# Final Report
Reef Monitoring of the Artificial Reef Gen. Hoyt S Vandenberg
Key West, Florida
April 30, 2009 to July 19, 2010

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REEF Monitoring of Gen Hoyt S Vandenberg

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Background

The Gen. Hoyt S. *Vandenberg* is a 523' steel hulled missile tracking ship that was intentionally sunk seven miles off Key West, Florida, on May 27, 2009, to serve as a recreational diving and fishing artificial reef. The ship lies in 140' of water; at its broadest point the deck is 71' wide, creating habitat from 45' to the sandy bottom. The Vandenberg is the largest artificial reef in the Florida Keys National Marine Sanctuary and the second largest in the world. The City of Key West, the Artificial Reefs of the Keys (ARK), Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Keys National Marine Sanctuary (FKNMS) worked closely to obtain, clean, scuttle and sink the vessel, as well as raise funds for the effort. Prior to the sinking, the Reef Environmental Education Foundation (REEF) was contracted by the FWC   to conduct a study with pre- and post-deployment monitoring of the fish assemblages associated with the *Vandenberg* and adjacent reef areas for a period of one year. This document summarizes that effort.

REEF

REEF is an international non-profit marine conservation organization that runs hands-on grassroots activities designed to educate and engage local communities in conservation-focused activities. REEF is based in Key Largo, Florida, with a Pacific office in Seattle, Washington. The mission of REEF is to conserve marine ecosystems for their recreational, commercial, and intrinsic value by educating, enlisting and enabling SCUBA divers and other marine enthusiasts to become active stewards and citizen scientists. REEF links the diving community with scientists, resource managers and conservationists through marine-life data collection and related activities. REEF coordinates the Volunteer Survey Project, which has trained and involved over 12,000 divers and snorkelers in marine life identification and the collection of useful population and distribution data. This citizen science program has generated one of the largest marine life databases in the world, with over 140,000 surveys conducted to date. REEF's active surveyors achieve one of five ratings of expertise and the most accomplished of these ratings (level 4/5) are considered experts.   Active members holding expert surveyor status make up our Advanced Assessment Team and take part in high level assessments for the State of Florida, National Park Service, NOAA and other international organizations.

Monitoring objectives

The primary objectives of this effort were to descriptively and comparatively quantify the fish assemblages over time at the *Vandenberg* and nearby reefs to document change as a result of increased habitat provided by the sinking of the *Vandenberg*. In 2009, REEF implemented a year-long monitoring effort to document fish species presence/absence, sighting frequency, and estimated abundance over time at the *Vandenberg* site and at seven nearby natural and artificial reef sites (Table 1 and Figure 1). Comparing changes in fish assemblage similarity between sites and over time, documenting progression of recruitment on the ship, and addressing differences in community assemblages were key elements of this effort. Additional efforts to document the occurrence of any non-native marine fishes, orange cup coral (*Tubastraea coccinea*) or titan acorn barnacles (*Megabalanus coccopoma*) were included to facilitate early detection and rapid response removal efforts. These organisms have been known to colonize artificial structures in other areas of Florida (Schofield et al 2009, USGS NAS database 2010) and are of concern due to potential impacts to native systems.

Methods

The study employed two methods to quantify fish assemblages; Roving Diver Technique surveys (RDT; Schmitt & Sullivan 1996) and stationery visual counts (Bohnsack and Bannerot, 1986). The RDT is a visual survey method specifically designed to generate a comprehensive species list and sighting frequency and relative abundance estimates. During RDT surveys, divers swim freely throughout a dive site and record every observed fish species. During each survey, divers assign each recorded species one of four $\log_{10}$ abundance categories [single (1); few (2-10), many (11-100), and abundant (>100)]. The RDT survey methodology is employed by the REEF Volunteer Fish Survey Project, and all survey data are archived in the REEF Marine Life Sightings Database. Following each survey dive, the surveyor enters their species data along with survey time, depth (from dive computers), temperature (from dive computers), and other environmental information, including habitat type, current, and visibility (estimated) into the REEF database via on-line data entry. During entry and prior to final uploading, data undergo QC/QA checks including automated and human reviews. Once uploaded into the REEF database, summary data are displayed on the Internet at REEF's homepage (http://www.REEF.org) by geographic location. In addition to a species list, the following metrics can be calculated from survey data for each site:

Sighting Frequency (%SF) = number of surveys reporting species / total number of surveys at that site

and

Density Score (DEN)= [$(n_S \times 1)+(n_F \times 2)+(n_M \times 3)+(n_A \times 4)$] / ($n_S + n_F + n_M + n_A$)

where n is the number of times each abundance category was assigned and s=single, f=few, m=many and a=abundant (the four categories of abundance recorded during RDT surveys). Using these two metrics, a weighted measure of abundance, Abundance Score, can be calculated as

Abundance Score= %SF * DEN

These Abundance Scores were used in ranking species for similarity analysis.

The RDT method does not include size estimates and so documenting changes in size structure is not be possible from this dataset. To document sizes of fish over time, we conducted stationary visual (SV) surveys on the *Vandenberg* and at one nearby reference site (Joe's Tug). During SV surveys the diver is stationery in the middle of an imaginary cylinder with a radius of 7.5m, recording all species present in the cylinder for a period of 5 minutes. Following the 5 minute list compilation, an abundance count and the corresponding minimum, maximum and mean sizes are recorded for each species present in the cylinder area. Additional information on time of day, depth, current, and visibility are recorded.

During all surveys, the occurrence of non-native marine species (including lionfish; *Pterois volitans/miles*), titan acorn barnacle (*Megabalanus coccopoma)*, and orange cup coral (*Tubastraea coccinea*), was recorded and the information was passed to FKNMS staff within 48 hours of the sighting.

Each sampling event was conducted by a team of REEF Advanced Assessment Team (AAT) members. The AAT is comprised of REEF surveyors who have achieved a Level 4 or 5 REEF experience level (Expert rating) through testing and a requisite number of diving surveys and have considerable experience and expertise in surveying local fish populations.

Eight sites were surveyed during each monitoring event. These included the *Vandenberg* sinking site, six adjacent natural reefs, and one artificial reef (Table 1). Dives were conducted using scuba from a commercial dive vessel (Dive Key West) with between 5-8 divers taking part in each dive. Shallow dive times were standardized to 60 minutes for each diver while deeper dives were standardized to 30 minutes. As per the original monitoring agreement, Vandenberg dives did not exceed 100 fsw nor did they penetrate any part of the inside of the ship. Vandenberg surveys were conducted primarily during swims along the main deck and superstructure. Surveying

was conducted once prior to deployment in April 2009. Post-deployment monitoring began 34 days following deployment and continued quarterly for the following three quarters for a total of five monitoring events. Between five and eight RDT surveys were conducted at each site during each monitoring period (Forty surveys were conducted during the March 2010 event, as opposed to the planned 48, due to diver equalization problems leaving the team one diver short. Eastern Dry Rocks sites also had two other events with only five surveys due to diver health issues and one set of point count data was lost from Joe's Tug when a diver was boarding the vessel during the November 2009 event.) (Table 2).

Table 1

| REEF SITE NAME	REEF Code	DEPTH	TYPE	LOCATION
Western Sambos Deep	34080094	60'-100'	Natural	24º 28.66' N/ -81º 42.93' W
Western Sambos Shallow	34080001	15'-30'	Natural	24º 28.75' N/ -81º 42.98' W
Joe's Tug	34080010	40'-65'	Artificial	24º 27.83' N/ -81º 44.24' W
Marker 32 Deep	34080095	60'-100'	Natural	24º 28.25' N/ -81º 44.72' W
Marker 32 Shallow	34080023	15'-30'	Natural	24º 28.34' N/ -81º 44.73' W
Eastern Dry Rocks Deep	34080096	60'-100'	Natural	24º 27.45' N/ -81º 50.44' W
Eastern Dry Rocks Shallow	34080008	15'-30'	Natural	24º 27.52' N/ -81º 50.67 W
Gen. Hoyt S Vandenberg	34080097	40'-100'	Artificial	24º 27.60' N/ -81º 44.25' W

Table 2. RDT and Point Count (PC) survey effort during monitoring events 1-5.

	4/30-5/3,2009 Event1	6/30-7/4,2009 Event 2	11/13-11/14,2009 Event 3	3/27-3/28,2010 Event 4	7/14-7/19,2010 Event 5
Vandenberg	6	6+2pc	6+2pc	5+2pc	7+2pc
Joe's Tug	6+2pc	6+2pc	6+1pc	5+2pc	8+2pc
Western Sambos Deep	6	6	6	5	6
Western Sambos Shallow	7	6	6	5	6
Marker 32 Deep	6	6	6	5	6
Marker 32 Shallow	6	6	6	5	6
Eastern Dry Rocks Deep	6	6	5	5	5
Eastern Dry Rocks Shallow	6	6	5	5	5
Total RDT	49	48	46	40	49
Total PC	2	4	3	4	4

Site Descriptions
The *Vandenberg* is located on a level sand bottom at a depth of approximately 140'. The seven reference sites were selected in consultation with FWC staff and represent a range of nearby natural and artificial structure (Figure 1 and Table 1)). The closest structure to the Vandenberg is a small patch of hard coral substrate and remnant sunken vessel rubble (*Joe's Tug*) located approximately 0.25 miles from the sinking location in a depth of approximately 70'. The nearest substantial reef structures are the natural reef edges at Marker 32 deep and Marker 32 (Topino Buoy), approximately 0.80 miles shoreward of the sinking site. These reefs include a sloping drop-off featuring a sediment covered low profile hardbottom with sparse coverings of small hard corals, soft corals such as gorgonians, and sponges and a shallow spur and groove reef featuring high profile coral ridges and *Montasrea* coral heads separated by narrow sand channels. Located approximately 1.8 miles east of the sinking site are Western Sambos Deep and Western Sambos Shallow (Haystacks buoy). These two sites are similar in depth and structure to the Marker 32 deeper and shallower sites, but differ from all other sites in that they are located inside a no-take Ecological Reserve zone of the FKNMS. The furthest study sites from the *Vandenberg* (6.5 miles West) are Eastern Dry Rocks Deep and Shallow, again featuring a deeper sloping reef similar in depth and structure to the Deep Sambos and Marker 32 site, and a shallow spur and groove site at the West end of Eastern Dry Rocks.

Figure 1. Aerial image of survey sites

Results and Discussion
RDT surveys
A total of 218 fish species were identified from all sites within the study area between April 2009 and July 2010. Of these, 59 species were found at all sites and 34 species were sighted at a single site (Appendix 1). Fish species rapidly colonized the *Vandenberg* following deployment with thirty species documented on the wreck less than a month after it was deployed (Figure 2). During the November 2009 survey, the team documented 52 species and within six months of sinking, 100 different fish species had been documented on REEF surveys at the *Vandenberg*. Total number of species reported from the ship increased to 123 species by the end of the survey period. When comparing species richness among sites, the shallow sites consistently showed the highest richness during each monitoring event (Fig 2). Cumulatively, the Eastern Dry Rocks Shallow and Western Sambos Shallow sites had the most species reported during the monitoring period with 182 and 157 species, respectively, and the Marker 32 Deep was the lowest with 116 species reported (Appendix 1). A comprehensive list of fish species recorded on the *Vandenberg* during REEF surveys (both during the coordinated monitoring events and during individual REEF volunteer efforts) is given in Appendix 2A and 2B, respectively.

Figure 2 Number of fish species reported at each site during each monitoring event
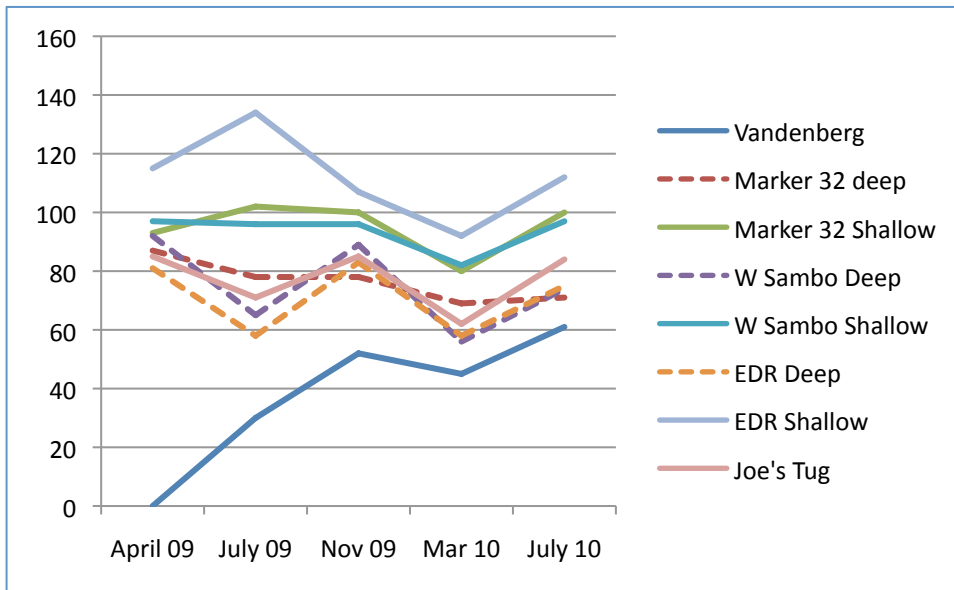
RDT Analysis

The software package Primer (by Marti Anderson) was used in calculating statistics and generating MDS ordination plots. The persistence in species present at the *Vandenberg* (e.g. the similarity of which species were seen during each monitoring event) as measured by the Jaccard Coefficient (J'), gradually increased through time (Figure 3). The Jaccard Coefficient measures similarity between sample sets, and is defined as the size of the intersection divided by the size of the union of the sample sets. In this instance we are measuring the percent similarity in species present between two sites or between two time points at a given site. A J' of 0.7 indicates a 70% overlap in species present between the two samples. Relatively low J' values between the first few monitoring events reflect the early colonization of the artificial reef. Over time we would expect to see the similarity in species present from one monitoring event to the next increase as the fish community on the ship became more stable. Indeed, the difference between the March 2010 and final July 2010 events show an overlap of close to 0.60 (indicating overlap of 60% in species present from one time period to the next, which approaches the similarity at natural reference sites). To evaluate the persistence in species composition (incorporating both species presence and abundance), Spearman Similarity Coefficient values were calculated based on the rank abundance scores of species with a sighting frequency of at least 10% at each site (Table 4). The similarity in species composition was generally lowest for the three shallow sites and highest at the deeper reference sites. This is likely due to the fact that shallow sites are not only more diverse, but also the habitat more variable than at the deeper sites. Lower similarities exhibited during the June 2009 and March 2010 events (Figure 4) may be due to poor visibility effects on both observers and on fish behaviours (Table 3).

Table 3. Estimated visibility across sites and survey periods

	March 09	June 09	November 09	March 10	July 10
Vandenberg	60	30	45	20	80
Joe's Tug	40	20	30	15	60
Eastern Dry Rocks	25	15	35	25	25
Eastern Dry Rocks Deep	20	8	35	10	30
Marker 32	20	10	35	10	25
Marker 32 Deep	20	12	30	8	18
Western Sambos	20	10	35	15	15
Western Sambos Deep	20	10	40	8	15
Average Visibility (ft)	28.15	14.37	35.62	13.87	33.5
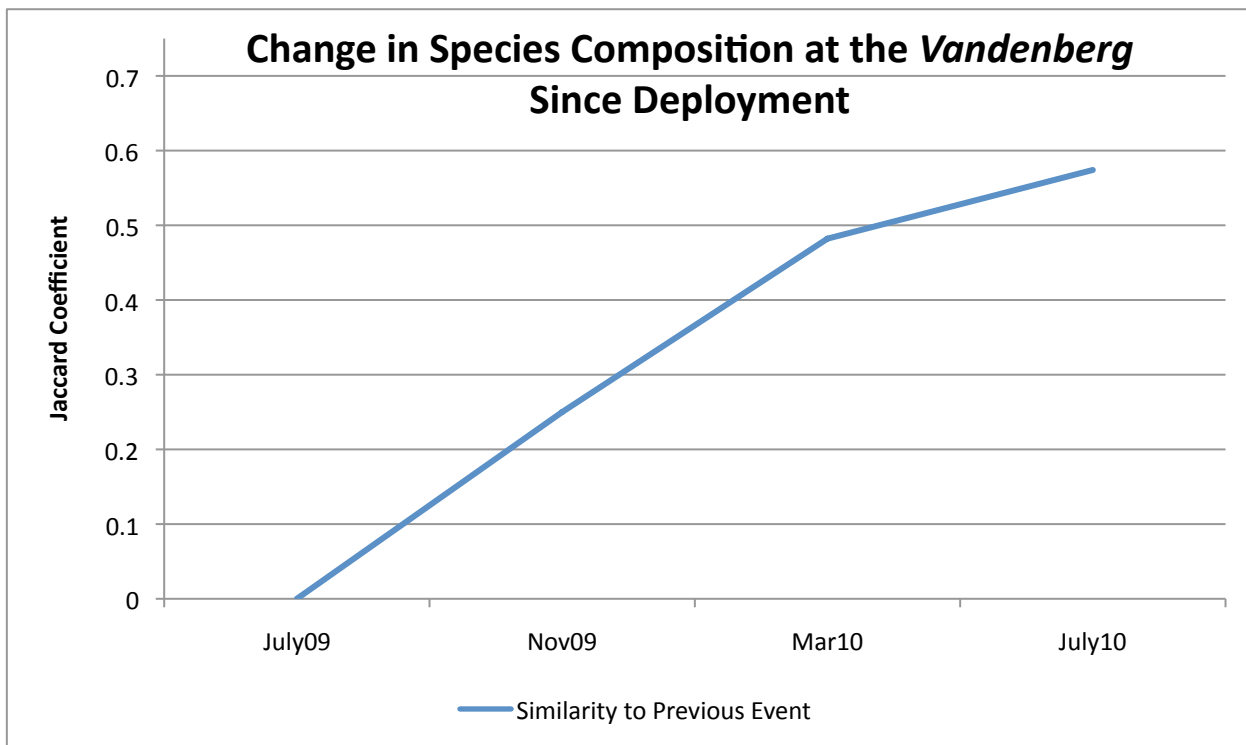
Figure 3. Change in fish species composition at the Vandenberg through time, as measured by the Jaccard Coefficient of each monitoring event compared with species recorded during the previous monitoring event.
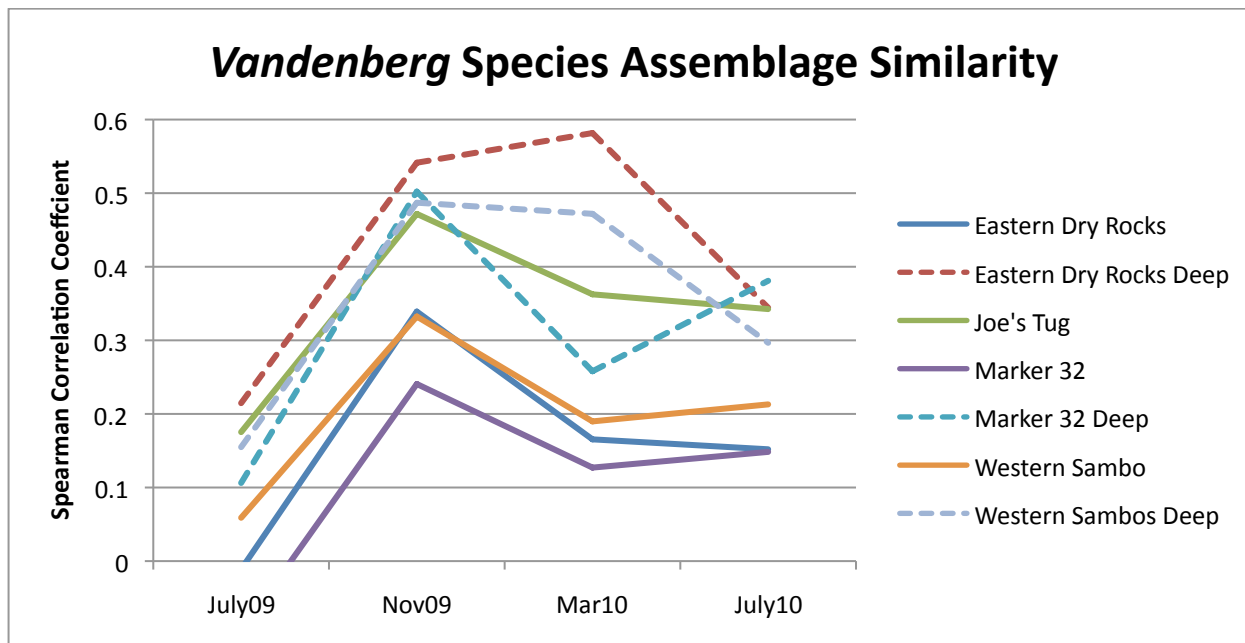
Figure 4. Comparison of fish community similarity between Vandenberg and reference sites.

Table 4. Similarity in species present among monitoring events for each site, measured by percent overlap in species present. Values given are mean Jaccard Coefficient (J') values for all events.

Site	J'
Eastern Dry Rocks	0.492
Eastern Dry Rocks Deep	0.609
Joe's Tug	0.633
Marker 32	0.640
Marker 32 Deep	0.288
Vandenberg	0.399
Western Sambos	0.553
Western Sambos Deep	0.665

*Value given for the Vandenberg does not include the similarity between monitoring time 1 and 2 (which is 0, due to no species sighted). If that is included, the value would be 0.299.

Ordination plots

In order to determine the degree of similarity between the fish species assemblage at the *Vandenberg* site over time and in comparison to other reference sites, we developed Multi-Dimensional Scaling (MDS) ordination plots based on the Gower similarity index using presence/absence and abundance. In Figure 4, Pearson's correlations show that the earlier *Vandenberg* surveys were characterized by sand dwelling and pelagic species such as chalk bass, juvenile grunts, blackfin snapper, and amberjack. Subsequently, in later surveys, correlations were driven by angelfishes, parrotfishes, surgeonfishes, and many other reef-dwelling species. This figure also shows that individual surveys tend to group together based on survey date, showing a higher degree of similarity between divers during the same event compared to differences between events. This similarity provides support for diver consistency and accuracy in observations.

When comparing the *Vandenberg* to reference sites, the fish communities at the ship were most similar to those at the deep reference sites and the *Vandenberg* becomes more similar to these sites over time (Figure 5). Figure 5 also shows vectors representing similarity between sites driven by butterflyfish, parrotfish, blennies, and other reef-dwelling species.

Figure 4. Ordination plot of Vandenberg fish assemblage over time. Numbers/symbols represent monitoring events 2-5.
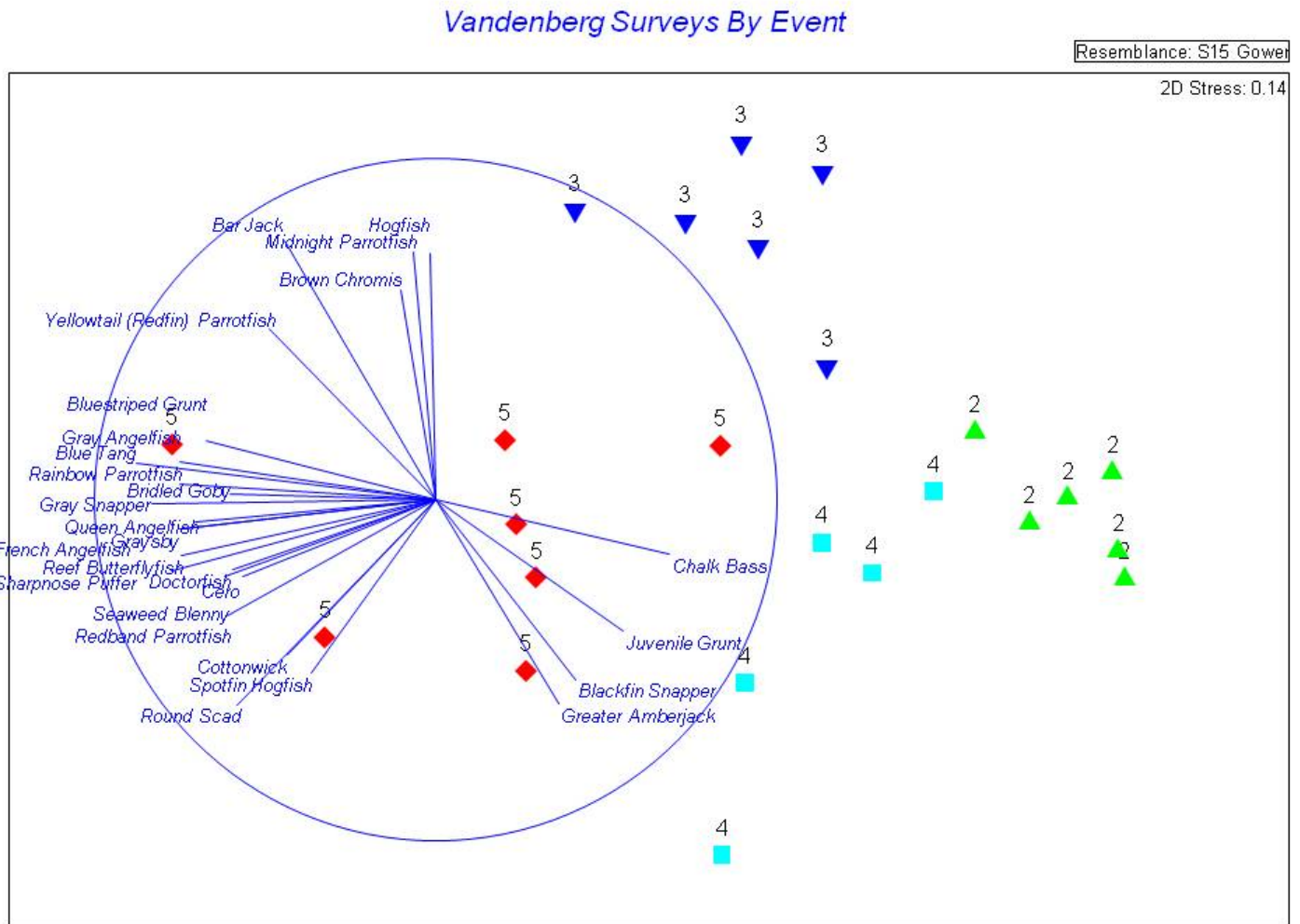
Figure 5 Ordination plot of fish assemblages at study sites over time
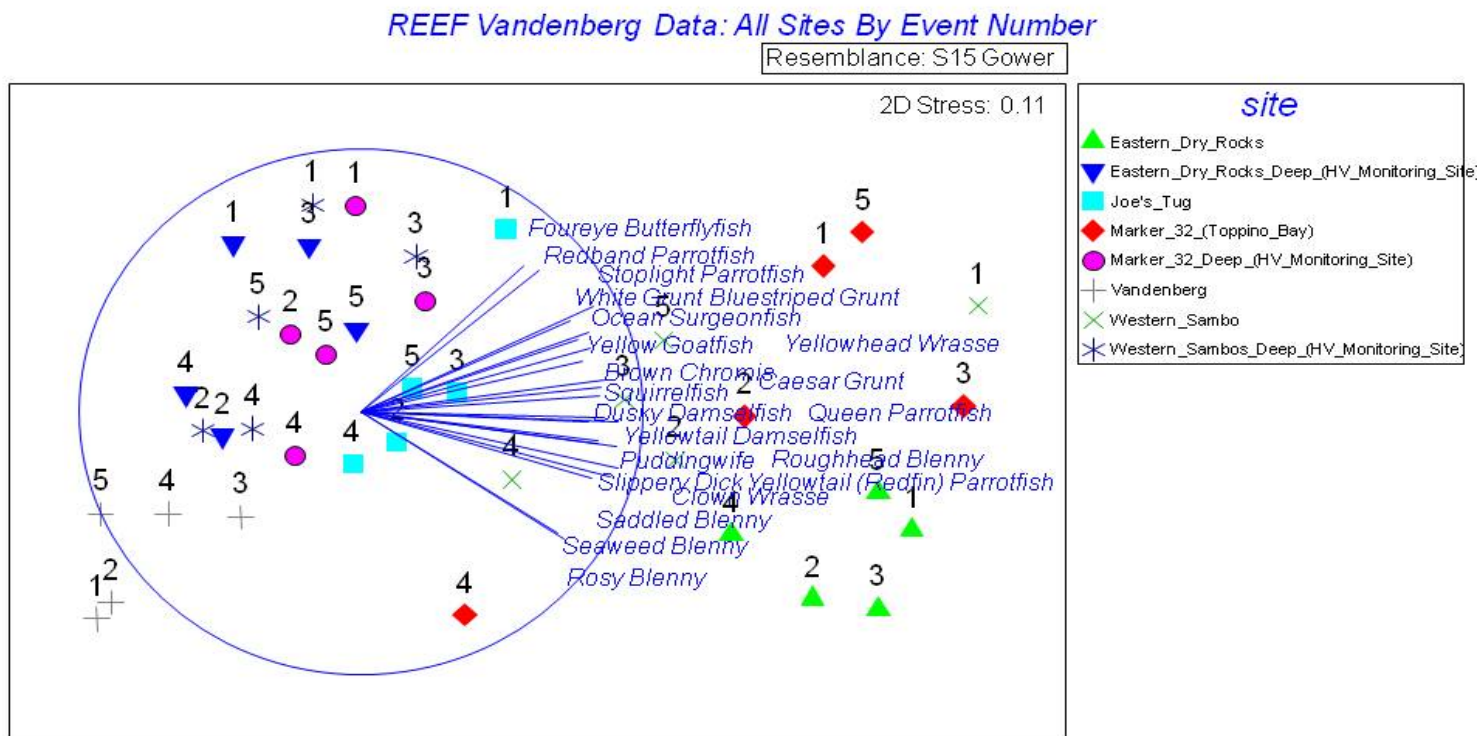
Stationary Visual Point Count Data
During each survey event at the *Vandenberg* and Joe's Tug, point count (PC) survey data were gathered by two divers during the beginning of each dive. Following point count surveys divers completed RDT surveys for the remainder of their dives and included PC sightings in their RDT survey data. Surveys were conducted at approximately 80' on the upper decks of the Vandenberg and at 70' within 100' of the mooring at Joe's Tug. Abundance and size of each fish species was recorded and data were entered into an Excel spreadsheet (attached Appendix 3). Differences between surveys were very high and with only 2-3 surveys per event, statistical analysis on this low sample size is unable to determine variation or establish error. For these reasons, these data are included as reference only. Of note in the point count results are the large numbers of individual fish on the *Vandenberg* during the March and July 2010 surveys (see Table 4) dominated primarily by round scad observed feeding on plankton in the water column above the ship. The larger number of individual fish documented on Joe's Tug consisted primarily of french and bluestriped grunts and masked gobies.

Table 5. Point count data representing number of species and number of fish seen in each survey.

	04/09 species	04/09 # fish	07/09 species	07/09 # fish	11/09 species	11/09 # fish	03/10 species	03/10 # fish	07/10 species	07/10 # fish
Vandenberg										
Diver 1	0	0	4	70	9	43	11	4561	20	699
Diver 2	0	0	6	49	12	87	12	125	14	226
Diver 3	0	0	-	-	7	93	-	-	-	-
Joe Tug										
Diver 1	23	113	25	228	15	112	14	213	18	157
Diver 2	18	209	-	-	30	99	16	266	30	423
Diver 3	23	315	-	-	20	464	-	-	-	-

Exotic Species

Lionfish (*Pterois volitans)* were the only non-native species observed during the project monitoring events. Team members reported lionfish from Joe's Tug and from Eastern Dry Rocks during events in March and July 2010. These reports were forwarded immediately to the FKNMS. Lionfish were not reported from project surveys at the Vandenberg site. However, both lionfish reports and removals by recreational divers have taken place on the ship since its sinking.   Most lionfish reports from the site have come from deeper areas near the bottom of the ship, at depths beyond those included in this monitoring effort, and removals by volunteers have been ongoing in efforts to keep populations down.

Conclusion

REEF monitored the fish assemblages of the *Vandenberg* and seven nearby natural and artificial reefs in Key West, Florida, from April 2009, prior to the ship's sinking, through July 2010. In the 12 months following deployment, fishes began to take residence on the *Vandenberg*. The total number of species present increased over time, from 30 species documented on the wreck approximately one month after it was sunk to a total of 123 species documented during the entire report period. Notable species such as little tunny, school bass, mackerel scad, king mackerel, almaco jack, and bank butterflyfish were sighted only on the *Vandenberg*. The overall persistence in species presence on the wreck was relatively low between early monitoring events just following deployment, however, by the end of year one, persistence in species composition increased to levels closer to those of the surrounding natural reefs.   Currently, the species composition of the *Vandenberg* just one year after deployment appears more similar to that of the deeper, natural reefs and least similar to that of the shallow reference sites.

Recommendations for Future Assessments

After completing the first year of the *Vandenberg* assessment, REEF offers two recommendations for continuation of this monitoring program:

1) Increase survey effort on the artificial reef structure itself. Due to the large size of the *Vandenberg* (500+') and the depth (~100-110' survey area), it is often impossible to survey the entire deck structure with a six-person team on a single dive. Sea conditions, currents, mooring buoy availability, and visibility also conspire to make a single assessment dive that covers the entire wreck untenable. It is recommended that survey effort be doubled on the *Vandenberg*, covering half the ship on each dive.

2) Increase effort of Stationary Visual surveys. Data resulting from only two point count surveys is not statistically capable of providing any measure of variation. In addition, the area (~350 sq meters) assessed during two point count surveys represents such a small portion of the overall ship structure that placement of the point count

surveys could widely influence results. It is recommended that at least 6 point counts be conducted on the site at set stations on the wreck to address biomass and size distribution questions.

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Appendix 1. Species sightings across monitoring sites, Green represents sightings at all sites, Yellow represents sightings at only a single site.

Species	Vandenberg	Marker 32 Deep	Marker 32 Shallow	Western Sambos Deep	Western Sambos Shallow	EDR Deep	EDR Shallow	Joe's Tug
Almaco Jack	x							
Atlantic Spadefish						x	x	x
Balloonfish			x		x		x	
Ballyhoo							x	
Banded Butterflyfish	x	x	x		x	x	x	x
Banded Jawfish							x	
Bandtail Puffer	x	x		x		x	x	
Bank Butterflyfish	x							
Bar Jack	x	x	x	x	x	x	x	x
Barred Blenny	x							
Barred Cardinalfish	x		x	x			x	
Barred Hamlet	x	x			x			
Beaugregory	x	x	x	x	x	x	x	x
Bermuda Chub/Yellow Chub	x	x	x	x	x	x	x	x
Bicolor Damselfish	x	x	x	x	x	x	x	x
Bigeye						x		
Black Grouper	x	x	x	x	x	x	x	x
Blackfin Snapper	x						x	
Black Margate		x	x	x	x	x	x	x
Blackbar Soldierfish			x				x	
Blackear Wrasse					x		x	
Blue Angelfish	x	x	x	x	x	x	x	x
Blue Chromis	x	x	x	x	x	x	x	x
Blue Dartfish (Blue Goby)		x	x	x			x	x
Blue Hamlet		x		x	x	x	x	x
Blue Parrotfish	x	x	x	x	x		x	x
Blue Runner	x	x		x	x	x	x	x
Blue Tang	x	x	x	x	x	x	x	x
Bluehead	x	x	x	x	x	x	x	x
Bluelip Parrotfish	x	x	x	x	x		x	x
Bluestriped Grunt	x	x	x	x	x	x	x	x
Boga	x							x
Bridled burrfish						x		
Bridled Goby	x	x	x	x	x	x	x	x
Brown Chromis	x	x	x	x	x	x	x	x
Bucktooth Parrotfish					x		x	
Butter Hamlet	x	x	x	x	x	x	x	x
Caesar Grunt	x	x	x	x	x		x	x
Cero	x	x	x	x	x	x	x	x
Chalk Bass	x			x	x	x	x	x
Cherubfish	x		x		x			x
Clown Wrasse	x	x	x		x	x	x	x

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Species	1	2	3	4	5	6	7	8
Cocoa Damselfish	x	x	x	x	x	x	x	x
Colon Goby	x	x	x	x	x		x	x
Coney		x		x	x	x	x	x
Cottonwick	x		x		x	x	x	x
Creole Wrasse	x	x	x	x	x	x	x	x
Creole-fish	x						x	x
Crevalle Jack	x					x	x	
Cubera Snapper	x					x		
Cubbyu								x
Dash Goby					x		x	
Darkheaded Blenny			x		x			
Doctorfish	x	x	x	x	x	x	x	x
Dog Snapper			x	x	x	x	x	
Dusky Cardinalfish					x			
Dusky Damselfish	x	x	x	x	x		x	x
Dusky Jawfish			x		x		x	
Dusky Squirrelfish			x				x	
Emerald Parrotfish					x		x	
Flamefish			x		x		x	
Foureye Butterflyfish	x	x	x	x	x	x	x	x
French Angelfish	x	x	x	x	x	x	x	x
French Grunt	x	x	x	x	x	x	x	
Gag			x	x	x		x	x
Glasseye Snapper			x					
Glassy Sweeper			x		x		x	
Goldentail Moray			x		x		x	x
Goldspot Goby	x	x	x	x	x	x	x	x
Goliath Grouper (Jewfish)	x	x		x		x	x	x
Gray Angelfish	x	x	x	x	x	x	x	x
Gray Snapper	x	x	x	x	x	x	x	x
Gray Triggerfish	x						x	
Graysby	x	x	x	x	x	x	x	x
Great Barracuda	x	x	x	x	x	x	x	x
Greater Amberjack	x			x	x			x
Greater Soapfish			x				x	x
Green Moray		x	x	x	x	x		x
Green Razorfish		x	x		x		x	
Greenblotch Parrotfish	x	x	x	x	x	x	x	x
Hamlet - Juvenile			x	x	x	x	x	x
Harlequin Bass	x	x	x	x	x	x	x	x
Highhat		x	x		x	x	x	x
Hogfish	x	x	x	x	x	x	x	x
Honeycomb Cowfish		x					x	x
Horse-Eye Jack	x				x		x	
Hovering Dartfish (Hovering Goby)			x	x		x		
Jolthead Porgy		x	x	x	x		x	
Juvenile Grunt	x	x	x	x	x	x	x	x
King Mackerel	x							
Knobbed Porgy		x	x	x	x	x	x	

Species	C1	C2	C3	C4	C5	C6	C7	C8
Lancer Dragonet		x						
Lane Snapper		x	x	x	x	x	x	x
Lantern Bass		x	x		x		x	
Leopard Goby						x		
Little Tunny	x							
Longfin Damselfish	x	x	x	x	x	x	x	x
Longjaw Squirrelfish		x	x					
Longsnout Butterflyfish	x					x		
Longspine Squirrelfish		x	x	x	x	x	x	x
Mackerel Scad	x							
Mahogany Snapper	x	x	x	x	x	x	x	
Marbled Blenny							x	
Masked Goby/Glass Goby	x	x	x	x	x	x	x	x
Midnight Parrotfish	x	x	x		x	x	x	x
Mirrorwing Flyingfish					x			
Mutton Snapper		x	x	x	x	x	x	x
Nassau Grouper		x		x	x		x	
Neon Goby		x	x	x	x	x	x	x
Nurse Shark	x		x	x	x	x	x	
Ocean Surgeonfish	x	x	x	x	x	x	x	x
Ocean Triggerfish	x				x	x	x	x
Orangespotted Filefish			x		x		x	
Pallid Goby		x	x	x	x	x	x	x
Papillose Blenny			x					
Permit					x		x	
Porcupinefish			x		x		x	x
Porkfish	x	x	x	x	x	x	x	x
Princess Parrotfish	x	x	x	x	x	x	x	x
Puddingwife			x	x	x		x	x
Pugjaw Wormfish					x			
Purple Reeffish	x	x	x	x	x	x	x	x
Purplemouth Moray							x	
Pygmy Filefish	x							
Queen Angelfish	x	x	x	x	x	x	x	x
Queen Parrotfish	x	x	x	x	x	x	x	x
Queen Triggerfish	x							
Rainbow Parrotfish	x	x	x		x	x	x	x
Rainbow Runner	x							x
Rainbow Wrasse							x	
Red Grouper				x	x		x	
Red Hind		x	x	x	x	x	x	
Red Lionfish (exotic)		x					x	x
Redband Parrotfish	x	x	x	x	x	x	x	x
Redeye Triplefin					x			

17

Species	1	2	3	4	5	6	7	8
Redlip Blenny			x		x		x	
Redspotted Hawkfish	x		x		x		x	
Redtail Parrotfish	x	x	x	x	x	x	x	x
Reef Butterflyfish	x	x	x	x	x	x	x	x
Reef Croaker						x	x	x
Reef Shark							x	
Reef Squirrelfish			x				x	
Rock Beauty	x	x	x	x	x	x	x	x
Rock Hind		x	x	x	x	x	x	x
Rosy Blenny			x		x	x	x	
Rosy Razorfish			x		x		x	
Roughhead Blenny		x	x	x	x	x	x	x
Round Scad	x							x
Rusty Goby				x	x		x	
Saddled Blenny	x	x	x	x	x	x	x	x
Sand Diver						x		x
Sailfin Blenny			x		x		x	
Sailors Choice	x	x	x	x	x		x	
Sand Diver		x		x	x		x	
Sand Tilefish			x				x	
Saucereye Porgy		x	x	x	x	x	x	x
Scamp	x			x		x	x	
School Bass	x							
Schoolmaster	x	x	x	x	x	x	x	x
Scrawled Cowfish		x	x	x	x	x	x	x
Scrawled Filefish	x		x	x	x		x	x
Seaweed Blenny	x		x		x	x	x	x
Sergeant Major	x	x	x	x	x		x	x
Sharksucker	x	x	x	x	x	x	x	x
Sharpnose Puffer	x	x	x	x	x	x	x	x
Shy Hamlet							x	
Silver Porgy			x					
Silversides, Herrings, Anchovies	x						x	
Slender Filefish	x		x	x	x		x	x
Slippery Dick	x	x	x	x	x	x	x	x
Smallmouth Grunt	x	x	x		x	x	x	
Smooth Trunkfish			x	x	x		x	x
Southern Stingray					x	x	x	
Spanish Grunt	x	x	x	x	x	x	x	x
Spanish Hogfish	x	x	x	x	x	x	x	x
Spotfin Butterflyfish	x	x	x	x	x	x	x	x
Spotfin Hogfish	x	x			x		x	x
Spottail Pinfish		x	x				x	
Spotted Drum			x	x	x	x	x	
Spotted Eagle Ray							x	
Spotted Goatfish	x	x	x	x	x	x	x	x
Spotted Moray		x	x			x	x	
Spotted Scorpionfish	x	x	x	x	x		x	
Spotted Trunkfish		x	x	x	x		x	x
Squirrelfish		x	x	x	x	x	x	x

Species	1	2	3	4	5	6	7	8
Starksia Blenny (unidentified)				x				
Stoplight Parrotfish	x	x	x	x	x	x	x	x
Striped Grunt	x		x					
Striped Parrotfish	x	x	x	x	x	x	x	x
Sunshinefish	x	x	x	x		x	x	x
Tan Hamlet				x			x	
Tarpon	x		x		x		x	
Threespot Damselfish	x	x	x	x	x	x	x	x
Tiger Grouper							x	
Tobaccofish	x	x	x	x	x		x	x
Tomtate	x	x	x	x	x	x	x	x
Townsend Angelfish		x		x		x	x	x
Triplefin species			x	x	x		x	x
Trumpetfish	x	x	x	x	x	x	x	x
Twospot Cardinalfish	x							
White Grunt	x	x	x	x	x	x	x	x
White Margate	x		x	x	x		x	
Whitespotted Filefish			x			x	x	
Wrasse Blenny	x		x		x	x	x	
Yellow Goatfish	x	x	x	x	x	x	x	x
Yellow Jack	x		x		x	x	x	x
Yellow Stingray			x					
Yellowcheek Wrasse		x	x					x
Yellowface Pikeblenny							x	
Yellowfin Grouper	x					x	x	
Yellowfin Mojarra				x		x		
Yellowhead Jawfish		x	x	x	x		x	x
Yellowhead Wrasse	x	x	x	x	x	x	x	x
Yellowmouth Grouper	x					x	x	
Yellowtail (Redfin) Parrotfish	x	x	x	x	x	x	x	x
Yellowtail Damselfish		x	x	x	x	x	x	x
Yellowtail Reeffish	x	x		x	x	x		x
Yellowtail Snapper	x	x	x	x	x	x	x	x

Appendix 2 – Summary of Vandenberg sightings from REEF database, between 4/1/2009 and 7/31/2010; report can also be accessed with this URL-
http://www.reef.org/db/reports/geo/TWA/34080097/2009-04-01/2010-07-31

Appendix 3 - Spreadsheet of Stationery Visual data

Geographic Zone Report

Region:
Tropical Western Atlantic ⬍

Geographic Zone:
Vandenberg (Hoyt Vandenberg Artificial Reef) (34080097)

Start Date:
Apr ⬍   1 ⬍   2009 ⬍

End Date:
Jul ⬍   31 ⬍   2010 ⬍

Species Display:
Chart (New) ⬍

Show:
Common names ⬍

(Change)
[Reset report options](#) [1]

Survey Type: SA = Species & Abundance; SO = Species Only[?] [2]
Click on a geographic place name to expand its sub-zones, or on a numeric zone ID to include only sites under that ID

| | | Surveys | | | | Bottom Time |
| | | Expert | | Novice | | |
Code	**Site**	**SA**	**SO**	**SA**	**SO**	**(H:M)**
[TWA](#) [3]						
3 [4]	FLORIDA (East Coast and Keys)	36	0	12	3	23:54
34 [5]	KEYS (Key Largo to Key West, including Fla. Bay)	36	0	12	3	23:54
[3408](#) [6]	Key West	36	0	12	3	23:54
[34080097](#) [7]	Vandenberg (Hoyt Vandenberg Artificial Reef)	36	0	12	3	23:54
TOTALS		36	0	12	3	23:54

Species

%SF = Sighting Frequency; DEN = Density Score[?] [2]

Bar length corresponds to sighting frequency
Color saturation corresponds to density score

Species	
Great Barracuda	SF: 86.3% I DEN: 2.5
Yellowtail Snapper	SF: 78.4% I DEN: 3.2
Bluehead	SF: 74.5% I DEN: 3.2
Bicolor Damselfish	SF: 72.5% I DEN: 2.9
Sharpnose Puffer	SF: 66.7% I DEN: 2.2
Blue Tang	SF: 62.7% I DEN: 2.2
Reef Butterflyfish	SF: 62.7% I DEN: 2.2
Gray Snapper	SF: 60.8% I DEN: 3
Purple Reeffish	SF: 58.8% I DEN: 2.2
Harlequin Bass	SF: 52.9% I DEN: 1.8
Sunshinefish	SF: 51% I DEN: 2.5
Rainbow Parrotfish	SF: 51% I DEN: 1.4
Scrawled Filefish	SF: 49% I DEN: 1.5
Spanish Hogfish	SF: 47.1% I DEN: 1.8
Bar Jack	SF: 47.1% I DEN: 2.7
Queen Angelfish	SF: 45.1% I DEN: 1.7
Ocean Surgeonfish	SF: 43.1% I DEN: 2.2
Gray Angelfish	SF: 43.1% I DEN: 1.5
Creole Wrasse	SF: 41.2% I DEN: 2.7
Porkfish	SF: 39.2% I DEN: 1.7
Round Scad	SF: 37.3% I DEN: 4
Bluestriped Grunt	SF: 35.3% I DEN: 2.1
Striped Grunt	SF: 33.3% I DEN: 3.2
Rock Beauty	SF: 33.3% I DEN: 1.5
Yellowtail Reeffish	SF: 33.3% I DEN: 1.9
Cero	SF: 31.4% I DEN: 2.1
Spotfin Hogfish	SF: 31.4% I DEN: 1.9
Redband Parrotfish	SF: 29.4% I DEN: 2.4
Striped Parrotfish	SF: 29.4% I DEN: 2.1
Hogfish	SF: 29.4% I DEN: 1.8
Butter Hamlet	SF: 27.5% I DEN: 1.6
Creole-fish	SF: 27.5% I DEN: 2.3

Species	Data
French Angelfish	SF: 27.5% I DEN: 1.6
Brown Chromis	SF: 27.5% I DEN: 2.4
Tomtate	SF: 27.5% I DEN: 2.1
Greater Amberjack	SF: 25.5% I DEN: 2.2
Trumpetfish	SF: 23.5% I DEN: 1.4
Graysby	SF: 23.5% I DEN: 1.8
Yellow Jack	SF: 23.5% I DEN: 2.4
Doctorfish	SF: 23.5% I DEN: 1.7
Cottonwick	SF: 21.6% I DEN: 1.8
Juvenile Grunt	SF: 21.6% I DEN: 3.4
Seaweed Blenny	SF: 19.6% I DEN: 2.2
Silversides, Herrings, Anchovies	SF: 17.6% I DEN: 4
Stoplight Parrotfish	SF: 17.6% I DEN: 2.8
Redspotted Hawkfish	SF: 17.6% I DEN: 1.6
Yellowtail (Redfin) Parrotfish	SF: 15.7% I DEN: 1.9
Redtail Parrotfish	SF: 15.7% I DEN: 1.6
Blackfin Snapper	SF: 13.7% I DEN: 2
Bridled Goby	SF: 13.7% I DEN: 2.1
Spotfin Butterflyfish	SF: 13.7% I DEN: 1.9
Chalk Bass	SF: 13.7% I DEN: 2
Yellowhead Wrasse	SF: 13.7% I DEN: 3.1
Midnight Parrotfish	SF: 13.7% I DEN: 1.4
Tobaccofish	SF: 13.7% I DEN: 1.3
Blue Chromis	SF: 11.8% I DEN: 2.8
Spotted Goatfish	SF: 11.8% I DEN: 1.8
Slender Filefish	SF: 11.8% I DEN: 1.5
Queen Parrotfish	SF: 11.8% I DEN: 2
Almaco Jack	SF: 11.8% I DEN: 2.5
Blue Parrotfish	SF: 11.8% I DEN: 2
Yellowfin Grouper	SF: 11.8% I DEN: 1.2
Scamp	SF: 11.8% I DEN: 1
Goliath Grouper (Jewfish)	SF: 11.8% I DEN: 1.3
Greenblotch Parrotfish	SF: 11.8% I DEN: 2
French Grunt	SF: 9.8% I DEN: 2

Goldspot Goby	SF: 9.8% I DEN: 1.8
Sharksucker	SF: 9.8% I DEN: 2
Black Grouper	SF: 9.8% I DEN: 1.2
Princess Parrotfish	SF: 9.8% I DEN: 1.6
Cubera Snapper	SF: 9.8% I DEN: 1.2
Spotted Scorpionfish	SF: 7.8% I DEN: 1.8
White Grunt	SF: 7.8% I DEN: 1.8
Smallmouth Grunt	SF: 7.8% I DEN: 2.8
Sailors Choice	SF: 7.8% I DEN: 2
Yellowmouth Grouper	SF: 7.8% I DEN: 1.3
Banded Butterflyfish	SF: 7.8% I DEN: 1.8
Barred Hamlet	SF: 7.8% I DEN: 1
Rainbow Runner	SF: 7.8% I DEN: 2.5
Pygmy Filefish	SF: 5.9% I DEN: 1.3
Sergeant Major	SF: 5.9% I DEN: 1.7
Boga	SF: 5.9% I DEN: 3.7
School Bass	SF: 5.9% I DEN: 3.3
Mackerel Scad	SF: 5.9% I DEN: 2.7
Schoolmaster	SF: 5.9% I DEN: 2.7
Bluelip Parrotfish	SF: 5.9% I DEN: 2.7
Queen Triggerfish	SF: 3.9% I DEN: 1.5
Blue Runner	SF: 3.9% I DEN: 2.5
Saddled Blenny	SF: 3.9% I DEN: 2
Caesar Grunt	SF: 3.9% I DEN: 2
Beaugregory	SF: 3.9% I DEN: 2.5
Masked Goby/Glass Goby	SF: 3.9% I DEN: 2.5
Foureye Butterflyfish	SF: 3.9% I DEN: 1.5
Spanish Grunt	SF: 3.9% I DEN: 2
White Margate	SF: 3.9% I DEN: 2
Cherubfish	SF: 3.9% I DEN: 1.5
Horse-Eye Jack	SF: 3.9% I DEN: 4
Cocoa Damselfish	SF: 3.9% I DEN: 1.5
Dusky Damselfish	SF: 3.9% I DEN: 1.5
Longfin Damselfish	SF: 3.9% I DEN: 2

Wrasse Blenny	SF: 2% I DEN: 1
Barred Blenny	SF: 2% I DEN: 2
Twospot Cardinalfish	SF: 2% I DEN: 2
King Mackerel	SF: 2% I DEN: 1
Loggerhead Sea Turtle	SF: 2% I DEN: 1
Little Tunny	SF: 2% I DEN: 3
Bank Butterflyfish	SF: 2% I DEN: 1
Longsnout Butterflyfish	SF: 2% I DEN: 1
Barred Cardinalfish	SF: 2% I DEN: 1
Bermuda Chub/Yellow Chub	SF: 2% I DEN: 2
Blue Angelfish	SF: 2% I DEN: 2
Gray Triggerfish	SF: 2% I DEN: 2
Crevalle Jack	SF: 2% I DEN: 2
Mahogany Snapper	SF: 2% I DEN: 2
Bandtail Puffer	SF: 2% I DEN: 1
Ocean Triggerfish	SF: 2% I DEN: 2
Colon Goby	SF: 2% I DEN: 1
Threespot Damselfish	SF: 2% I DEN: 2
Nurse Shark	SF: 2% I DEN: 1
Slippery Dick	SF: 2% I DEN: 3
Yellow Goatfish	SF: 2% I DEN: 2
Clown Wrasse	SF: 2% I DEN: 3
Tarpon	SF: 2% I DEN: 2

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish	2	12	12	12
133	Bar Jack	1	30	30	30
47	Beaugregory				
221	Bermuda Chub/Yellow Chub	1	30	30	30
48	Bicolor Damselfish	50	6	10	6
91	Black Grouper				
109	Black Margate				
1	Blue Angelfish	3	30	40	35
42	Blue Chromis	2	10	10	10
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead	25	3	15	12
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis	2	8	10	9
121	Butter Hamlet	1	10	10	10
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse	1	20	20	20
180	Creole-fish				
55	Cubbyu				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
95	Graysby				

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass				
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish				
149	Princess Parrotfish	1	30	30	30
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish	1	30	30	30
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish	5	20	20	20
154	Redtail Parrotfish				
33	Reef Butterflyfish	2	12	12	12
58	Reef Croaker				
6	Rock Beauty	1	15	15	15
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster				
26	Scrawled Cowfish				
70	Scrawled Filefish	1	50	50	50
21	Seaweed Blenny				
52	Sergeant Major				

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer				
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish	1	8	10	9
34	Spotfin Butterflyfish	2	12	12	12
132	Spotfin Hogfish				
76	Spotted Goatfish	1	25	25	25
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish				
156	Striped Parrotfish	1	25	25	25
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt	1	25	25	25
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse	2	4	15	9
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	6	20	30	25

23
113

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish				
133	Bar Jack				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	125	3	5	4
91	Black Grouper				
109	Black Margate				
1	Blue Angelfish				
42	Blue Chromis				
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet	1	10	10	10
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead	36	6	15	8
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet	3	10	10	10
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse	1	15	15	15
180	Creole-fish				
55	Cubbyu				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish	1	10	10	10
3	French Angelfish				
108	French Grunt				
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
95	Graysby	2	20	20	20

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass	1	8	8	8
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby	1	3	3	3
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish	2	14	14	14
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish				
149	Princess Parrotfish	1	30	30	30
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish	6	10	20	10
154	Redtail Parrotfish				
33	Reef Butterflyfish				
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster				
26	Scrawled Cowfish				
70	Scrawled Filefish	1	50	50	50
21	Seaweed Blenny				
52	Sergeant Major				

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer	3	4	6	4
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
76	Spotted Goatfish	1	20	20	20
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish				
156	Striped Parrotfish	2	10	20	15
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt				
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish	20	6	10	8
220	Yellowhead Wrasse				
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	2	30	30	30
	# Species	18			
	# Fish	209			

Sp #	Name	#	Min	Max	Mean	
235	Atlantic Spadefish					
30	Banded Butterflyfish					
133	Bar Jack					
47	Beaugregory	1	6	6	6	
221	Bermuda Chub/Yellow Chub					
48	Bicolor Damselfish	39	2	5	4	
91	Black Grouper					
109	Black Margate					
1	Blue Angelfish					
42	Blue Chromis					
78	Blue Dartfish (Blue Goby)					
120	Blue Hamlet					
144	Blue Parrotfish					
134	Blue Runner					
204	Blue Tang					
213	Bluehead	25	3	7	5	
145	Bluelip Parrotfish					
105	Bluestriped Grunt	3	22	24	22	
23	Boga					
79	Bridled Goby	2	6	6	6	
43	Brown Chromis	60	8	10	8	
121	Butter Hamlet					
106	Caesar Grunt					
142	Cero					
179	Chalk Bass					
2	Cherubfish					
214	Clown Wrasse					
49	Cocoa Damselfish					
80	Colon Goby					
93	Coney					
107	Cottonwick					
215	Creole Wrasse	9	18	21	20	
180	Creole-fish					
55	Cubbyu					
205	Doctorfish					
50	Dusky Damselfish					
31	Foureye Butterflyfish	1	7	7	7	
3	French Angelfish					
108	French Grunt	140	15	20	20	
94	Gag					
62	Goldentail Moray					
81	Goldspot Goby					
96	Goliath Grouper (Jewfish)					
4	Gray Angelfish					
192	Gray Snapper					
95	Graysby					

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda	1	80	80	80
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass	1	10		
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby	11	4	6	5
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish	2	24	26	25
149	Princess Parrotfish				
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish	2	24	24	24
154	Redtail Parrotfish				
33	Reef Butterflyfish				
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster	1	29	29	29
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major	7	14	16	15

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer	2	6	6	6
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish	1	20	20	20
114	Spanish Grunt				
131	Spanish Hogfish	1	3	3	3
34	Spotfin Butterflyfish	2	14	14	14
132	Spotfin Hogfish				
76	Spotted Goatfish				
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish				
156	Striped Parrotfish				
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt	1	22	22	22
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse	2	8	10	9
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish	1	14	14	14
46	Yellowtail Reeffish				
197	Yellowtail Snapper				
	# Species	23			
	# Fish	315			

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish				
133	Bar Jack	1	20	20	20
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	31	2	6	5
91	Black Grouper				
109	Black Margate				
1	Blue Angelfish	1	22	22	22
42	Blue Chromis				
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet				
144	Blue Parrotfish	1	40	40	40
134	Blue Runner				
204	Blue Tang				
213	Bluehead	21	5	10	7
145	Bluelip Parrotfish				
105	Bluestriped Grunt	14	20	25	22
23	Boga				
79	Bridled Goby				
43	Brown Chromis	1	7	7	7
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish	1	5	5	5
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse	1	20	20	20
180	Creole-fish				
55	Cubbyu				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish	1	8	8	8
3	French Angelfish				
108	French Grunt	120	15	20	18
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper	3	30	30	30
95	Graysby				

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass	1	12	12	12
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish	2	15	15	15
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish	1	25	25	25
149	Princess Parrotfish	1	18	18	18
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish	1	18	18	18
154	Redtail Parrotfish				
33	Reef Butterflyfish	1	10	10	10
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind	1	30	30	30
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster	6	25	30	28
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major	12	12	15	14

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer				
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
76	Spotted Goatfish	1	15	15	15
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish	1	25	25	25
156	Striped Parrotfish				
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt	1	20	20	20
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse	3	7	15	12
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper				
	# Species	25			
	# Fish	228			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack				
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	2	2	3	2
91	Black Grouper				
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis	5	1	3	2
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead				
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
208	Gray Triggerfish				

Sp #	Name	#	Min	Max	Mean
95	Graysby				
7	Great Barracuda	1	110	110	110
136	Greater Amberjack				
147	Greenblotch Parrotfish				
181	Harlequin Bass				
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish				
394	Pygmy Filefish				
5	Queen Angelfish				
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
226	Redspotted Hawkfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish	1	2	2	2
6	Rock Beauty				
461	Round Scad				
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp				
539	School Bass				
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				
231	Sharksucker				
167	Sharpnose Puffer				
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish				
155	Stoplight Parrotfish				
115	Striped Grunt	60	6	8	7
156	Striped Parrotfish				
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	1	30	30	30
	# Species	6			
	# Fish	70			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack				
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	3	1	2	1
91	Black Grouper				
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead				
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
208	Gray Triggerfish				

Sp #	Name	#	Min	Max	Mean
95	Graysby				
7	Great Barracuda				
136	Greater Amberjack				
147	Greenblotch Parrotfish				
181	Harlequin Bass				
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish				
394	Pygmy Filefish				
5	Queen Angelfish				
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
226	Redspotted Hawkfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish				
6	Rock Beauty				
461	Round Scad				
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp				
539	School Bass	20	1	5	3
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				
231	Sharksucker				
167	Sharpnose Puffer				
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish				
155	Stoplight Parrotfish				
115	Striped Grunt				
156	Striped Parrotfish				
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish	1	2	2	2
116	Tomtate				
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	25	20	30	25
	# Species	4			
	# Fish	49			

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish				
133	Bar Jack	9	15	30	25
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	25	2	6	5
91	Black Grouper				
109	Black Margate				
1	Blue Angelfish				
42	Blue Chromis	1	5	5	5
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet	1	7	7	7
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang	1	10	10	10
213	Bluehead	15	5	8	8
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish	2	5	5	5
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
55	Cubbyu				
205	Doctorfish	1	10	10	10
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish	1	15	15	15
108	French Grunt				
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
95	Graysby				

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack	1	30	30	30
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass				
56	Highhat				
130	Hogfish	1	20	20	20
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby	30	2	3	3
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish	2	15	15	15
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish				
149	Princess Parrotfish				
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish	1	20	20	20
154	Redtail Parrotfish				
33	Reef Butterflyfish	1	10	10	10
58	Reef Croaker				
6	Rock Beauty	1	10	10	10
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster				
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer				
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
76	Spotted Goatfish	2	10	10	10
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish	1	5	5	5
156	Striped Parrotfish				
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt				
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse	4	5	10	5
228	Yellowhead Jawfish				
220	Yellowhead Wrasse				
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	12	15	30	25
	# Species	20			
	# Fish	112			

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish	2	16	16	16
133	Bar Jack				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	1	10	10	10
91	Black Grouper	1	62	62	62
109	Black Margate	2	50	75	62
1	Blue Angelfish				
42	Blue Chromis				
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead				
145	Bluelip Parrotfish				
105	Bluestriped Grunt	30	30	40	40
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero	1	65	65	65
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
55	Cubbyu				
205	Doctorfish	1	45	45	45
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt	50	23	34	26
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
95	Graysby	1	32	32	32

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass				
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish	2	30	30	30
149	Princess Parrotfish	1	28	28	28
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner	1	53	53	53
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish				
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster	1	45	45	45
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer				
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
76	Spotted Goatfish				
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish	1	58	58	58
156	Striped Parrotfish				
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt				
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse				
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	4	40	55	50
	# Species	15			
	# Fish	99			

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish				
133	Bar Jack	1	22	22	22
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	42	1	7	6
91	Black Grouper				
109	Black Margate	1	45	45	45
1	Blue Angelfish				
42	Blue Chromis				
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet	1	12	12	12
144	Blue Parrotfish	1	70	70	70
134	Blue Runner				
204	Blue Tang				
213	Bluehead	6	4	9	6
145	Bluelip Parrotfish				
105	Bluestriped Grunt	26	22	30	26
23	Boga				
79	Bridled Goby				
43	Brown Chromis	25	10	14	12
121	Butter Hamlet	1	9	9	9
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse	9	7	24	12
180	Creole-fish				
55	Cubbyu				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish	1	9	9	9
3	French Angelfish	1	35	35	35
108	French Grunt	220	16	22	20
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby	1	7	7	7
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish	1	30	30	30
192	Gray Snapper	1	40	40	40
95	Graysby	1	16	16	16

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass				
56	Highhat	1	12	12	12
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby	95	2	5	4
148	Midnight Parrotfish	1	90	90	90
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish	1	16	16	16
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish	12	26	32	28
149	Princess Parrotfish	1	18	18	18
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish				
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster	2	26	26	26
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major	3	17	17	17

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer	1	6	6	6
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish	3	12	12	12
132	Spotfin Hogfish				
76	Spotted Goatfish				
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish	1	32	32	32
156	Striped Parrotfish				
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt	1	24	24	24
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse				
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	3	25	25	25
	# Species	30			
	# Fish	464			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack				
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	5	6	7	7
91	Black Grouper				
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang	2	18	18	18
213	Bluehead	27	2	10	8
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish	1	33	33	33
192	Gray Snapper	1	26	26	26
208	Gray Triggerfish				

Sp #	Name	#	Min	Max	Mean
95	Graysby				
7	Great Barracuda	1	70	70	70
136	Greater Amberjack				
147	Greenblotch Parrotfish				
181	Harlequin Bass				
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish				
394	Pygmy Filefish				
5	Queen Angelfish				
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
226	Redspotted Hawkfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish				
6	Rock Beauty				
461	Round Scad				
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp				
539	School Bass				
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				
231	Sharksucker				
167	Sharpnose Puffer	2	5	7	6
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish				
155	Stoplight Parrotfish				
115	Striped Grunt				
156	Striped Parrotfish				
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate	1	10	10	10
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	3	30	30	30
	# Species	9			
	# Fish	43			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack				
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	8	6	8	7
91	Black Grouper				
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis	3	8	11	10
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang	3	12	30	25
213	Bluehead	60	4	10	7
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis	1	7	7	7
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish	1	40	40	40
192	Gray Snapper	3	40	45	42
208	Gray Triggerfish				

Sp #	Name	#	Min	Max	Mean
95	Graysby				
7	Great Barracuda	2	65	85	75
136	Greater Amberjack				
147	Greenblotch Parrotfish				
181	Harlequin Bass	2	9	9	9
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish				
394	Pygmy Filefish				
5	Queen Angelfish				
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish	1	55	55	55
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
226	Redspotted Hawkfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish	1	10	10	10
6	Rock Beauty				
461	Round Scad				
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp				
539	School Bass				
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				
231	Sharksucker				
167	Sharpnose Puffer				
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish				
155	Stoplight Parrotfish				
115	Striped Grunt				
156	Striped Parrotfish				
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	2	32	36	34
	# Species	12			
	# Fish	87			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack				
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	25	3	7	5
91	Black Grouper				
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead	40	4	12	8
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
208	Gray Triggerfish				

Sp #	Name	#	Min	Max	Mean
95	Graysby				
7	Great Barracuda	5	40	75	57
136	Greater Amberjack				
147	Greenblotch Parrotfish				
181	Harlequin Bass	1	10	10	10
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish				
394	Pygmy Filefish				
5	Queen Angelfish				
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish	1	75	75	75
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
226	Redspotted Hawkfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish				
6	Rock Beauty				
461	Round Scad				
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp				
539	School Bass				
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				
231	Sharksucker				
167	Sharpnose Puffer	1	6	6	6
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish				
155	Stoplight Parrotfish				
115	Striped Grunt				
156	Striped Parrotfish				
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	20	20	30	25
	# Species	7			
	# Fish	93			

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish				
133	Bar Jack				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	8	5	9	7
91	Black Grouper				
109	Black Margate				
1	Blue Angelfish				
42	Blue Chromis	2	9	11	10
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead	9	5	11	8
145	Bluelip Parrotfish				
105	Bluestriped Grunt	2	28	32	30
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse	27	7	25	16
180	Creole-fish				
55	Cubbyu				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish	1	7	7	7
3	French Angelfish				
108	French Grunt	50	14	25	19
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
95	Graysby				

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass				
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish	1	16	16	16
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish	3	23	36	28
149	Princess Parrotfish				
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish				
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad	100	10	25	17
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster	1	28	28	28
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major	7	12	22	18

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer	1	5	5	5
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
76	Spotted Goatfish				
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish				
156	Striped Parrotfish				
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt	1	26	26	26
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse				
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper				
	# Species	14			
	# Fish	213			

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish				
133	Bar Jack				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish				
91	Black Grouper				
109	Black Margate				
1	Blue Angelfish	1			35
42	Blue Chromis				
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang	1			14
213	Bluehead	2			3
145	Bluelip Parrotfish				
105	Bluestriped Grunt	17	22	26	24
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse	3			12
180	Creole-fish				
55	Cubbyu				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt	220	16	20	20
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
95	Graysby				

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack	1			100
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass				
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby	1			4
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish	2			18
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish				
149	Princess Parrotfish	1			30
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish	1			30
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish				
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster	8	27	35	33
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major	4	14	17	15

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer				
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
76	Spotted Goatfish				
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish	1			45
156	Striped Parrotfish				
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt	2			22
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse				
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish	1			14
46	Yellowtail Reeffish				
197	Yellowtail Snapper				
	# Species	16			
	# Fish	266			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack				
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	2			9
91	Black Grouper	1			38
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang	1			21
213	Bluehead	28	10	15	12
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse	14			16
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
208	Gray Triggerfish				

Sp #	Name	#	Min	Max	Mean
95	Graysby				
7	Great Barracuda	2	80	100	90
136	Greater Amberjack				
147	Greenblotch Parrotfish				
181	Harlequin Bass				
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish				
394	Pygmy Filefish				
5	Queen Angelfish				
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
226	Redspotted Hawkfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish	1			12
6	Rock Beauty	1			16
461	Round Scad	4500			15
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp				
539	School Bass				
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major	1			15
231	Sharksucker				
167	Sharpnose Puffer	2	5	7	6
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish				
155	Stoplight Parrotfish				
115	Striped Grunt				
156	Striped Parrotfish				
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	8	25	35	32
	# Species	12			
	# Fish	4561			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack				
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	5	4	9	7
91	Black Grouper				
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang	2	10	28	19
213	Bluehead	6	5	12	9
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish	1	10	10	10
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper	1	36	36	36
208	Gray Triggerfish				

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Sp #	Name	#	Min	Max	Mean
95	Graysby				
7	Great Barracuda				
136	Greater Amberjack	6	74	110	86
147	Greenblotch Parrotfish				
181	Harlequin Bass				
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish	1	12	12	12
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish				
394	Pygmy Filefish				
5	Queen Angelfish				
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish				
226	Redspotted Hawkfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish				
6	Rock Beauty	1	10	10	10
461	Round Scad	100	9	25	15
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp				
539	School Bass				
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				
231	Sharksucker				
167	Sharpnose Puffer	1	4	4	4
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish	1	21	21	21
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish				
155	Stoplight Parrotfish				
115	Striped Grunt				
156	Striped Parrotfish				
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper				
	# Species	11			
	# Fish	125			

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish				
133	Bar Jack				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	7	1	4	3
91	Black Grouper				
109	Black Margate				
1	Blue Angelfish				
42	Blue Chromis				
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead	8	1	6	2
145	Bluelip Parrotfish				
105	Bluestriped Grunt	25	17	25	20
23	Boga				
79	Bridled Goby	1	2	2	2
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse	4	12	17	14
180	Creole-fish				
55	Cubbyu				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt	13	14	18	16
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby	1	2	2	2
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
95	Graysby				

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish				
843	Hamlet - Juvenile				
181	Harlequin Bass	1	4	4	4
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby	60	1	2	1
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish	2	17	17	17
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish	1	19	19	19
149	Princess Parrotfish				
216	Puddingwife				
44	Purple Reeffish				
5	Queen Angelfish				
150	Queen Parrotfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish	5	3	17	15
154	Redtail Parrotfish				
33	Reef Butterflyfish				
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster	15	18	22	19
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major	2	8	8	8

Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer				
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
76	Spotted Goatfish				
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish	1	31	31	31
156	Striped Parrotfish	1	14	14	14
45	Sunshinefish				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt	6	16	19	18
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse	4	2	6	4
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper				
	# Species	18			
	# Fish	157			

Sp #	Name	#	Min	Max	Mean
235	Atlantic Spadefish				
30	Banded Butterflyfish				
133	Bar Jack				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	34	3	6	5
91	Black Grouper				
109	Black Margate				
1	Blue Angelfish				
42	Blue Chromis				
78	Blue Dartfish (Blue Goby)				
120	Blue Hamlet	1	12	12	12
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang	1	12	12	12
213	Bluehead	14	3	9	6
145	Bluelip Parrotfish				
105	Bluestriped Grunt	20	20	26	24
23	Boga				
79	Bridled Goby	1	6	6	6
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero				
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish	1	8	8	8
80	Colon Goby				
93	Coney				
107	Cottonwick				
215	Creole Wrasse	2	10	20	15
180	Creole-fish				
55	Cubbyu				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish	2	8	8	8
3	French Angelfish				
108	French Grunt	120	16	16	16
94	Gag				
62	Goldentail Moray				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper				
95	Graysby	1	18	18	18

Sp #	Name	#	Min	Max	Mean
7	Great Barracuda				
136	Greater Amberjack				
234	Greater Soapfish				
63	Green Moray				
147	Greenblotch Parrotfish	2	10	8	9
843	Hamlet - Juvenile				
181	Harlequin Bass	1	8	8	8
56	Highhat				
130	Hogfish				
25	Honeycomb Cowfish				
792	Juvenile Grunt				
193	Lane Snapper				
51	Longfin Damselfish				
201	Longspine Squirrelfish				
83	Masked Goby/Glass Goby	150	2	3	3
148	Midnight Parrotfish				
195	Mutton Snapper				
84	Neon Goby				
206	Ocean Surgeonfish	3	15	15	15
209	Ocean Triggerfish				
86	Pallid Goby				
166	Porcupinefish				
111	Porkfish	14	24	24	24
149	Princess Parrotfish	1	22	22	22
216	Puddingwife				
44	Purple Reeffish	1	4	4	4
5	Queen Angelfish				
150	Queen Parrotfish	1	22	22	22
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)	1	16	16	16
152	Redband Parrotfish	2	16	28	22
154	Redtail Parrotfish				
33	Reef Butterflyfish				
58	Reef Croaker				
6	Rock Beauty				
100	Rock Hind				
336	Roughhead Blenny				
461	Round Scad				
19	Saddled Blenny				
230	Sand Diver				
160	Saucereye Porgy				
196	Schoolmaster	21	24	35	33
26	Scrawled Cowfish				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major	4	14	15	15

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Sp #	Name	#	Min	Max	Mean
231	Sharksucker				
167	Sharpnose Puffer	1	6	6	6
71	Slender Filefish				
218	Slippery Dick				
27	Smooth Trunkfish				
114	Spanish Grunt				
131	Spanish Hogfish	1	15	15	15
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
76	Spotted Goatfish				
28	Spotted Trunkfish				
203	Squirrelfish				
155	Stoplight Parrotfish				
156	Striped Parrotfish	2	6	6	6
45	Sunshinefish	16	2	3	3
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
592	Townsend Angelfish				
622	Triplefin species				
239	Trumpetfish				
117	White Grunt	1	24	24	24
77	Yellow Goatfish				
141	Yellow Jack				
219	Yellowcheek Wrasse				
228	Yellowhead Jawfish				
220	Yellowhead Wrasse	3	7	12	9
153	Yellowtail (Redfin) Parrotfish				
54	Yellowtail Damselfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	1	24	24	24
	# Species	30			
	# Fish	423			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack	6	30	50	45
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish				
91	Black Grouper				
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang	1	4	4	4
213	Bluehead				
145	Bluelip Parrotfish				
105	Bluestriped Grunt	1	20	20	20
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero	1	45	45	45
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish	1	30	30	30
192	Gray Snapper	18	25	35	30
208	Gray Triggerfish				

Sp #	Name	#	Min	Max	Mean
95	Graysby	1	25	25	25
7	Great Barracuda	1	60	60	60
136	Greater Amberjack				
147	Greenblotch Parrotfish				
181	Harlequin Bass				
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish				
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish	6	2	4	3
394	Pygmy Filefish				
5	Queen Angelfish	1	15	15	15
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish	1	25	25	25
226	Redspotted Hawkfish				
154	Redtail Parrotfish	1	25	25	25
33	Reef Butterflyfish	2	7	7	7
6	Rock Beauty				
461	Round Scad	600	10	15	13
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp	1	25	25	25
539	School Bass				
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny	1	6	6	6
52	Sergeant Major				
231	Sharksucker				
167	Sharpnose Puffer	2	6	6	6
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish				
155	Stoplight Parrotfish				
115	Striped Grunt				
156	Striped Parrotfish	2	20	20	20
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish	2	4	7	5
197	Yellowtail Snapper	50	25	40	35
	# Species	20			
	# Fish	699			

Sp #	Name	#	Min	Max	Mean
449	Almaco Jack				
30	Banded Butterflyfish				
164	Bandtail Puffer				
594	Bank Butterflyfish				
133	Bar Jack	10	26	35	28
311	Barred Blenny				
35	Barred Cardinalfish				
118	Barred Hamlet				
47	Beaugregory				
221	Bermuda Chub/Yellow Chub				
48	Bicolor Damselfish	5	3	5	3
91	Black Grouper				
189	Blackfin Snapper				
1	Blue Angelfish				
42	Blue Chromis				
144	Blue Parrotfish				
134	Blue Runner				
204	Blue Tang				
213	Bluehead	7	1	5	3
145	Bluelip Parrotfish				
105	Bluestriped Grunt				
23	Boga				
79	Bridled Goby				
43	Brown Chromis				
121	Butter Hamlet				
106	Caesar Grunt				
142	Cero	1	26	26	26
179	Chalk Bass				
2	Cherubfish				
214	Clown Wrasse				
49	Cocoa Damselfish				
80	Colon Goby				
107	Cottonwick				
215	Creole Wrasse				
180	Creole-fish				
135	Crevalle Jack				
190	Cubera Snapper				
205	Doctorfish				
50	Dusky Damselfish				
31	Foureye Butterflyfish				
3	French Angelfish				
108	French Grunt				
81	Goldspot Goby				
96	Goliath Grouper (Jewfish)				
4	Gray Angelfish				
192	Gray Snapper	12	18	26	24
208	Gray Triggerfish				

Sp #	Name	#	Min	Max	Mean
95	Graysby				
7	Great Barracuda	6	36	65	42
136	Greater Amberjack				
147	Greenblotch Parrotfish				
181	Harlequin Bass				
130	Hogfish				
137	Horse-Eye Jack				
792	Juvenile Grunt				
473	King Mackerel				
599	Little Tunny				
657	Loggerhead Sea Turtle				
51	Longfin Damselfish				
32	Longsnout Butterflyfish				
457	Mackerel Scad				
194	Mahogany Snapper				
83	Masked Goby/Glass Goby				
148	Midnight Parrotfish				
187	Nurse Shark				
206	Ocean Surgeonfish	1	17	17	17
209	Ocean Triggerfish				
111	Porkfish				
149	Princess Parrotfish				
44	Purple Reeffish				
394	Pygmy Filefish				
5	Queen Angelfish				
150	Queen Parrotfish				
210	Queen Triggerfish				
151	Rainbow Parrotfish				
140	Rainbow Runner				
683	Red Lionfish (exotic)				
152	Redband Parrotfish	1	16	16	16
226	Redspotted Hawkfish				
154	Redtail Parrotfish				
33	Reef Butterflyfish	2	8	11	10
6	Rock Beauty				
461	Round Scad	150	5	5	5
19	Saddled Blenny				
112	Sailors Choice				
101	Scamp				
539	School Bass				
196	Schoolmaster				
70	Scrawled Filefish				
21	Seaweed Blenny				
52	Sergeant Major				
231	Sharksucker				
167	Sharpnose Puffer	4	2	4	3
232	Silversides, Herrings, Anchovies				

Sp #	Name	#	Min	Max	Mean
71	Slender Filefish				
218	Slippery Dick				
113	Smallmouth Grunt				
114	Spanish Grunt				
131	Spanish Hogfish				
34	Spotfin Butterflyfish				
132	Spotfin Hogfish				
59	Spotted Drum				
76	Spotted Goatfish				
178	Spotted Scorpionfish	1	23	23	23
155	Stoplight Parrotfish				
115	Striped Grunt				
156	Striped Parrotfish	1	15	15	15
45	Sunshinefish				
237	Tarpon				
53	Threespot Damselfish				
185	Tobaccofish				
116	Tomtate				
239	Trumpetfish				
40	Twospot Cardinalfish				
117	White Grunt				
110	White Margate				
339	Wrasse Blenny				
77	Yellow Goatfish				
141	Yellow Jack				
103	Yellowfin Grouper				
220	Yellowhead Wrasse				
104	Yellowmouth Grouper				
153	Yellowtail (Redfin) Parrotfish				
46	Yellowtail Reeffish				
197	Yellowtail Snapper	25	25	35	30
	# Species	14			
	# Fish	226			