Date: April 2012 – July 2012

Project: FY12—CFSAN Sampling for Seafood Species Labeling in Wholesale Seafood

## BACKGROUND

All FDA regulated products are required to be labeled in a manner that is truthful and not misleading. One aspect of truthful labeling is identifying seafood species by their acceptable market names. The Seafood List - FDA's Guide to Acceptable Market Names for Seafood Sold in Interstate Commerce was developed to provide guidance to industry about what FDA considers to be acceptable market names for seafood sold in interstate commerce and to assist manufacturers in labeling seafood products. Incorrect use of an established acceptable market name, which causes the labeling to be false and/or misleading, can result in the product being misbranded under section 403(a)(1) of the Federal Food Drug and Cosmetic (FD&C) Act (21 U.S.C. 343(a)(1)).

## OBJECTIVES

The goal of this project was to determine the accuracy of seafood species labeling at the level of wholesale distribution for select products with a known history of mislabeling.
This effort was conducted from April 2012 through July 2012. All samples were analyzed for species identification using the DNA Based Fish Identification (Barcoding) Method. FDA inspectors were instructed to conduct this sampling at the level of wholesale distribution (i.e. any level after import/primary processing and prior to retail sale). Both previously imported and domestic samples were suitable for collection.

## SAMPLE COLLECTION

For this sampling effort, 100 product lots were targeted for sampling with 96 lots ultimately tested. The product categories that were targeted were cod, haddock, grouper, catfish, basa, and swai. For each lot of fish, four containers (case, master carton, etc.) were selected at random and two filets were sampled randomly per container (8 filets total per sampled lot comprised one "sample"). For each sample, all supplementary information (i.e. product labeling, country of origin, producer, etc.) were recorded. Four filets (one from each container) were analyzed for species identification using the DNA Based Fish Identification (Barcoding) Method while the remaining 4 filets were held as (required) reserve samples in case of further regulatory action. Products were considered mislabeled if any of the 4 filets were determined by DNA testing to not match the product labeling.

**DETAILED RESULTS**

***Cod and Haddock***

Twenty five lots of cod and haddock were sampled from the following states: Massachusetts [11], Maine [4], Connecticut [4], New Hampshire [2], Vermont [2], and Rhode Island [2]. The average lot size for cod and haddock, on site at the time of collection, was 722 lbs. and ranged from 10 lbs. to 5,000 lbs. Country of origin varied depending on the product.

**Country of Origin for Cod and Haddock Samples**

| Country | Species | # of Samples |
|---|---|---|
| **China** | Cod<br>Haddock | 2<br>5 |
| **United States** | Cod<br>Haddock | 8<br>1 |
| **Norway** | Cod<br>Haddock | -<br>4 |
| **Iceland** | Cod<br>Haddock | 3<br>1 |
| **Canada** | Cod<br>Haddock | 1<br>- |

*Labeling*

There were a total of 14 cod samples collected; 8 labeled as "cod," 2 labeled as "Atlantic cod," and 4 labeled as "Pacific cod."

There were a total of 11 haddock samples collected; 9 were labeled as "haddock," 1 was labeled as "Atlantic haddock", and 1 was labeled as "scrod haddock."

*DNA Testing*

All 25 lots of fish identified as either cod or haddock were found to be properly labeled in accordance with FDA guidelines.

The results by DNA testing for cod and haddock were:

- *Gadus morhua*, market name: cod or Atlantic cod - 8 samples,
- *Gadus macrocephalus*, market name: cod or Alaska cod or Pacific cod – 6 samples,
- *Melanogrammus aeglefinus*, market name: haddock – 11 samples.

## *Catfish, Basa, Swai*

Twenty six samples of catfish, basa, and swai , were collected in California. The basa [1] and swai [20] samples were sourced from Vietnam, while the catfish [5] samples were sourced domestically. The average lot size for catfish, basa, and swai, on site at the time of collection was 7,496 lbs. and ranged from 22 lbs. to 42,000 lbs.

*Labeling*

Of these samples, 20 were labeled as swai, 5 as catfish, and 1 as basa. 12 of the 20 samples labeled as swai (60%) contained the word "basa" in the brand name (i.e. Mekong Basa Brand, Basa Queen Brand, Gourmet Basa Brand, and Freshness Basa Brand).

*DNA Testing*

Twenty six samples of fish were collected as catfish, basa, or swai, and 25 were found to be properly labeled in accordance with FDA guidelines. The one sample that was mislabeled was the sample labeled as basa. The results of the analysis showed that the sample labeled as basa was actually swai.

The results by DNA testing for catfish, basa, and swai were:

- *Pangasius hypopthalamus*, market name: swai or sutchi or striped Pangasius or tra - 21 samples,
- *Ictalurus punctatus*, market name: catfish or channel catfish – 5 samples,
- *Pangasius bocourti*, market name: basa – 0 samples.

## *Grouper*

Forty five samples of grouper were collected from the following states: Florida [22], Louisiana [9], Alabama [6], Tennessee [4], and Mississippi [4]. The average lot size for grouper on site at the time of collection was 411 lbs. and ranged from 10 lbs. to 2,920 lbs.

**Country of Origin for Grouper Samples**

| Country | # of Samples |
|---|---|
| **Mexico** | 20 |
| **United States** | 11 |
| **China** | 6 |
| **Indonesia** | 2 |
| **Panama** | 2 |
| **Nicaragua** | 1 |
| **Vietnam** | 1 |
| **Ecuador** | 1 |
| **India** | 1 |

*Labeling*

The market names used to label the 45 samples were "Grouper" [30 samples], "Red Grouper" [10 samples], and "Black Grouper" [5 samples]. Five samples contained additional scientific species information on the label such as "*Epinephelus* spp., *Mycteroperca* spp. and *Hypothrodus* spp.", and 1 sample contained additional common names (edge, marble, scamp).

*DNA Testing*

Of the 45 samples of fish collected as grouper, 40 were found to be properly labeled in accordance with FDA guidelines. Two samples incorrectly labeled as "black grouper" were found to be either scamp grouper or star-studded grouper, and three samples labeled as "grouper" were found to be species with the market names jobfish, cuskeel, or weakfish.

Altogether, 18 different species of grouper were collected. In total, 5 of 45 samples were found to contain a mixture of grouper species. Below is a full list of the species of grouper that were collected:

## Samples Containing One Species

| Species | Market Names | # of Samples |
|---|---|---|
| ***Epinephelus morio*** | Grouper or Red Grouper | 20 |
| ***Epinephelus diacanthus*** | Grouper or Spiny Cheek Grouper | 6 |
| ***Mycteroperca bonaci*** | Grouper or Black Grouper | 5 |
| ***Epinephelus nigritus*** | Grouper or Warsaw Grouper | 1 |
| ***Mycteroperca phenax*** | Grouper or Scamp | 1 |
| ***Epinephelus guttatus*** | Grouper or Hind or Red Hind | 1 |
| ***Hypothrodus niphobles*** | Grouper or Star-Studded Grouper | 1 |
| ***Mycteroperca microlepis*** | Grouper or Gag | 1 |
| ***Mycteroperca* sp. (exact species could not be determined)** | Grouper | 1 |

## Samples Containing More Than One Species

| Species | Market Names | # of Samples |
|---|---|---|
| ***- Epinephelus areolatus***<br>***- Epinephelus heniochus*** | - Grouper or Aerolate Grouper<br>- Grouper or Bridled Grouper | 1 |
| ***- Hypothrodus flavolimbatus***<br>***- Mycteroperca phenax***<br>***- Mycteroperca interstitalis*** | - Grouper or Yellowedge Grouper<br>- Grouper or Scamp<br>- Grouper or Marble Grouper | 1 |
| ***- Epinephelus morio***<br>***- Mycteroperca bonaci***<br>***- Mycteroperca microlepis*** | - Grouper or Red Grouper<br>- Grouper or Black Grouper<br>- Grouper or Gag | 1 |
| ***- Epinephelus latifasciatus***<br>***- Epinephelus sp.*** | - Grouper or Striped Grouper<br>- Grouper | 1 |
| ***- Epinephelus latifasciatus***<br>***- Epinephelus undulosis***<br>***- Epinephelus bleekeri*** | - Grouper or Striped Grouper<br>- Grouper or Wavy-Lined Grouper<br>- Grouper or Dusky Tail Grouper | 1 |

## Non-Grouper Species Labeled as Grouper

| Species | Market Names | # of Samples |
|---|---|---|
| ***Cynoscion virescens*** | Weakfish or Green Weak Fish | 1 |
| ***Aprion virescens*** | Jobfish or Green Jobfish | 1 |
| ***Brotula barbata*** | Cuskeel, Brotula or Bearded Brotula | 1 |

As expected based on natural distributions, certain grouper species were found to be regionally specific: red grouper and black grouper are predominantly from Mexico and the United States; with lesser amounts of scamp, gag, marble, and yellowedge grouper also found in these regions. Other species were found in Central American countries such as Panama and Nicaragua (Warsaw and star-studded grouper, and red hind). In this sampling effort, spiny cheek grouper came exclusively from China, while a mixture of additional species were imported from Indonesia, Vietnam, and India (striped, wavy-lined, dusky-tail, aerolate, and bridled grouper).

**SUMMARY**

All 96 samples collected (384 individual filets) were successfully identified using DNA testing such that product labeling could be confirmed. The size of the lots sampled during this study varied greatly for all products (10 - 42,000 lbs.), but the average lot size was different depending on the type of fish being targeted with Swai/Catfish (7,496 lbs.) > Cod/Haddock (722 lbs.) > Grouper (411 lbs.).

In total, 90 out of 96 samples (94%) were found to be correctly labeled according to the FDA Seafood List.

- 25 out of 25 (100%) cod and haddock samples were labeled correctly
- 25 out of 26 ( 96%) catfish, basa, and swai samples were labeled correctly
- 40 out of 45 (89%) grouper samples were labeled correctly.

Of the 26 samples of catfish, basa, and swai collected, 20 samples were collected as swai, 5 samples were collected as catfish, and 1 sample was collected as basa. All 25 of the swai and catfish samples were confirmed to be swai and catfish, and one sample collected as basa was actually found to be swai.

The five samples of grouper that were found to be mislabeled include two samples that were another species of grouper than the specific species listed on the label. The other three samples were identified as species with market names other than grouper (weakfish, job fish, and cuskeel).

Dates: October 2012 – March 2013

Project: FY13—CFSAN Sampling for Seafood Species Labeling in Wholesale Seafood

## BACKGROUND

All FDA regulated products are required to be labeled in a manner that is truthful and not misleading. One aspect of truthful labeling is identifying seafood species by their acceptable market names. The Seafood List - FDA's Guide to Acceptable Market Names for Seafood Sold in Interstate Commerce was developed to provide guidance to industry about what FDA considers to be acceptable market names for seafood sold in interstate commerce and to assist manufacturers in labeling seafood products. Incorrect use of an established acceptable market name, which causes the labeling to be false and/or misleading, can result in the product being misbranded under section 403(a)(1) of the Federal Food Drug and Cosmetic (FD&C) Act (21 U.S.C. 343(a)(1)).

## OBJECTIVES

The goal of this project was to determine the accuracy of seafood species labeling mainly in the product "Snapper." This effort was conducted from October 1, 2012 through March 2013. All samples were analyzed for species identification using the DNA Based Fish Identification (Barcoding) Method. FDA inspectors were instructed to conduct this sampling at the level of wholesale distribution (i.e. any level after import/primary processing and prior to retail sale). Both previously imported and domestic samples were suitable for collection.

## SAMPLE COLLECTION

For this sampling effort, 100 product lots were targeted for sampling, 40 within the general product category of snapper, 40 within the specific product category of red snapper (*Lutjanus campechanus*), and an additional 20 product lots targeted with the category determined at the discretion of the FDA investigators. For the 80 product lots of snapper and red snapper originally targeted, only 26 were ultimately collected (reasons detailed below). Of the 20 samples to be collected at the discretion of the FDA investigators, 8 were collected as snapper, therefore 34 total samples were collected under the product category of snapper. One sample was collected per lot. Each "sample" was comprised of 8 sub-samples, 2 sub-samples each from 4 randomly selected containers. For each sample, all supplementary information (i.e. product labeling, country of origin, producer, etc.) were recorded. Four filets (one from each container) were analyzed for species identification using the DNA Based Fish Identification (Barcoding) Method, while the 4 remaining filets were held as (required) reserve samples in case of further

regulatory action. Products were considered mislabeled if any of the 4 filets were determined by DNA testing to not match the product labeling.

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## DETAILED RESULTS

### *Sampling*

In total, 46 samples were collected from the following states: California (4), Florida (9), Illinois (20), Texas (10) and Washington (3).

For snapper, a larger number of samples would have been desirable, however, during the collection of Red Snapper, specifically *Lutjanus campechanus*, samples in Florida and Texas, it was determined that the bulk of product labeled as "Red Snapper" were distributed as whole fish rather than as filets, which are what was originally targeted for sampling. In addition, investigators observed that most snapper in this region were harvested from the Gulf of Mexico and was distributed from primary processors directly to retail establishments. Therefore, red snapper was not frequently encountered in wholesale distribution, which was the sampling point for this assignment.

Filets labeled as snapper, which could have included any label containing the word snapper (e.g. "Snapper," "Red Snapper," "Crimson Snapper," "Scarlet Snapper," "Yellowtail Snapper," etc.), were also not common in wholesale distribution in the state of Washington or in California.

It is known that various rockfish species of the genus *Sebastes* are marketed as "Pacific Snapper" in several West coast states. This is also a common practice in Canada. According to the Seafood List, these products must be labeled as rockfish while in interstate commerce. During collection, much of the product offered by wholesalers as "snapper" was actually labeled as rockfish, and therefore not collected in most cases. Additionally, whole fish labeled as snapper were encountered but were often not collected due to the original instructions to focus on fresh or frozen filets.

#### *Samples Collected*

Of the 46 samples collected, 31 were labeled as either "Red Snapper" or "Snapper." Among these 31 samples, 15 were labeled incorrectly according to the Seafood List (48%). Three additional non-snapper samples were also collected. Although the investigators requested snapper or red snapper from the supplier they were provided products labeled as either rockfish (2 samples) or red fish (1 sample), which are distinctly different products. In these cases, the samples were still collected to determine the species of these products being offered as, but not necessarily labeled as, snapper.

**Country of Origin for Snapper Samples**

| Country of Origin | # of Samples | Labeled Correctly | Labeled Incorrectly |
|---|---|---|---|
| **United States** | 9 | 8 | 1 |
| **Indonesia** | 7 | 2 | 5 |
| **Thailand** | 5 | 1 | 4 |
| **Brazil** | 2 | 2 | 0 |
| **Canada** | 2 | 0 | 2 |
| **New Zealand** | 2 | 0 | 2 |
| **Guyana** | 1 | 1 | 0 |
| **Mexico** | 1 | 1 | 0 |
| **Nicaragua** | 1 | 0 | 1 |
| **Surinam** | 1 | 1 | 0 |

*Labeling*

Among the 31 snapper samples collected, only 6 used the general labeling of "Snapper." The remainder used specific labeling such as Red Snapper (8), Scarlet Snapper (7), Pacific Snapper (2), Lane Snapper (2), Caribbean Red Snapper (2), Yellowtail Snapper (1), Crimson Snapper (1), Tai Snapper (1), and Scarlet Red Snapper (1). Among all of these, 9 products contained additional scientific species names on the label such as *Lutjanus sanguineus* for "Scarlet Snapper," *Pagrus auratus* for "Tai Snapper," *Sebastes* sp. for "Pacific Snapper," and *Lutjanus purpureus* for "Caribbean Red Snapper."

*DNA Testing*

**Snapper Samples Labeled Correctly**

| Species | Labeled As | # of Samples |
|---|---|---|
| *Lutjanus campechanus* | Snapper or Red Snapper | 10 |
| *Lutjanus purpureus*[1] | Caribbean Red Snapper | 2 |
| *Lutjanus erythropterus* and *Lutjanus sebae* (mixed) | Snapper | 1 |
| *Lutjanus malabaricus* | Snapper | 1 |
| *Lutjanus sebae* | Snapper | 1 |
| *Ocyurus chrysurus* | Yellowtail Snapper | 1 |

[1] The current DNA testing method employed by the FDA cannot distinguish *L. campechanus* (Red Snapper) from *L. purpureus* (Caribbean Red Snapper). All samples labeled as Caribbean Red Snapper, both originating from Brazil which is in the natural range for Caribbean Red Snapper, matched the FDA standards for both *L. campechanus and L. purpureus;* therefore these products were considered to be correctly labeled.

## Snapper Samples Labeled Incorrectly

| Species | Labeled As | Acceptable Label | # of Samples |
|---|---|---|---|
| *Lutjanus malabaricus* | Scarlet Snapper (*Lutjanus sanguineus*) | Snapper, or, Malabar Snapper | 5 |
| *Lutjanus malabaricus* and *Lutjanus erythropterus* (mixed) | Scarlet Snapper | Snapper, or, Malabar Snapper and Crimson Snapper | 1 |
| *Lutjanus malabaricus* and *Lutjanus erythropterus* (mixed) | Scarlet Red Snapper | Snapper, or, Malabar Snapper and Crimson Snapper | 1 |
| *Lutjanus erythropterus* | Scarlet Snapper | Snapper, or, Crimson Snapper | 1 |
| *Lutjanus guttatus* | Lane Snapper | Snapper, or, Rose Snapper | 2 |
| *Pristipomoides multidens and Pristipomoides typhus (mixed)* | Crimson Snapper | Jobfish or Snapper, or, Goldbanded Jobfish and Sharptooth Jobfish | 1 |

## Non-Snapper Samples Labeled Incorrectly as Snapper

| Species | Labeled As | Acceptable Label | # of Samples |
|---|---|---|---|
| *Sebastes alutus*[2] | Pacific Snapper | Ocean Perch or Rockfish, or, Pacific Ocean Perch | 1 |
| *Sebastes alutus*[2] | Pacific Snapper (*Sebastes*) | Ocean Perch or Rockfish, or, Pacific Ocean Perch | 1 |
| *Pagrus auratus* | Tai Snapper (*Pagrus auratus*) | Porgy, or, Squirefish | 1 |
| *Pagrus auratus* | Snapper (*Pagrus auratus*) | Porgy, or, Squirefish | 1 |

[2] This labeling is allowed in Canada and in California and Oregon (for within-state commerce), but is not correct for products in interstate commerce in the U.S. Both of these products originated in Canada.

**Additional Non-Snapper Samples Presented by Wholesaler as Snapper (All Labeled Correctly)**

| Species | Labeled As | # of Samples |
|---|---|---|
| *Sciaenops ocellatus* | Redfish | 1 |
| *Sebastes alutus* | Rockfish | 1 |
| *Sebastes flavidus* and *Sebastes brevispinis* (mixed) | Rockfish | 1 |

***Additional Non-Snapper Samples Collected by FDA Investigators in Illinois***

*Samples Collected*

Due to their previous experiences with sampling for species substitution, FDA investigators in Illinois were assigned 20 samples to be collected at their discretion, focusing on products with a history of substitution violations. The investigators collected all 20 samples. Eight of these samples were labeled as "Snapper" and were included in the data above. The remaining 12 samples are reported below.

*Labeling*

All non-snapper products collected by FDA investigators in Illinois were labeled correctly according to the Seafood List.

*DNA Testing*

**Non-Snapper Samples Collected by FDA Investigators in Illinois (All Correctly Labeled)**

| Species | Labeled As | # of Samples | Country of Origin |
|---|---|---|---|
| *Coryphaena hippurus* | Mahi Mahi | 1 | Ecuador |
| *Epinephelus guttatus* | Grouper or Red Grouper | 2 | United States |
| *Gadus morhua* | Atlantic Cod | 1 | United States |
| *Hoplostethus atlanticus* | Orange Roughy | 3 | New Zealand (1)<br>China (2) |
| *Lophius americanus* | Monkfish | 1 | United States |
| *Oreochromis niloticus* | Tilapia | 2 | Taiwan |
| *Rastrelliger kanagurta* | Mackerel | 1 | Thailand |
| *Xiphias gladius* | Swordfish | 1 | Singapore |

**SUMMARY**

Even though the number of samples of snapper was limited, due mainly to the unavailability of processed filets labeled as snapper at wholesale distribution in the assigned districts, several observations that will be useful for future sampling were made.

All products labeled using the general term "Snapper" were correctly labeled. All samples labeled specifically as Red Snapper, Caribbean Red Snapper, and Yellowtail Snapper, originating from North and South America, were also correctly labeled.

Most violations occurred from previously imported products using specific market or common names such as Scarlet Snapper, Pacific Snapper, Crimson Snapper, or Tai Snapper. In all these cases the species found were not the ones associated with these common names. Tai Snapper is not associated with any specific species and is considered a fictitious market name for labeling of products in interstate commerce.

In the case of products labeled as Scarlet Snapper (the name associated with the species *Lutjanus sanguineus*), many of the products included the specific species name on the label. In all cases, products labeled as Scarlet Snapper were found to be, either alone or as mixtures, *Lutjanus malabaricus* (Malabar Snapper) and *Lutjanus erythropterus* (Crimson Snapper). A separate product labeled as Crimson Snapper was also not the correct species of *Lutjanus erythropterus* but was a mixture of *Pristipomoides multidens* and *typhus*. These species have the acceptable market names of Jobfish or Snapper, or, Goldbanded Jobfish and Sharptooth Jobfish, respectively, but are not allowed to be marketed as "Crimson Snapper."

FDA is aware of the within-state allowance of labeling *Sebastes* spp. Rockfish as Pacific Snapper on the West Coast. This labeling is not acceptable for products distributed through interstate commerce in the United States. This labeling is allowed in Canada but imported *Sebastes* Rockfish also cannot be labeled as "Snapper." The two samples of *Sebastes alutus* (acceptable market name Rockfish or Ocean Perch) that were labeled as Pacific Snapper in this study had previously been imported from Canada.

A new issue brought forth in this project is the labeling of imported *Pagrus auratus* as "Snapper," "Tai Snapper," or "New Zealand Snapper" (labeling not found during this assignment but observed elsewhere). *Pagrus auratus* is commonly sold as "Snapper" in Australia and New Zealand. *Pagrus auratus* has the acceptable market names in the U.S. of Porgy or Squirefish. All of the species on the Seafood List with the acceptable market name of Snapper come from the family Lutjanidae. Labeling *Pagrus auratus* as Snapper in the U.S., while acceptable in other countries where this species has historically been recognized for marketing purposes as snapper is potentially confusing to U.S. consumers.

Dates: June 2013 – September 2013

Project: FY13—CFSAN Sampling for Seafood Species Labeling in Imported Seafood

## BACKGROUND

All FDA regulated products are required to be labeled in a manner that is truthful and not misleading. One aspect of truthful labeling is identifying seafood species by their acceptable market names. The Seafood List - FDA's Guide to Acceptable Market Names for Seafood Sold in Interstate Commerce was developed to provide guidance to industry about what FDA considers to be acceptable market names for seafood sold in interstate commerce and to assist manufacturers in labeling seafood products. Incorrect use of an established acceptable market name, which causes the labeling to be false and/or misleading, can result in the product being misbranded under section 403(a)(1) of the Federal Food Drug and Cosmetic (FD&C) Act (21 U.S.C. 343(a)(1)).

## OBJECTIVES

The goal of this project was to determine the accuracy of seafood species labeling in the specific product categories of "Snapper" and "Grouper" at the import level in the Florida District. This effort was conducted from June 2013 through September 2013. All samples were analyzed for species identification using the DNA Based Fish Identification (Barcoding) Method.

## SAMPLE COLLECTION

This sampling effort focused on snapper and grouper products imported through Florida. 15 products lots of each category were targeted for sampling. 33 product lots (16 snapper and 17 grouper) were ultimately sampled. One sample was collected per lot. Each sample was comprised of 4 sub-samples, 1 sub-sample each from 4 randomly selected containers. For each sample, all supplementary information (i.e. product labeling, country of origin, producer, etc.) was recorded. All four filets were analyzed for species identification according to the DNA Based Fish Identification (Barcoding) Method. Products were considered mislabeled if any of the 4 filets were determined by DNA testing to not match the product labeling.

**DETAILED RESULTS**

***Snapper***

During this phase of the project, 16 samples of snapper were collected in Florida. Among the 16 samples collected within the product category "Snapper," one was not analyzed due to sample degradation. Among the 15 "Snapper" samples analyzed, 3 were labeled incorrectly according to the Seafood List (19%). For all 3 of these samples, the products were species within the general category of snappers (family Lutjanidae) but did not match the specific product labeling (e.g. were labeled as Scarlet Snapper but were not *Lutjanus sanguineus*).

Three additional samples, labeled as either "Snapper" or "Goldband Snapper," contained species within the previous product category of "Jobfish" (*Aphareus* spp, *Aprion* spp., *Pristipomoides* spp.). The acceptable market names for these species have been recently changed to "Jobfish or Snapper" in the Seafood List because they are all in the family Lutjanidae. It should be noted that prior to this change, these samples would have been considered mislabeled.

Six of the 15 samples analyzed (40%) contained a mixture of snapper species.

**Country of Origin for Snapper Samples**

| Country of Origin | # of Samples | Labeled Correctly | Labeled Incorrectly |
|---|---|---|---|
| **Indonesia** | 7 | 4 | 3 |
| **Surinam** | 3 | 3 | 0 |
| **Brazil** | 2 | 2 | 0 |
| **Mexico** | 1 | 1 | 0 |
| **Trinidad and Tobago** | 1 | 1 | 0 |
| **Vietnam** | 1 | 1 | 0 |

*Labeling*

Among the 15 snapper samples analyzed, only 4 used the general labeling of "Snapper." The remainder used specific labeling such as Red Snapper (3), Caribbean Red Snapper (3), Scarlet Snapper (3), and Goldband Snapper (2).

*DNA Testing*

## Snapper Samples Labeled Correctly

| Species | Labeled As | # of Samples |
|---|---|---|
| *Lutjanus campechanus* | Red Snapper | 3 |
| *Lutjanus purpureus*[1] | Caribbean Red Snapper | 3 |
| *Pristipomoides multidens*[2] | Goldband Snapper | 2 |
| *Lutjanus campechanus* | Snapper | 1 |
| *Aphareus rutilans* [2] and *Paracaesio kusakarii* and *Paracaesio xanthura* and *Pristipomoides multidens*[2] (mixed) | Snapper | 1 |
| *Aprion virescens*[2] and *Lutjanus bohar* (mixed) | Snapper | 1 |
| *Lutjanus erythropterus* and *Pinjalo pinjalo* (mixed) | Snapper | 1 |

[1] The current DNA testing method employed by the FDA cannot distinguish *L. campechanus* (Red Snapper) from *L. purpureus* (Caribbean Red Snapper). All samples labeled as Caribbean Red Snapper, one originating from Brazil and two originating from Surinam, which are both in the natural range for Caribbean Red Snapper, matched the FDA standards for both *L. campechanus* and *L. purpureus;* therefore these products were considered to be correctly labeled.
[2] Indicates species that were previously in the product category of "Jobfish" but now have the acceptable market names of "Jobfish or Snapper."

## Snapper Samples Labeled Incorrectly

| Species | Labeled As | Acceptable Label | # of Samples |
|---|---|---|---|
| *Lutjanus erythropterus* and *Lutjanus malabaricus* (mixed) | Scarlet Snapper | Snapper, or, Crimson Snapper and Malabar Snapper | 1 |
| *Lutjanus erythropterus* and *Lutjanus malabaricus* and *Lutjanus sebae* (mixed) | Scarlet Snapper | Snapper, or, Malabar Snapper and Crimson Snapper and Emperor Snapper | 1 |
| *Lutjanus erythropterus* and *Lutjanus* sp. (mixed) | Scarlet Snapper | Snapper, or, Crimson Snapper and Snapper sp. | 1 |

***Grouper***

During this phase of the project, 17 samples of grouper were collected in Florida. All 17 samples collected within the product category "Grouper," were successfully analyzed such that the product labeling could be confirmed. Among the 17 "Grouper" samples analyzed, 2 were labeled incorrectly according to the Seafood List (12%). For both of these samples, the products were species within the general category of groupers but did not match the specific product labeling (e.g. were labeled as Black Grouper but were not *Mycteroperca bonaci*).

Six of the 16 samples analyzed (35%) contained a mixture of grouper species.

**Country of Origin for Grouper Samples**

| Country of Origin | # of Samples | Labeled Correctly | Labeled Incorrectly |
|---|---|---|---|
| **Mexico** | 11 | 9 | 2 |
| **Indonesia** | 3 | 3 | 0 |
| **China** | 2 | 2 | 0 |
| **India** | 1 | 1 | 0 |

*Labeling*

Among the 17 Grouper samples analyzed, 7 used the general labeling of "Grouper." The remainder used specific labeling such as Red Grouper (8) and Black Grouper (2).

*DNA Testing*

**Grouper Samples Labeled Correctly**

| Species | Labeled As | # of Samples |
|---|---|---|
| *Epinephelus morio* | Red Grouper | 8 |
| *Epinephelus diacanthus* | Grouper | 2 |
| *Epinephelus morio* | Grouper | 1 |
| *Epinephelus diacanthus and Epinephelus* sp. (mixed) | Grouper | 1 |
| *Epinephelus latifacciatus and Epinephelus multinotatus* and *Epinephelus* sp. (mixed) | Grouper | 1 |
| *Epinephelus bleekeri and Epinephelus poecitonotus* (mixed) | Grouper | 1 |
| *Cephalopholis sonnerati* and *Epinephelus morrhua* and *Epinephelus amblycephalus* and *Epinephelus cyanopodus* (mixed) | Grouper | 1 |

**Grouper Samples Labeled Incorrectly**

| Species | Labeled As | Acceptable Label | # of Samples |
|---|---|---|---|
| *Mycteroperca bonaci* and *Epinephelus morio* (mixed) | Black Grouper | Grouper, or, Black Grouper and Red Grouper | 1 |
| *Mycteroperca phenax* and *Mycteroperca interstitalis* (mixed) | Black Grouper | Grouper, or, Scamp Grouper and Yellowmouth Grouper | 1 |

**SUMMARY**

In total, 32 of the 33 collected samples (128 individual fillets) were successfully analyzed such that the product labeling could be confirmed. The one sample that was collected but not analyzed was due to sample degradation.

Lot sizes sampled ranged from 292 to >22,000 lbs. for snapper and 300 to >15,000 lbs. for grouper.

For products in the category of "Snapper," the substitutions found during this import sampling effort were similar to those found in the previous two assignments performed at the wholesale level, namely species of snapper other than *Lutjanus sanguineus* being labeled as "Scarlet Snapper." In all assignments thus far, the species being sold under the market name "Scarlet Snapper" were either alone or as mixtures; *Lutjanus malabaricus* (Malabar Snapper), *Lutjanus erythropterus* (Crimson Snapper), and *Lutjanus sebae* (Emperor Snapper). Other snapper substitutions found in the previous wholesale level assignments (e.g. *Sebastes* spp. being labeled as "Pacific Snapper" and *Pagrus auratus* being labeled as "Snapper" or "Tai Snapper") were not seen in this collection project, which was conducted in Florida, and these other types of snapper substitutions were seen in previous assignments only on the west coast in products imported from Canada and New Zealand.

The mislabeling found within the product category "Grouper" in this import sampling effort (2 samples) were still grouper but were not the specific species with the allowable market name of "Black Grouper". This is in contrast to previous assignments where 3 of the 5 mislabeled products found in this category were products not within the "Grouper" category (e.g. weakfish, jobfish/snapper, and cuskeel). The remaining mislabeled grouper samples from previous assignments were also labeled specifically as black grouper but were not the allowed species for this market name of *Mycteroperca bonaci*.