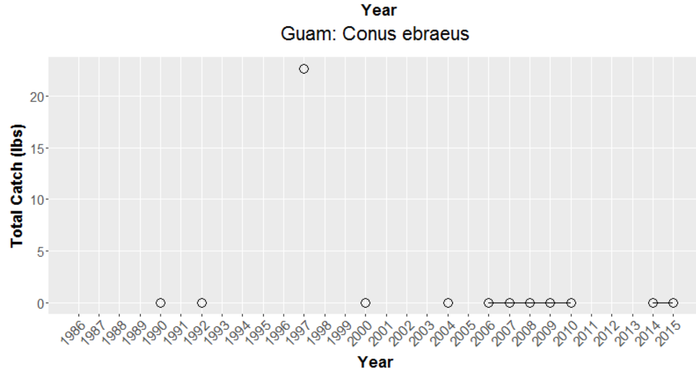

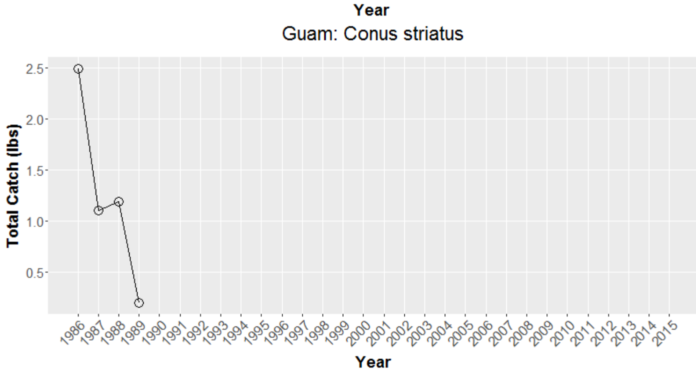

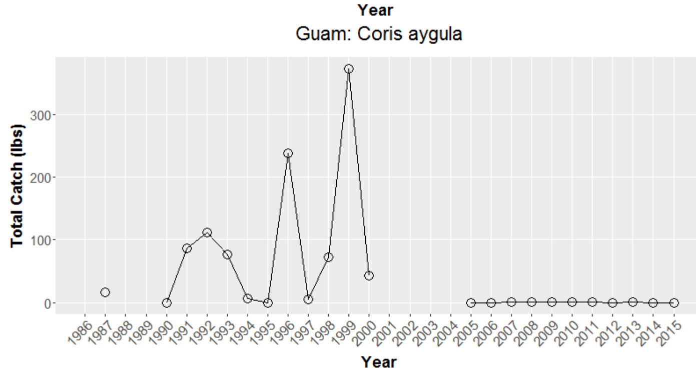

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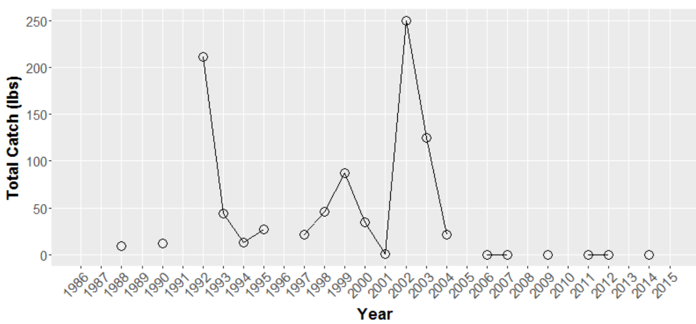
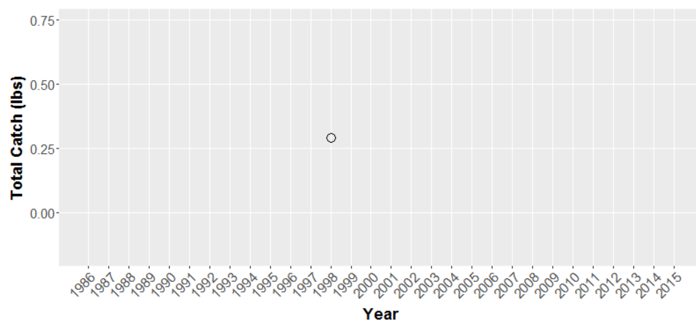
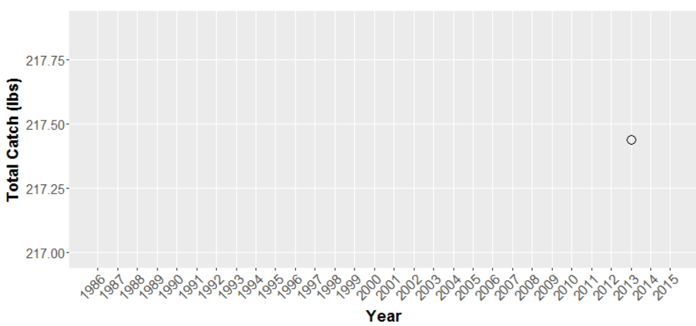
Guam: Coris gaimard



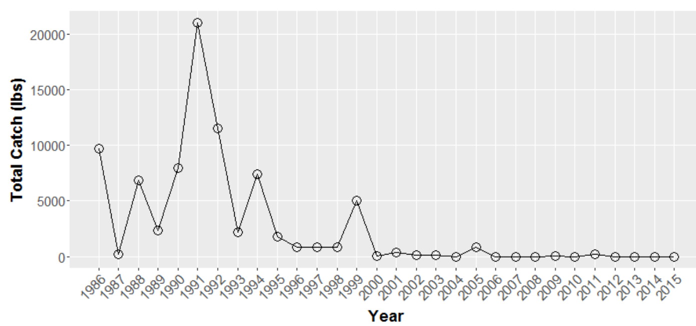
Guam: Corythoichthys intestinalis



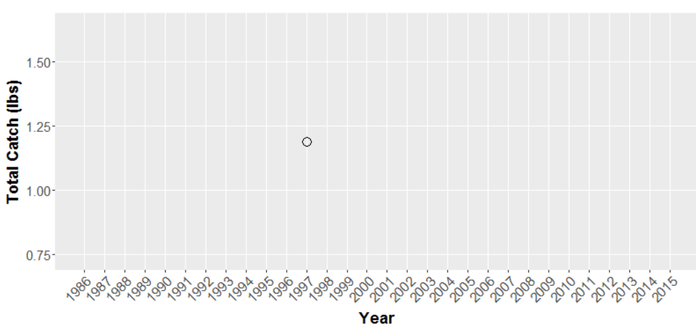
Guam: Corythoichthys schultzi



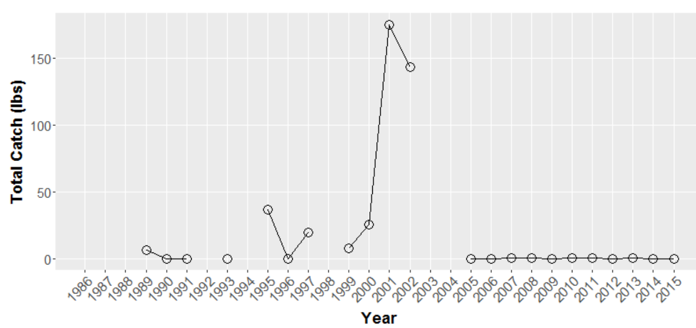
Guam: Crenimugil crenilabis



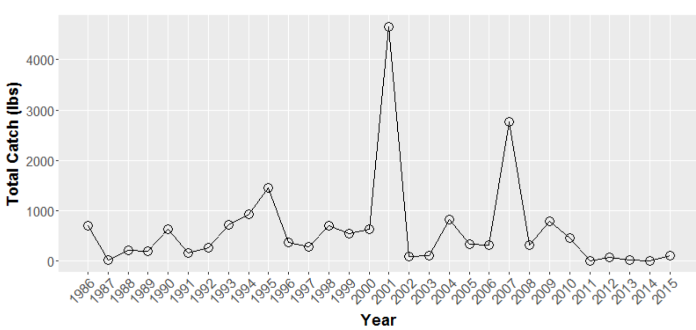
Guam: Cryptocentrus caeruleomaculatus



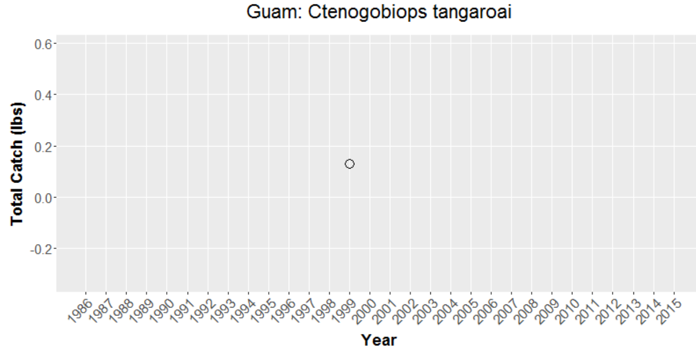
Guam: Ctenochaetus binotatus



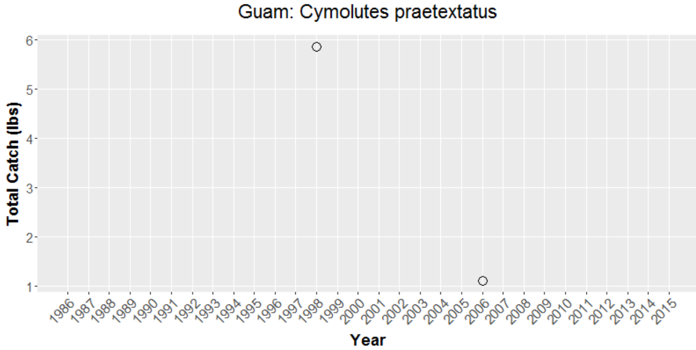
Guam: Ctenochaetus striatus



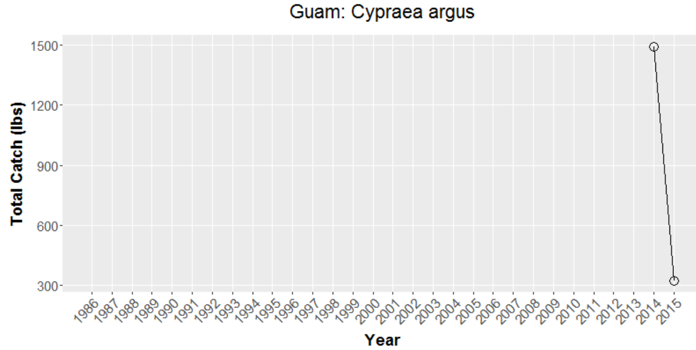
Guam: Ctenogobiops tangaroai



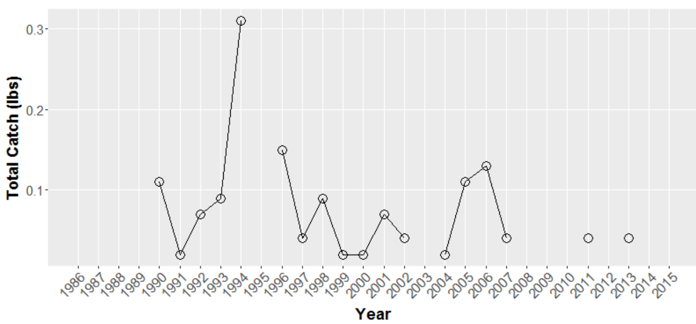
Guam: Cymolutes praetextatus



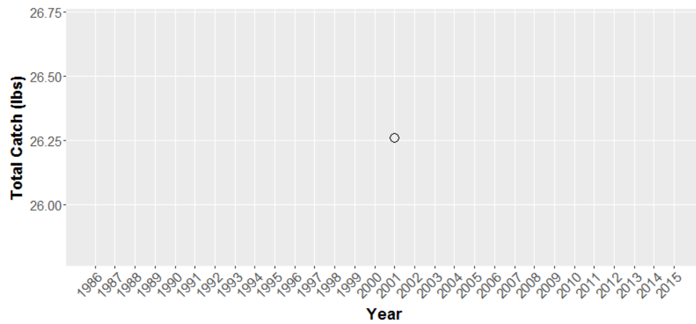
Guam: Cypraea argus



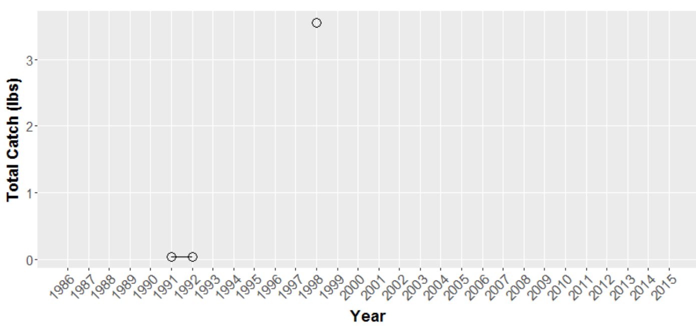
Guam: Cypraea erosa



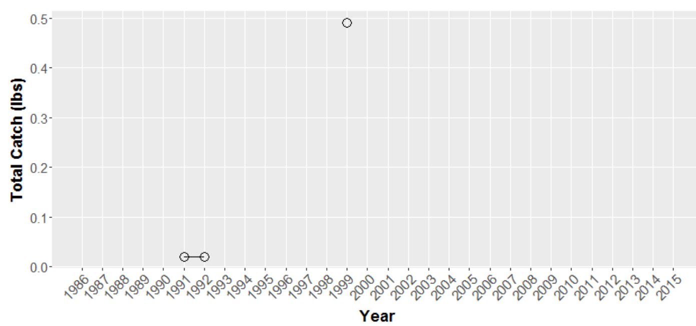
Guam: Cypraea mappa



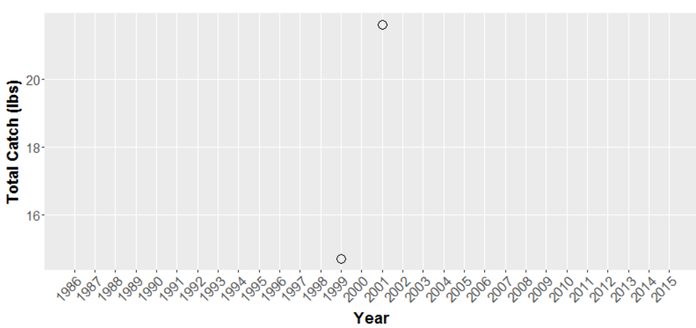
Guam: Cypraea mauritiana



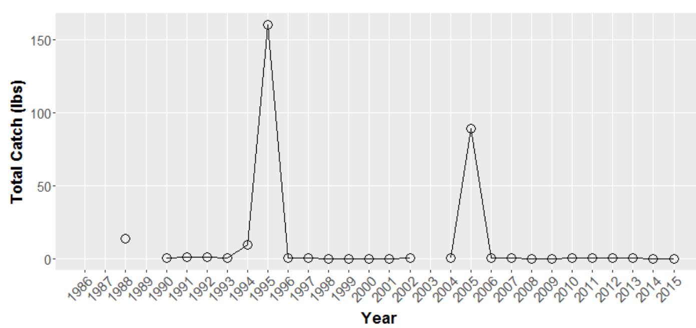
Guam: Cypraea tigris



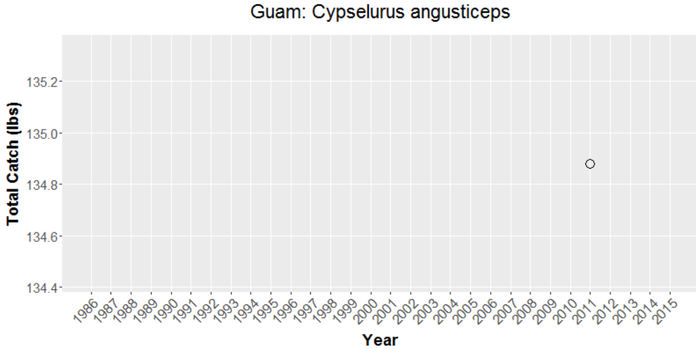
Guam: Cypraea ventriculus



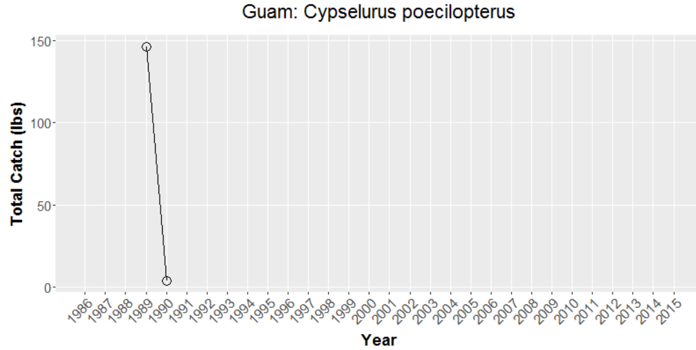
Guam: Cypraeidae



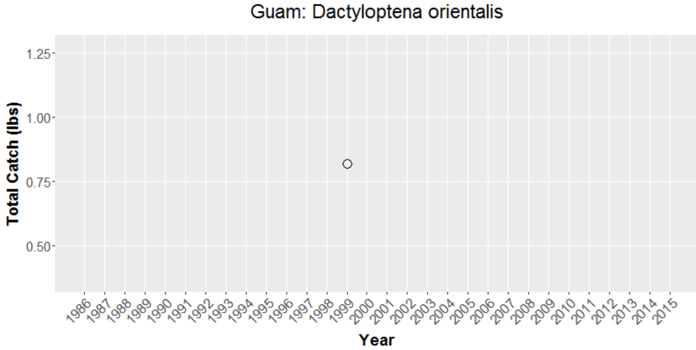
Guam: Cypselurus angusticeps



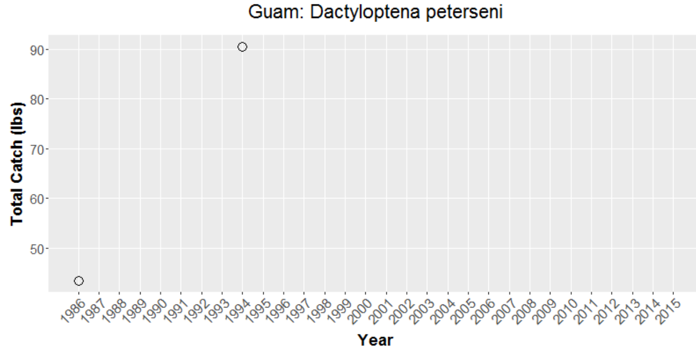
Guam: Cypselurus poecilopterus

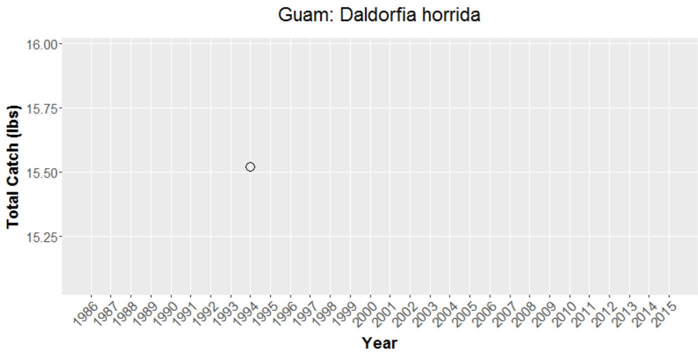


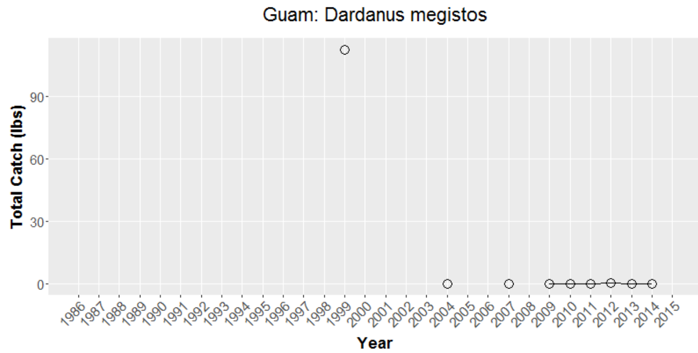
Guam: Dactyloptena orientalis

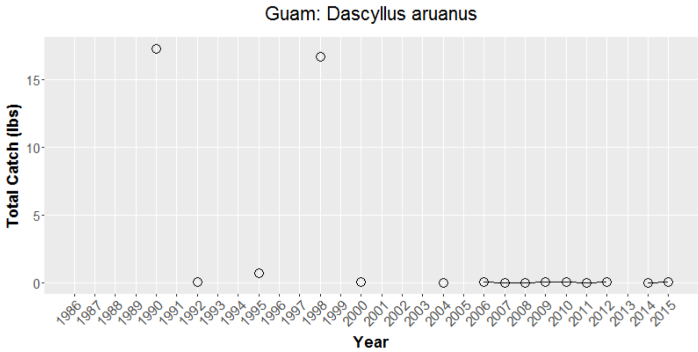


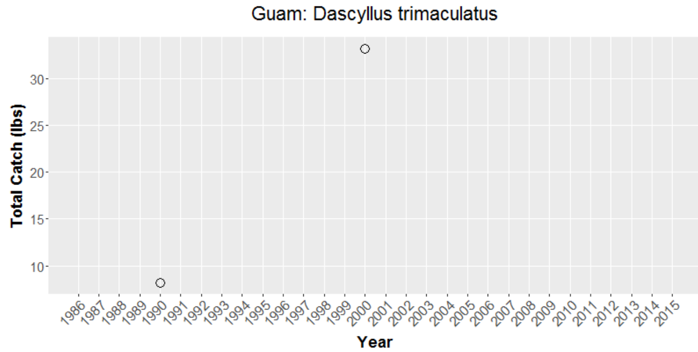
Guam: Dactyloptena peterseni

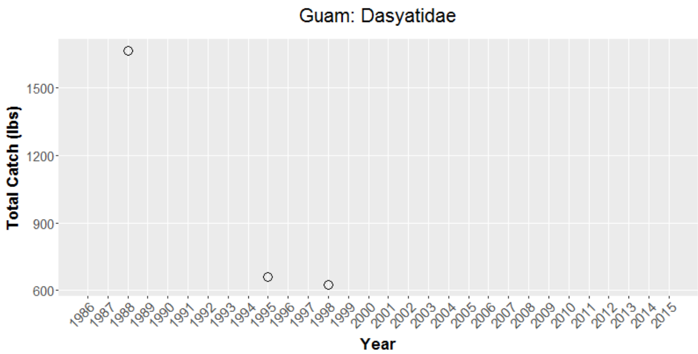


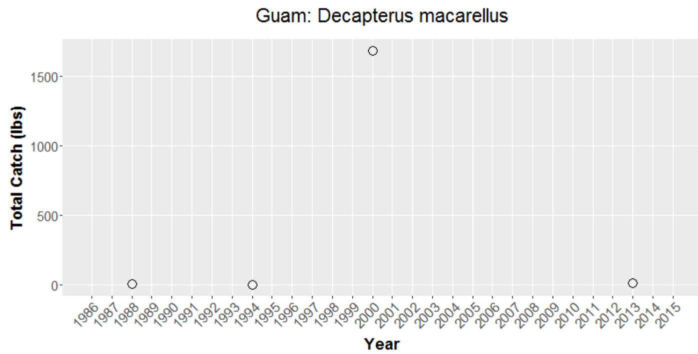

Guam: Daldorfia horrida
Total Catch (lbs)
16.00
15.75
15.50
15.25
Year

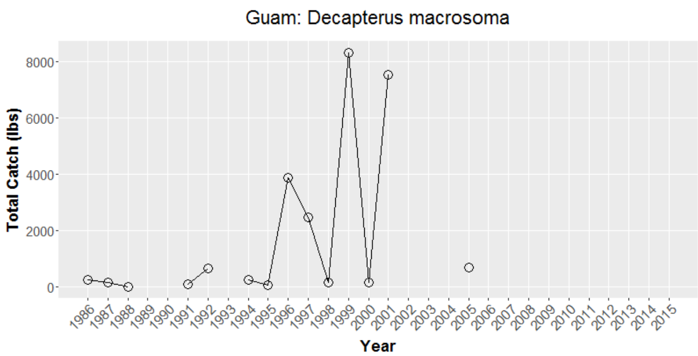

Guam: Dardanus megistos
Total Catch (lbs)
90
60
30
0
Year

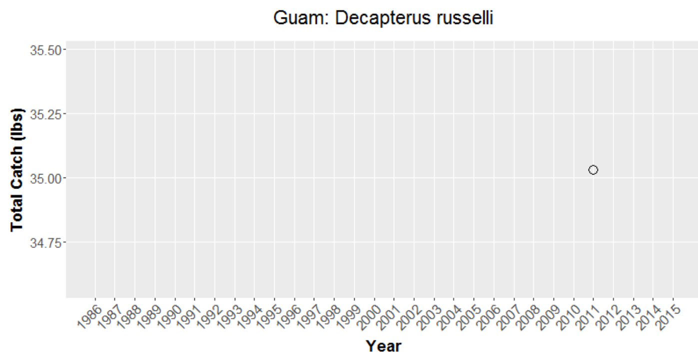

Guam: Dascyllus aruanus
Total Catch (lbs)
15
10
5
0
Year

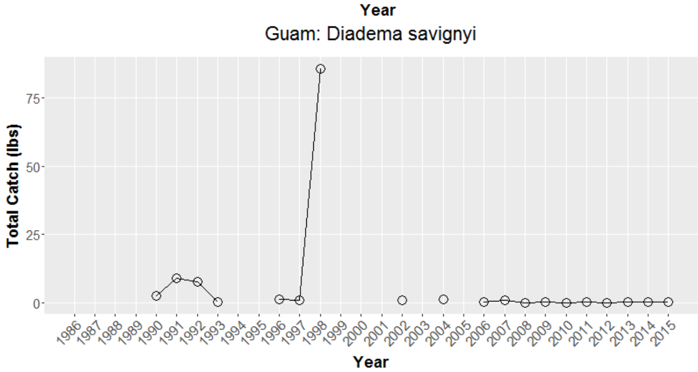

Guam: Dascyllus trimaculatus
Total Catch (lbs)
30
25
20
15
10
Year

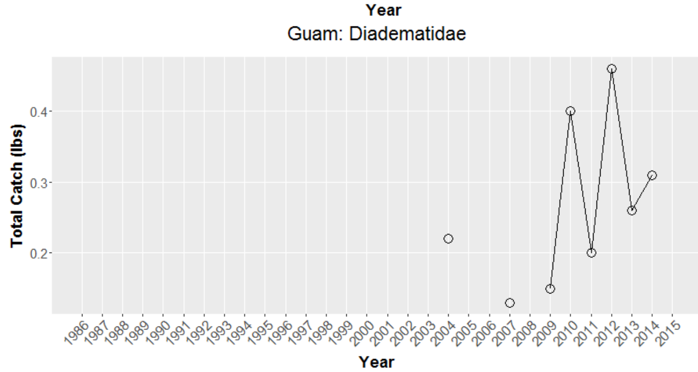

Guam: Dasyatidae
Total Catch (lbs)
1500
1200
900
600
Year


Guam: Decapterus macarellus
Total Catch (lbs)
1500
1000
500
0
Year

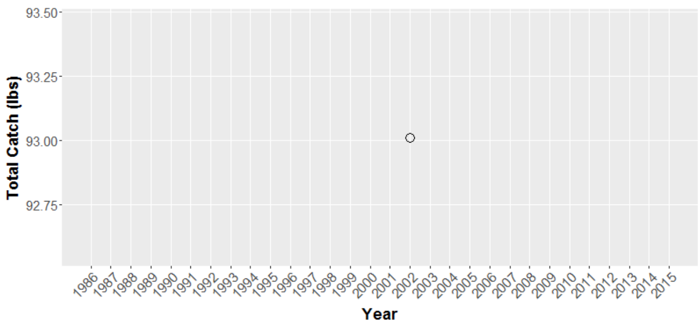

Guam: Decapterus macrosoma
Total Catch (lbs)
8000
6000
4000
2000
0
Year


Guam: Decapterus russelli
Total Catch (lbs)
35.50
35.25
35.00
34.75
Year

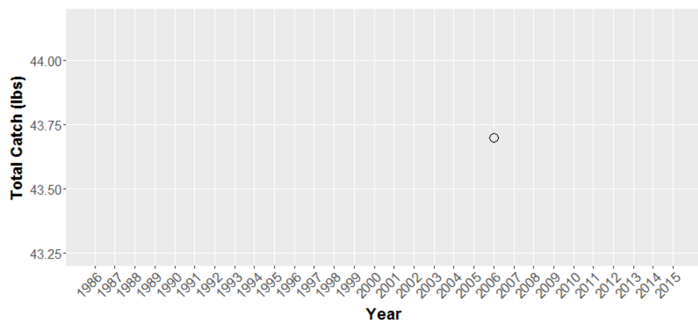

Guam: Diadema savignyi
Total Catch (lbs)
75
50
25
0
Year


Guam: Diadematidae
Total Catch (lbs)
0.4
0.3
0.2
Year

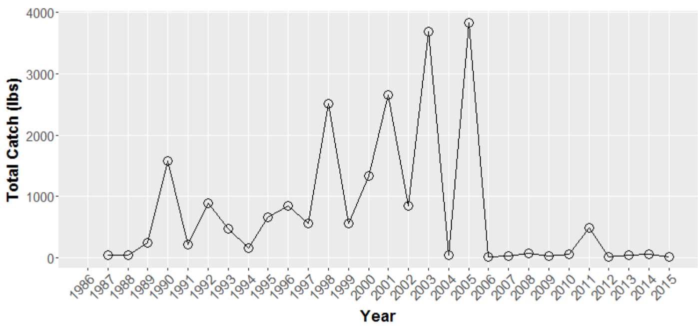
Guam: Diagramma pictum



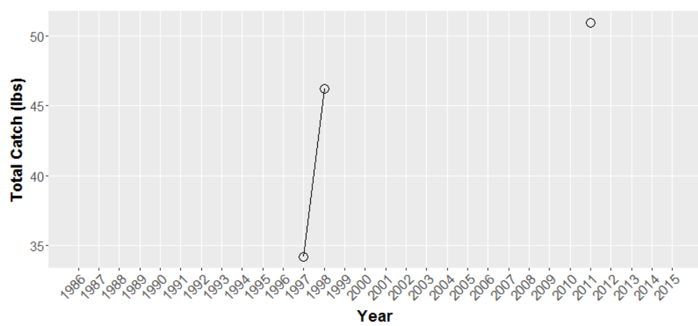
Guam: Diodon eydouxii



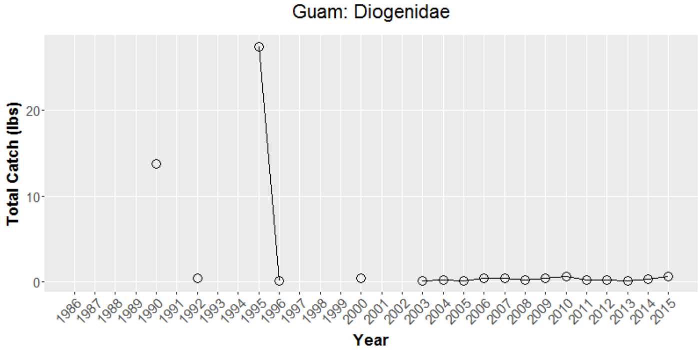
Guam: Diodon hystrix



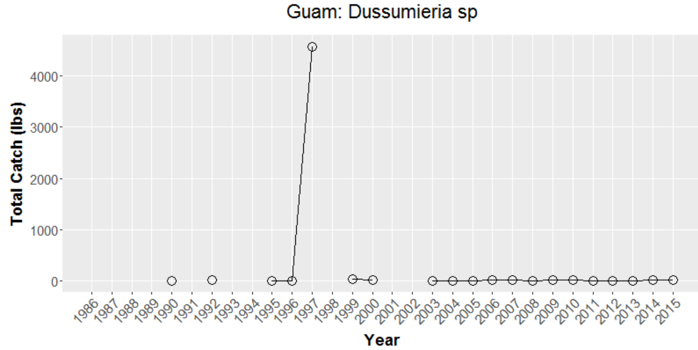
Guam: Diodon liturosus



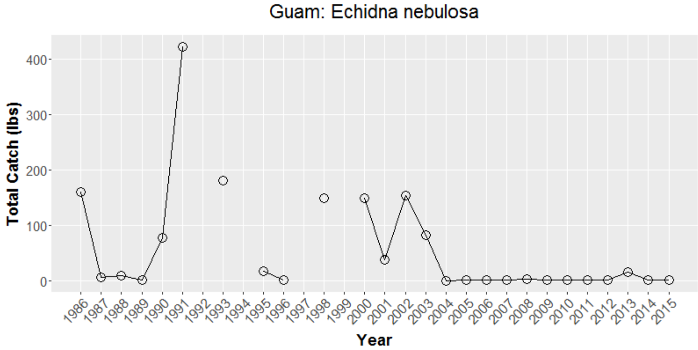
Guam: Diogenidae



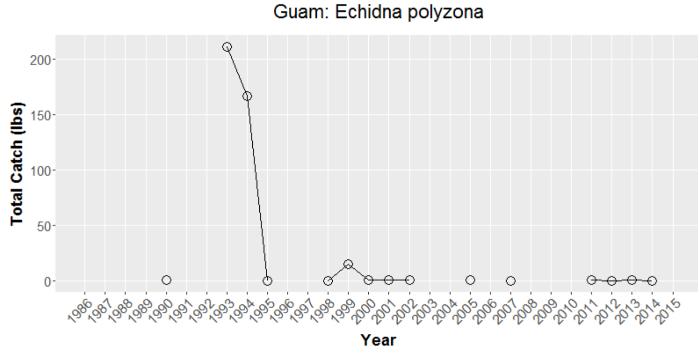
Guam: Dussumieria sp



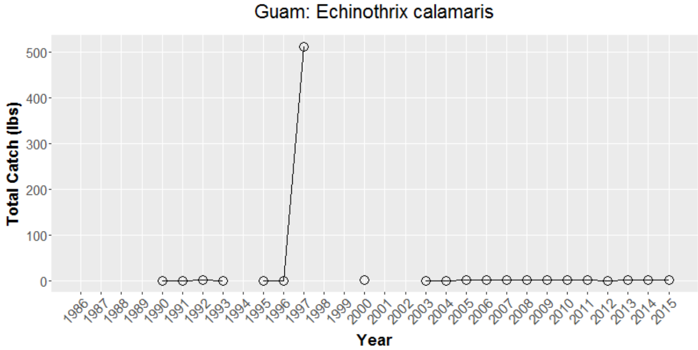
Guam: Echidna nebulosa



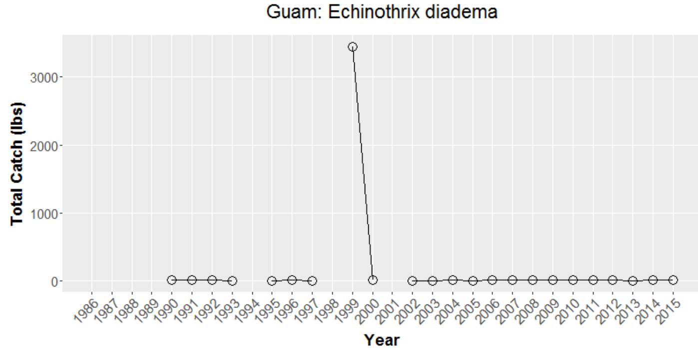
Guam: Echidna polyzona

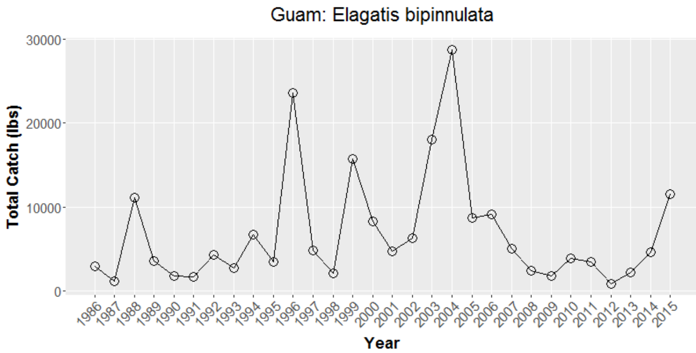


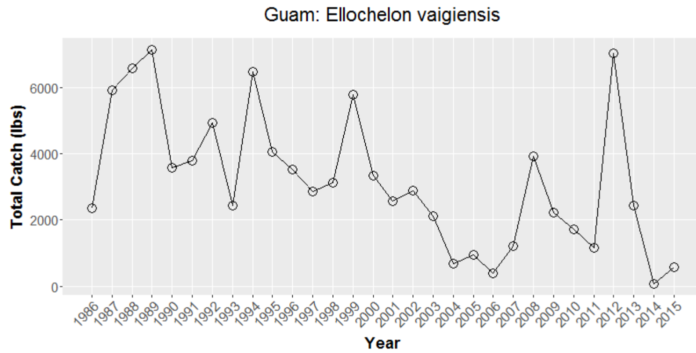
Guam: Echinothrix calamaris

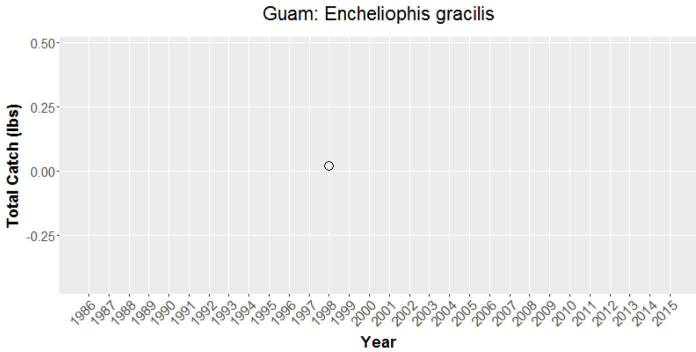


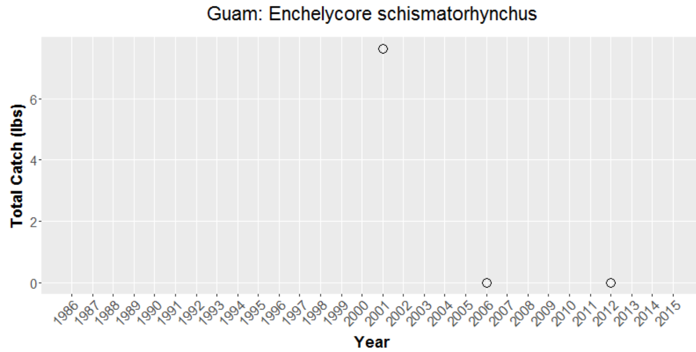
Guam: Echinothrix diadema

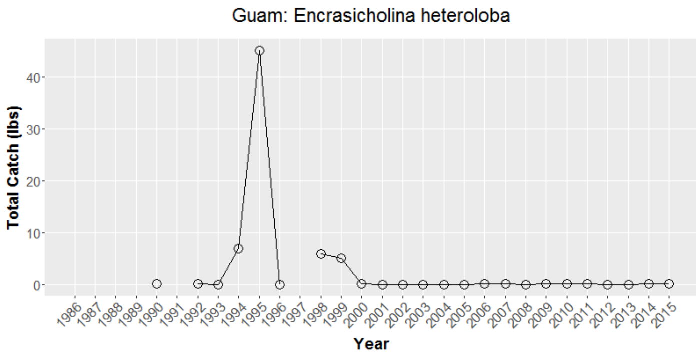


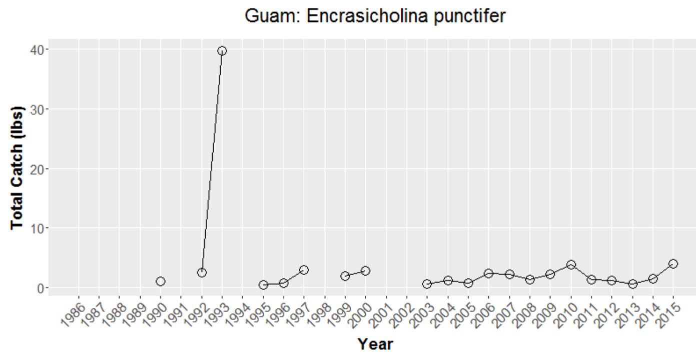

Guam: Elagatis bipinnulata
Total Catch (lbs)
0
10000
20000
30000
Year

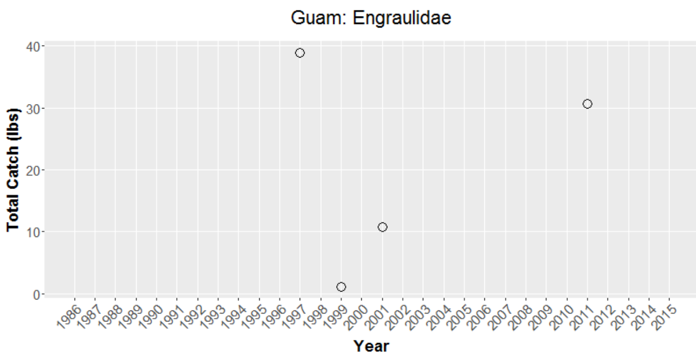

Guam: Ellochelon vaigiensis
Total Catch (lbs)
0
2000
4000
6000
Year

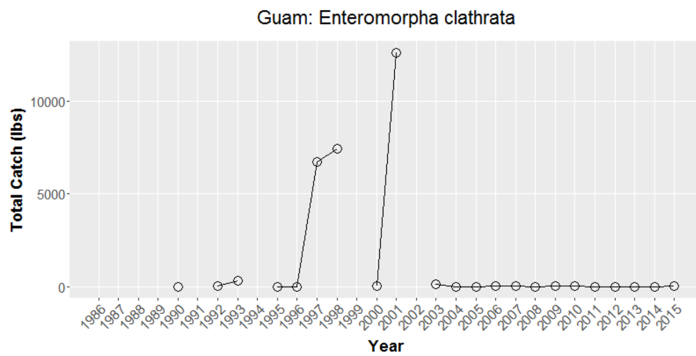

Guam: Encheliophis gracilis
Total Catch (lbs)
-0.25
0.00
0.25
0.50
Year

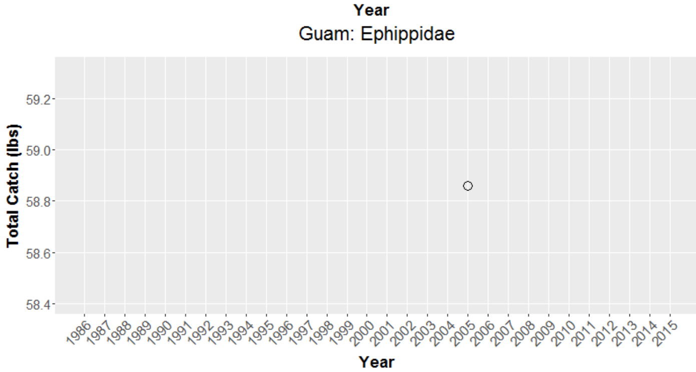

Guam: Enchelycore schismatorhynchus
Total Catch (lbs)
0
2
4
6
Year

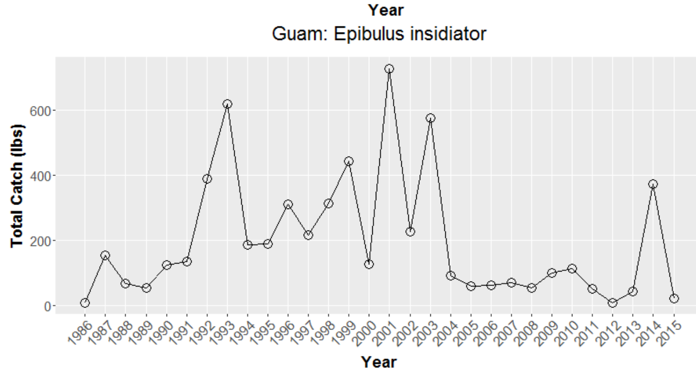

Guam: Encrasicholina heteroloba
Total Catch (lbs)
0
10
20
30
40
Year

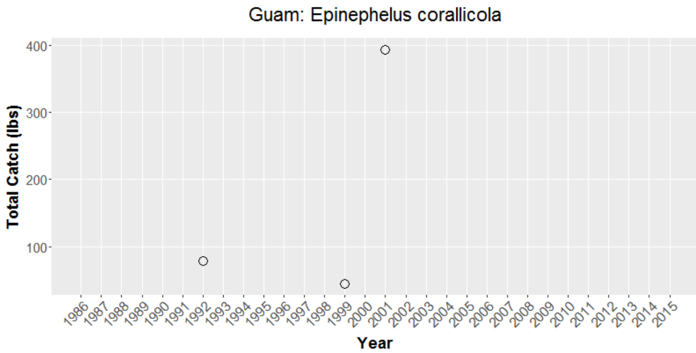

Guam: Encrasicholina punctifer
Total Catch (lbs)
0
10
20
30
40
Year

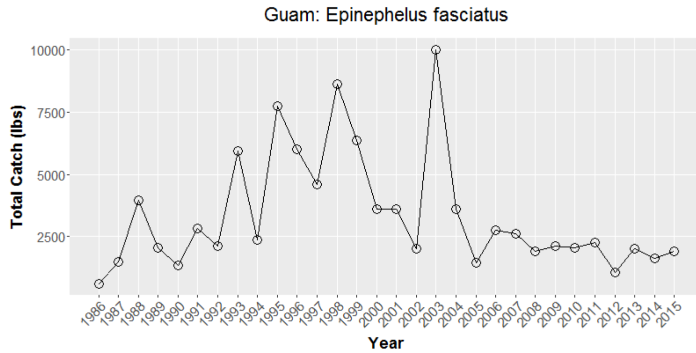

Guam: Engraulidae
Total Catch (lbs)
0
10
20
30
40
Year

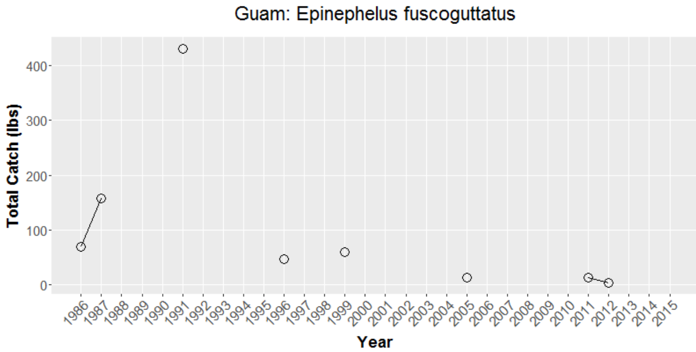

Guam: Enteromorpha clathrata
Total Catch (lbs)
0
5000
10000
Year

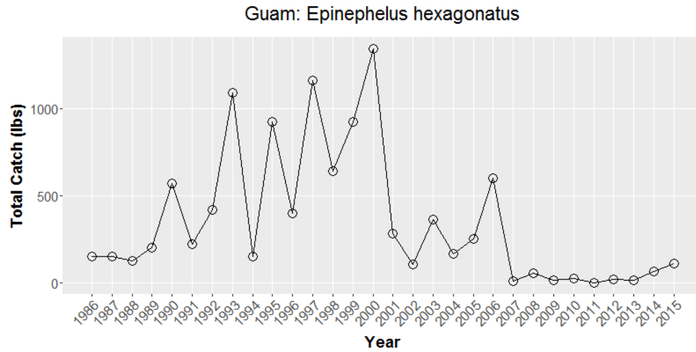

Guam: Ephippidae
Total Catch (lbs)
58.4
58.6
58.8
59.0
59.2
Year

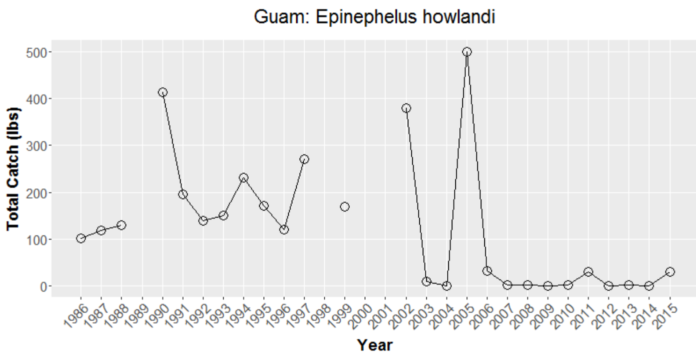

Guam: Epibulus insidiator
Total Catch (lbs)
0
200
400
600
Year

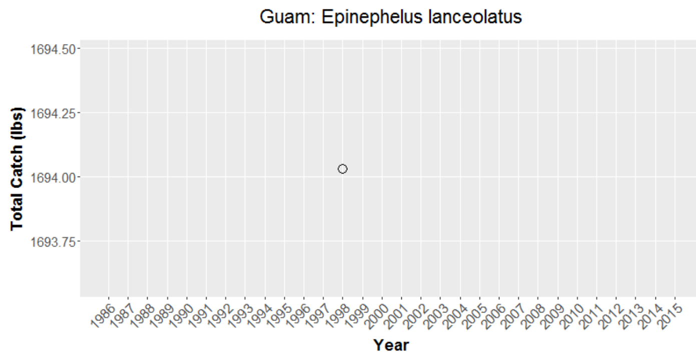

Guam: Epinephelus corallicola
Total Catch (lbs)
Year

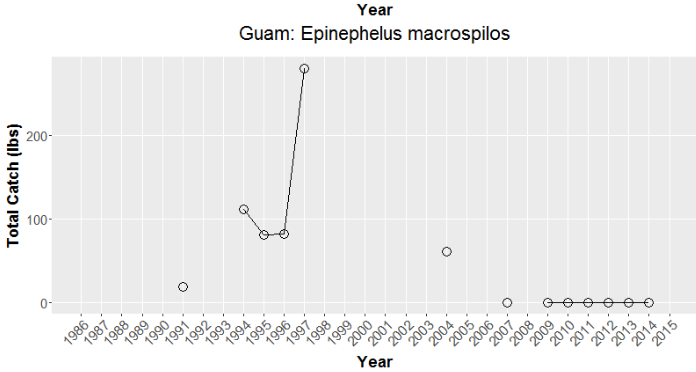

Guam: Epinephelus fasciatus
Total Catch (lbs)
Year

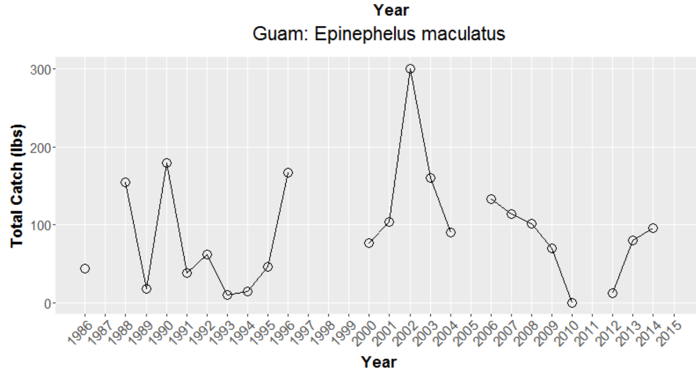

Guam: Epinephelus fuscoguttatus
Total Catch (lbs)
Year

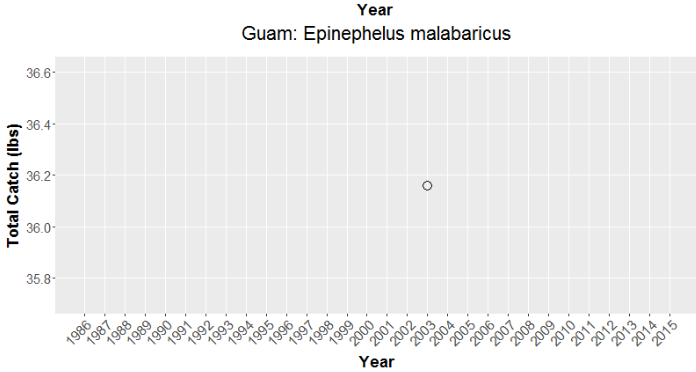

Guam: Epinephelus hexagonatus
Total Catch (lbs)
Year

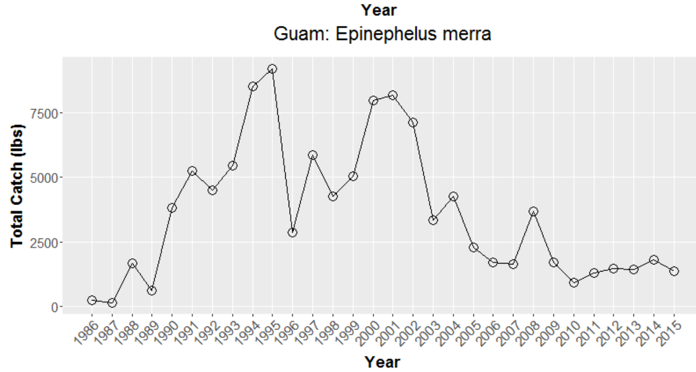

Guam: Epinephelus howlandi
Total Catch (lbs)
Year


Guam: Epinephelus lanceolatus
Total Catch (lbs)
Year

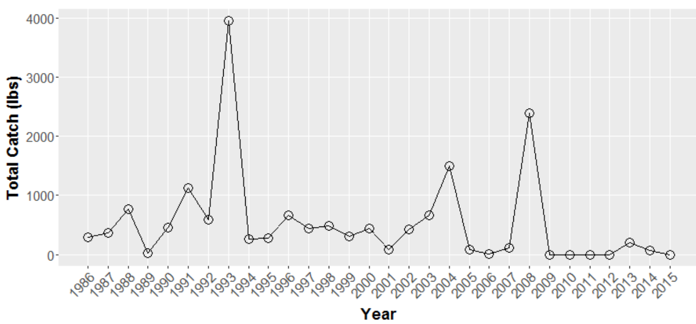

Guam: Epinephelus macrospilos
Total Catch (lbs)
Year


Guam: Epinephelus maculatus
Total Catch (lbs)
Year

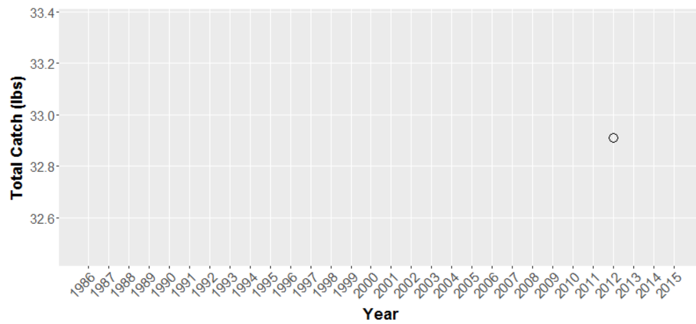

Guam: Epinephelus malabaricus
Total Catch (lbs)
Year


Guam: Epinephelus merra
Total Catch (lbs)
Year

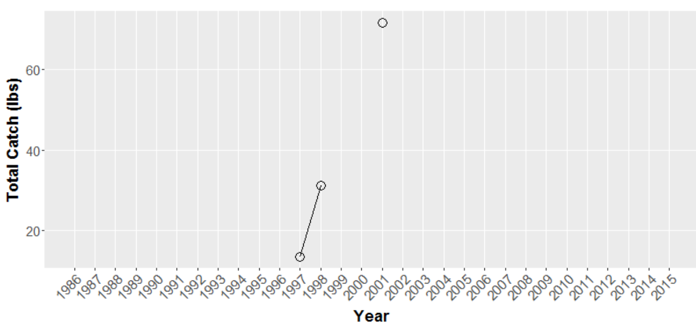
Guam: Epinephelus polyphekadion



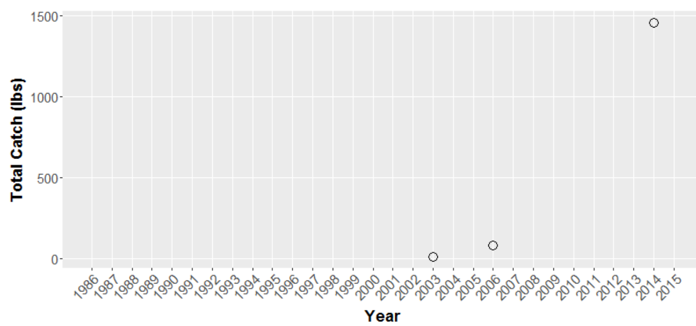
Guam: Epinephelus retouti



Guam: Epinephelus socialis

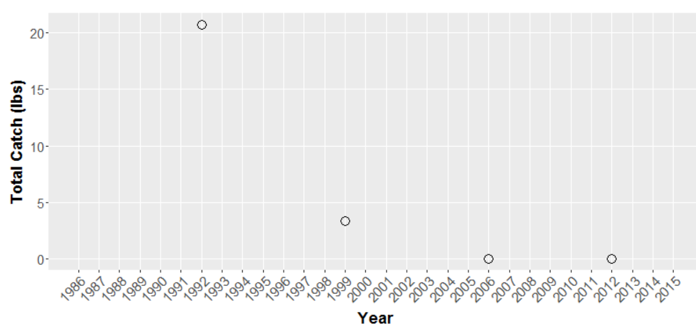


Guam: Epinephelus spilotoceps

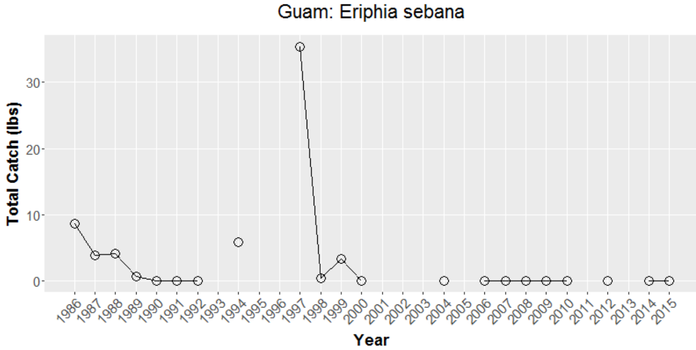


Guam: Epinephelus tauvina

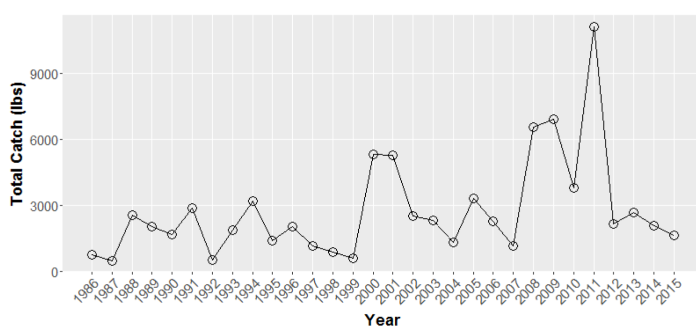
Guam: Equulites stercorarius



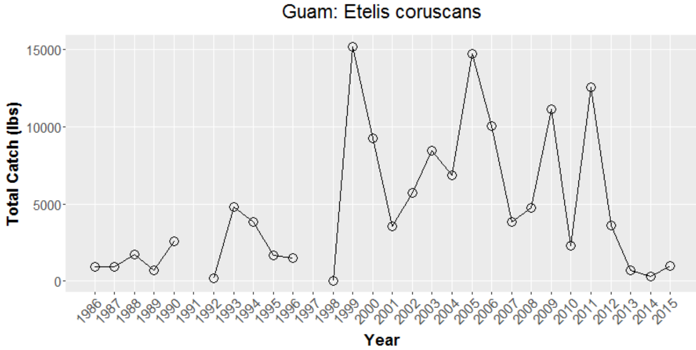
Guam: Eriphia sebana



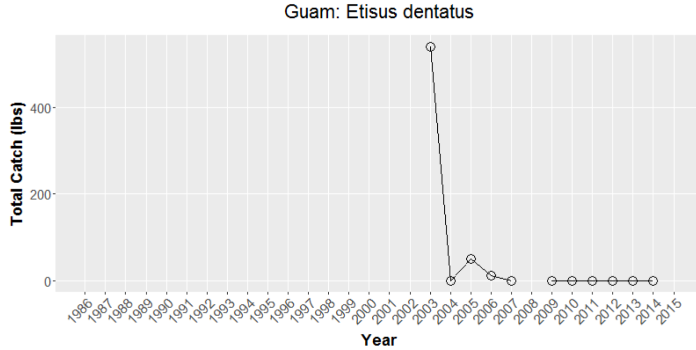
Guam: Etelis carbunculus



Guam: Etelis coruscans

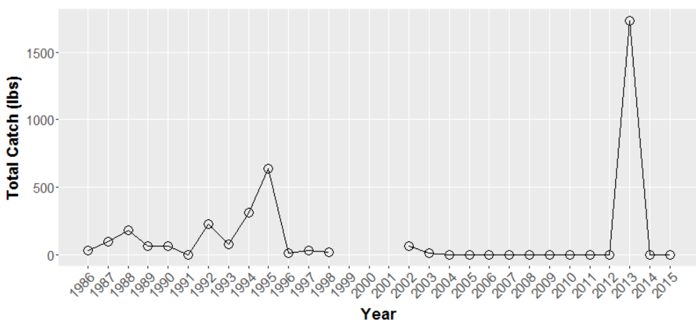


Guam: Etisus dentatus

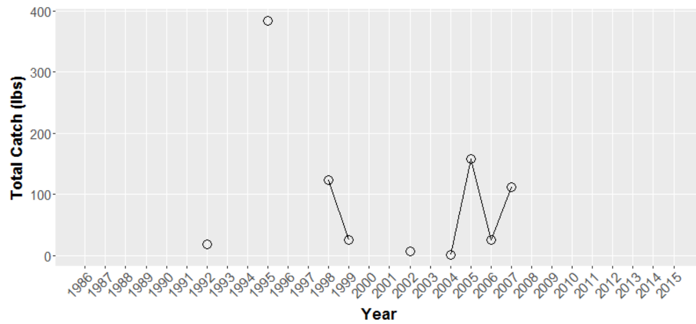


VERSION: 3/20/2018 4:45:11 PM

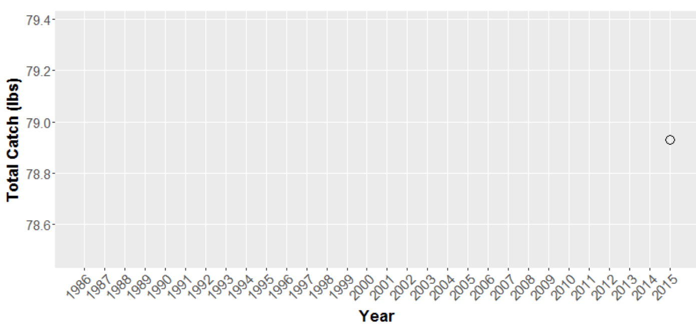
Guam: Etisus splendidus



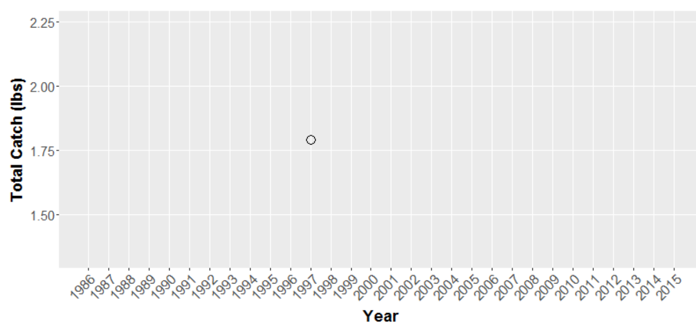
Guam: Exocoetidae



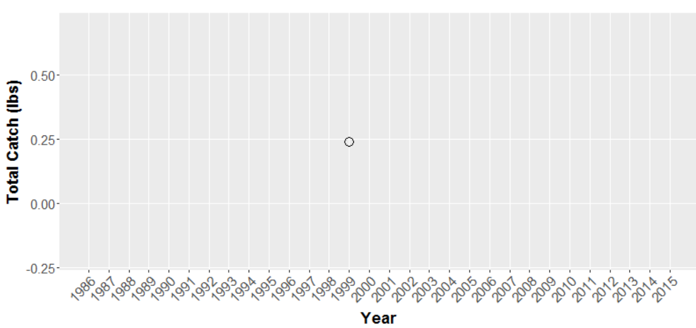
Guam: Exocoetus volitans



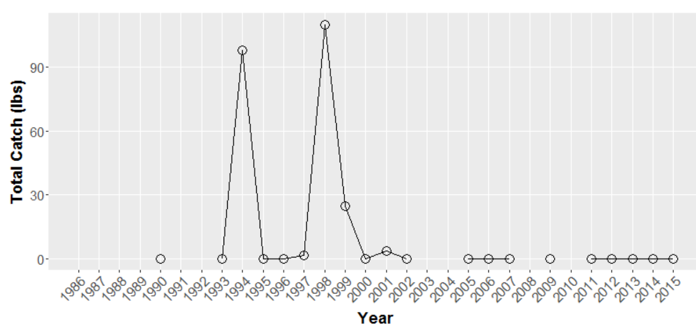
Guam: Exyrias belissimus



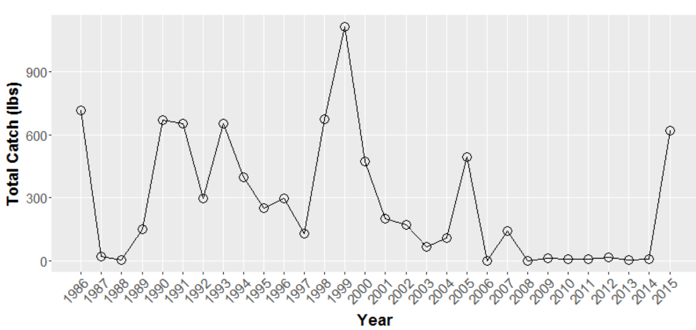
Guam: Fibramia amboinensis



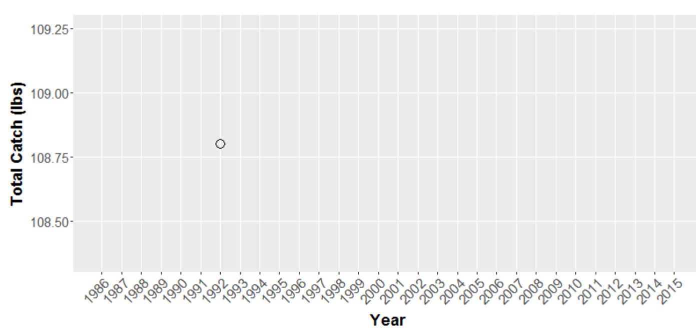
Guam: Fibramia lateralis



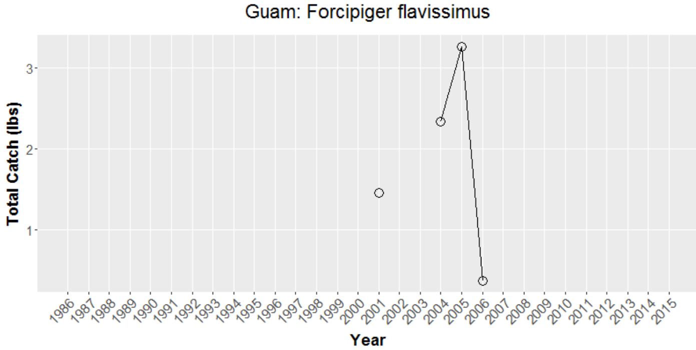
Guam: Fistularia commersonii



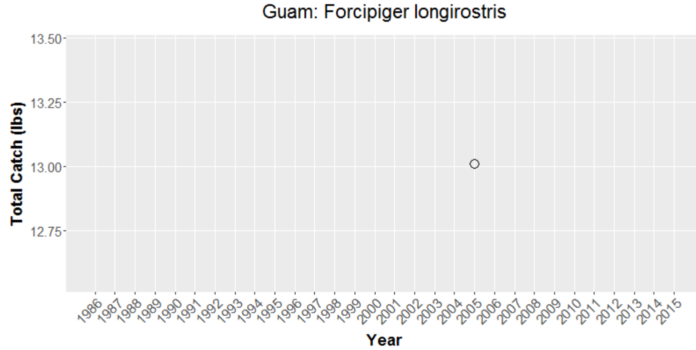
Guam: Fistulariidae

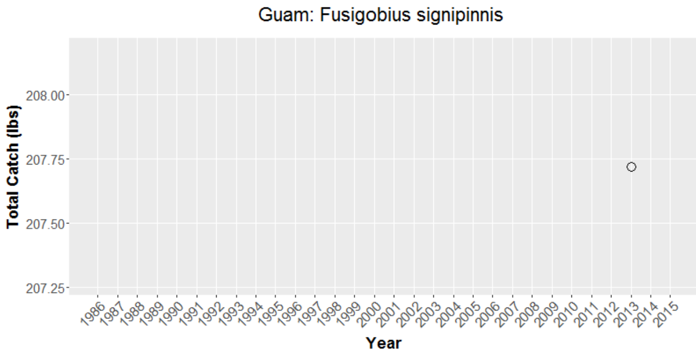


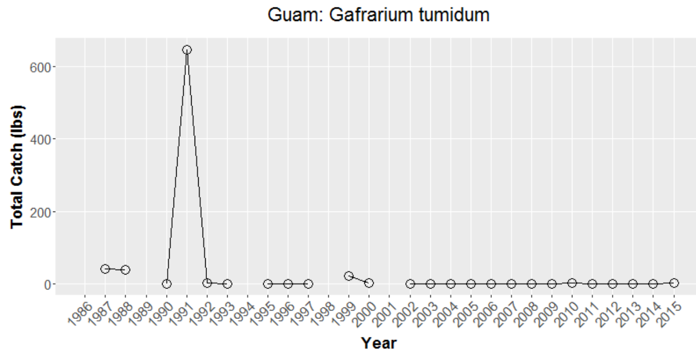
Guam: Forcipiger flavissimus

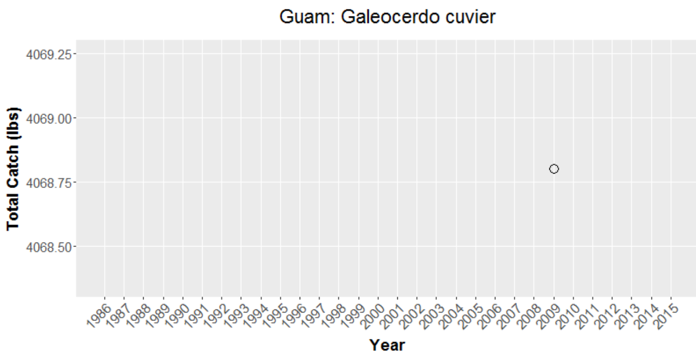


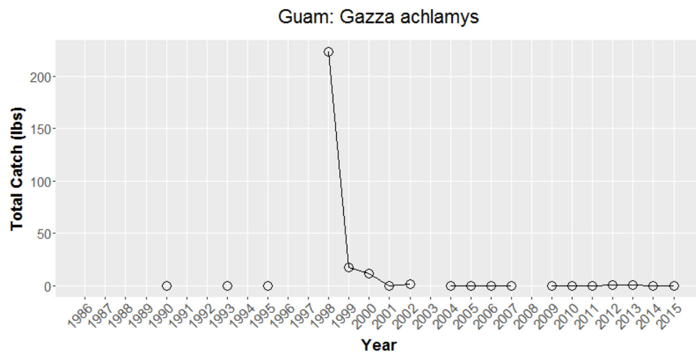
Guam: Forcipiger longirostris

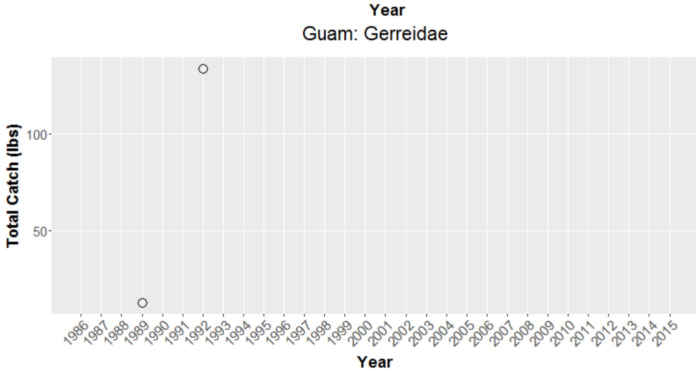


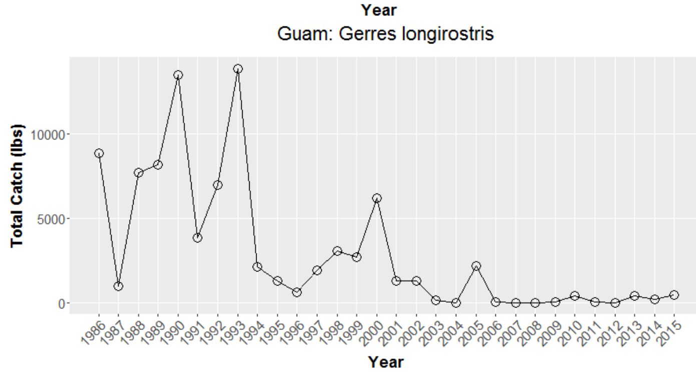

Guam: Fusigobius signipinnis
Total Catch (lbs)
Year

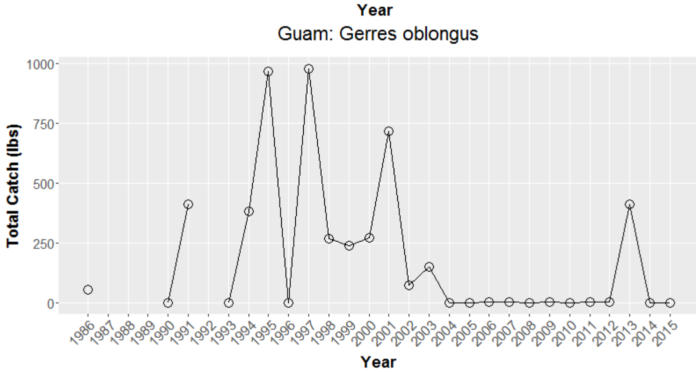

Guam: Gafrarium tumidum
Total Catch (lbs)
Year

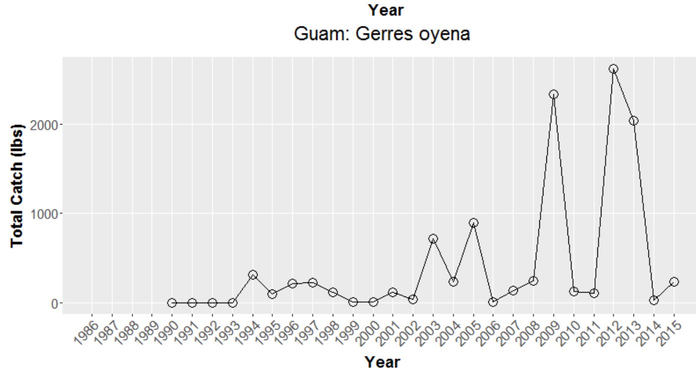

Guam: Galeocerdo cuvier
Total Catch (lbs)
Year

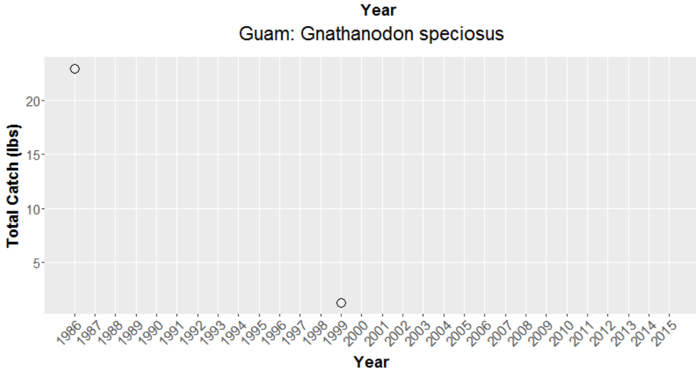

Guam: Gazza achlamys
Total Catch (lbs)
Year

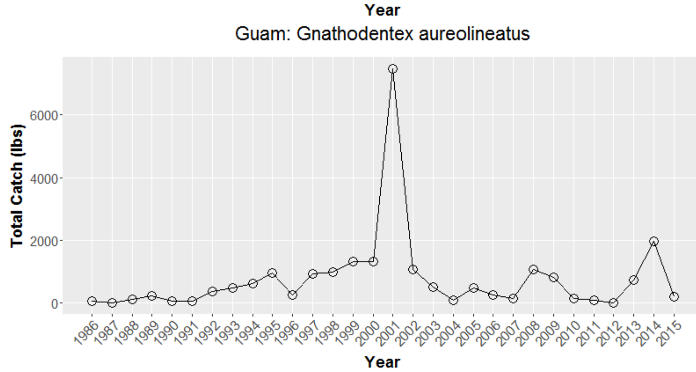

Guam: Gerreidae
Total Catch (lbs)
Year


Guam: Gerres longirostris
Total Catch (lbs)
Year

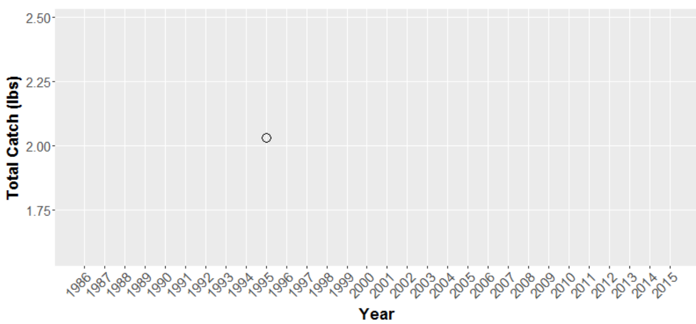

Guam: Gerres oblongus
Total Catch (lbs)
Year


Guam: Gerres oyena
Total Catch (lbs)
Year

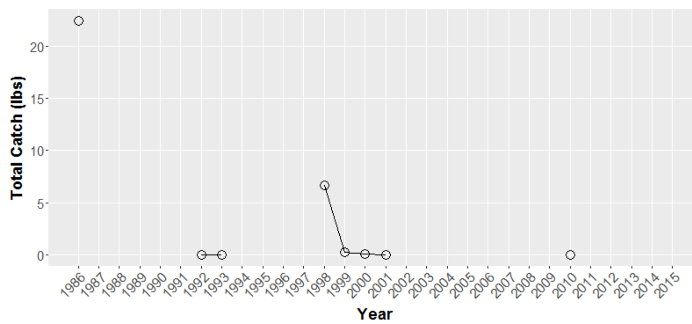

Guam: Gnathanodon speciosus
Total Catch (lbs)
Year


Guam: Gnathodentex aureolineatus
Total Catch (lbs)
Year

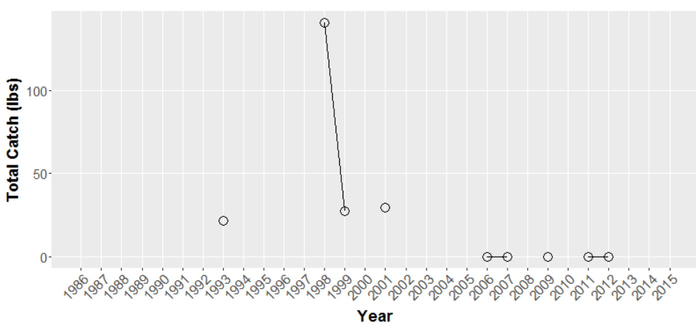
Guam: Gnatholepis sp



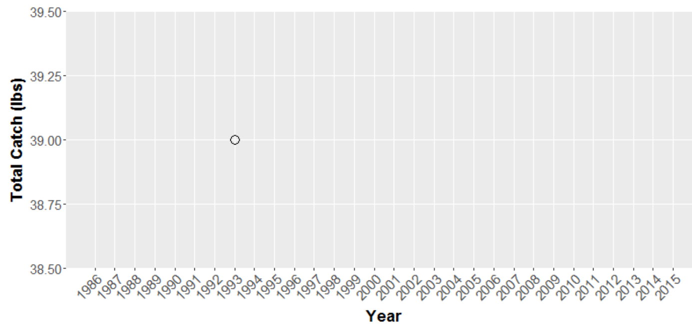
Guam: Gobiidae



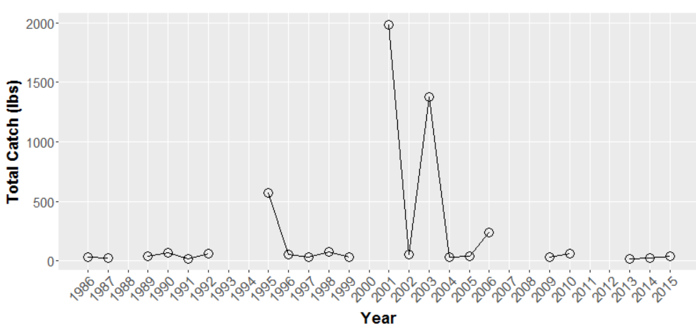
Guam: Gomphosus varius



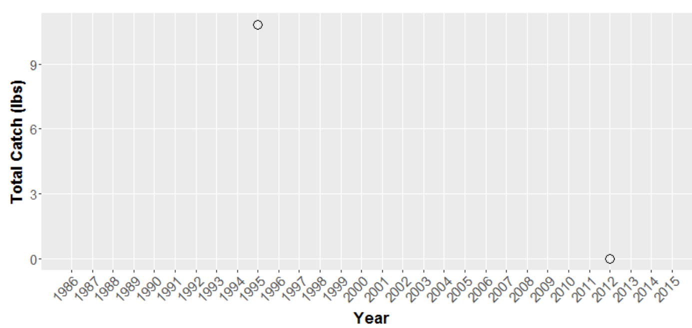
Guam: Gracila albomarginata



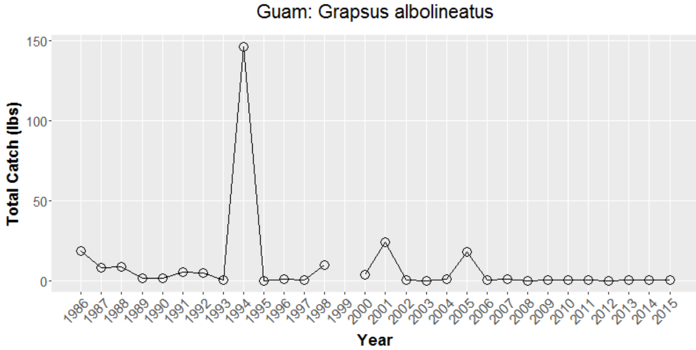
Guam: Grammatorcynus bilineatus



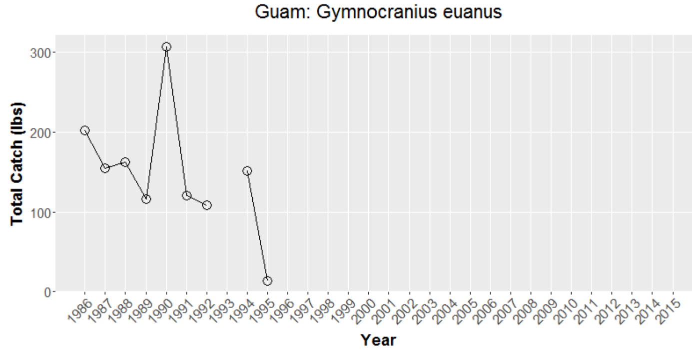
Guam: Grammistes sexlineatus



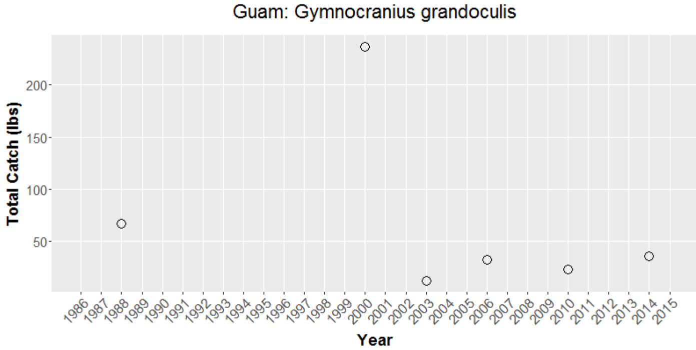
Guam: Grapsus albolineatus



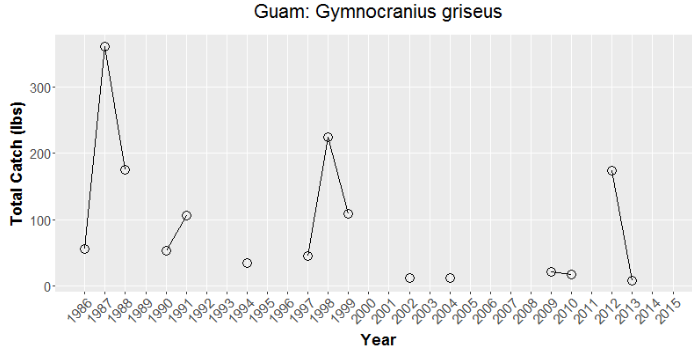
Guam: Gymnocranius euanus



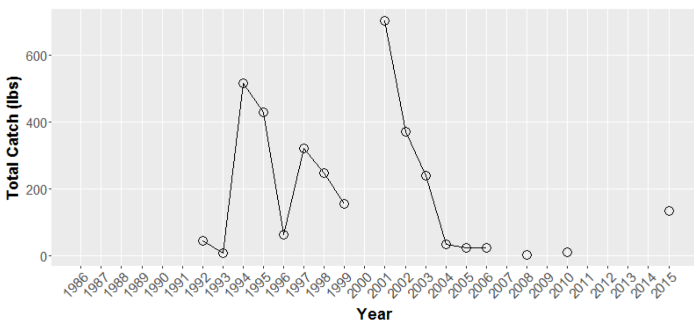
Guam: Gymnocranius grandoculis



Guam: Gymnocranius griseus

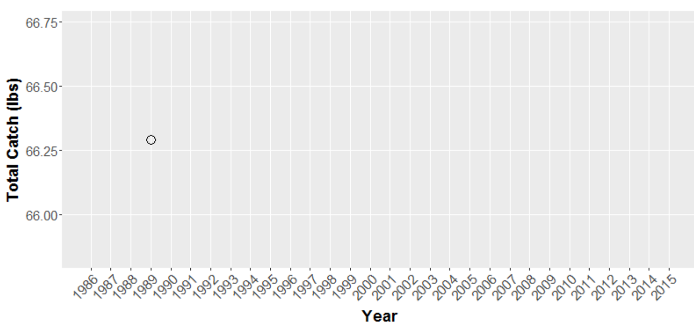


Guam: Gymnocranius microdon

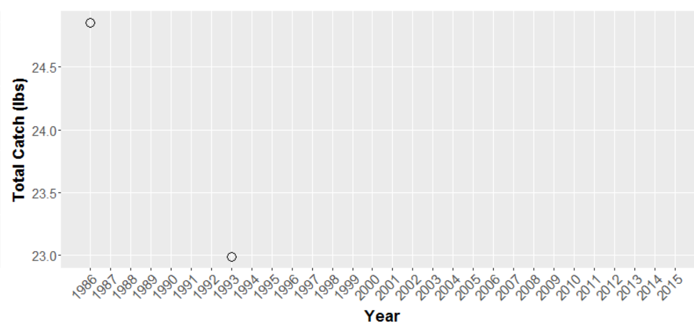


Guam: Gymnocranius sp.

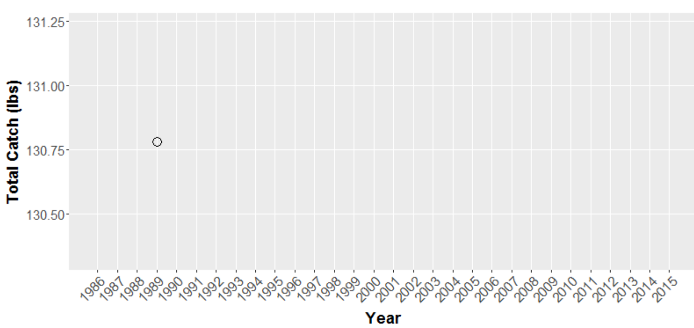
Guam: Gymnothorax berndti



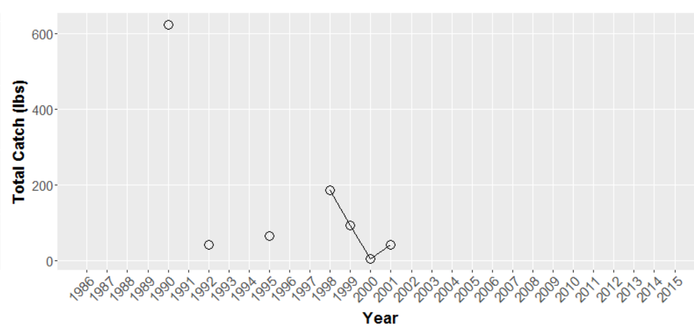
Guam: Gymnothorax elegans



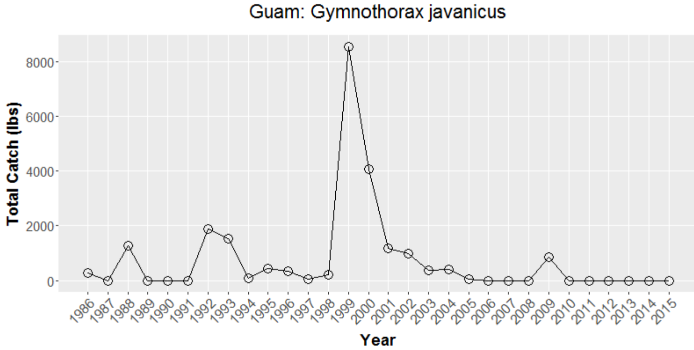
Guam: Gymnothorax fimbriatus



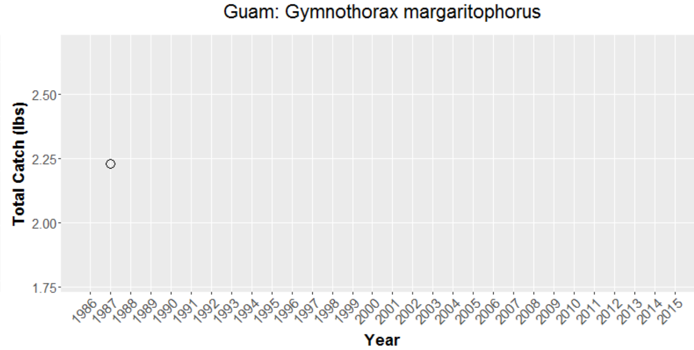
Guam: Gymnothorax flavimarginatus



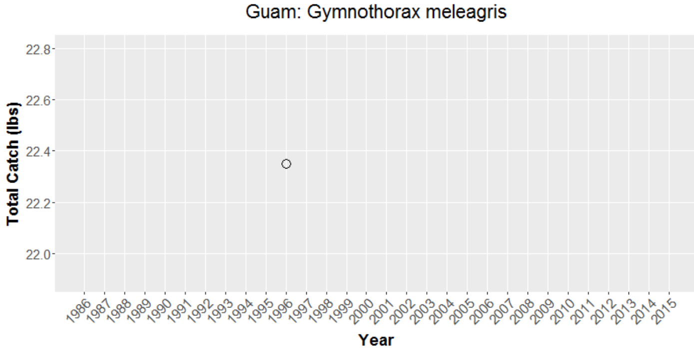
Guam: Gymnothorax javanicus



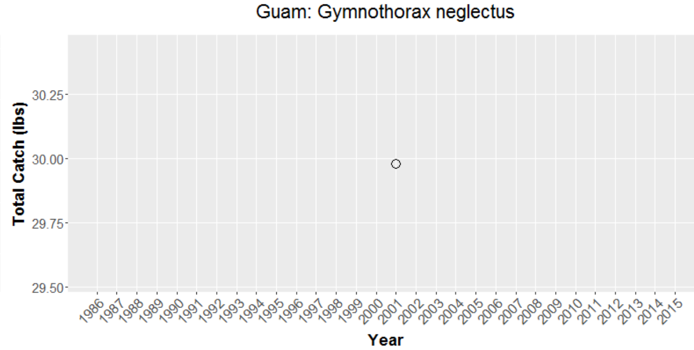
Guam: Gymnothorax margaritophorus



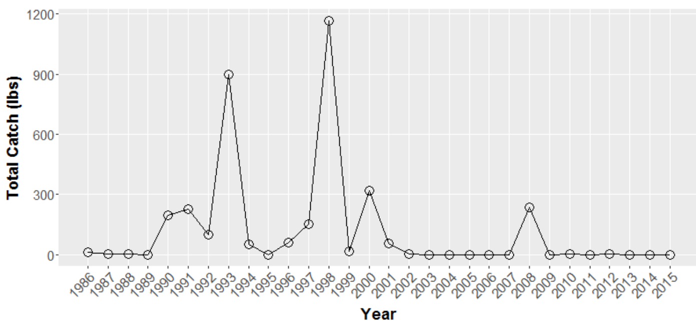
Guam: Gymnothorax meleagris



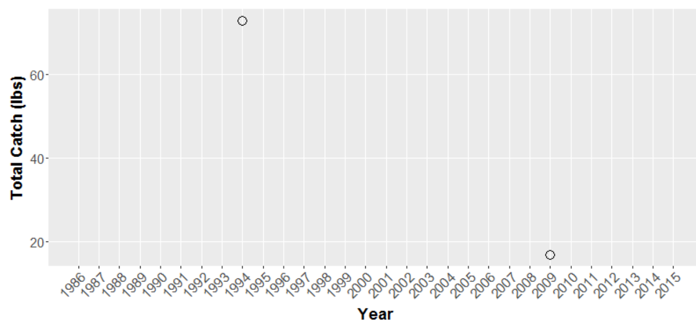
Guam: Gymnothorax neglectus



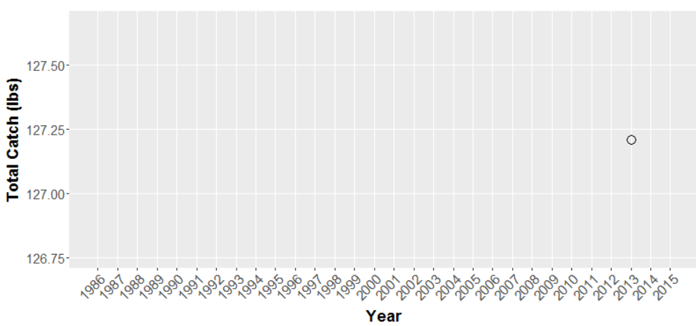
Guam: Gymnothorax pictus



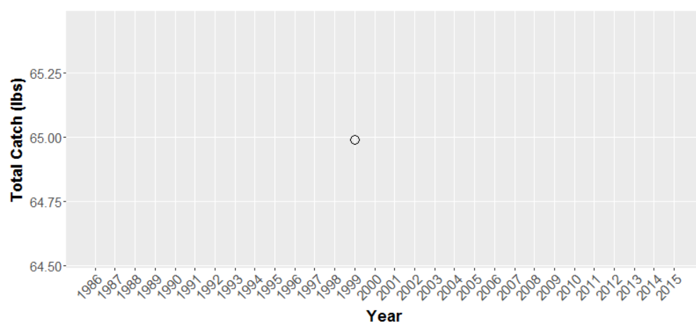
Guam: Gymnothorax pindae



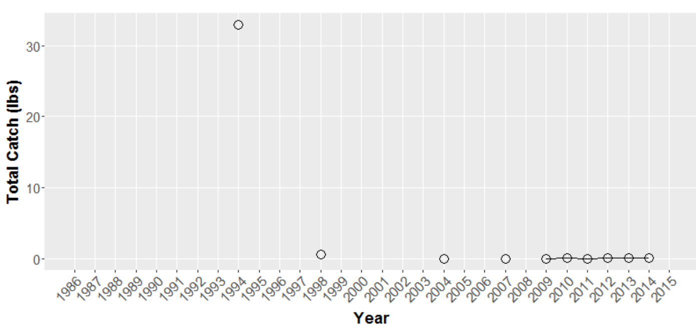
Guam: Gymnothorax richardsonii



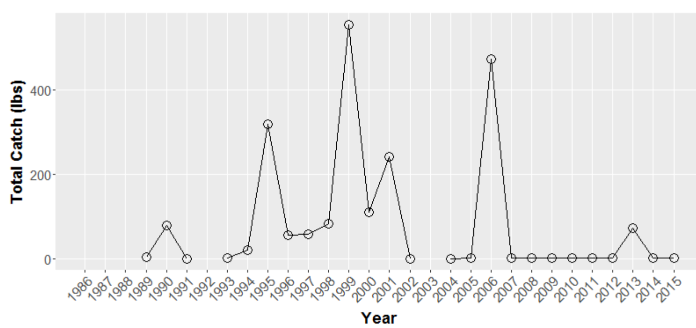
Guam: Gymnothorax rueppelliae



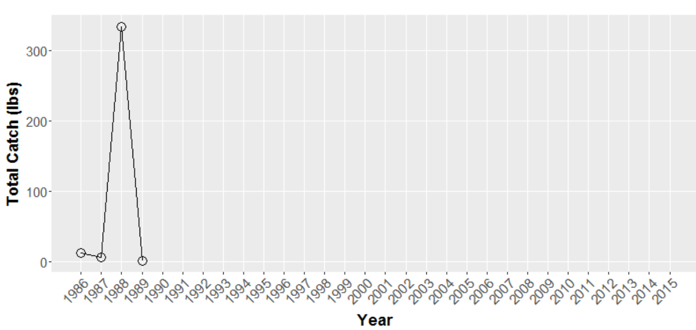
Guam: Gymnothorax thyrsoideus



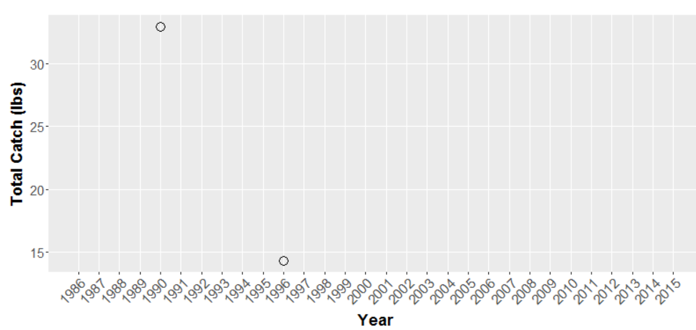
Guam: Gymnothorax undulatus



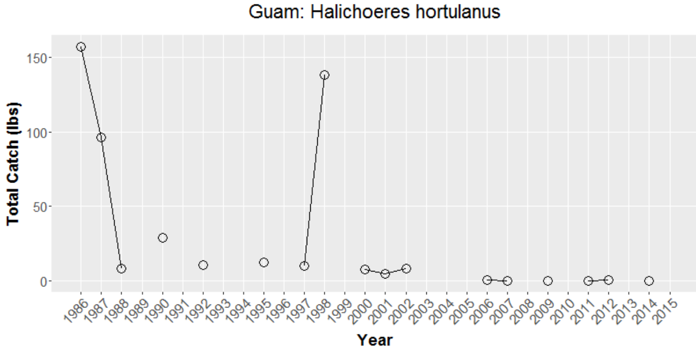
Guam: Haemulidae



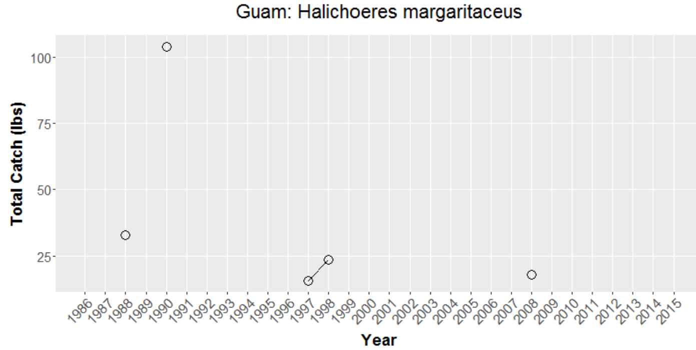
Guam: Halichoeres biocellatus



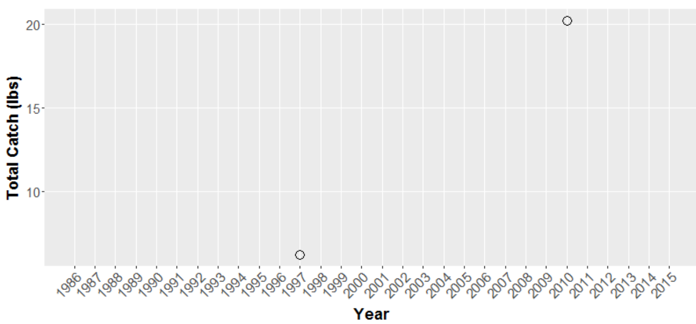
Guam: Halichoeres hortulanus



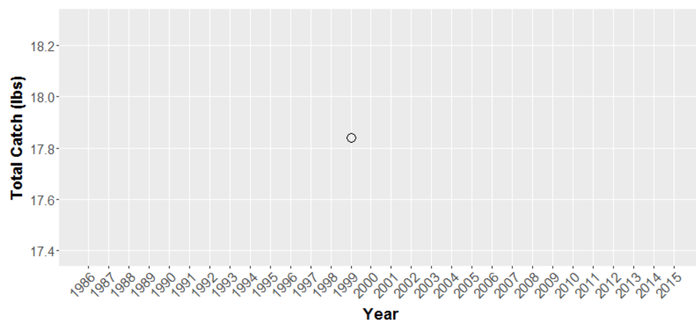
Guam: Halichoeres margaritaceus



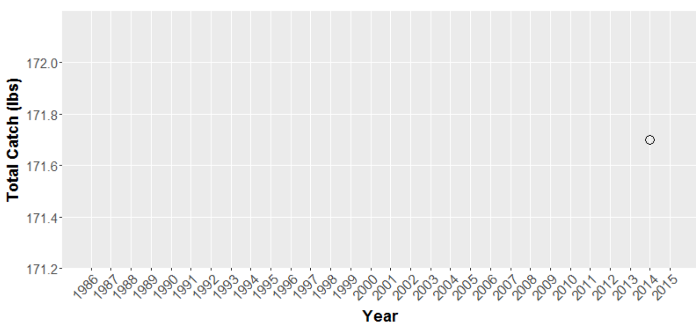
Guam: Halichoeres marginatus



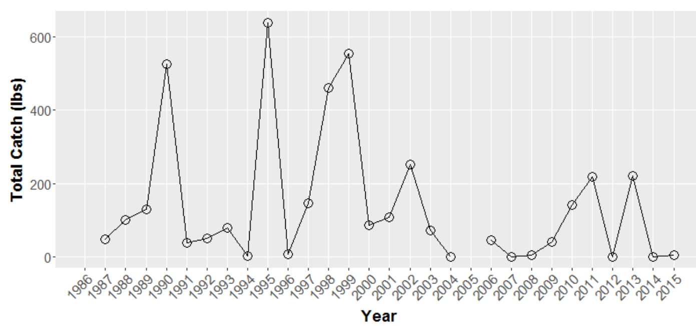
Guam: Halichoeres richmondi



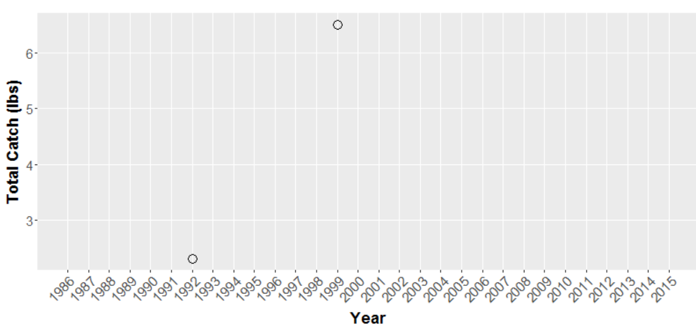
Guam: Halichoeres sp.



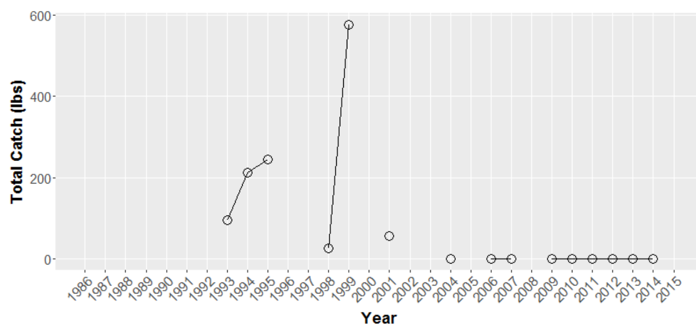
Guam: Halichoeres trimaculatus



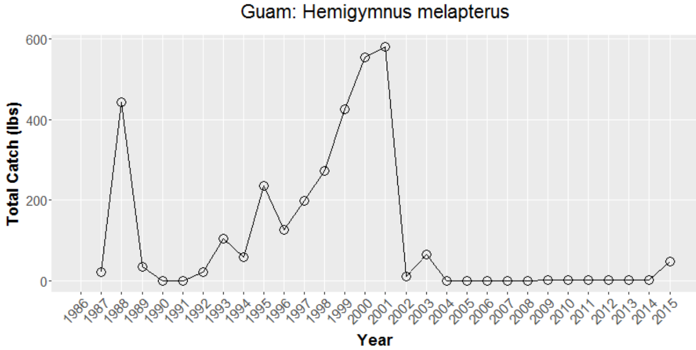
Guam: Halichoeres zeylonicus



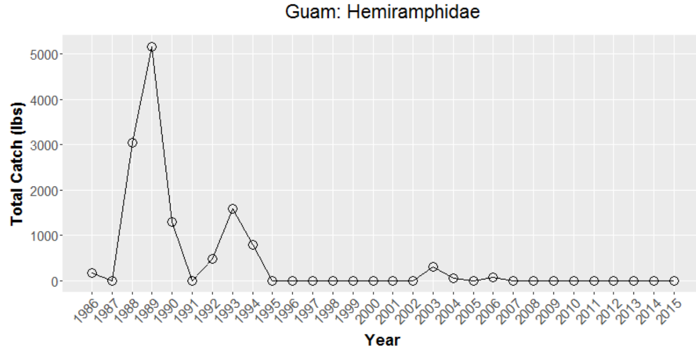
Guam: Hemigymnus fasciatus



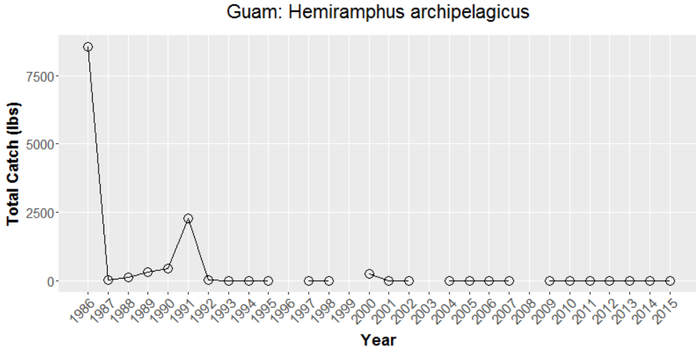
Guam: Hemigymnus melapterus



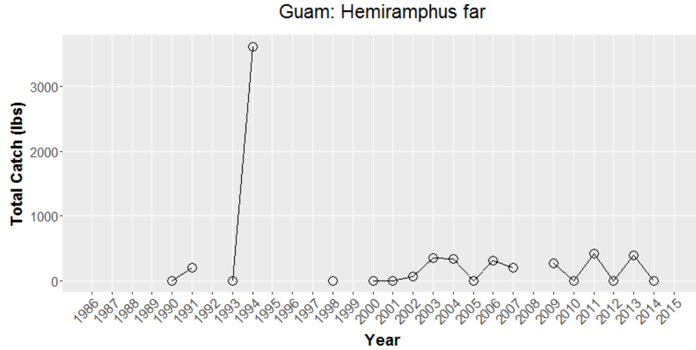
Guam: Hemiramphidae



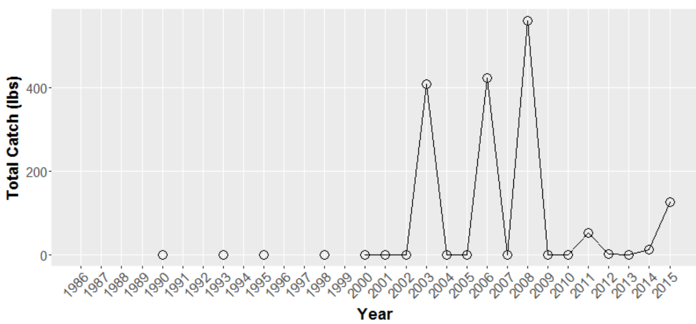
Guam: Hemiramphus archipelagicus



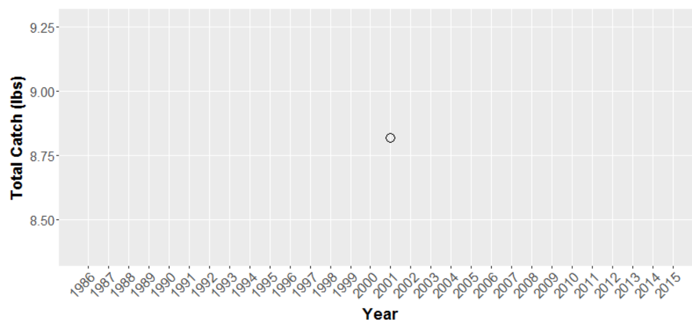
Guam: Hemiramphus far



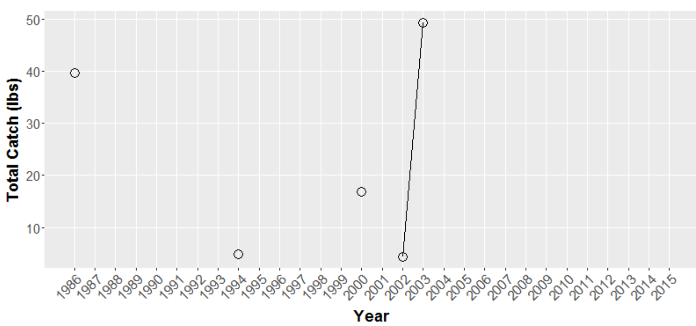
Guam: Hemiramphus lutkei



Guam: Hemitaurichthys polylepis

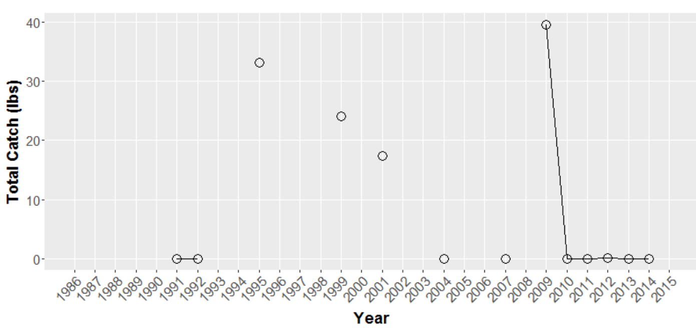


Guam: Heniochus acuminatus

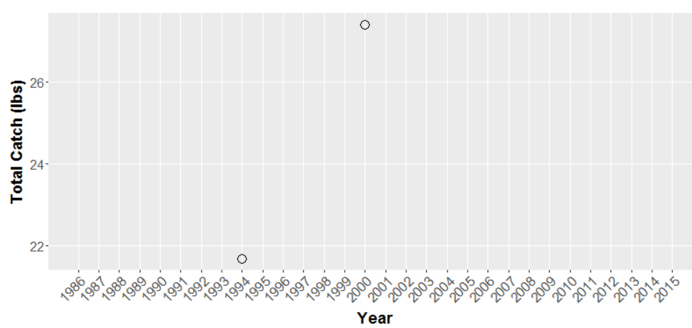


Guam: Heniochus chrysostomus

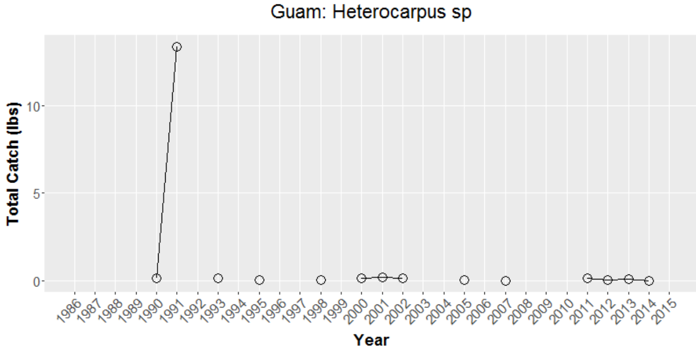
Guam: Heniochus monoceros



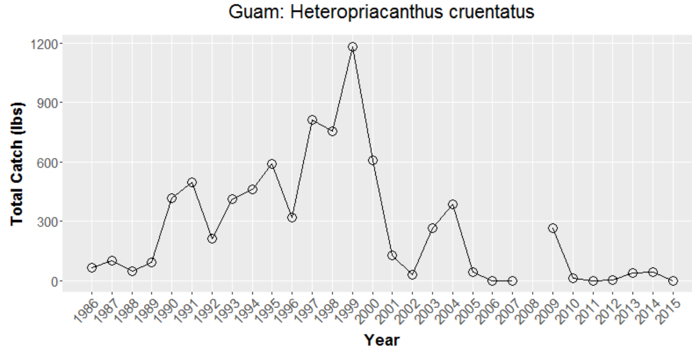
Guam: Heniochus singularius



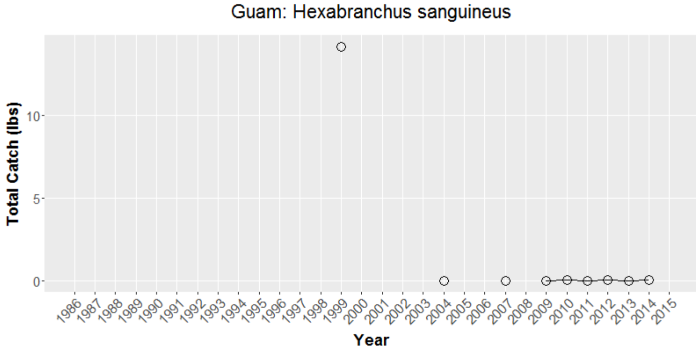
Guam: Heterocarpus sp



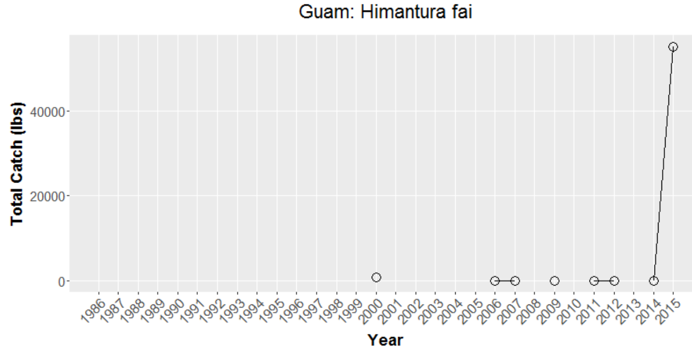
Guam: Heteropriacanthus cruentatus



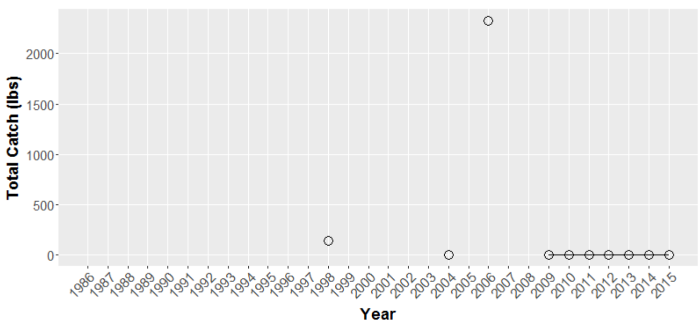
Guam: Hexabranchus sanguineus



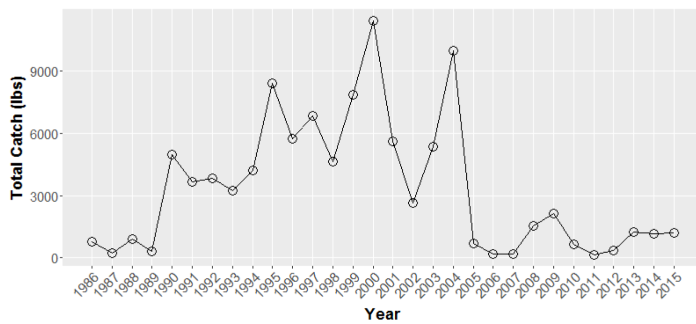
Guam: Himantura fai



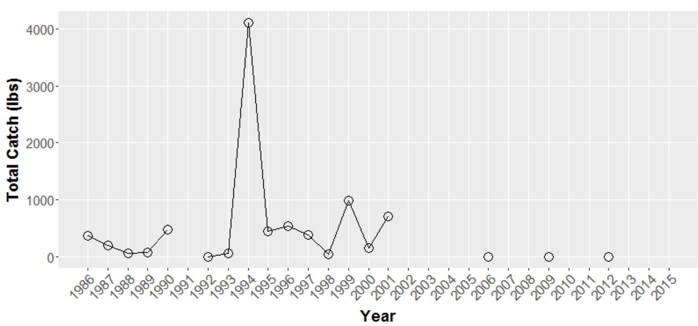
Guam: Himantura granulata



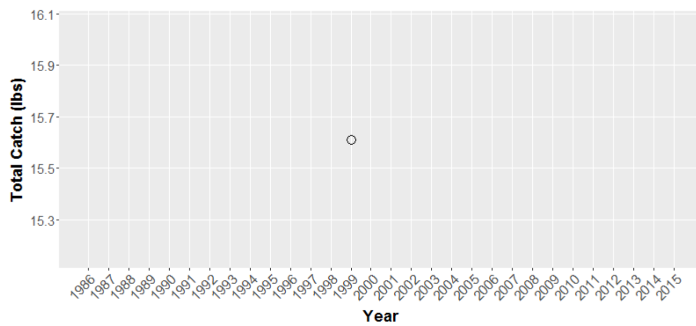
Guam: Hipposcarus longiceps



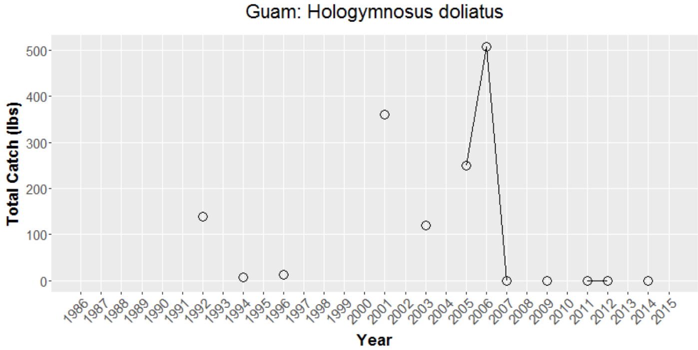
Guam: Holocentridae



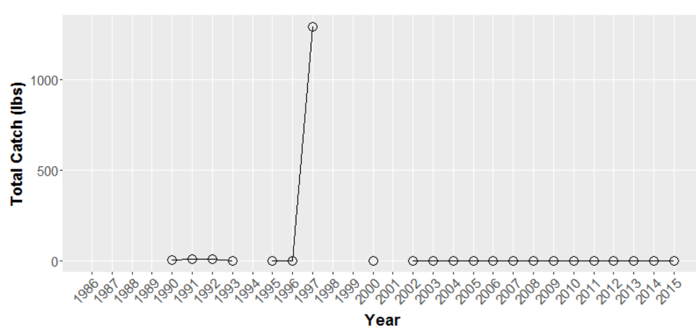
Guam: Holocentrus adscensionis



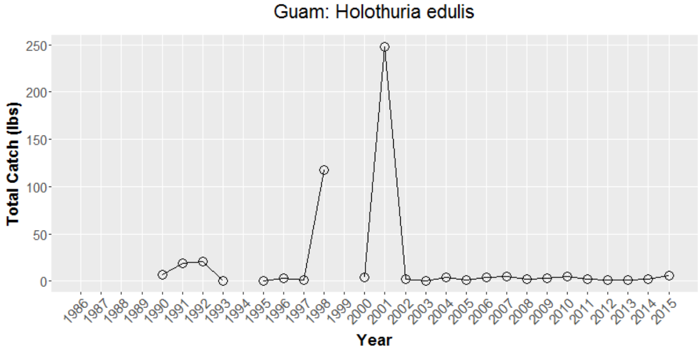
Guam: Hologymnosus doliatus



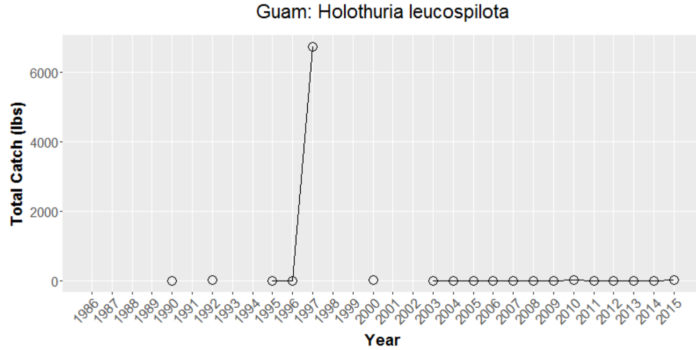
Guam: Holothuria atra



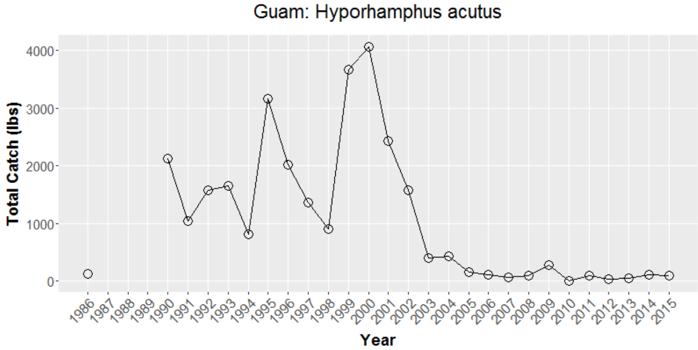
Guam: Holothuria edulis



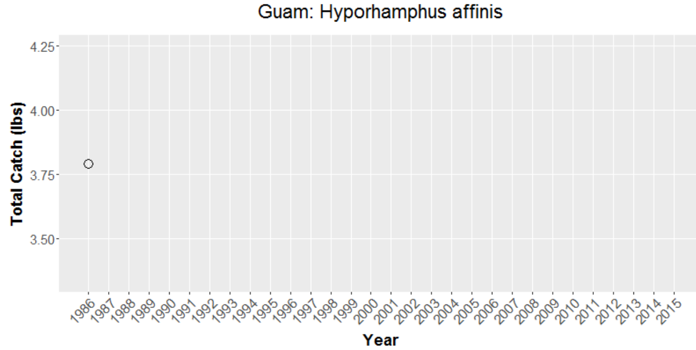
Guam: Holothuria leucospilota

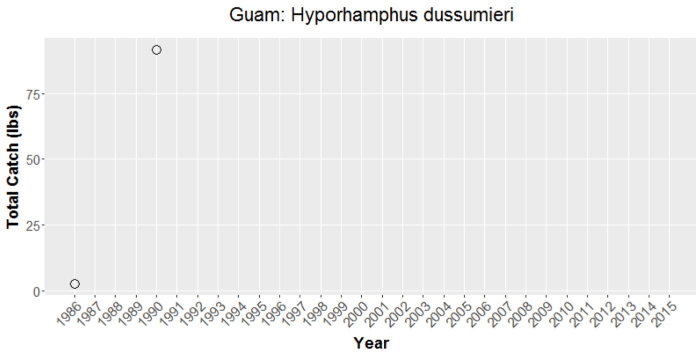


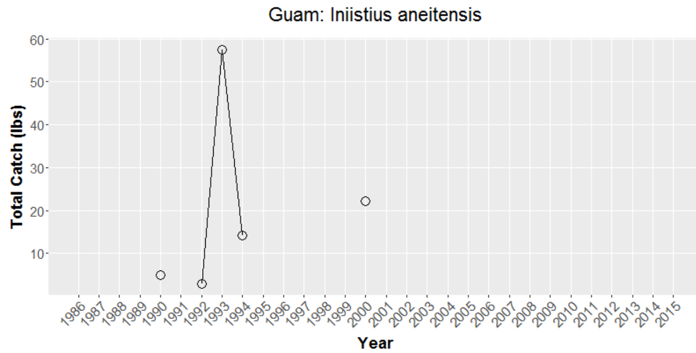
Guam: Hyporhamphus acutus

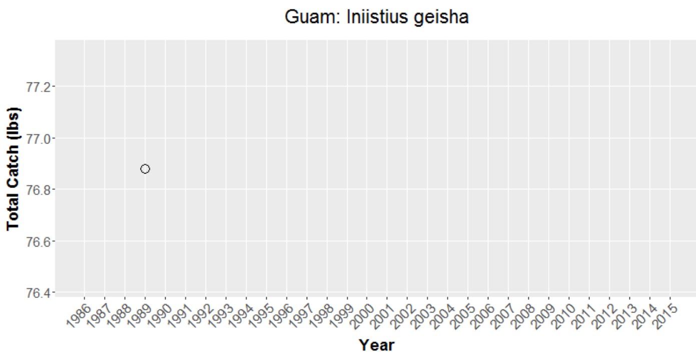


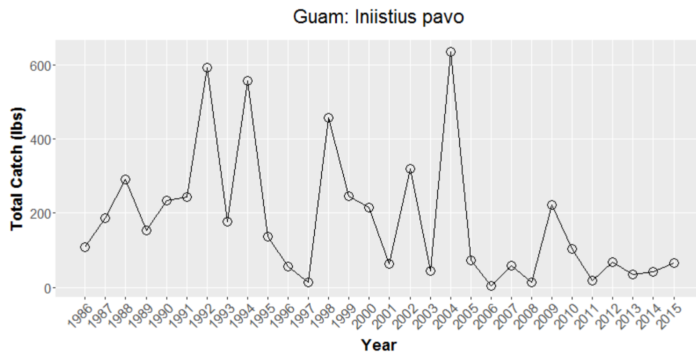
Guam: Hyporhamphus affinis

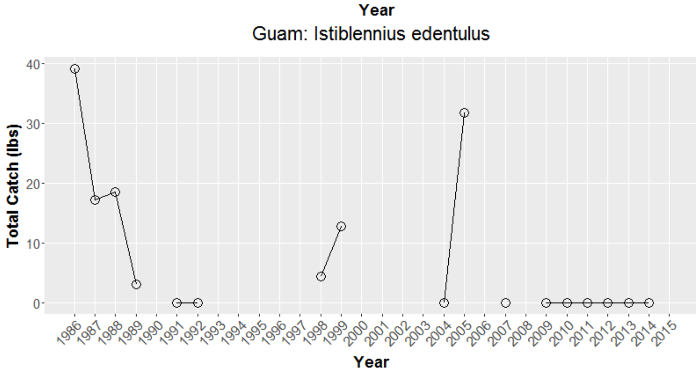


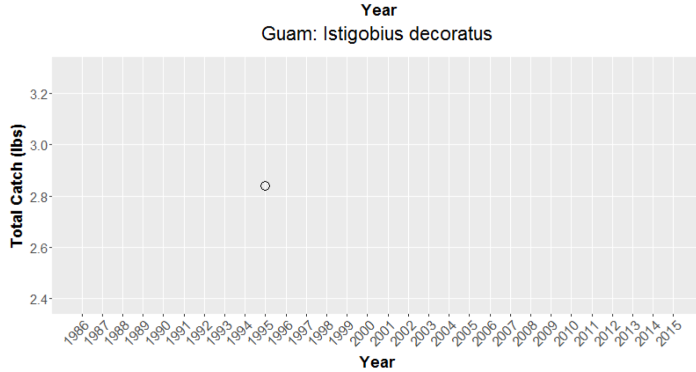

Guam: Hyporhamphus dussumieri
Total Catch (lbs)
Year

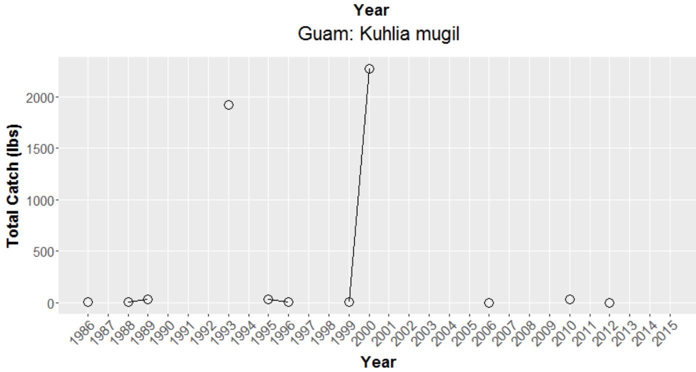

Guam: Iniistius aneitensis
Total Catch (lbs)
Year

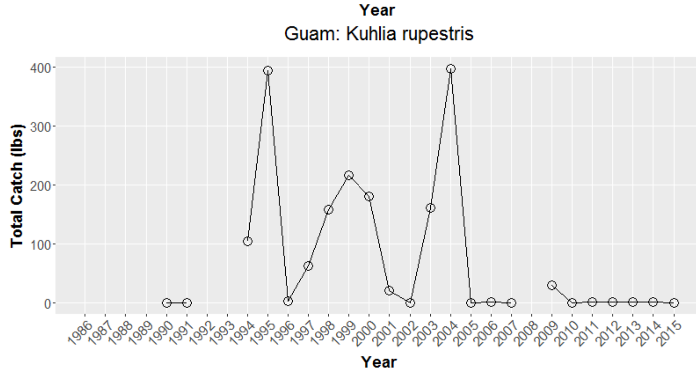

Guam: Iniistius geisha
Total Catch (lbs)
Year

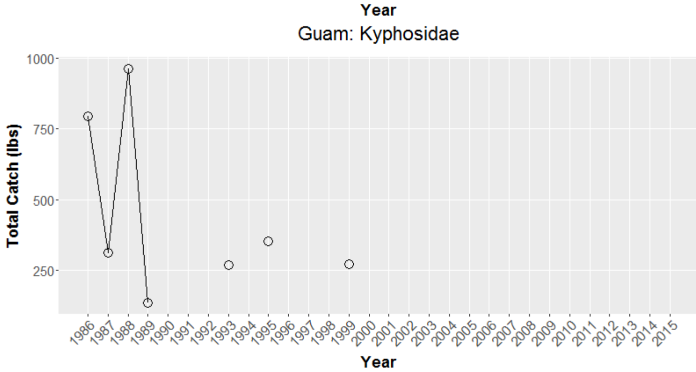

Guam: Iniistius pavo
Total Catch (lbs)
Year

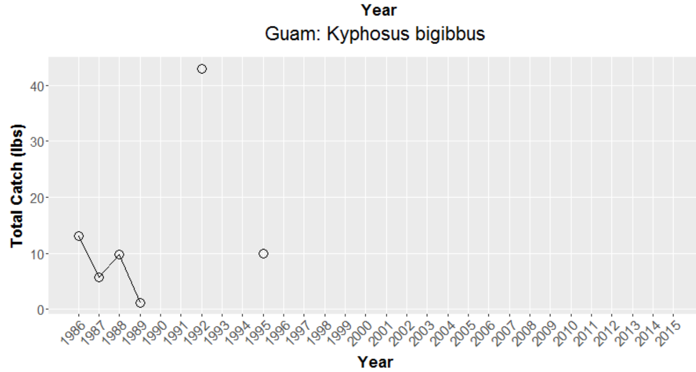

Guam: Istiblennius edentulus
Total Catch (lbs)
Year


Guam: Istigobius decoratus
Total Catch (lbs)
Year

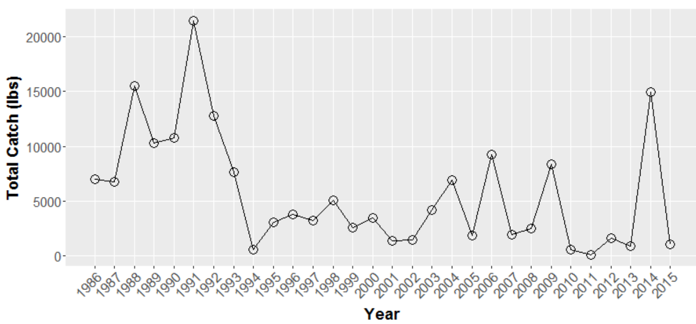

Guam: Kuhlia mugil
Total Catch (lbs)
Year


Guam: Kuhlia rupestris
Total Catch (lbs)
Year

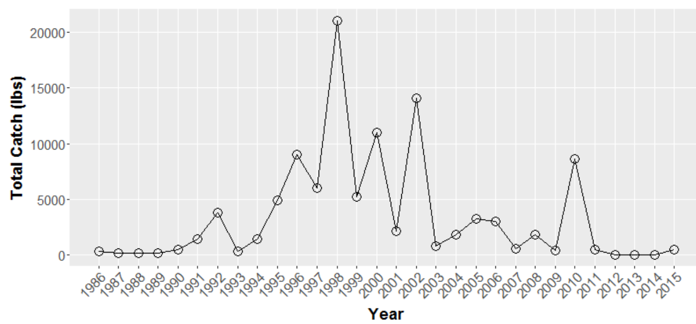

Guam: Kyphosidae
Total Catch (lbs)
Year


Guam: Kyphosus bigibbus
Total Catch (lbs)
Year

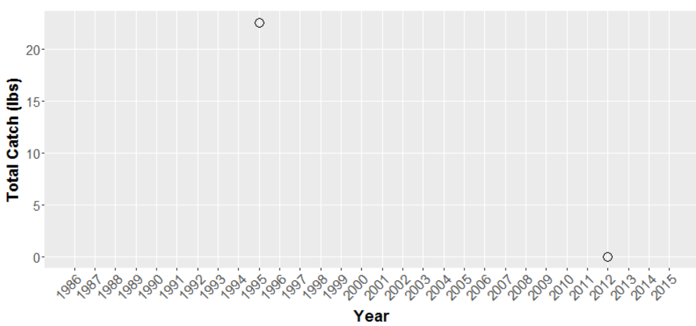
Guam: Kyphosus cinerascens



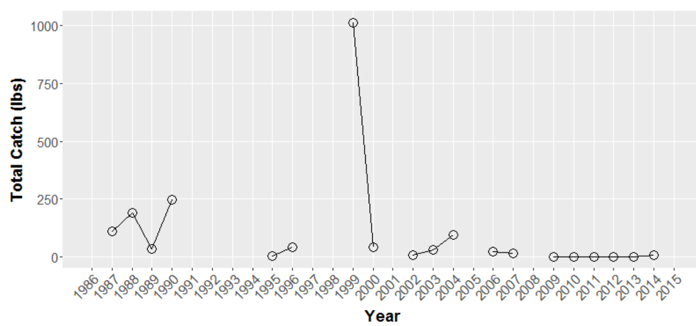
Guam: Kyphosus vaigiensis



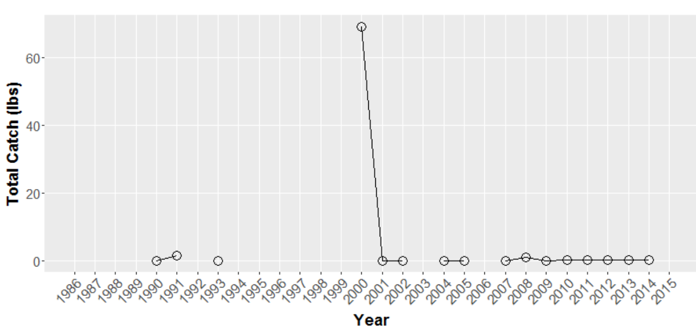
Guam: Labrichthys unilineatus



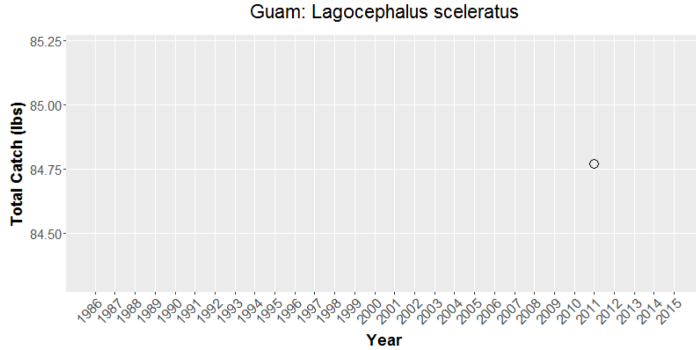
Guam: Labridae



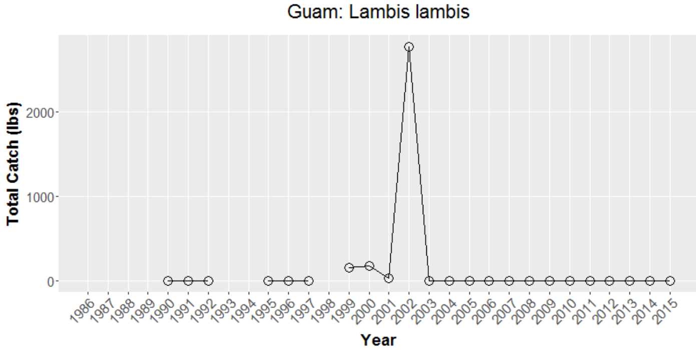
Guam: Lactoria cornuta



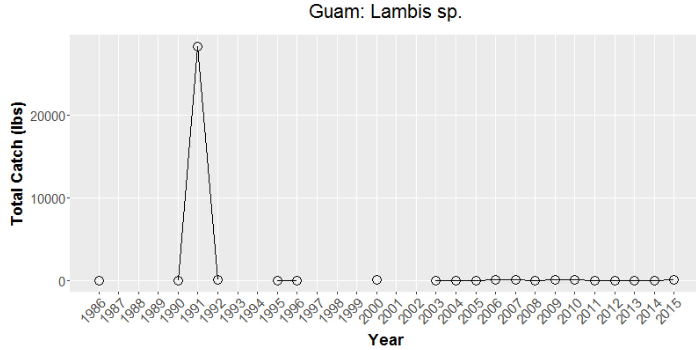
Guam: Lagocephalus sceleratus



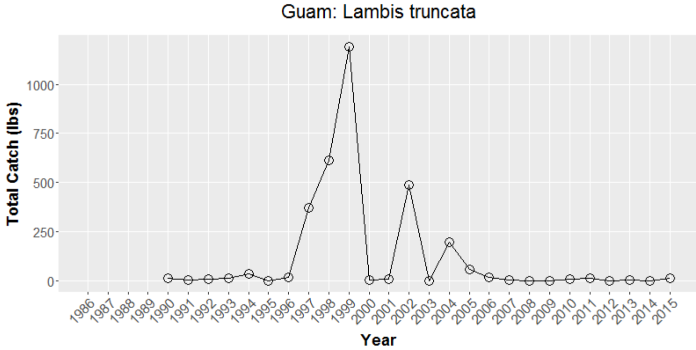
Guam: Lambis lambis



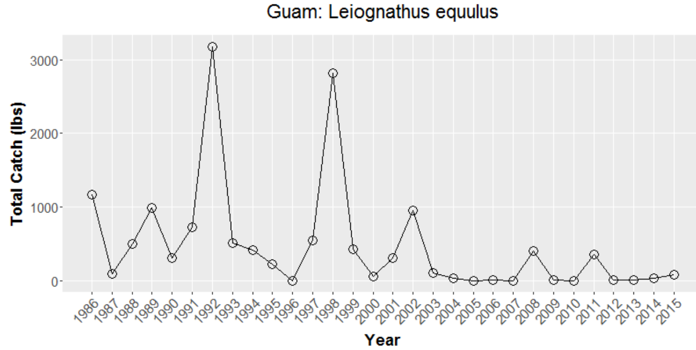
Guam: Lambis sp.



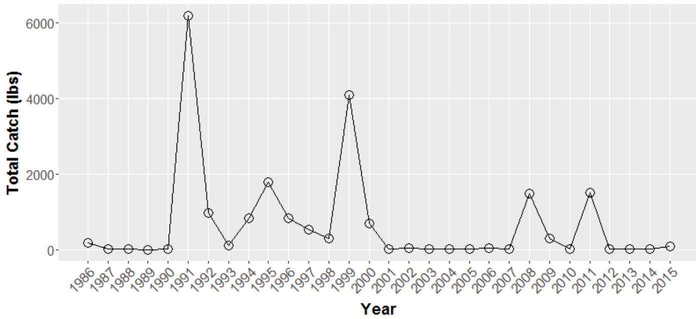
Guam: Lambis truncata



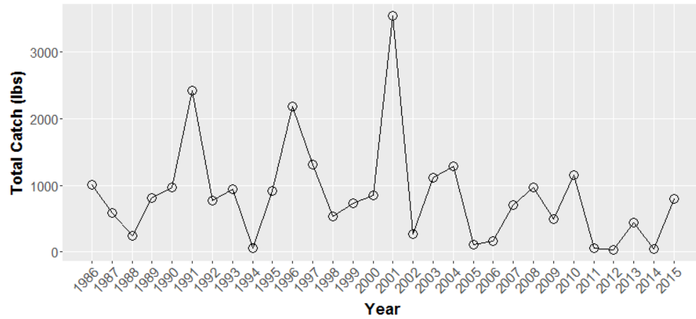
Guam: Leiognathus equulus



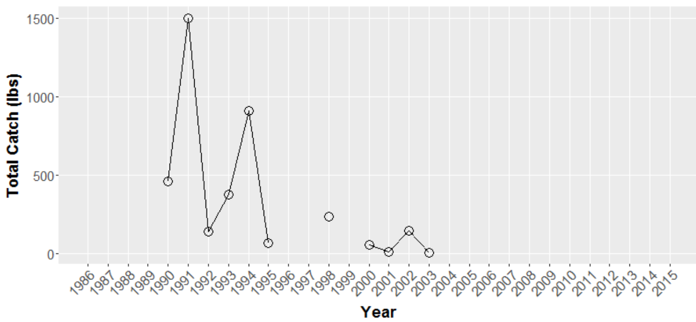
Guam: Leptoscarus vaigiensis



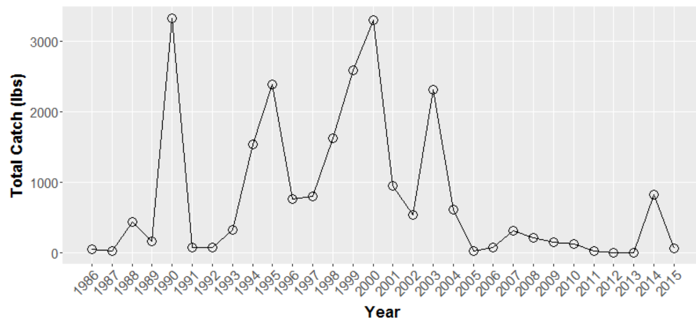
Guam: Lethrinidae



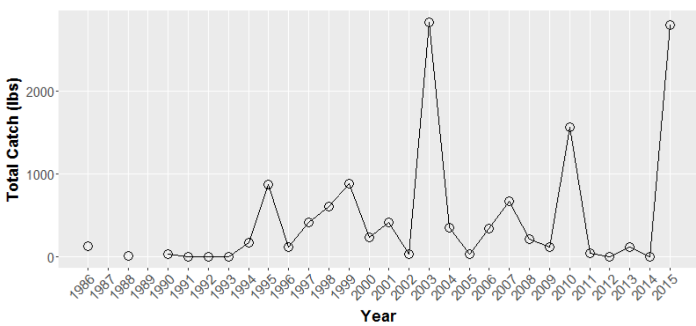
Guam: Lethrinus amboinensis



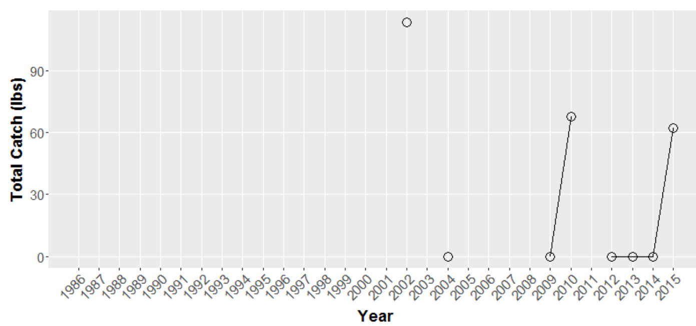
Guam: Lethrinus atkinsoni



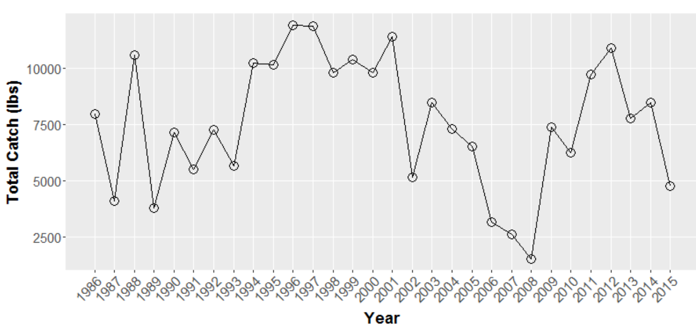
Guam: Lethrinus erythracanthus



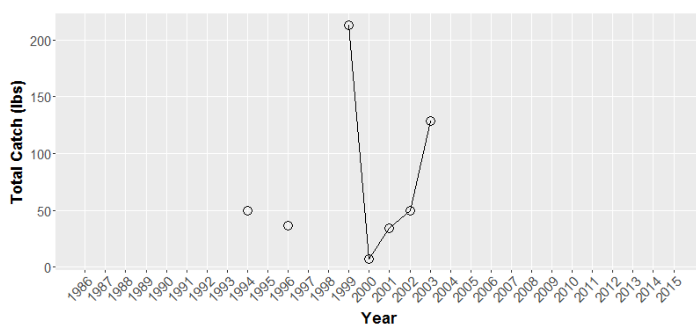
Guam: Lethrinus erythropterus



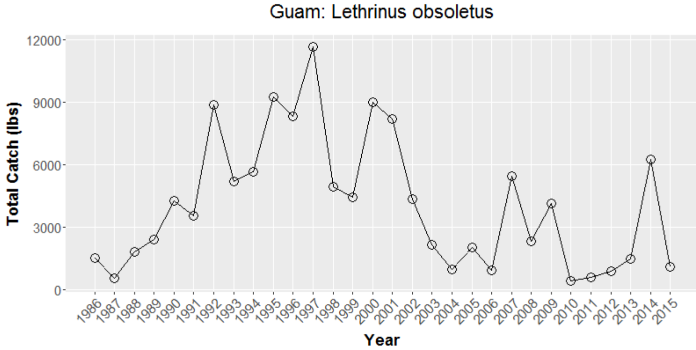
Guam: Lethrinus harak



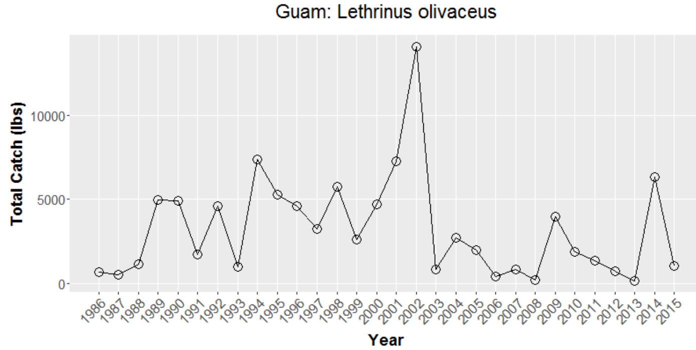
Guam: Lethrinus microdon



Guam: Lethrinus obsoletus



Guam: Lethrinus olivaceus



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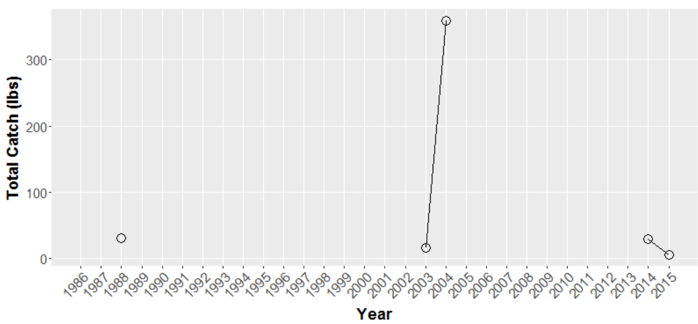
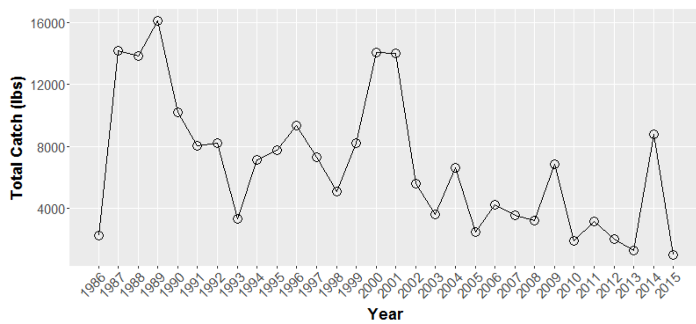
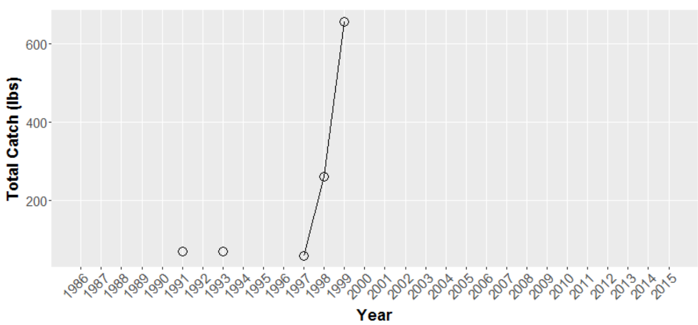
Guam: Lethrinus ornatus



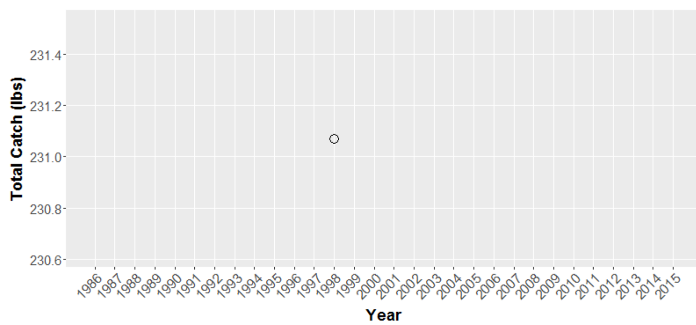
Guam: Lethrinus rubrioperculatus



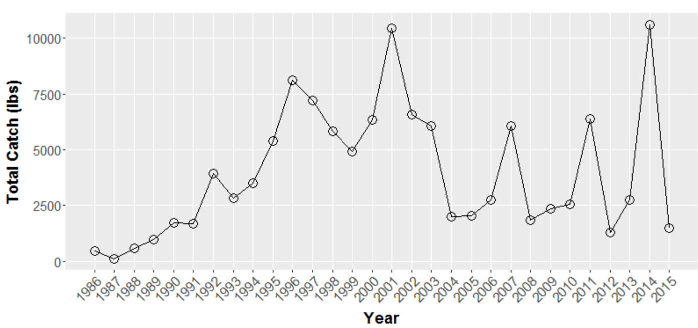
Guam: Lethrinus semicinctus



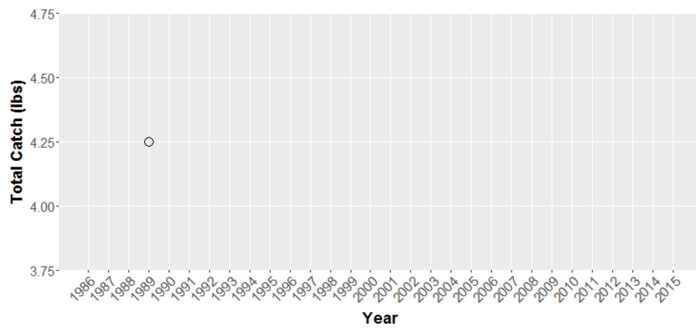
Guam: Lethrinus variegatus



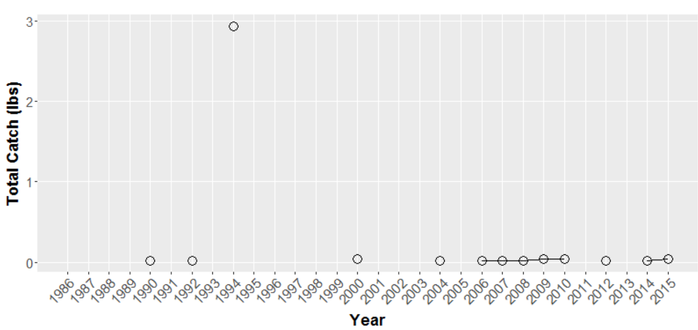
Guam: Lethrinus xanthochilus



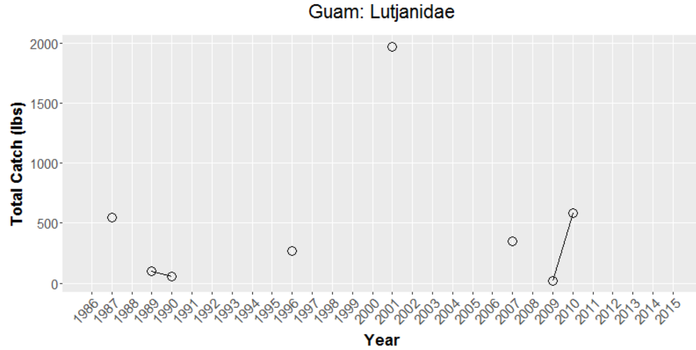
Guam: Liopropoma maculatum



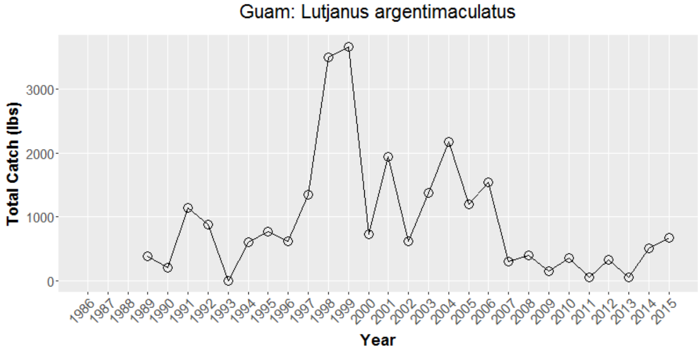
Guam: Littorinidae



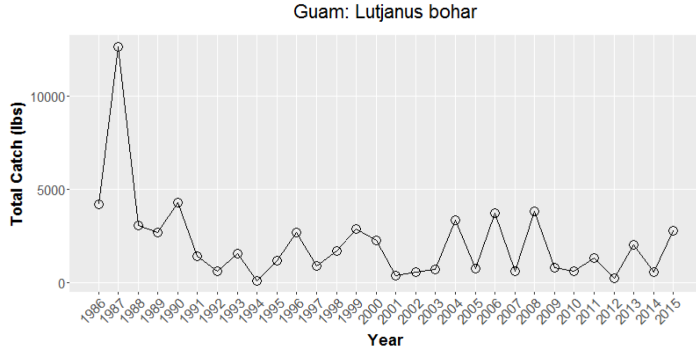
Guam: Lutjanidae

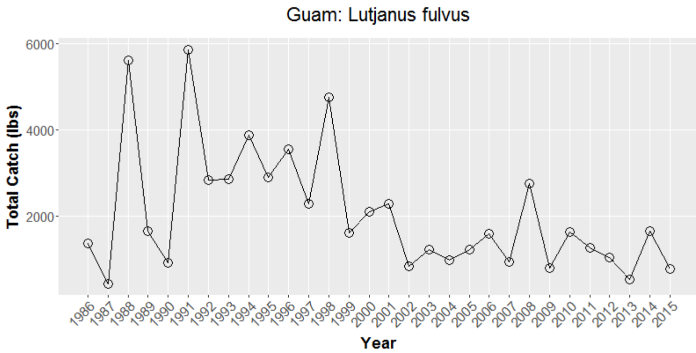


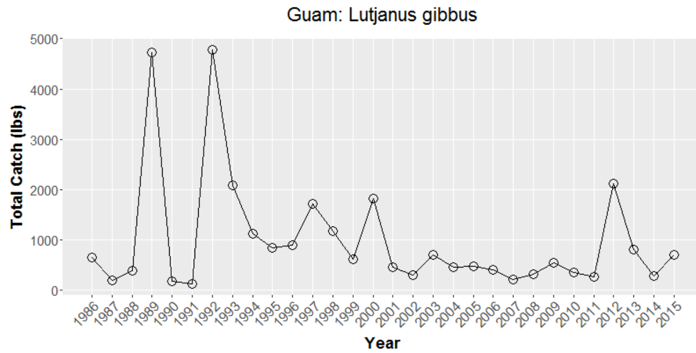
Guam: Lutjanus argentimaculatus

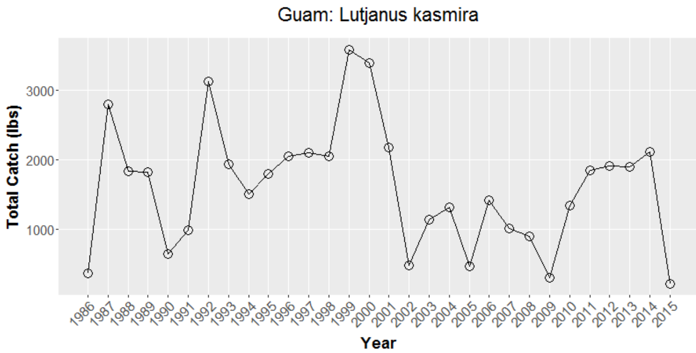


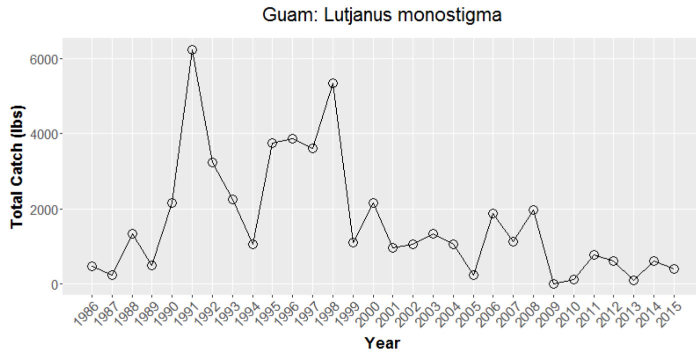
Guam: Lutjanus bohar

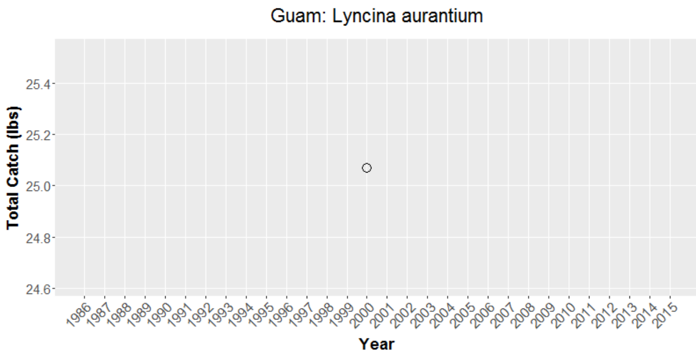


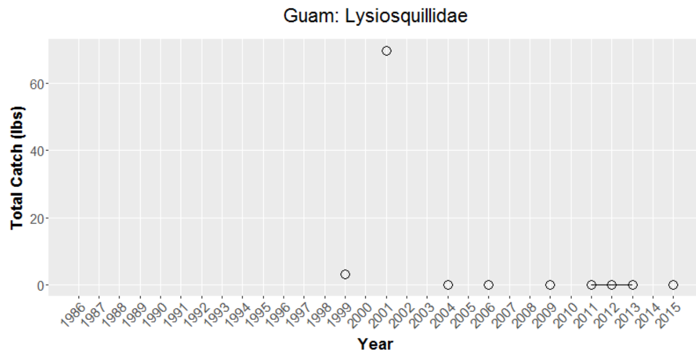

Guam: Lutjanus fulvus
Total Catch (lbs)
Year

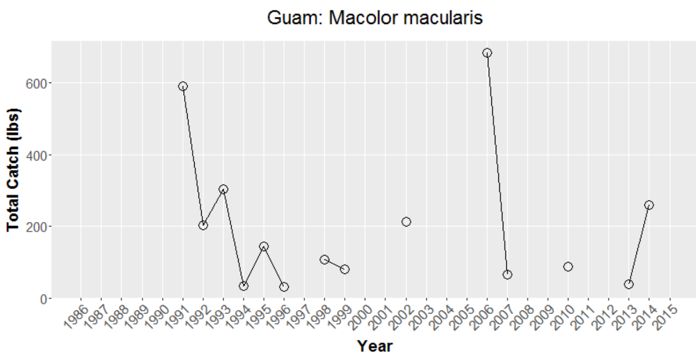

Guam: Lutjanus gibbus
Total Catch (lbs)
Year

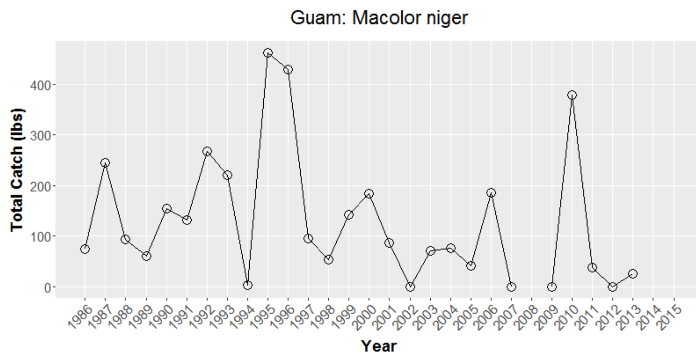

Guam: Lutjanus kasmira
Total Catch (lbs)
Year

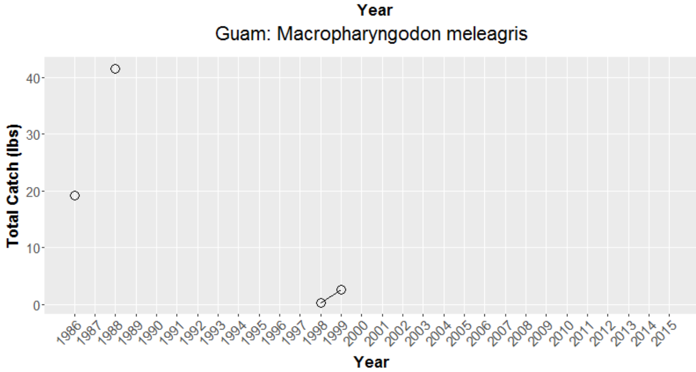

Guam: Lutjanus monostigma
Total Catch (lbs)
Year

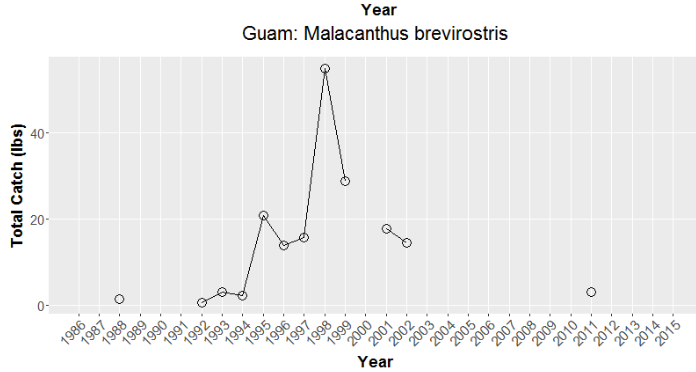

Guam: Lyncina aurantium
Total Catch (lbs)
Year


Guam: Lysiosquillidae
Total Catch (lbs)
Year

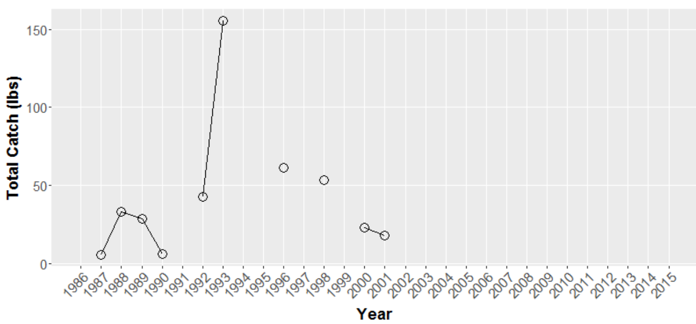

Guam: Macolor macularis
Total Catch (lbs)
Year


Guam: Macolor niger
Total Catch (lbs)
Year

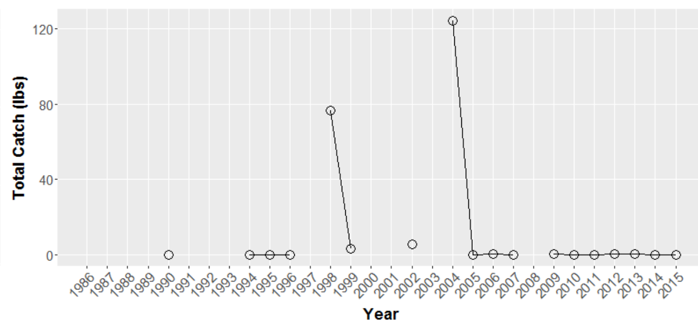

Guam: Macropharyngodon meleagris
Total Catch (lbs)
Year


Guam: Malacanthus brevirostris
Total Catch (lbs)
Year

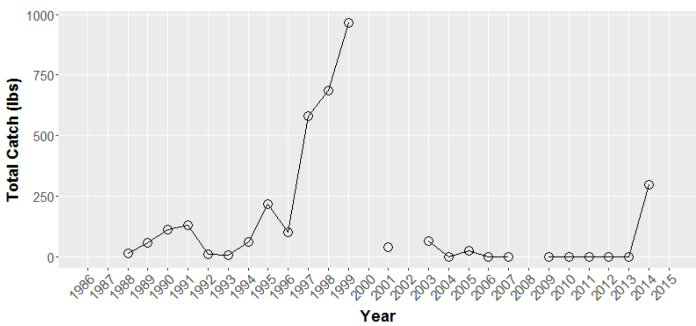
Guam: Malacanthus latovittatus



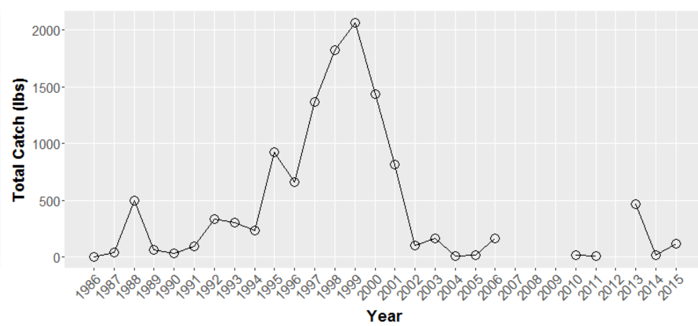
Guam: Megalops cyprinoides



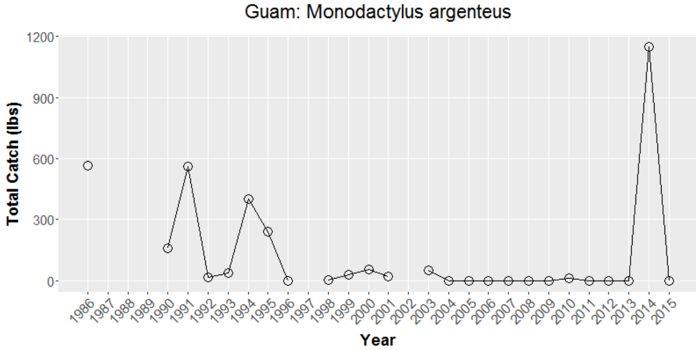
Guam: Melichthys niger



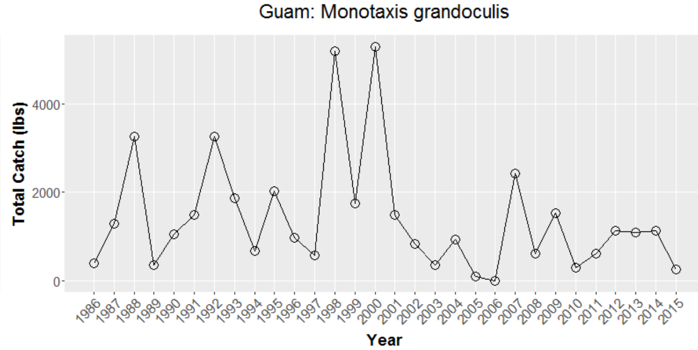
Guam: Melichthys vidua



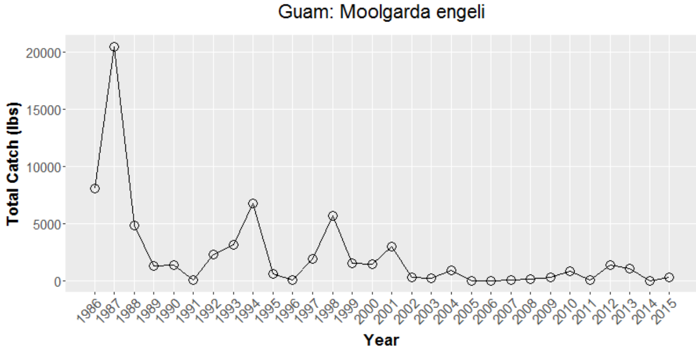
Guam: Monodactylus argenteus



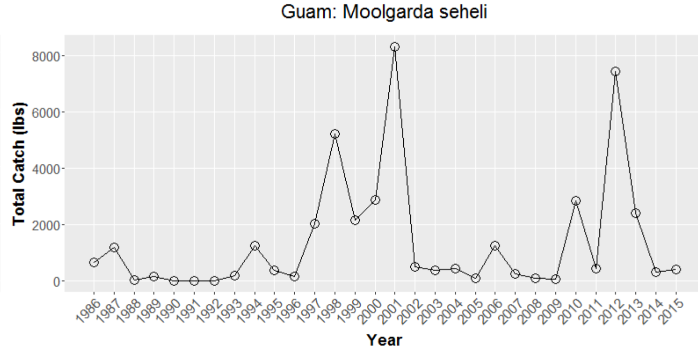
Guam: Monotaxis grandoculis



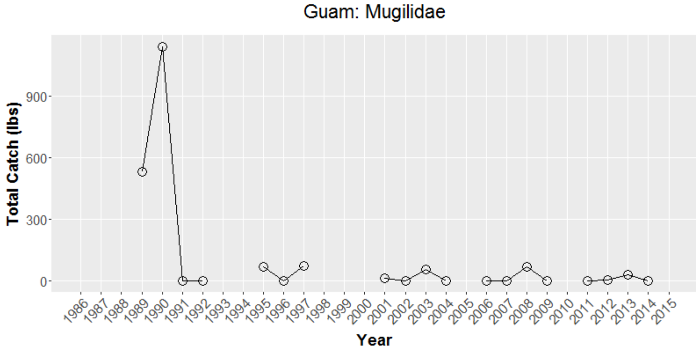
Guam: Moolgarda engeli



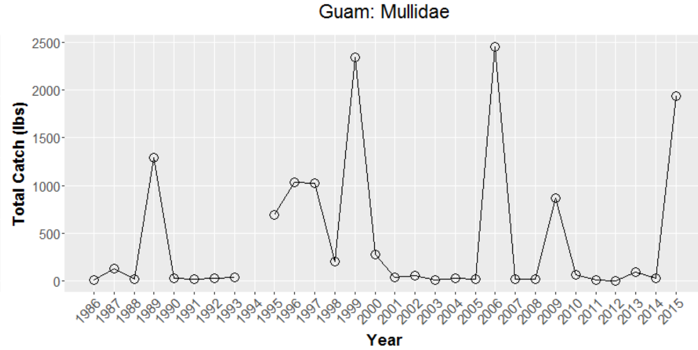
Guam: Moolgarda seheli



Guam: Mugilidae



Guam: Mullidae



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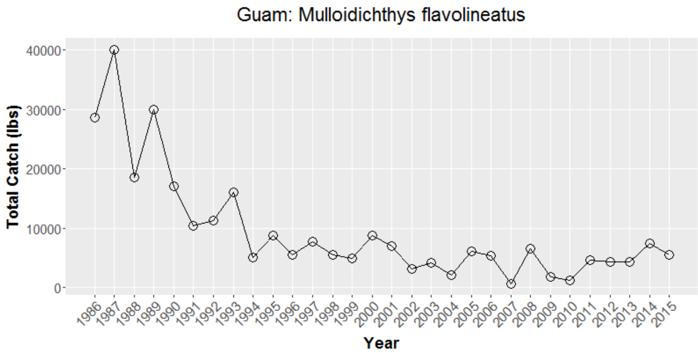
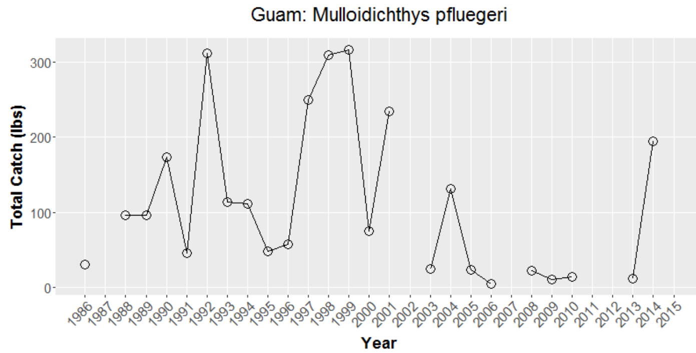
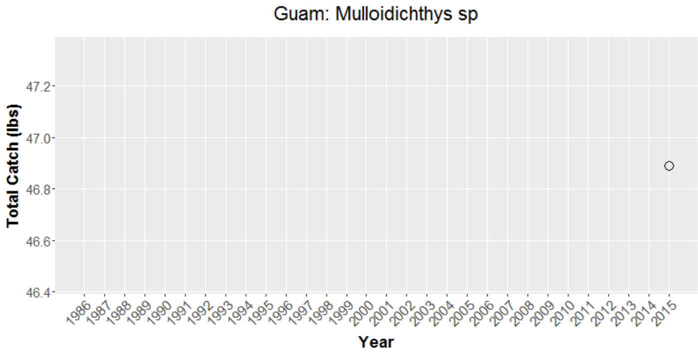
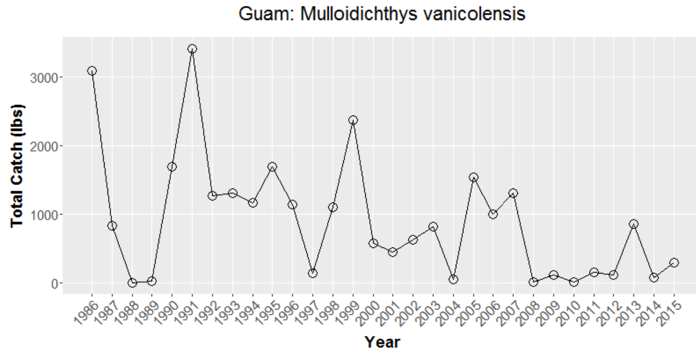
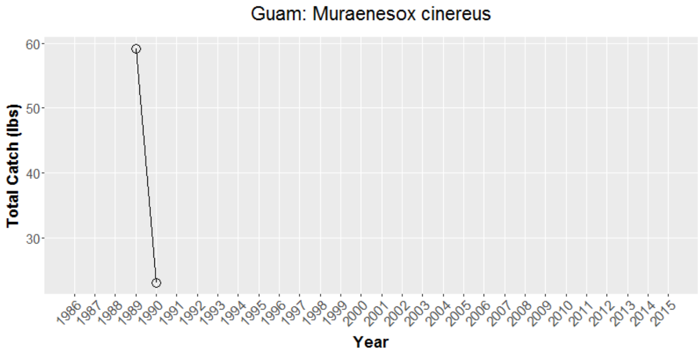
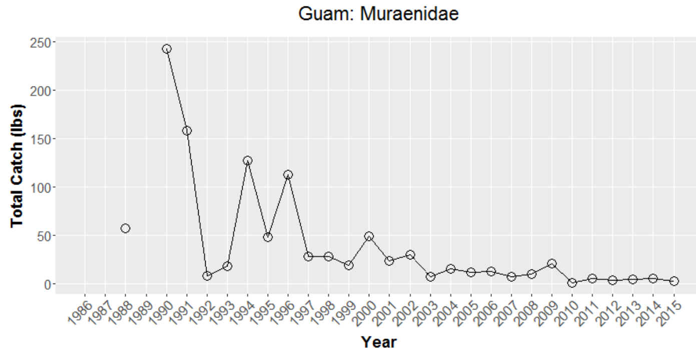


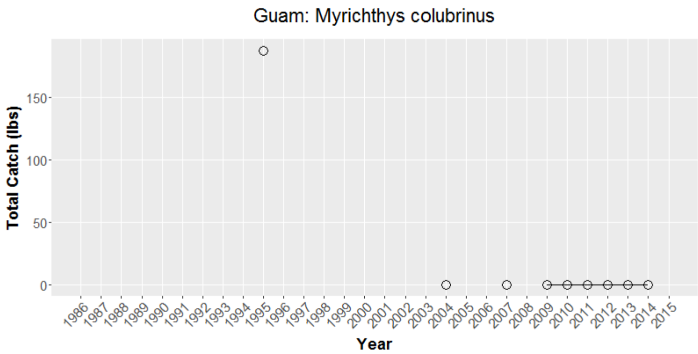


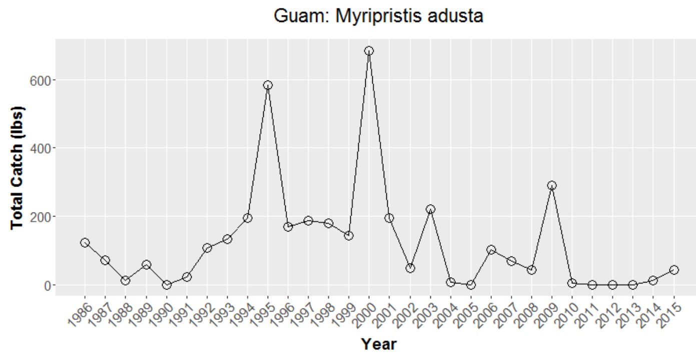


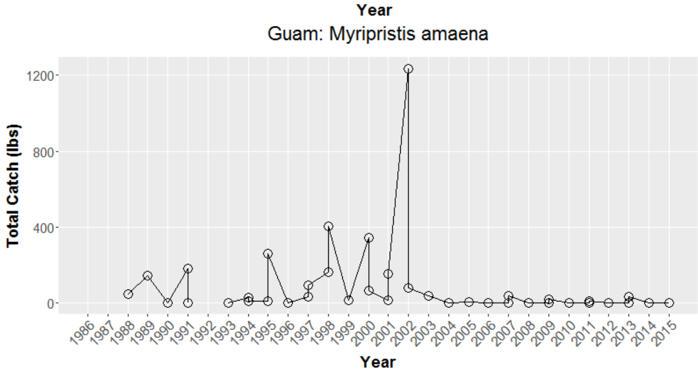


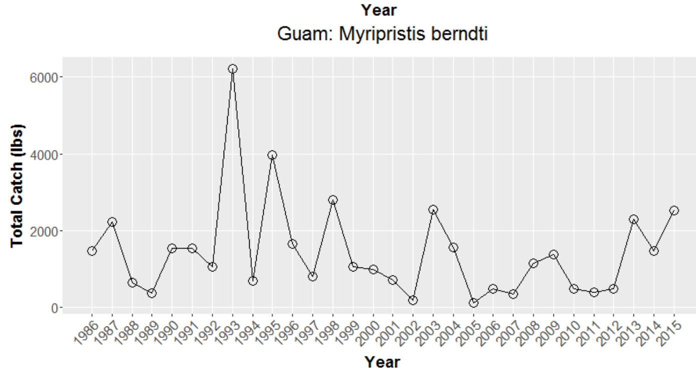


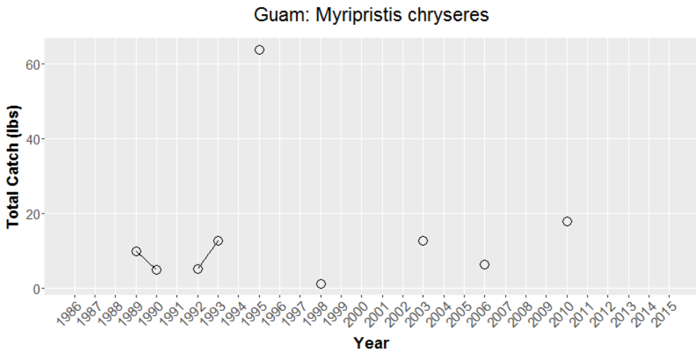


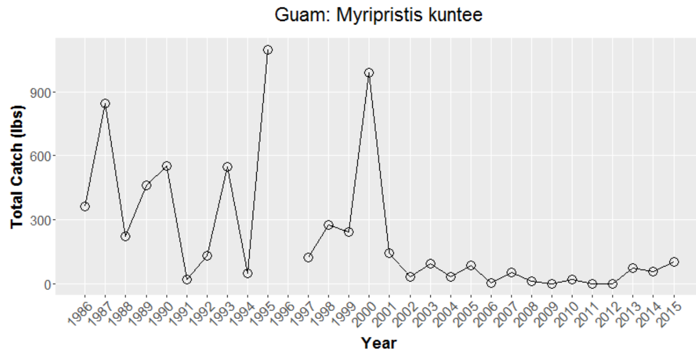


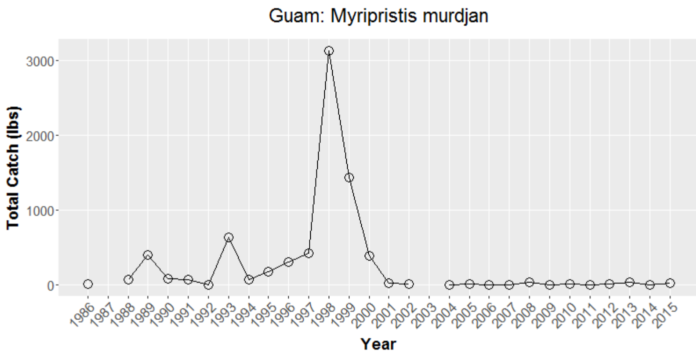


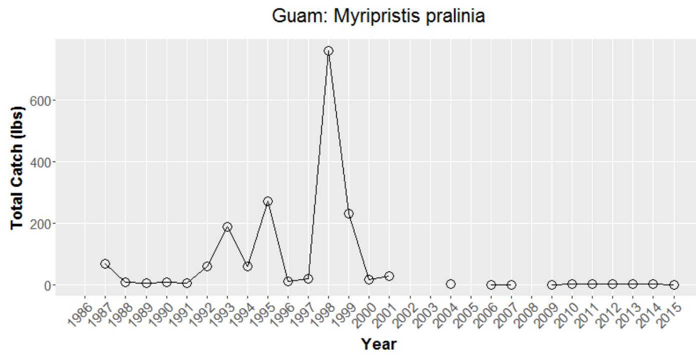


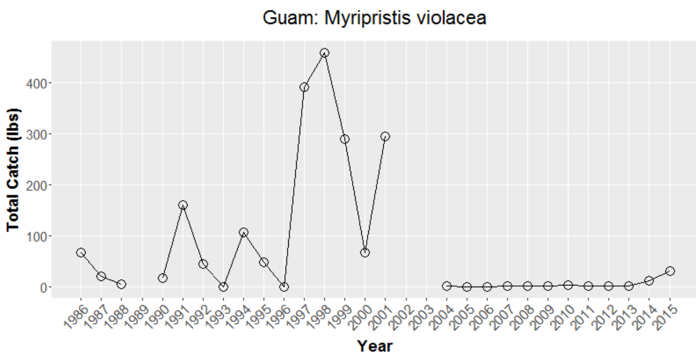


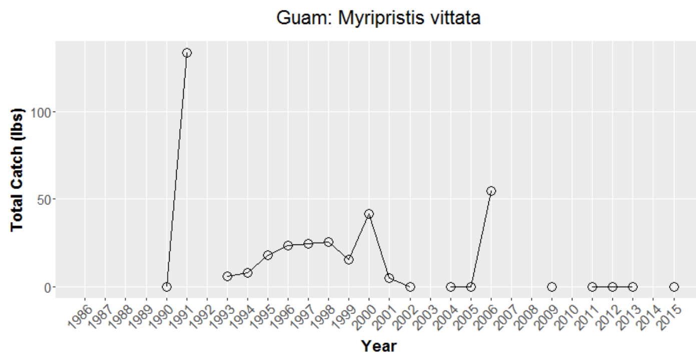

Guam: Myripristis chryseres
Total Catch (lbs)
0 20 40 60
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

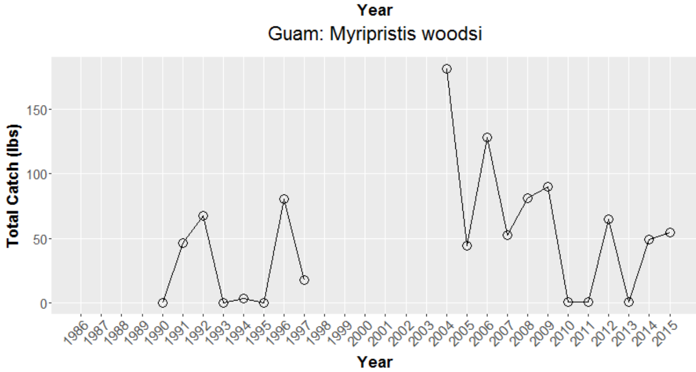

Guam: Myripristis kuntee
Total Catch (lbs)
0 300 600 900
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

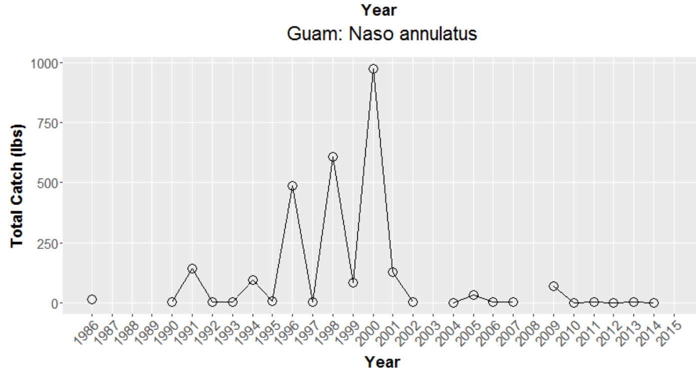

Guam: Myripristis murdjan
Total Catch (lbs)
0 1000 2000 3000
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

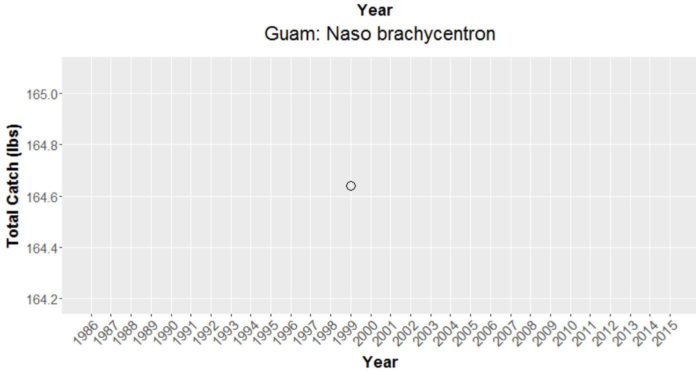

Guam: Myripristis pralinia
Total Catch (lbs)
0 200 400 600
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

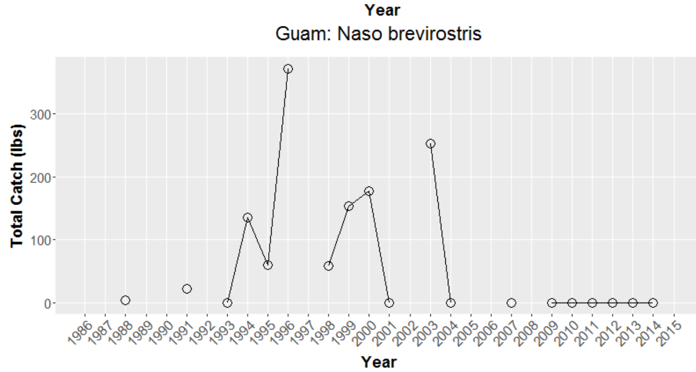

Guam: Myripristis violacea
Total Catch (lbs)
0 100 200 300 400
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

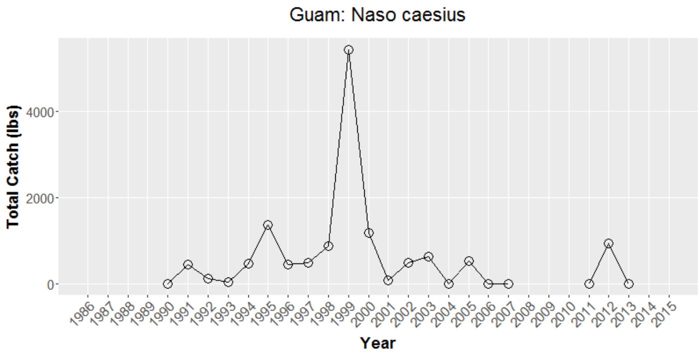

Guam: Myripristis vittata
Total Catch (lbs)
0 50 100
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

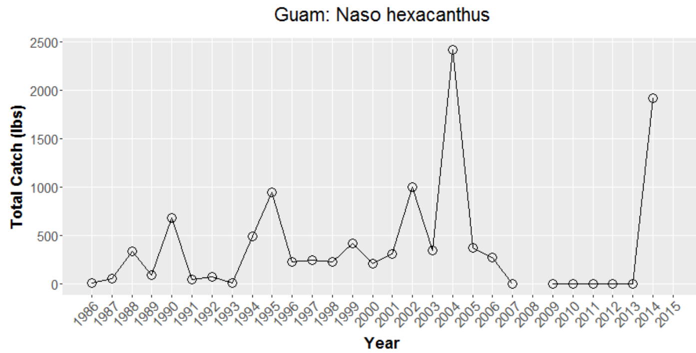

Guam: Myripristis woodsi
Total Catch (lbs)
0 50 100 150
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

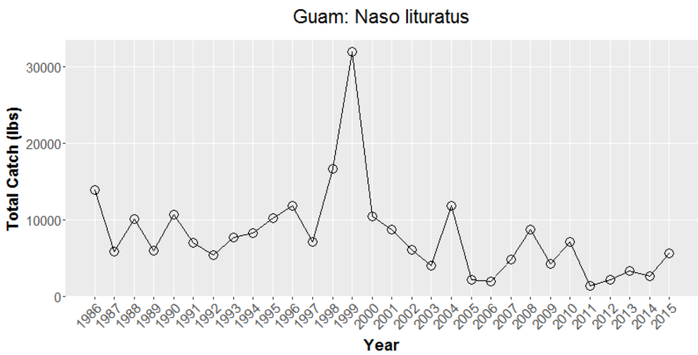

Guam: Naso annulatus
Total Catch (lbs)
0 250 500 750 1000
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

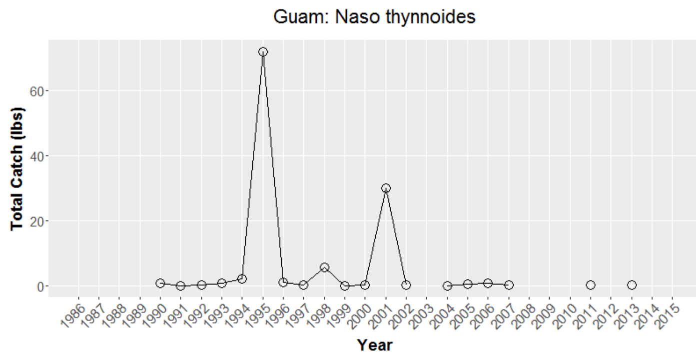

Guam: Naso brachycentron
Total Catch (lbs)
164.2 164.4 164.6 164.8 165.0
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

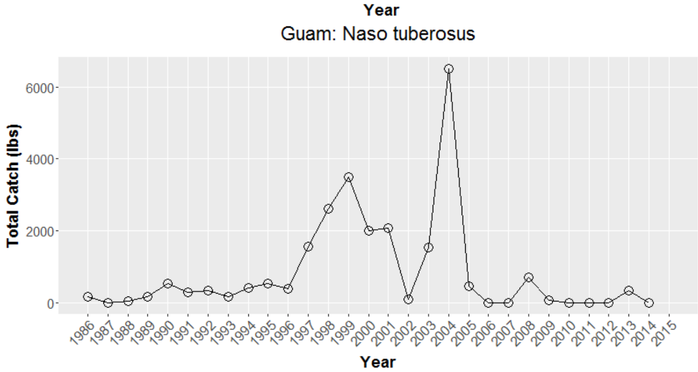

Guam: Naso brevirostris
Total Catch (lbs)
0 100 200 300
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

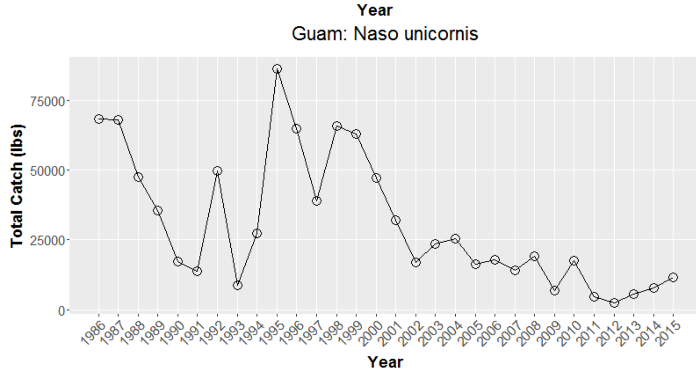

Guam: Naso caesius
Total Catch (lbs)
Year

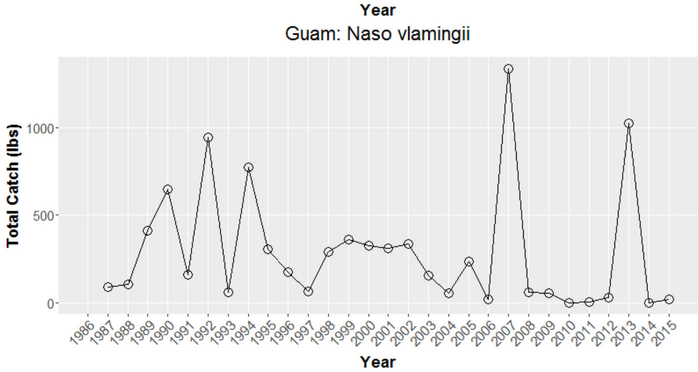

Guam: Naso hexacanthus
Total Catch (lbs)
Year

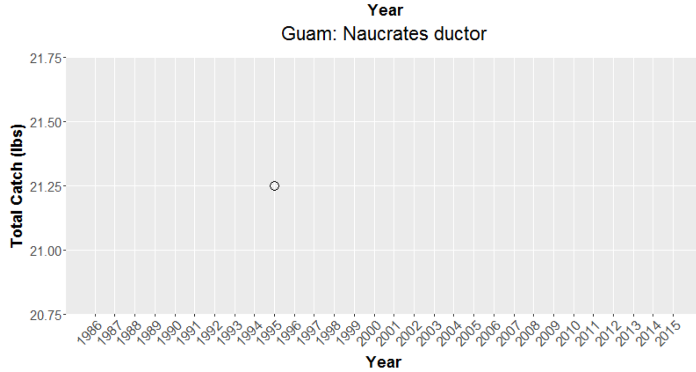

Guam: Naso lituratus
Total Catch (lbs)
Year

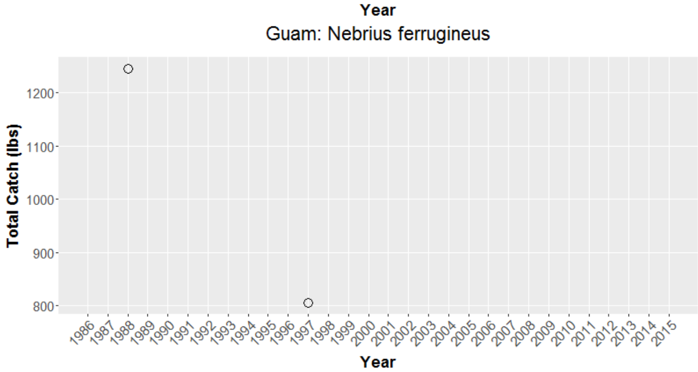

Guam: Naso thynnoides
Total Catch (lbs)
Year

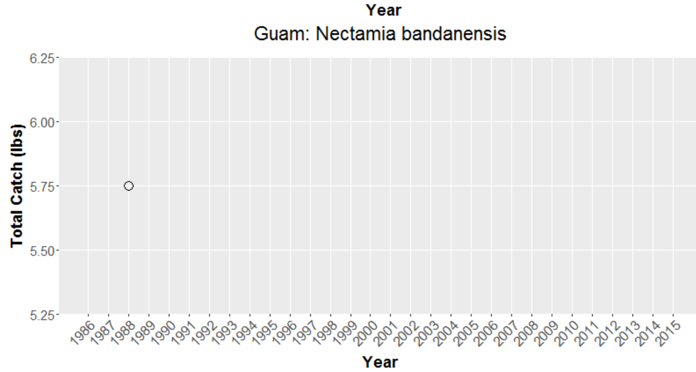

Guam: Naso tuberosus
Total Catch (lbs)
Year

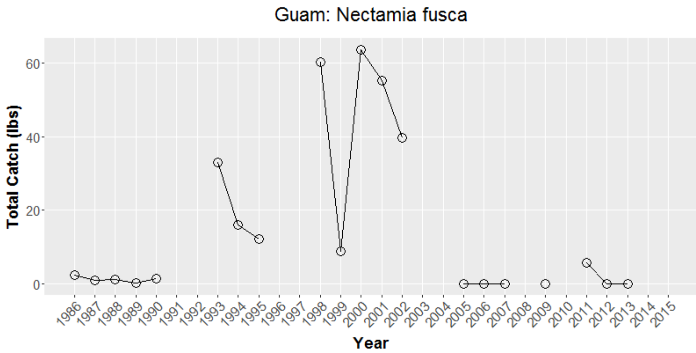

Guam: Naso unicornis
Total Catch (lbs)
Year

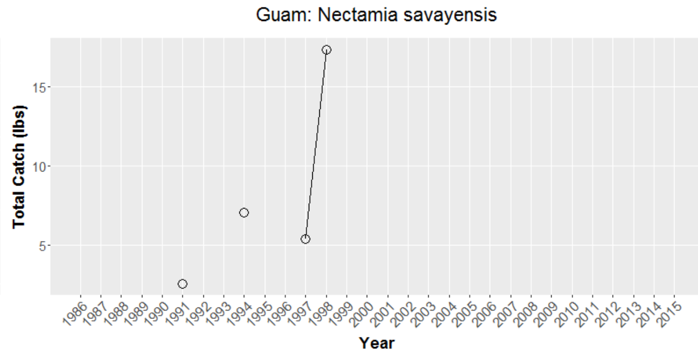

Guam: Naso vlamingii
Total Catch (lbs)
Year

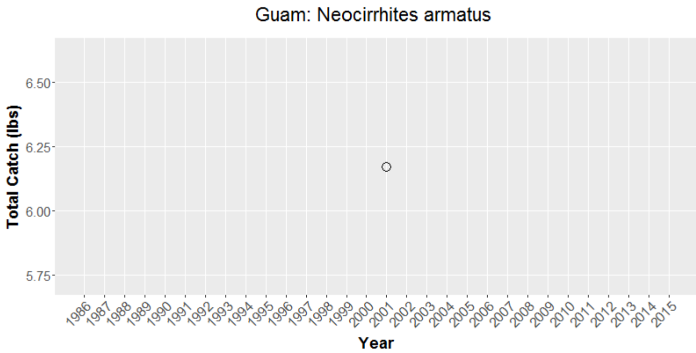

Guam: Naucrates ductor
Total Catch (lbs)
Year

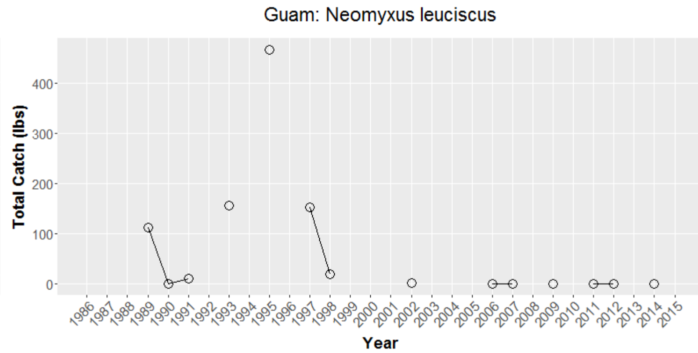

Guam: Nebrius ferrugineus
Total Catch (lbs)
Year

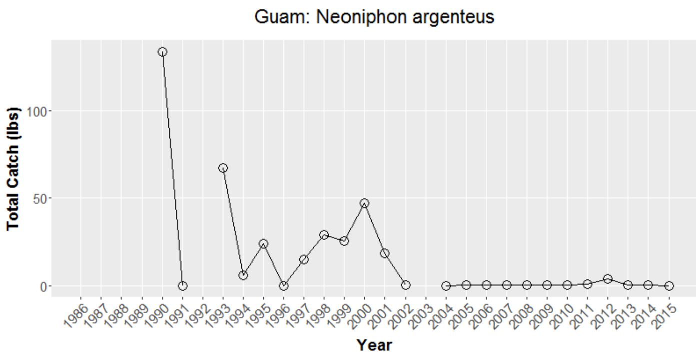

Guam: Nectamia bandanensis
Total Catch (lbs)
Year

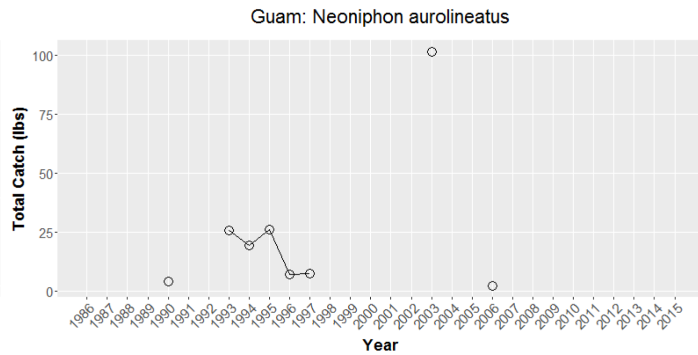

Guam: Nectamia fusca
Total Catch (lbs)
0
20
40
60
Year

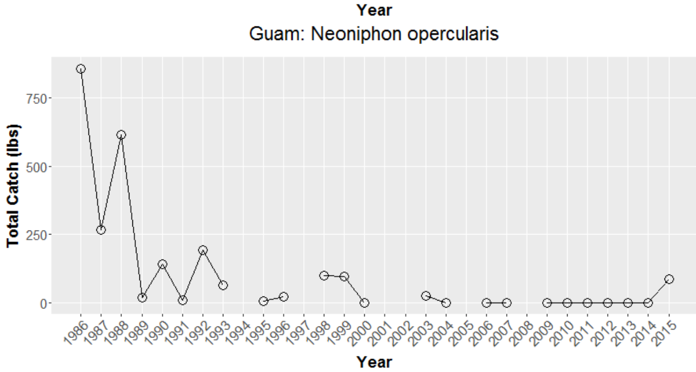

Guam: Nectamia savayensis
Total Catch (lbs)
5
10
15
Year

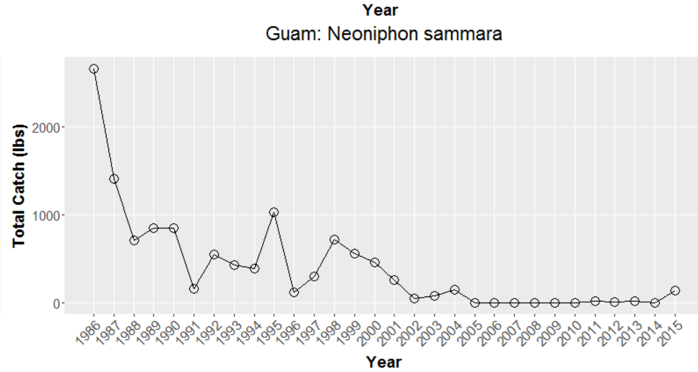

Guam: Neocirrhites armatus
Total Catch (lbs)
5.75
6.00
6.25
6.50
Year

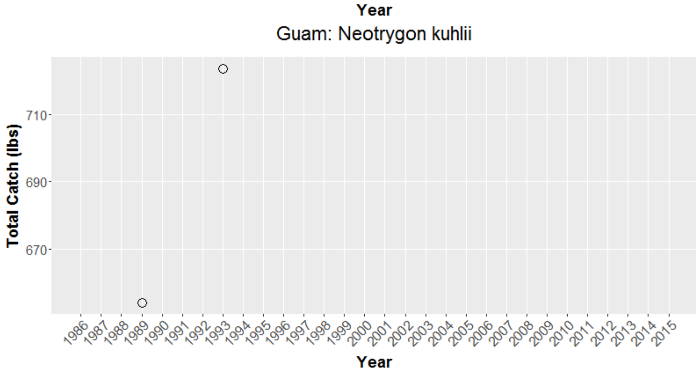

Guam: Neomyxus leuciscus
Total Catch (lbs)
0
100
200
300
400
Year

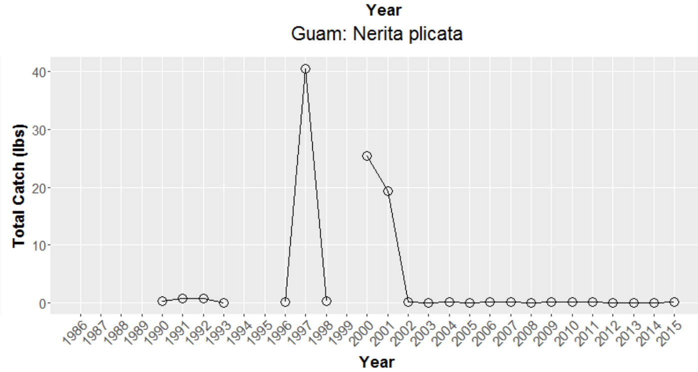

Guam: Neoniphon argenteus
Total Catch (lbs)
0
50
100
Year


Guam: Neoniphon aurolineatus
Total Catch (lbs)
0
25
50
75
100
Year

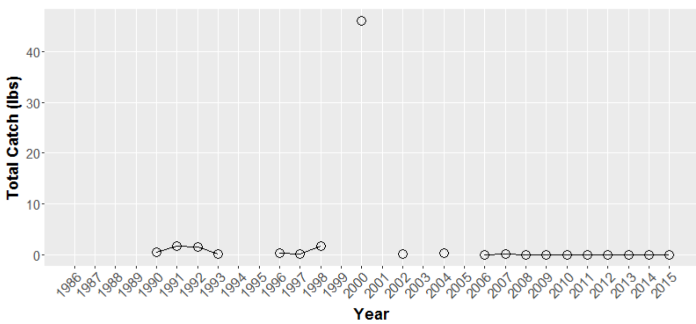

Guam: Neoniphon opercularis
Total Catch (lbs)
0
250
500
750
Year


Guam: Neoniphon sammara
Total Catch (lbs)
0
1000
2000
Year

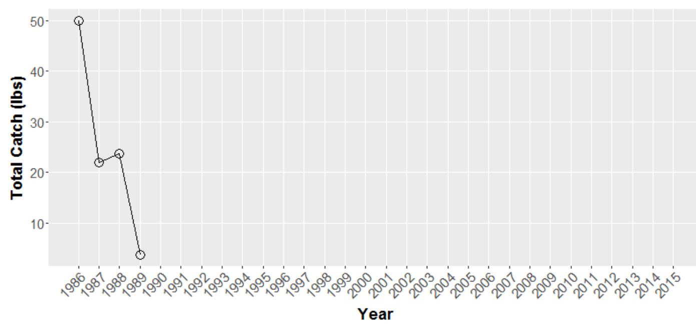

Guam: Neotrygon kuhlii
Total Catch (lbs)
670
690
710
Year


Guam: Nerita plicata
Total Catch (lbs)
0
10
20
30
40
Year

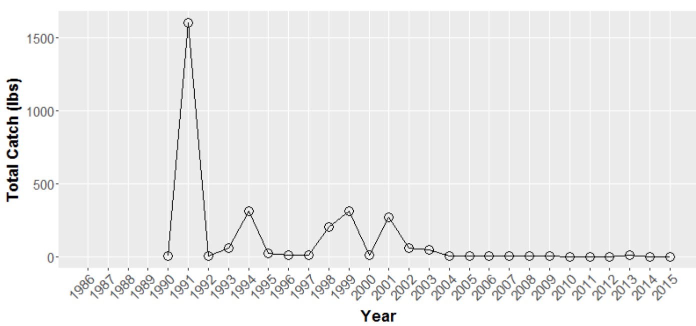
Guam: Nerita polita



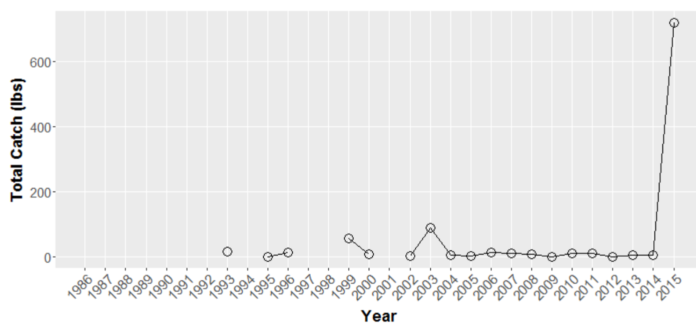
Guam: Neritidae



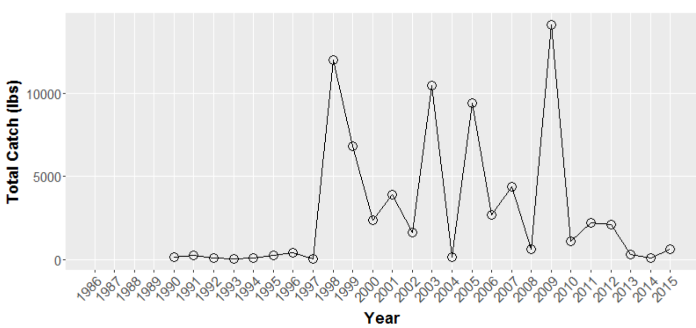
Guam: Novaculichthys taeniourus



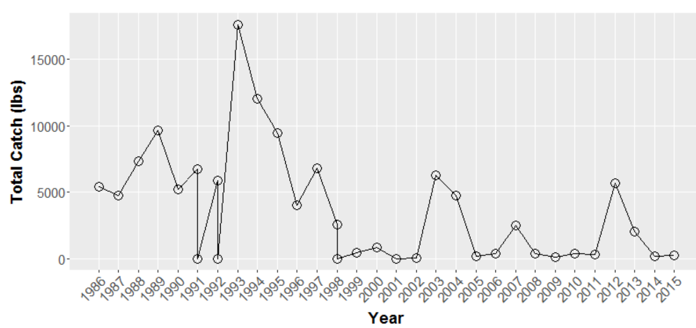
Guam: Octopodidae



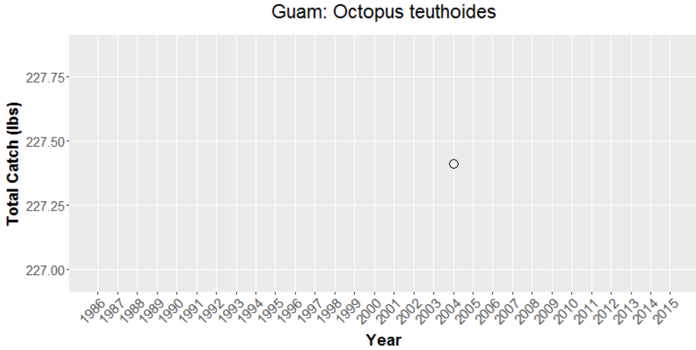
Guam: Octopus cyanea



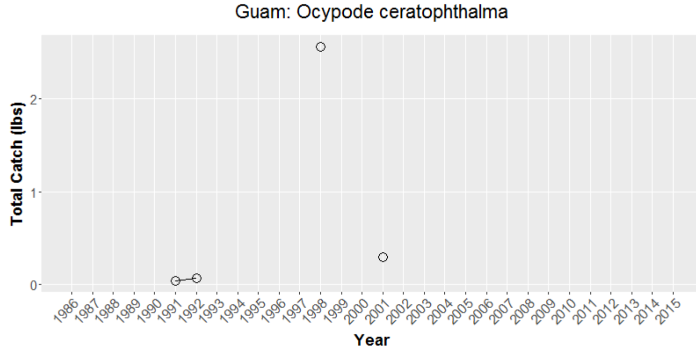
Guam: Octopus sp



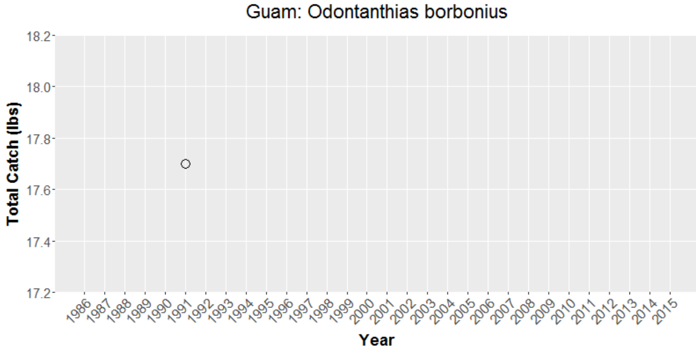
Guam: Octopus teuthoides



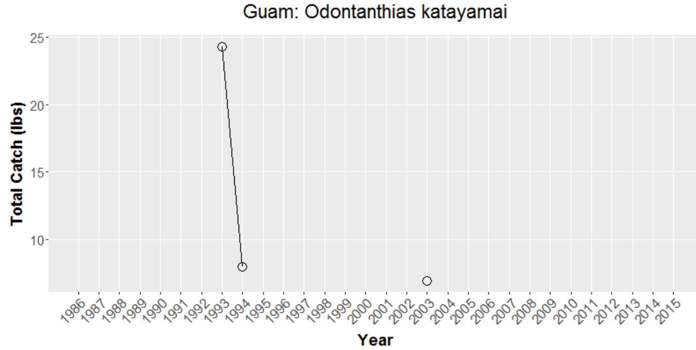
Guam: Ocypode ceratophthalma



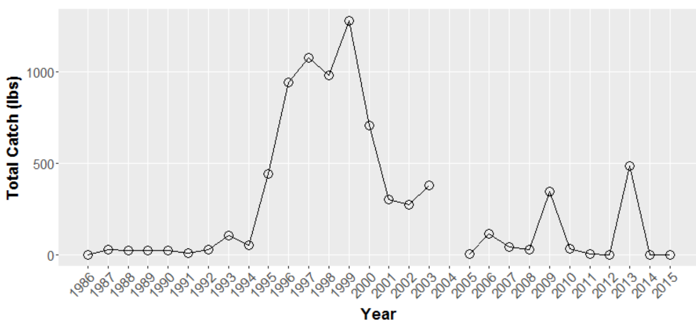
Guam: Odontanthias borbonius



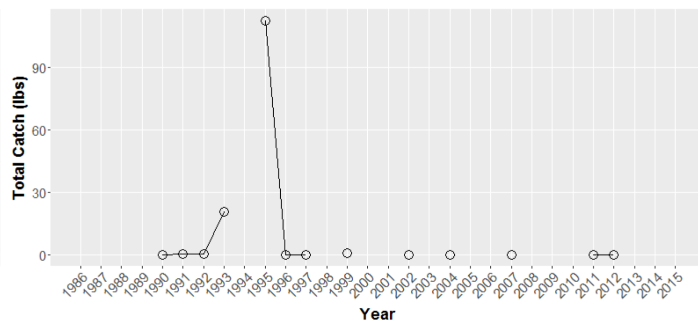
Guam: Odontanthias katayamai



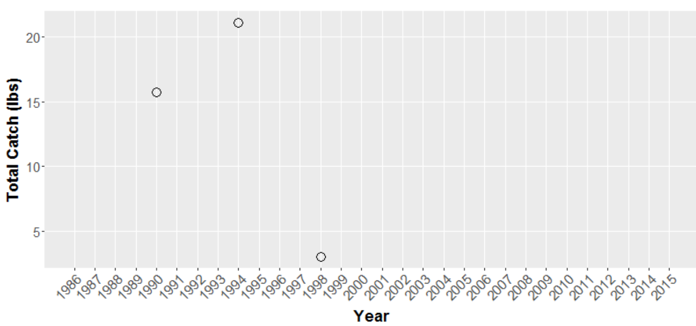
Guam: Odonus niger



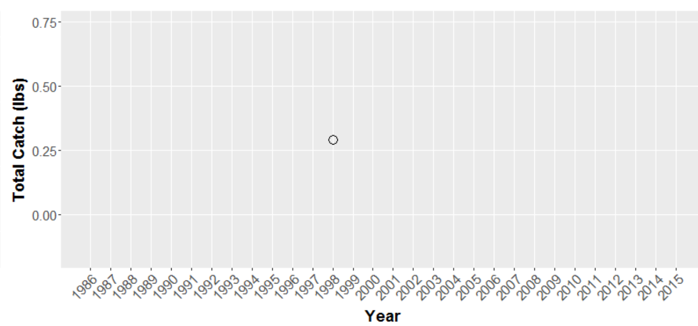
Guam: Oratosquilla oratoria



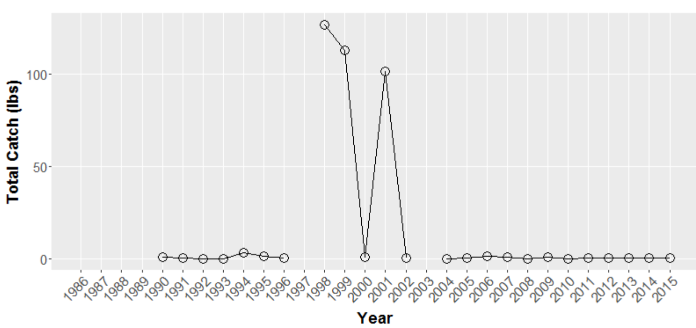
Guam: Order Archaeogastropoda



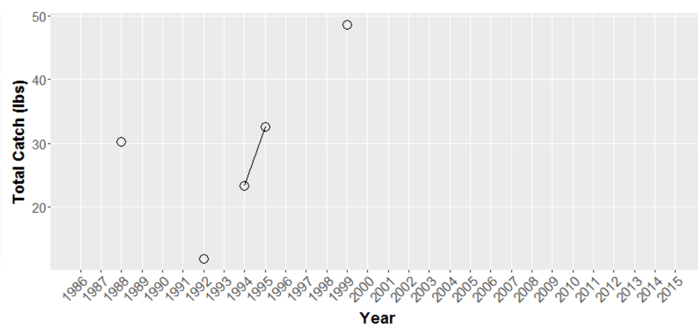
Guam: Order Decapoda



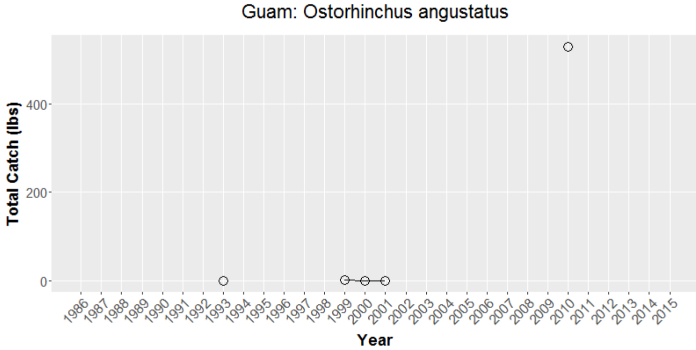
Guam: Oreochromis mossambicus



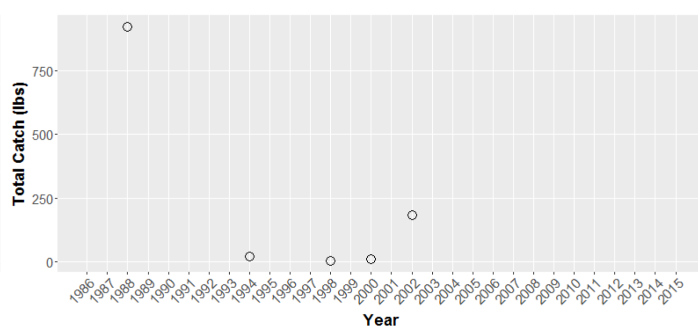
Guam: Ostichthys kaianus



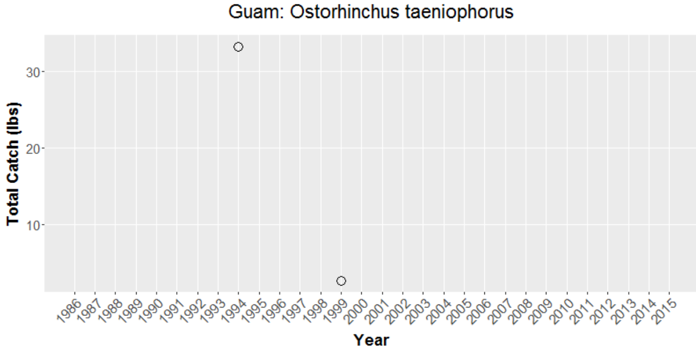
Guam: Ostorhinchus angustatus



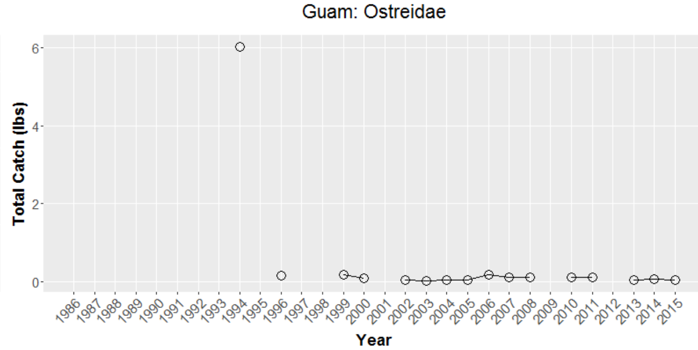
Guam: Ostorhinchus novemfasciatus



Guam: Ostorhinchus taeniophorus



Guam: Ostreidae



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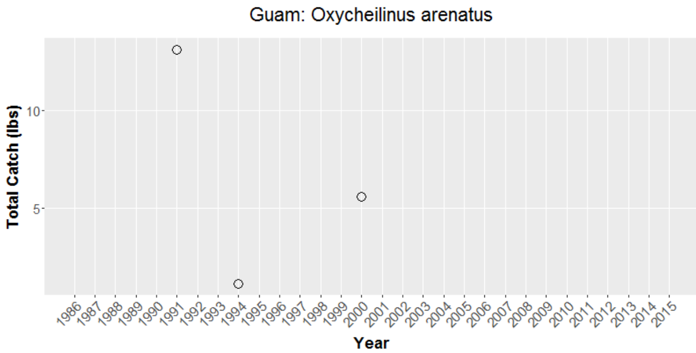
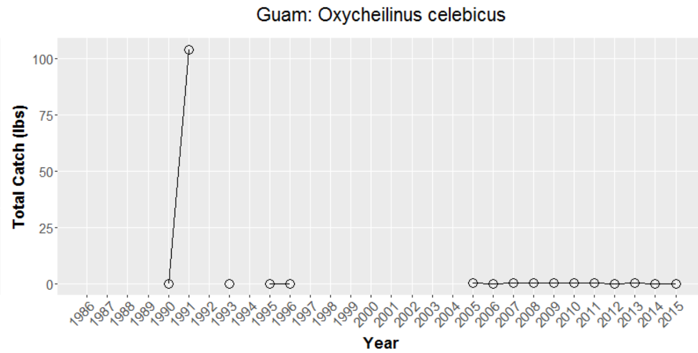
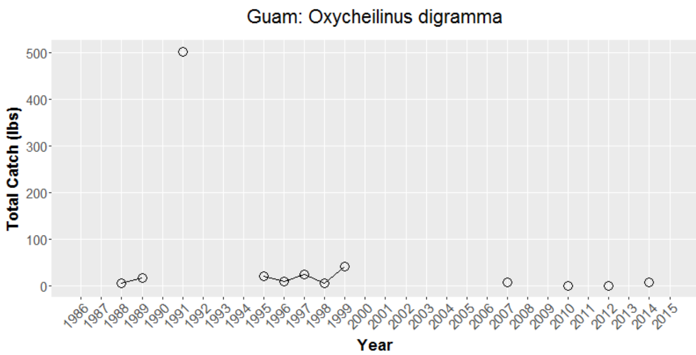
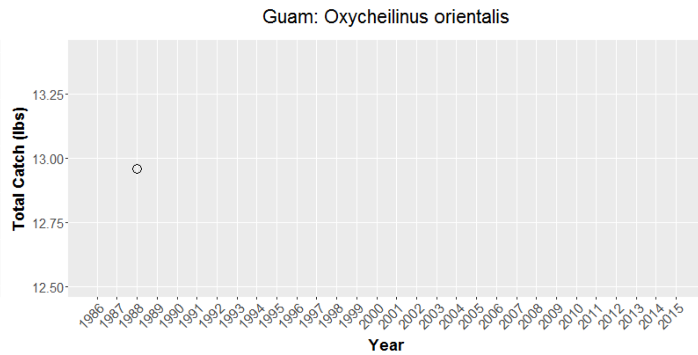
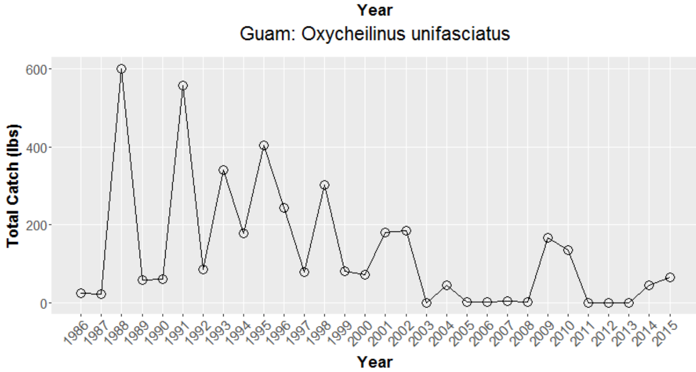
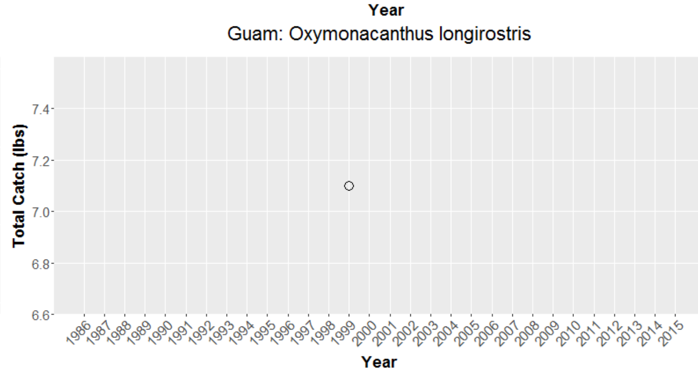


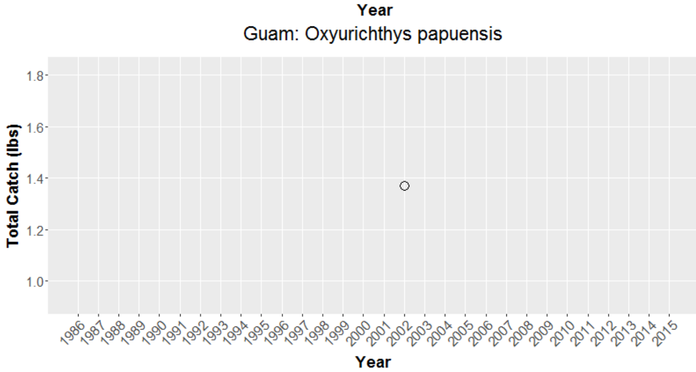


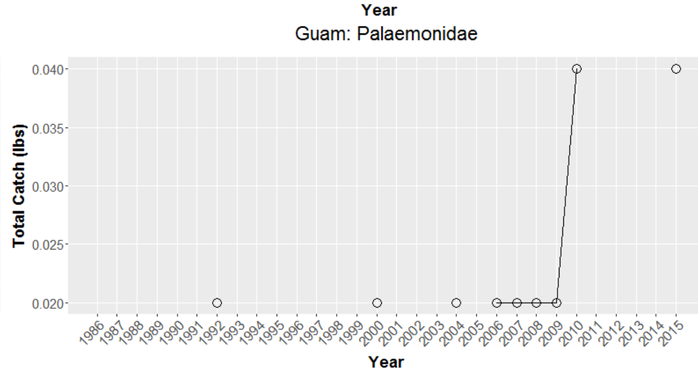


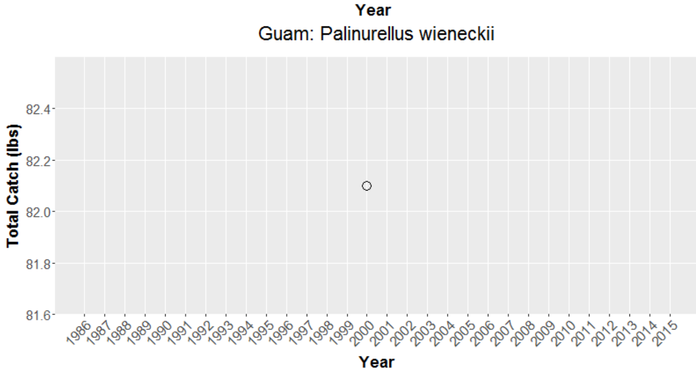


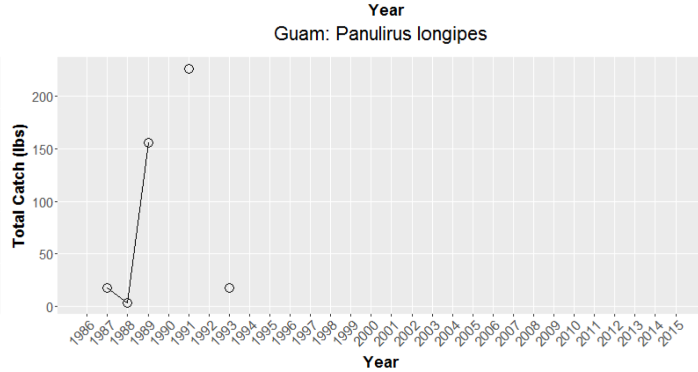




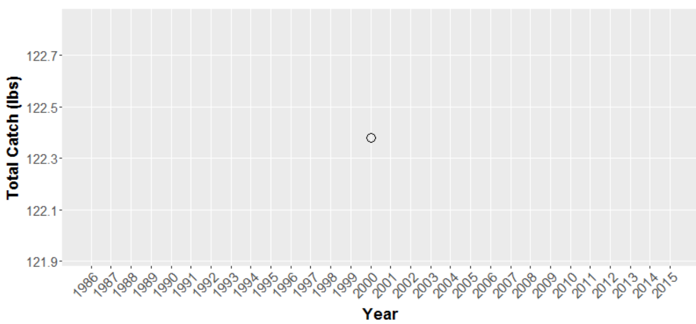




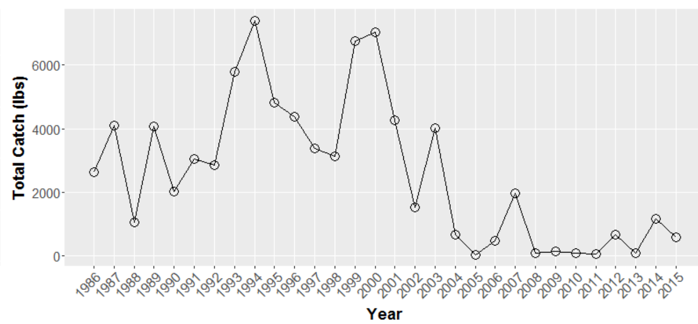




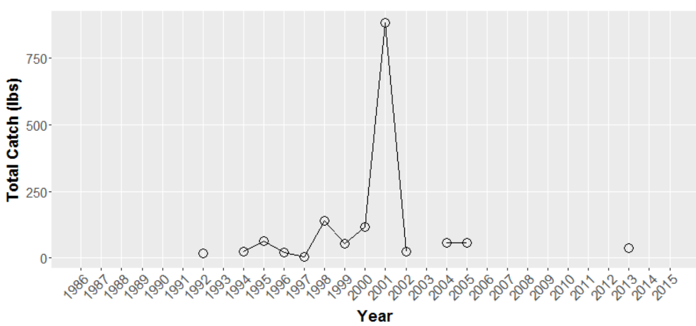
Guam: Panulirus ornatus



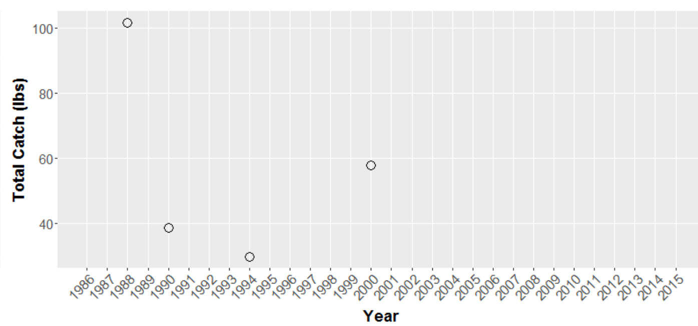
Guam: Panulirus penicillatus



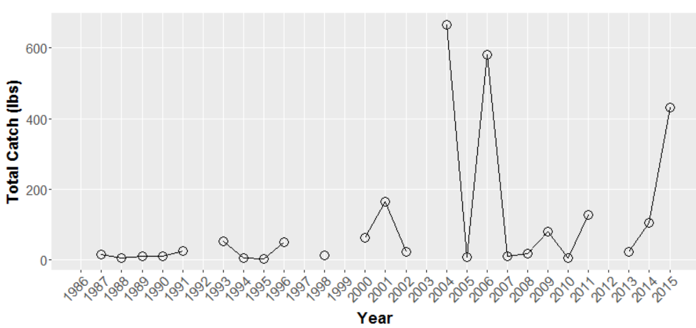
Guam: Panulirus versicolor



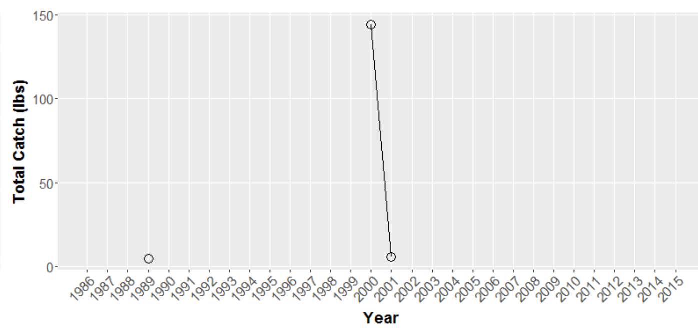
Guam: Paracaesio sordida



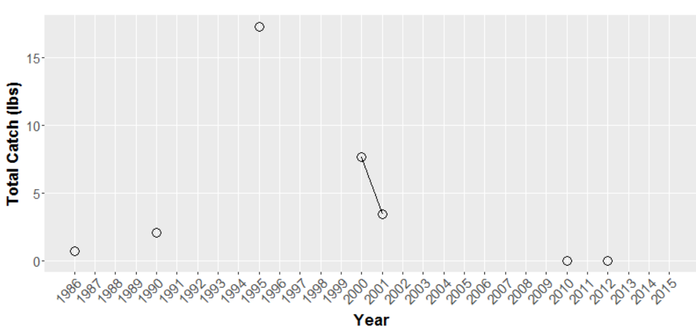
Guam: Paracaesio xanthura



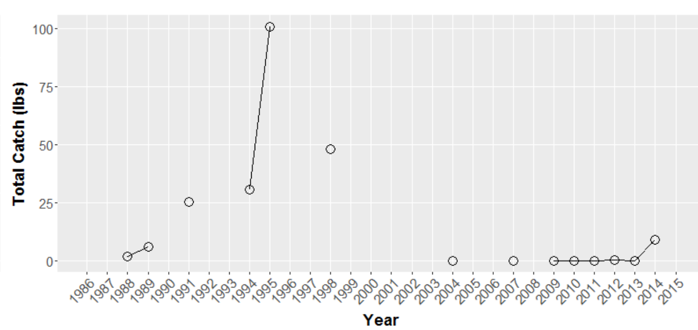
Guam: Paracanthurus hepatus



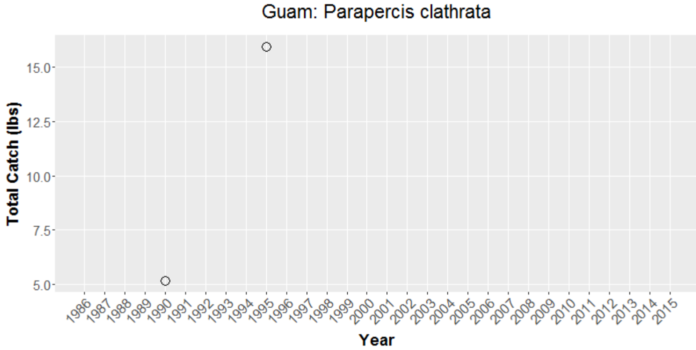
Guam: Paracirrhites forsteri



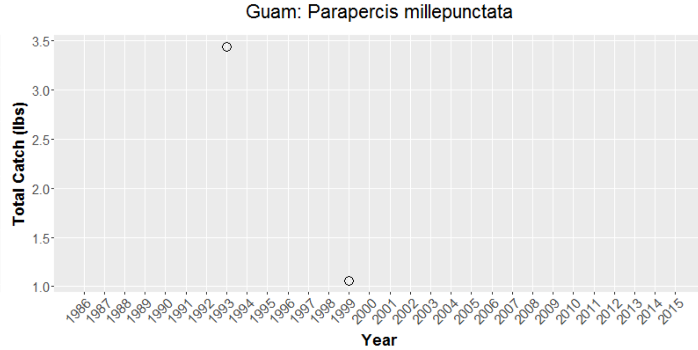
Guam: Paracirrhites hemistictus



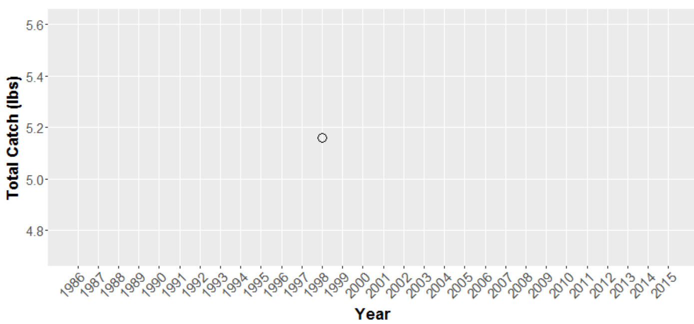
Guam: Parapercis clathrata



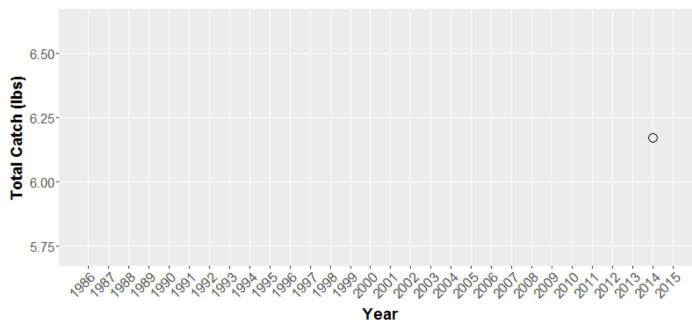
Guam: Parapercis millepunctata



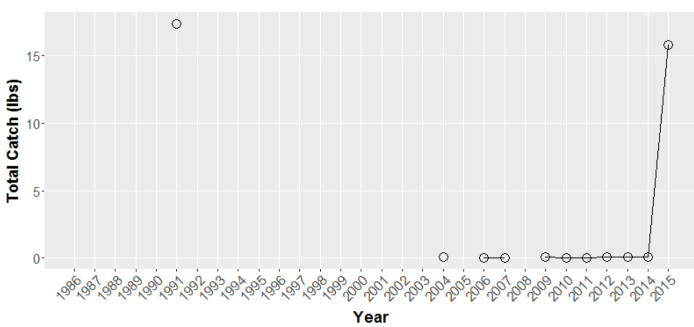
Guam: Parapriacanthus ransonneti



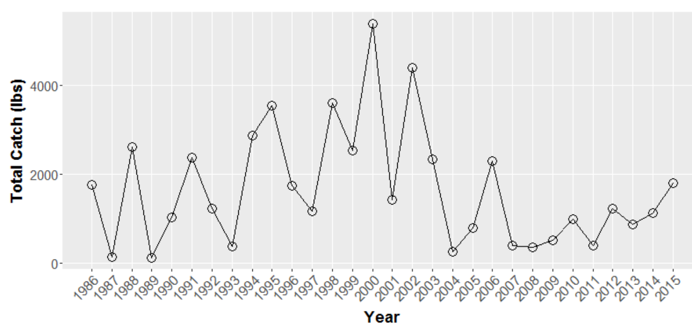
Guam: Parexocoetus brachypterus



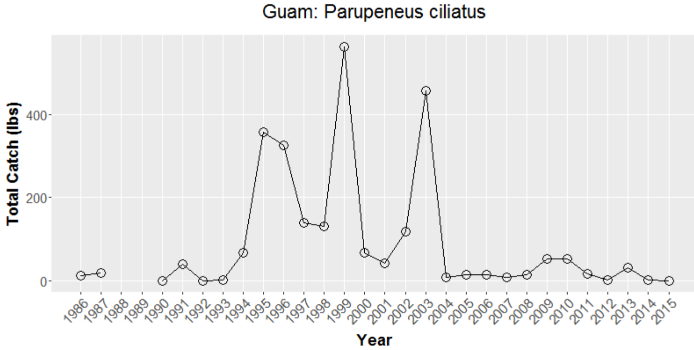
Guam: Parupeneus barberinoides



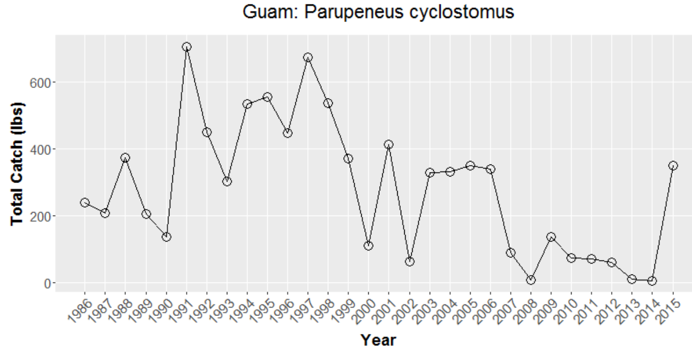
Guam: Parupeneus barberinus



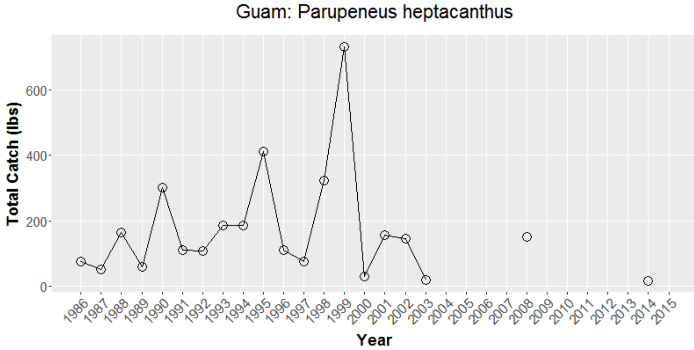
Guam: Parupeneus ciliatus



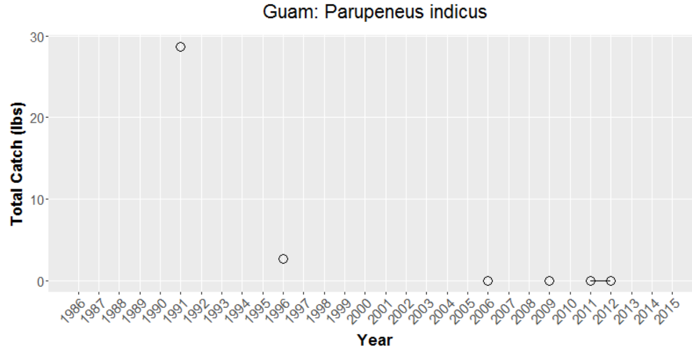
Guam: Parupeneus cyclostomus



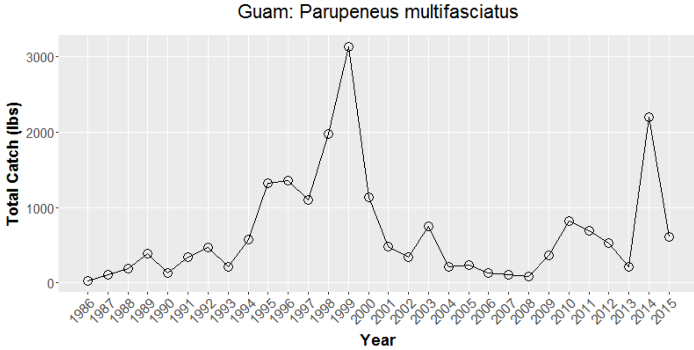
Guam: Parupeneus heptacanthus



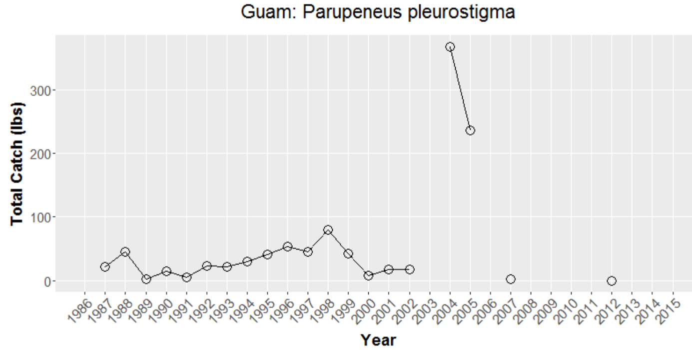
Guam: Parupeneus indicus

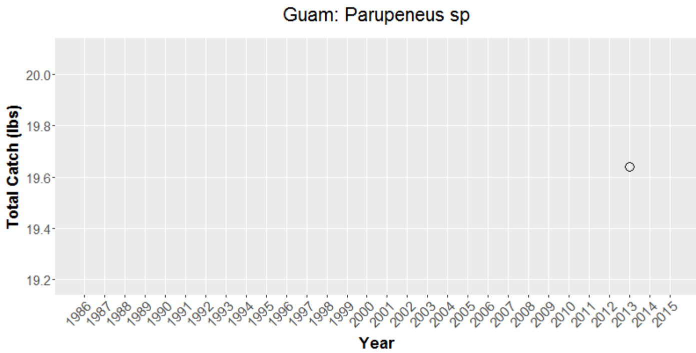


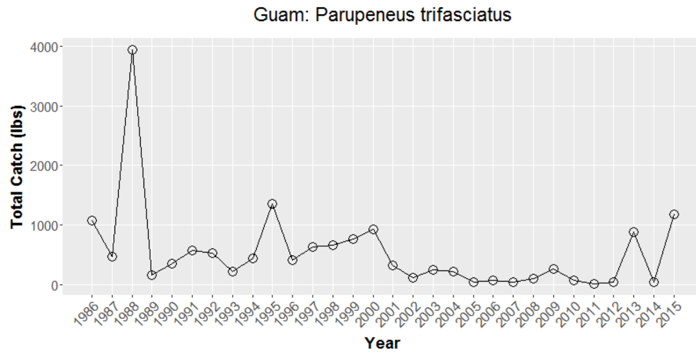
Guam: Parupeneus multifasciatus

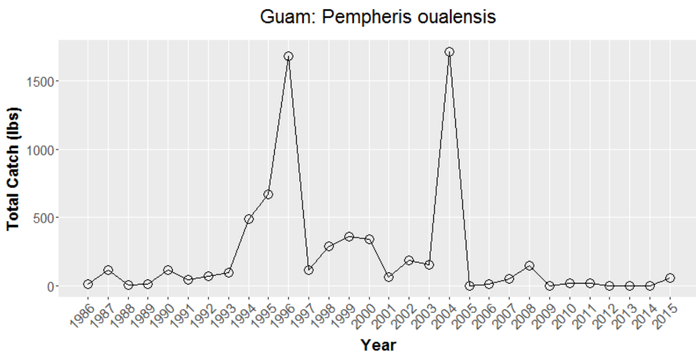


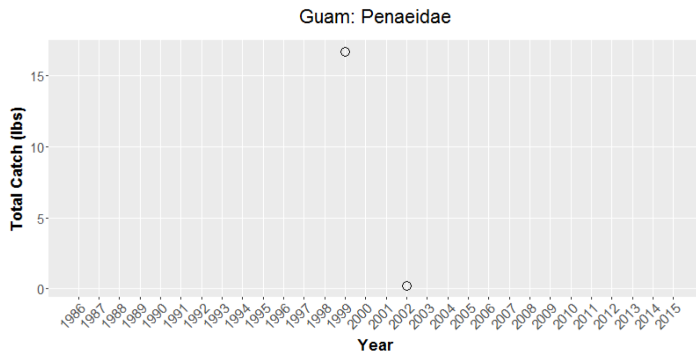
Guam: Parupeneus pleurostigma

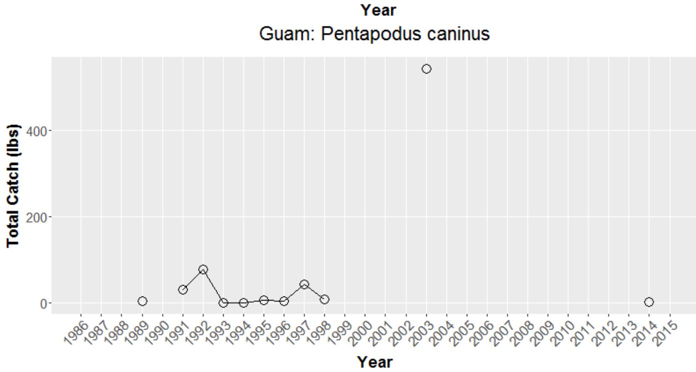


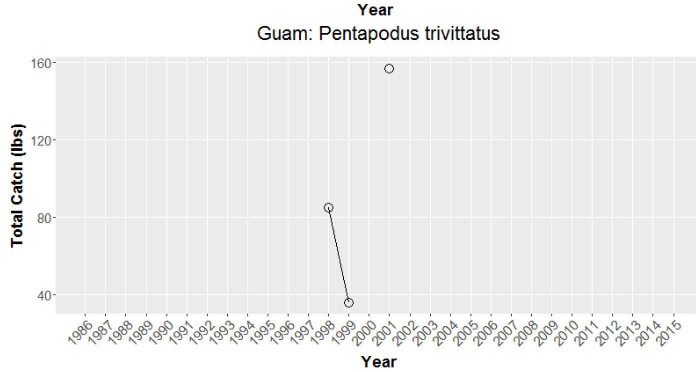

Guam: Parupeneus sp
Total Catch (lbs)
20.0
19.8
19.6
19.4
19.2
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

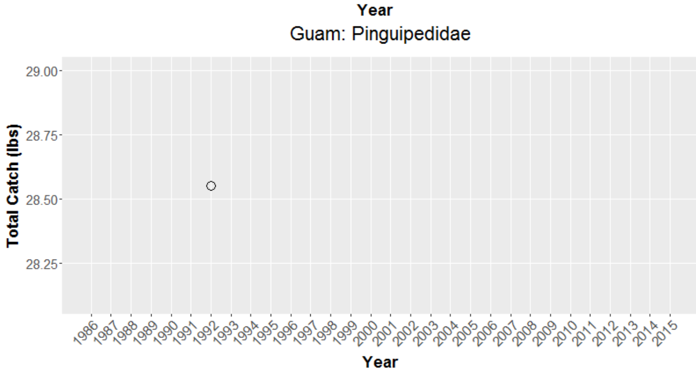

Guam: Parupeneus trifasciatus
Total Catch (lbs)
4000
3000
2000
1000
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

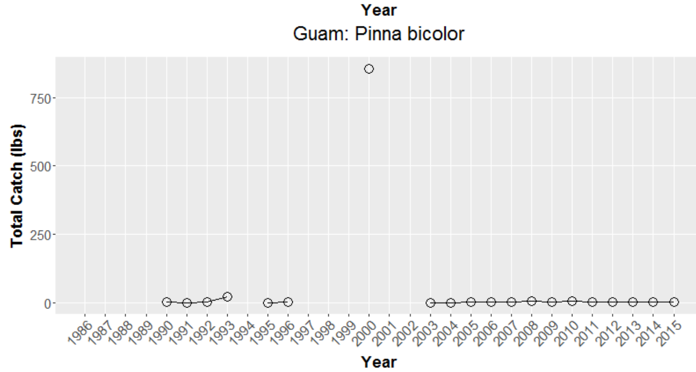

Guam: Pempheris oualensis
Total Catch (lbs)
1500
1000
500
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

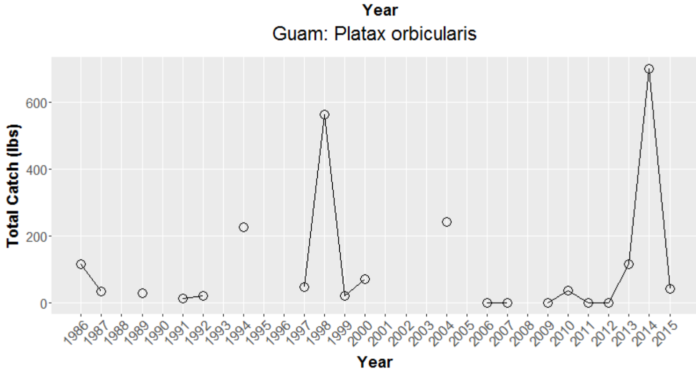

Guam: Penaeidae
Total Catch (lbs)
15
10
5
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

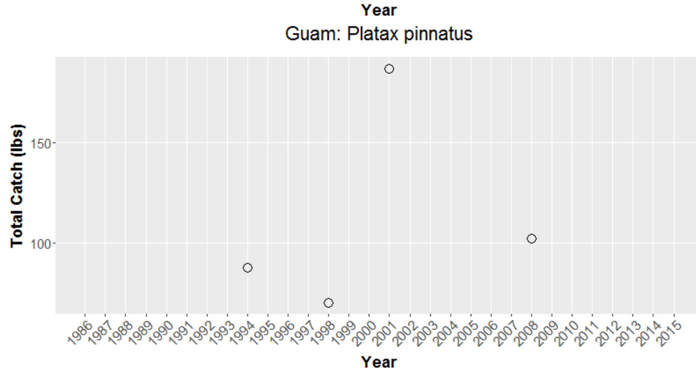

Guam: Pentapodus caninus
Total Catch (lbs)
400
200
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

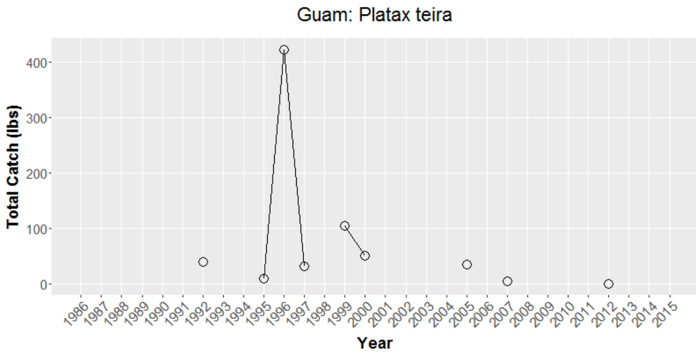

Guam: Pentapodus trivittatus
Total Catch (lbs)
160
120
80
40
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

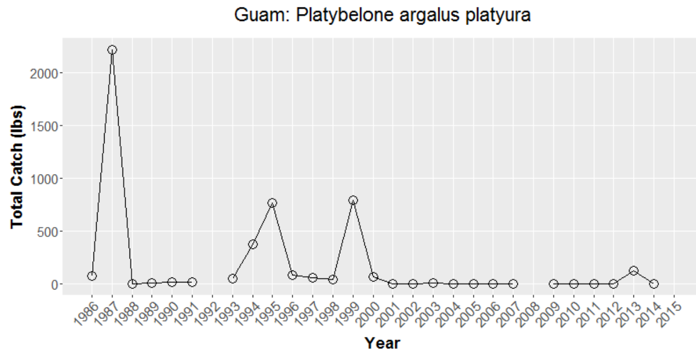

Guam: Pinguipedidae
Total Catch (lbs)
29.00
28.75
28.50
28.25
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

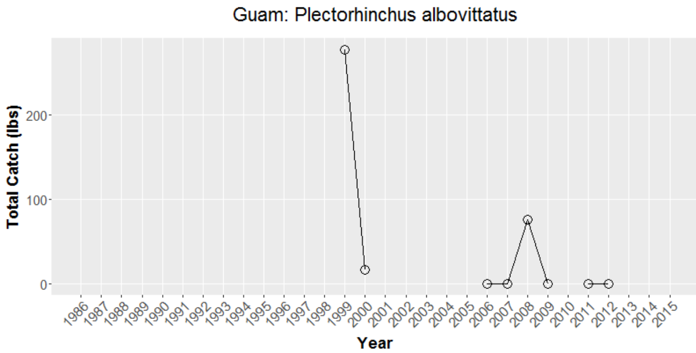

Guam: Pinna bicolor
Total Catch (lbs)
750
500
250
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

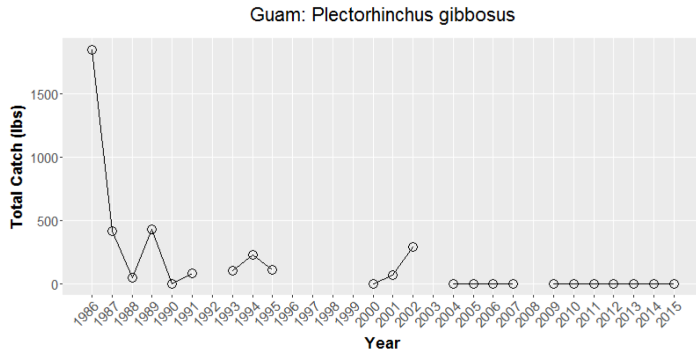

Guam: Platax orbicularis
Total Catch (lbs)
600
400
200
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

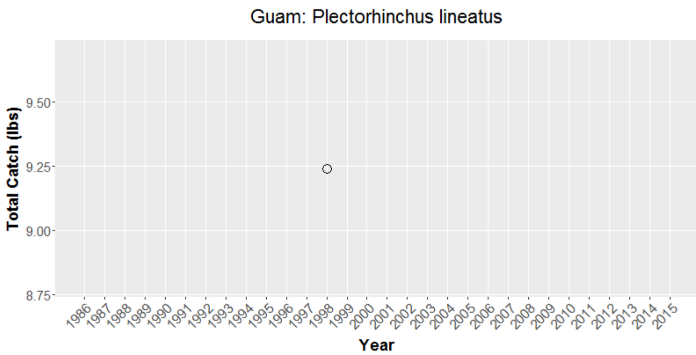

Guam: Platax pinnatus
Total Catch (lbs)
150
100
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

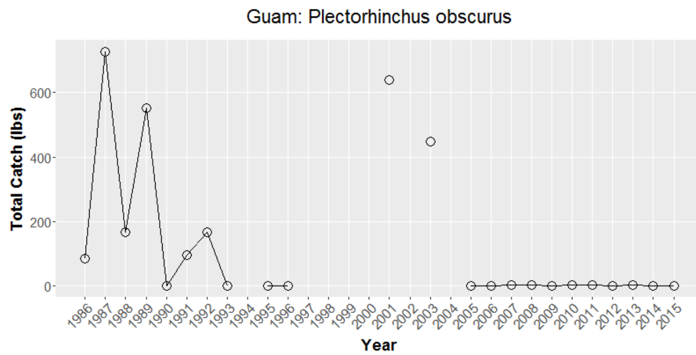

Guam: Platax teira
Total Catch (lbs)
Year

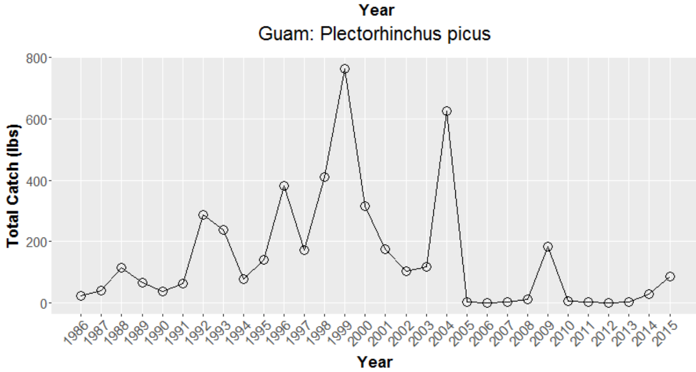

Guam: Platybelone argalus platyura
Total Catch (lbs)
Year

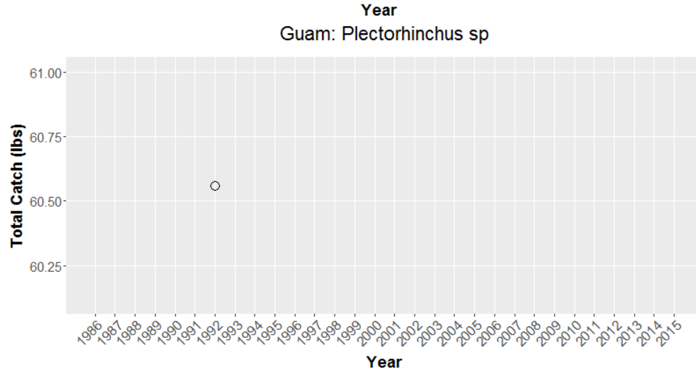

Guam: Plectorhinchus albovittatus
Total Catch (lbs)
Year

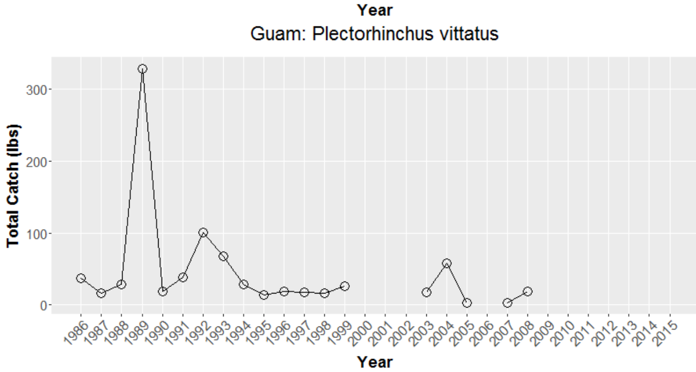

Guam: Plectorhinchus gibbosus
Total Catch (lbs)
Year

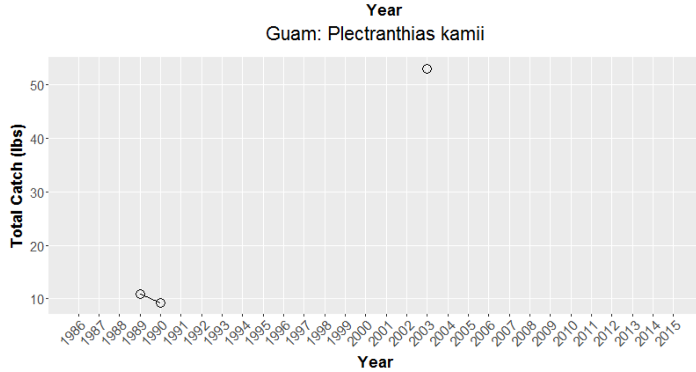

Guam: Plectorhinchus lineatus
Total Catch (lbs)
Year

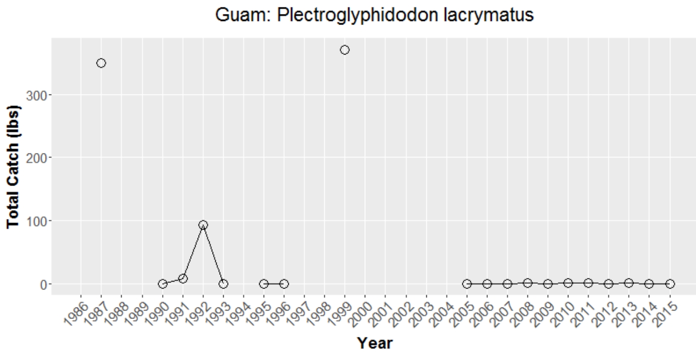

Guam: Plectorhinchus obscurus
Total Catch (lbs)
Year

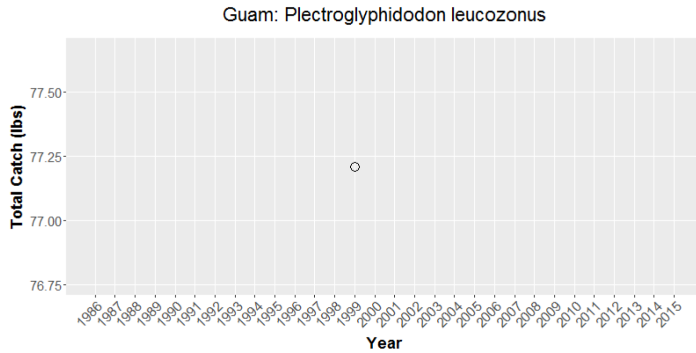

Guam: Plectorhinchus picus
Total Catch (lbs)
Year

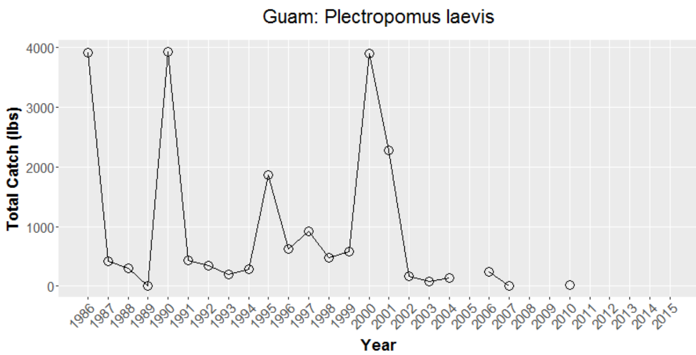

Guam: Plectorhinchus sp
Total Catch (lbs)
Year

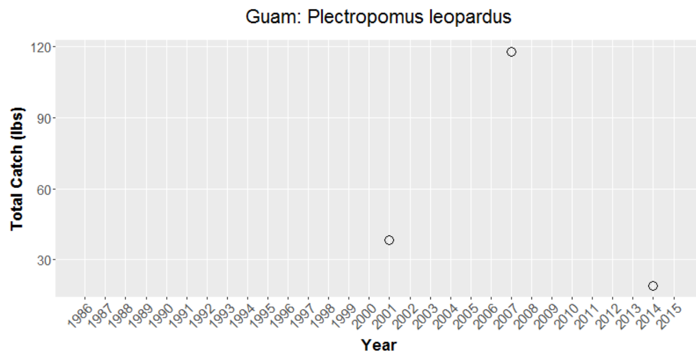

Guam: Plectorhinchus vittatus
Total Catch (lbs)
Year

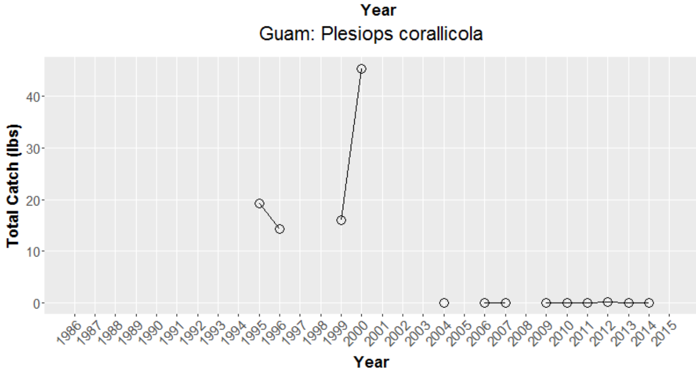

Guam: Plectranthias kamii
Total Catch (lbs)
Year

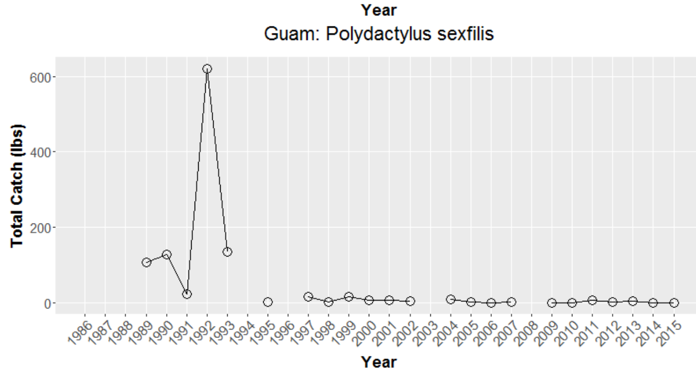

Guam: Plectroglyphidodon lacrymatus
Total Catch (lbs)
Year

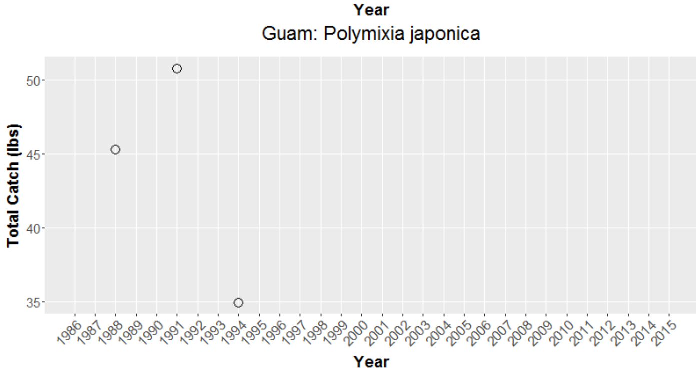

Guam: Plectroglyphidodon leucozonus
Total Catch (lbs)
Year

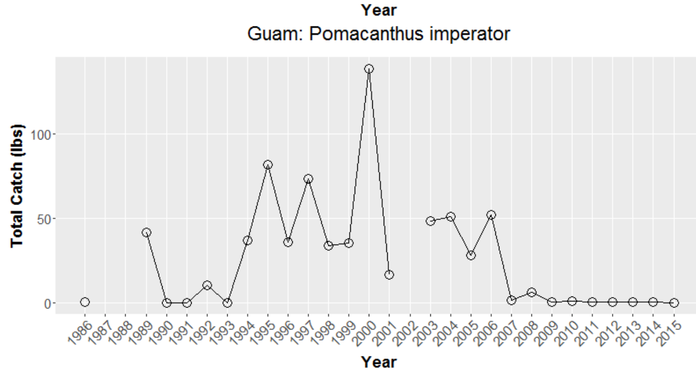

Guam: Plectropomus laevis
Total Catch (lbs)
Year

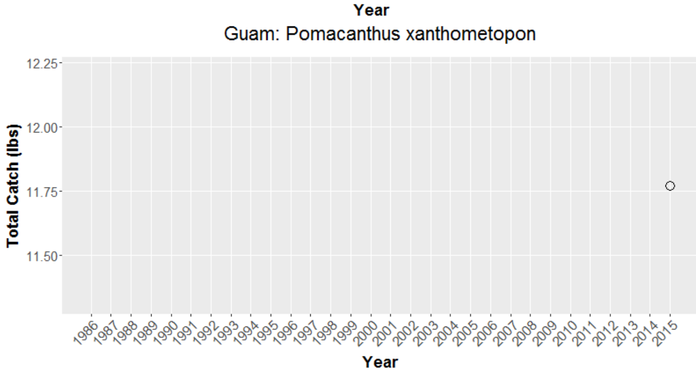

Guam: Plectropomus leopardus
Total Catch (lbs)
Year

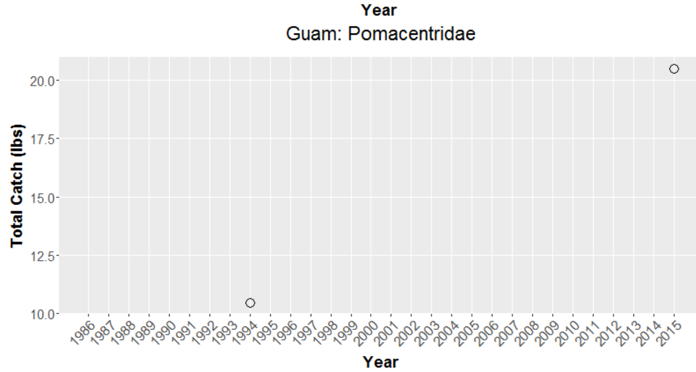

Guam: Plesiops corallicola
Total Catch (lbs)
Year

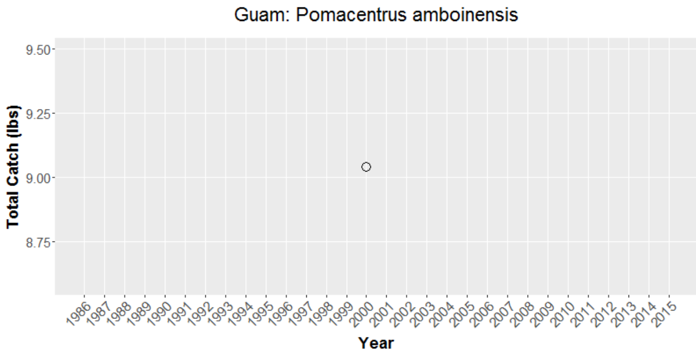

Guam: Polydactylus sexfilis
Total Catch (lbs)
Year

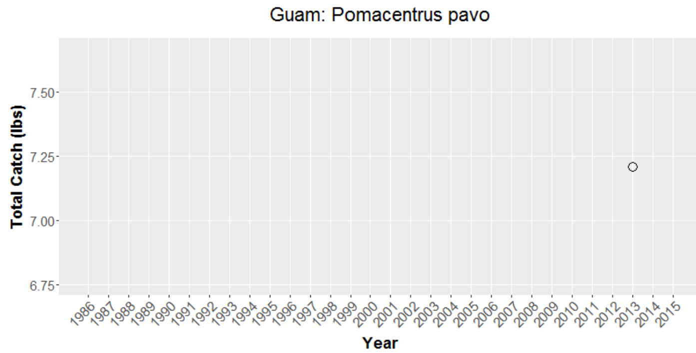

Guam: Polymixia japonica
Total Catch (lbs)
Year

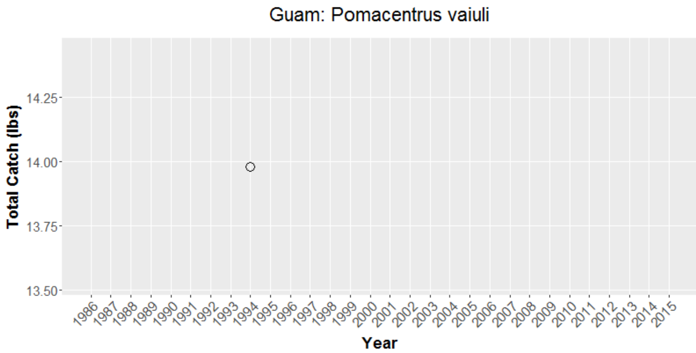

Guam: Pomacanthus imperator
Total Catch (lbs)
Year

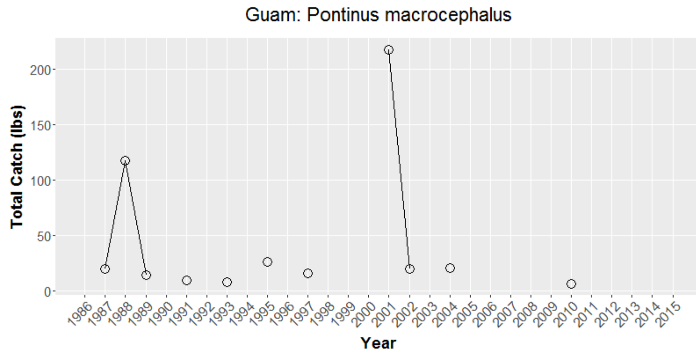

Guam: Pomacanthus xanthometopon
Total Catch (lbs)
Year

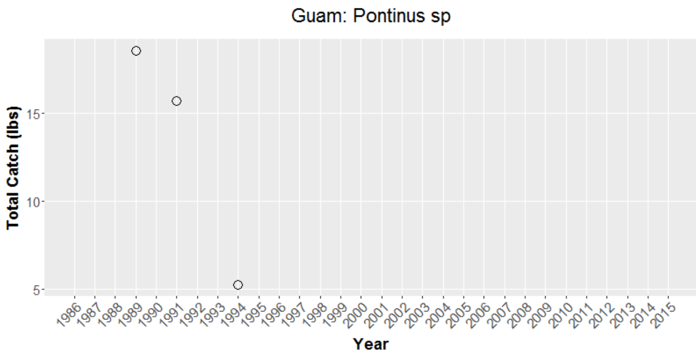

Guam: Pomacentridae
Total Catch (lbs)
Year

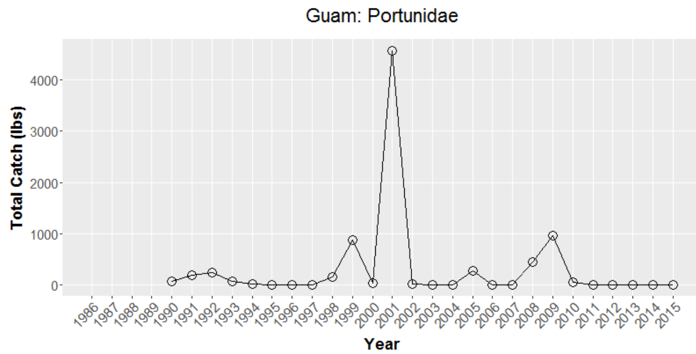

Guam: Pomacentrus amboinensis
Total Catch (lbs)
9.50
9.25
9.00
8.75
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

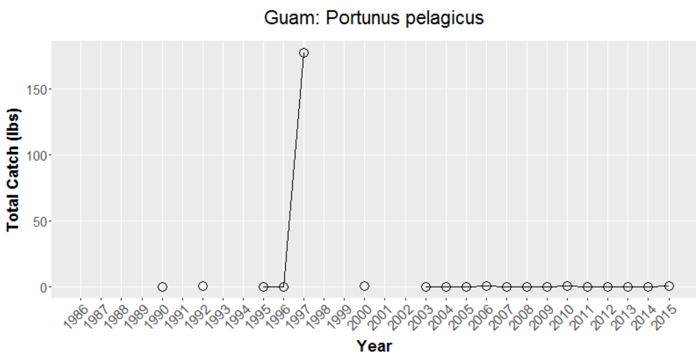

Guam: Pomacentrus pavo
Total Catch (lbs)
7.50
7.25
7.00
6.75
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

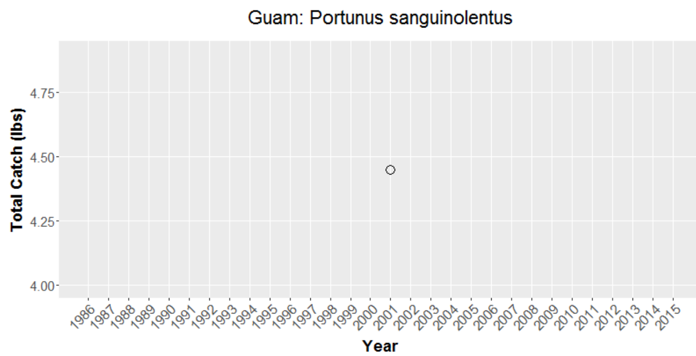

Guam: Pomacentrus vaiuli
Total Catch (lbs)
14.25
14.00
13.75
13.50
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

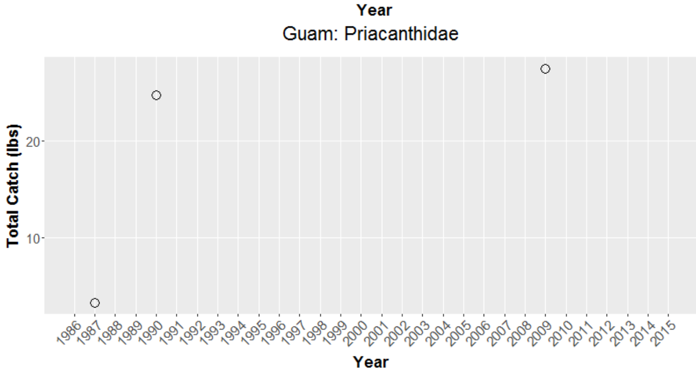

Guam: Pontinus macrocephalus
Total Catch (lbs)
200
150
100
50
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

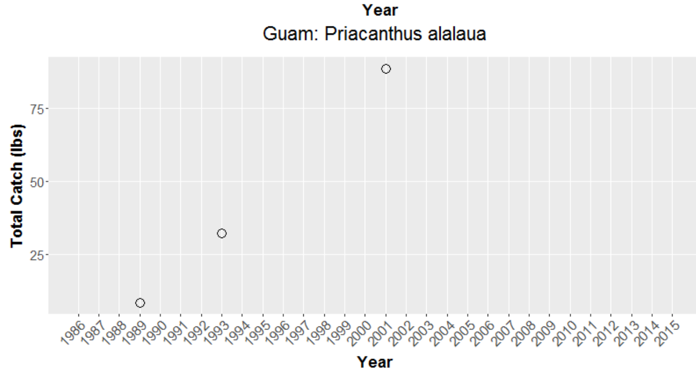

Guam: Pontinus sp
Total Catch (lbs)
15
10
5
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


Guam: Portunidae
Total Catch (lbs)
4000
3000
2000
1000
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

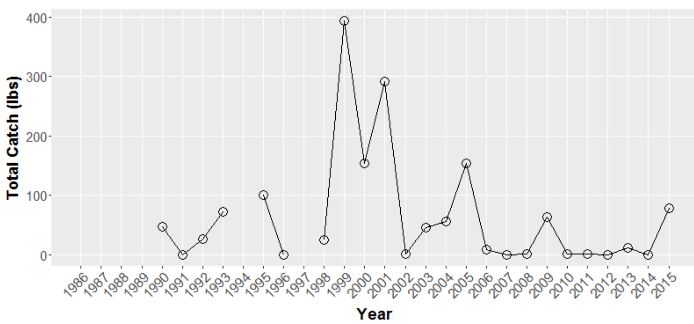

Guam: Portunus pelagicus
Total Catch (lbs)
150
100
50
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


Guam: Portunus sanguinolentus
Total Catch (lbs)
4.75
4.50
4.25
4.00
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

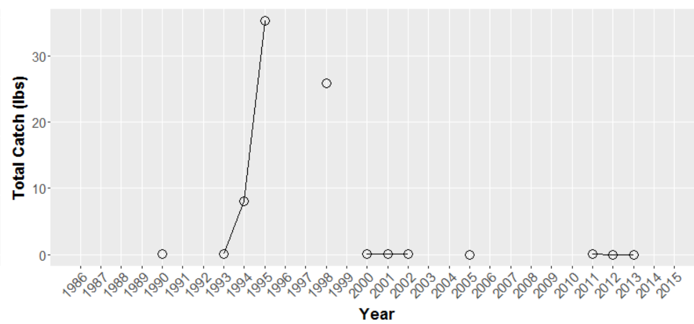

Guam: Priacanthidae
Total Catch (lbs)
20
10
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


Guam: Priacanthus alalaua
Total Catch (lbs)
75
50
25
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

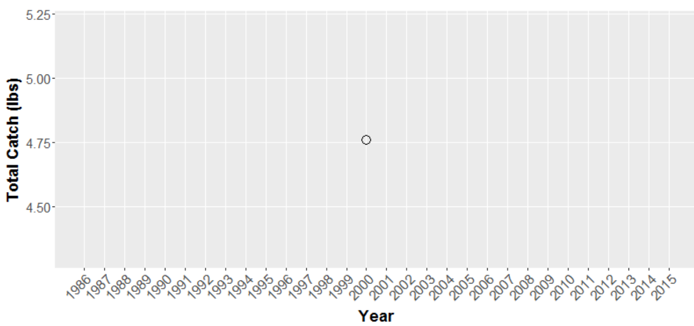
Guam: Priacanthus hamrur



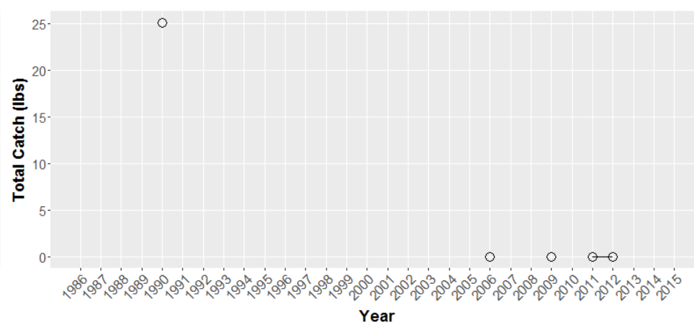
Guam: Pristiapogon exostigma



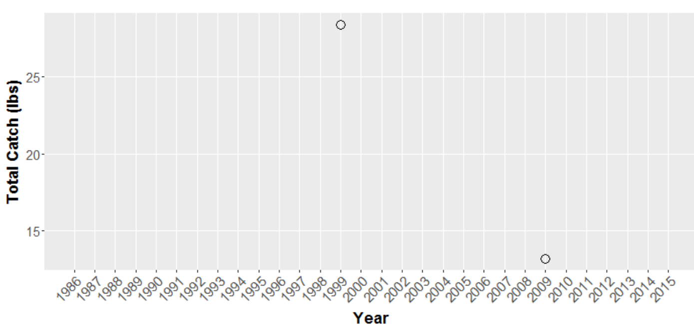
Guam: Pristiapogon kallopterus



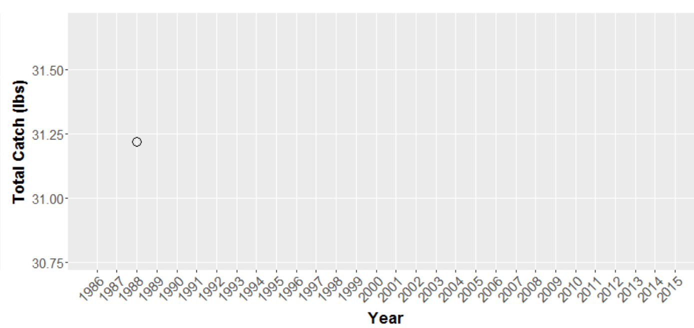
Guam: Pristiapogon taeniopterus



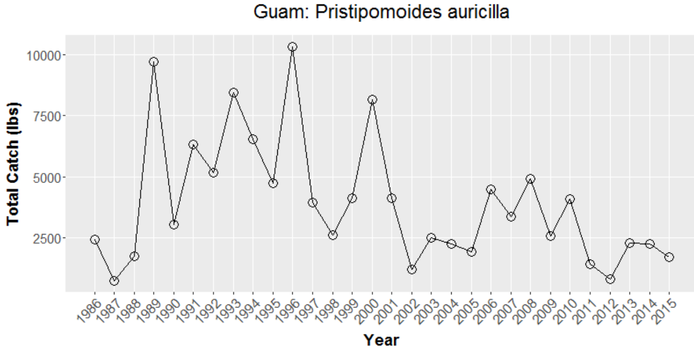
Guam: Pristicon trimaculatus



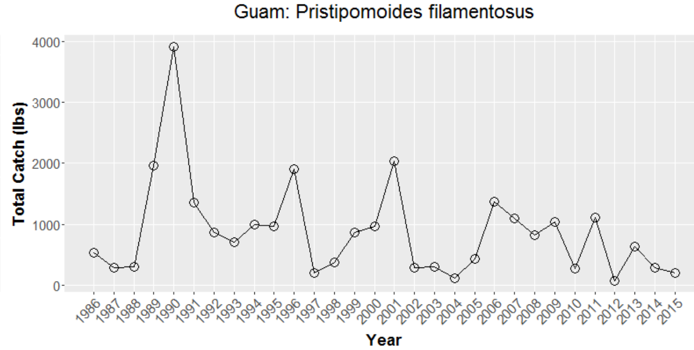
Guam: Pristigenys meyeri



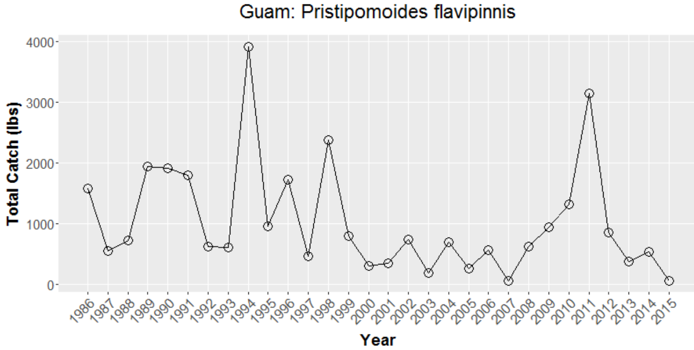
Guam: Pristipomoides auricilla



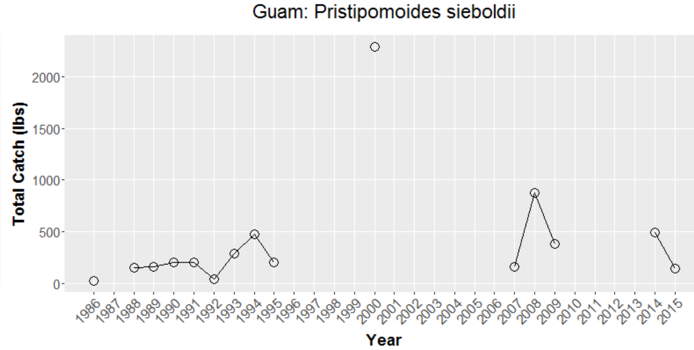
Guam: Pristipomoides filamentosus



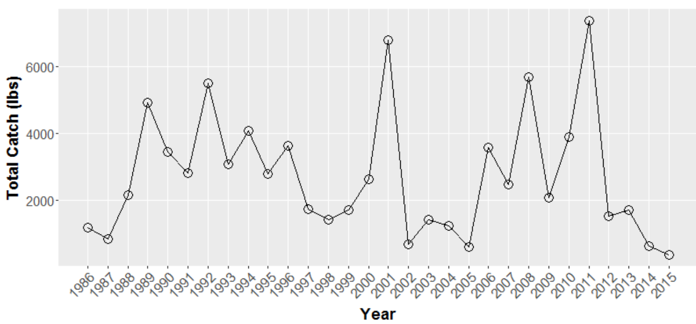
Guam: Pristipomoides flavipinnis



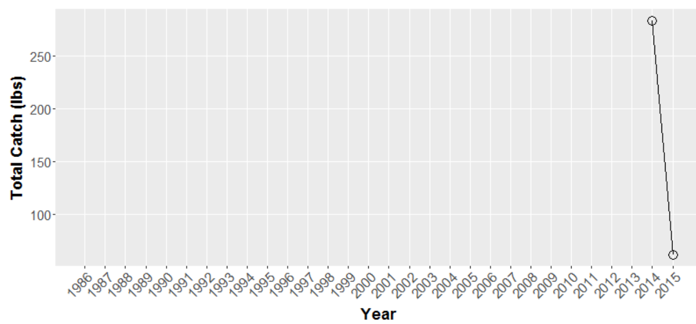
Guam: Pristipomoides sieboldii



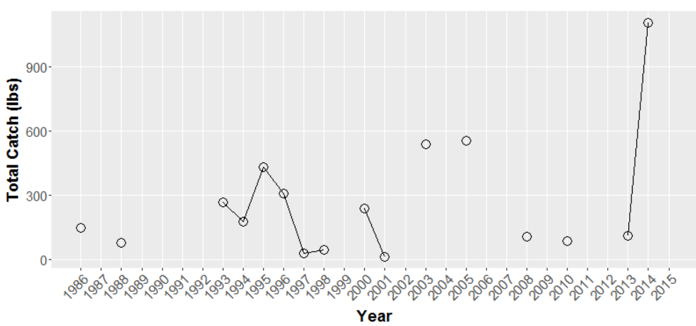
Guam: Pristipomoides zonatus



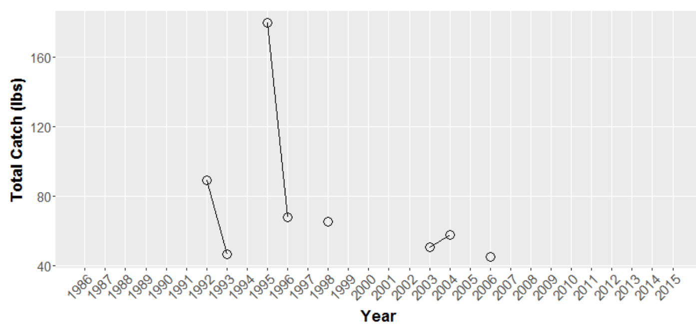
Guam: Pseudamia zonata



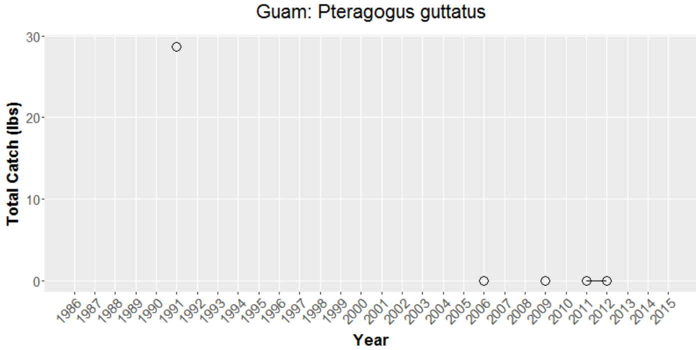
Guam: Pseudobalistes flavimarginatus



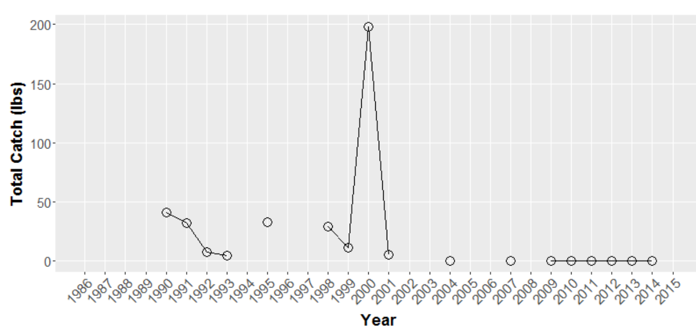
Guam: Pseudobalistes fuscus



Guam: Pteragogus guttatus



Guam: Pterocaesio marri



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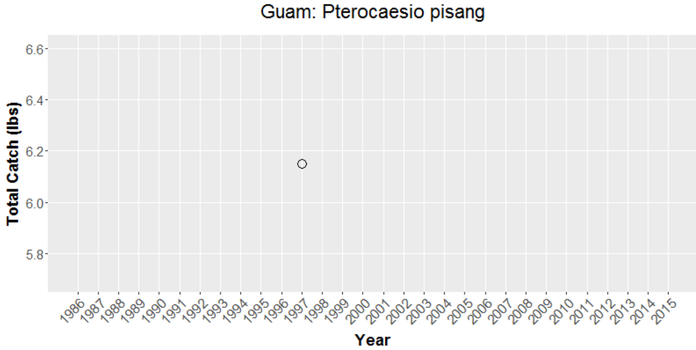
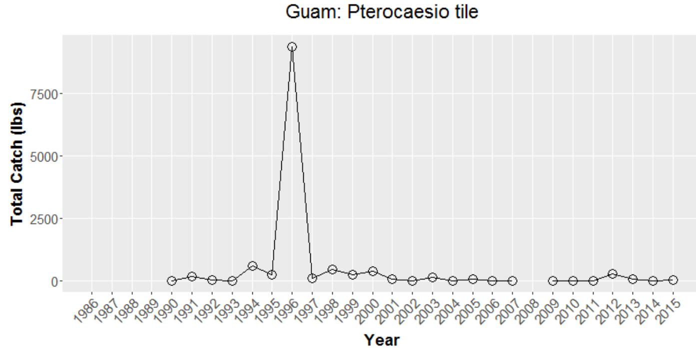
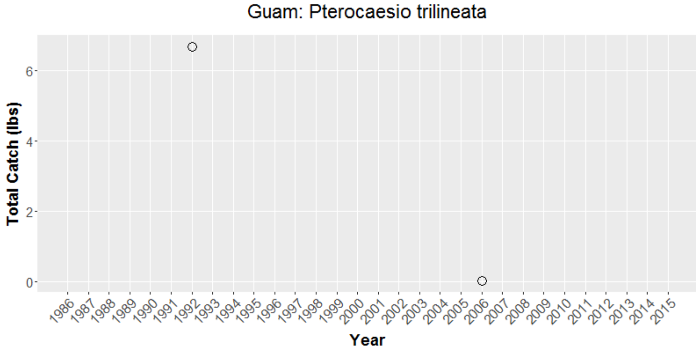


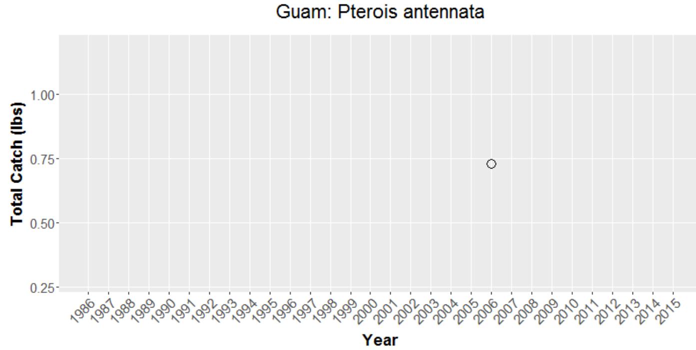
Guam: Pterocaesio tile



Guam: Pterocaesio trilineata



Guam: Pterois antennata



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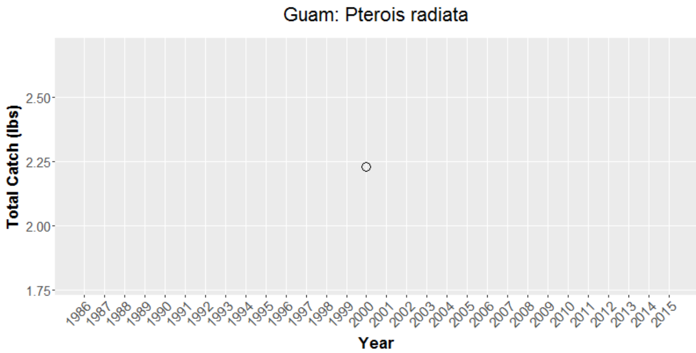
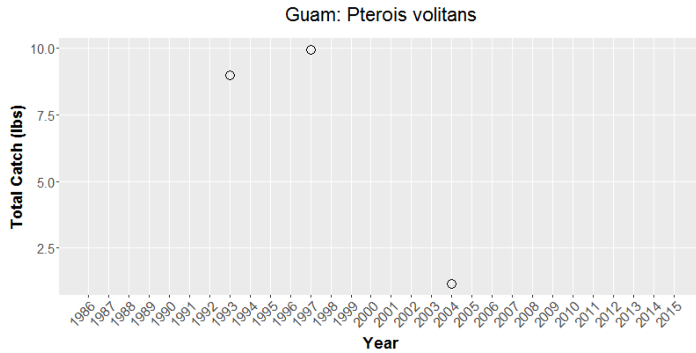
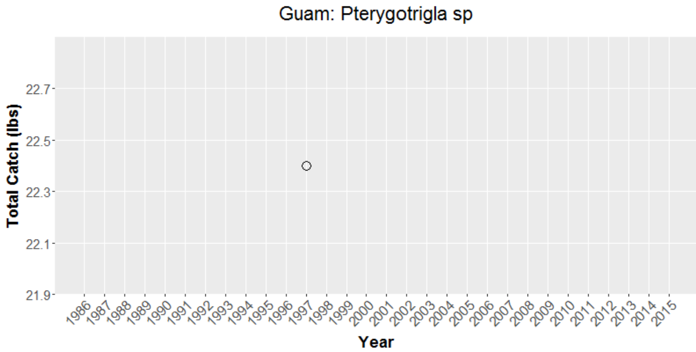
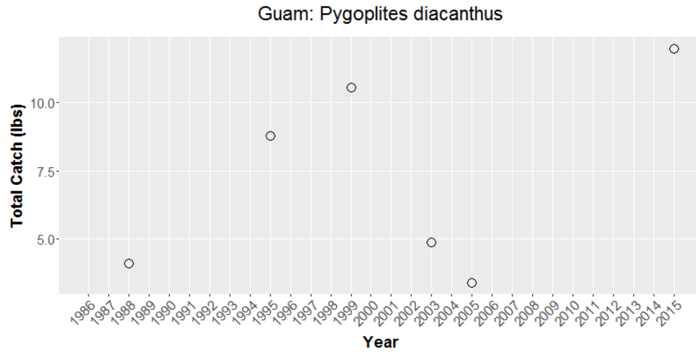
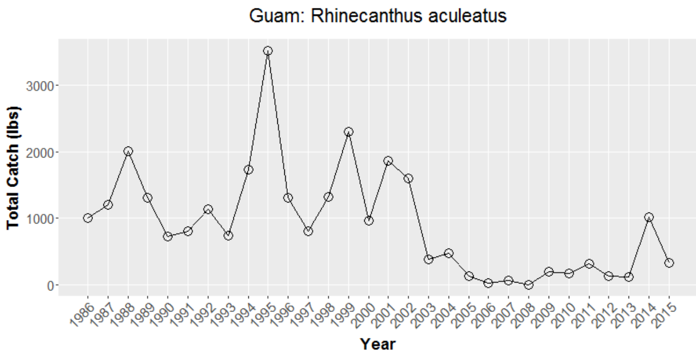
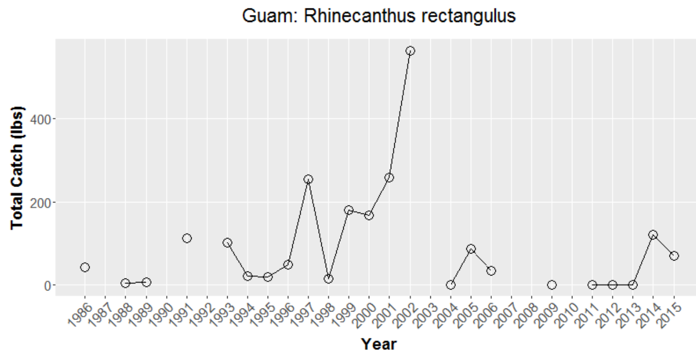


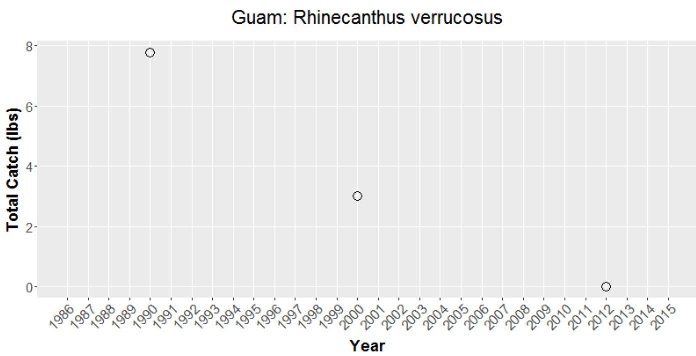


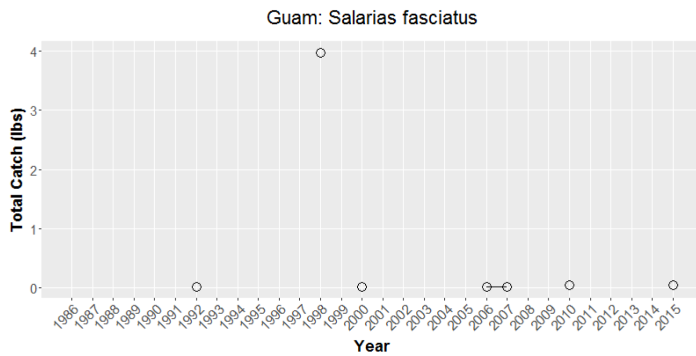


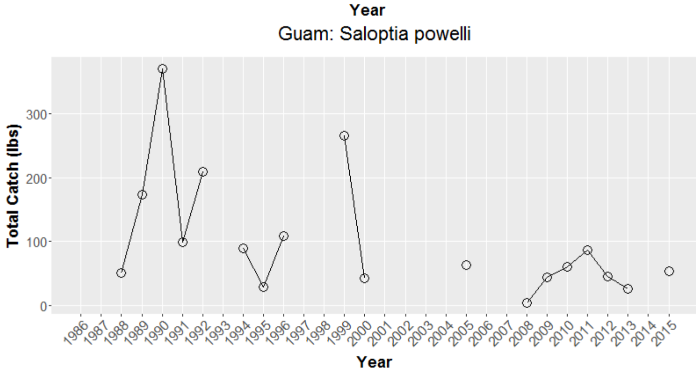


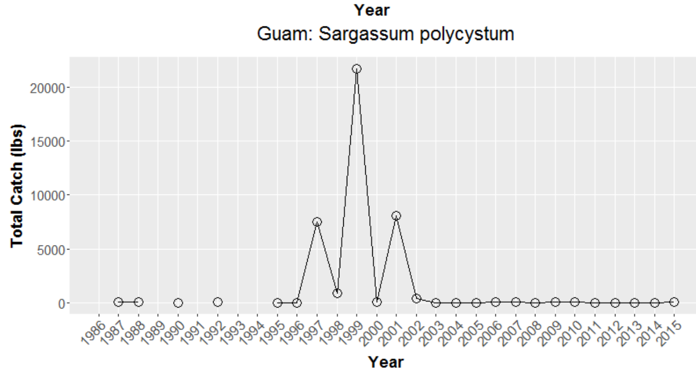


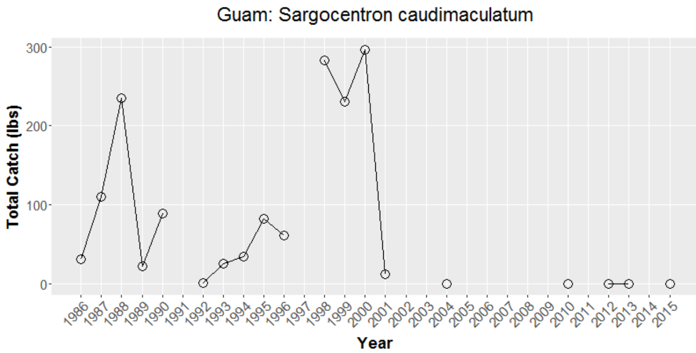


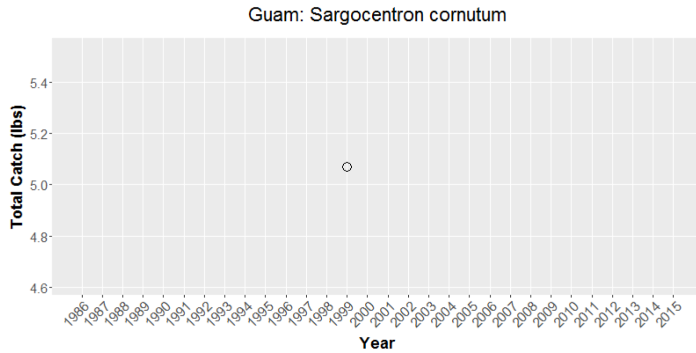


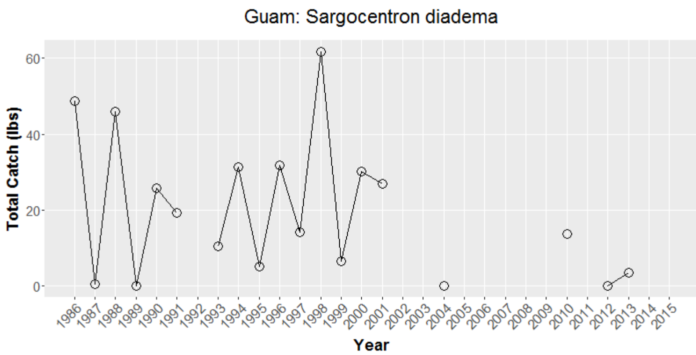


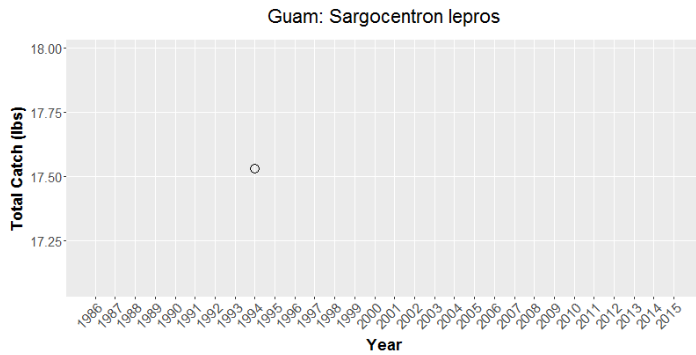


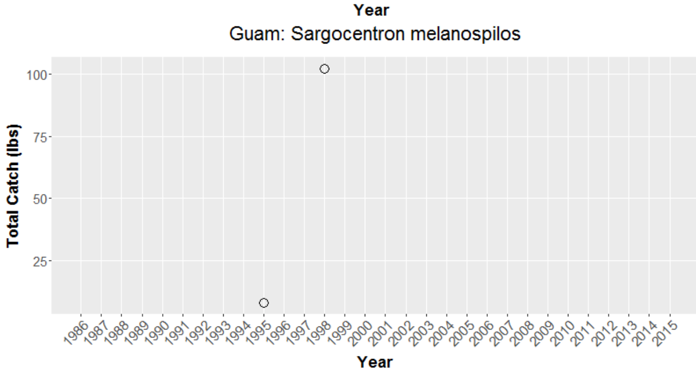


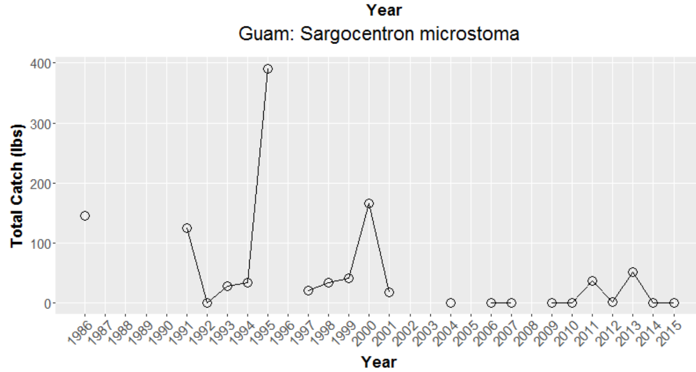

Guam: Sargocentron caudimaculatum
Total Catch (lbs)
Year

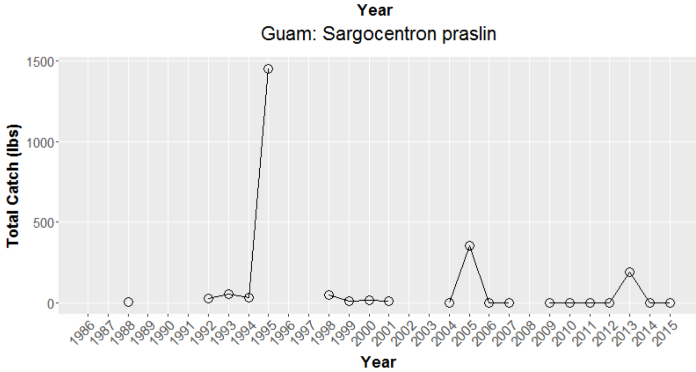

Guam: Sargocentron cornutum
Total Catch (lbs)
Year

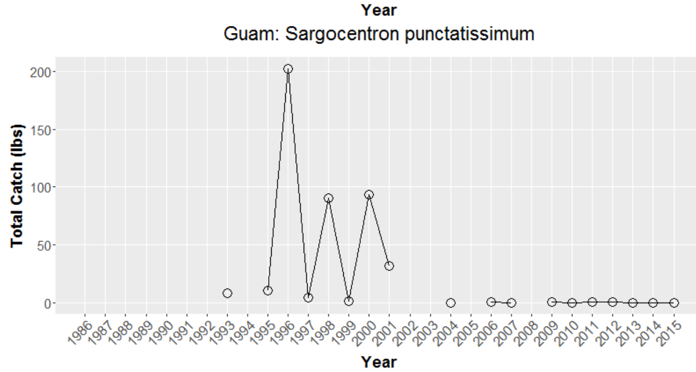

Guam: Sargocentron diadema
Total Catch (lbs)
Year

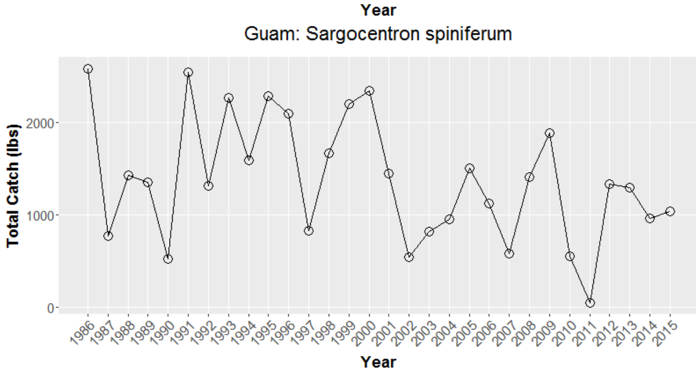

Guam: Sargocentron lepros
Total Catch (lbs)
Year

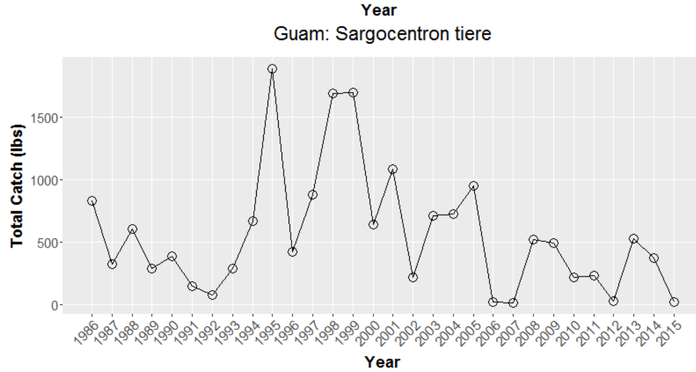

Guam: Sargocentron melanospilos
Total Catch (lbs)
Year


Guam: Sargocentron microstoma
Total Catch (lbs)
Year

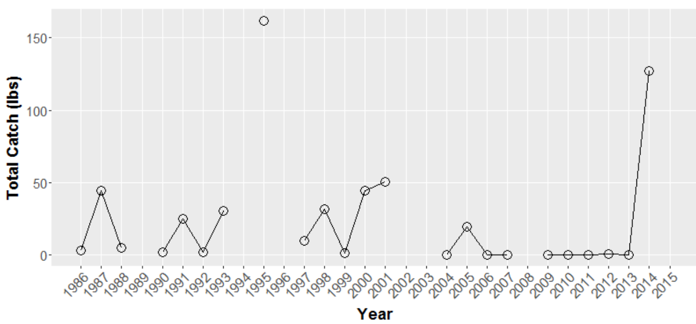

Guam: Sargocentron praslin
Total Catch (lbs)
Year


Guam: Sargocentron punctatissimum
Total Catch (lbs)
Year

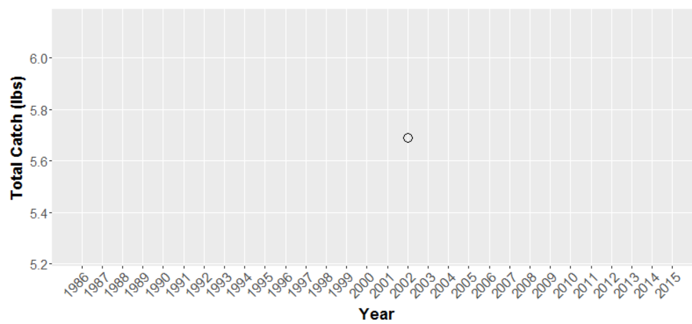

Guam: Sargocentron spiniferum
Total Catch (lbs)
Year


Guam: Sargocentron tiere
Total Catch (lbs)
Year

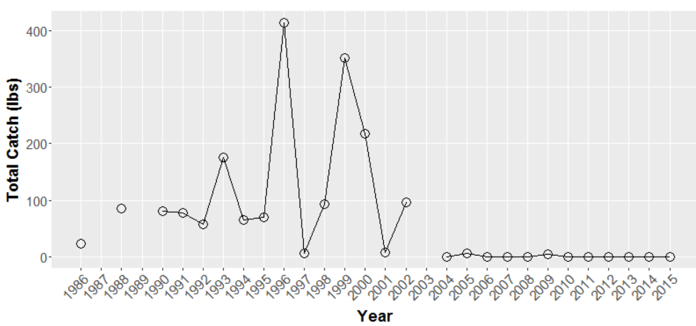
Guam: Sargocentron tiereoides



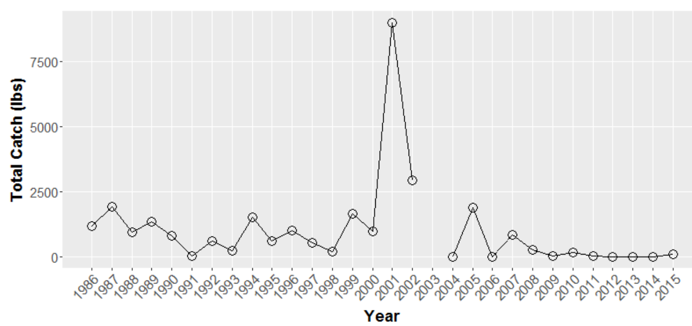
Guam: Sargocentron violaceum



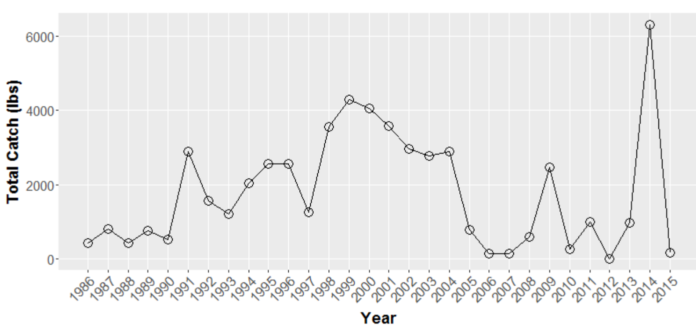
Guam: Saurida gracilis



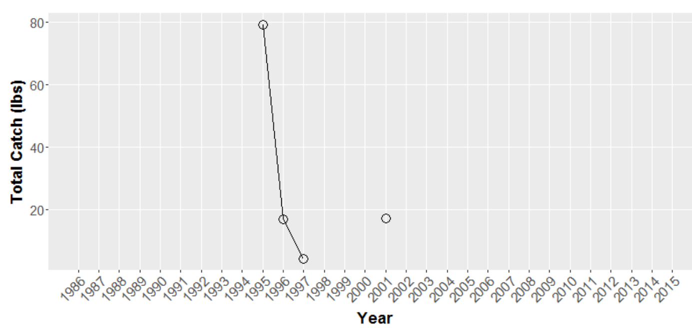
Guam: Scaridae



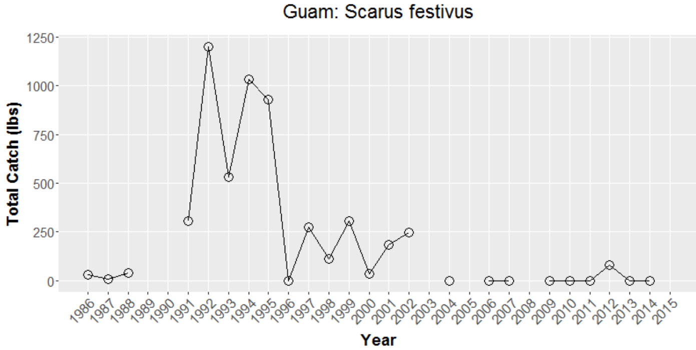
Guam: Scarus altipinnis



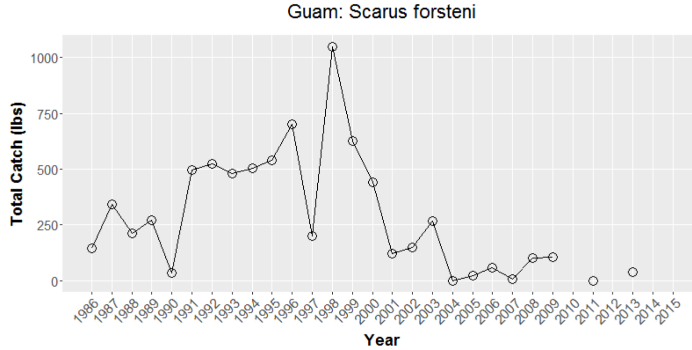
Guam: Scarus dimidiatus



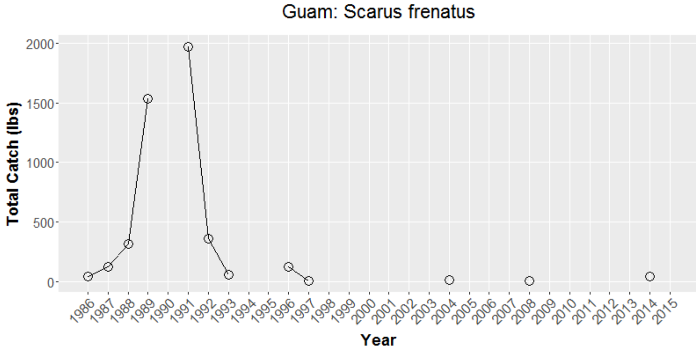
Guam: Scarus festivus



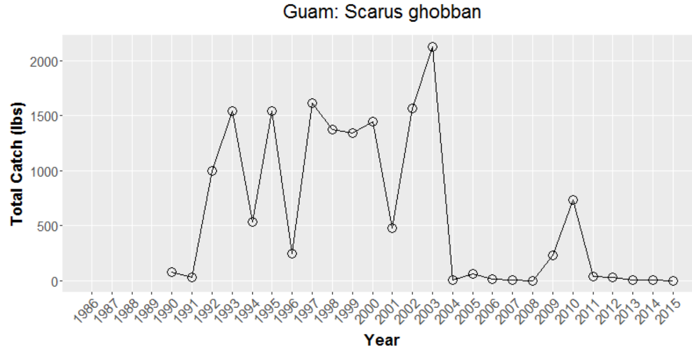
Guam: Scarus forsteni

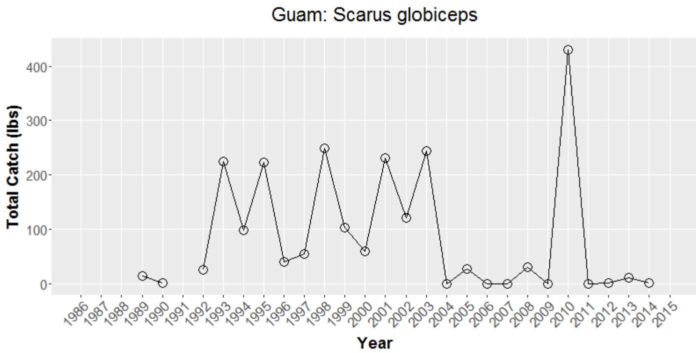


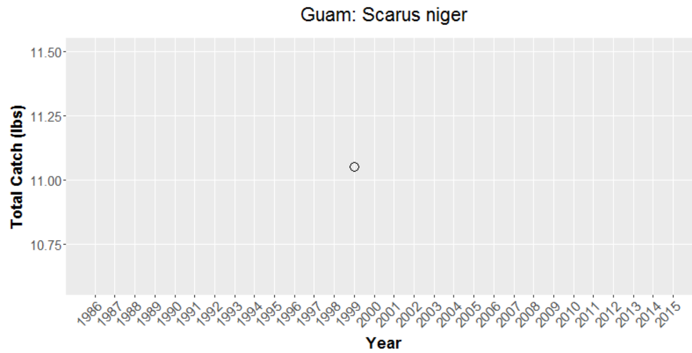
Guam: Scarus frenatus

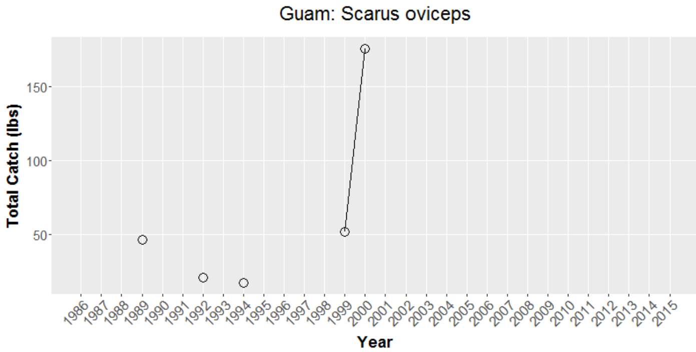


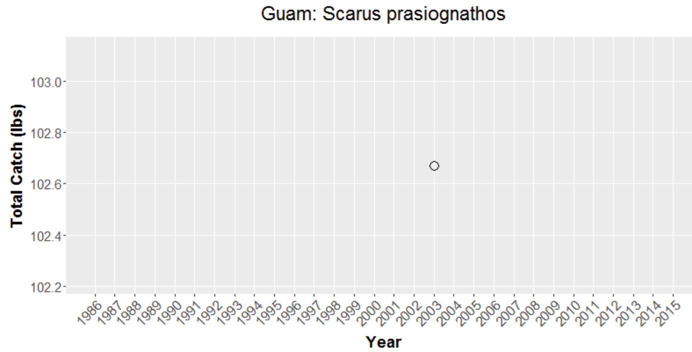
Guam: Scarus ghobban

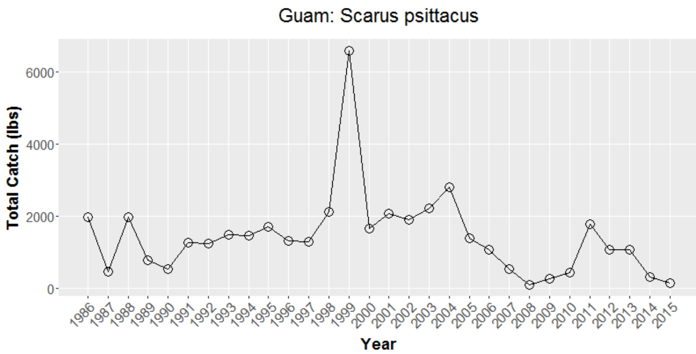


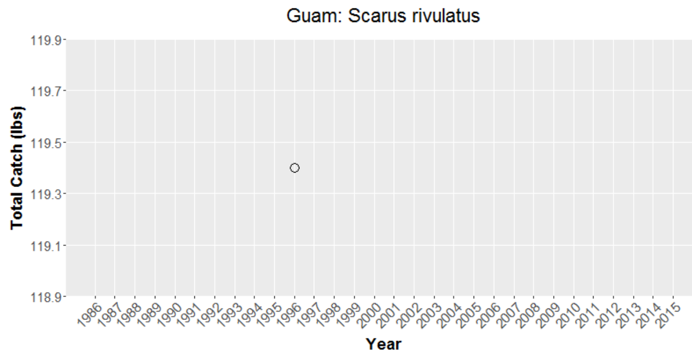

Guam: Scarus globiceps
Total Catch (lbs)
Year

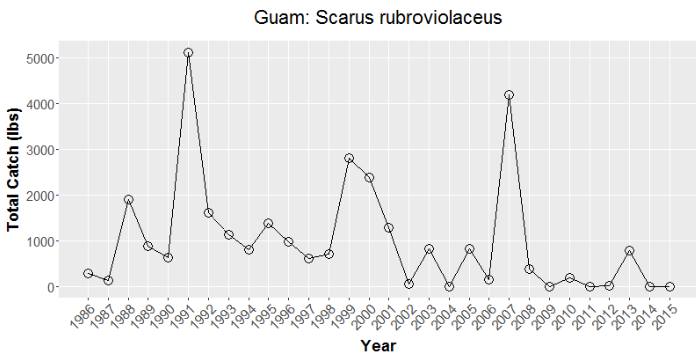

Guam: Scarus niger
Total Catch (lbs)
Year

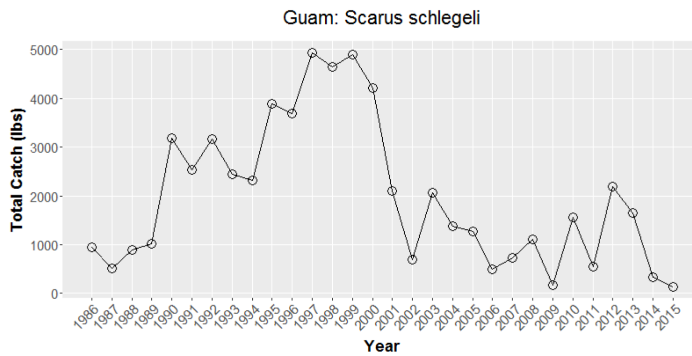

Guam: Scarus oviceps
Total Catch (lbs)
Year

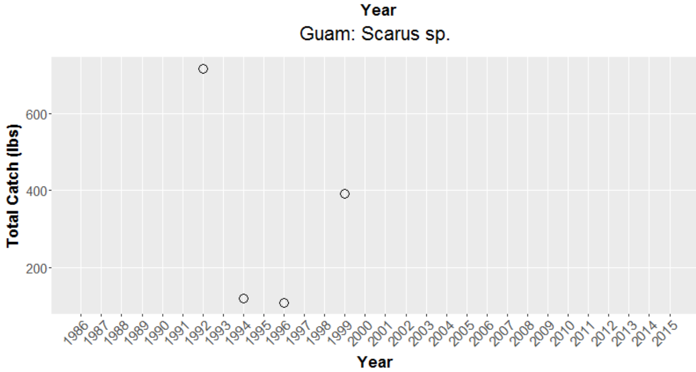

Guam: Scarus prasiognathos
Total Catch (lbs)
Year

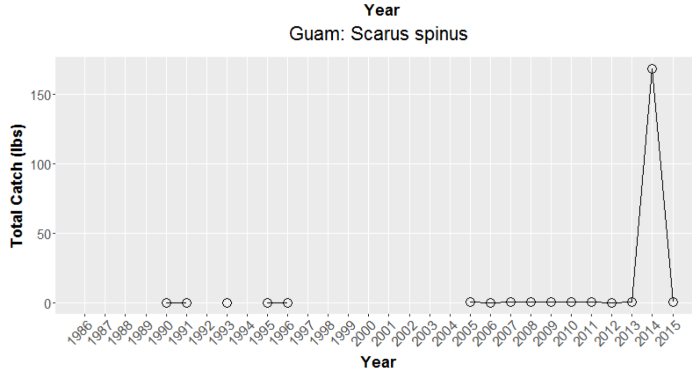

Guam: Scarus psittacus
Total Catch (lbs)
Year


Guam: Scarus rivulatus
Total Catch (lbs)
Year

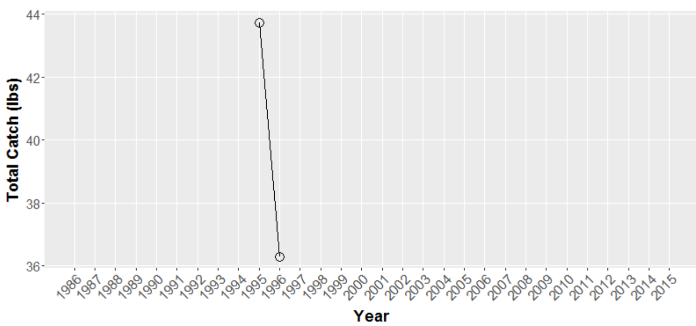

Guam: Scarus rubroviolaceus
Total Catch (lbs)
Year


Guam: Scarus schlegeli
Total Catch (lbs)
Year

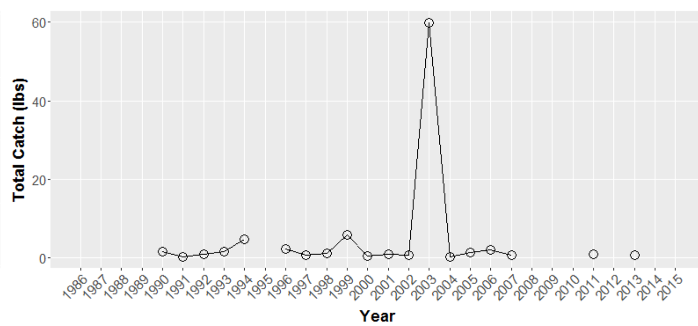

Guam: Scarus sp.
Total Catch (lbs)
Year


Guam: Scarus spinus
Total Catch (lbs)
Year

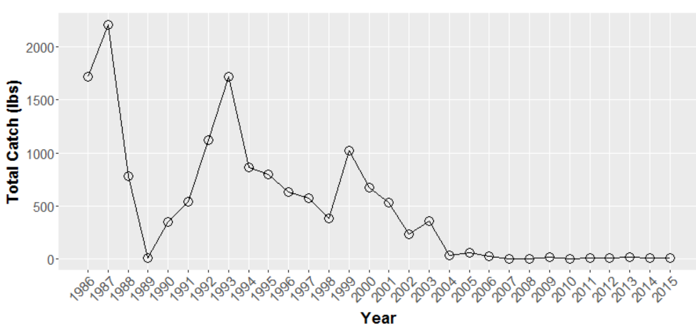
Guam: Scarus tricolor



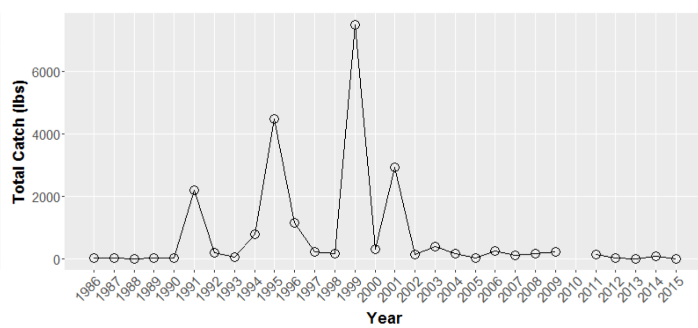
Guam: Scolopsis bilineata



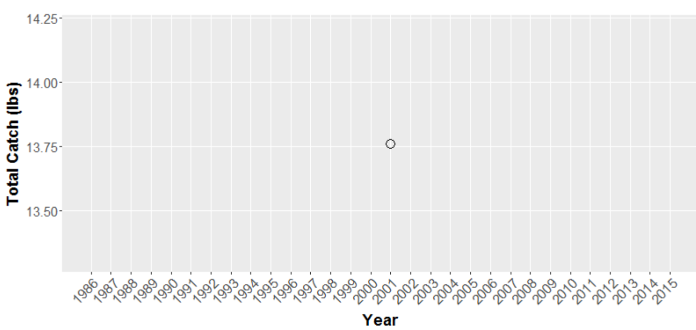
Guam: Scolopsis lineata



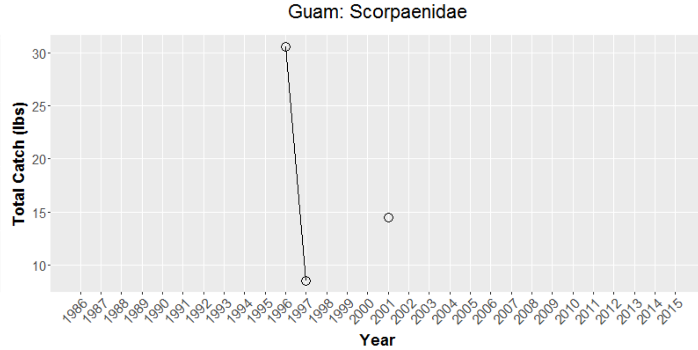
Guam: Scomberoides lysan



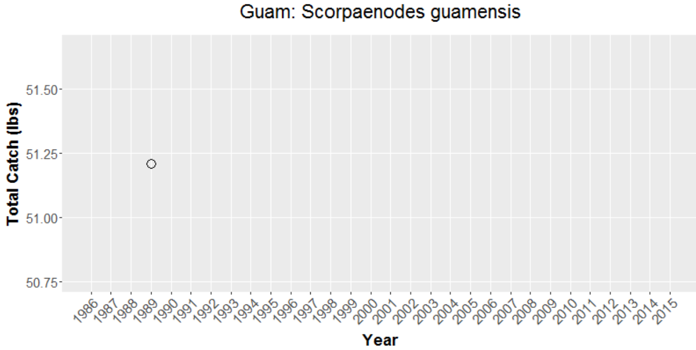
Guam: Scomberomorus commerson



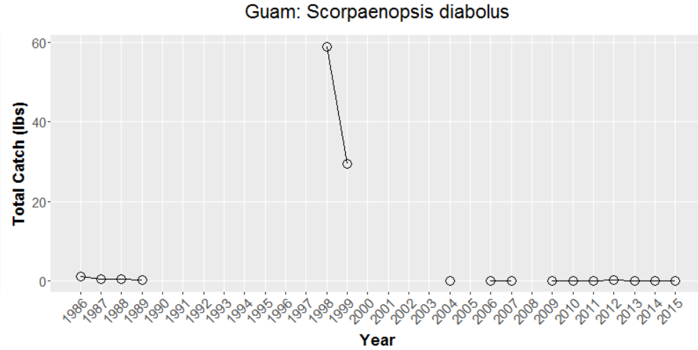
Guam: Scorpaenidae



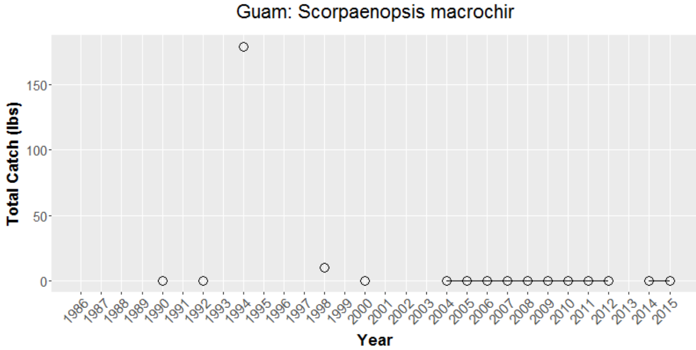
Guam: Scorpaenodes guamensis



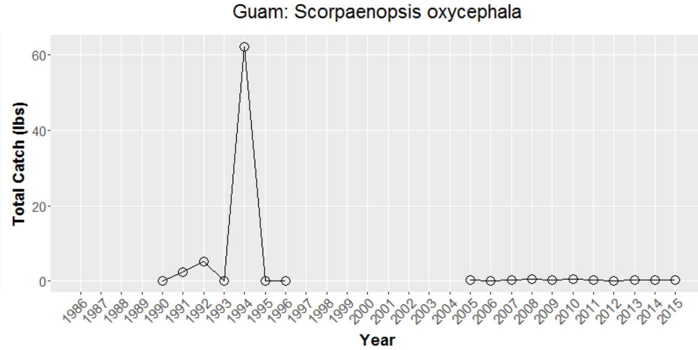
Guam: Scorpaenopsis diabolus

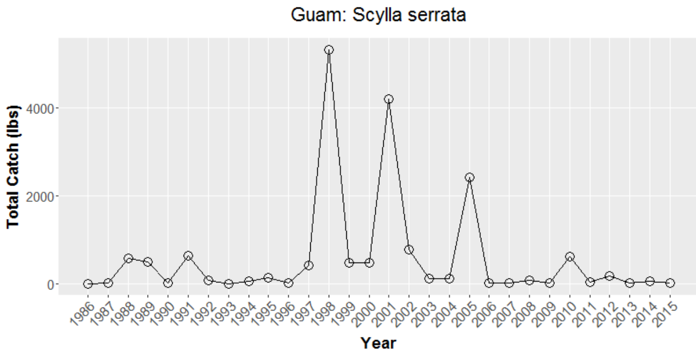


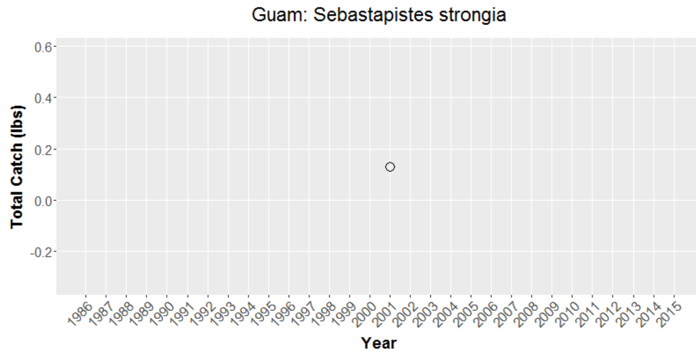
Guam: Scorpaenopsis macrochir

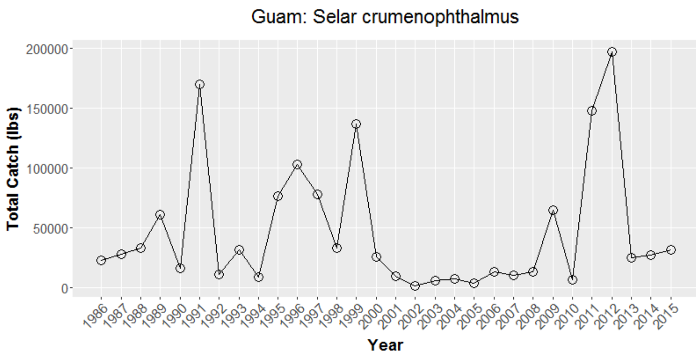


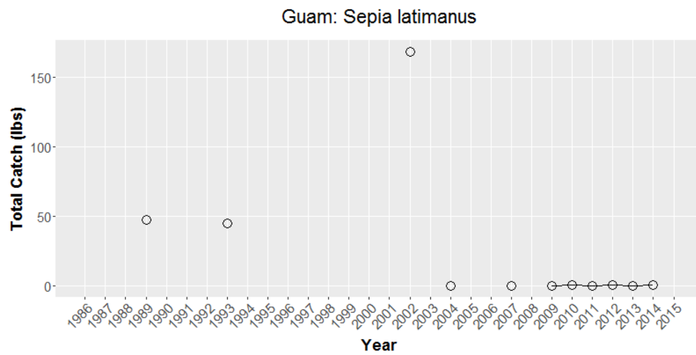
Guam: Scorpaenopsis oxycephala

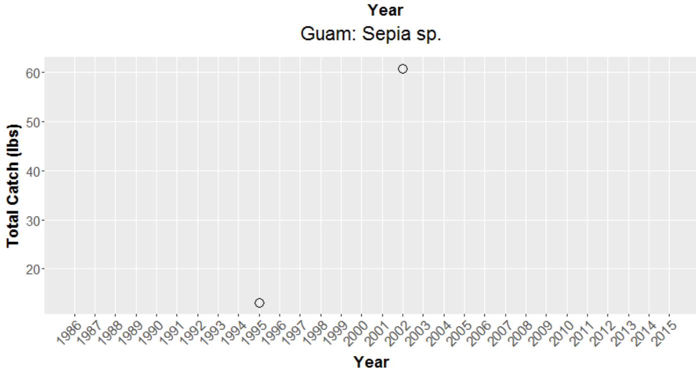


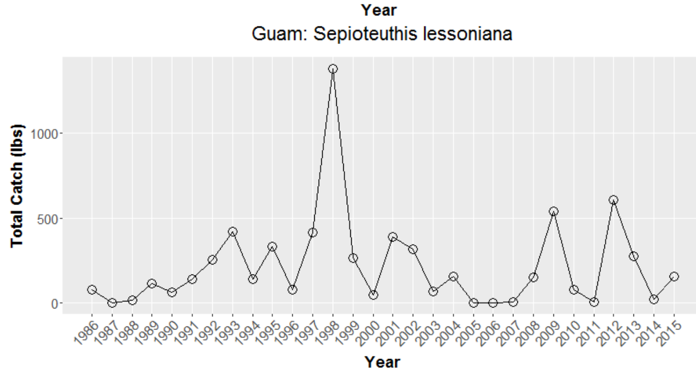

Guam: Scylla serrata
Total Catch (lbs)
4000
2000
0
Year

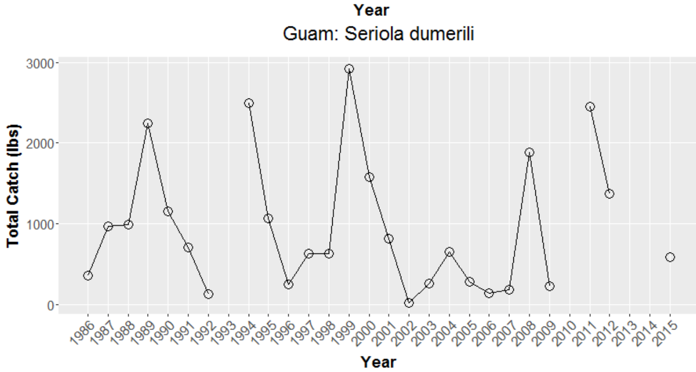

Guam: Sebastapistes strongia
Total Catch (lbs)
0.6
0.4
0.2
0.0
-0.2
Year

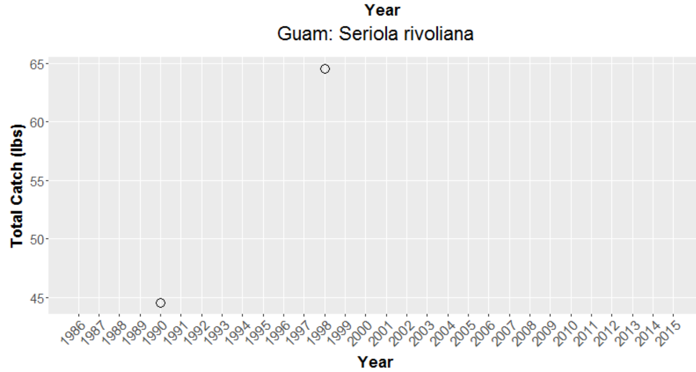

Guam: Selar crumenophthalmus
Total Catch (lbs)
200000
150000
100000
50000
0
Year

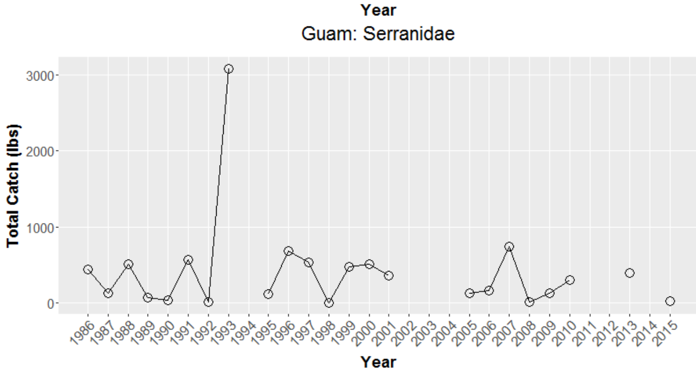

Guam: Sepia latimanus
Total Catch (lbs)
150
100
50
0
Year

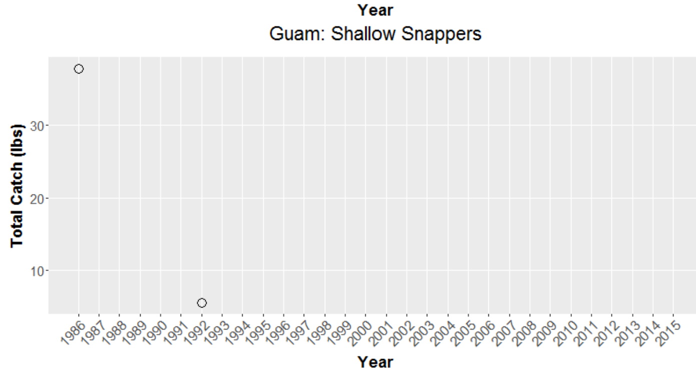

Guam: Sepia sp.
Total Catch (lbs)
60
50
40
30
20
Year

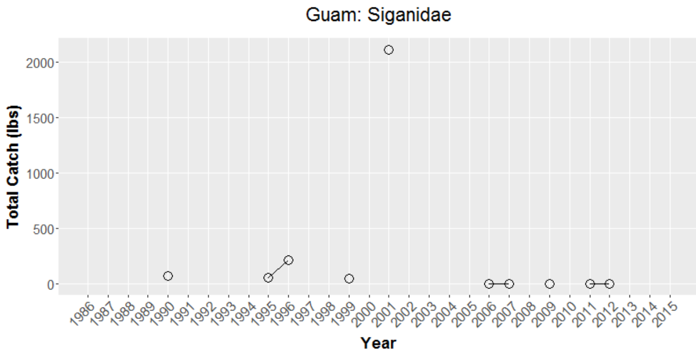

Guam: Sepioteuthis lessoniana
Total Catch (lbs)
1000
500
0
Year

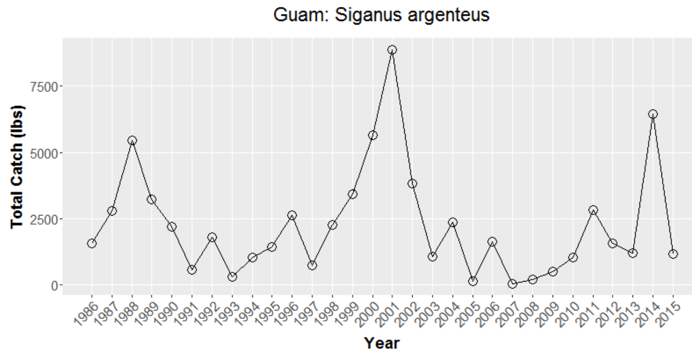

Guam: Seriola dumerili
Total Catch (lbs)
3000
2000
1000
0
Year

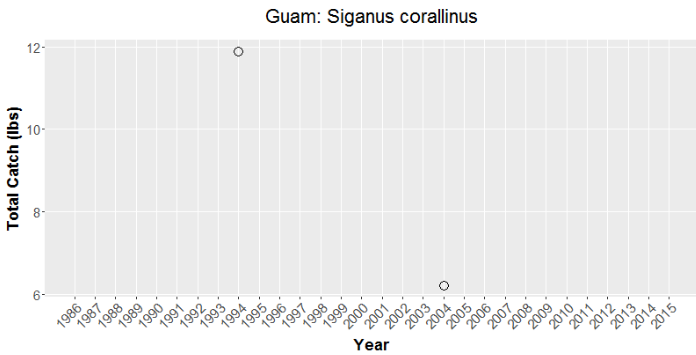

Guam: Seriola rivoliana
Total Catch (lbs)
65
60
55
50
45
Year

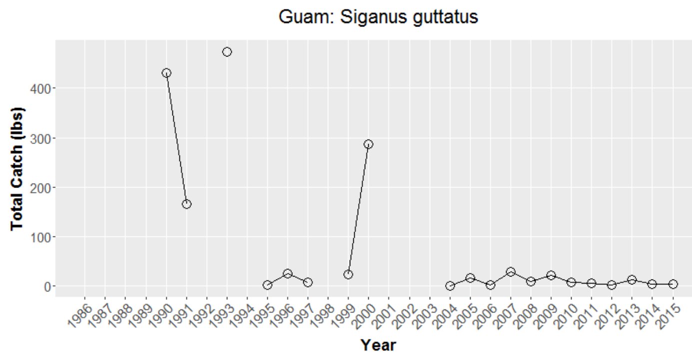

Guam: Serranidae
Total Catch (lbs)
3000
2000
1000
0
Year

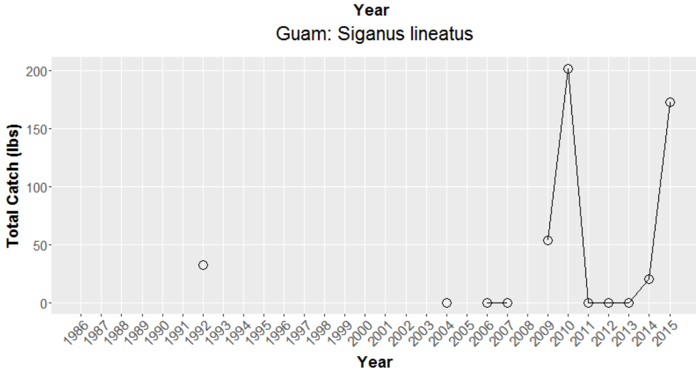

Guam: Shallow Snappers
Total Catch (lbs)
30
20
10
Year

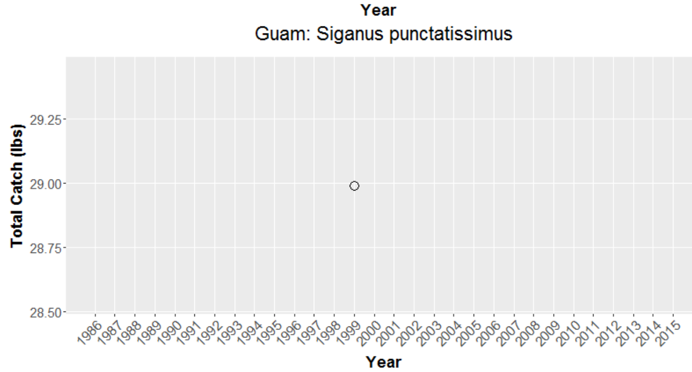

Guam: Siganidae
Total Catch (lbs)
0
500
1000
1500
2000
Year

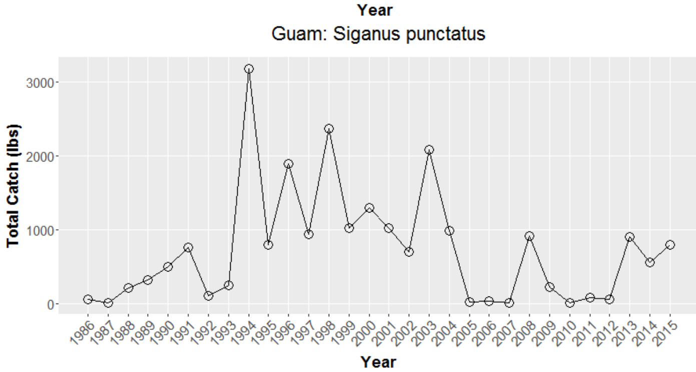

Guam: Siganus argenteus
Total Catch (lbs)
0
2500
5000
7500
Year

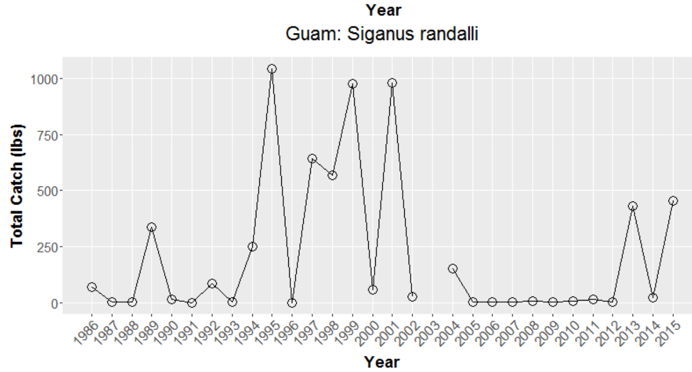

Guam: Siganus corallinus
Total Catch (lbs)
6
8
10
12
Year

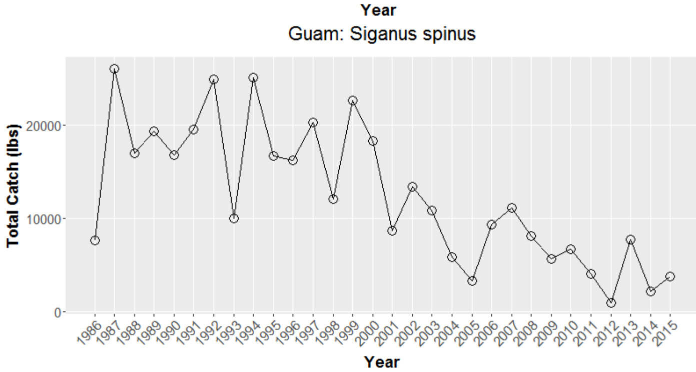

Guam: Siganus guttatus
Total Catch (lbs)
0
100
200
300
400
Year

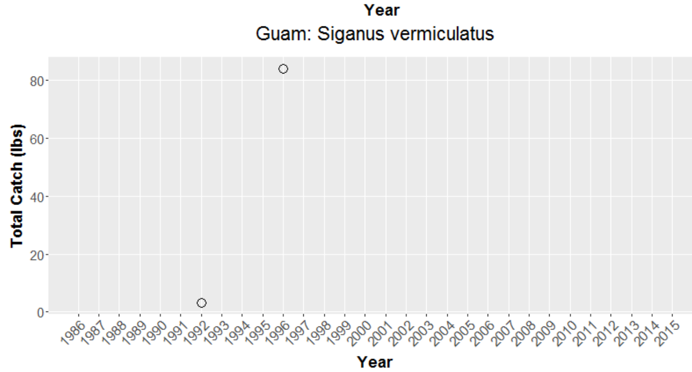

Guam: Siganus lineatus
Total Catch (lbs)
0
50
100
150
200
Year

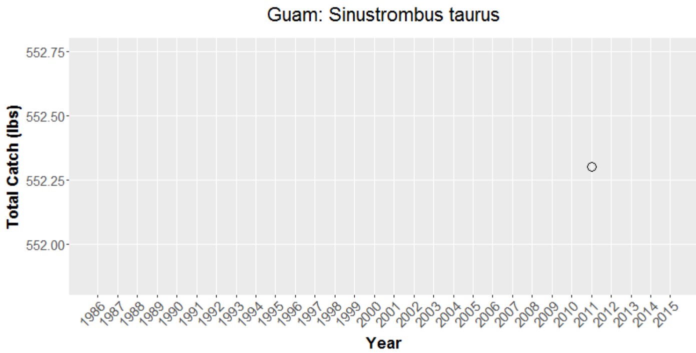

Guam: Siganus punctatissimus
Total Catch (lbs)
28.50
28.75
29.00
29.25
Year

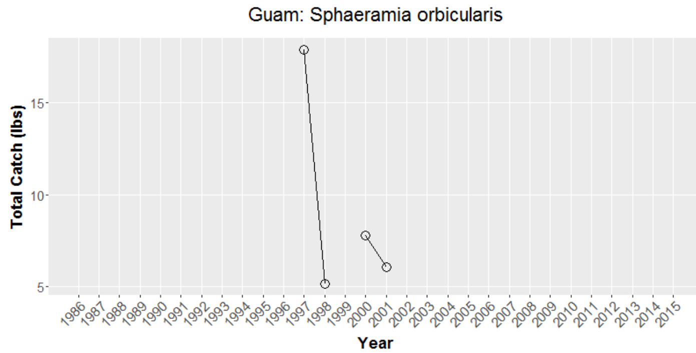

Guam: Siganus punctatus
Total Catch (lbs)
0
1000
2000
3000
Year

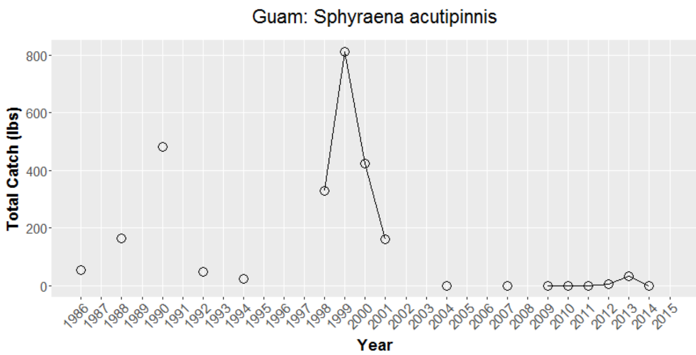

Guam: Siganus randalli
Total Catch (lbs)
0
250
500
750
1000
Year

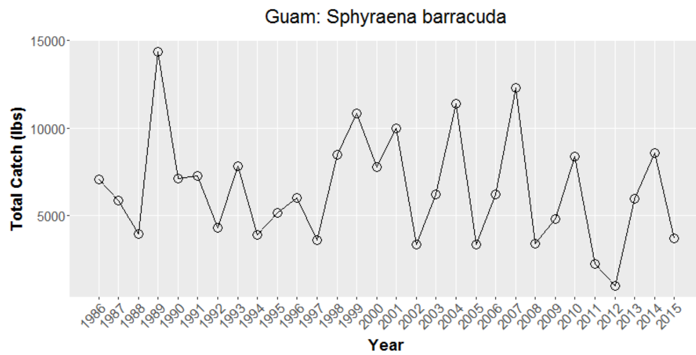

Guam: Siganus spinus
Total Catch (lbs)
0
10000
20000
Year

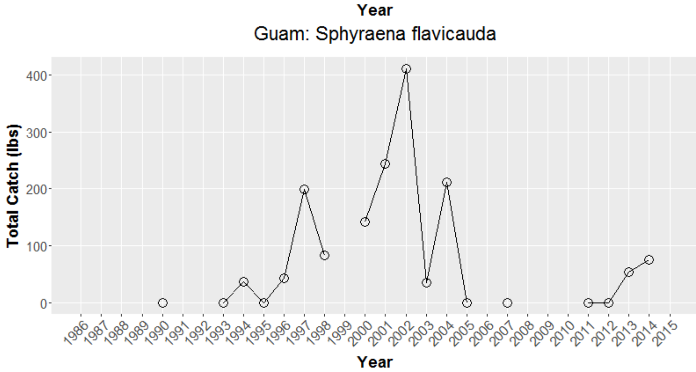

Guam: Siganus vermiculatus
Total Catch (lbs)
0
20
40
60
80
Year

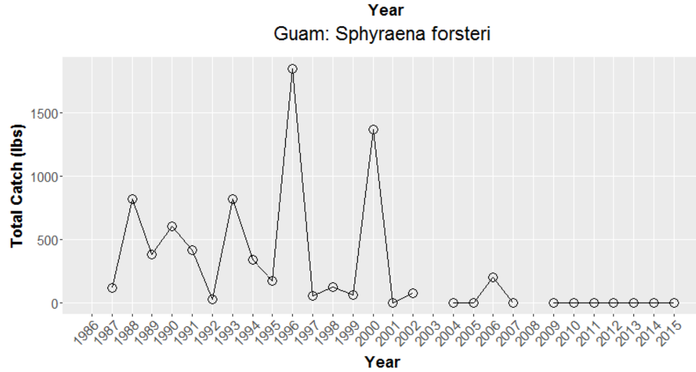

Guam: Sinustrombus taurus
552.75
552.50
552.25
552.00
Total Catch (lbs)
Year

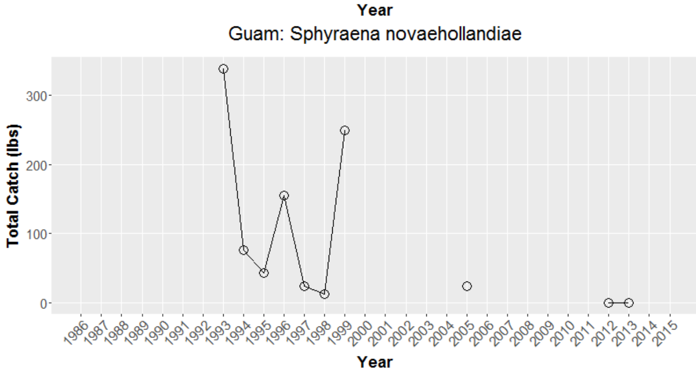

Guam: Sphaeramia orbicularis
15
10
5
Total Catch (lbs)
Year

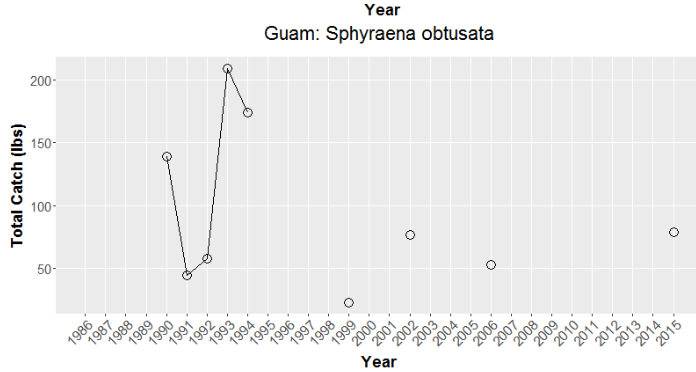

Guam: Sphyraena acutipinnis
800
600
400
200
0
Total Catch (lbs)
Year

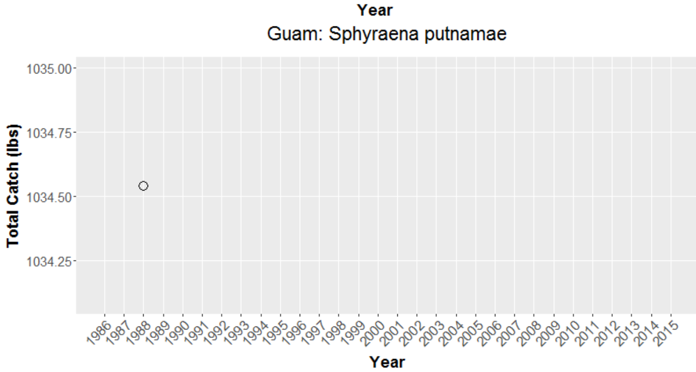

Guam: Sphyraena barracuda
15000
10000
5000
Total Catch (lbs)
Year

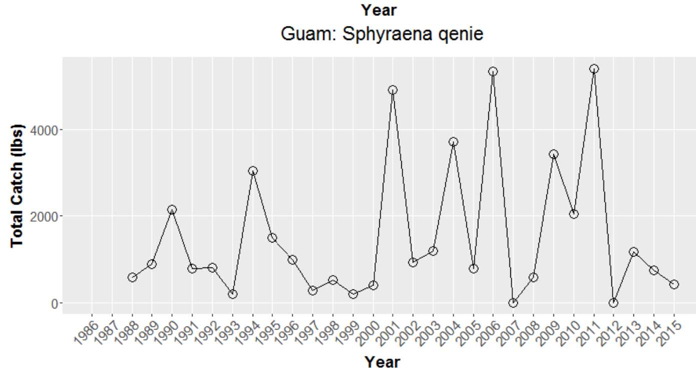

Guam: Sphyraena flavicauda
400
300
200
100
0
Total Catch (lbs)
Year


Guam: Sphyraena forsteri
1500
1000
500
0
Total Catch (lbs)
Year

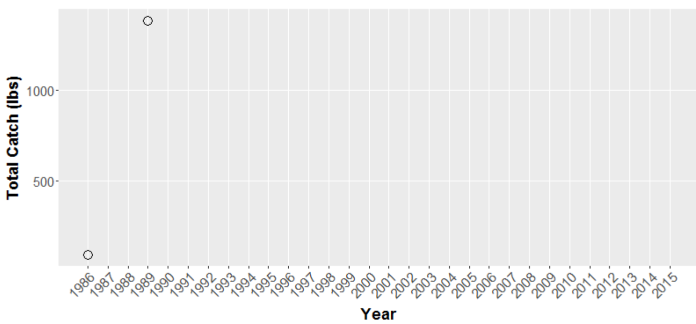

Guam: Sphyraena novaehollandiae
300
200
100
0
Total Catch (lbs)
Year


Guam: Sphyraena obtusata
200
150
100
50
Total Catch (lbs)
Year


Guam: Sphyraena putnamae
1035.00
1034.75
1034.50
1034.25
Total Catch (lbs)
Year

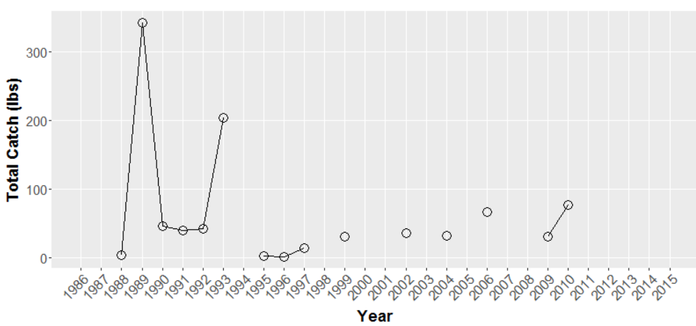

Guam: Sphyraena qenie
4000
2000
0
Total Catch (lbs)
Year

Guam: Sphyraenidae

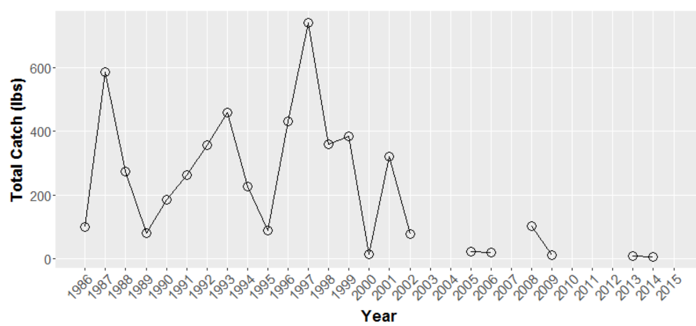


Guam: Sufflamen bursa

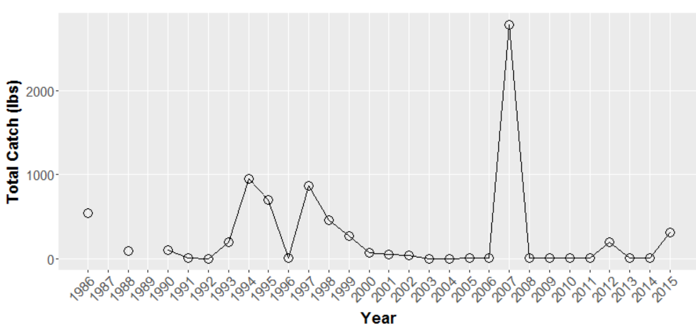
Guam: Sufflamen chrysopterum



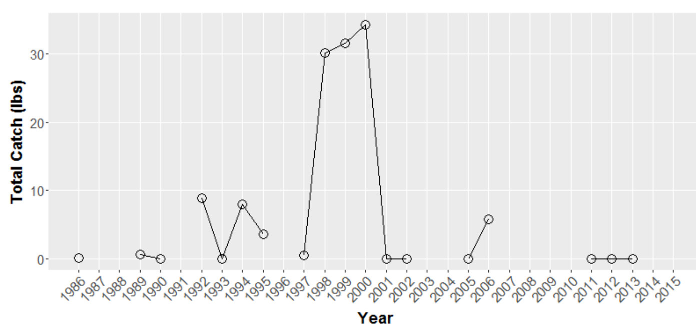
Guam: Sufflamen fraenatum



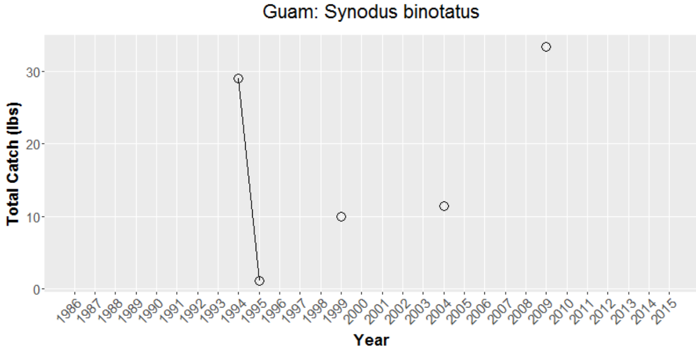
Guam: Synanceia verrucosa



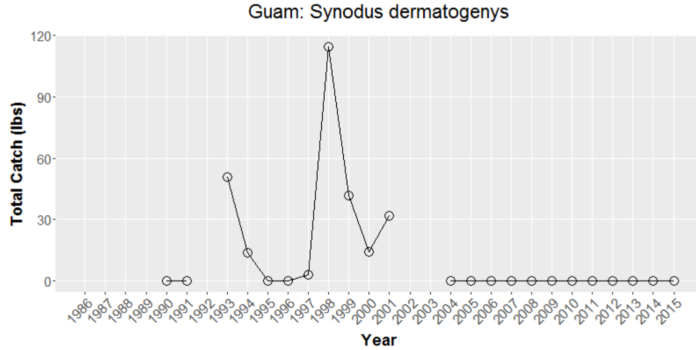
Guam: Synodontidae



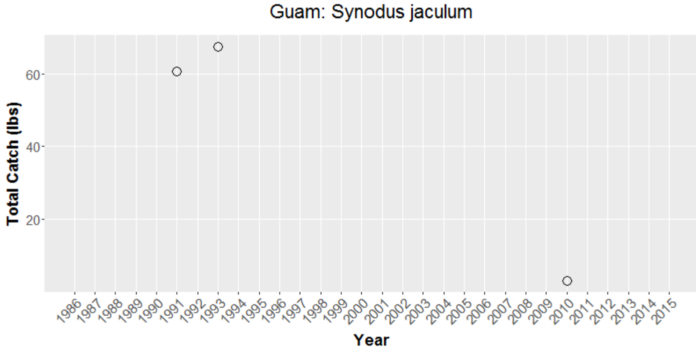
Guam: Synodus binotatus



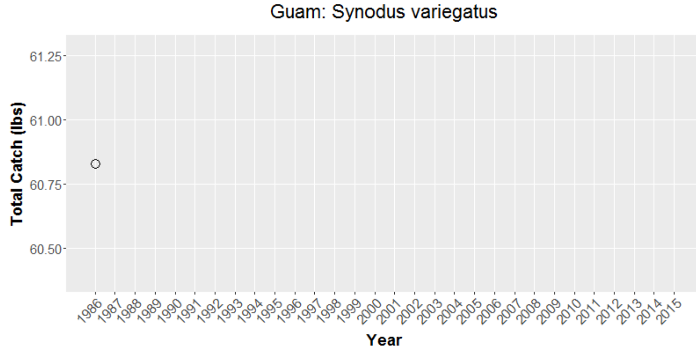
Guam: Synodus dermatogenys



Guam: Synodus jaculum



Guam: Synodus variegatus



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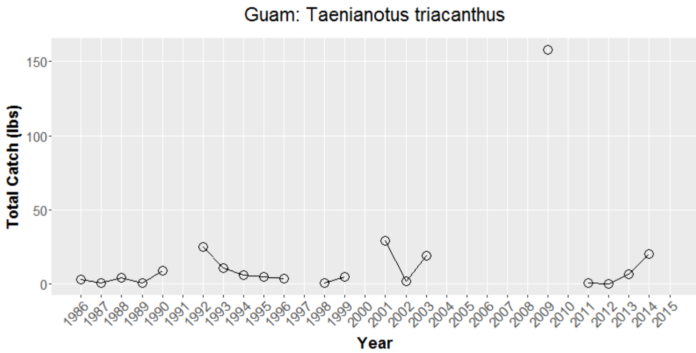
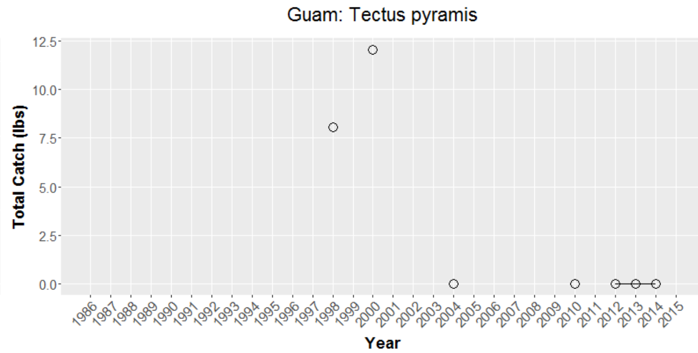
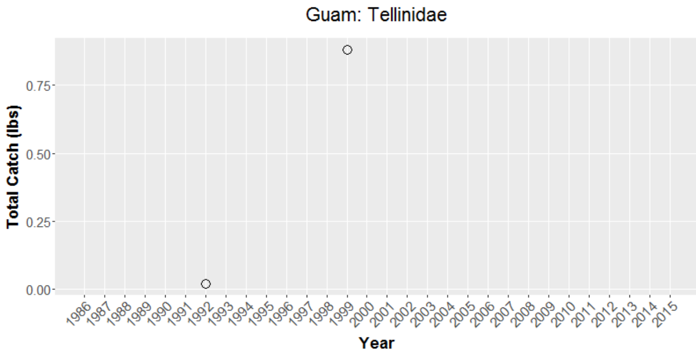
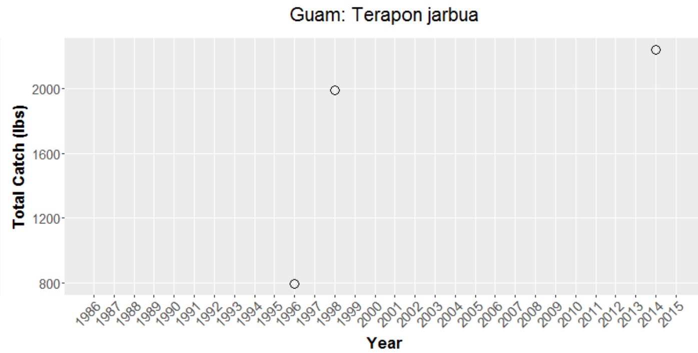
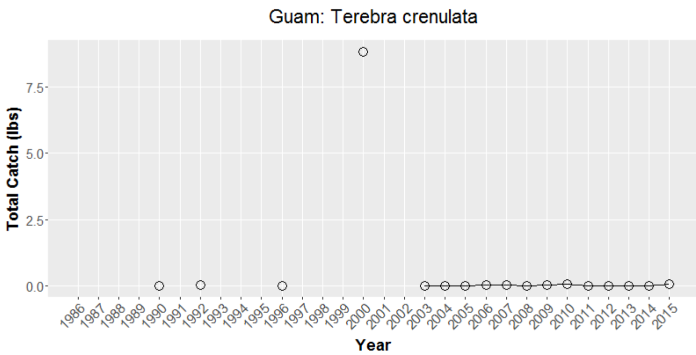
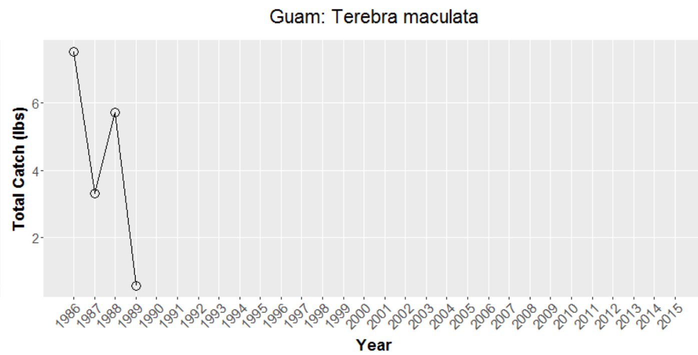


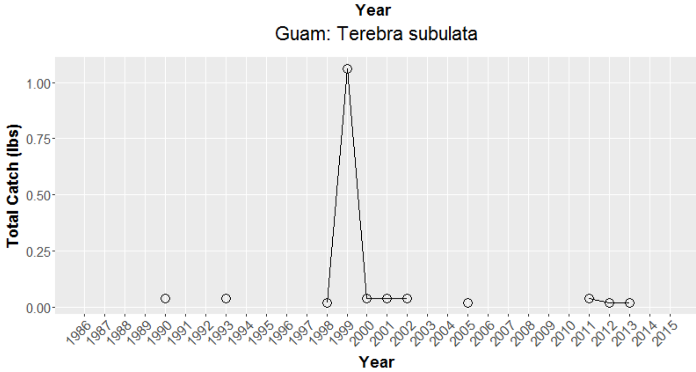


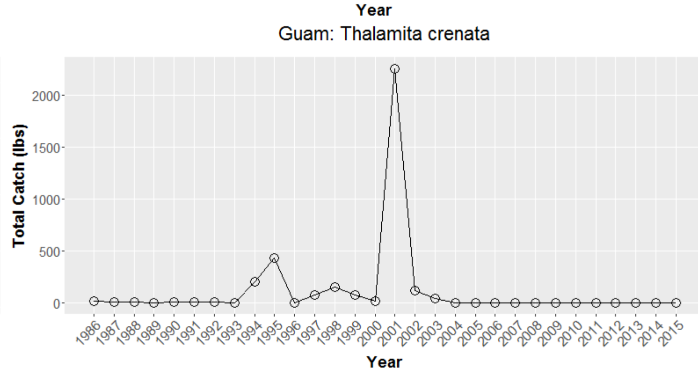


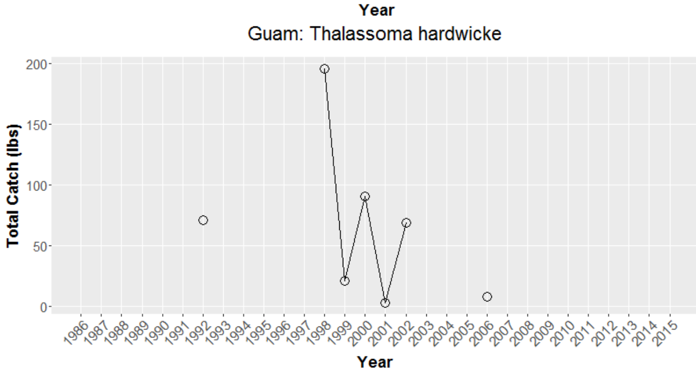


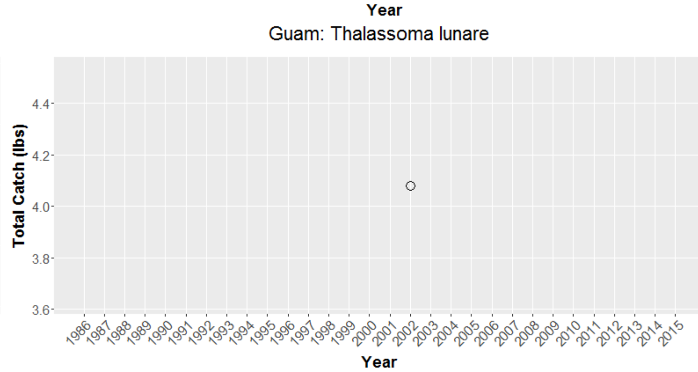




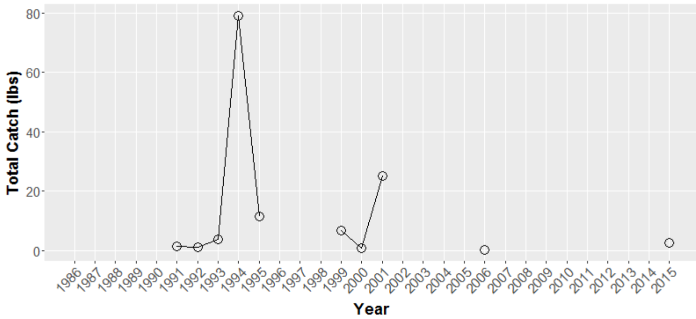




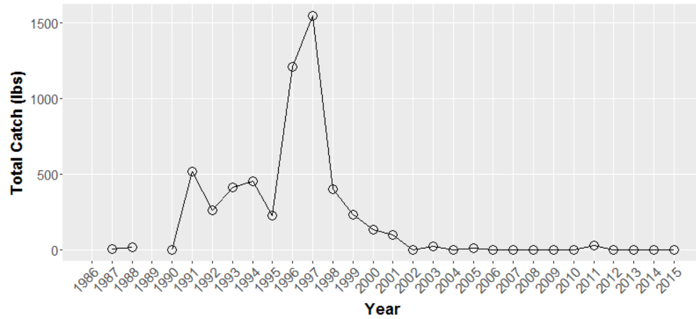




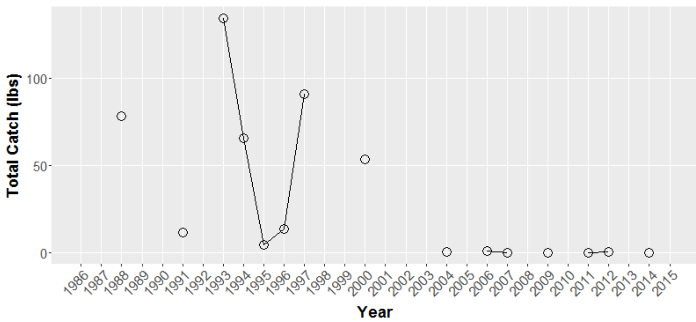
Guam: Thalassoma lutescens



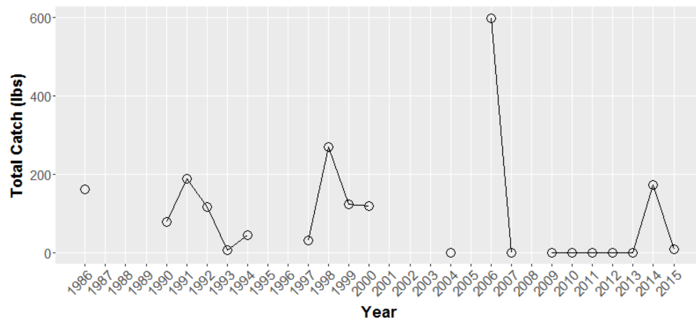
Guam: Thalassoma purpureum



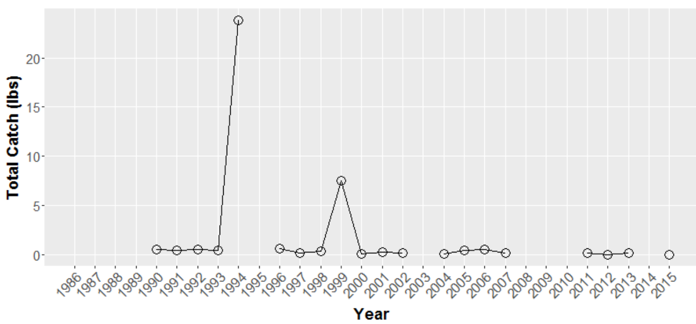
Guam: Thalassoma quinquevittatum



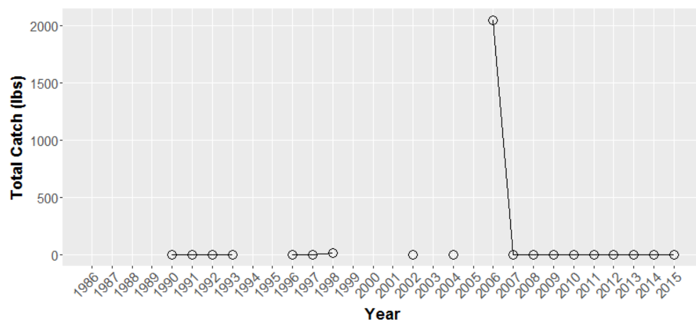
Guam: Thalassoma trilobatum



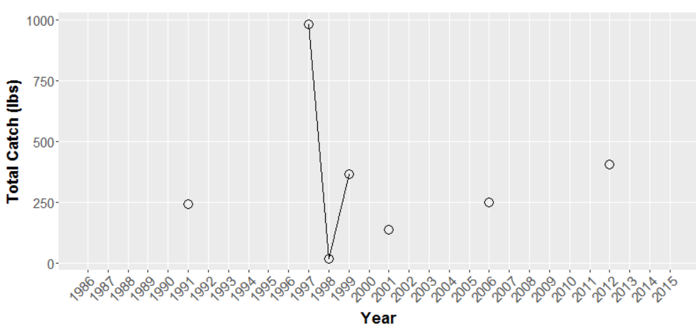
Guam: Tonna perdix



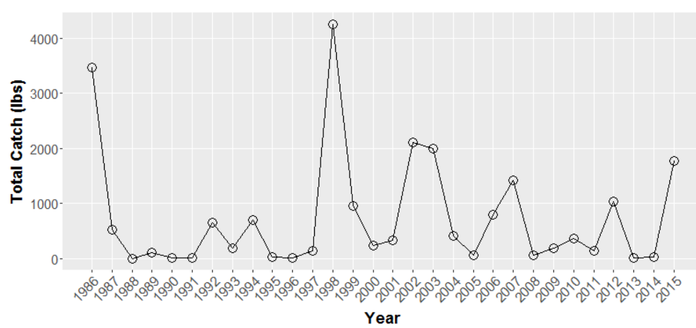
Guam: Toxopneustes pileolus



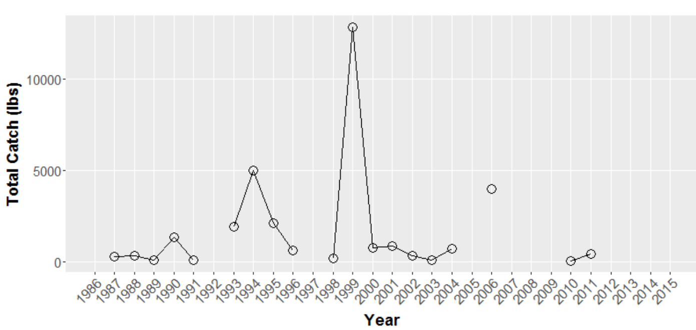
Guam: Trachinotus baillonii



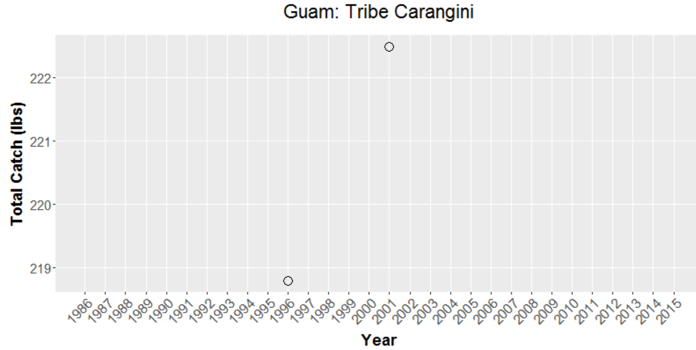
Guam: Trachinotus blochii



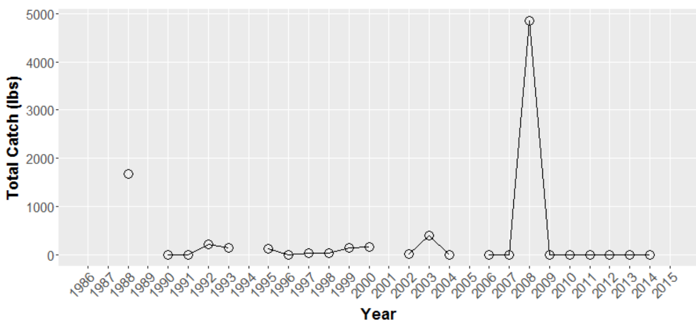
Guam: Triaenodon obesus



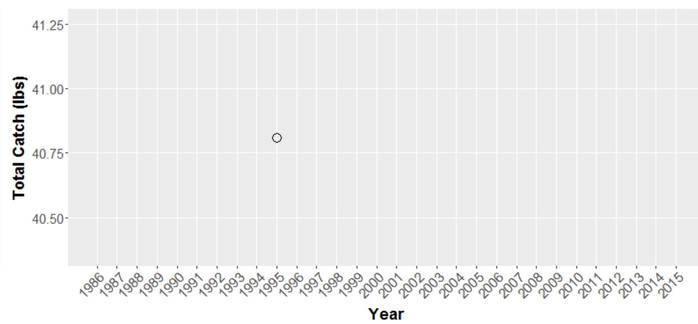
Guam: Tribe Carangini



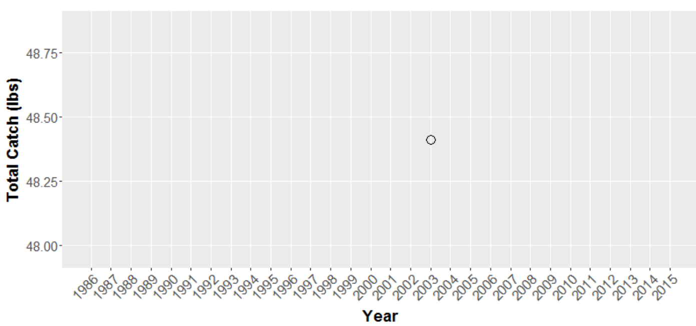
Guam: Tridacna maxima



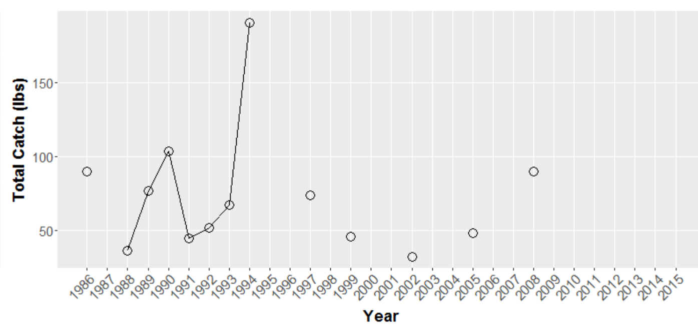
Guam: Tridacna squamosa



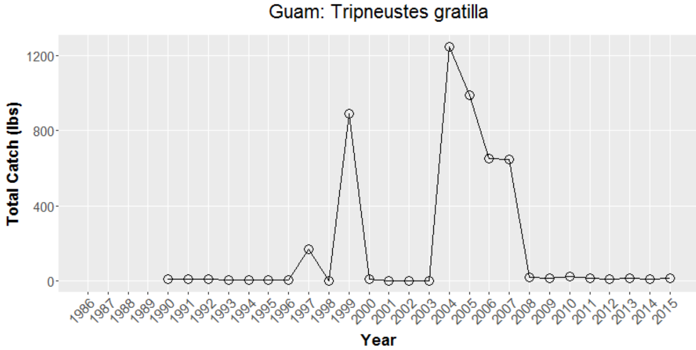
Guam: Triglidae



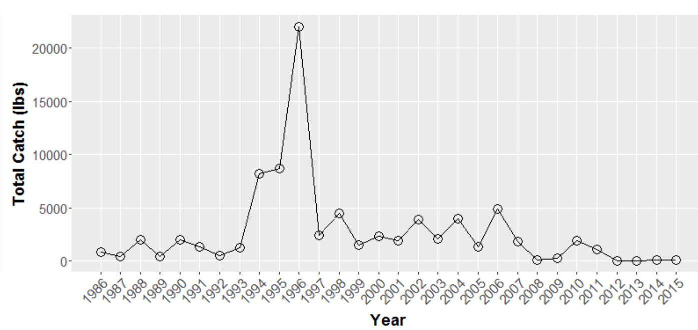
Guam: Triodon macropterus



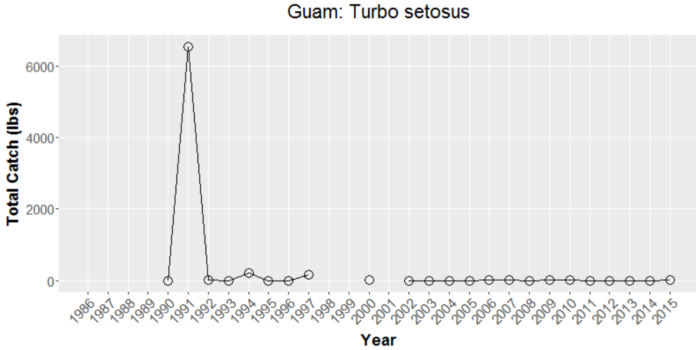
Guam: Tripneustes gratilla



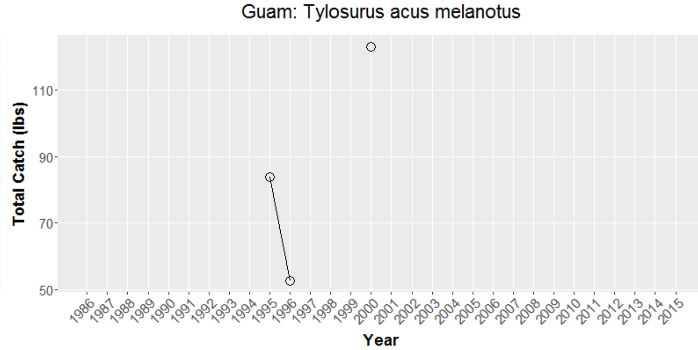
Guam: Trochus niloticus



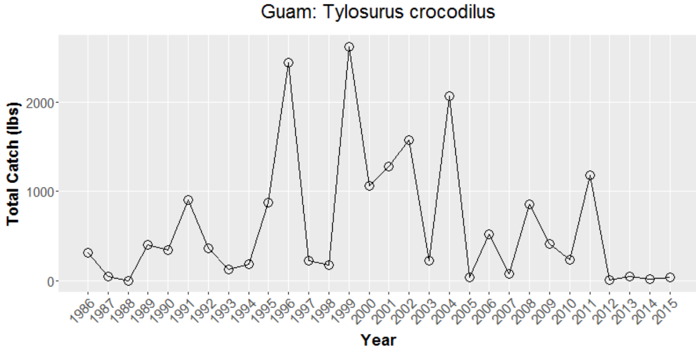
Guam: Turbo setosus



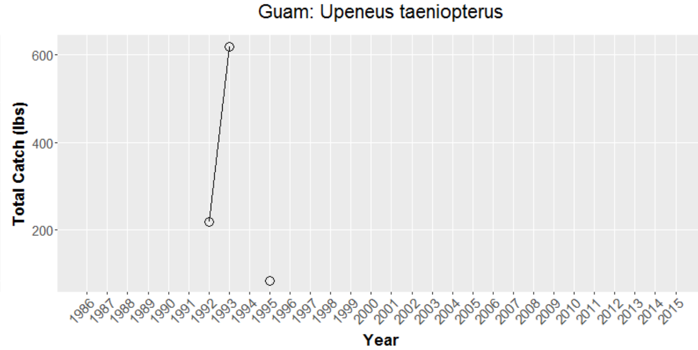
Guam: Tylosurus acus melanotus

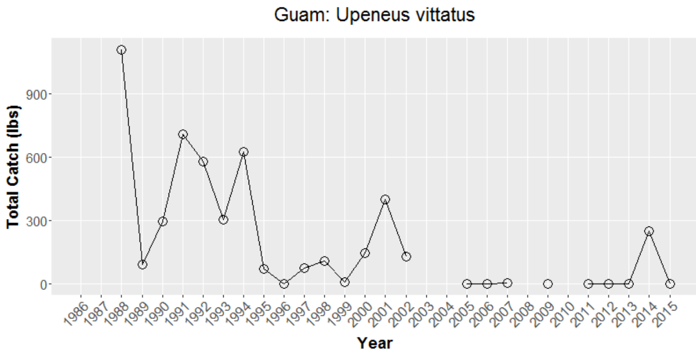


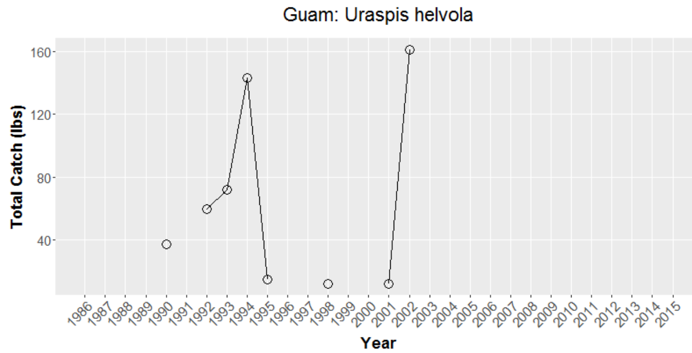
Guam: Tylosurus crocodilus

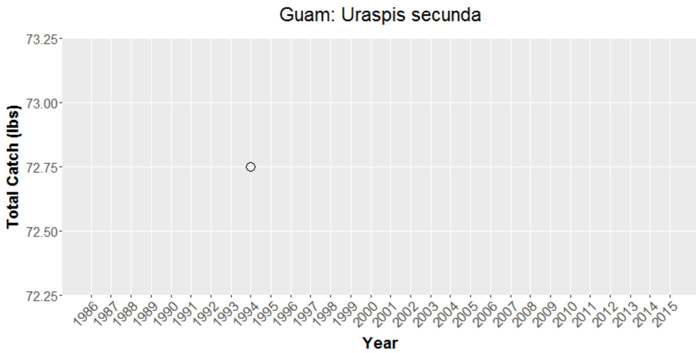


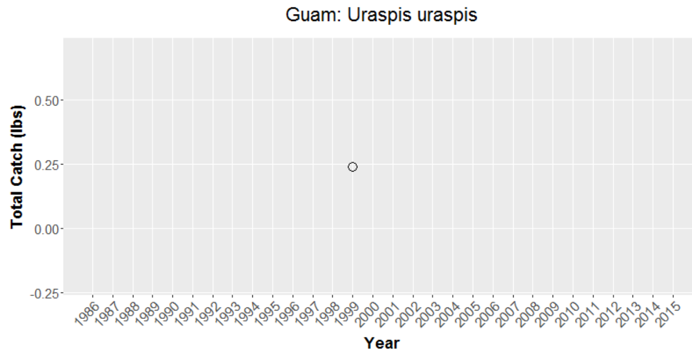
Guam: Upeneus taeniopterus

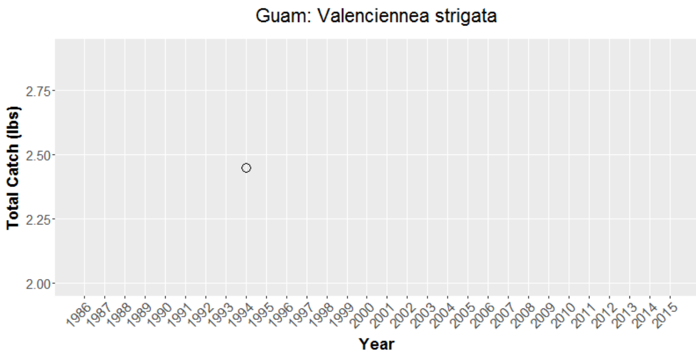


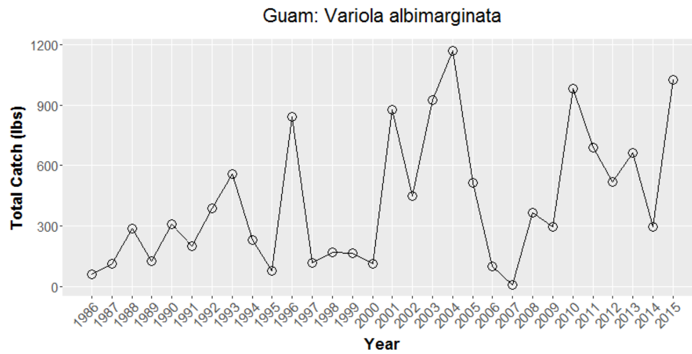

Guam: Upeneus vittatus
Total Catch (lbs)
Year

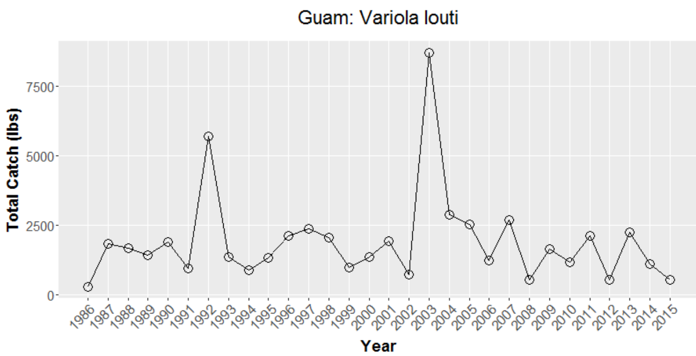

Guam: Uraspis helvola
Total Catch (lbs)
Year

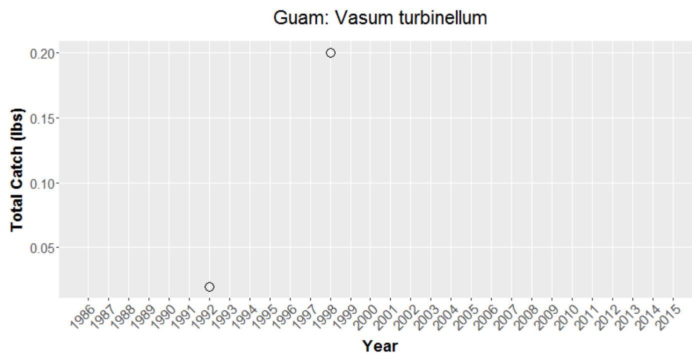

Guam: Uraspis secunda
Total Catch (lbs)
Year

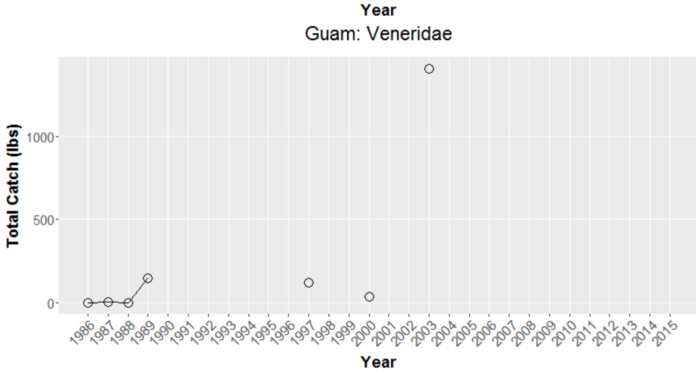

Guam: Uraspis uraspis
Total Catch (lbs)
Year

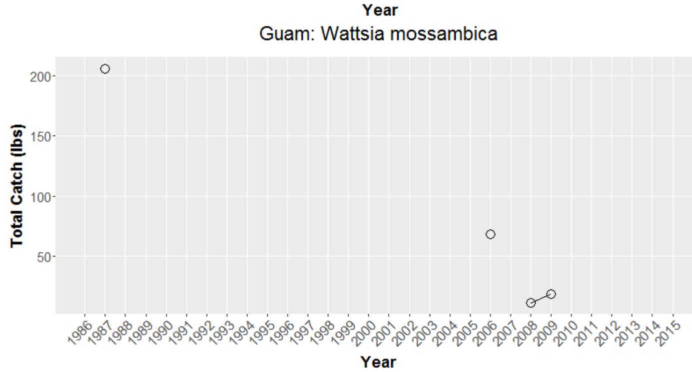

Guam: Valenciennea strigata
Total Catch (lbs)
Year

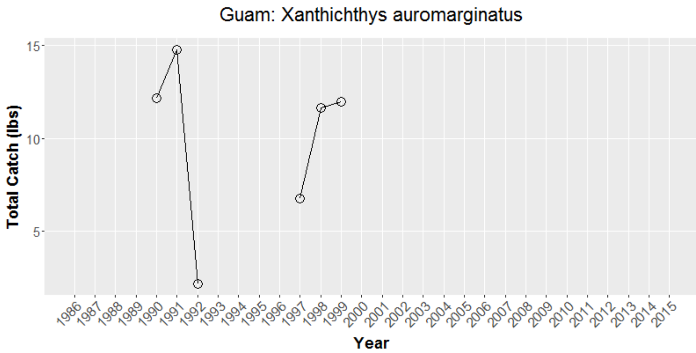

Guam: Variola albimarginata
Total Catch (lbs)
Year

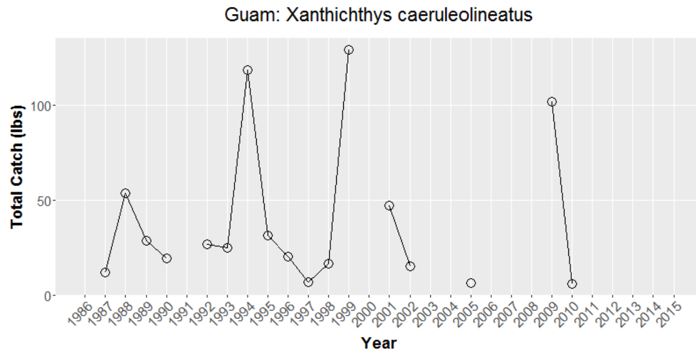

Guam: Variola louti
Total Catch (lbs)
Year

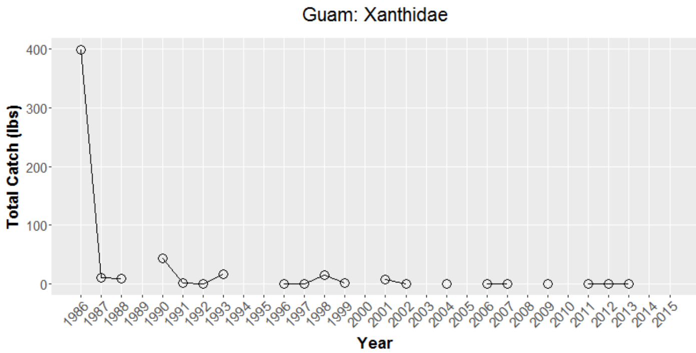

Guam: Vasum turbinellum
Total Catch (lbs)
Year

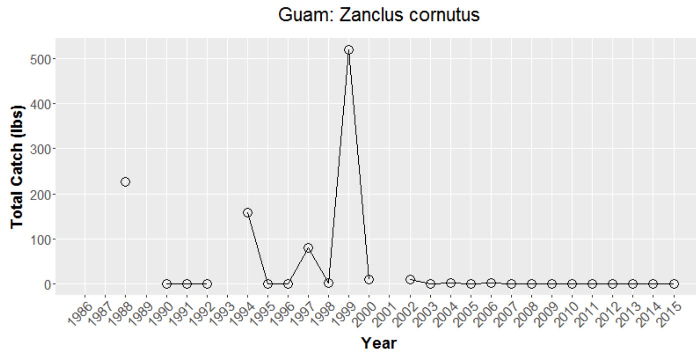

Guam: Veneridae
Total Catch (lbs)
Year

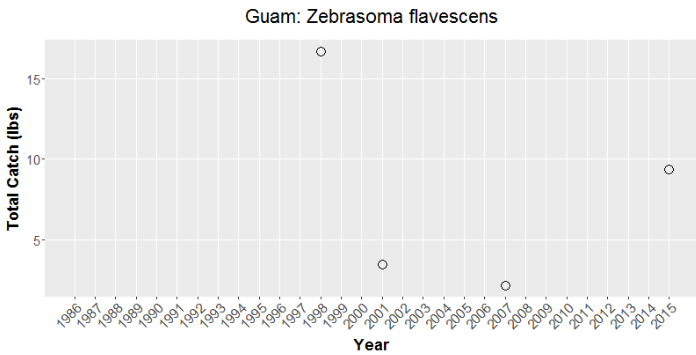

Guam: Wattsia mossambica
Total Catch (lbs)
Year

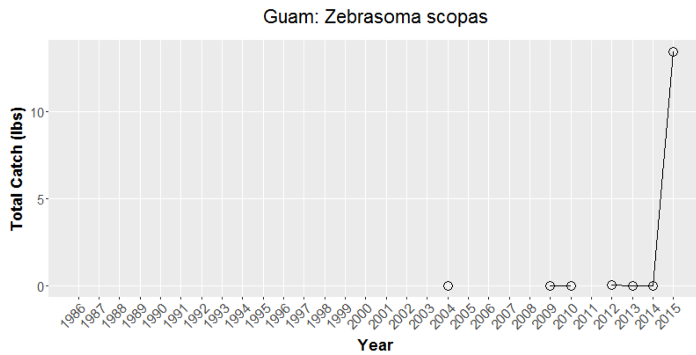

Guam: Xanthichthys auromarginatus
Total Catch (lbs)
Year

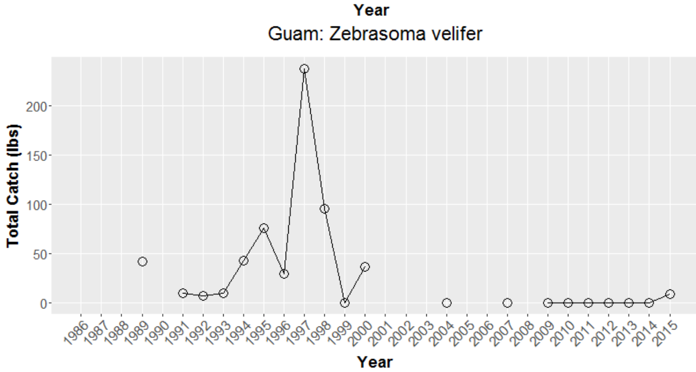

Guam: Xanthichthys caeruleolineatus
Total Catch (lbs)
Year

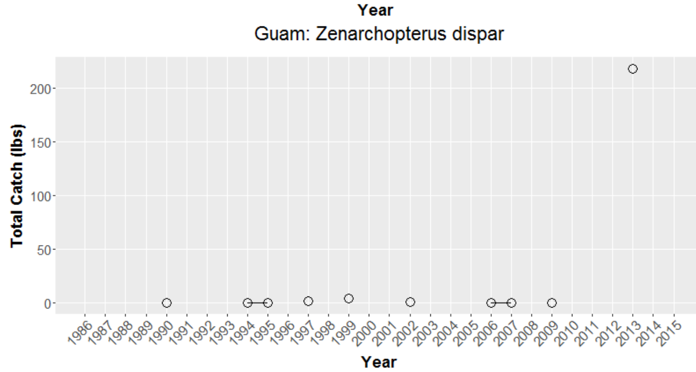

Guam: Xanthidae
Total Catch (lbs)
Year


Guam: Zanclus cornutus
Total Catch (lbs)
Year

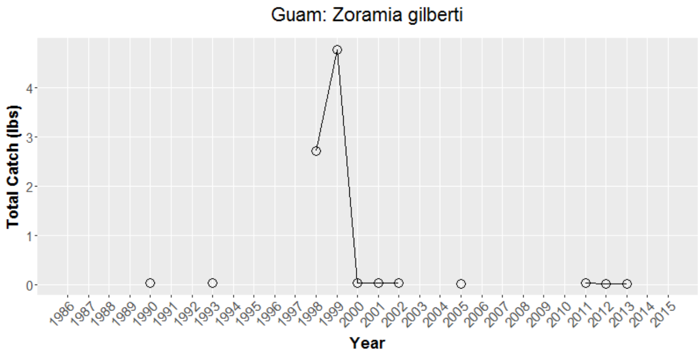

Guam: Zebrasoma flavescens
Total Catch (lbs)
Year

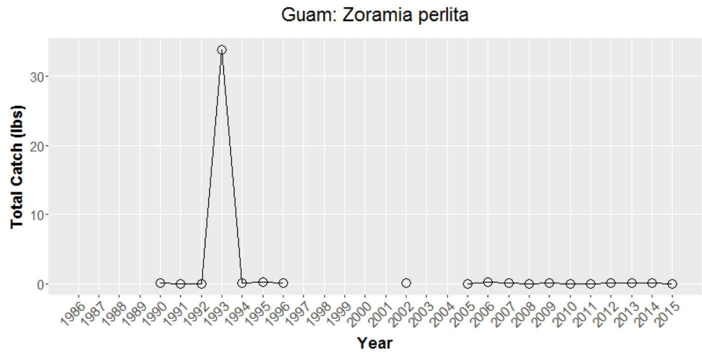

Guam: Zebrasoma scopas
Total Catch (lbs)
Year

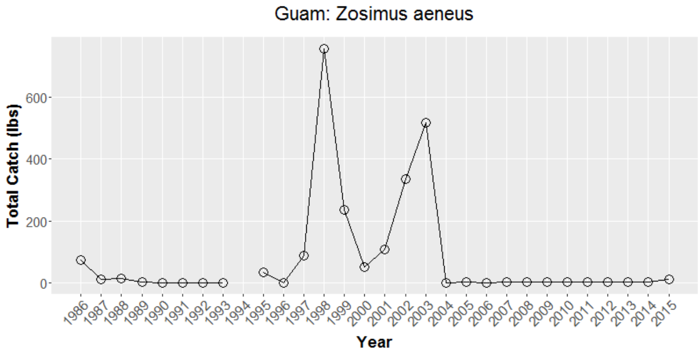

Guam: Zebrasoma velifer
Total Catch (lbs)
Year


Guam: Zenarchopterus dispar
Total Catch (lbs)
Year

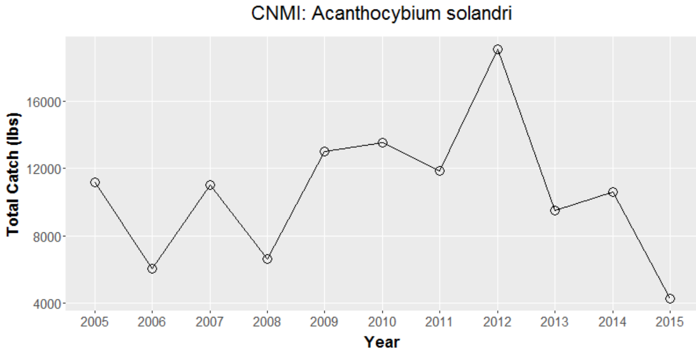
VERSION: 3/20/2018 4:45:11 PM

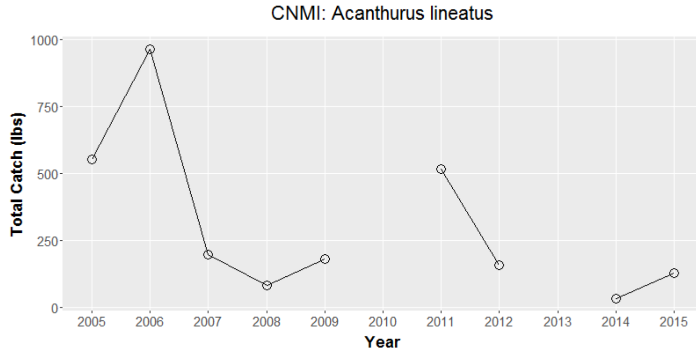


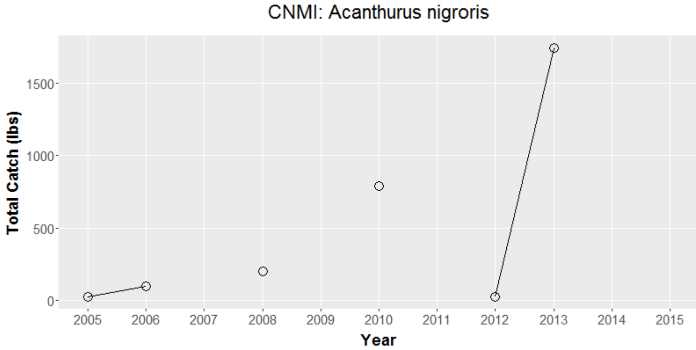


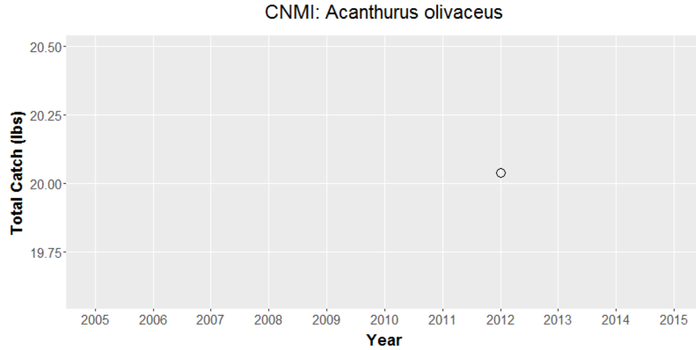


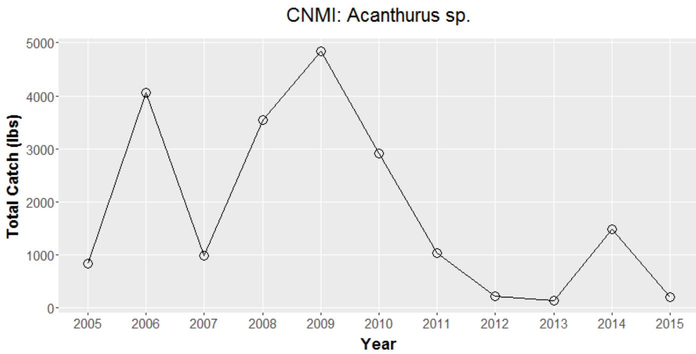
11.5 TIME SERIES CHARTS OF TOTAL CATCH PER MANAGEMENT UNIT SPECIES IN COMMONWEALTH OF NORTHERN MARIANA ISLANDS

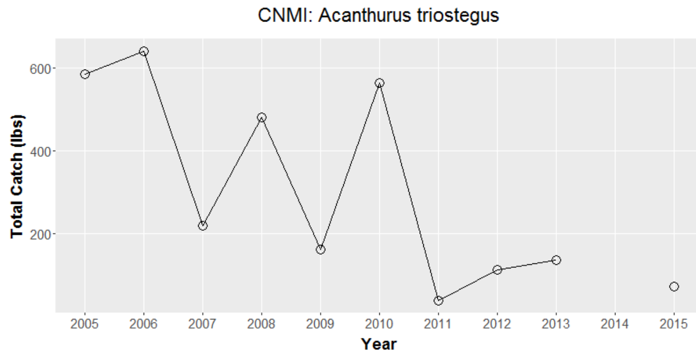


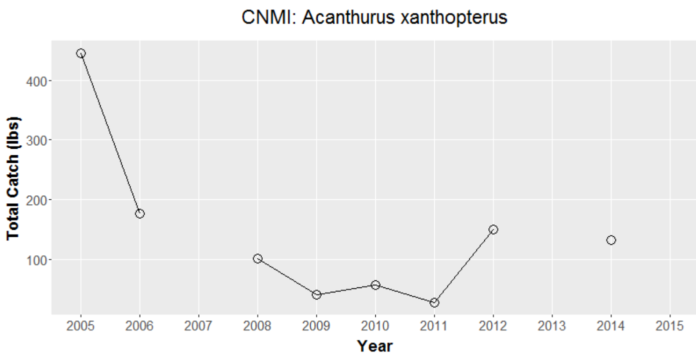


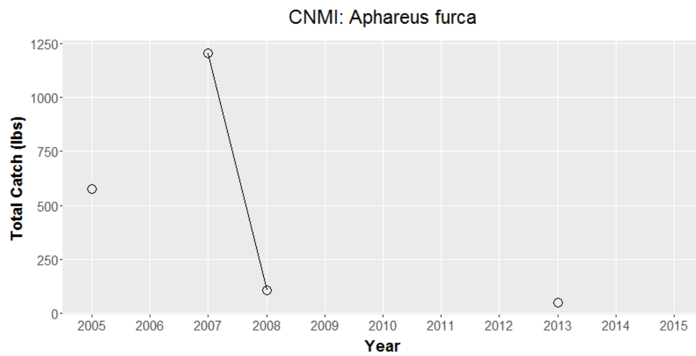




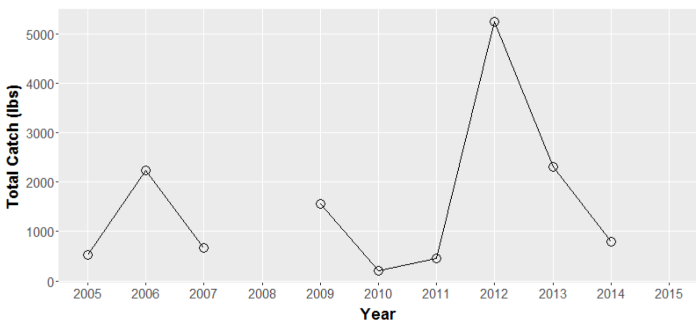




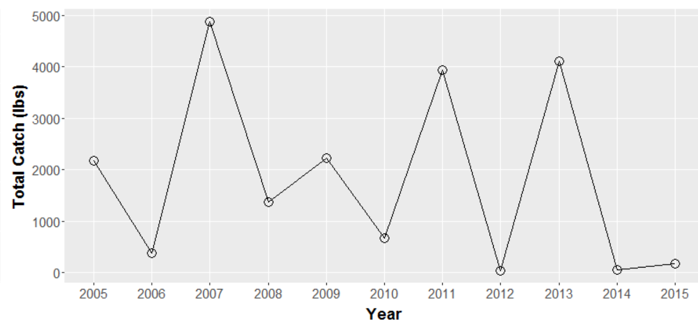




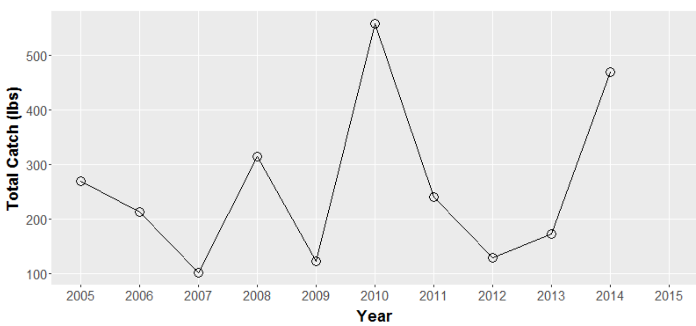
CNMI: Aphareus rutilans



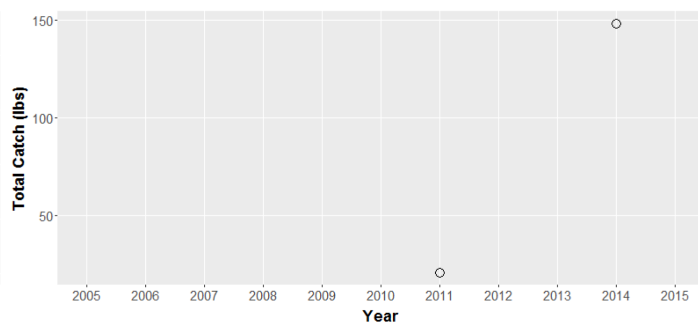
CNMI: Aprion virescens



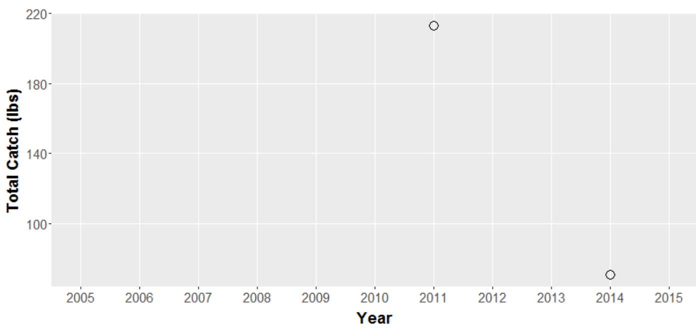
CNMI: Aulostomus chinensis



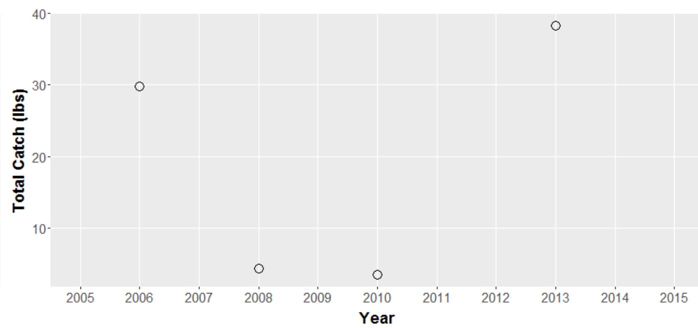
CNMI: Balistapus undulatus



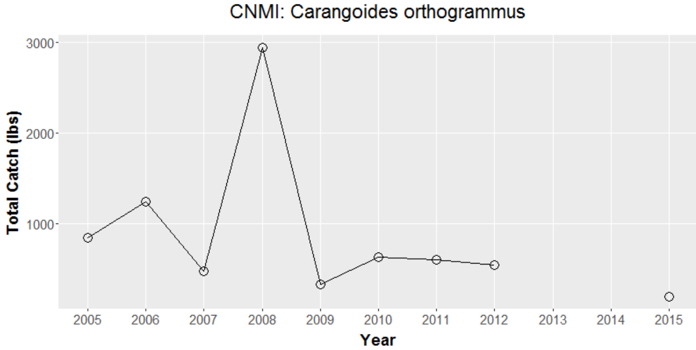
CNMI: Balistoides viridescens



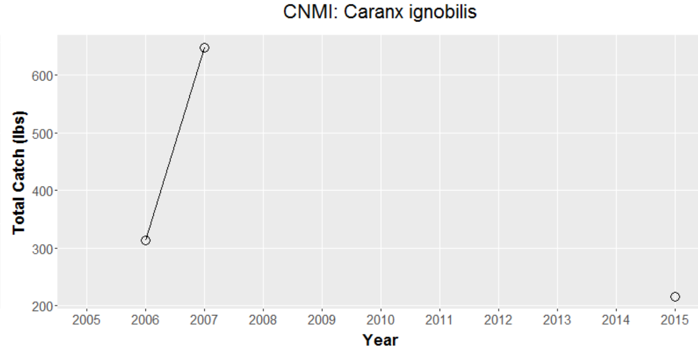
CNMI: Bothus sp.



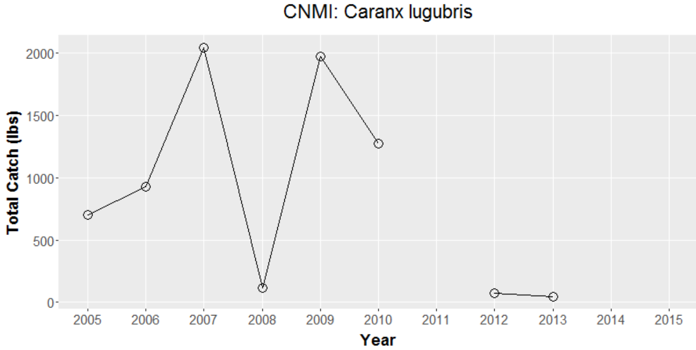
CNMI: Carangoides orthogrammus



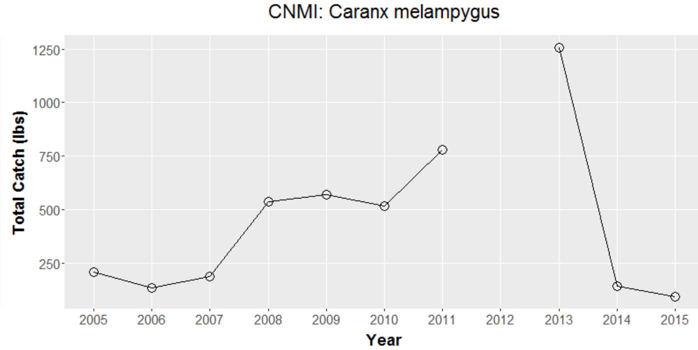
CNMI: Caranx ignobilis



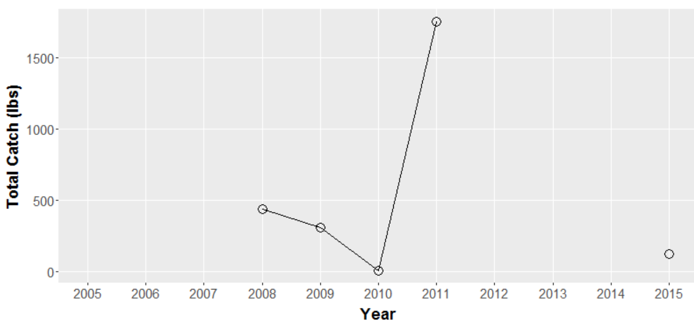
CNMI: Caranx lugubris



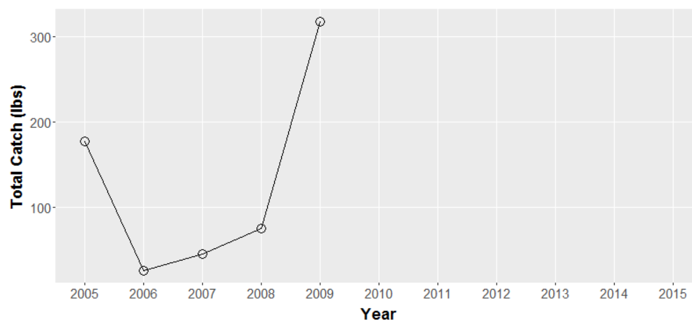
CNMI: Caranx melampygus



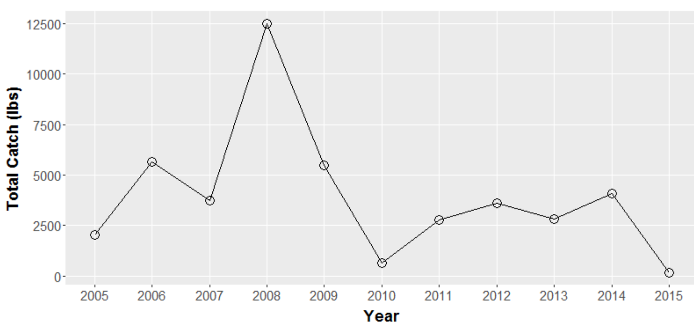
CNMI: Caranx papuensis



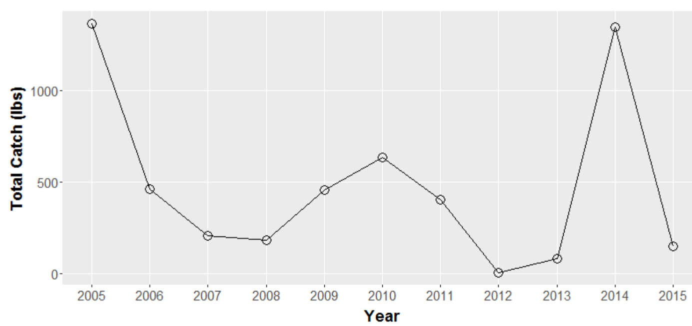
CNMI: Caranx sexfasciatus



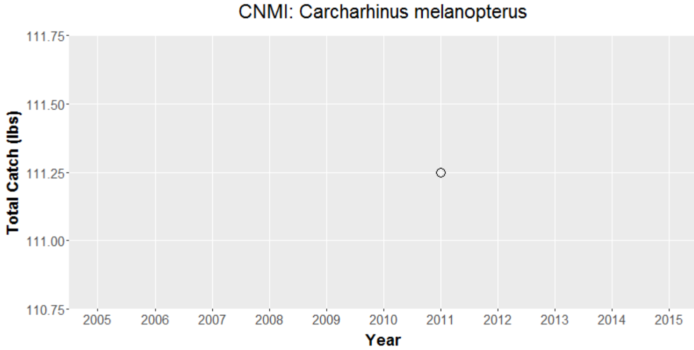
CNMI: Caranx sp. (juvenile)



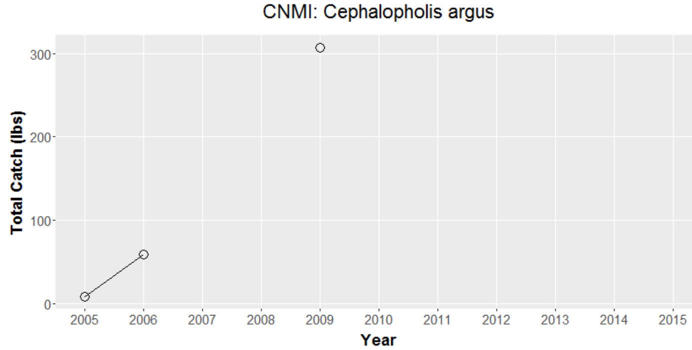
CNMI: Caranx sp.



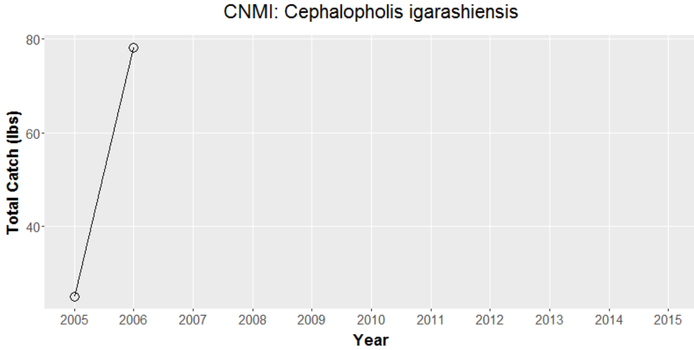
CNMI: Carcharhinus melanopterus



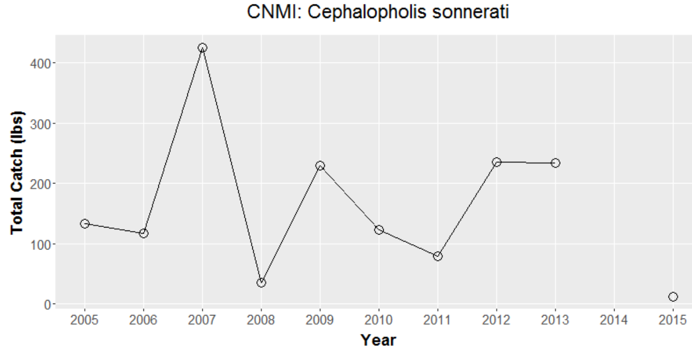
CNMI: Cephalopholis argus



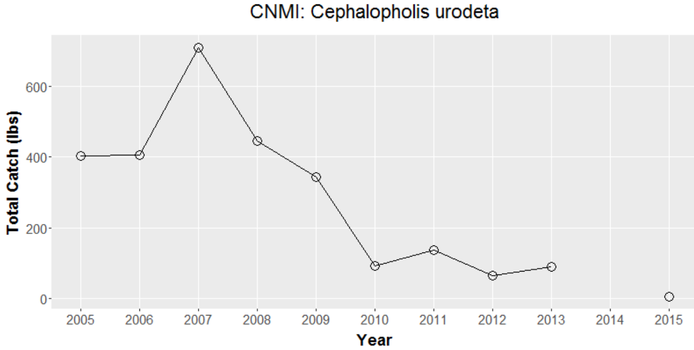
CNMI: Cephalopholis igarashiensis



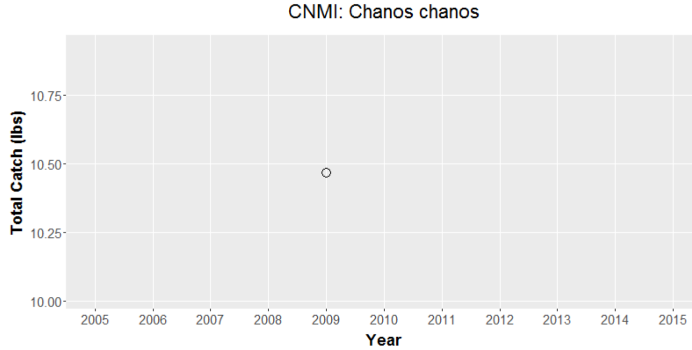
CNMI: Cephalopholis sonnerati

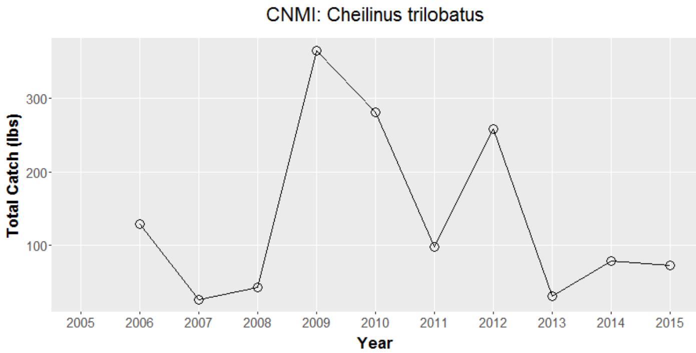


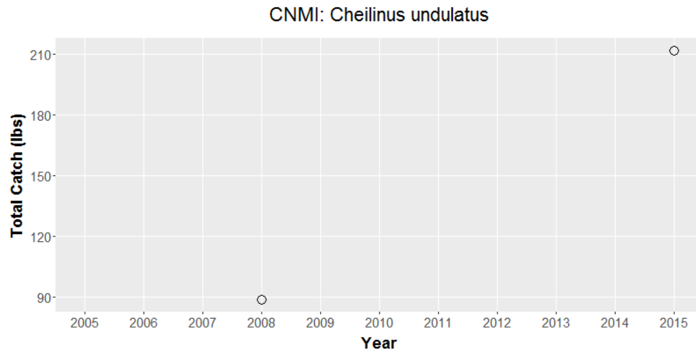
CNMI: Cephalopholis urodeta

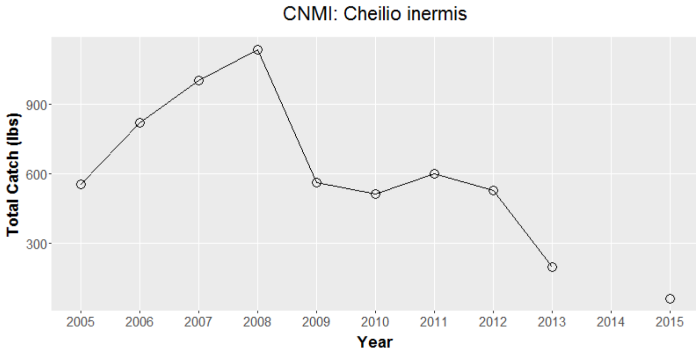


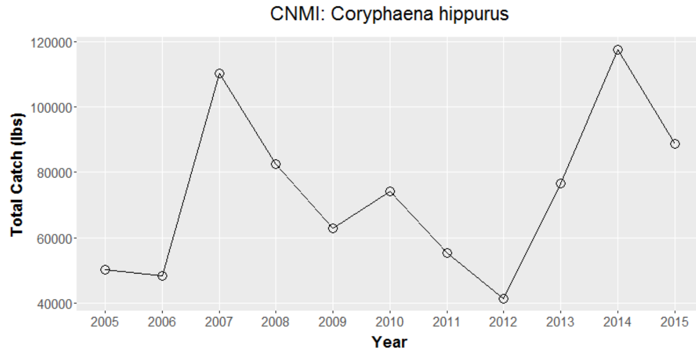
CNMI: Chanos chanos

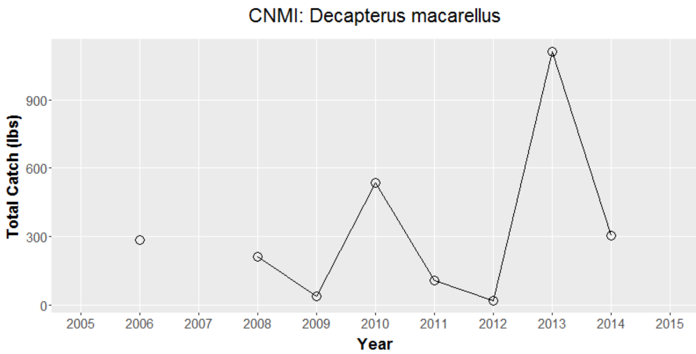


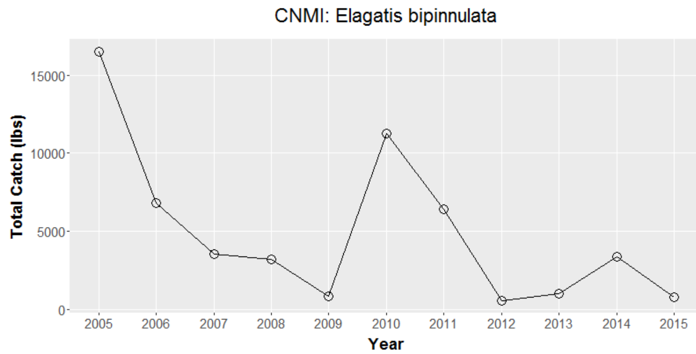

CNMI: Cheilinus trilobatus
Total Catch (lbs)
100
200
300
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

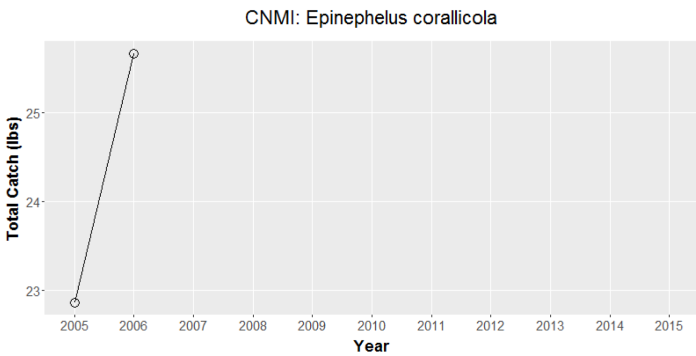

CNMI: Cheilinus undulatus
Total Catch (lbs)
90
120
150
180
210
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

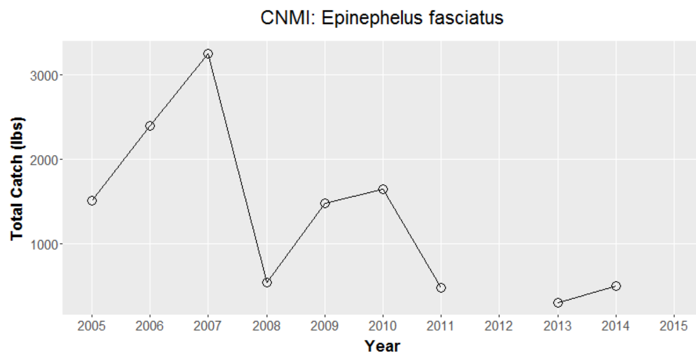

CNMI: Cheilio inermis
Total Catch (lbs)
300
600
900
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

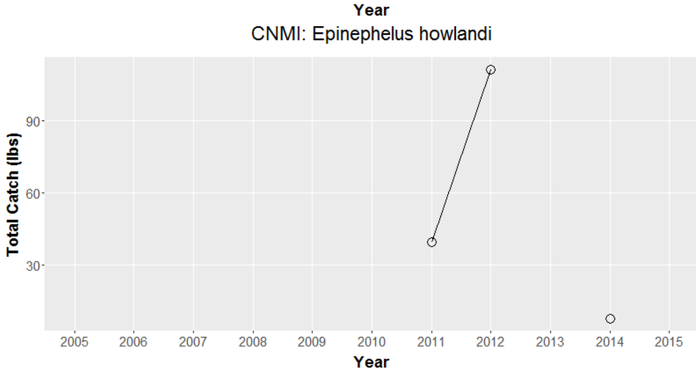

CNMI: Coryphaena hippurus
Total Catch (lbs)
40000
60000
80000
100000
120000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

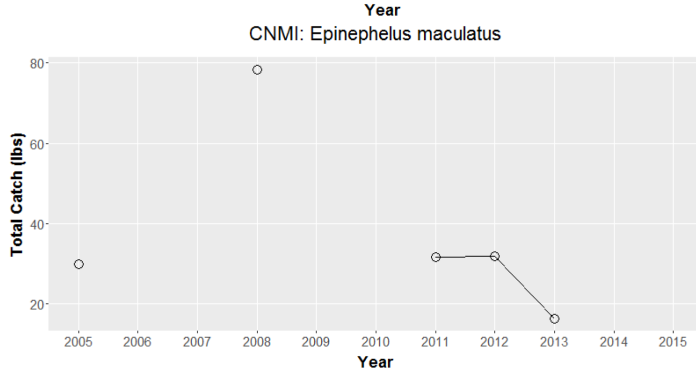

CNMI: Decapterus macarellus
Total Catch (lbs)
0
300
600
900
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


CNMI: Elagatis bipinnulata
Total Catch (lbs)
0
5000
10000
15000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


CNMI: Epinephelus corallicola
Total Catch (lbs)
23
24
25
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


CNMI: Epinephelus fasciatus
Total Catch (lbs)
1000
2000
3000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


CNMI: Epinephelus howlandi
Total Catch (lbs)
30
60
90
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


CNMI: Epinephelus maculatus
Total Catch (lbs)
20
40
60
80
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

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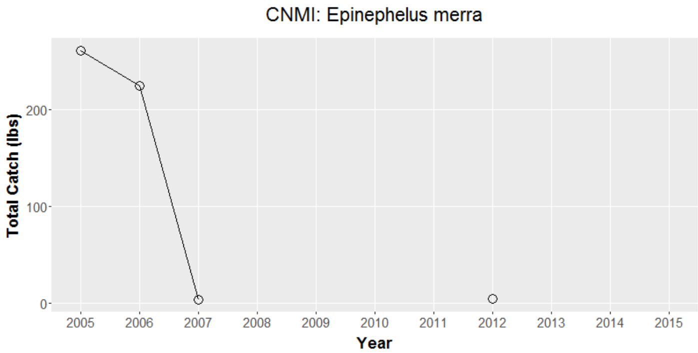
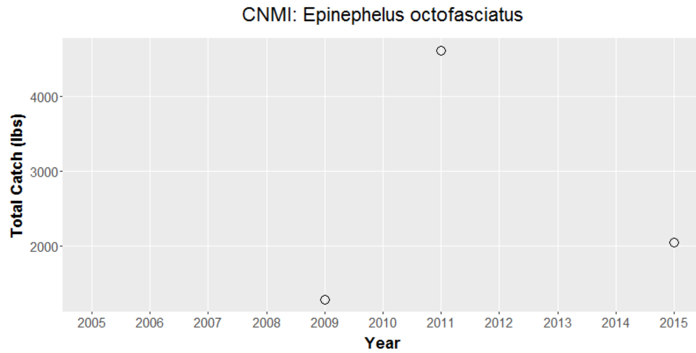
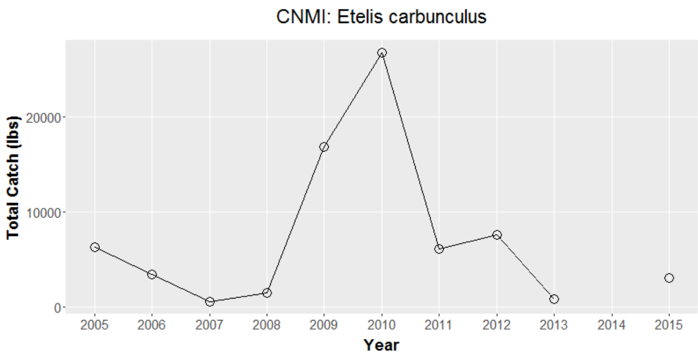
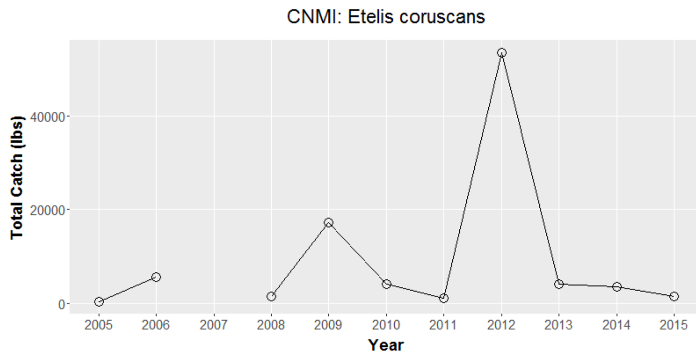
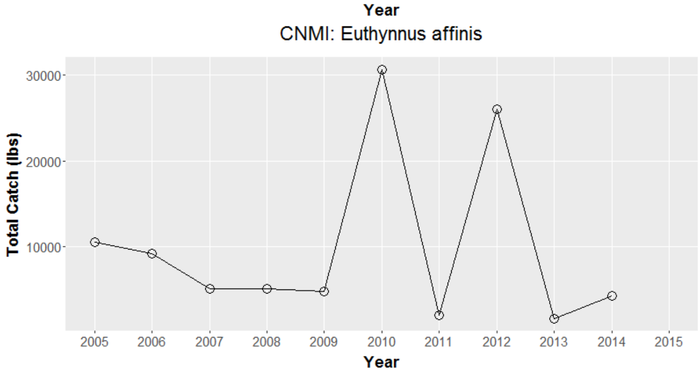
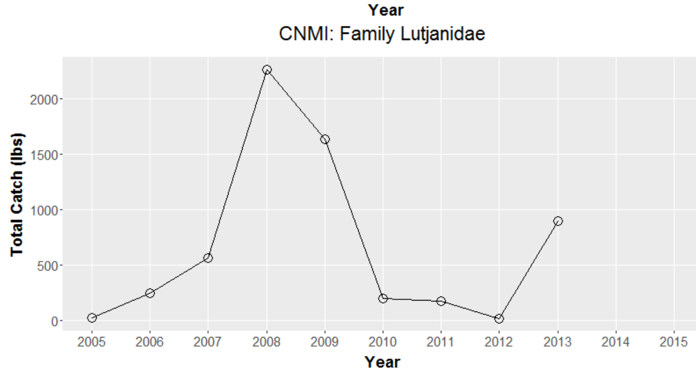


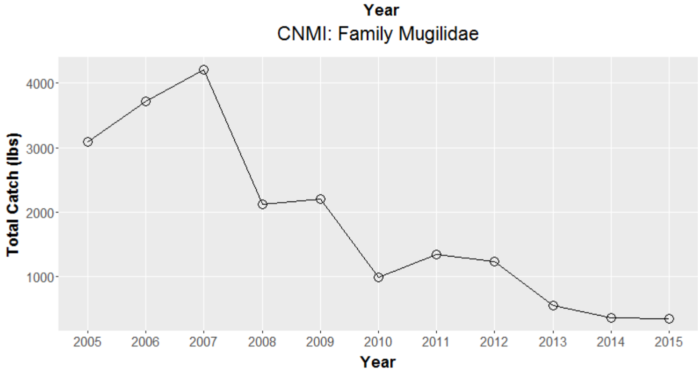


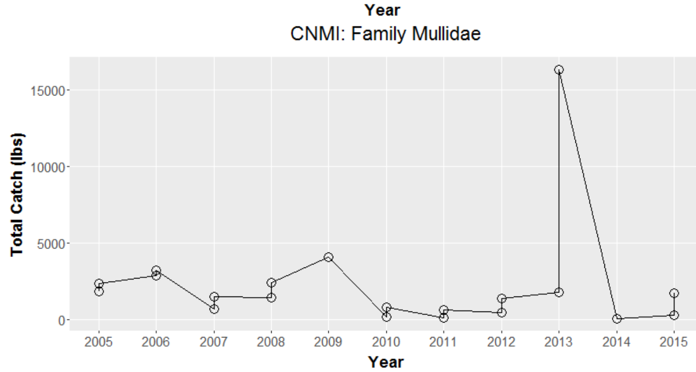


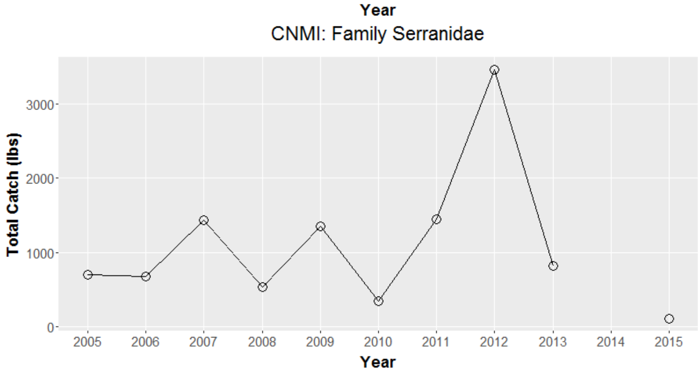


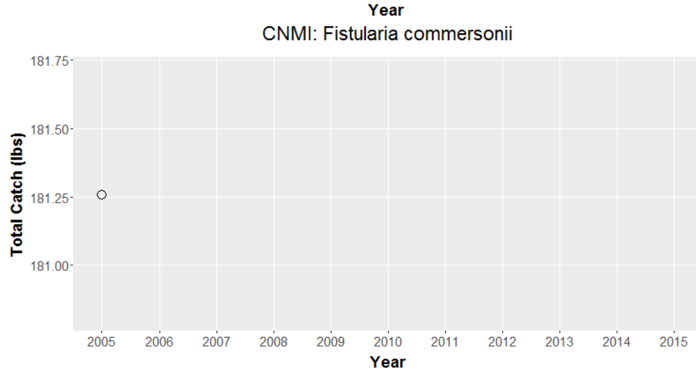


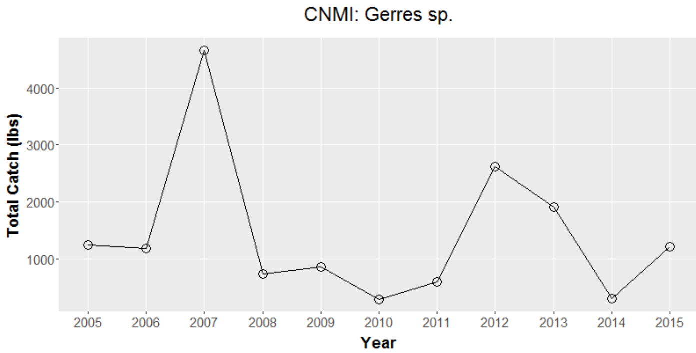


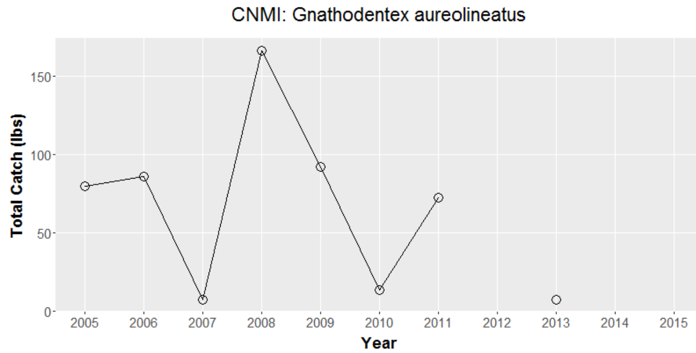


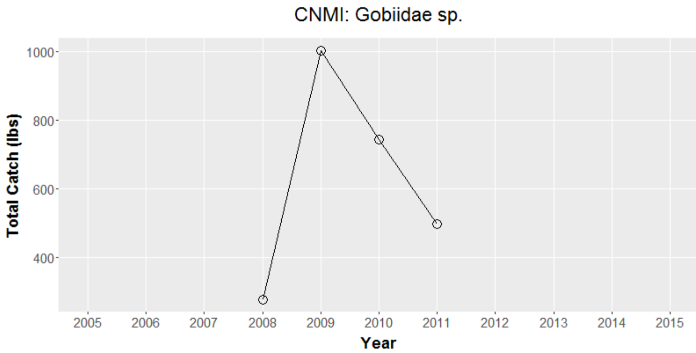


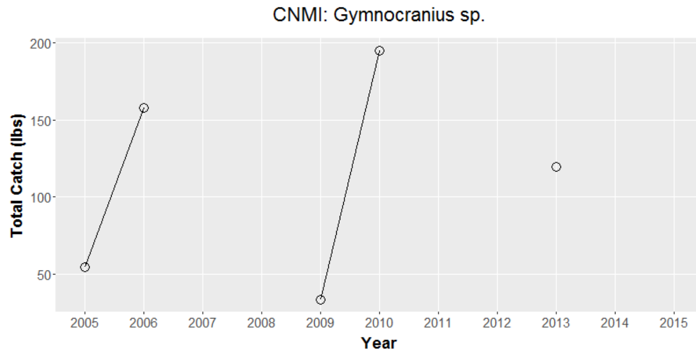


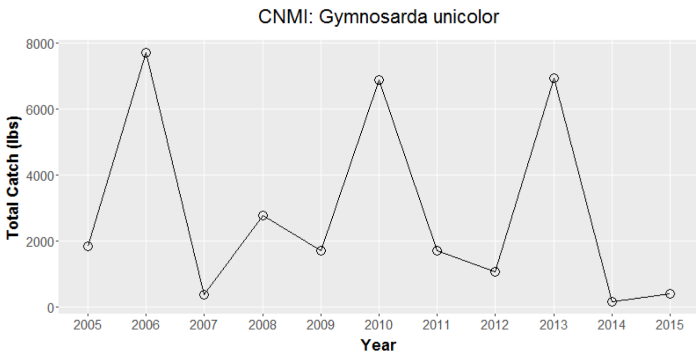


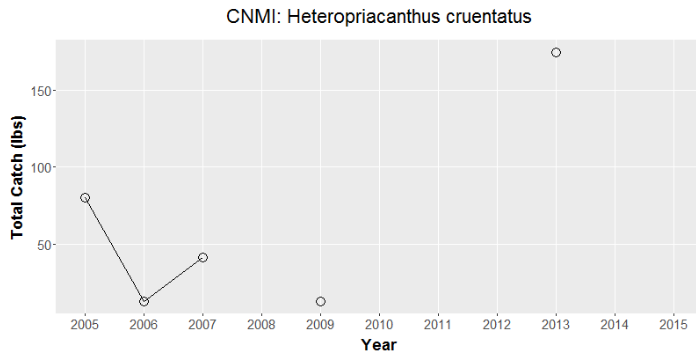

CNMI: Gerres sp.
Total Catch (lbs)
1000 2000 3000 4000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

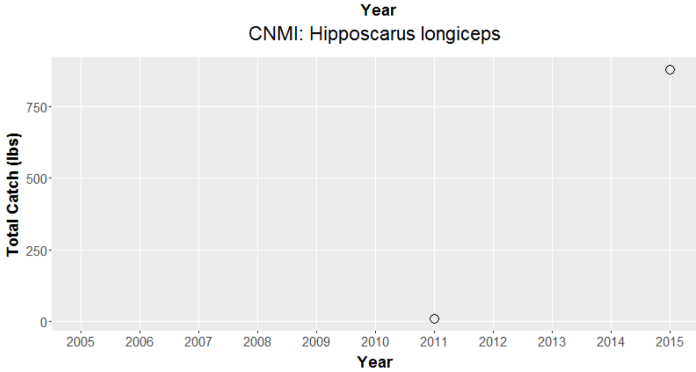

CNMI: Gnathodentex aureolineatus
Total Catch (lbs)
0 50 100 150
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

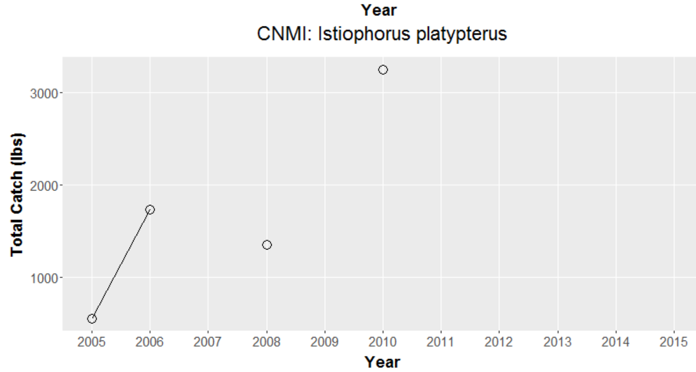

CNMI: Gobiidae sp.
Total Catch (lbs)
400 600 800 1000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

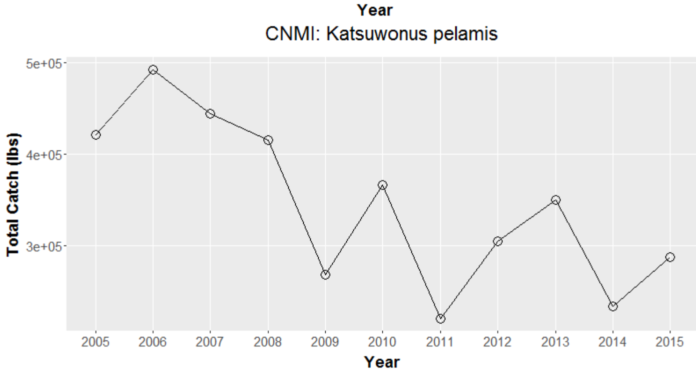

CNMI: Gymnocranius sp.
Total Catch (lbs)
50 100 150 200
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

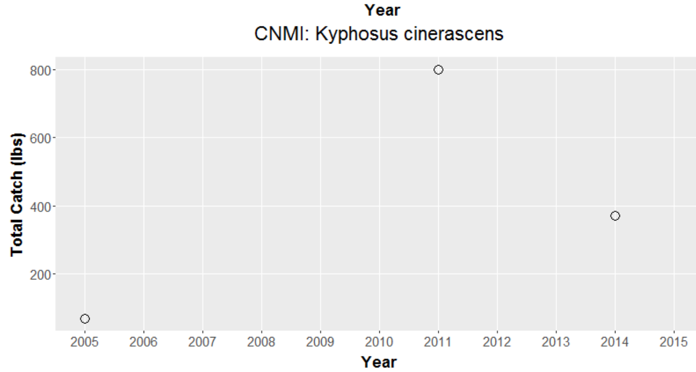

CNMI: Gymnosarda unicolor
Total Catch (lbs)
0 2000 4000 6000 8000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

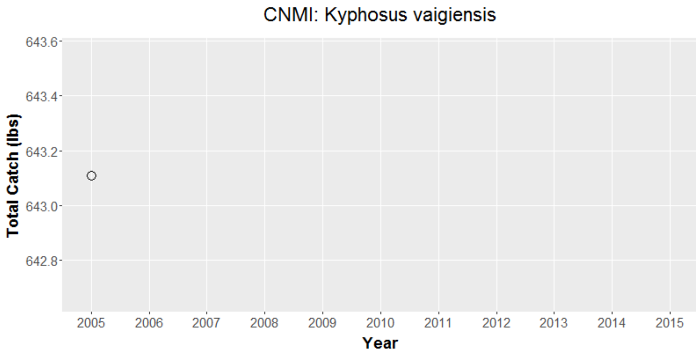

CNMI: Heteropriacanthus cruentatus
Total Catch (lbs)
50 100 150
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

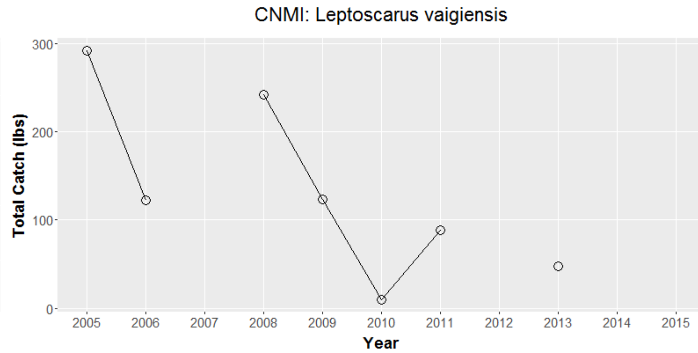

CNMI: Hipposcarus longiceps
Total Catch (lbs)
0 250 500 750
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

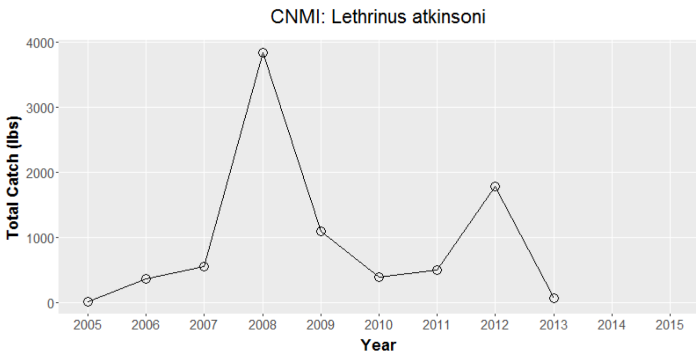

CNMI: Istiophorus platypterus
Total Catch (lbs)
1000 2000 3000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

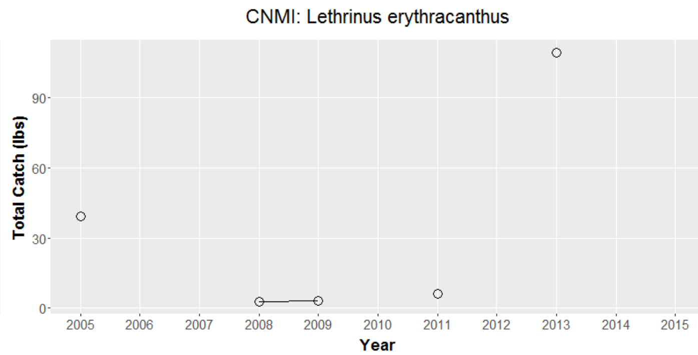

CNMI: Katsuwonus pelamis
Total Catch (lbs)
3e+05 4e+05 5e+05
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

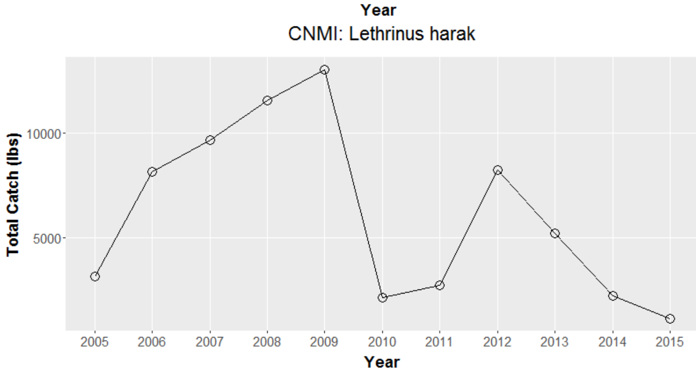

CNMI: Kyphosus cinerascens
Total Catch (lbs)
200 400 600 800
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

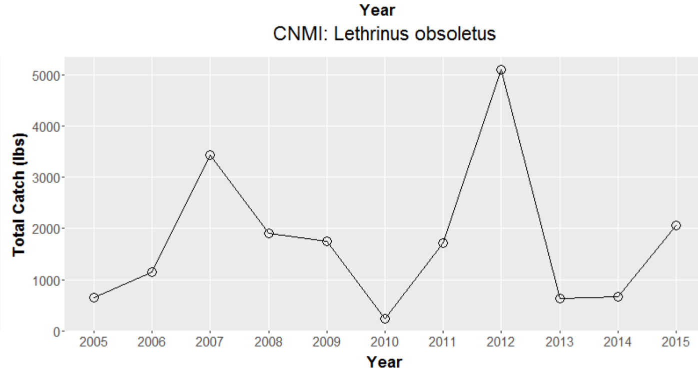

CNMI: Kyphosus vaigiensis
Total Catch (lbs)
Year

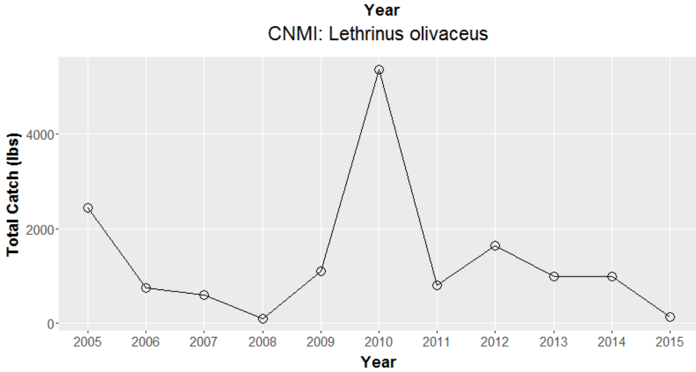

CNMI: Leptoscarus vaigiensis
Total Catch (lbs)
Year

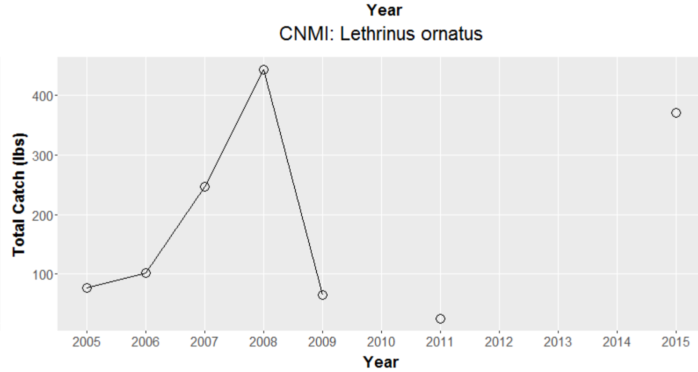

CNMI: Lethrinus atkinsoni
Total Catch (lbs)
Year

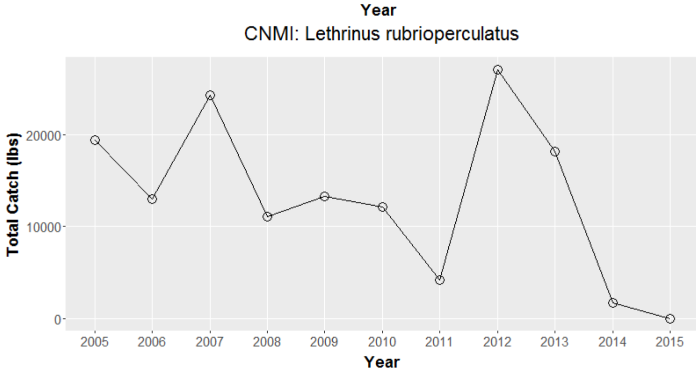

CNMI: Lethrinus erythracanthus
Total Catch (lbs)
Year

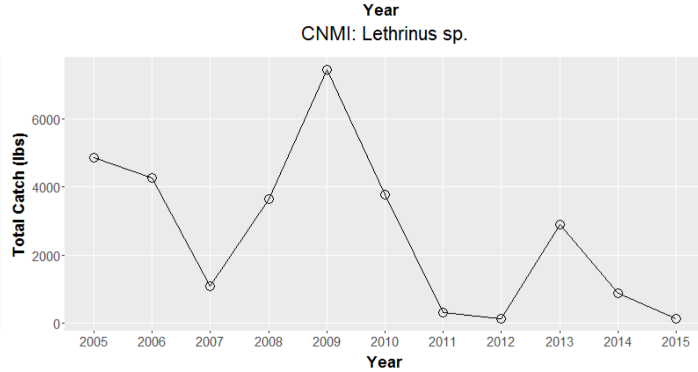

CNMI: Lethrinus harak
Total Catch (lbs)
Year

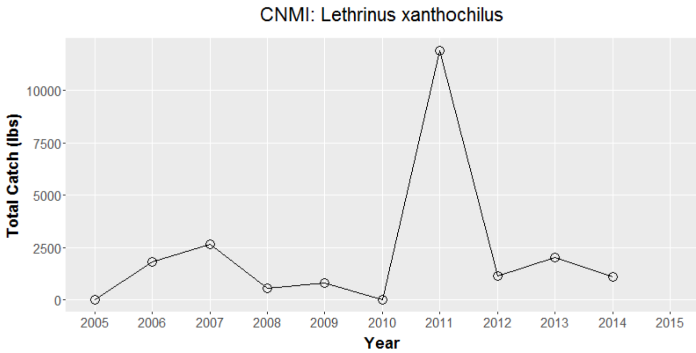

CNMI: Lethrinus obsoletus
Total Catch (lbs)
Year

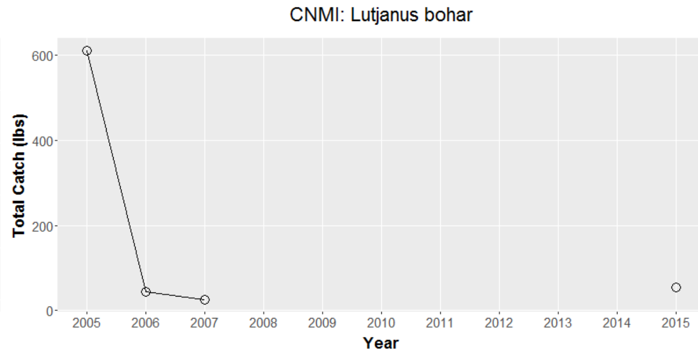

CNMI: Lethrinus olivaceus
Total Catch (lbs)
Year

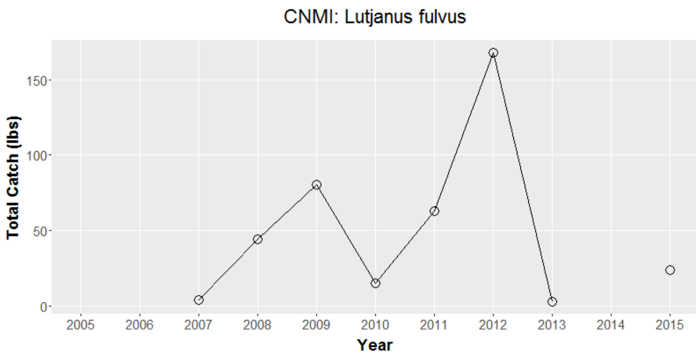

CNMI: Lethrinus ornatus
Total Catch (lbs)
Year

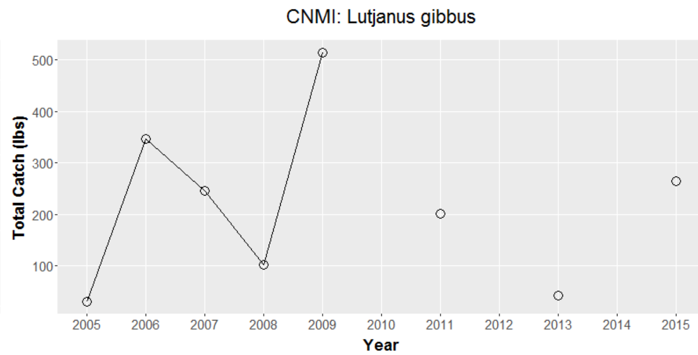

CNMI: Lethrinus rubrioperculatus
Total Catch (lbs)
Year

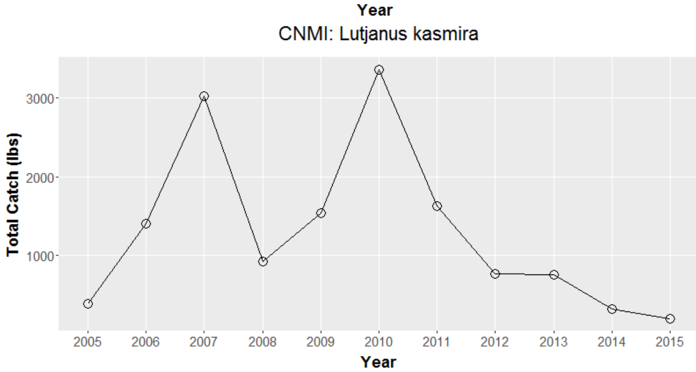

CNMI: Lethrinus sp.
Total Catch (lbs)
Year

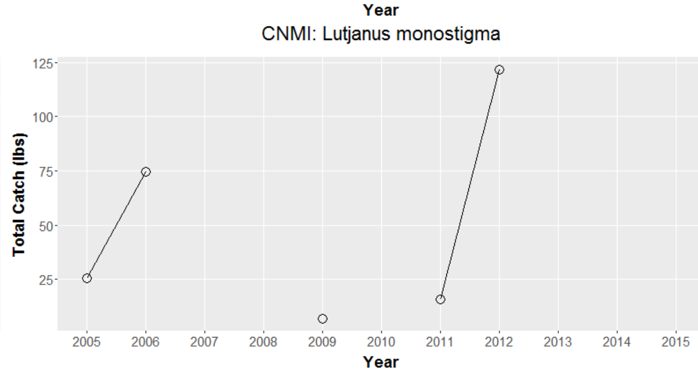

CNMI: Lethrinus xanthochilus
Total Catch (lbs)
0
2500
5000
7500
10000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

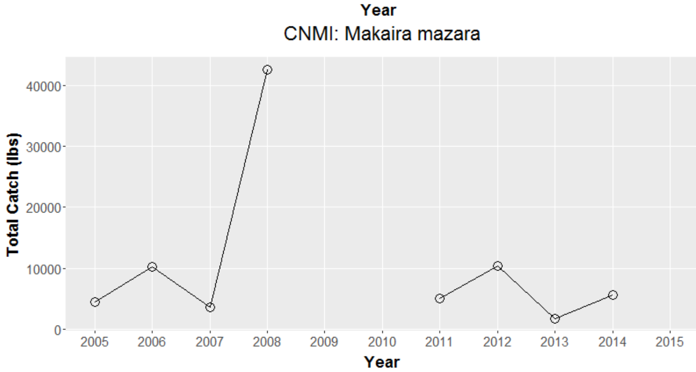

CNMI: Lutjanus bohar
Total Catch (lbs)
0
200
400
600
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

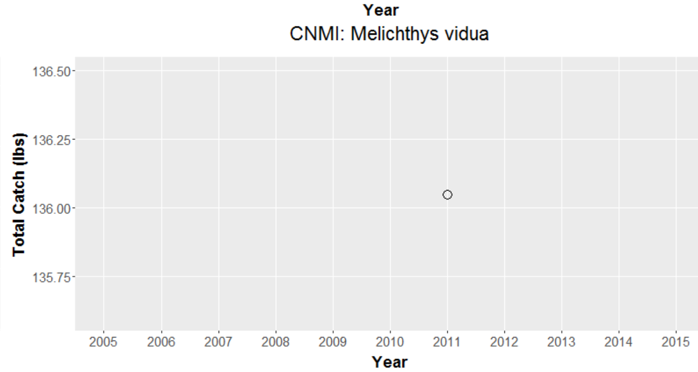

CNMI: Lutjanus fulvus
Total Catch (lbs)
0
50
100
150
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

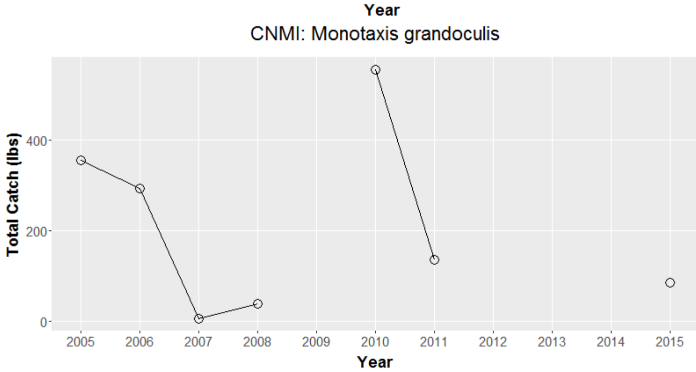

CNMI: Lutjanus gibbus
Total Catch (lbs)
100
200
300
400
500
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

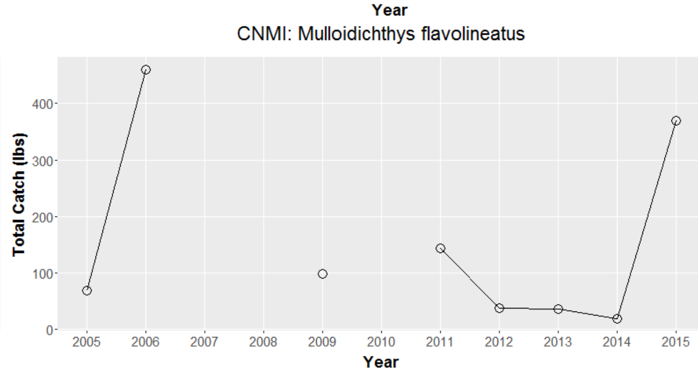

CNMI: Lutjanus kasmira
Total Catch (lbs)
1000
2000
3000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

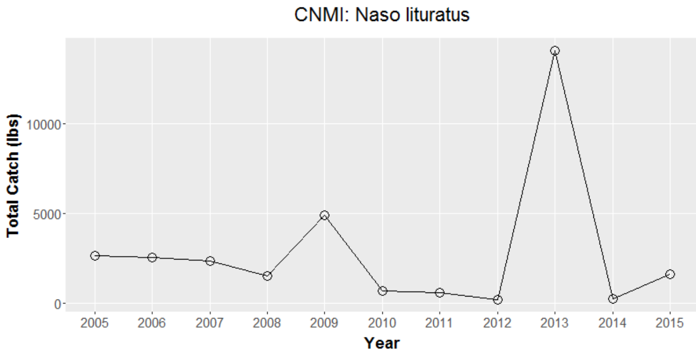

CNMI: Lutjanus monostigma
Total Catch (lbs)
25
50
75
100
125
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

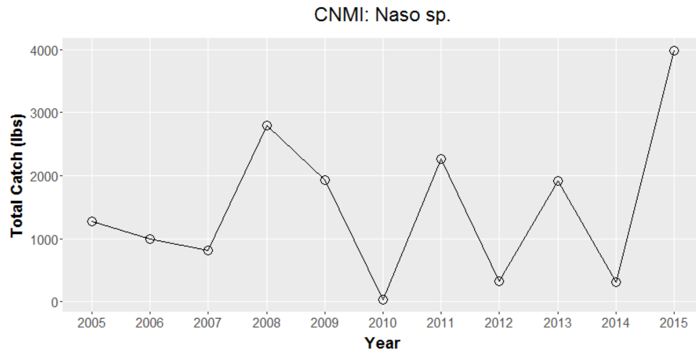

CNMI: Makaira mazara
Total Catch (lbs)
0
10000
20000
30000
40000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

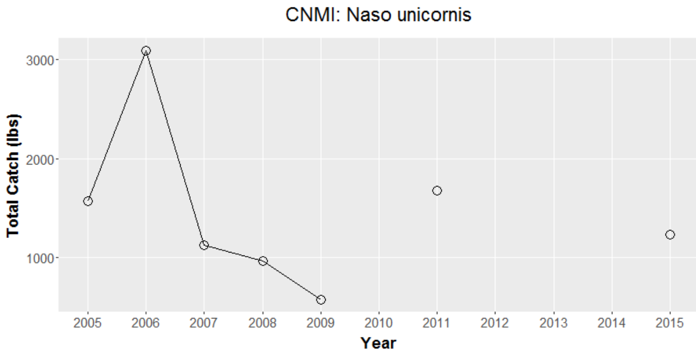

CNMI: Melichthys vidua
Total Catch (lbs)
135.75
136.00
136.25
136.50
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

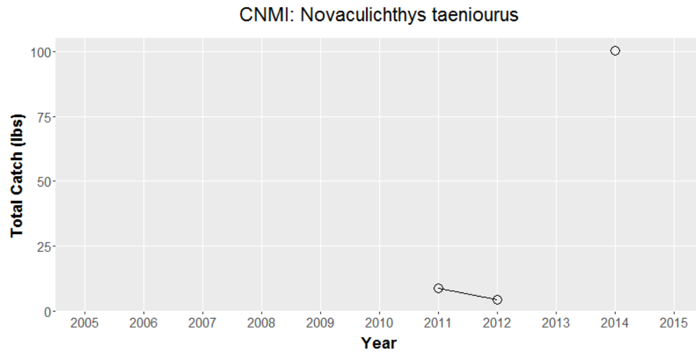

CNMI: Monotaxis grandoculis
Total Catch (lbs)
0
200
400
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

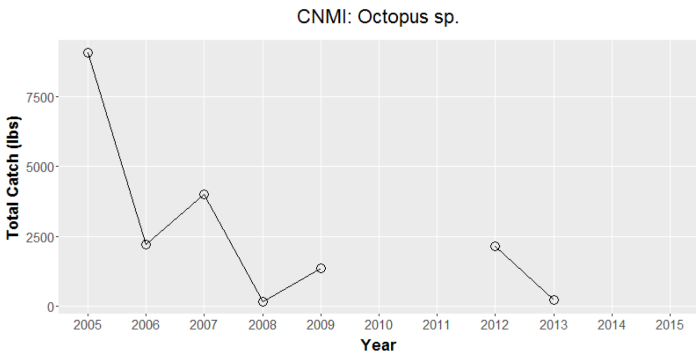

CNMI: Mulloidichthys flavolineatus
Total Catch (lbs)
0
100
200
300
400
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

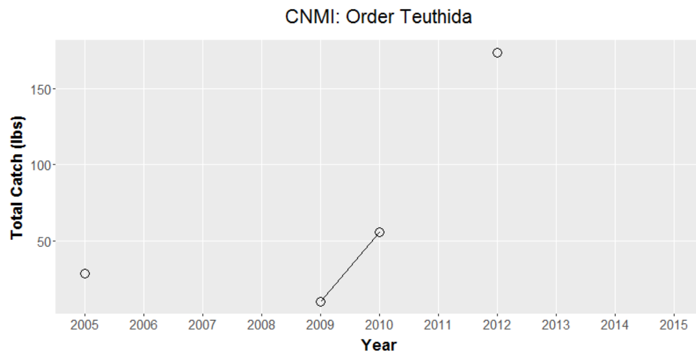

CNMI: Naso lituratus
Total Catch (lbs)
0
5000
10000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

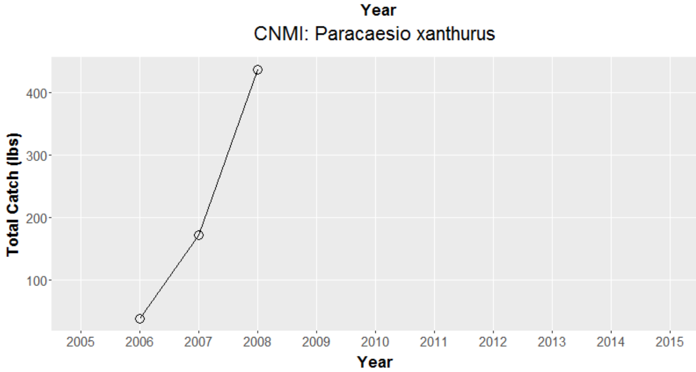

CNMI: Naso sp.
Total Catch (lbs)
0
1000
2000
3000
4000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

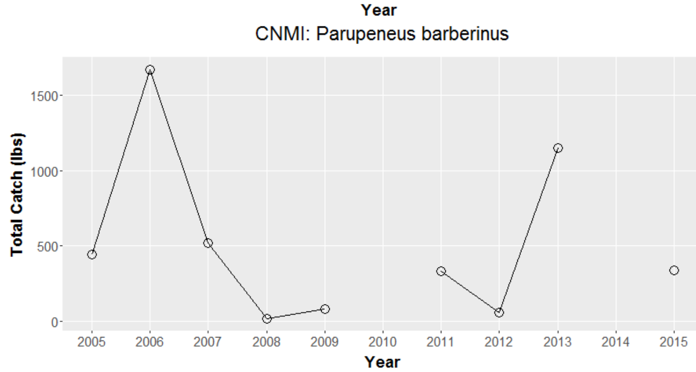

CNMI: Naso unicornis
Total Catch (lbs)
1000
2000
3000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

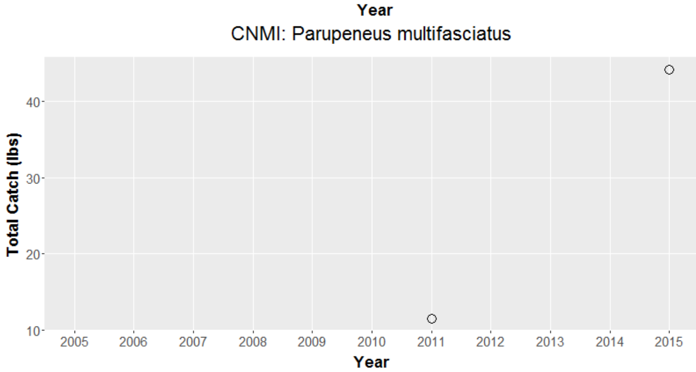

CNMI: Novaculichthys taeniourus
Total Catch (lbs)
0
25
50
75
100
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

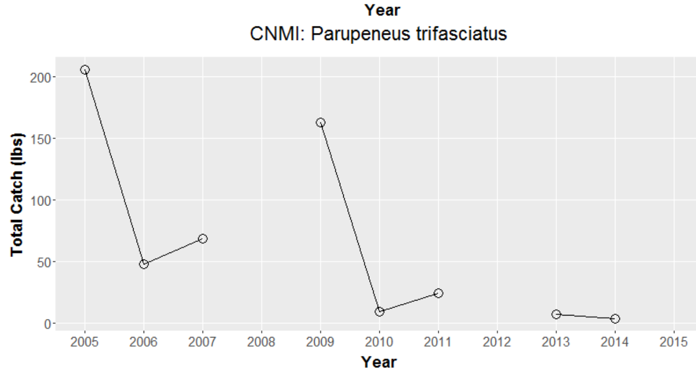

CNMI: Octopus sp.
Total Catch (lbs)
0
2500
5000
7500
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

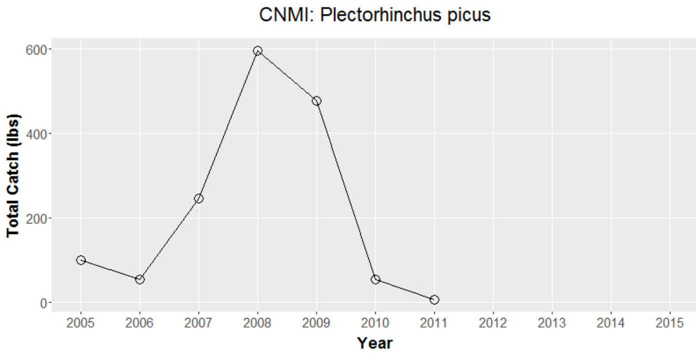

CNMI: Order Teuthida
Total Catch (lbs)
50
100
150
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

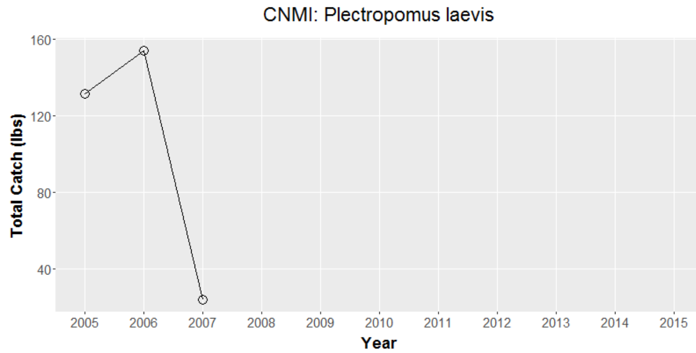

CNMI: Paracaesio xanthurus
Total Catch (lbs)
100
200
300
400
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

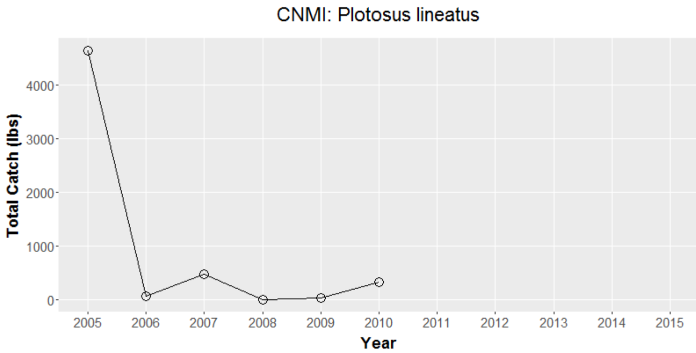

CNMI: Parupeneus barberinus
Total Catch (lbs)
0
500
1000
1500
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

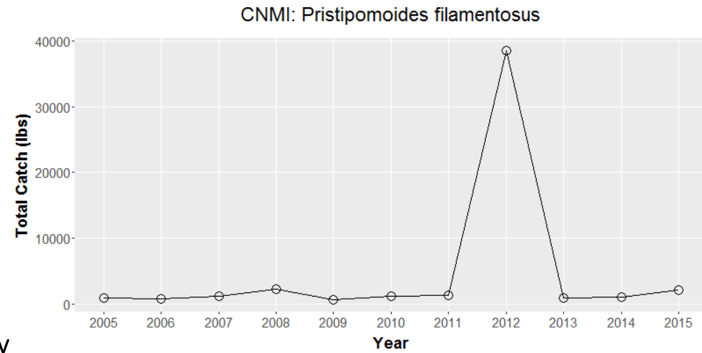

CNMI: Parupeneus multifasciatus
Total Catch (lbs)
10
20
30
40
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


CNMI: Parupeneus trifasciatus
Total Catch (lbs)
0
50
100
150
200
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

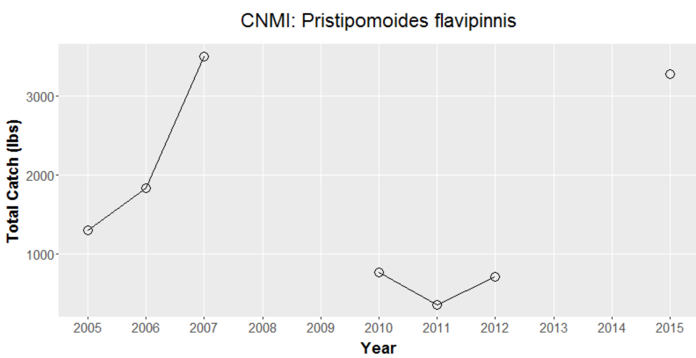

CNMI: Plectorhinchus picus
Total Catch (lbs)
0
200
400
600
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

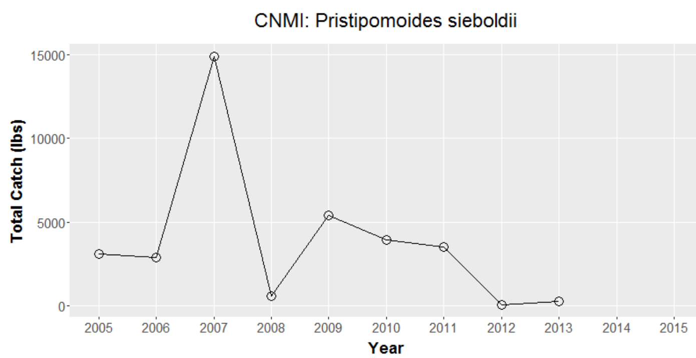

CNMI: Plectropomus laevis
Total Catch (lbs)
40
80
120
160
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

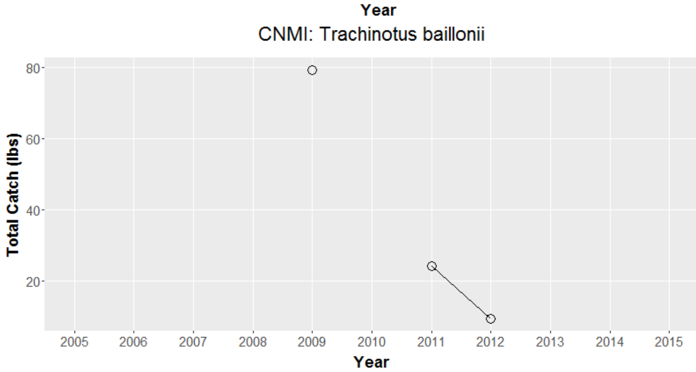

CNMI: Plotosus lineatus
Total Catch (lbs)
0
1000
2000
3000
4000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

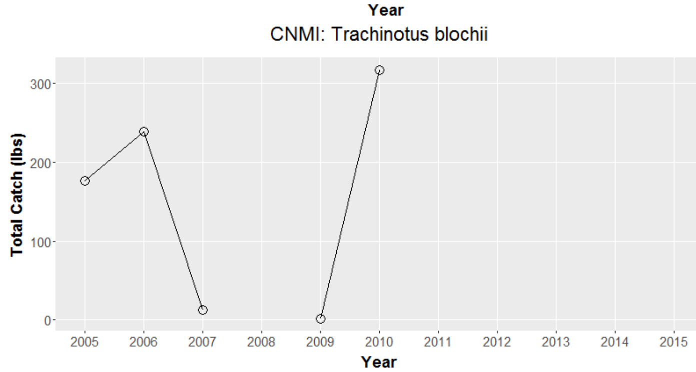

CNMI: Pristipomoides filamentosus
Total Catch (lbs)
0
10000
20000
30000
40000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

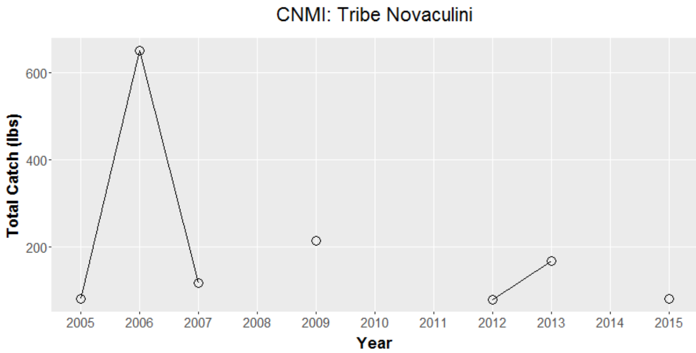
y

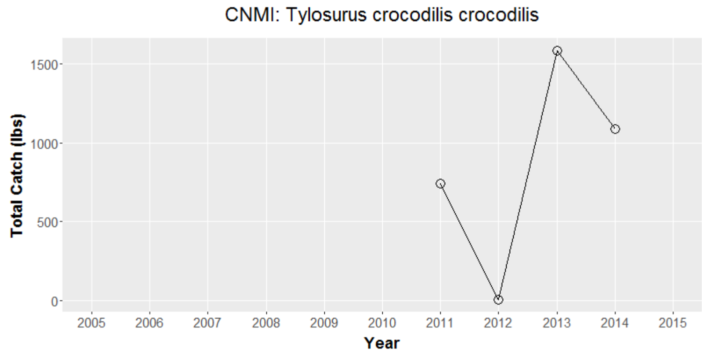

CNMI: Pristipomoides flavipinnis
Total Catch (lbs)
1000
2000
3000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

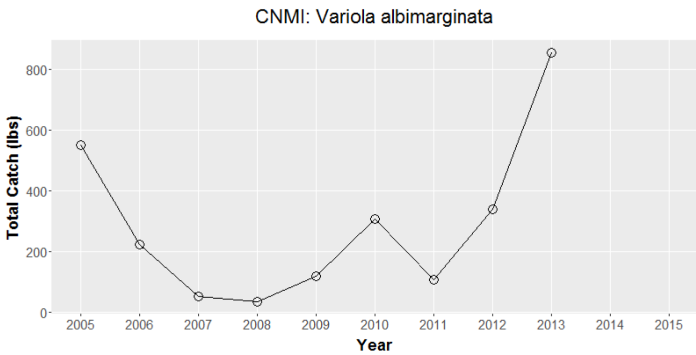

CNMI: Pristipomoides sieboldii
Total Catch (lbs)
0
5000
10000
15000
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

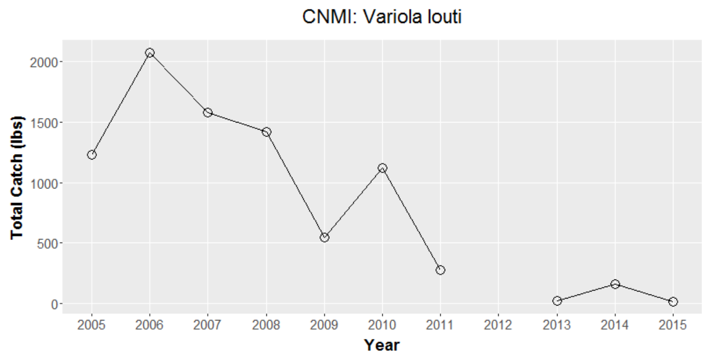

CNMI: Trachinotus baillonii
Total Catch (lbs)
20
40
60
80
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


CNMI: Trachinotus blochii
Total Catch (lbs)
0
100
200
300
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

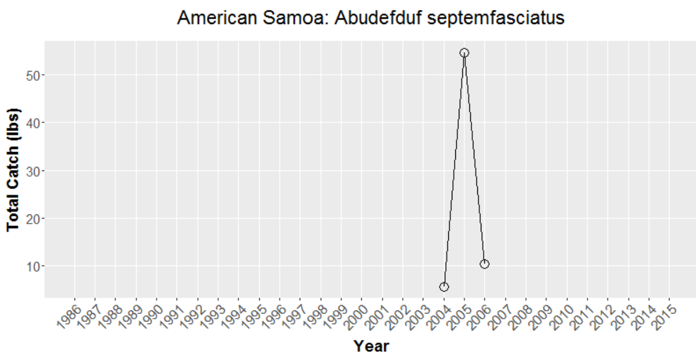

CNMI: Tribe Novaculini
Total Catch (lbs)
600
400
200
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

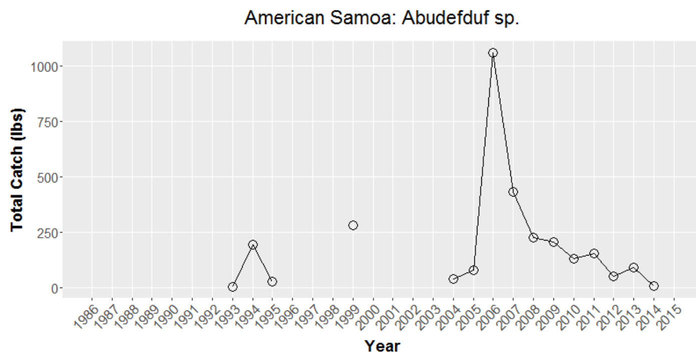

CNMI: Tylosurus crocodilis crocodilis
Total Catch (lbs)
1500
1000
500
0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

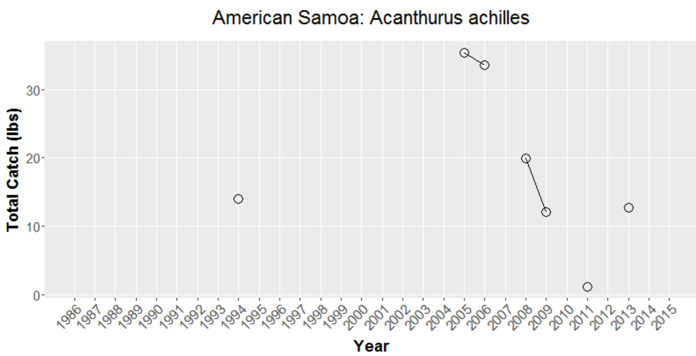

CNMI: Variola albimarginata
Total Catch (lbs)
800
600
400
200
0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

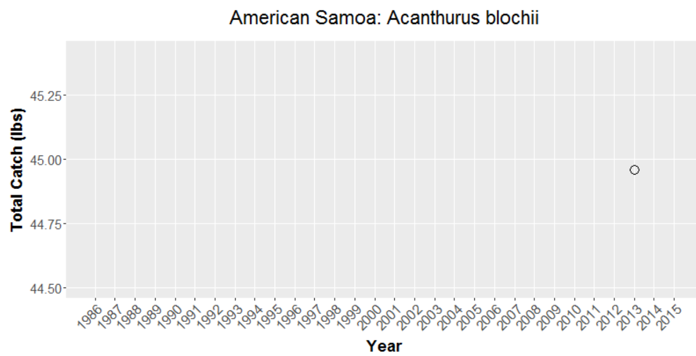

CNMI: Variola louti
Total Catch (lbs)
2000
1500
1000
500
0
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

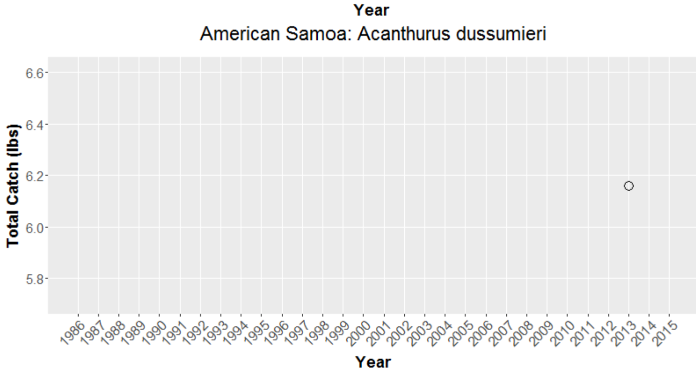
11.6 TIME SERIES CHARTS OF TOTAL CATCH PER MANAGEMENT UNIT SPECIES IN AMERICAN SAMOA

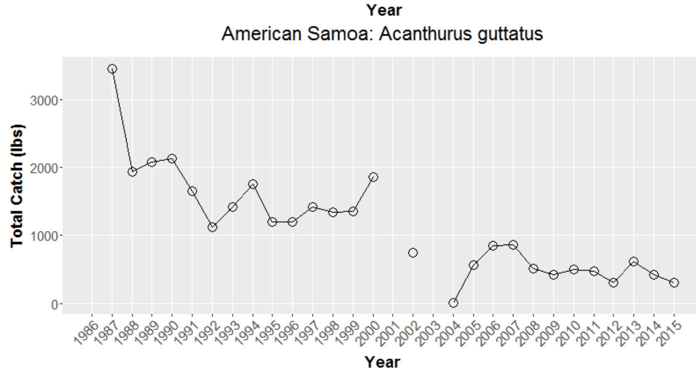


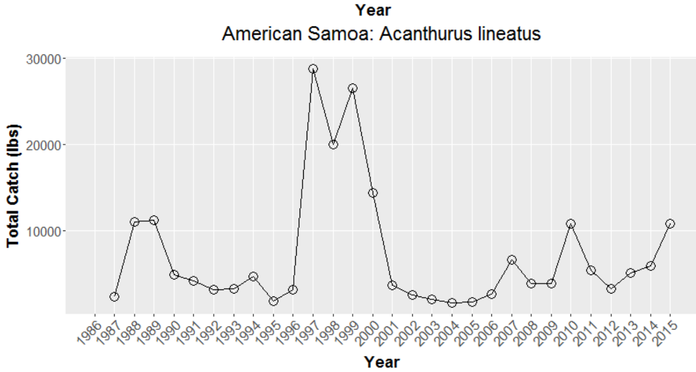


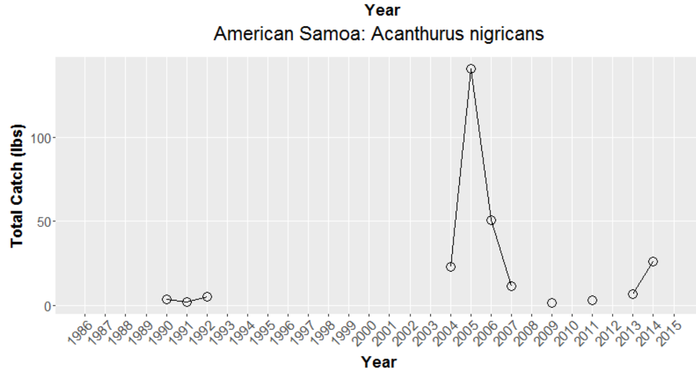












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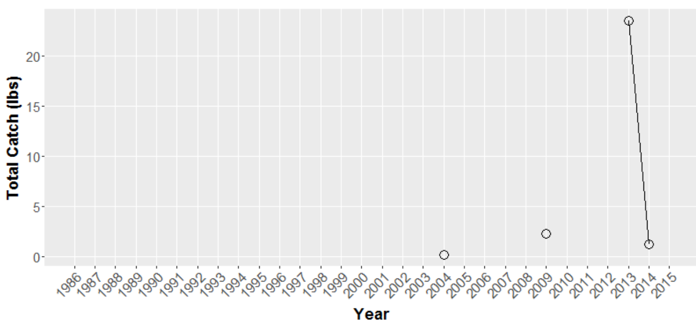
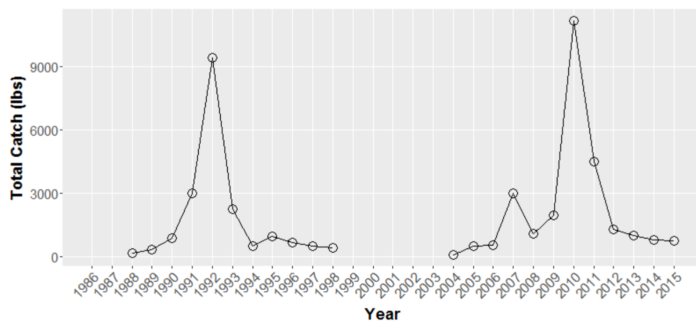
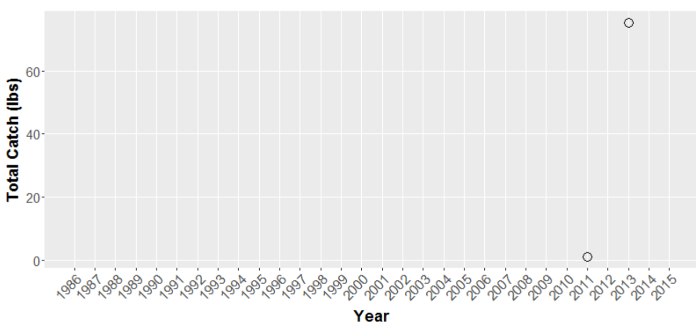
American Samoa: Acanthurus nigricauda



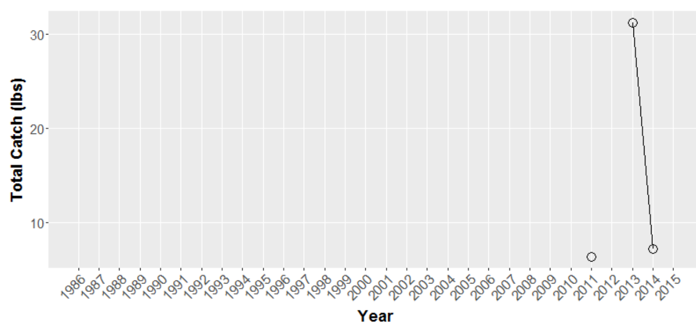
American Samoa: Acanthurus nigrofuscus



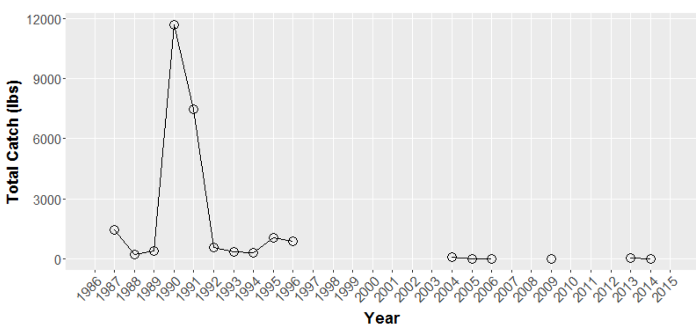
American Samoa: Acanthurus nigroris



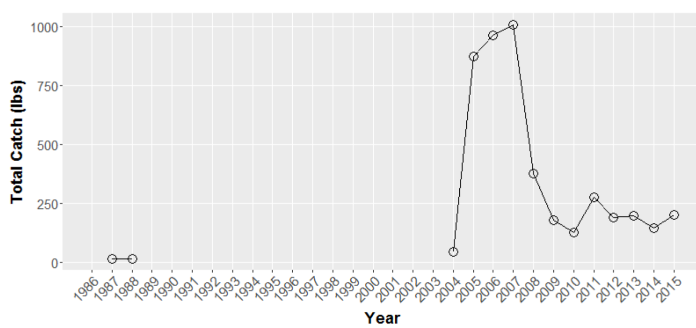
American Samoa: Acanthurus olivaceus



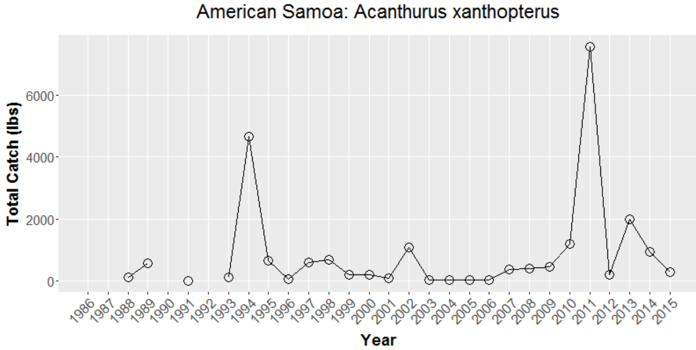
American Samoa: Acanthurus sp.



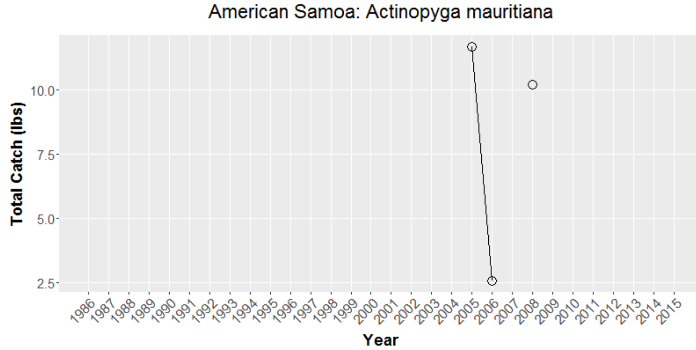
American Samoa: Acanthurus triostegus



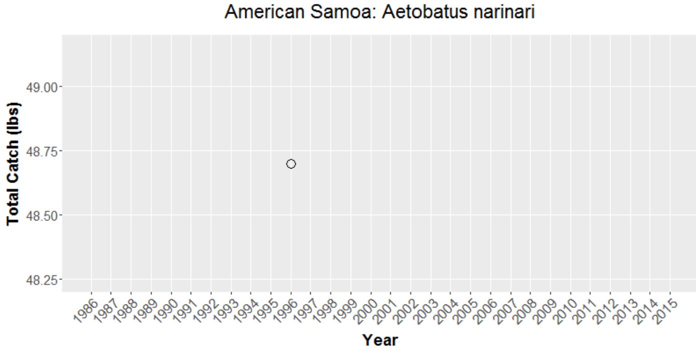
American Samoa: Acanthurus xanthopterus



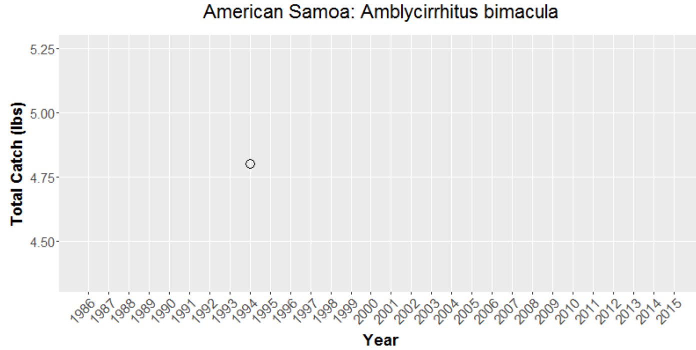
American Samoa: Actinopyga mauritiana



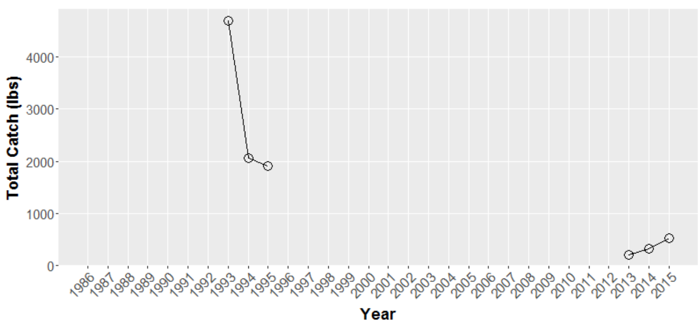
American Samoa: Aetobatus narinari



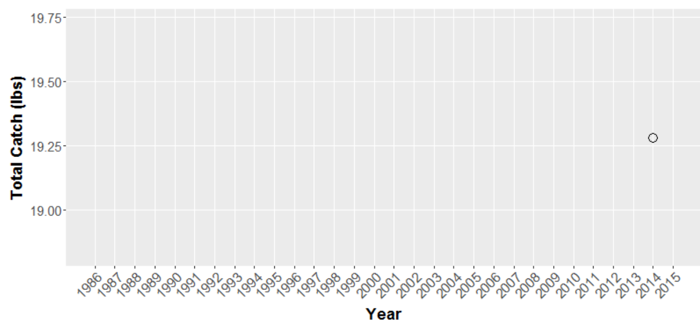
American Samoa: Amblycirrhitus bimacula



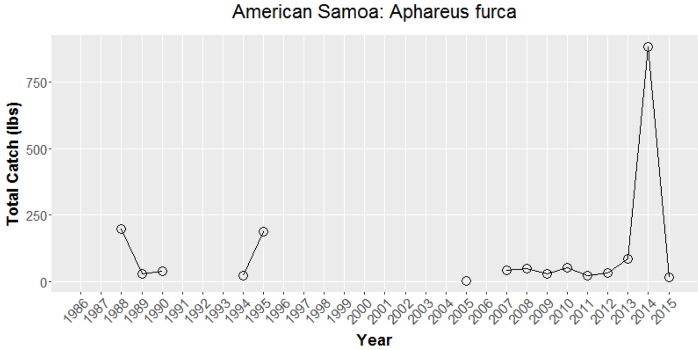
American Samoa: Anodontia (Anodontia) edentula



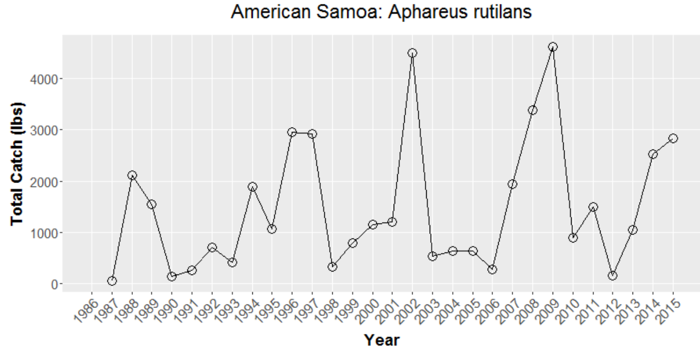
American Samoa: Anyperodon leucogrammicus



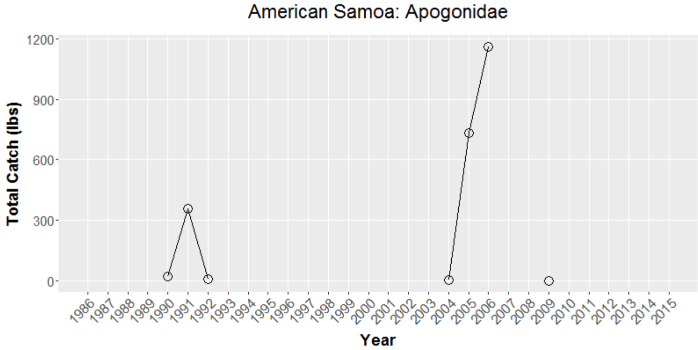
American Samoa: Aphareus furca



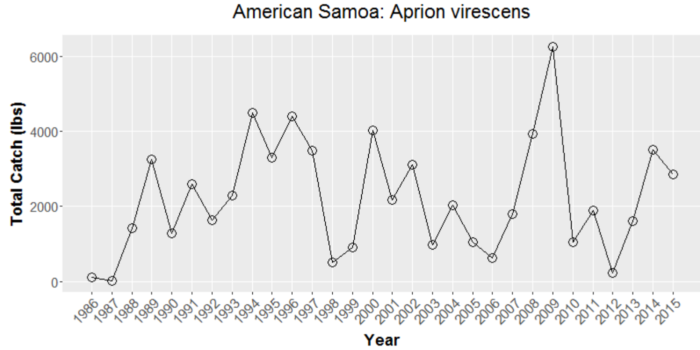
American Samoa: Aphareus rutilans



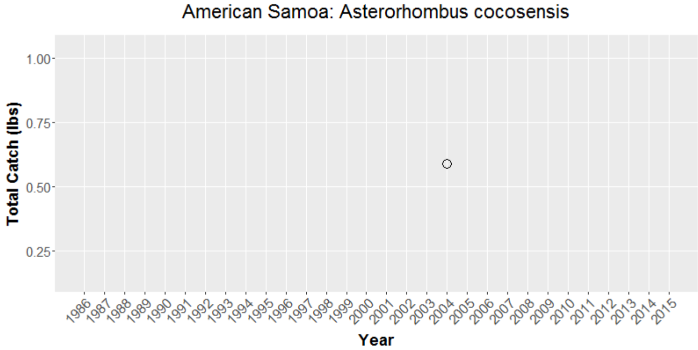
American Samoa: Apogonidae



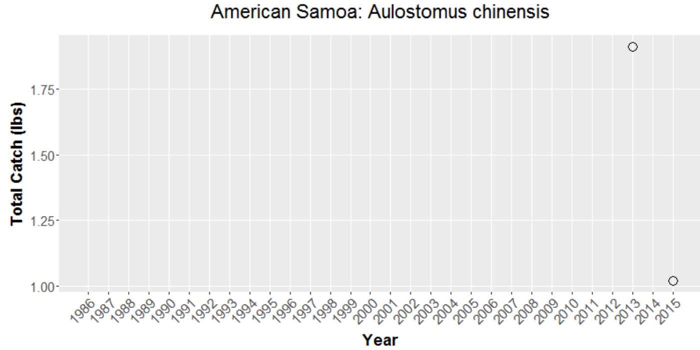
American Samoa: Aprion virescens



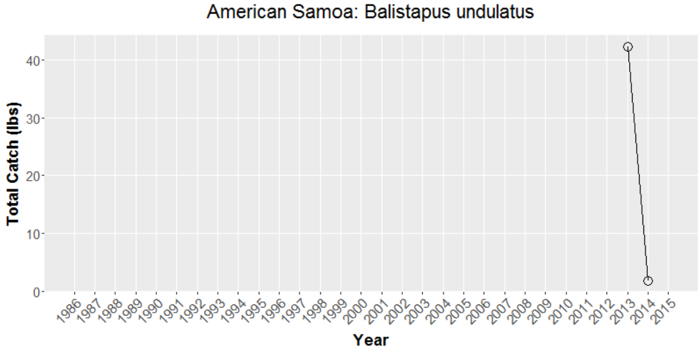
American Samoa: Asterorhombus cocosensis



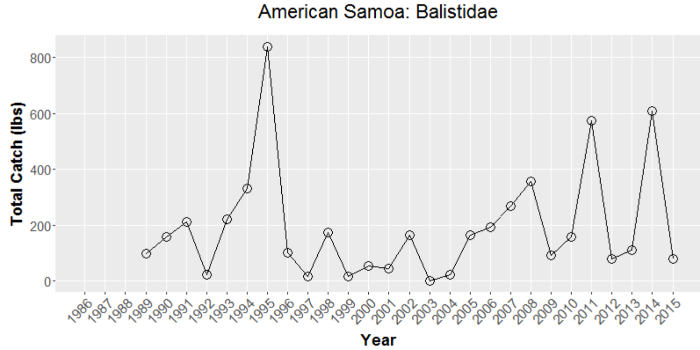
American Samoa: Aulostomus chinensis

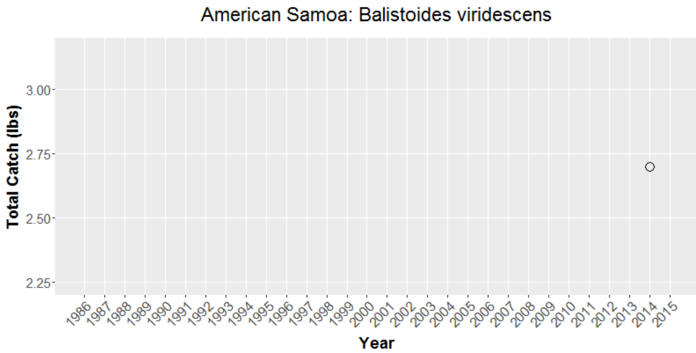


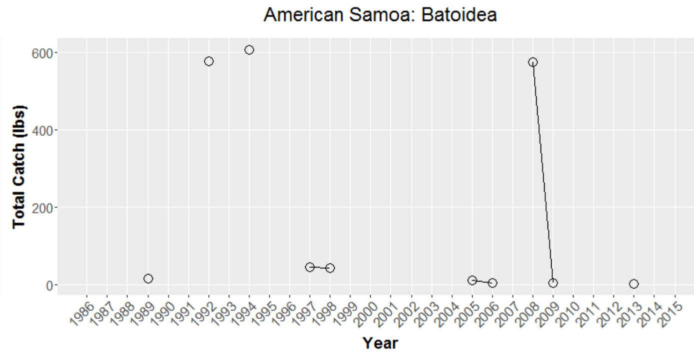
American Samoa: Balistapus undulatus

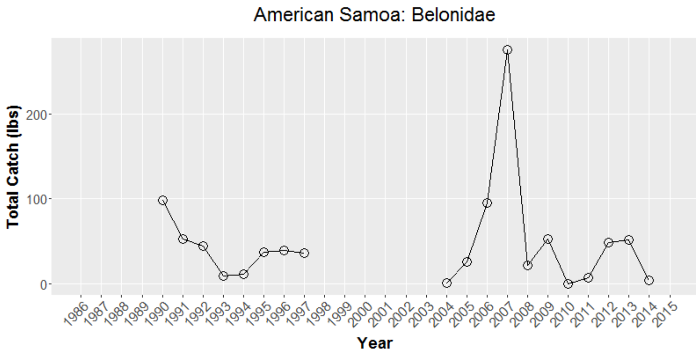


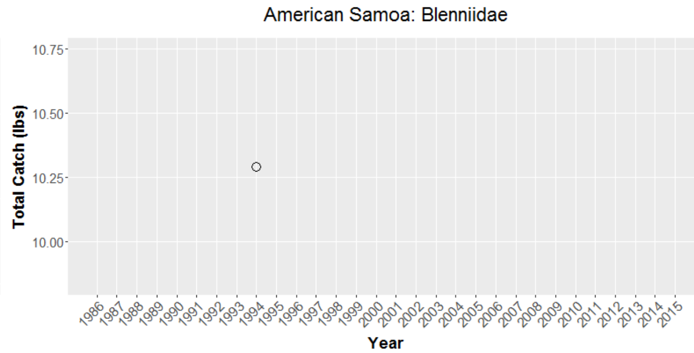
American Samoa: Balistidae

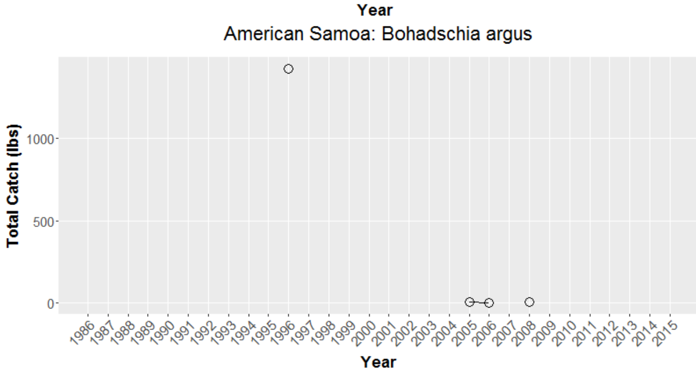


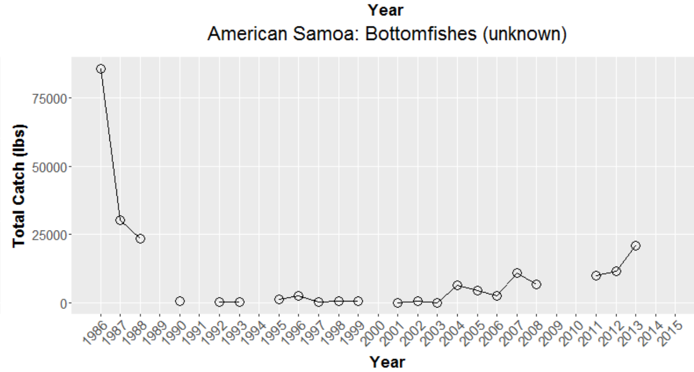

American Samoa: Balistoides viridescens
Total Catch (lbs)
Year

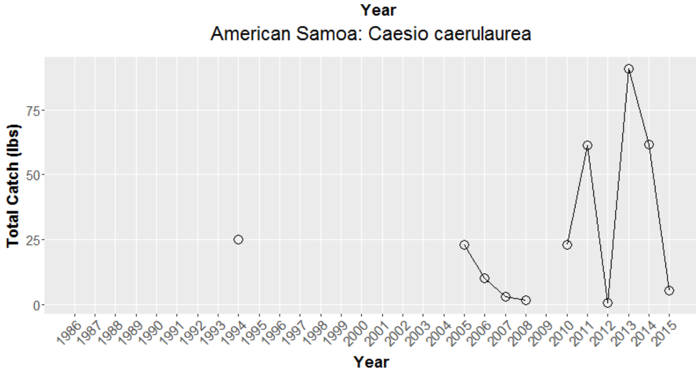

American Samoa: Batoidea
Total Catch (lbs)
Year

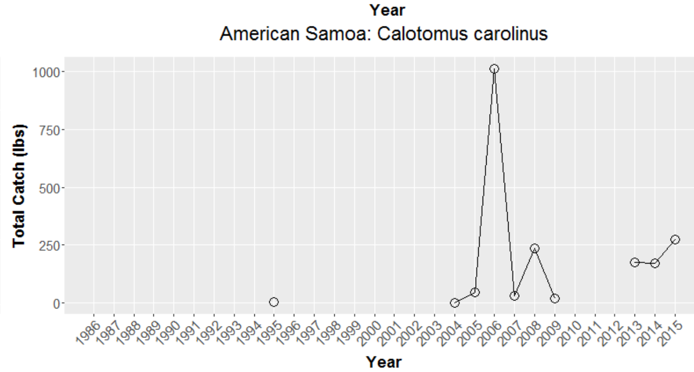

American Samoa: Belonidae
Total Catch (lbs)
Year

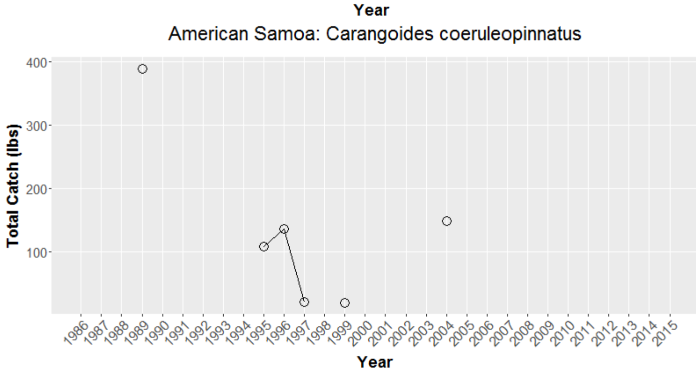

American Samoa: Blenniidae
Total Catch (lbs)
Year

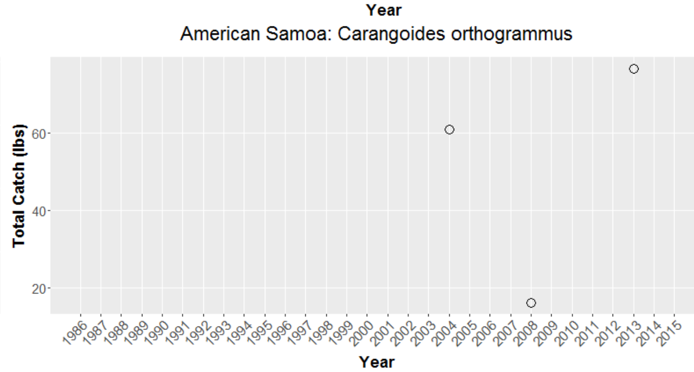

American Samoa: Bohadschia argus
Total Catch (lbs)
Year

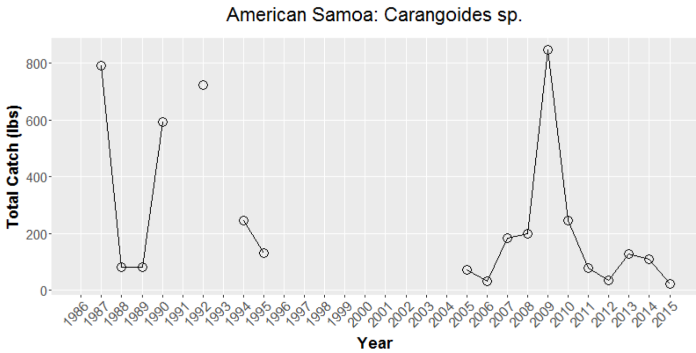

American Samoa: Bottomfishes (unknown)
Total Catch (lbs)
Year

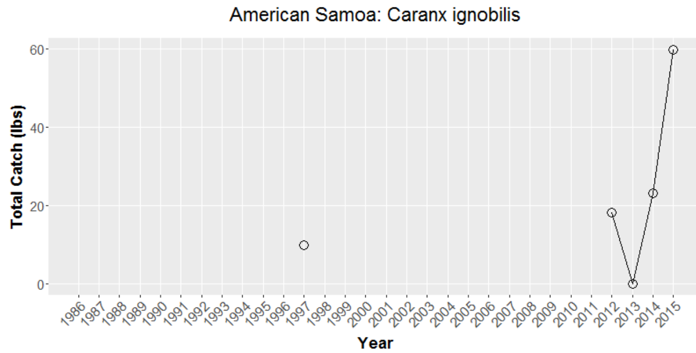

American Samoa: Caesio caerulaurea
Total Catch (lbs)
Year

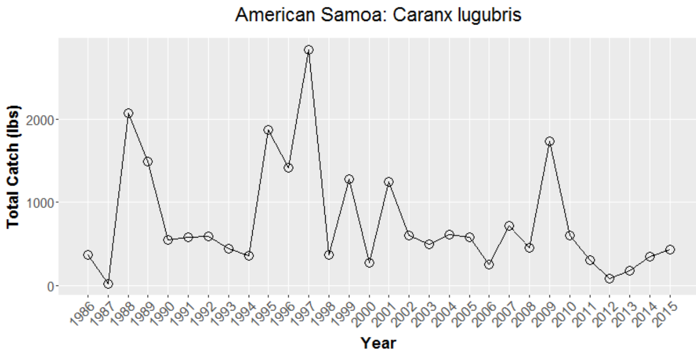

American Samoa: Calotomus carolinus
Total Catch (lbs)
Year

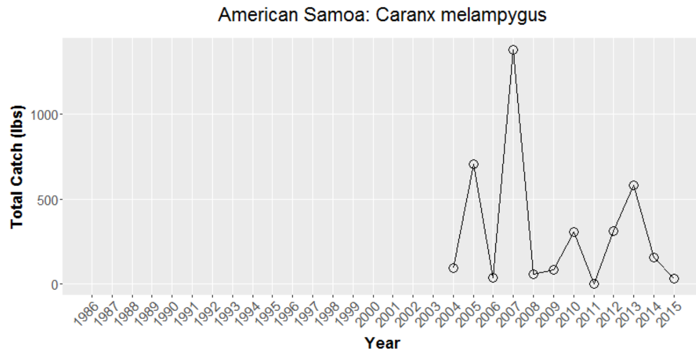

American Samoa: Carangoides coeruleopinnatus
Total Catch (lbs)
Year

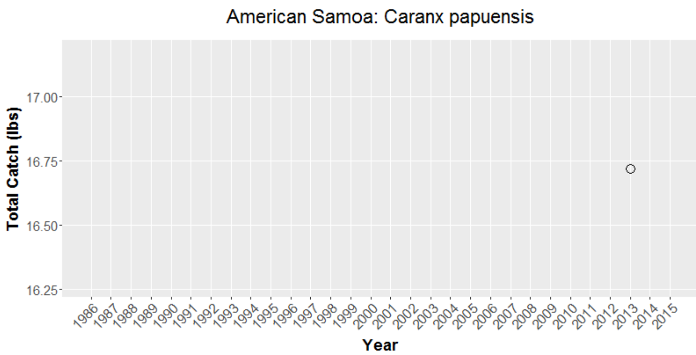

American Samoa: Carangoides orthogrammus
Total Catch (lbs)
Year

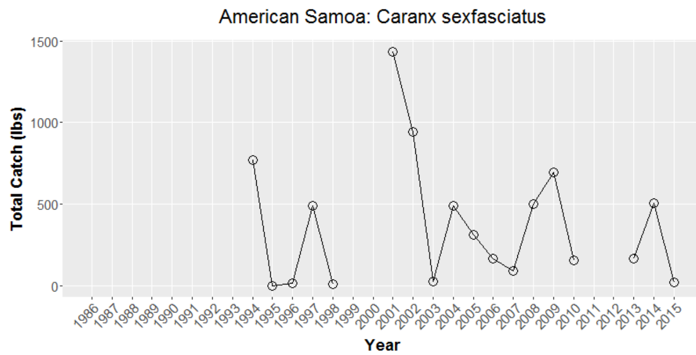

American Samoa: Carangoides sp.
Total Catch (lbs)
0 200 400 600 800
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

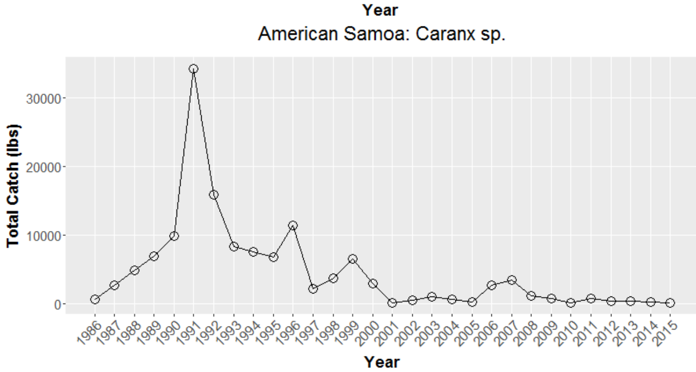

American Samoa: Caranx ignobilis
Total Catch (lbs)
0 20 40 60
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

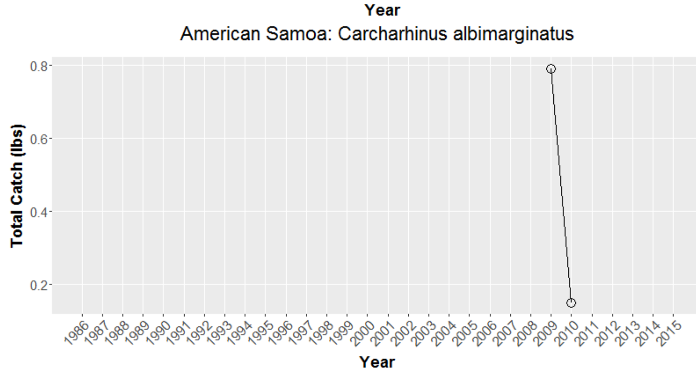

American Samoa: Caranx lugubris
Total Catch (lbs)
0 1000 2000
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

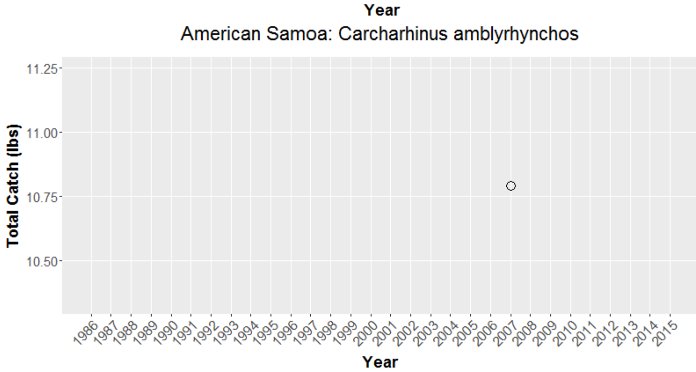

American Samoa: Caranx melampygus
Total Catch (lbs)
0 500 1000
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

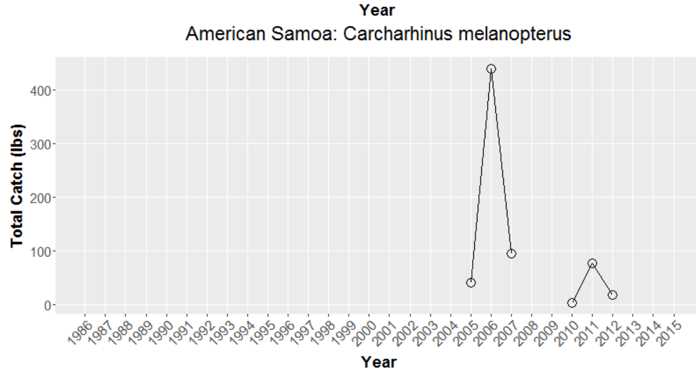

American Samoa: Caranx papuensis
Total Catch (lbs)
16.25 16.50 16.75 17.00
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


American Samoa: Caranx sexfasciatus
Total Catch (lbs)
0 500 1000 1500
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

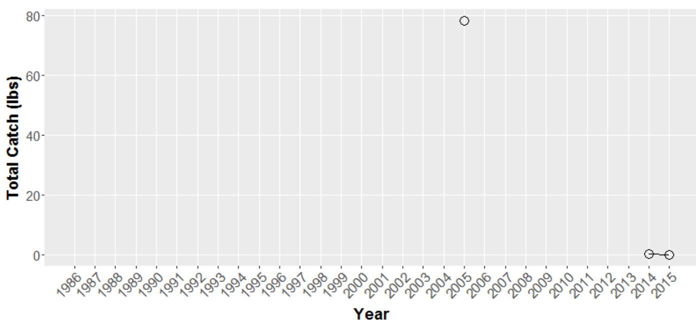

American Samoa: Caranx sp.
Total Catch (lbs)
0 10000 20000 30000
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


American Samoa: Carcharhinus albimarginatus
Total Catch (lbs)
0.2 0.4 0.6 0.8
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

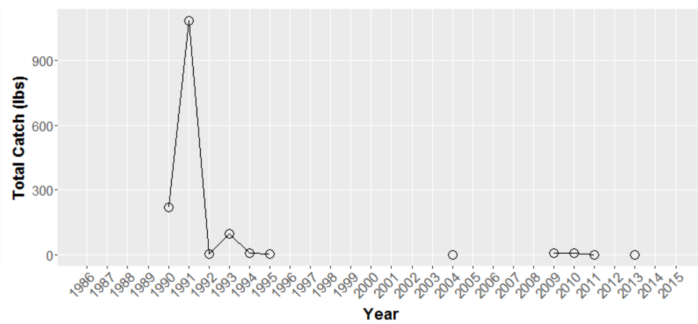

American Samoa: Carcharhinus amblyrhynchos
Total Catch (lbs)
10.50 10.75 11.00 11.25
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year


American Samoa: Carcharhinus melanopterus
Total Catch (lbs)
0 100 200 300 400
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

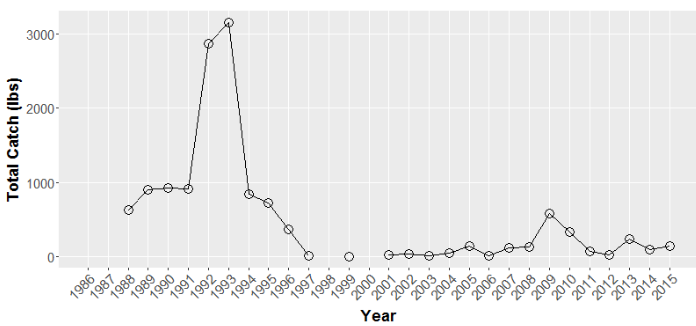
American Samoa: Carpilius maculatus



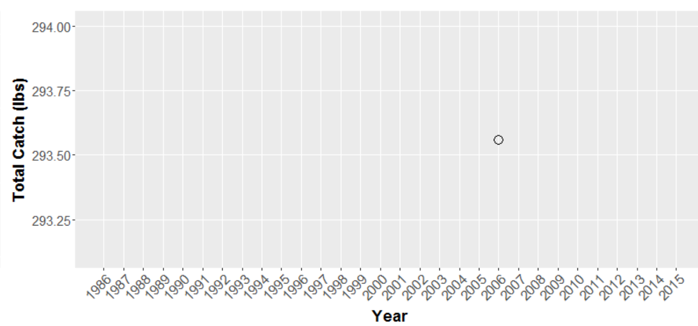
American Samoa: Centropyge flavissima



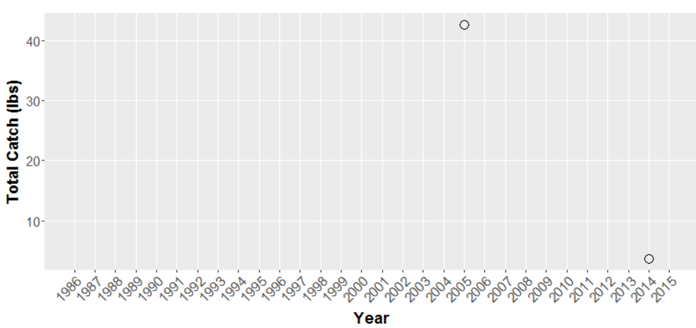
American Samoa: Cephalopholis argus



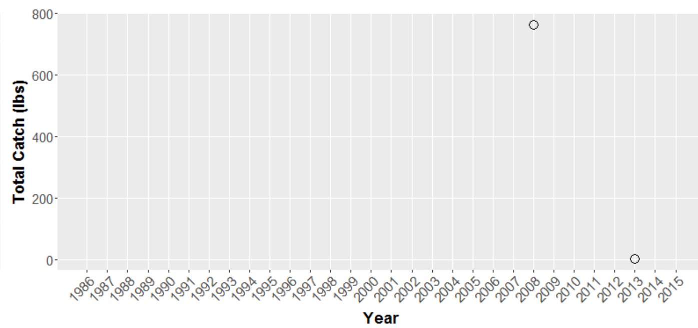
American Samoa: Cephalopholis aurantia



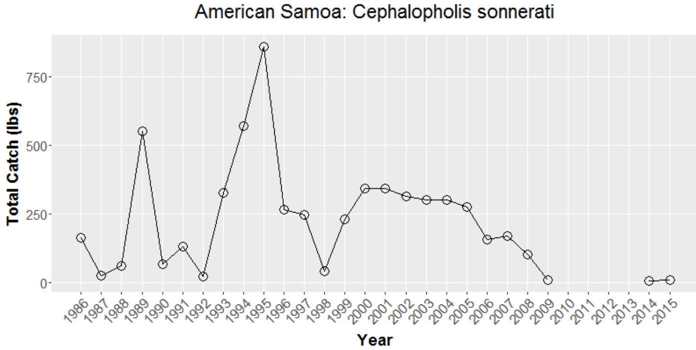
American Samoa: Cephalopholis igarashiensis



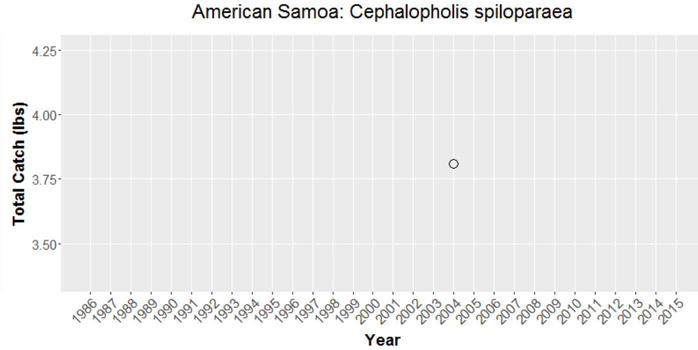
American Samoa: Cephalopholis sexmaculata



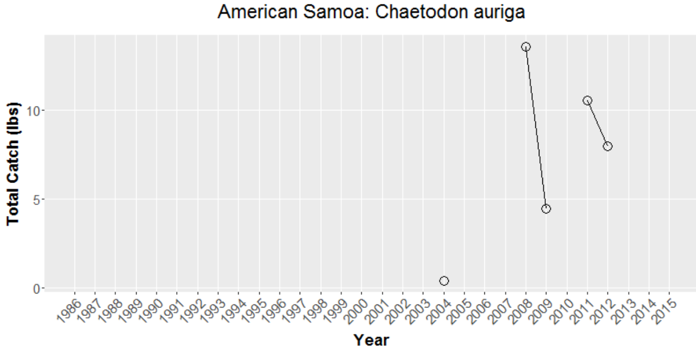
American Samoa: Cephalopholis sonnerati



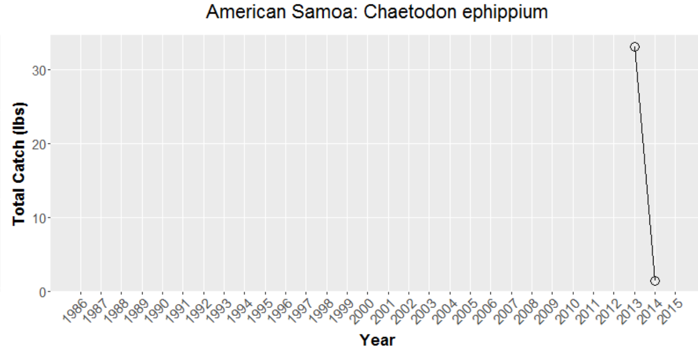
American Samoa: Cephalopholis spiloparaea

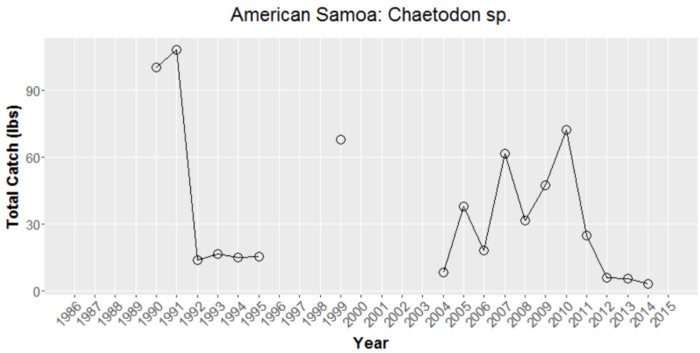


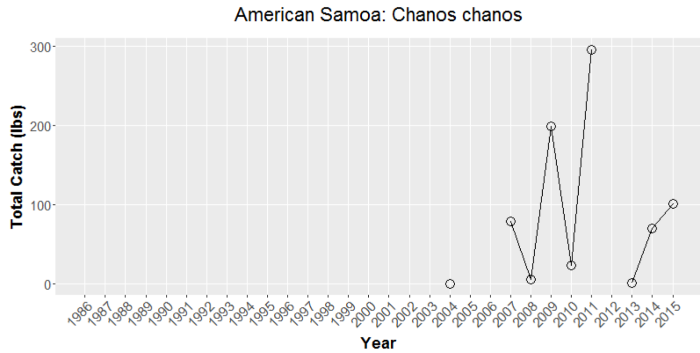
American Samoa: Chaetodon auriga

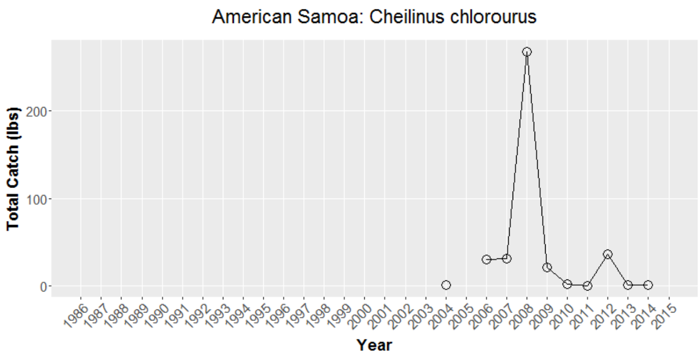


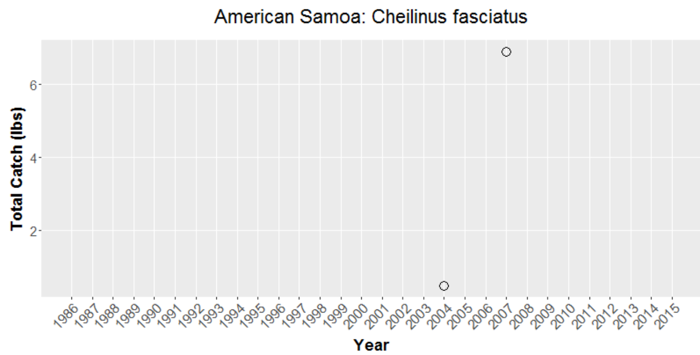
American Samoa: Chaetodon ephippium

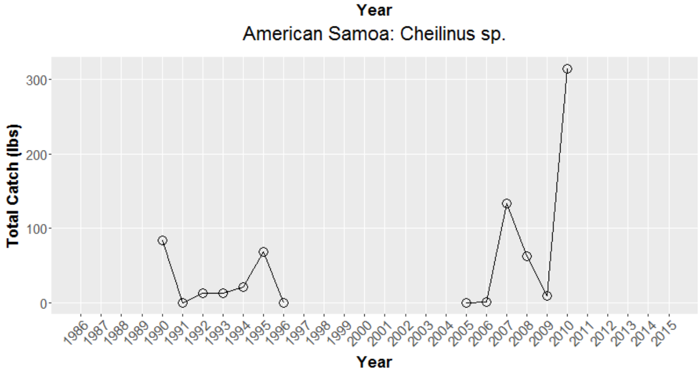


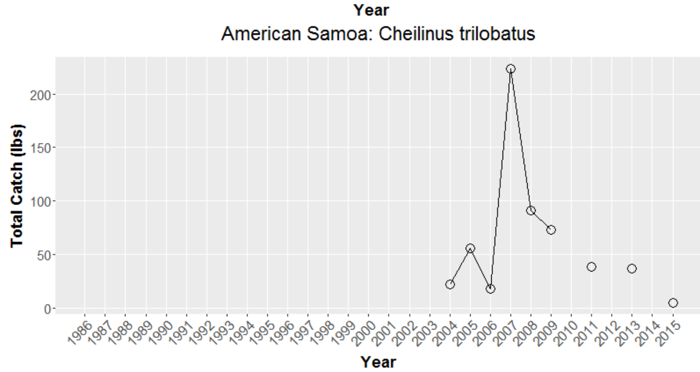

American Samoa: Chaetodon sp.
Total Catch (lbs)
Year

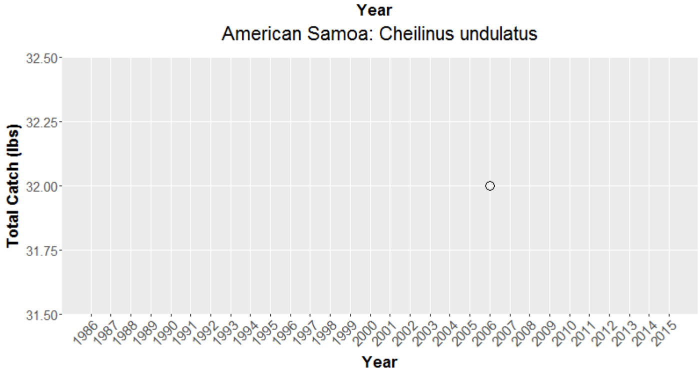

American Samoa: Chanos chanos
Total Catch (lbs)
Year

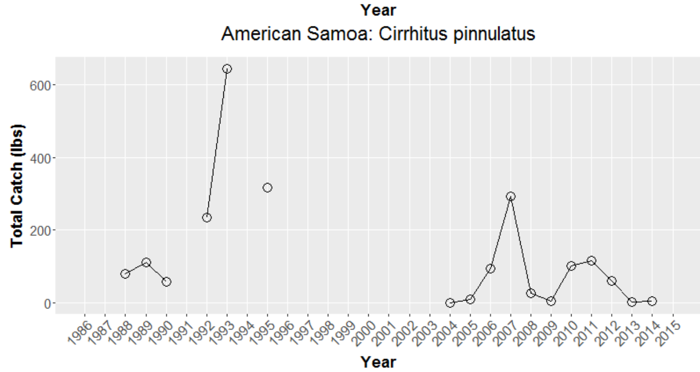

American Samoa: Cheilinus chlorourus
Total Catch (lbs)
Year

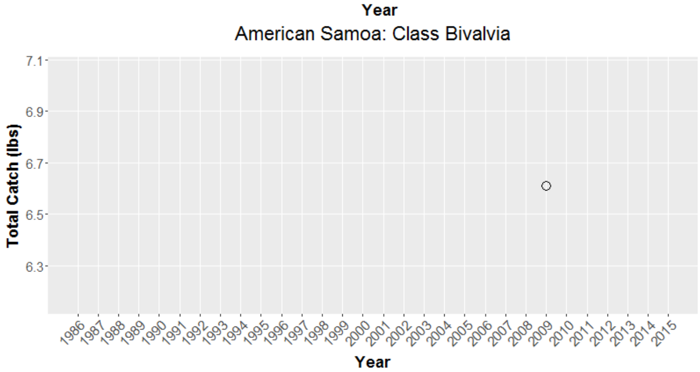

American Samoa: Cheilinus fasciatus
Total Catch (lbs)
Year

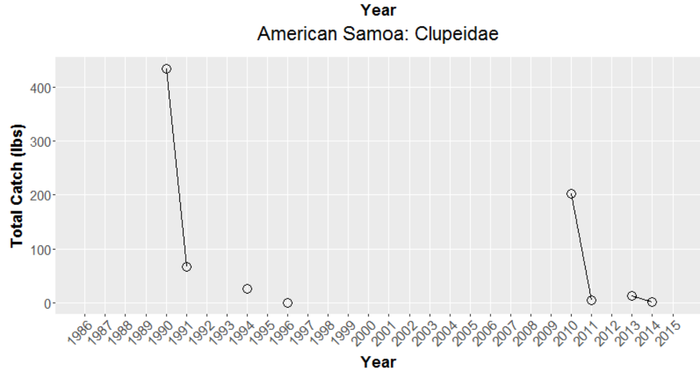

American Samoa: Cheilinus sp.
Total Catch (lbs)
Year


American Samoa: Cheilinus trilobatus
Total Catch (lbs)
Year

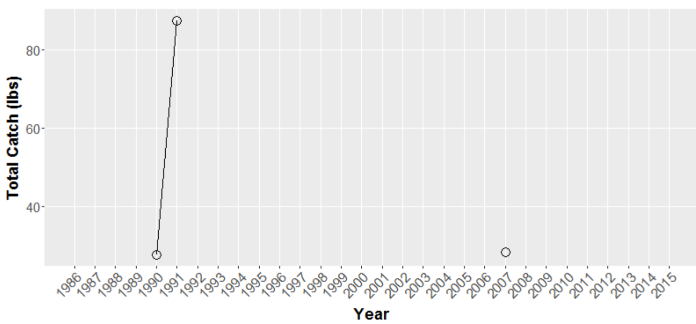

American Samoa: Cheilinus undulatus
Total Catch (lbs)
Year


American Samoa: Cirrhitus pinnulatus
Total Catch (lbs)
Year

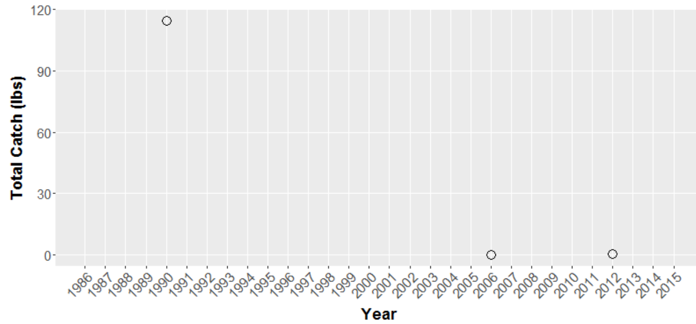

American Samoa: Class Bivalvia
Total Catch (lbs)
Year


American Samoa: Clupeidae
Total Catch (lbs)
Year

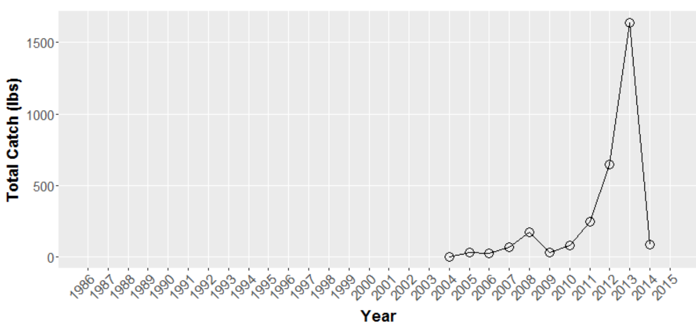
American Samoa: Coenobita clypeatus



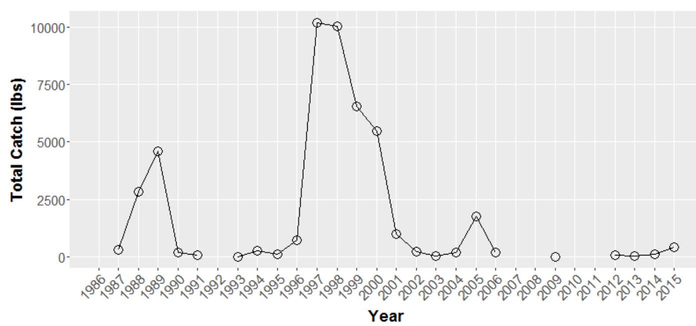
American Samoa: Conger sp.



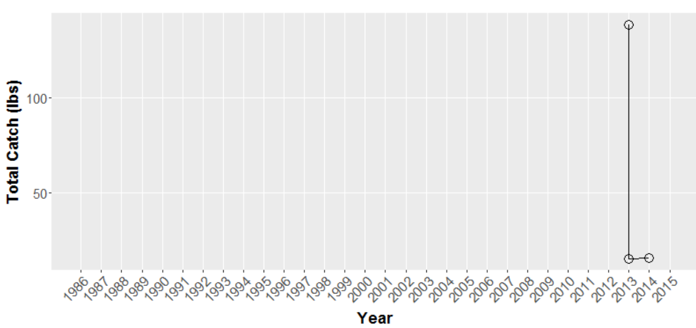
American Samoa: Crenimugil crenilabis



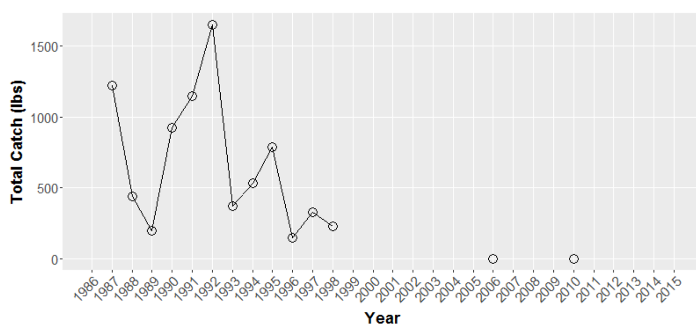
American Samoa: Ctenochaetus striatus



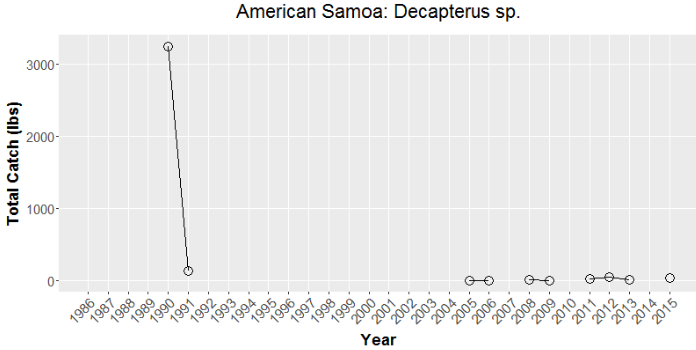
American Samoa: Cucumariidae



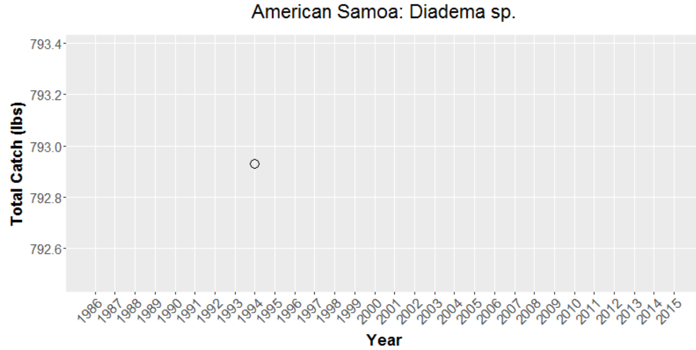
American Samoa: Dascyllus trimaculatus



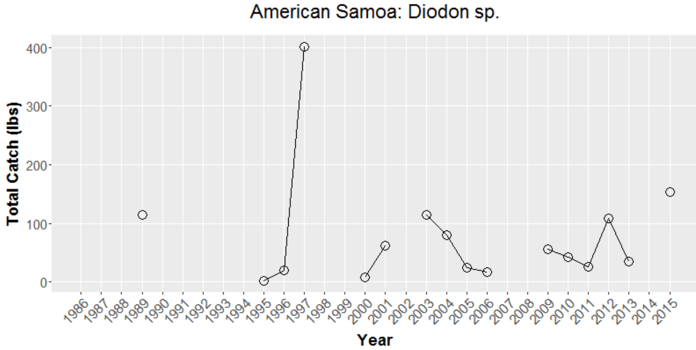
American Samoa: Decapterus sp.



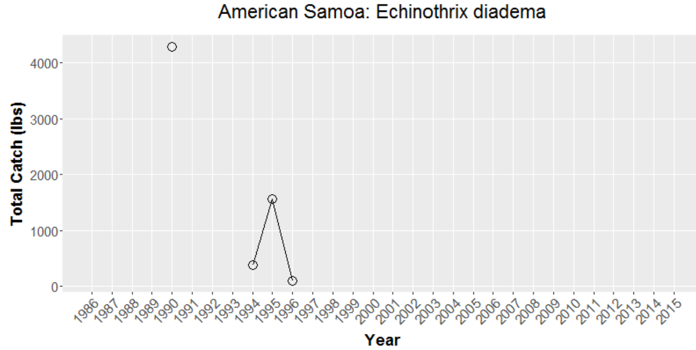
American Samoa: Diadema sp.

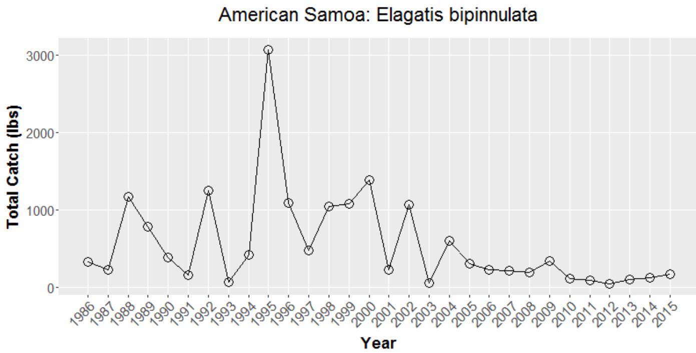


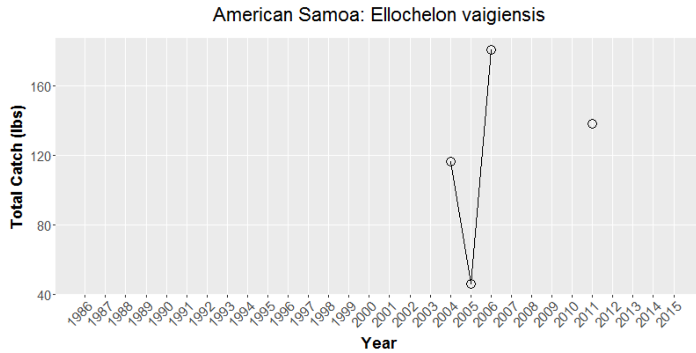
American Samoa: Diodon sp.

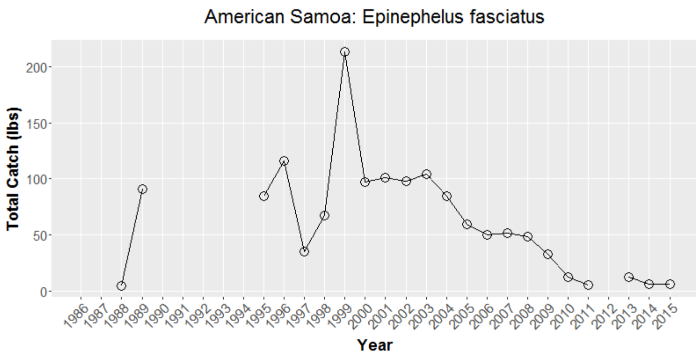


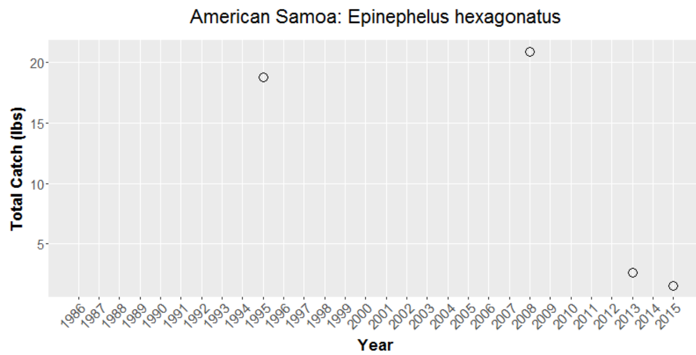
American Samoa: Echinothrix diadema

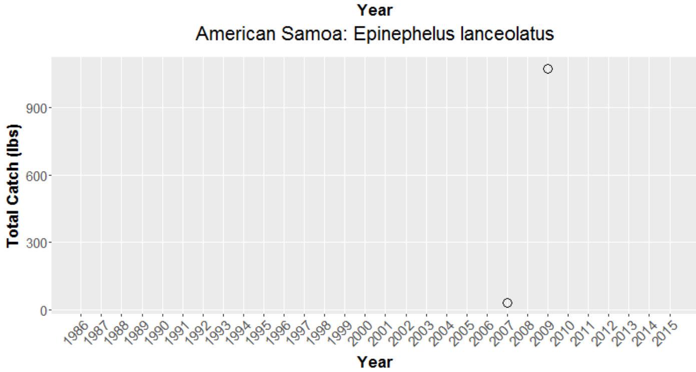


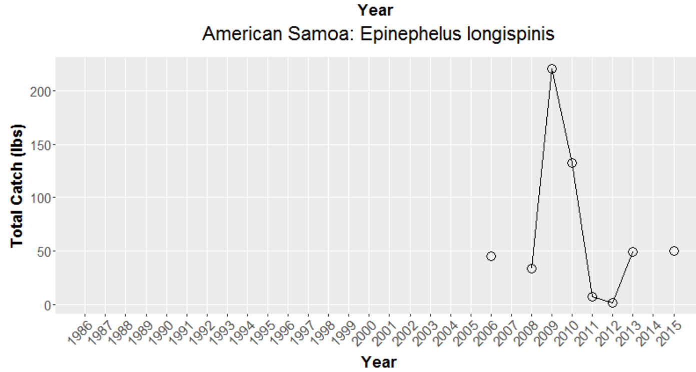

American Samoa: Elagatis bipinnulata
Total Catch (lbs)
0
1000
2000
3000
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

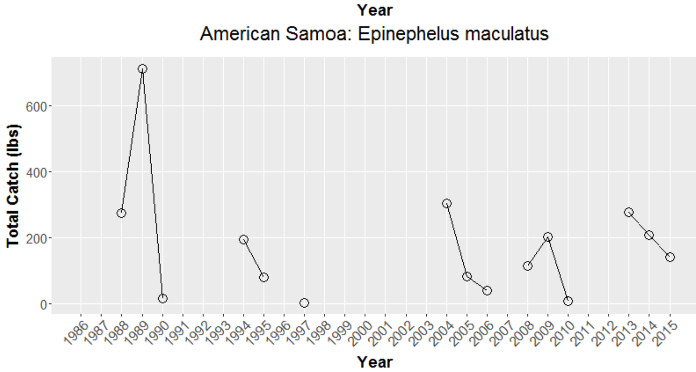

American Samoa: Ellochelon vaigiensis
Total Catch (lbs)
40
80
120
160
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

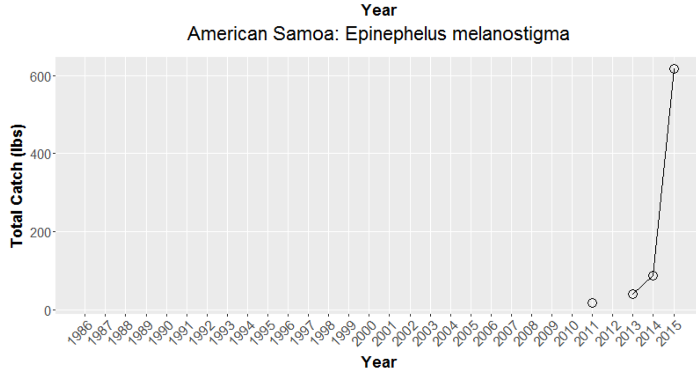

American Samoa: Epinephelus fasciatus
Total Catch (lbs)
0
50
100
150
200
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

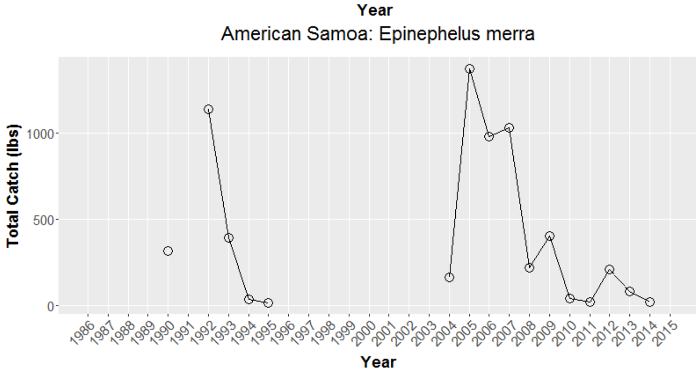

American Samoa: Epinephelus hexagonatus
Total Catch (lbs)
5
10
15
20
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

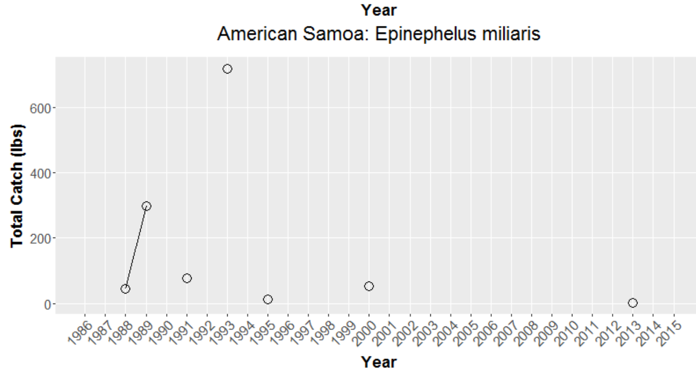

American Samoa: Epinephelus lanceolatus
Total Catch (lbs)
0
300
600
900
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

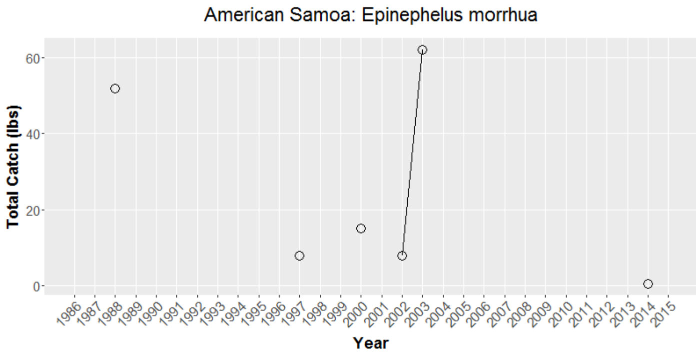

American Samoa: Epinephelus longispinis
Total Catch (lbs)
0
50
100
150
200
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

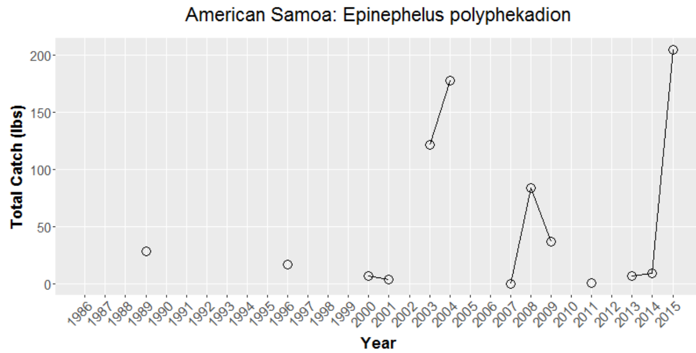

American Samoa: Epinephelus maculatus
Total Catch (lbs)
0
200
400
600
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

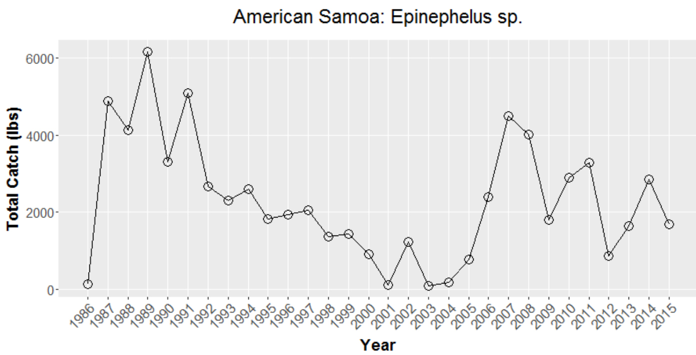

American Samoa: Epinephelus melanostigma
Total Catch (lbs)
0
200
400
600
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

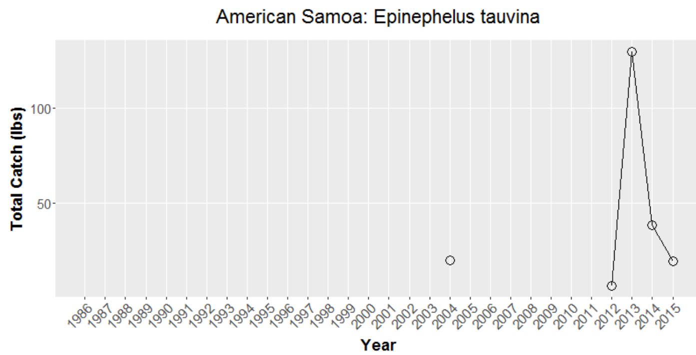

American Samoa: Epinephelus merra
Total Catch (lbs)
0
500
1000
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

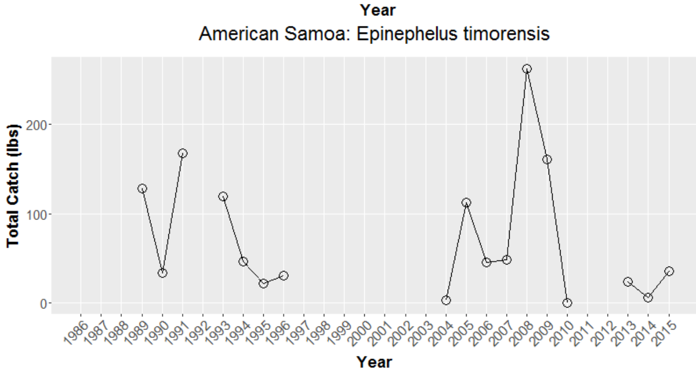

American Samoa: Epinephelus miliaris
Total Catch (lbs)
0
200
400
600
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

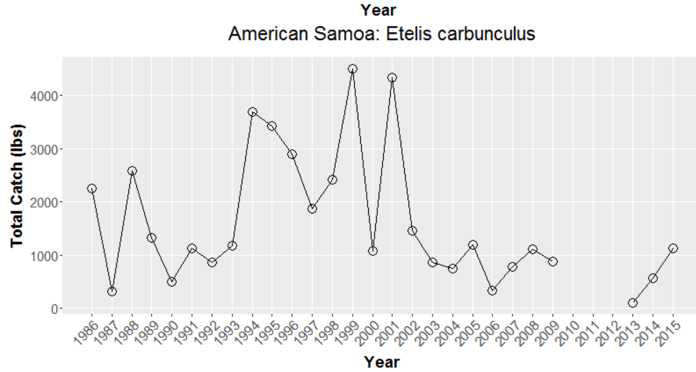

American Samoa: Epinephelus morrhua
Total Catch (lbs)
Year

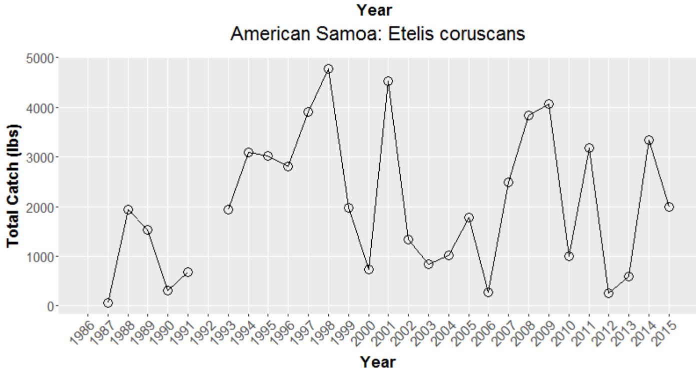

American Samoa: Epinephelus polyphekadion
Total Catch (lbs)
Year

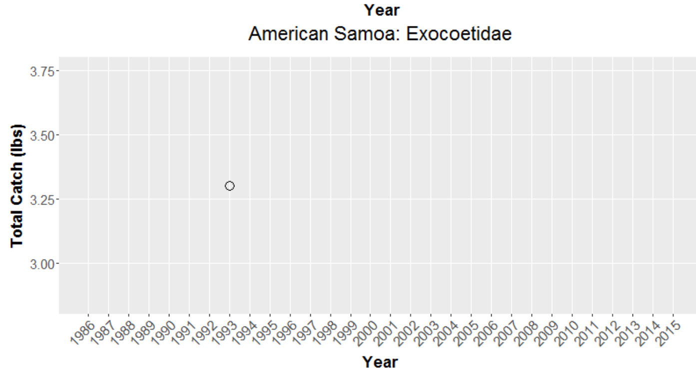

American Samoa: Epinephelus sp.
Total Catch (lbs)
Year

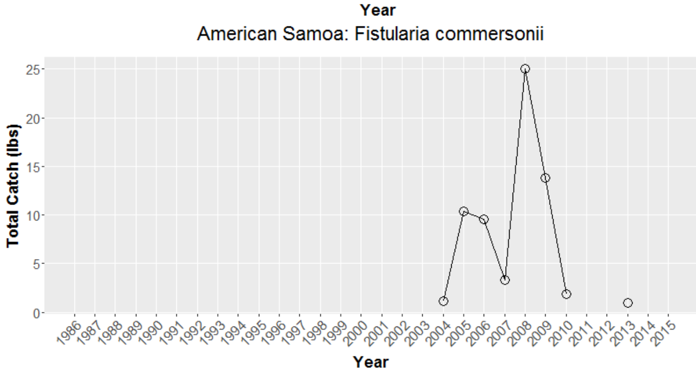

American Samoa: Epinephelus tauvina
Total Catch (lbs)
Year

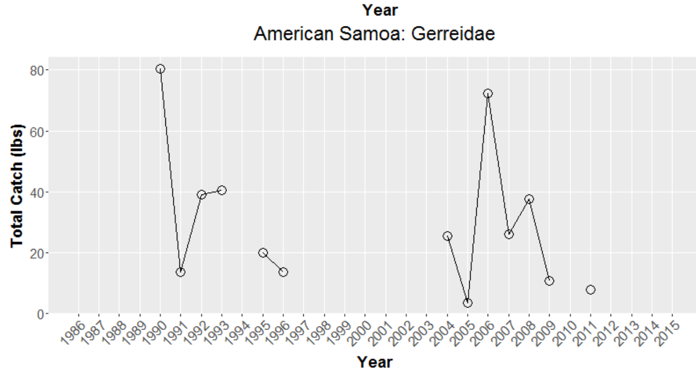

American Samoa: Epinephelus timorensis
Total Catch (lbs)
Year

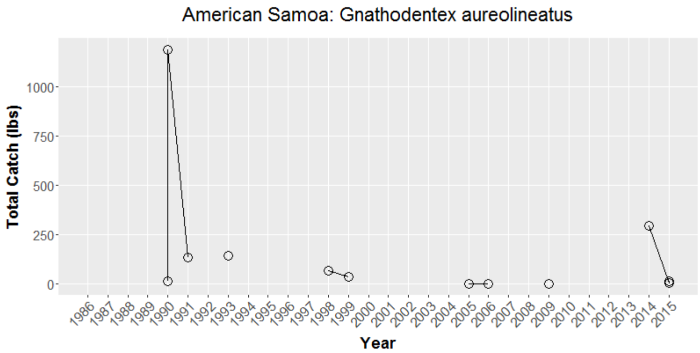

American Samoa: Etelis carbunculus
Total Catch (lbs)
Year

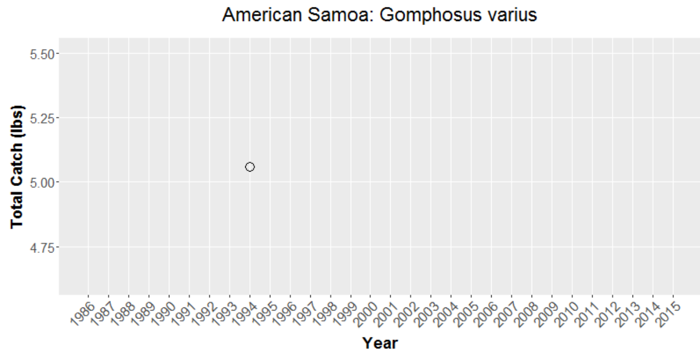

American Samoa: Etelis coruscans
Total Catch (lbs)
Year

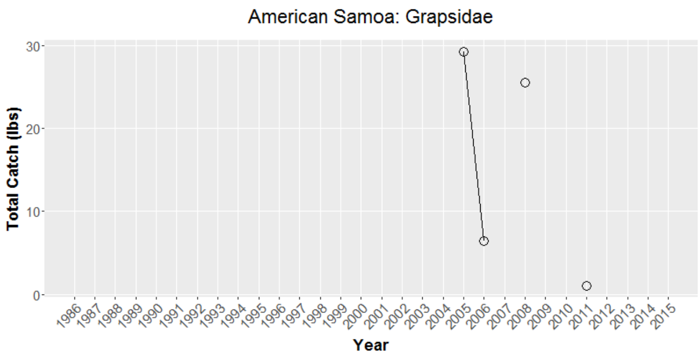

American Samoa: Exocoetidae
Total Catch (lbs)
Year

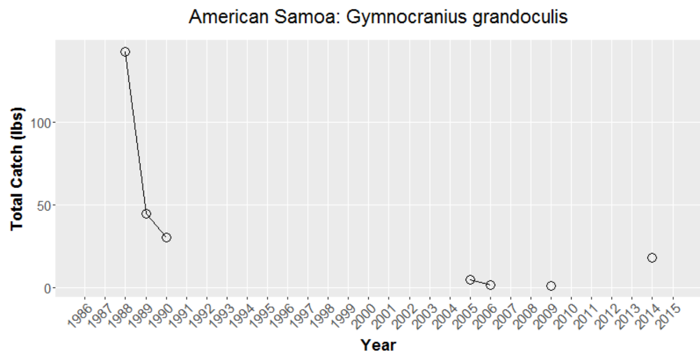

American Samoa: Fistularia commersonii
Total Catch (lbs)
Year

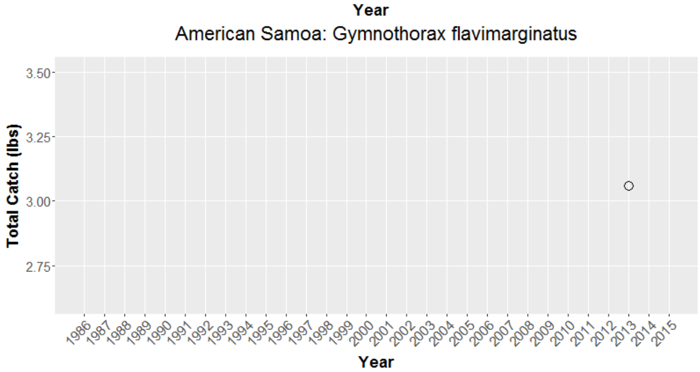

American Samoa: Gerreidae
Total Catch (lbs)
Year

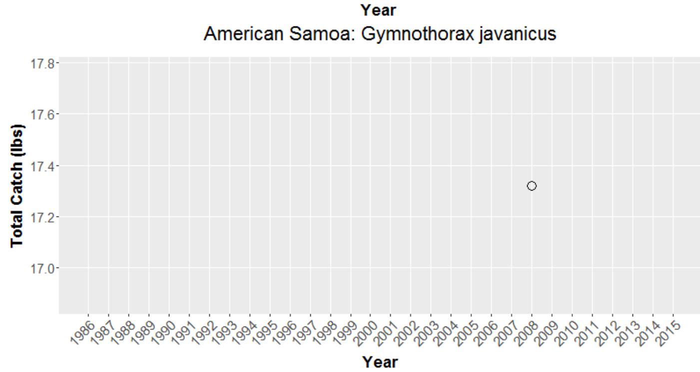

American Samoa: Gnathodentex aureolineatus
Total Catch (lbs)
0
250
500
750
1000
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

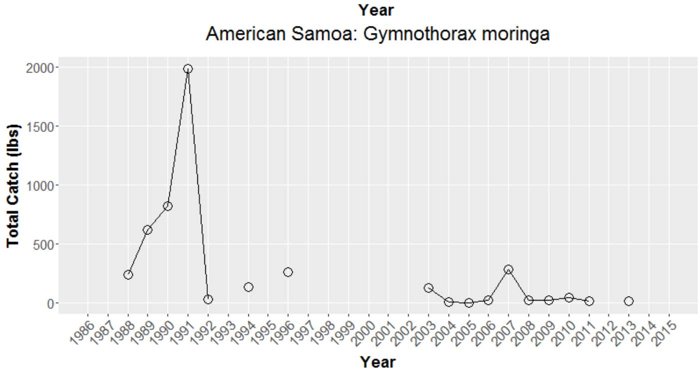

American Samoa: Gomphosus varius
Total Catch (lbs)
4.75
5.00
5.25
5.50
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

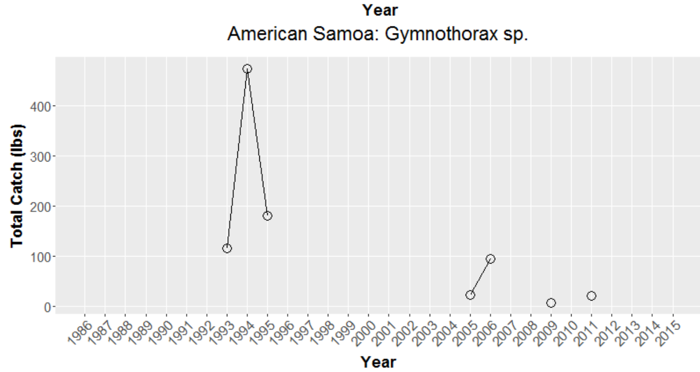

American Samoa: Grapsidae
Total Catch (lbs)
0
10
20
30
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

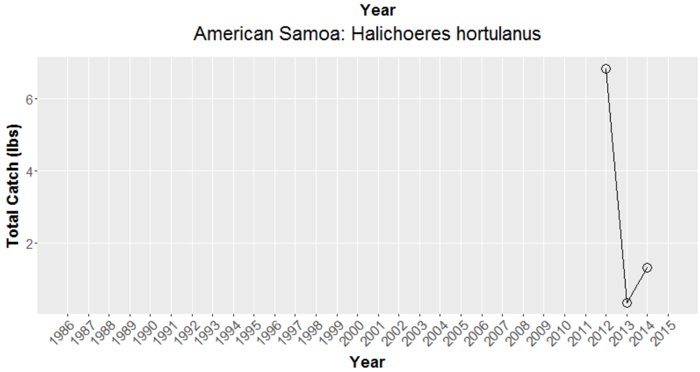

American Samoa: Gymnocranius grandoculis
Total Catch (lbs)
0
50
100
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

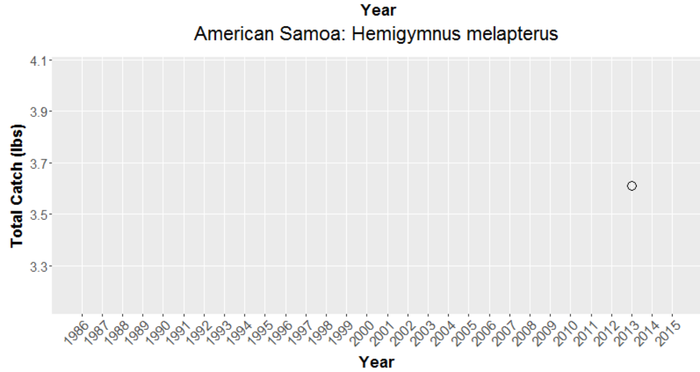

American Samoa: Gymnothorax flavimarginatus
Total Catch (lbs)
2.75
3.00
3.25
3.50
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015


American Samoa: Gymnothorax javanicus
Total Catch (lbs)
17.0
17.2
17.4
17.6
17.8
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

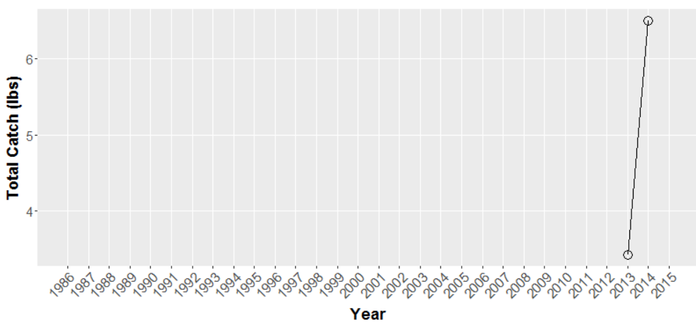

American Samoa: Gymnothorax moringa
Total Catch (lbs)
0
500
1000
1500
2000
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015


American Samoa: Gymnothorax sp.
Total Catch (lbs)
0
100
200
300
400
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015


American Samoa: Halichoeres hortulanus
Total Catch (lbs)
2
4
6
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

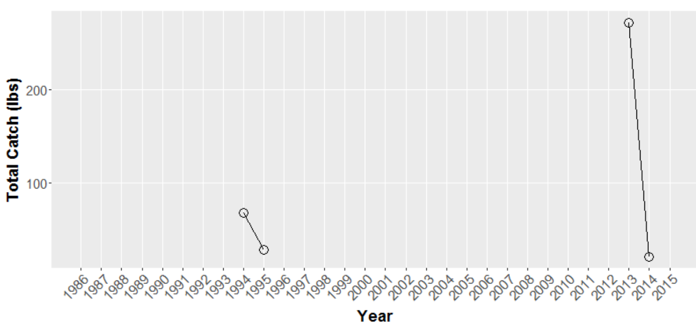

American Samoa: Hemigymnus melapterus
Total Catch (lbs)
3.3
3.5
3.7
3.9
4.1
Year
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

American Samoa: Hipposcarus longiceps

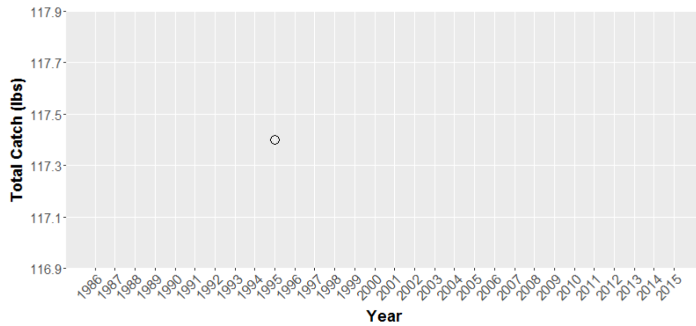


American Samoa: Holothuria (Halodeima) atra

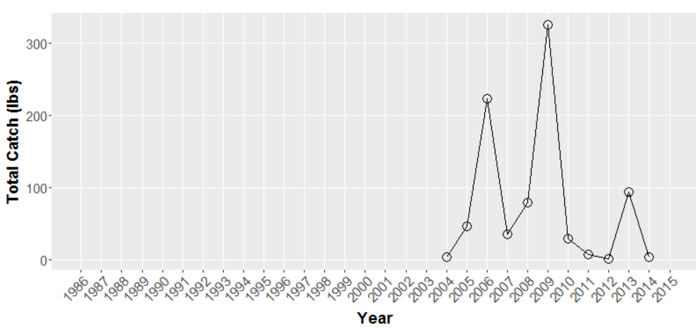
American Samoa: Hypoatherina temminckii



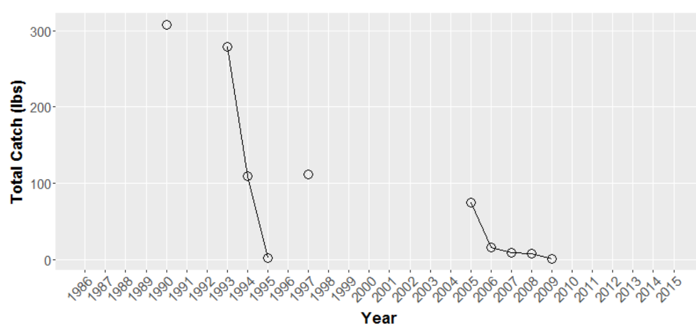
American Samoa: Invertebrates (unknown)



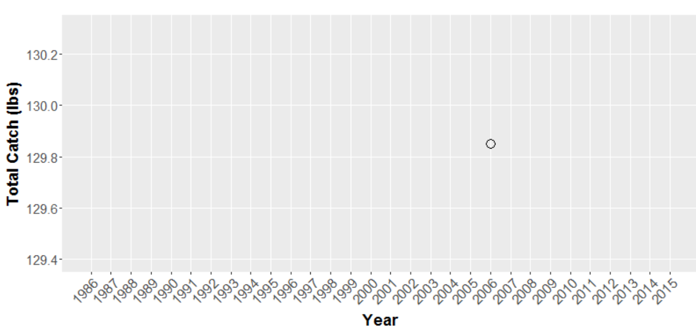
American Samoa: Kuhlia mugil



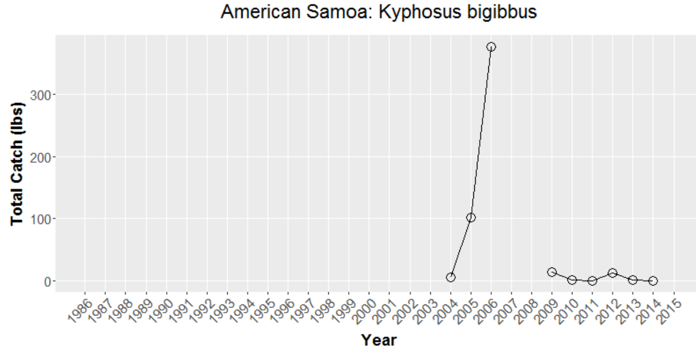
American Samoa: Kuhlia sp.



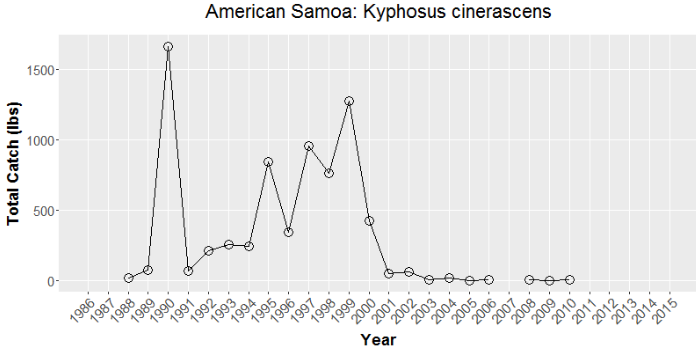
American Samoa: Kuhliidae



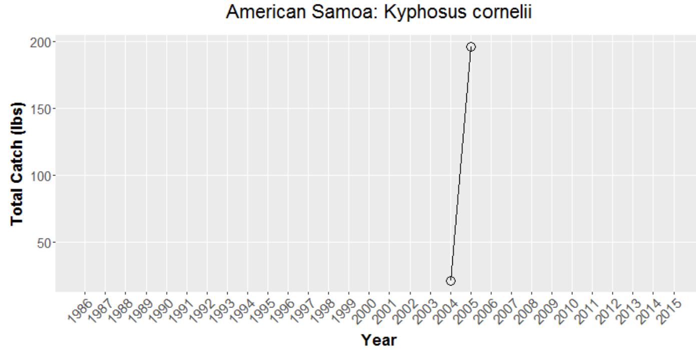
American Samoa: Kyphosus bigibbus



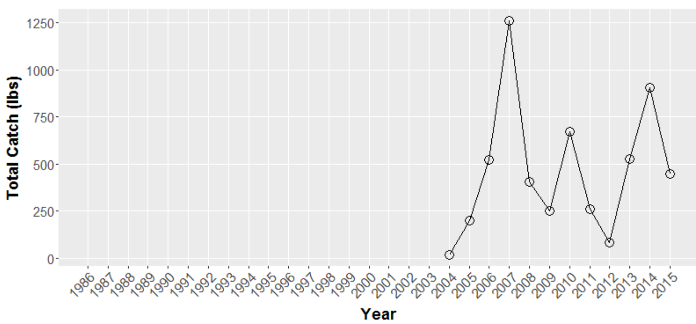
American Samoa: Kyphosus cinerascens



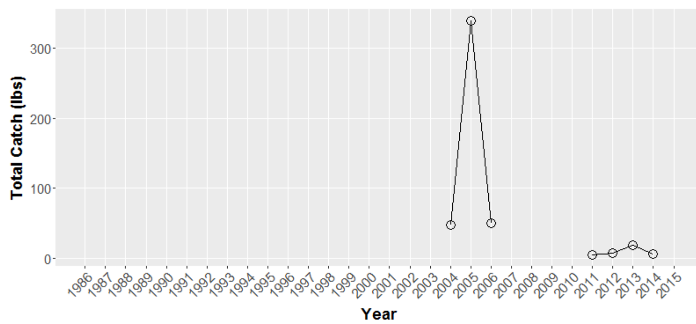
American Samoa: Kyphosus cornelii



American Samoa: Kyphosus sp.

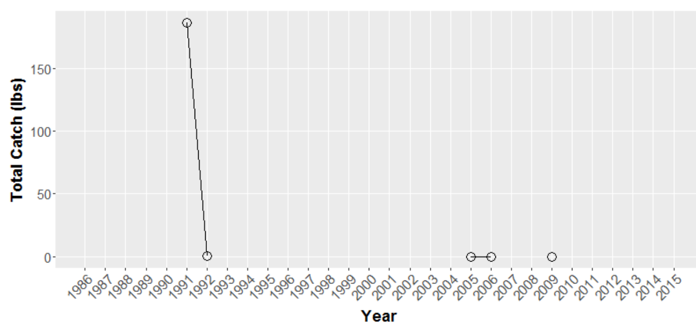


American Samoa: Kyphosus vaigiensis

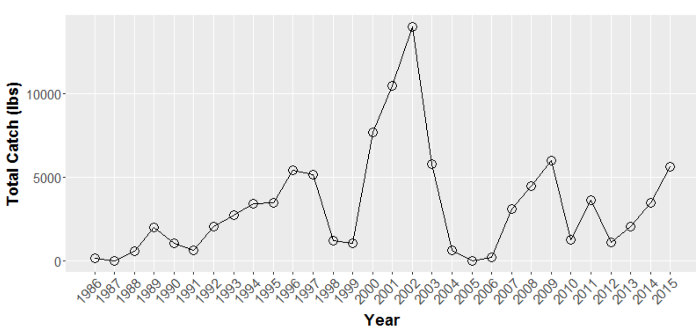


American Samoa: Labridae

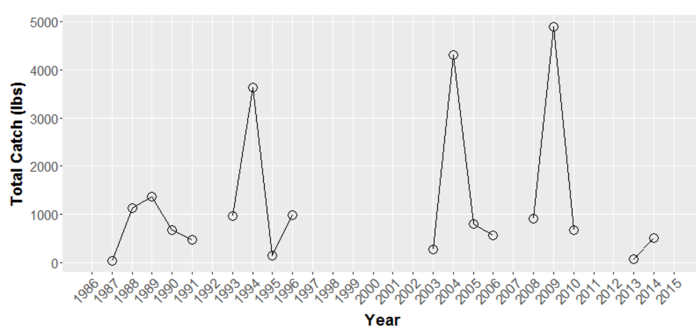
American Samoa: Leiognathidae



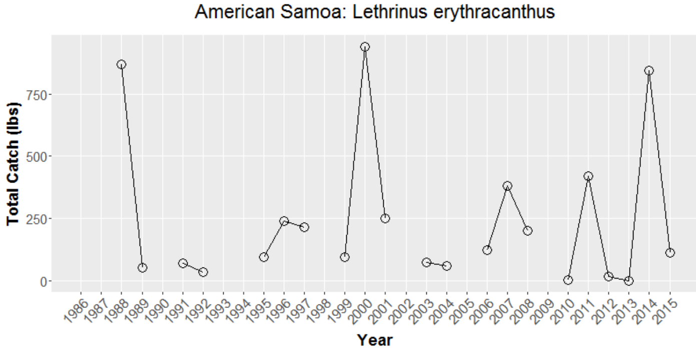
American Samoa: Lethrinidae



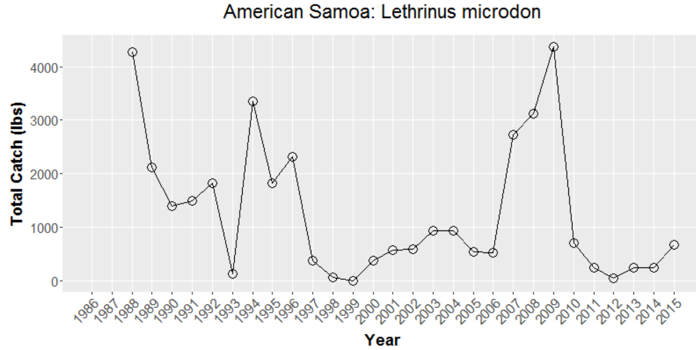
American Samoa: Lethrinus amboinensis



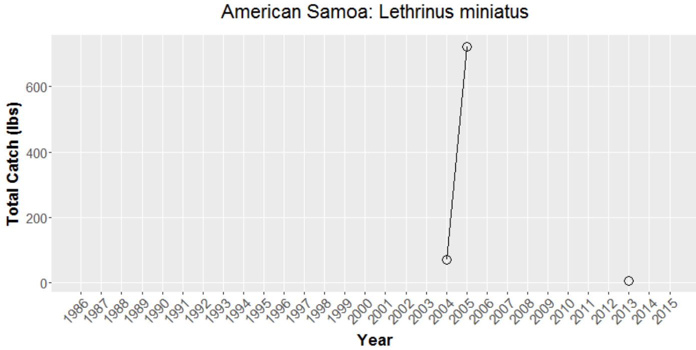
American Samoa: Lethrinus erythracanthus



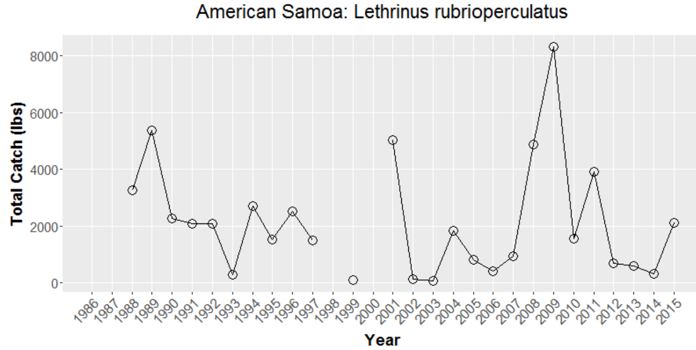
American Samoa: Lethrinus microdon

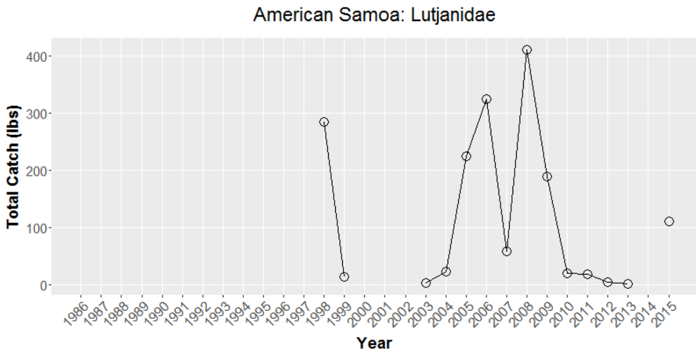


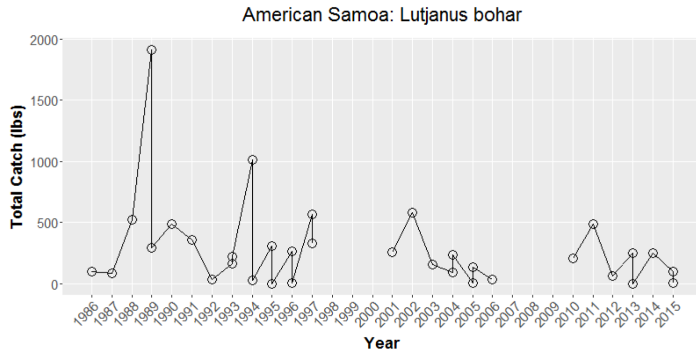
American Samoa: Lethrinus miniatus

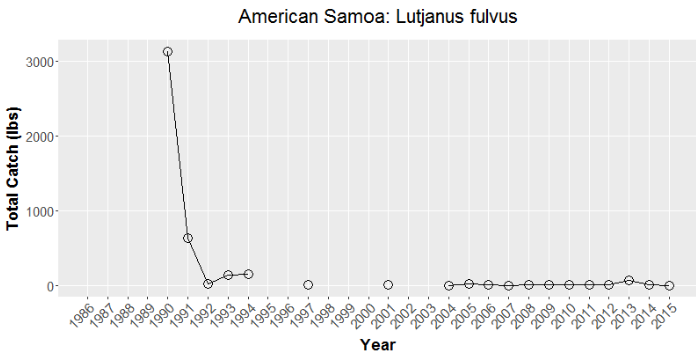


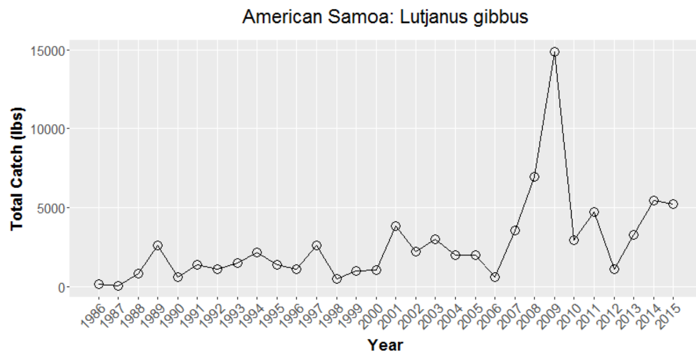
American Samoa: Lethrinus rubrioperculatus

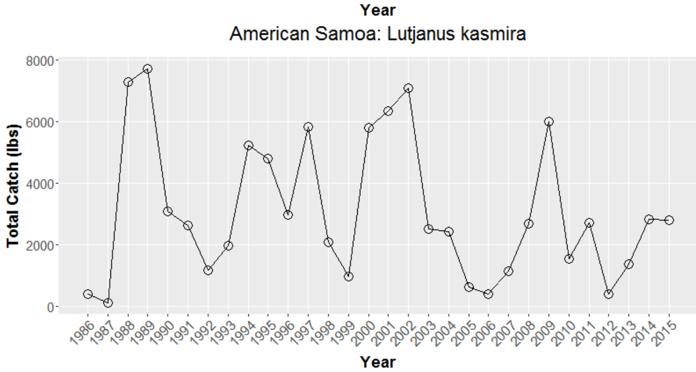


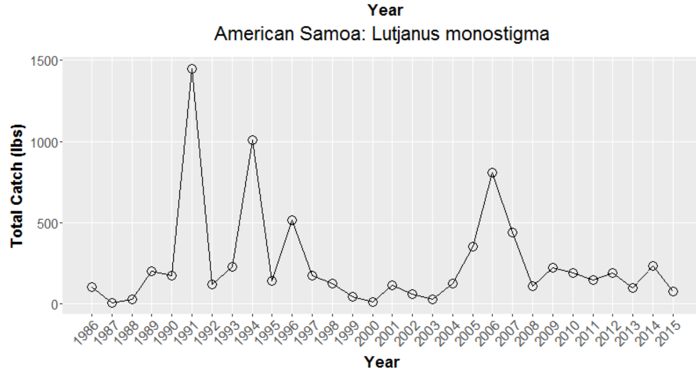

American Samoa: Lutjanidae
Total Catch (lbs)
Year

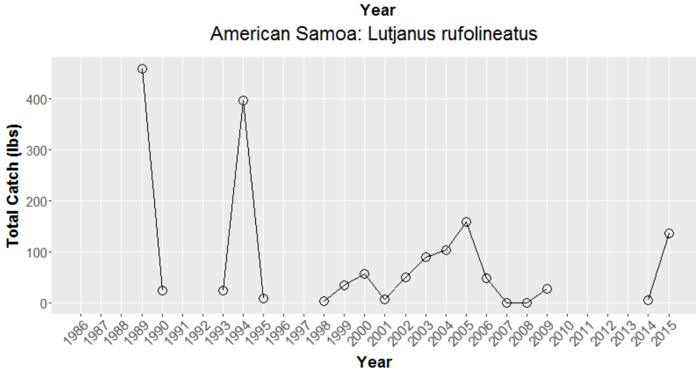

American Samoa: Lutjanus bohar
Total Catch (lbs)
Year

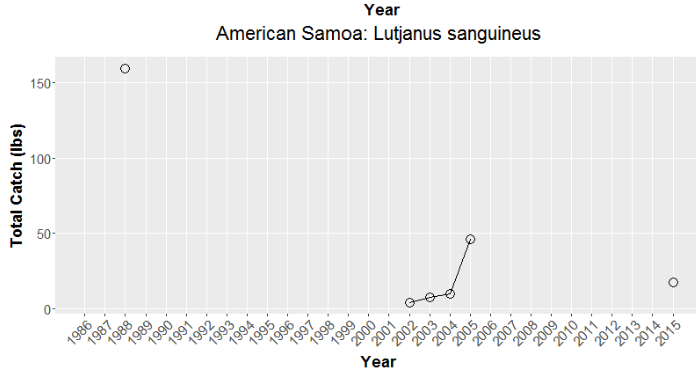

American Samoa: Lutjanus fulvus
Total Catch (lbs)
Year

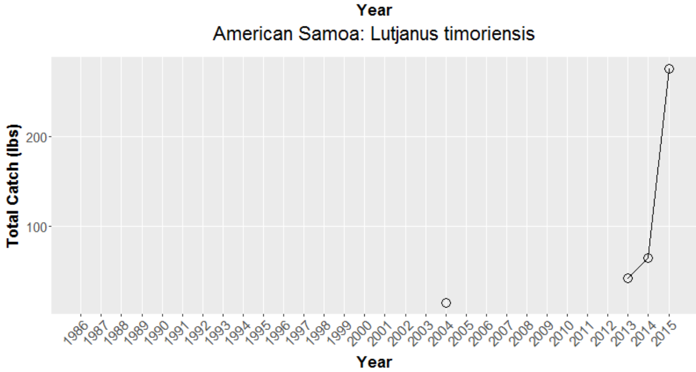

American Samoa: Lutjanus gibbus
Total Catch (lbs)
Year

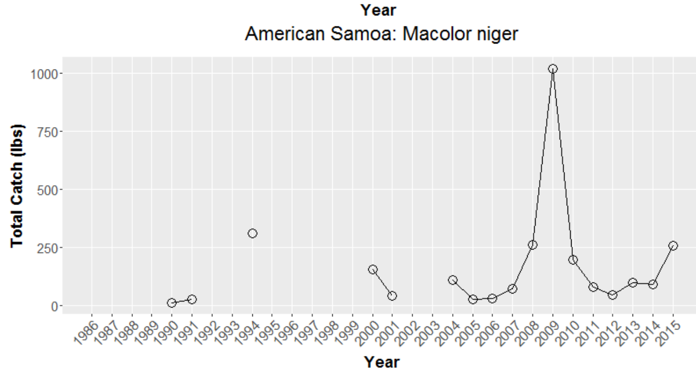

American Samoa: Lutjanus kasmira
Total Catch (lbs)
Year

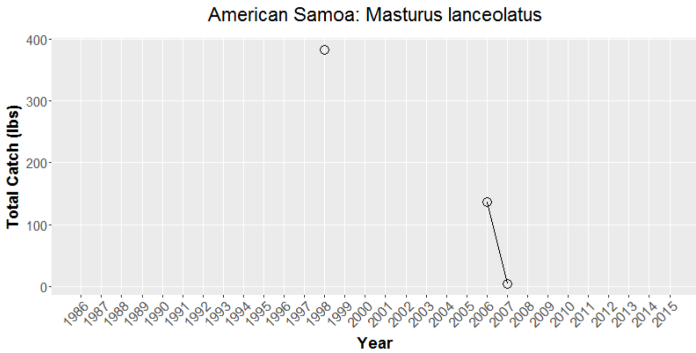

American Samoa: Lutjanus monostigma
Total Catch (lbs)
Year

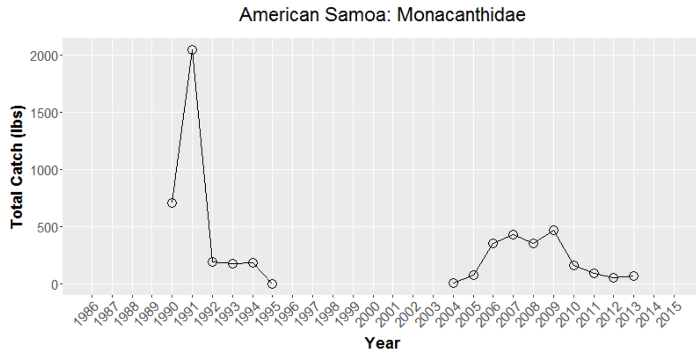

American Samoa: Lutjanus rufolineatus
Total Catch (lbs)
Year

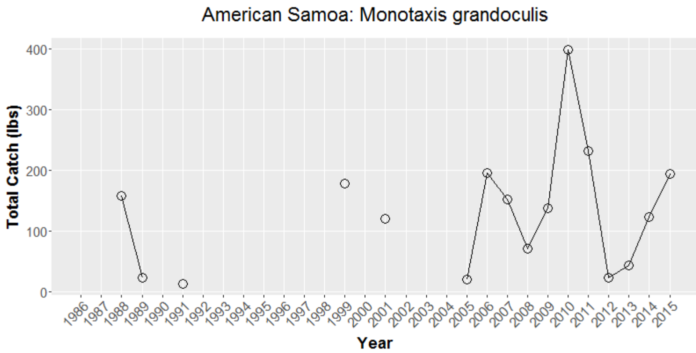

American Samoa: Lutjanus sanguineus
Total Catch (lbs)
Year

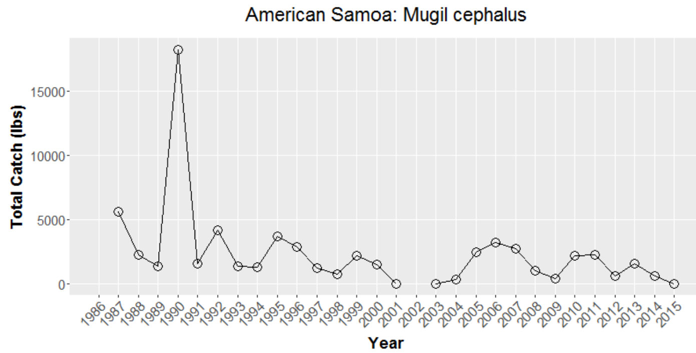

American Samoa: Lutjanus timoriensis
Total Catch (lbs)
Year

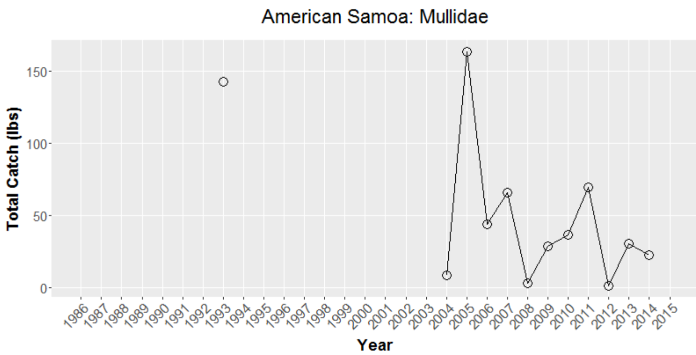

American Samoa: Macolor niger
Total Catch (lbs)
Year

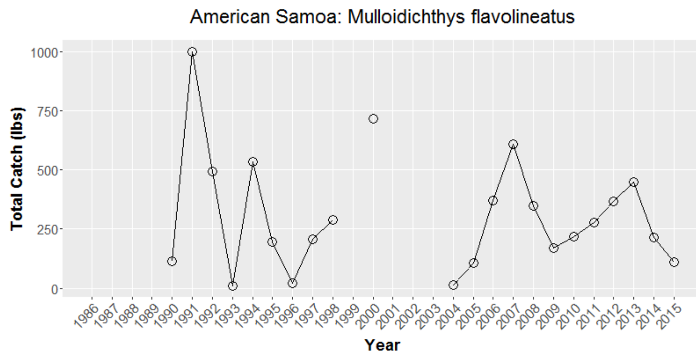

American Samoa: Masturus lanceolatus
Total Catch (lbs)
Year

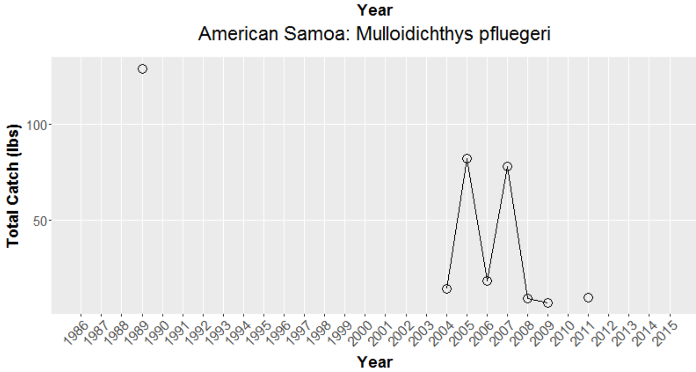

American Samoa: Monacanthidae
Total Catch (lbs)
Year

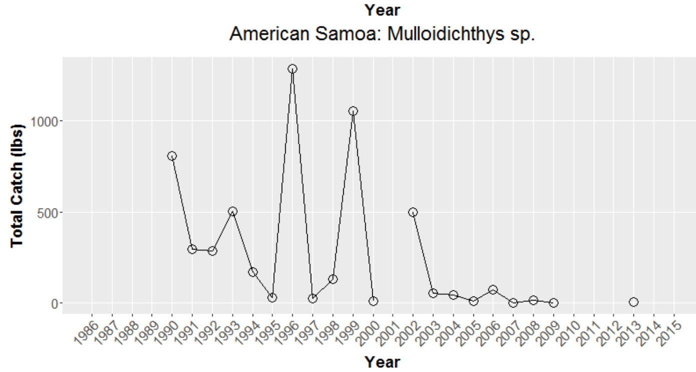

American Samoa: Monotaxis grandoculis
Total Catch (lbs)
Year

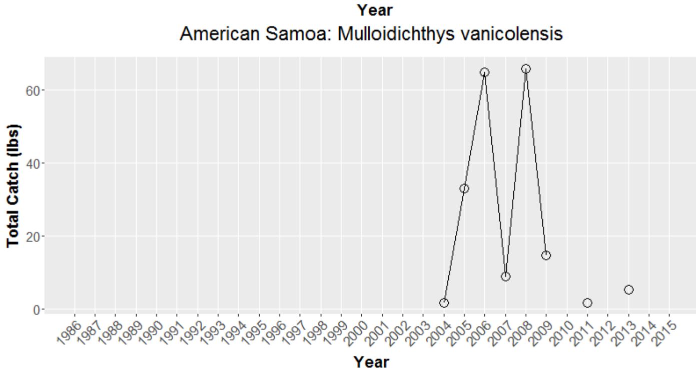

American Samoa: Mugil cephalus
Total Catch (lbs)
Year

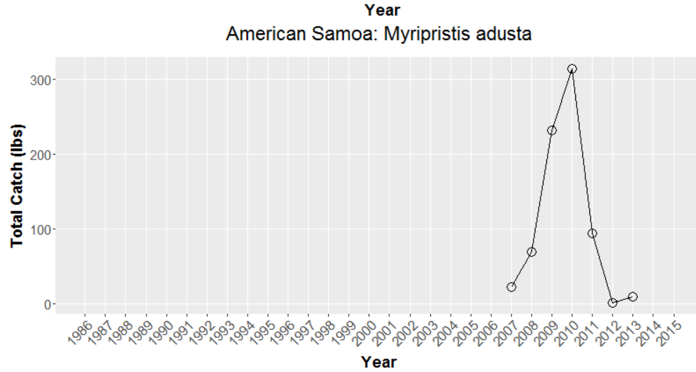

American Samoa: Mullidae
Total Catch (lbs)
Year


American Samoa: Mulloidichthys flavolineatus
Total Catch (lbs)
Year

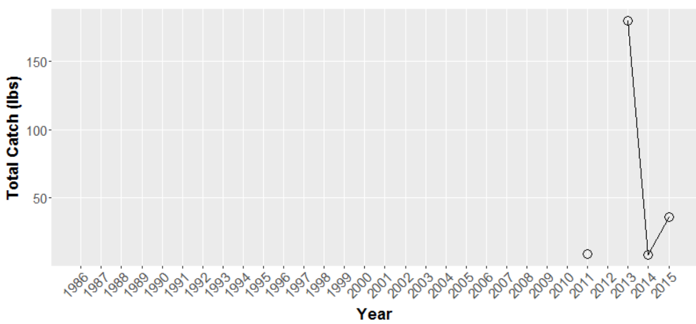

American Samoa: Mulloidichthys pfluegeri
Total Catch (lbs)
Year


American Samoa: Mulloidichthys sp.
Total Catch (lbs)
Year

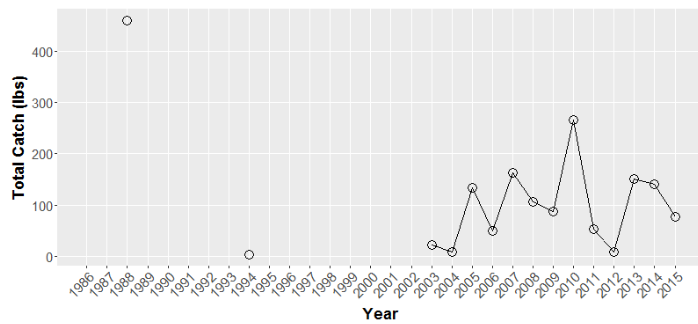

American Samoa: Mulloidichthys vanicolensis
Total Catch (lbs)
Year


American Samoa: Myripristis adusta
Total Catch (lbs)
Year

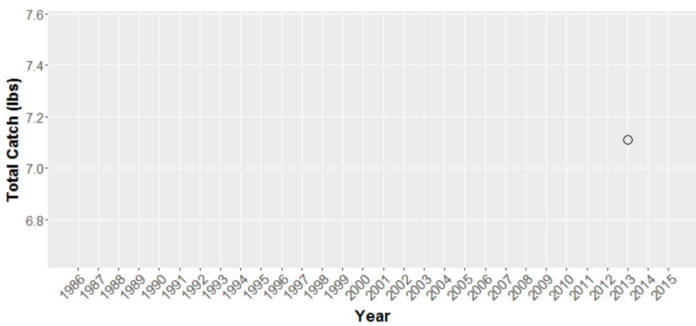
American Samoa: Myripristis amaena



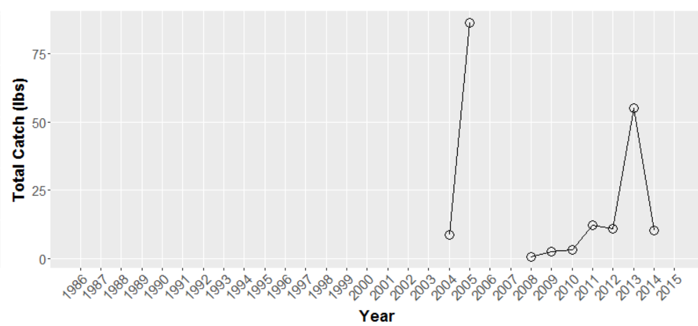
American Samoa: Myripristis berndti



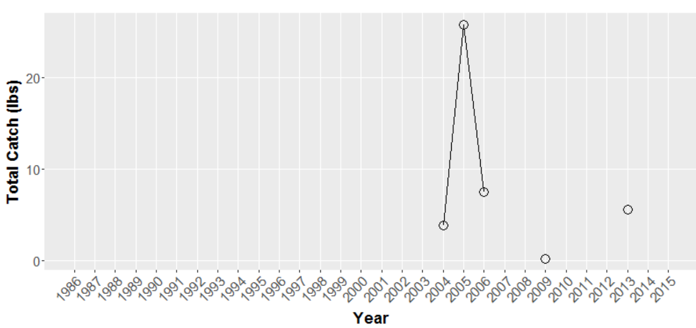
American Samoa: Myripristis kuntee



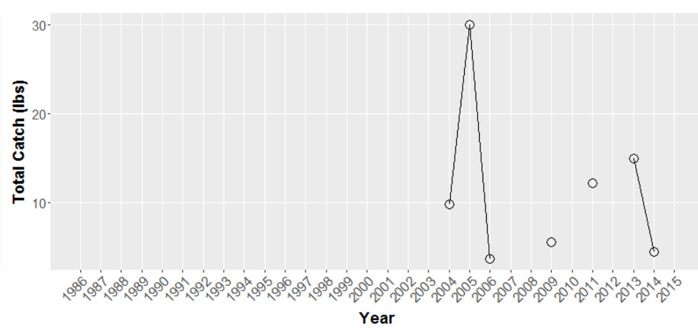
American Samoa: Myripristis murdjan



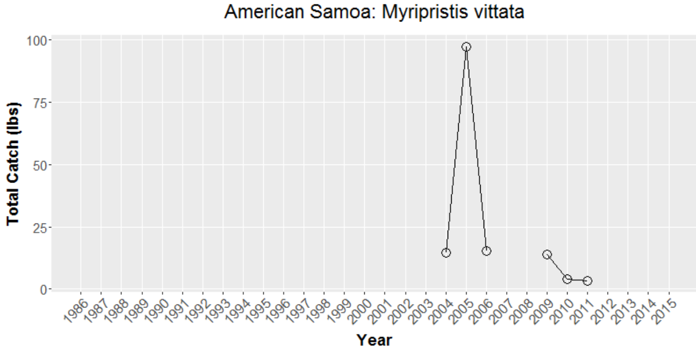
American Samoa: Myripristis pralinia



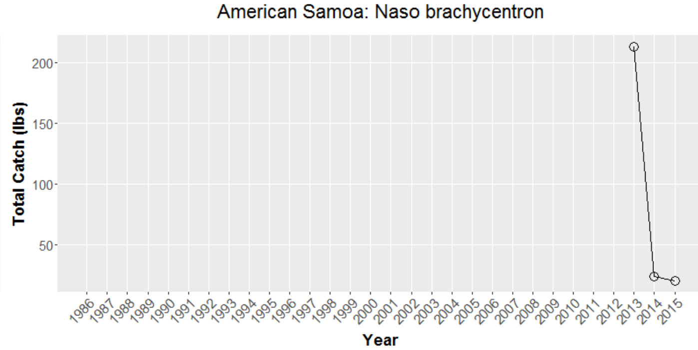
American Samoa: Myripristis violacea



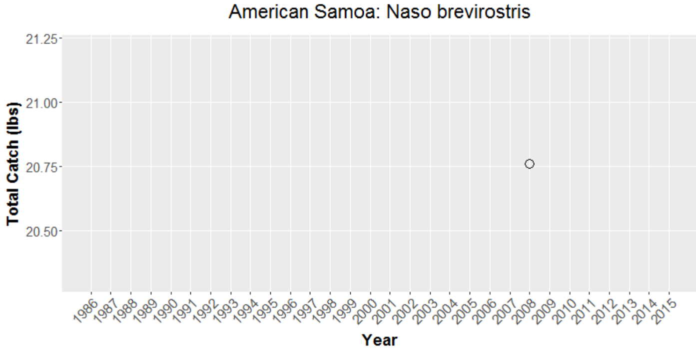
American Samoa: Myripristis vittata



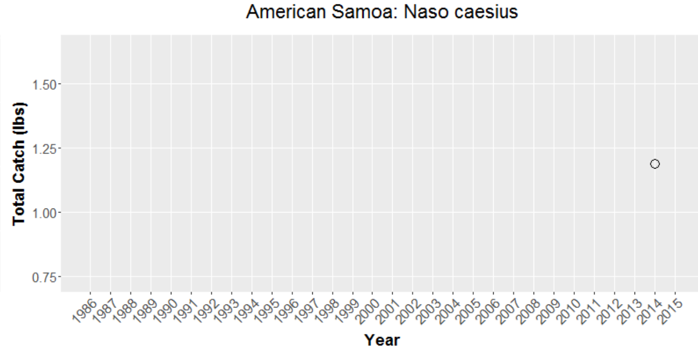
American Samoa: Naso brachycentron



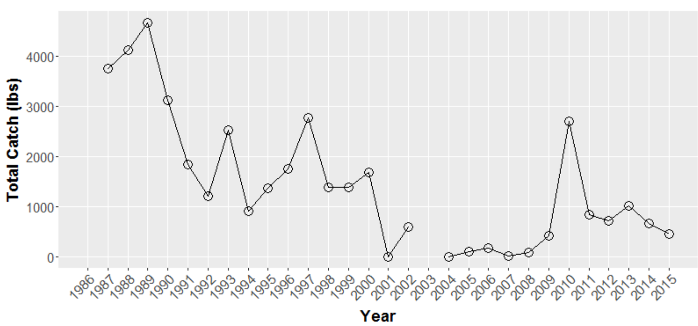
American Samoa: Naso brevirostris



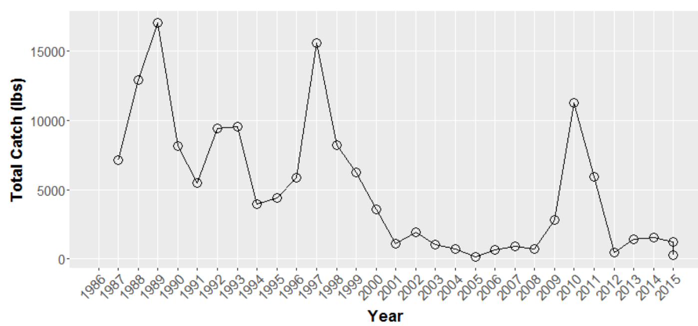
American Samoa: Naso caesius



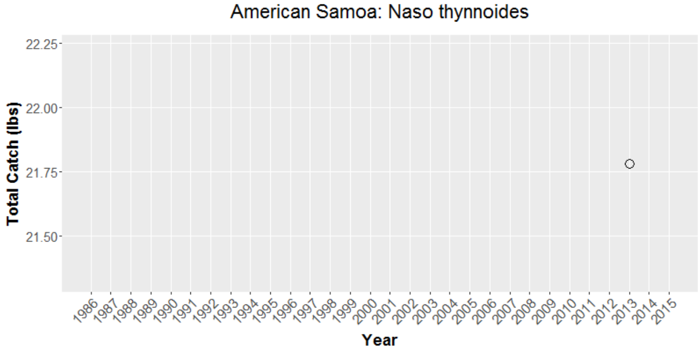
American Samoa: Naso lituratus



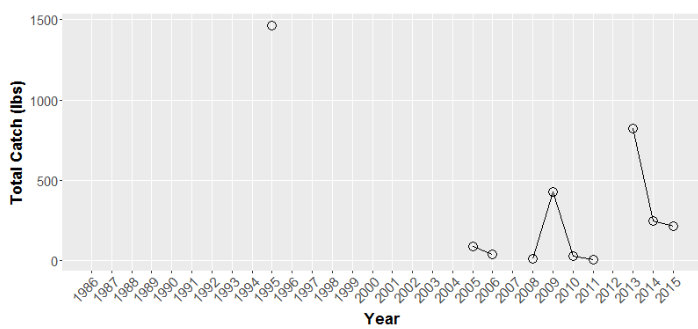
American Samoa: Naso sp.



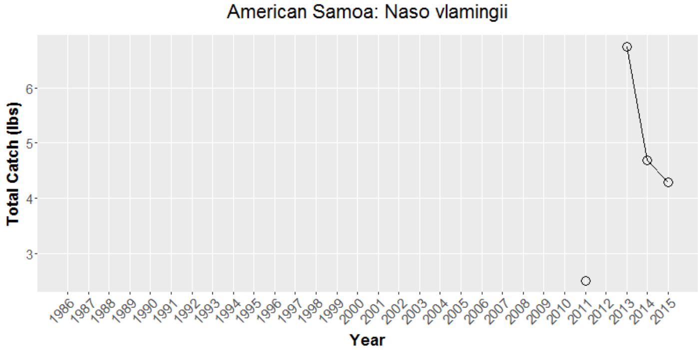
American Samoa: Naso thynnoides



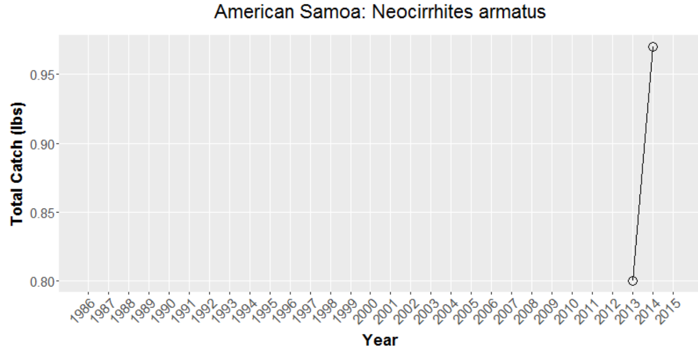
American Samoa: Naso unicornis



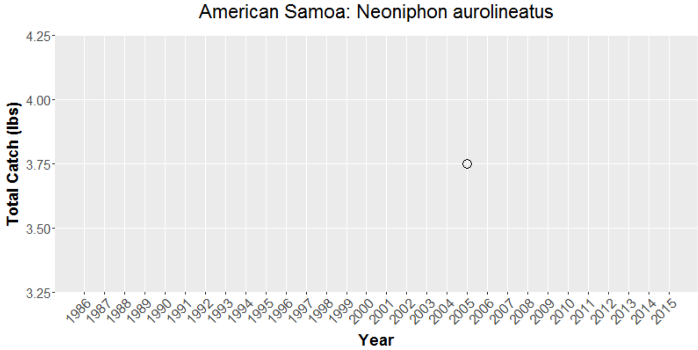
American Samoa: Naso vlamingii



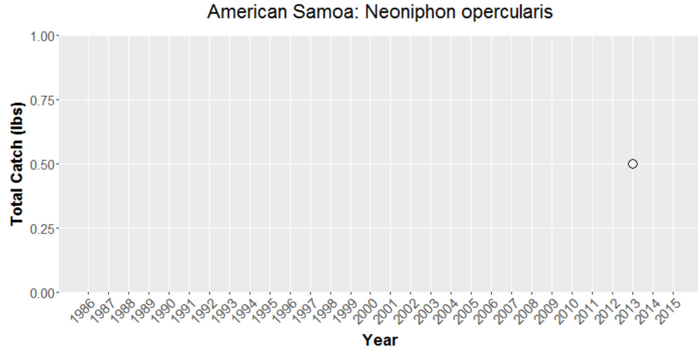
American Samoa: Neocirrhites armatus



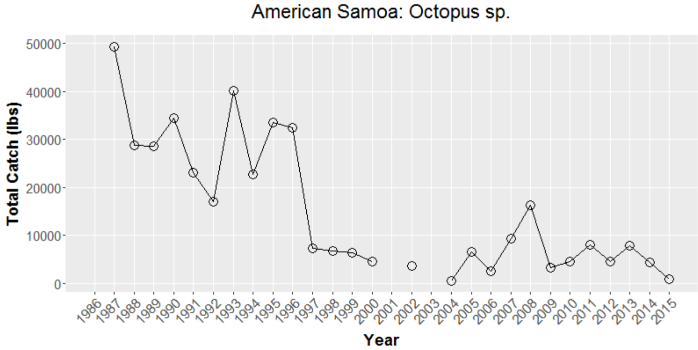
American Samoa: Neoniphon aurolineatus



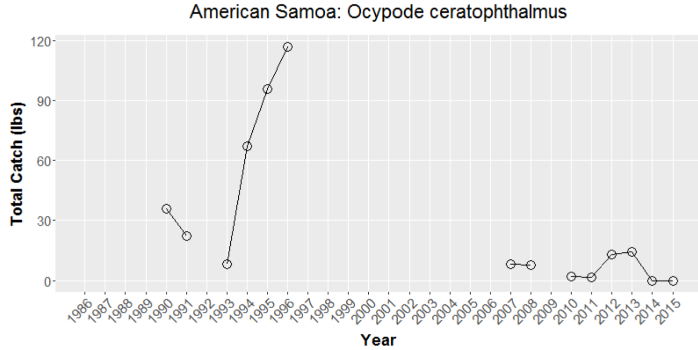
American Samoa: Neoniphon opercularis

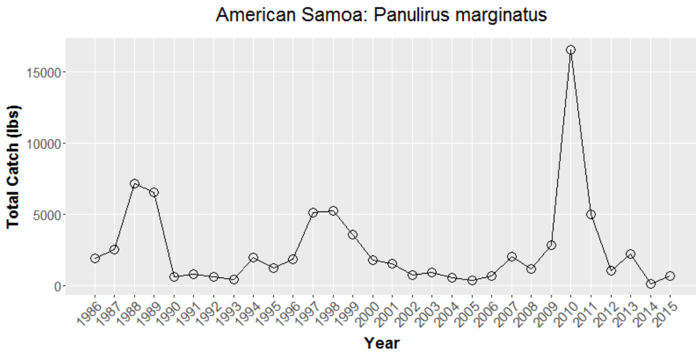


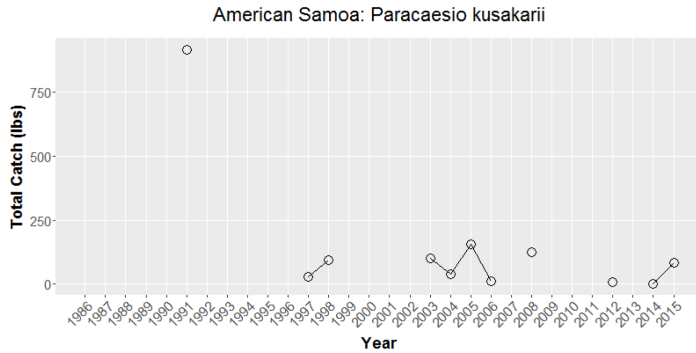
American Samoa: Octopus sp.

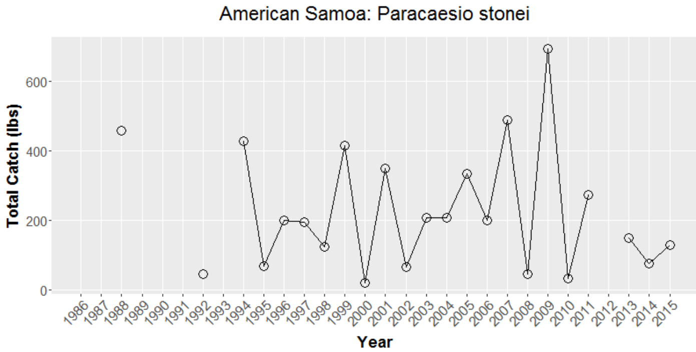


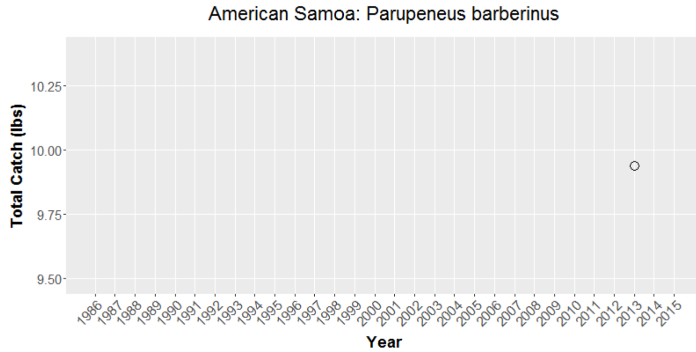
American Samoa: Ocypode ceratophthalmus

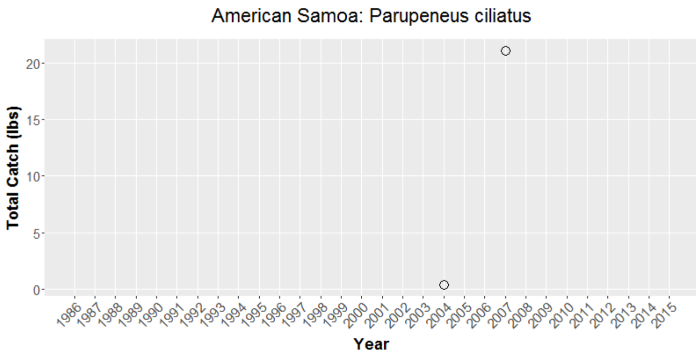


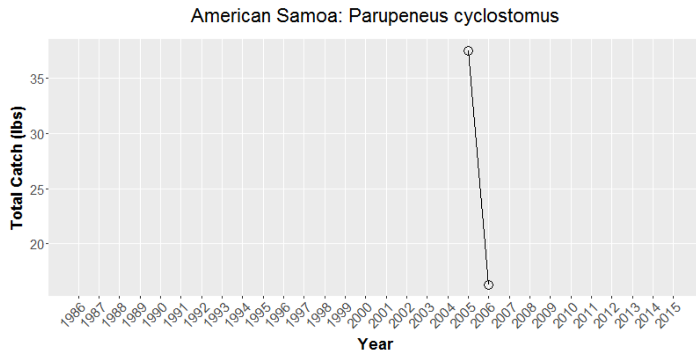

American Samoa: Panulirus marginatus
Total Catch (lbs)
0
5000
10000
15000
Year

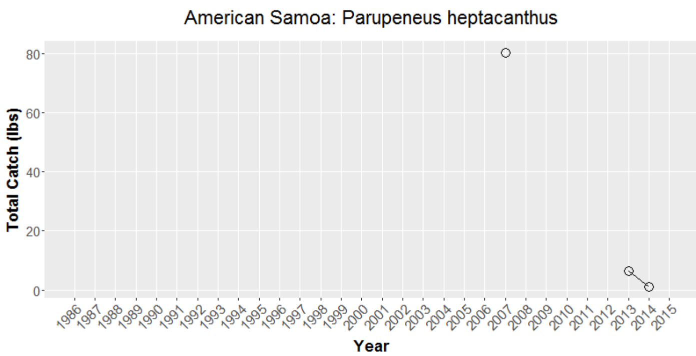

American Samoa: Paracaesio kusakarii
Total Catch (lbs)
0
250
500
750
Year

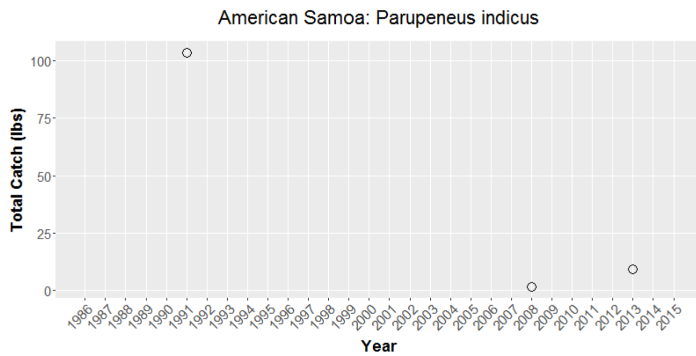

American Samoa: Paracaesio stonei
Total Catch (lbs)
0
200
400
600
Year

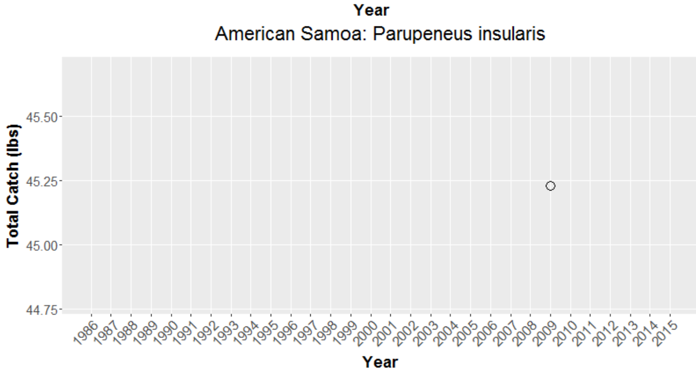

American Samoa: Parupeneus barberinus
Total Catch (lbs)
9.50
9.75
10.00
10.25
Year

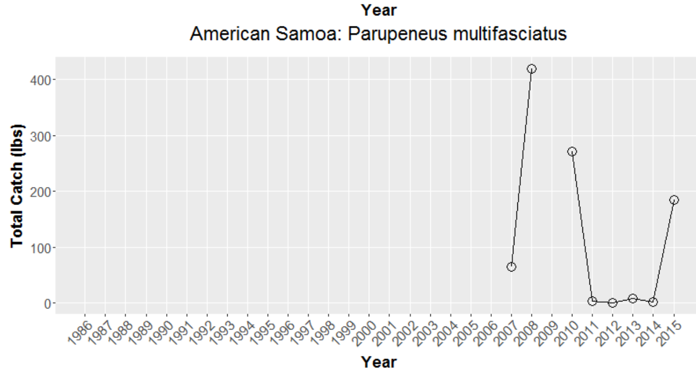

American Samoa: Parupeneus ciliatus
Total Catch (lbs)
0
5
10
15
20
Year

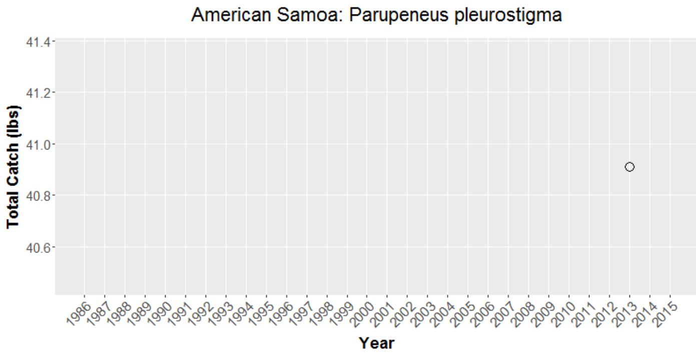

American Samoa: Parupeneus cyclostomus
Total Catch (lbs)
20
25
30
35
Year

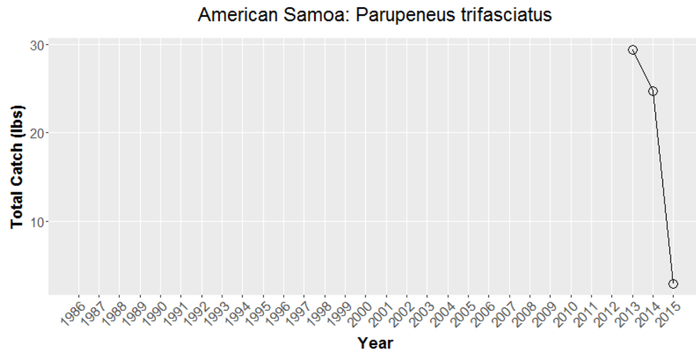

American Samoa: Parupeneus heptacanthus
Total Catch (lbs)
0
20
40
60
80
Year

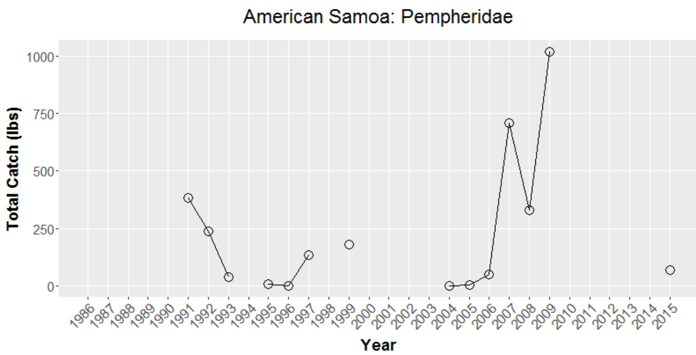

American Samoa: Parupeneus indicus
Total Catch (lbs)
0
25
50
75
100
Year

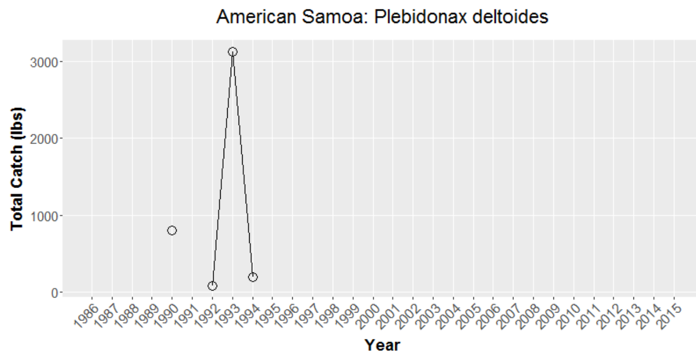

American Samoa: Parupeneus insularis
Total Catch (lbs)
44.75
45.00
45.25
45.50
Year

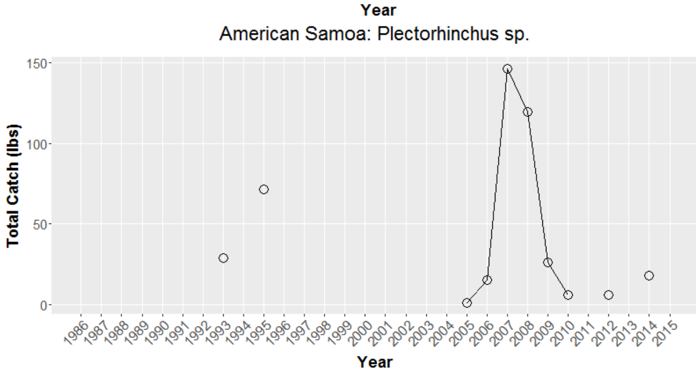

American Samoa: Parupeneus multifasciatus
Total Catch (lbs)
0
100
200
300
400
Year

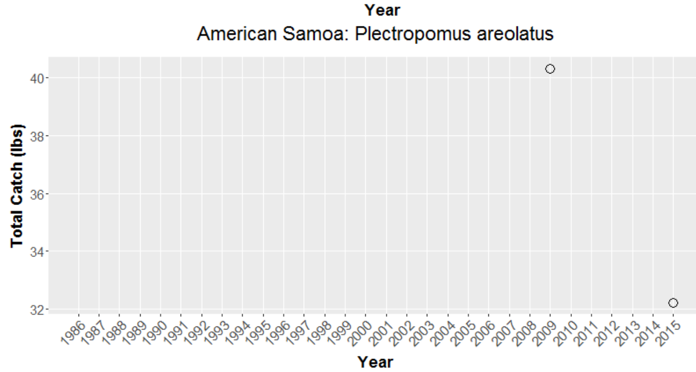

American Samoa: Parupeneus pleurostigma
Total Catch (lbs)
41.4
41.2
41.0
40.8
40.6
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

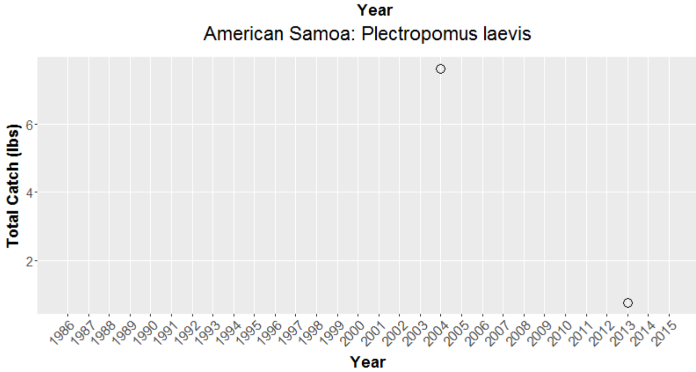

American Samoa: Parupeneus trifasciatus
Total Catch (lbs)
30
20
10
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

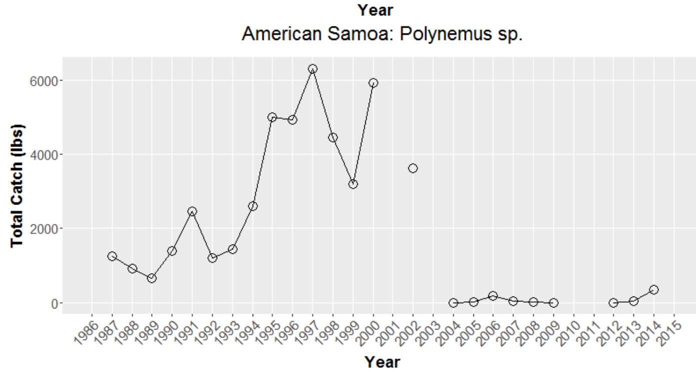

American Samoa: Pempheridae
Total Catch (lbs)
1000
750
500
250
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

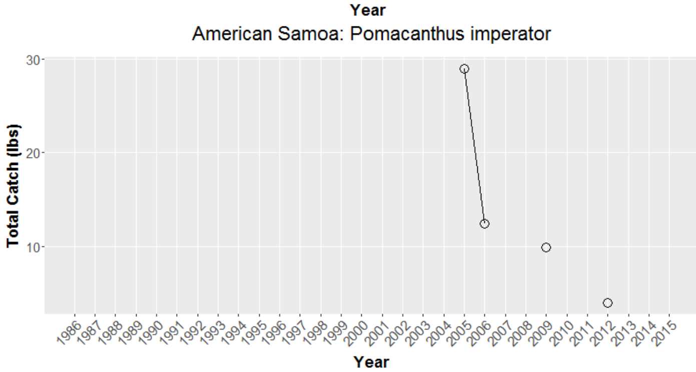

American Samoa: Plebidonax deltoides
Total Catch (lbs)
3000
2000
1000
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

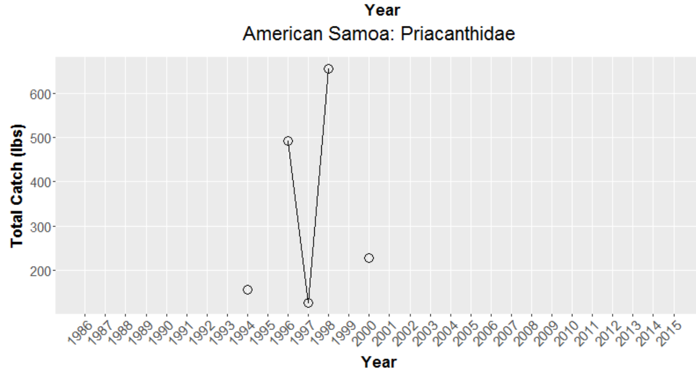

American Samoa: Plectorhinchus sp.
Total Catch (lbs)
150
100
50
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

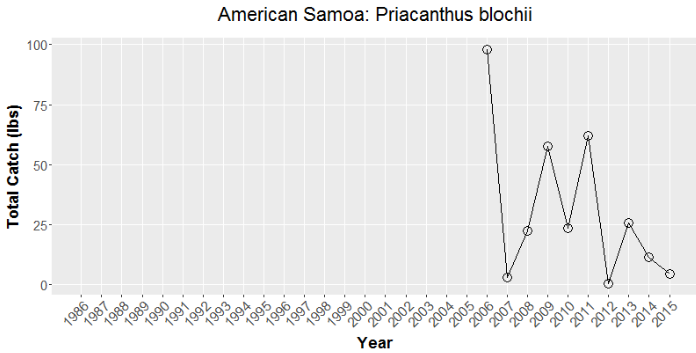

American Samoa: Plectropomus areolatus
Total Catch (lbs)
40
38
36
34
32
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

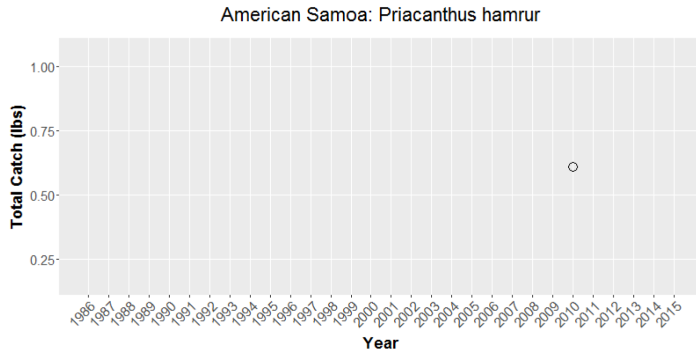

American Samoa: Plectropomus laevis
Total Catch (lbs)
6
4
2
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

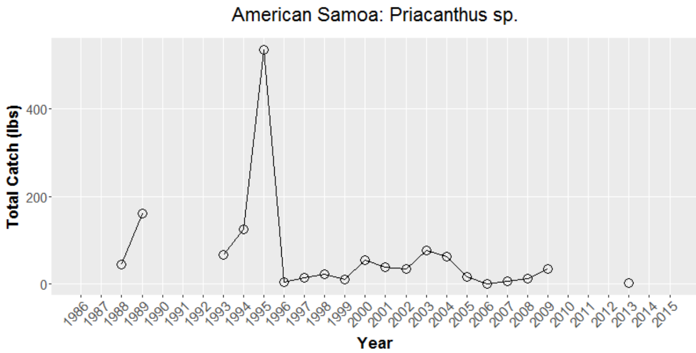

American Samoa: Polynemus sp.
Total Catch (lbs)
6000
4000
2000
0
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

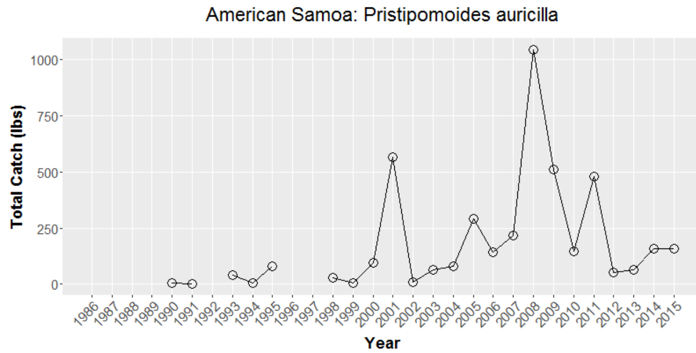

American Samoa: Pomacanthus imperator
Total Catch (lbs)
30
20
10
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

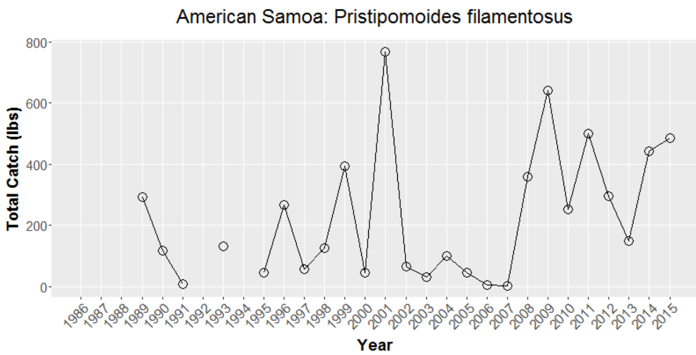

American Samoa: Priacanthidae
Total Catch (lbs)
600
500
400
300
200
1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year

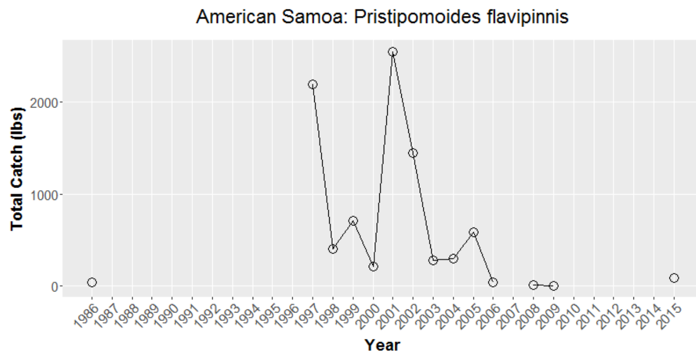

American Samoa: Priacanthus blochii
Total Catch (lbs)
Year

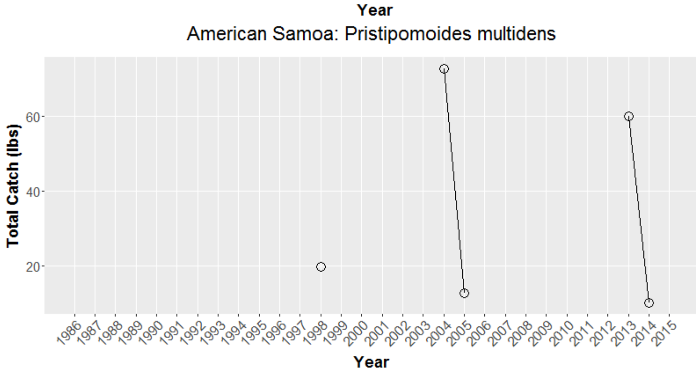

American Samoa: Priacanthus hamrur
Total Catch (lbs)
Year

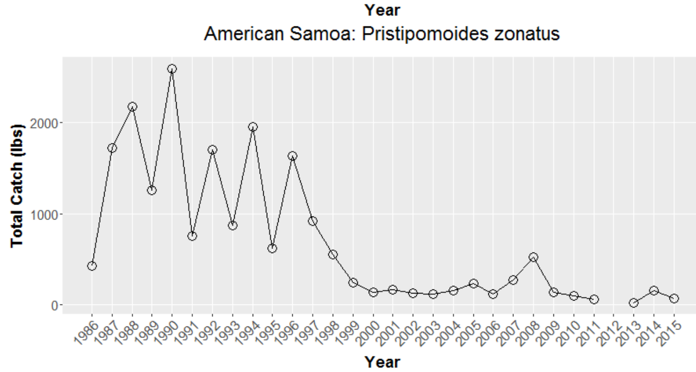

American Samoa: Priacanthus sp.
Total Catch (lbs)
Year

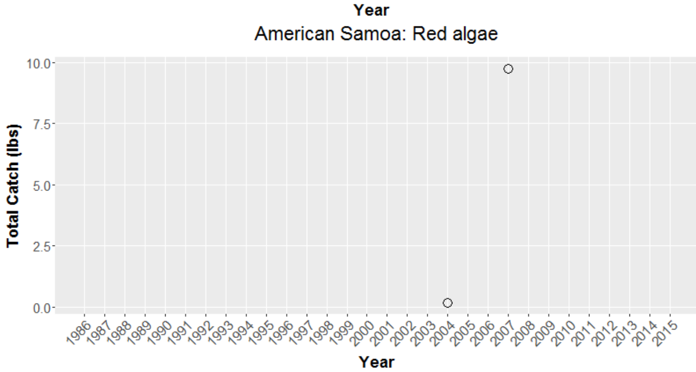

American Samoa: Pristipomoides auricilla
Total Catch (lbs)
Year

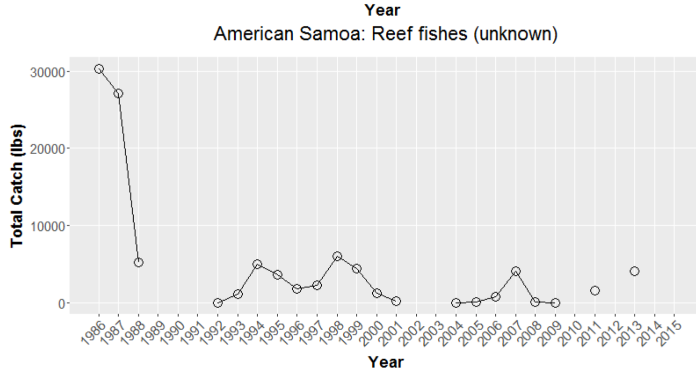

American Samoa: Pristipomoides filamentosus
Total Catch (lbs)
Year

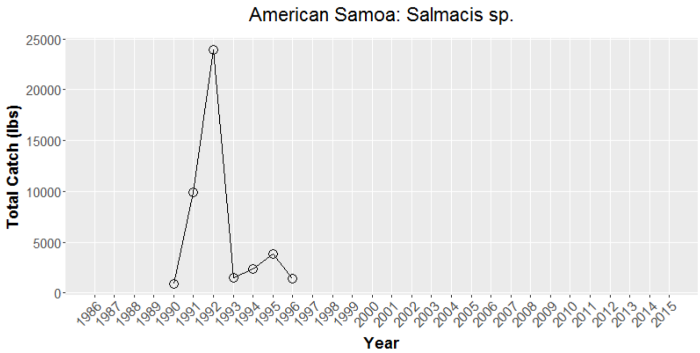

American Samoa: Pristipomoides flavipinnis
Total Catch (lbs)
Year

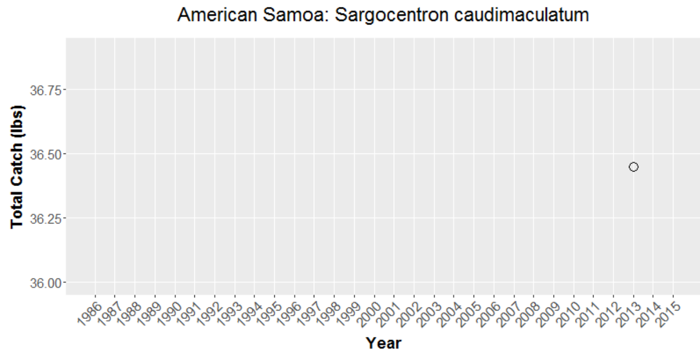

American Samoa: Pristipomoides multidens
Total Catch (lbs)
Year

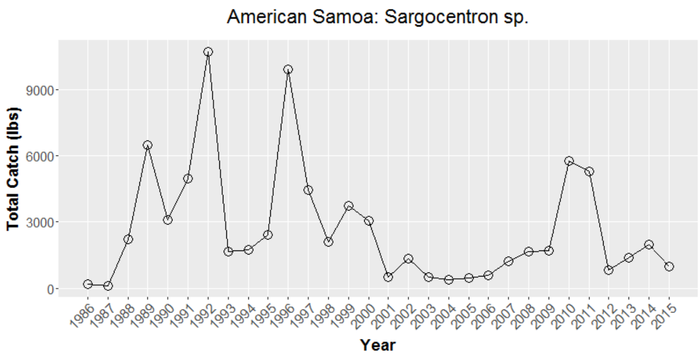

American Samoa: Pristipomoides zonatus
Total Catch (lbs)
Year

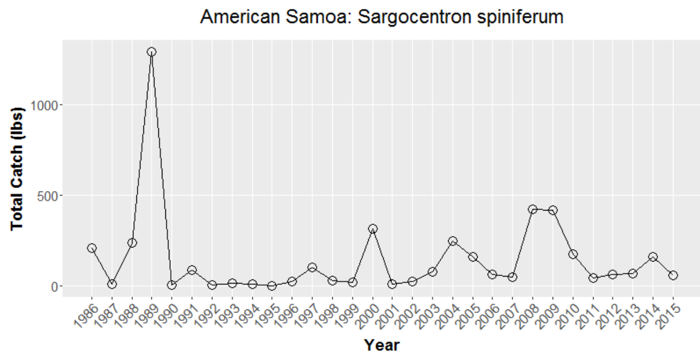

American Samoa: Red algae
Total Catch (lbs)
Year

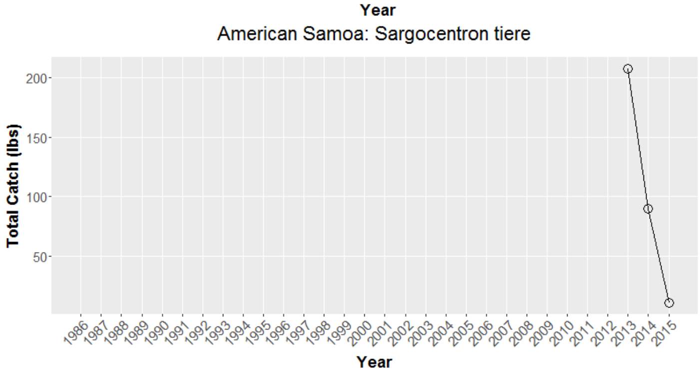

American Samoa: Reef fishes (unknown)
Total Catch (lbs)
Year

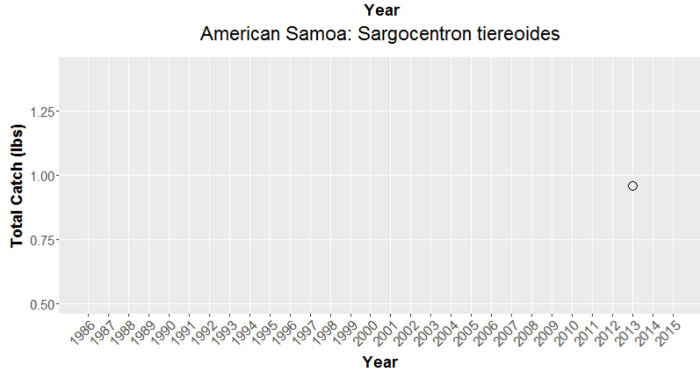

American Samoa: Salmacis sp.
Total Catch (lbs)
Year

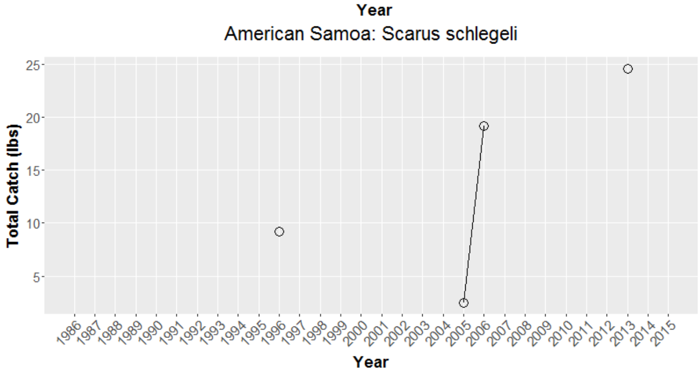

American Samoa: Sargocentron caudimaculatum
Total Catch (lbs)
Year

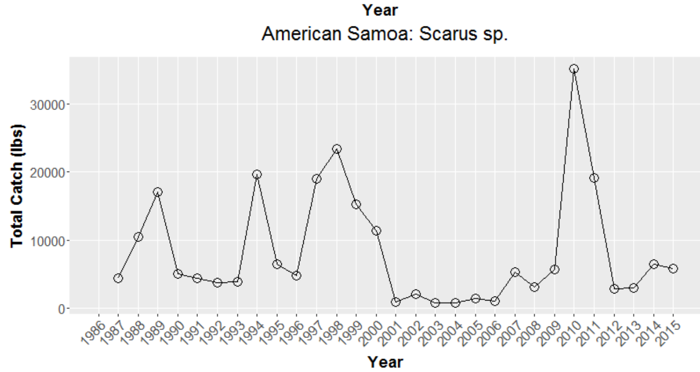

American Samoa: Sargocentron sp.
Total Catch (lbs)
Year

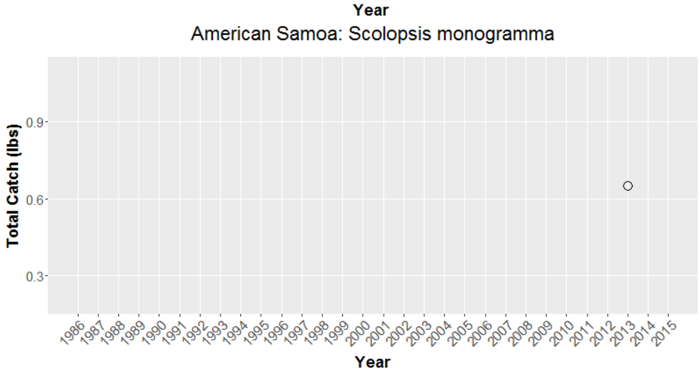

American Samoa: Sargocentron spiniferum
Total Catch (lbs)
Year

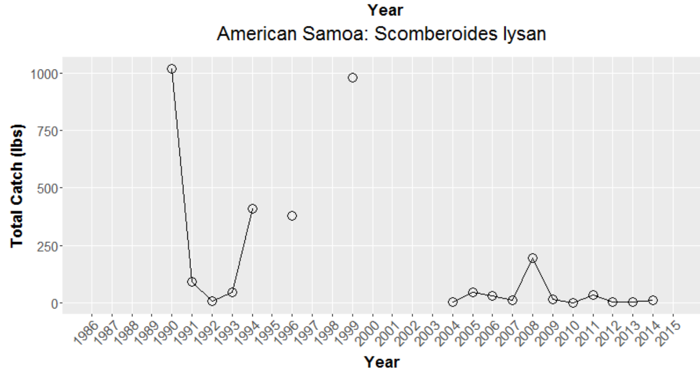

American Samoa: Sargocentron tiere
Total Catch (lbs)
Year


American Samoa: Sargocentron tiereoides
Total Catch (lbs)
Year

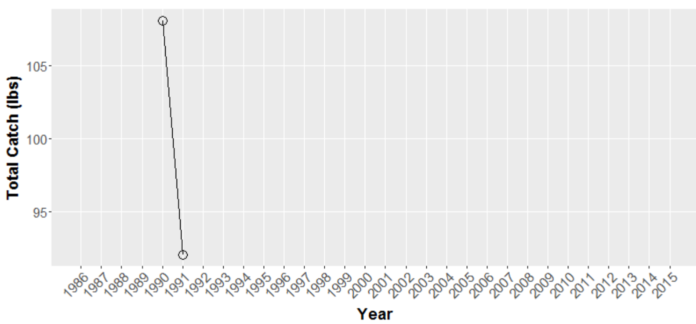

American Samoa: Scarus schlegeli
Total Catch (lbs)
Year


American Samoa: Scarus sp.
Total Catch (lbs)
Year

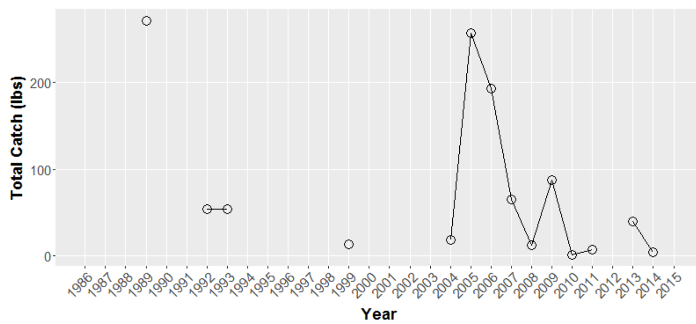

American Samoa: Scolopsis monogramma
Total Catch (lbs)
Year


American Samoa: Scomberoides lysan
Total Catch (lbs)
Year

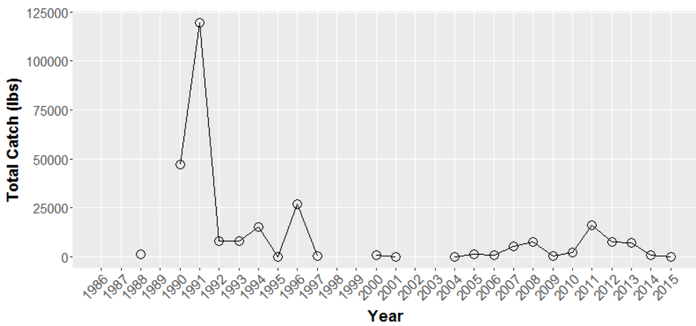
American Samoa: Scorpaenidae



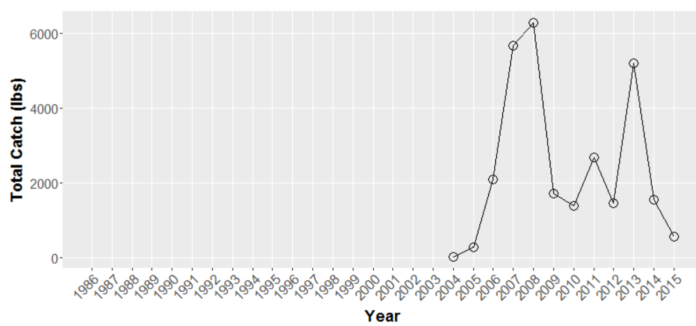
American Samoa: Scyllaridae



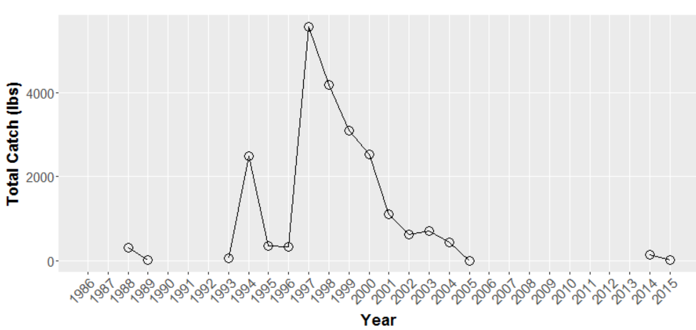
American Samoa: Selar crumenophthalmus



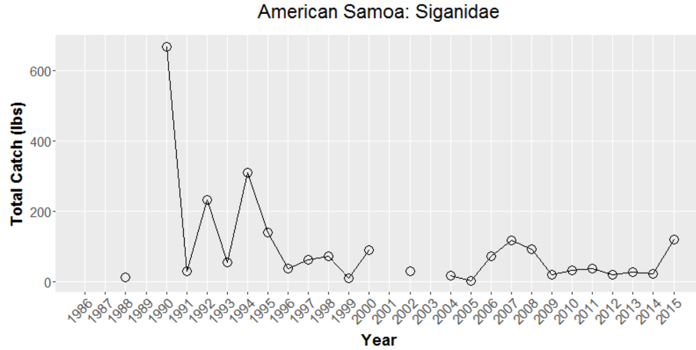
American Samoa: Seriola dumerili



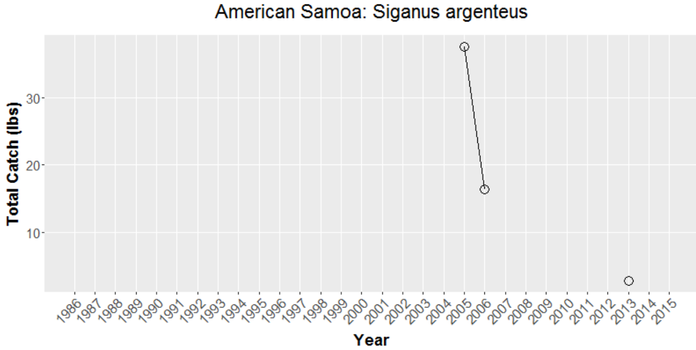
American Samoa: Serranidae



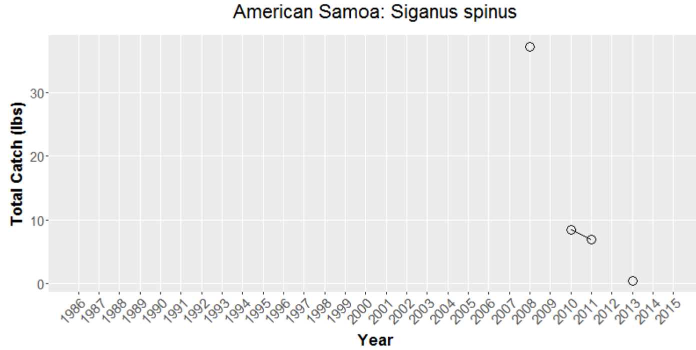
American Samoa: Siganidae



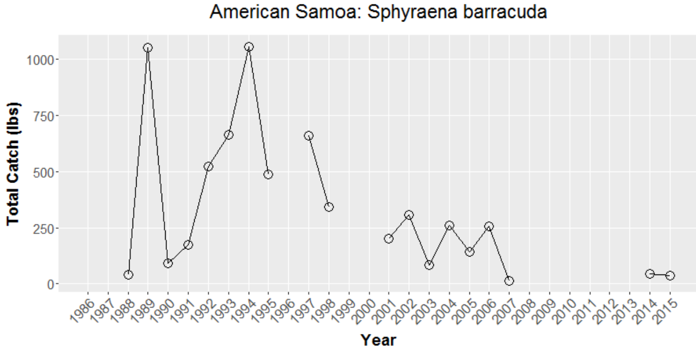
American Samoa: Siganus argenteus



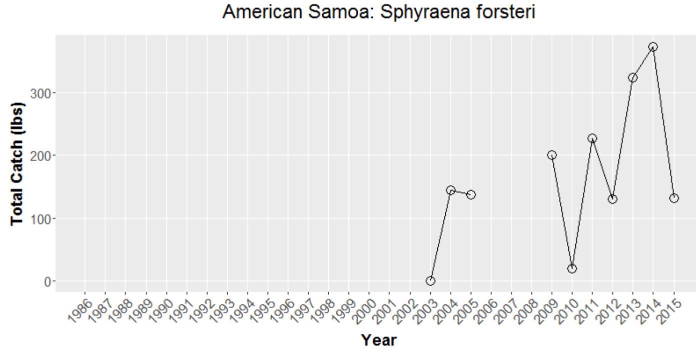
American Samoa: Siganus spinus

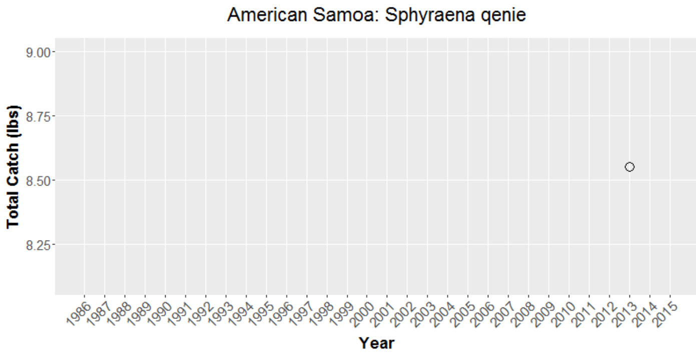


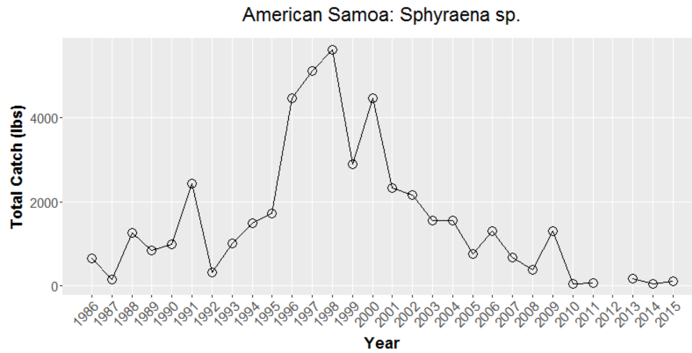
American Samoa: Sphyraena barracuda

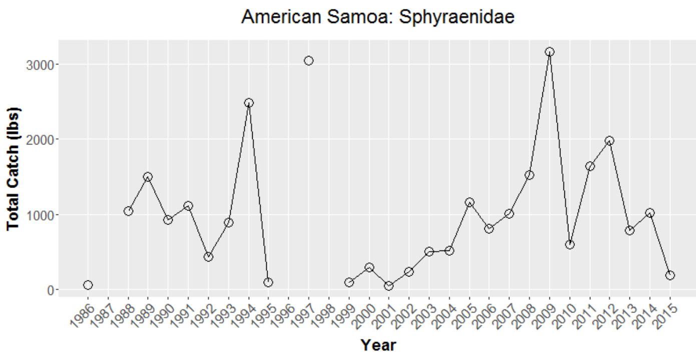


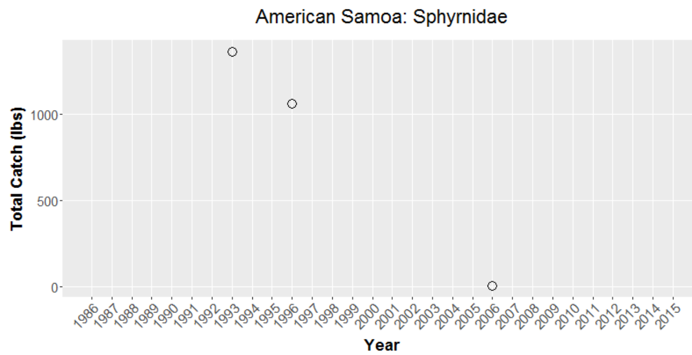
American Samoa: Sphyraena forsteri

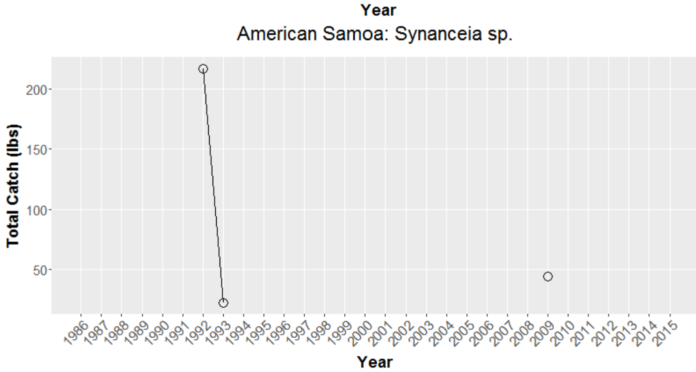


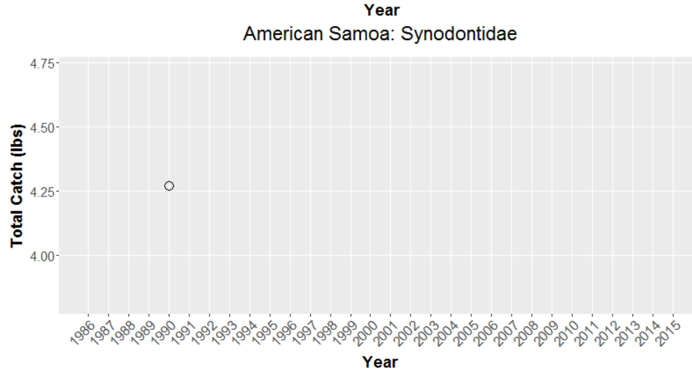

American Samoa: Sphyraena qenie
Total Catch (lbs)
Year

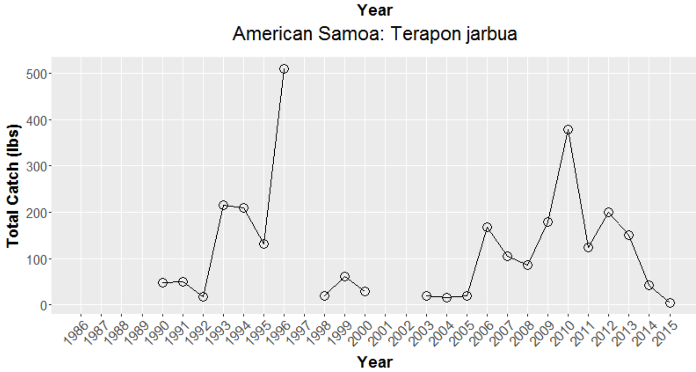

American Samoa: Sphyraena sp.
Total Catch (lbs)
Year

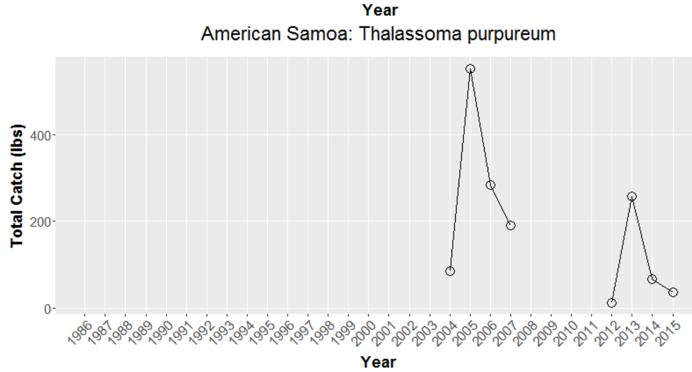

American Samoa: Sphyraenidae
Total Catch (lbs)
Year

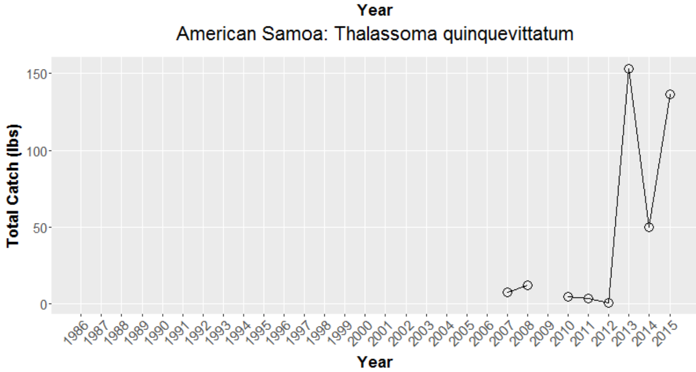

American Samoa: Sphyrnidae
Total Catch (lbs)
Year

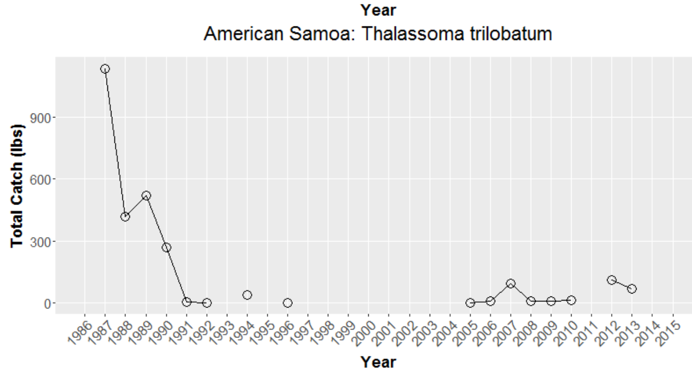

American Samoa: Synanceia sp.
Total Catch (lbs)
Year


American Samoa: Synodontidae
Total Catch (lbs)
Year


American Samoa: Terapon jarbua
Total Catch (lbs)
Year


American Samoa: Thalassoma purpureum
Total Catch (lbs)
Year


American Samoa: Thalassoma quinquevittatum
Total Catch (lbs)
Year


American Samoa: Thalassoma trilobatum
Total Catch (lbs)
Year

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