



Reef Environmental Education Foundation

with support from
Fagatele Bay National Marine Sanctuary,
American Samoa Department of Marine and Wildlife Resources,
and the Coral Reef Advisory Group

Present

Fishwatching
in
American Samoa
(Including the Fagatele Bay National Marine Sanctuary)

A special thanks to Nancy Dashbach, Manager of the FBNMS and Leslie Whaylen, American Samoa Coral Reef Monitoring Coordinator, in the creation of this curriculum.

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Original Version – Nov 2004, Revised – May 2006

**Reef Environmental Education Foundation (REEF)
Introduction to Fish Identification of American Samoa**

The Reef Environmental Education Foundation (REEF) has designed this 3-hour long curriculum to introduce recreational divers and snorkelers to the fun and educational activity of fishwatching in American Samoa. The 86 slide presentation will prepare participants to begin identifying fish, initiate a life list of sightings and engage in community activities such as the REEF Fish Survey Project and REEF's Great Annual Fish Count (GAFC).

Course Objectives

At the end of the course participants will be able to:

1. Identify 68 of the most commonly sighted fish species, two sea turtles, and two key invertebrate species seen in Samoan waters
2. Recognize members of 29 common reef fish families.
3. Use different texts as reference tools.
4. Use an underwater slate for recording sightings.
5. Begin a personal life list of fish sightings.
6. Understand the purpose of Reef Environmental Education Foundation (REEF), the Great Annual Fish Count (GAFC), ongoing marine life monitoring programs, and how they can take an active role.
7. Understand the mission, purpose and goals of NOAA's National Marine Sanctuary Program, particularly the Fagatele Bay National Marine Sanctuary (FBNMS).

Materials Needed

1. Classroom
2. Computer with CD player, and digital projector with remote control and screen
3. Light pointer or pointer stick to point out details in the pictures
4. Copies of hand outs for participants
5. Pencils

Materials Provided with Curriculum

1. CD-ROM with **86** labeled and numbered slides
2. Teaching guide text
3. Quick Look ID Reference Guide
4. Formatted sheets used to produce handouts (Note sheets, REEF Fish Quiz sheet)
5. Slide list
6. Fish Quiz answer sheet
7. Brief overview of REEF, Great Annual Fish Count, Fagatele Bay National Marine Sanctuary, and how to participate in REEF's Fish Survey Project.
8. REEF membership application form
9. Sample Underwater ID Slate with waterproof reef fish identification card
10. REEF Fish Survey Project scanforms

11. Sample underwater survey paper

Materials Provided by Participants

1. Starter Kit, which includes:
 - a. Full color underwater ID reference card
 - b. Underwater ID slate
 - c. Waterproof survey paper
 - d. Two REEF scanforms
 - e. REEF brochure and membership form
 - f. REEF decal
 - g. REEF BC Tag
2. A personal reference book is optional, however, *Reef Fish Identification: Tropical Pacific* by Gerald Allen, Roger Steene, Paul Humann and Ned DeLoach is highly recommended. The common names presented in this course are based on this reference.

Other Recommended Reference Books

1. *Reef and Shore Fishes of the South Pacific* by John Randall
2. *A Guide to Angelfishes & Butterflyfishes* by Gerald R Allen, Roger Steene and Mark Allen
3. *Indo-Pacific Coral Reef Field Guide* by Dr. Gerald R. Allen and Roger Steene

How To Teach The Class

The main focus of this course is to INTRODUCE divers and snorkelers to marine life identification and surveying. It would be impossible to turn them into experts in a one hour session, but it is more than possible, even probable, that you can instill in them an excitement and encouragement that will lead to a lifetime of fishwatching. To do this you have to make your course FUN! A lot of review is helpful, but the best way to make your course a fun one is to involve your students. Let them help you come up with memory clues to remember fish names. Engage them in lots of questions and discussion. It's okay to not know some of the answers. Its much more fun to say you don't know and keep them asking, than to pretend you know it all and have silence. You will find that some of your best memory clues and stories will come from the courses you teach and this will become one of your favorite course offerings.

The three main principles in the introductory course are:

1. Make it fun.
2. Review often.
3. Involve your students in coming up with memory clues to remember fish names.

As you teach the course for the first few times you may want to read through the curriculum guide as you go. Slides are listed in order and the names of the fish are

highlighted in **bold** text. Following the fish names are the key identification characteristics that separate the particular fish on the screen from those that might appear similar. A sample memory clue is often included for you to use, but coming up with your own is often more fun.

During your presentation, be sure to mention the importance of scientific names for the species. The common names used in this course and in all of REEF's survey materials are based on the names given in *Reef Fish Identification: Tropical Pacific* by Gerald Allen, Roger Steene, Paul Humann and Ned DeLoach (2003). However, unlike fish species in North America, which are issued standard common names by the American Fisheries Society, there is no common name standard for West Pacific fishes. Therefore, common names will not always be standardized across reference guides. The only way to be sure that we are communicating about the same animal is to refer to the internationally used scientific name. While you will not need to know the scientific names for this course, it is important to be comfortable enough to refer to them in a book. You will notice that every scientific name is written the same way. There are two names for each animal. The first name is always capitalized and is known as the Genus. The second name or Species is always all lower case. To show that it is a scientific name, the entire name is either underlined or italicized. The scientific name is given with each species description in the course (as well as any common Samoan names). Scientific names are also listed in REEF's survey materials.

In each of the species descriptions, along with the common, Samoan and scientific names, a basic description of the fish is given, along with any distinguishing information about habitat, behavior, or life-history. If the species is found in Hawaii as well, but is referred to as a different common name (due to the problem discussed above), a notation is made – e.g. (HAW – Blue Goatfish) for the Goldsaddle Goatfish (*Parupeneus cyclostomus*).

REEF Fish Identification Quiz (for novice- REEF Level 2)

The Fish Identification Quiz is designed to show both you and your students how much they have learned during the course. This is not a pass or fail examination. However, any students that pass the exam with a score of 80% or higher and conduct two surveys can reach the REEF Experience Level 2. After completing the quiz, any students scoring 80% or higher and completing two surveys may submit their name to REEF for upgrading to Level 2.

Reef Environmental Education Foundation (REEF) Introduction to Fish Identification of American Samoa

1. Identification of American Samoan Fishes

This program is the result of a cooperative effort between REEF (the Reef Environmental Education Foundation), Fagatele Bay National Marine Sanctuary, American Samoa Department of Marine and Wildlife Resources, and the Coral Reef Advisory Group. It is one of twelve similar courses, developed with PADI Project AWARE, to teach fish identification and survey methods to divers and snorkelers around the world.

2. Reef Scene

Diving and snorkeling give us the rare opportunity to explore one of the most beautiful and mysterious habitats on Earth. From the moment you enter into the coral reef realm, you are surrounded by sea creatures, including a dazzling array of fishes that occupy every niche of the reef ecosystem. In and around Samoa we find a thriving coral reef marine habitat.

Unfortunately, even after many visits to the reef, few people are able to identify more than a handful of fishes. By taking this course you will learn to identify common species of fish and their families as well as master an easy to learn fish identification system designed specifically for recreational divers and snorkelers. You will also learn how to conduct regular fish surveys for REEF, including REEF's Great Annual Fish Count.

3. Group 1 – Colorful Ovals: Butterflyfish, Angelfish, Surgeonfish, and Moorish Idol -

These fish are important to learn because they are often the first to catch a diver's eye. They are very common and are usually found around the colorful coral reef bottom.

Butterflyfish - have a rounded tail, like a butterfly's wing. Put two together nose to nose and you get the whole butterfly! Usually seen in pairs, many species of butterflyfish mate for life.

Angelfish - Angelfishes can be separated from butterflyfishes by the presence of a small cheek spine on their gill cover.

Surgeonfish - Surgeonfish have a very sharp spine at the base of the tail that is sometimes referred to as a scalpel. The Surgeon wields the scalpel. Most are important grazers on the reef system, continually keeping excess algae growth in check. This prevents corals from being smothered and provides clean areas on the bottom for new corals to attach. The Moorish Idol is technically not a member of the surgeonfish family, though it is similar in its swimming behavior.

4. Pennant Bannerfish (*Heniochus chrysostomus*; laulaufau-laumea)

The pennant bannerfish is a white butterflyfish with three black bands, one through eye, one through the dorsal and anal fin and the other along the upper rear of the body. The top of the snout is yellow. And this species lacks the trailing dorsal fin that is often seen in bannerfishes. Solitary or in pairs, this butterflyfish is found inshore and along outer reefs. Size: to 18 cm.

5. Reticulated Butterflyfish (*Chaetodon reticulatus*; tifitifi-maono)

The most noticeable characteristic on this butterflyfish is the mesh-like reticulated pattern, making it easy to remember the common name of reticulated butterflyfish. The reticulated butterflyfish is associated with coral rich reefs and are usually seen in pairs. Size: to 16 cm.

6. **Saddled Butterflyfish** (*Chaetodon ephippium*; tifitifi-tuauli)
This beautiful fish is blue-grey with a distinct black saddle across the back, and cannot be mistaken for anything else. The saddled butterflyfish is usually seen in pairs. Size: to 23 cm. (HAW - Saddleback Butterflyfish)
7. **Raccoon Butterflyfish** (*Chaetodon lunula*; tifitifi-laumea)
The raccoon butterflyfish is yellow with a unique black eye mask with accompanying white crescent like a raccoon. There are dark, thin, diagonal bands on the back half of the body. Size: to 21cm.
8. **Chevroned Butterflyfish** (*Chaetodon trifascialis*; tifitifi-sae-u)
The obvious black chevron markings distinguish this species of butterflyfish. It has a white body and black tail with a yellow margin. Unlike most butterflyfish, including similar looking species with chevroned patterns, rather than a plain black eye bar, this one is edged in yellow. This species is an obligate coral feeder so is typically an indicator of healthy reefs. Chevroned butterflyfish are typically solitary. Size: to 18 cm.
9. **Lemonpeel Angelfish** (*Centropyge flavissimus*; tu`u`u-sama, tu`u`u-lega)
This small angelfish is bright yellow with a blue edge on gill covers. There is also usually a blue ring around the eyes. They are found exclusively on reef slopes (not reef flats or crests). Lemonpeel angelfish are sometimes found in harems. Size: To 14 cm.
10. **Regal Angelfish** (*Pygoplites diacanthus*; tu`u`u-moana)
Regal is a good name for this beautiful angelfish. It is a yellow orange color with 7-8 bluish-white dark edged bars. It has a bright yellow tail and the dark eyes are outlined in bright blue. You have to look closely for this beauty because they are often found hiding in ledges or under rocks/boulders. Size: to 25 cm.
11. **Emperor Angelfish** (*Pomocanthus imperator*; tu`u`u-vaolo, tu`u`u-nuanua, tu`u`u-moana)
While the last fish looks regal, this one is the definitely the emperor. One of the larger angelfish, it has bright blue and yellow bands and a yellow tail. There is a blue-edged black mask around the eyes. These fish are solitary and make a loud drumming sound when alarmed. They are another to look closely for because they are often found hiding in ledges or under rocks/boulders. Size: to 38 cm.
12. **Striped Surgeonfish** (*Acanthurus lineatus*; alogo)
Familiar to most Samoans, the *alogo*, or striped surgeonfish is a common resident on Samoan reefs. The striking blue stripes and the presence of a spine at the base of the tail (the key characteristic of all surgeonfish), are keys to identifying the striped surgeonfish. They are solitary, territorial and aggressive and are typically found near the reef crest or just off the reef slope. Divers may notice a high abundance of juveniles in January through March. This is a very important food fish in American Samoa. Size: to 38 cm.
13. **Convict Tang** (*Acanthurus tristegus*; manini)
The convict tang is light green to silver with black bars. You can think of this fish as a convict behind bars. They are often in found large aggregations grazing on algae. The local name *manini* is the same in many areas of the Pacific. Divers are most likely to find convict tangs on the reef flats and crest. Size: to 26 cm.

14. **Brushtail Tang (w/ Juvenile Phase)** (*Zebrasoma scopas*; pitopito, pe`ape`a)
The body coloration on the brushtail tang is yellowish-brown fading to almost black around the tail area. There are dark, brush-like bristles near the white scalpel, or tail spine. You can remember the name by thinking that it brushed its scalpel white. When the dorsal and ventral fins are spread, this fish looks very tall. Small juveniles have yellow bars. The brushtail tang inhabits coral rich areas in depths of 1 to 60 meters. May be solitary or in small groups. Size: to 20 cm.
15. **Lined Bristletooth** (*Ctenochaetus striatus*; pone, pala`ia, logoulia)
This is by far the most abundant and common fish that you are likely to encounter in American Samoa. The lined bristletooth, often called the striped bristletooth, is dark brown with small yellow speckles on the face and thin yellow lines in sides. Juveniles are bright blue with gold stripes. May be solitary or in groups. Size: to 26 cm.
16. **Whitecheek Surgeonfish** (*Acanthurus nigricans*; i`usina, laulama, gaitolama)
This species gets its common name from the white smudge under the eye. However, the gold margins along the base of the dorsal and anal fins are what you are likely to notice first about the whitecheek surgeonfish. This surgeonfish is dark brown, blue or black with a yellow tail spine. The tail is white with a yellow bar through it. Commonly inhabits the surge zone where it feeds on filamentous algae. Size: to 21 cm.
17. **Moorish Idol w/ Longfin Bannerfish** (*H. acuminatus*) in corner for comparison (*Zanclus cornutus*; pe`ape`a, laulaufau)
At first glance these two fish look similar, but when you look closer there are obvious differences. Both fish have a long filament trailing from the dorsal fin and similar coloration. The Moorish idol is in a family all its own. It has an orange-yellow saddle over a long snout. There is a wide yellow bar down the center of the body with 2 wide black bars and a mostly black tail. The longfin bannerfish is actually a butterflyfish. It is white with 2 black bands on the body and a yellow tail. The bannerfish is not a common inhabitant of American Samoa, but the Moorish idol is. Size (Moorish idol): to 16 cm.
18. **Group 2 – Silvery Swimmers: Jack, Mullet, and Chub** – Silvery fish are most often found in areas where they blend in with the background - open water where their color reflects light or sandy bottoms that are lacking in coloration. Most silvery fishes are not seen during a dive around a coral reef, and therefore only a few families are included in this group.
Jacks - Streamlined bodies, forked tails and long pectorals are characteristics of jacks. Jacks are voracious predators and they tend to swim quickly and constantly around the reef.
Mullet – Mullet are extremely active swimming fish that often travel in large schools. They are tolerant of various salinity levels and are often found near rivers in brackish water and in tidal zones.
Chub - Chub, also known as rudderfish, are characterized by deep bodies, a continuous dorsal fin, and a very small mouth.
19. **Bluefin Trevally** (*Caranx melampygus*; malauli-apamoana, atugaloloa) – The bluefin trevally can change colorations but is usually a silvery blue with bright blue fins with black and blue spots on the body. They can reach sizes of over 2 feet in length and travel either in small groups or individually. Bluefin trevally are a popular target for fishing. Size: to 100 cm.

20. **Diamond-scale Mullet** (*Liza vaigiensis*; anae) – The diamond-scale mullet is silver with large diamond shaped scales. It has black pectoral fins and a yellowish tan square-cut tail. Found in schools along protected sandy shorelines of lagoons and reef flats. Size: to 52 cm.
21. **Chubs: Topsail Drummer, Lowfin Drummer, Gray Drummer** (*Kyphosus cinerascens*/*K. vaigiensis*/*K. bigibbus*; nanue, mata-mutu, mutumutu) – The drummers or chubs, as they are often called, all have small heads for their large rounded bodies. Basically a football with fins. There are three similar looking, but distinguishable species in American Samoa. The first species has a dorsal fin that is distinct from the other two. The other two are distinguished by how the anal fin lines up with the upper lobe of the tail.
- The **topsail drummer** is silvery-grey with thin dark horizontal lines on body. The rear dorsal fin is distinctly tall. That is its topsail. Size: to 45 cm.
- The **lowfin drummer** is also a silvery-grey color. The rear dorsal fin is **not** tall so we can say it has a lowfin. The outer edge of anal fin is aligned with outer edge of upper tail lobe. Size: to 45 cm.
- The **gray drummer** is the largest of the 3 and can attain lengths of 70cm. It is also a silvery-grey color and may have large white spots. The rear edge of the anal fin aligns forward of the front edge of upper tail lobe. Size: to 70 cm.
22. **Group 3 – Snapper & Emperor** – This group contains two related families, snapper and emperor. Species in these two families are carnivorous. The reef is not the only place you'll find snappers, you can also see them on the menu at almost any restaurant! For that reason, they are some of the most important food fish throughout the world and of great commercial value.
23. **Blacktail Snapper** (*Lutjanus fulvus*; tamala, taiva) – The overall body color of the blacktail snapper is grayish yellow, but the key feature is the dark tail fin that has a reddish tint to the edges. They also have distinct yellow anal and pectoral fins. Normally a solitary fish as an adult, but is sometimes found in loose aggregations. They prefer to remain close to the bottom. Size: to 40 cm.
24. **Black Snapper/Midnight Snapper** (*Macolor niger*/*Macolor macularis*; matala`oa) – There are two species of snapper that are difficult to visually distinguish, and therefore we will group them together. This species complex includes two species of snapper that are stocky and drab gray to brown, covered in numerous indistinct blotches. The juveniles are more striking, with a distinctive black and white pattern. Black/midnight snapper are only found on reef slopes and are not associated with the bottom, but rather are found up in the water column. They will often allow close approach by divers. Size: to 60 cm.
25. **Red Snapper** (*Lutjanus bohar*; mu, mu-a`a, mu-mea) – Larger than the previous two species, this reddish snapper lacks any distinguishing markings. However, a key identification characteristic is the large, pronounced groove in front of the eyes. The juveniles have white spots, and these are sometimes retained in the adults. This snapper is prone to ciguatera toxin, and therefore is not eaten. Size: to 75 cm.
26. **Smalltooth Jobfish** (*Aphareus furca*; palu-aloalo) – Jobfish are a type of snapper with a very slender body and extremely forked tail. The smalltooth jobfish is blue-gray with long pectoral fins, and is distinguished from other jobfish by the obvious bar on its gill

cover. They allow close approach by divers, and are always found up in the water column. Size: to 40 cm.

27. **Humpnose Bigeye Bream** (*Monotaxis grandoculis*; mu-matavaivai, matamu, matamatamu, loalia) – This common species, not actually a bream, but an emperor, is a close relative to snapper. Reaching a size of up to 2 feet in length, the humpnose bigeye bream (also known as the bigeye emperor) tends to hover midwater at the edge of the reef. The blunt head and big eye can be a key to recognizing this species, as can the white body bars that are sometimes present. The juveniles keep the white bars all the time. They are very curious and allow close approach. Size: to 60 cm. (HAW: Bigeye Emperor).
28. **Group 4 – Damselfish** – Small oval shaped fish are usually not on the top of a beginner's fish list, but after the charismatic, big fish are sighted, most divers begin searching for the smaller and less obvious species. Damselfish are often the first small fish a diver will notice. Damselfish are generally found near the bottom and tend to stay in a confined area. They can be divided into two groups depending on their preferred foods. Many damselfish are algae eaters that actually stake out a territory on the reef to farm their favorite algae. If another fish comes too close, or even a diver for that matter, the damselfish will charge out and chase the intruder away, regardless of size. For that reason we say damselfish are very *selfish* with their territory. In fact, they are *Damn - Selfish!* Other damsels prefer to feed on plankton and will be found hovering over the reef picking plankton from the water column. These plankton picking damsels as known as chromis, and often have forked tails.
29. **Philippine Damsel** (*Pomacentrus philippinus*)
This very common damselfish is found individually or in loose groups on reef slopes and passages. Philippine damsel are dark gray to purple with a dark spot at the base of the pectoral fin. The edges of all fins are translucent, which may appear yellow in other locales (but not in Samoa). The scales have black margins, making them look distinct. Size: to 10 cm.
30. **Blue-green Chromis** (*Chromis viridis*; i`alanumoana, tu`u`u-segasega)
As the name implies, this species is identified primarily by the bright blue-green wash over its entire body. Unlike similar species, there is no black spot at the base of the pectoral fin. This species tends to form large schools over shallow, branching coral thickets. Size: to 8cm.
31. **Pale-tail Chromis vs. Bicolor Chromis vs. Pacific Half and Half Chromis** (*Chromis xanthurus*, *C. margaritifer*, *C. iomelas*; tu`u`u-i`usina) – These are three relatively common black and white chromis species found in American Samoa. The first two can be differentiated by where the white on the tail ends. In the bicolor chromis, white extends onto the dorsal and anal fins, whereas in the pale-tail chromis the white stops at the base of the tail. The third species shown here, the Pacific half and half chromis is distinctly bicolored. Pale-tail chromis has a faint bar on the gill cover and is often bigger and out swimming in the water column whereas other two are more associated with reef bottom. Size: pale-tail chromis to 15 cm, bicolor chromis to 8 cm, Pacific half and half chromis to 7 cm.
32. **Banded Sergeant vs. Blackspot Sergeant** (*Abudefduf septemfasciatus*, *A. sordidus*; mutu) – These two similar looking sergeants have brown/black body bars and can be

distinguished by the presence of the small black saddle marking at the base of the tail in the blackspot sergeant. Both species are found in high-surge areas in rocky inshore reefs in shallow water (less than 3 meters). Size: both species to 19 cm.

33. **South Sea Devil** (*Chrysiptera taupou*) – This small damselfish is typically found in relatively shallow water (less than 5 meters). It is distinctive with a bright blue body with yellow to orange dorsal, anal and tail fins. Fishwatchers need to beware: the yellow is highly variable and the rear fins can be translucent with no color. Size: to 8 cm.
34. **Surge Demoiselle** (*Chrysiptera brownriggi*; tu`u`u-alamu, tu`u`u-tulisegasaga) – Another small, blue and yellow damselfish, the juvenile surge demoiselle has a yellow to orange body and a bright neon blue stripe that extends from the snout to the tail. However, the key identification characteristic that will distinguish it from other similar looking species is the two blue and black spots on the upper base of the tail. The adult of this species is much less distinctive, shown here, is brown with white body bars. The surge demoiselle is only seen on reef flats, hovering close to the substrate. Size: to 8.5 cm.
35. **Humbug Dascyllus** (*Dascyllus aruanus*; mamo) – This distinctive black and white damselfish has 3 black bars, and is distinguished by other similar looking dascyllus by the solid black ventral fins and solid white tail. Like most dascyllus, this species is often found in groups and seek shelter among branching corals. Size: to 8 cm.
36. **Jewel Damselfish** (*Plectroglyphidodon lacrymatus*) – The jewel damselfish has a brownish body that often fades to light tan or white toward the tail. It is covered in small blue spots (these are sometimes difficult to see) and is found in relatively shallow water (to 12 m) on reef slopes. A good way to remember the name of this species is the bright golden colored eyes are like jewels in the jewel damselfish. Size: to 10 cm.
37. **Princess Damselfish** (*Pomacentrus vaiuli*; tu`u`u-lau) – Like many damselfishes in the genus *Pomacentrus*, the princess damselfish has an obvious black ocellated spot on the rear dorsal fin and a smaller black “ear” spot. It can be distinguished by the body color – bluish purple with orange on the upper head and back, the thin blue lines extending from the snout onto the back. Size: to 10 cm.
38. **Blackbar Damselfish** (*Plectroglyphidodon dickii*; tu`u`u-i`usina) – The key identification characteristic on this damselfish gives it the common name of blackbar damselfish. The black bar on the back half of the body divides the coloration of the body – tan at the front and a white back and tail. This solitary species is typically found in coral-rich areas, never in reef flats. Size: to 11 cm.
39. **Group 5 – Heavy Bodied Fish: Grouper, Hawkfish & Grunt (Sweetlips)**
Grouper - Groupers (part of the larger Seabass family) are sequential hermaphrodites meaning they start life as females and, after being sexually mature for a number of years, change sex to spend the remainder of their life as males. This sex /age relationship has serious implications for larger seabasses when placed under the old fishing standard of throwing the little ones back and keeping only the big ones. It has been shown in some species that effective spawning is inhibited if the number of males drops below a certain threshold. Groupers are robust fish with large, underslung mouths and heavily structured jaws. Like snappers, groupers are also found on dining menus around the world and are consequently under extremely heavy fishing pressure. A top reef predator, groupers grow

very slowly and can be many decades old.

Hawkfish - Hawkfish normally rest motionless on the top of coral branches or rocky bottom. Hawkfish are carnivorous and typically prey on small fishes and crustaceans. Species in this family can be identified by small tassels that extend from the tops of the dorsal spines.

Grunt (AKA Sweetlips) – Sweetlips are closely related to snappers but are not quite as large and have more prominent lips. They are known as “grunts” in many other parts of the world because of the grunting sound that they can make with their teeth. These are nocturnal predators that feed on crustaceans; they spend their daylight hours hovering alone or in groups near the reef. Juvenile sweetlips often have very dramatic markings and coloration and do not resemble the adults.

40. **Honeycomb Grouper** (*Epinephelus merra*; gatala-aloalo, gatala-pulepule) – This relatively small grouper is typically found in relatively shallow water in sheltered areas. It is covered in brown hexagons, making a honeycomb pattern. They sometimes exhibit dark bands on the upper half of the body. Honeycomb grouper are very shy. Size: to 32 cm. (but typically much smaller on American Samoa reefs).
41. **Flagtail Grouper** (*Cephalopholis urodeta*) – This distinctively reddish brown grouper is distinguished by the diagonal white lines that go across the edges of the tail. This grouper, typically larger than honeycomb grouper, are only found on reef slopes and allow close reproach. Size: to 27 cm.
42. **Peacock Grouper** (*Cephalopholis argus*; gatala-uli, loi) – This species can get considerably larger than the other two. It is distinguished by the small bright blue dots that cover its body, similar to markings on a peacock. Be sure to look for the round tail, which distinguishes it from the rarely sighted squaretail grouper that also has blue spots. They are generally dark brown, but can lighten up considerably and display light bars toward the back. Peacock grouper are relatively shy and are often seen darting into the reef. All three of these grouper can be found resting on the reef, and the flagtail grouper is also sometimes found hovering in the water column. Size: to 55 cm.
43. **Freckled Hawkfish** (*Paracirrhites forsteri*; lausiva) (HAW- Blackside Hawkfish) – Easy to identify, the freckled hawkfish has small spots on the head and fore body. There is often has a prominent white body stripe on the rear half of the body, but the colors are quite variable. This relatively large hawkfish is typically found perched on coral heads and rocks. Size: to 22 cm.
44. **Oriental Sweetlips** (*Plectorhinchus vittatus*; ava`ava-moana) – These large, dramatic looking fish are members of the grunt family and are typically solitary or in small groups. Unlike the grouper we just looked at, you would never see these guys sitting on the reef. Despite being nocturnal, divers will see them drifting above the reef during the day. They are white with horizontal (not diagonal) black spots with bright yellow fins and snout. Their dorsal, tail and anal fins are distinctly spotted. Size: to 85 cm.
45. **Group 6 – Fish That Swim with Pectorals: Wrasse & Parrotfish** - Fish in this group all swim with their pectoral fins rather than their tails and they have large obvious scales. Members of both the wrasse and parrotfish families change sex from female to male as they get large, and they have complex social mating and social systems. Most species live in harems with a single, large dominant terminal phase male (TP) and several smaller female initial phase (IP) individuals. Wrasse have canine teeth to capture hard-shelled

invertebrates, while the teeth of parrotfish are fused into a powerful beak that is used to scrape filamentous algae off dead coral and rocks. In the process of eating, large quantities of calcium carbonate from the old coral structure are consumed and consequently excreted out as fine sediment sand. It is estimated that a large parrotfish can deposit more than 5,000 pounds of sediment annually – something to think about next time you are lying on the beach!

46. **Checkerboard Wrasse** (*Halichoeres hortulanus*; sugale-a`au, sugale-pagota, ifigi) – Both TP and IP individuals have green and orange/pink lines on the face and head. The back half of the body in both phases is light greenish blue and each scale has a dark blue bar, giving the fish a distinctly “checkerboarded” look but this is not very obvious. A distinctive key for this species is the yellow blotches just under the dorsal fin, you can think of these as checkers. Size: TP to 27 cm and IP to 20 cm.
47. **Sixbar Wrasse** (*Thalassoma hardwicke*; sugale-a`au, lape-ele`ele) – The TP and IP in this beautifully colored wrasse are similar. The sixbar wrasse is distinguished by six dark saddles that gradually decrease in size from head to tail and thick pink bands radiating from the eye. They form small groups and are typically found in relatively shallow water (up to 15m). Size: to 20 cm.
48. **Slingjaw Wrasse** (TP, IP) (*Epibulus insidiator*) – This solitary, deep-bodied wrasse is one of the largest wrasse found on Samoan reefs. In addition to the body shape and size, the pointed dorsal, anal and tail fins and the obvious large mouth distinguish it from other wrasse. The TP is distinctly bicolored, with a pale head and dark orange/black body. This phase has a black streak through the eye, like a slingshot. The IP is dark brown. There is also an all yellow phase. Size: to 35 cm.
49. **Bluestreak Cleaner Wrasse** (TP, IP) (*Labroides dimidiatus*; sugale-mo`otai) – A fish with an important role on the reefs, the bluestreak cleaner wrasse is a common resident on American Samoan reefs. As a cleaner, it picks invertebrate parasites from other fish. This elongated wrasse is often seen bobbing up and down in a jerky motion to attract cleaning clients. There is a dark stripe that extends from the snout and becomes thicker toward the tail. Juvenile individuals are navy blue with a neon blue stripe from snout to tail. Size: to 11.5 cm.
50. **Bird Wrasse** (JP, IP) (*Gomphosus varius*; gutusi`o, gutu`umi, sugale-lupe) - The bird wrasse is quite unlike any other wrasse species, or other fish species for that matter. The elongated, curved snout is their distinctive characteristic. Terminal phase males are dark green in coloration. The initial phase bird wrasse has many different color phases but always has the curved snout. Think of this long snout as the long beak on a bird. Size: to 28 cm.
51. **Bullethead Parrotfish** (TP, IP) (*Scarus sordidus*; fuga-gutumumu, fugausi-tuavela, laea-tuavela) - A commonly encountered member of the parrotfish family, the bullethead is identified by its symmetrical *bullet-shaped head*. The area above and below the beak-like mouth is the same. The TP is variable in coloration but will generally have a bluish-green body with some orange or yellow wash on the sides or cheeks. The key markings on the very different looking IP are the light head, dark body, often with rows of small white spots on the back part of the body and/or a pale tail that has a dark spot in the center. Think of these holes as the bullet hole on the bullethead. Size: TP to 40 cm, IP to

26 cm.

52. **Dark-capped Parrotfish** (TP, IP) (*Scarus oviceps*; uga-alosina, laea-tuavela) – The distinguishing characteristic of this species is obviously the dark cap that is present in both the TP and IP. The TP is dark blue-green with narrow pink scale margins, with a dark purple cap. The IP is light gray and yellow with a dark gray cap. The TP also has distinctively bicolored pectoral fins with lime green and dark blue. Size: TP to 31 cm and IP to 25 cm.
53. **Japanese Parrotfish** (TP, IP) (*Chlorurus japanensis*; fuga-si`umu, laea-ulusama) – The TP of the Japanese parrotfish is light green with a distinctive broad purple band that extends from the forehead to the belly (think of this as a Japanese kimono). Again- the IP is quite different, with a dark brown body and red-orange tail. Size: to 30 cm.
54. **Group 7 – Reddish with Large Eyes: Squirrelfish** - Most fish that are reddish and have large eyes are nocturnal, only venturing out at night. However, divers often encounter them under ledges and in caves. The reddish coloration makes them harder to see at night while the large eyes enhance night vision.
55. **Spotfin Squirrelfish** (*Neoniphon sammara*; malau-tui, malau-pe`ape`a) – This squirrelfish is more silver than red and has thin dark red/black stripes running the length of the body. Identification characteristics in squirrelfish are often on the dorsal fin – this species is distinguished by the large black spot at the front end of the dorsal. Size: to 32 cm.
56. **Blotcheye Soldierfish** (*Myripristis murdjan*) – The blotcheye soldierfish is a light red/silver, and can be distinguished from others in this group by the thin white edges on all fins (except pectorals) and a brown margin on the gill cover. Despite the name of this soldierfish, the dark blotch on the eye is not a distinguishing characteristic. Size: to 27 cm.
57. **Shadowfin Soldierfish** (*Myripristis adusta*; malau-tuavela, malau-`uo) – The ID key for the shadowfin soldierfish are the dark margins on the rear of the dorsal, tail and anal fins. The body color is a pale salmon pink, and similar to the previous species does have a faint brown margin on the gill cover. But the fins are the keys to distinguish the two – the dark shadows on the fins make it a shadowfin soldierfish. Size: to 32 cm.
58. **Group 8 – Elongate Bottom Dwellers: Blenny, Goby, Dartfish & Sandperch** - Because of their size and often cryptic behavior, elongated bottom dwellers are often passed over by divers. However, they can be some of the most interesting fish on the reef. Blennies and gobies are often confused, but they can be easily distinguished by their dorsal fin and behavior. Blennies have only a *single dorsal*, and gobies have *two*, though the easiest way to tell them apart may be their behavior. Gobies tend to posture themselves very straight with little expression on their face. Blennies tend to curve their bodies and perch up with a curious expression. Many blennies also may have fleshy cirri on their heads that look much like eyelashes or antlers. Unlike the others shown in this group, dartfish tend to hover and are often called hovering gobies. Sandperch are found in sand/rubble areas and are curious, often allowing close approach by divers.
59. **Red-speckled Blenny** (*Cirripectes variolosus*) – A relatively large blenny, the red-speckled blenny has obvious red markings on the face and head. The male is dark brown

- and the females are light grayish brown. The identification key for this species is not actually the red speckling, but rather the silver iris. This blenny often seeks refuge in holes and cracks, typically near live coral. Size: to 8 cm.
60. **Bluestreak Goby** (*Valenciennea strigata*; mano`o-sina) – The next three species are typically found in sand/rubble areas adjacent to coral reefs. The bluestreak goby is a burrow-dwelling goby that is often found in pairs, busily maintaining their sand and rubble home. Bluestreak gobies are pale gray with a bright yellow snout and cheeks. The name comes from the blue streak under the eye. Size: to 15.5 cm.
 61. **Twotone Dartfish** (*Ptereleotris evides*; ma`ulu) – Dartfish, also known as hovering gobies, never rest on the ground but rather are always seen hovering just above the sand or darting into a burrow. In addition to the obvious bi-coloration in the adults (juveniles are more of a uniform blue-gray), the twotone dartfish is distinguished by the tall dorsal and anal fins, which it will “flare” when swimming. Pairs live together in a sand burrow in exposed lagoon and outer reef slopes. Unlike most other dartfish, the tail on a bicolor is forked. Size: To 13.5 cm.
 62. **Latticed Sandperch** (*Parapercis clathrata*; ta`oto). The latticed sandperch is found resting on sand and rubble in lagoons and seaward reefs, from shallow to deep water. They are distinguished by a row of orange brown bars, each with a black center, that run the length of the body. There are also small, black dots on the cheek and males have an ocellated spot above the gill cover. The tail will often have a white bar. Size: to 17.5 cm.
 63. **Group 10 – Odd-Shaped Swimmers: Goatfish, Triggerfish, Filefish, Pufferfish & Porcupinefish-** There are many odd shaped fish that spend their time swimming about the reef. These are often fish that catch a diver’s eye due to either their odd color or body shape.
 64. **Manybar Goatfish** (*Parupeneus multifasciatus*) – Found around sandy bottoms, goatfish tend to feed on small shrimp and invertebrates that are buried there. Manybar goatfish gets its name from the three to four wide bars on the body, including one dark bar at the base of the tail, which distinguishes it from similar looking goatfish with bars but that have white at the base of the tail. Manybar goatfish also often a dark streak at the eye. At night, these goatfish are often in a red phase and these bars tend to disappear. Size: to 30 cm.
 65. **Goldsaddle Goatfish** (*Parupeneus cyclostomus*) – One of the larger species in the goatfish family, the goldsaddle goatfish are typically blue or purple with a distinctive yellow gold saddle at the base of the tail (there is also an all yellow phase, as shown here). Colorations can vary widely but the large size, as well as the blue lines radiating from the eyes can be a key to identification. Unlike other goatfish species, that are often seen in large groups, goldsaddled goatfish are often solitary or in pairs. Goldsaddles feed primarily on small fish (whereas most other goatfish feed on small invertebrates). Size: to 50 cm. (HAW- Blue Goatfish)
 66. **Pinktail Triggerfish** (*Melichthys vidua*; sumu-`apa`apasina, sumu-si`umumu) – The pinktail triggerfish has a olive green body, with a distinctive white and pink tail (at depth, the pink will actually look green). This species is found solitary or in small groups in the water column on outer reefs. Size: to 30 cm.

67. **Orange-lined Triggerfish** (*Balistapus undulatus*; sumu-aiamauna) – The distinctive orange diagonal lines that cover this triggerfish make it hard to miss. There is also sometimes a large black blotch at the base of the tail. Orange-lined triggerfish are typically solitary and are found in high coral-cover areas in lagoons and outer reefs. This solitary triggerfish is typically shy. Size: to 30 cm.
68. **Picasso Triggerfish** (*Rhinecanthus aculeatus*; sumu-uo`uo), compared with Wedgetail Triggerfish (*R. rectangulus*) – This ornately designed triggerfish is typically found in shallow depths (up to 4 meters) in lagoons and reef flats. The orange-yellow band that extends from its mouth and the diagonal white and black bands on the belly distinguish this species. The less common wedgetail triggerfish, also has angular lines and bold markings, but is distinguished by a black belly and a yellow wedge on the back. Size: to 25 cm. (HAW- Lagoon Triggerfish)
69. **Yelloweye Filefish** (*Cantherhines dumerili*; pa`umalo) – A large, stocky filefish, the yelloweye filefish is brownish gray with faint dark bars on the rear of the body and obvious yellow eyes. The dorsal, anal, and tail fins are usually orangish-yellow. Their diet consists primarily of live coral. Size: to 35 cm. (HAW- Barred Filefish)
70. **Longnose Filefish** (*Oxymonacanthus longirostris*; pa`umalo-gutuumi) – Definitely one of the cutest fish a diver will see in American Samoa, the longnose filefish is easy to pick out. This small member of the filefish family is blue-green with rows of orange spots. They are often found in pairs swimming among the branching coral *Acropora*, feeding on coral polyps with its specialized long snout. Size: to 9 cm.
71. **Guineafowl Pufferfish** (*Arothron meleagris*; sue-puleuli) – The guineafowl pufferfish reaches about 1 foot in size and is covered in white spots, including spots on the fins. This species is found in coral rich areas. There is also a golden color phase of the guineafowl pufferfish that is bright yellow-gold with a few scattered black spots. (HAW – Spotted Pufferfish)
72. **Porcupinefish** (*Diodon hystrix*; tauta, tautu) – The porcupinefish is a large yellowish-brown fish that is covered with small black dots over the body and fins. You will often find porcupinefish hiding under ledges. This species is circumtropical. Size: to 71 cm.
73. **Groups 11&12 – EELS, SHARKS & RAYS** - Though looking like snakes, eels are fish. They have a bad reputation mainly due to the constant opening and closing of their sharp-toothed mouths. However, this is not a threat to divers, as this action pumps water through their gills. Most eels are actually very shy. Sharks and rays are fishes that have a skeleton made up of cartilage rather than bone. They are some of the most ancient creatures in the sea.
74. **Giant Moray** (*Gymnothorax javanicus*; pusi-gatala, maoa`e) – This common moray eel is one of the most common large moray found on the reefs of the Western Pacific. As the name implies, it is one of the largest species in the family, reaching lengths of up to 8 feet, twice that of other “large” morays. The giant moray is brown with irregular dark brown blotches covering the entire body. There is also a large black spot at the gill opening. Size: to 279 cm.
75. **Blacktip Reef Shark** (*Carcharhinus melanopterus*; apeape, malie-alamata) – Blacktip reef sharks are most often seen solitary or in pairs, cruising along coastlines in relatively

shallow water. As with most sharks, they are relatively skittish and are not typically aggressive. This species is distinguished by the black tips on all fins (unlike the blacktip shark, *C. limbatus* which lacks a black tip on the anal fin). Size: to 180 cm.

76. **Spotted Eagle Ray (*Actobatus narinari*)** – Seeing a spotted eagle ray gliding by is a magnificent sight underwater. These majestic creatures are open water species and will never be found resting on the bottom. They do come into sandy areas adjacent to reefs to feed on small burrowing invertebrates and fishes. Hard to mistake, the dark brown back covered with white spots is the key to identifying the spotted eagle ray. Size: wingspan to 350 cm.

77. **Sea Turtles** – In 2001, REEF and Seaturtle.org initiated our Sea Turtle Sightings Program. As part of this program, REEF surveyors are now asked to include sea turtle sightings as an additional species on the back of the survey form. If the turtle can be identified to species, its common name and/or scientific name should be given, otherwise the surveyor should just mark 'Sea Turtle sp.' Divers should also keep a look out for fibrous growths on the eyes, neck, flippers, and in the mouth. These tumors are called fibropapillomatosis (FP). More information on FP can be found on REEF's website. The same abundance codes should be used (S,F,M,A) and this program is applicable in all regions. For more information and to view identification information, visit <http://www.reef.org/data/seaturtle.htm>.

78. **Green Sea Turtle and Hawksbill Sea Turtle** – The two primary turtle species you are likely to see in American Samoa are the green and the hawksbill. Despite the obvious hawk-like beak on the hawksbill the two species can be confused. The primary way to tell them apart is how the scutes are aligned – the scutes, or shell plates, overlap on the hawksbill like shingles. The edges of the shell on the hawksbill is also serrated, versus smooth edges on the green sea turtle. Green sea turtles are vegetarians, consuming sea grasses and hawksbills eat primarily sponges.

79. **Key Invertebrates: Crown-of-Thorns and Giant Clams** – Due to their cultural and ecological importance, two key invertebrates are also monitored as part of the REEF survey program in American Samoa.

The crown-of-thorns starfish is a voracious coral predator. They can range in color and are covered in menacing looking spines. Using their many arms, they can quickly move across a coral head and consume the living tissue. A severe outbreak of crown-of-thorns occurred in American Samoa in the late 1970's. Size: 25-35 cm wide.

There are three species of giant clam in American Samoa, REEF is monitoring all species collectively. Giant clams

80. **REEF Logo** - With what you have learned in this course you are ready to start keeping a record of the fish you see on your dives. Many divers keep a log of all the species they have observed, with a life list reaching hundreds of species. In addition to your personal records, you can also take fish surveys for the Reef Environmental Education Foundation (REEF) as part of their Fish Survey Project. These surveys provide important marine environment information by tracking fish populations. The Great Annual Fish Count (GAFC) is an annual event in July that provides a focused time for conducting REEF surveys and introduces new divers to the world of fishwatching. This is an exciting

opportunity to learn more about our local underwater wildlife, have a good time, and at the same time participate in an important environmental event.

81. **REEF Roving Diver Technique Survey Method** – To participate in the program is simple and you can conduct surveys anytime and anywhere that you go diving. All you do is take your slate along on dives and record the names of all the fish species you can positively identify (this is very important, never guess on a species' identification). Look high and low, in crevices, up in the water column, and in the sand. For a “mystery” fish that you cannot identify, take notes and make a simple sketch of identifying clues. At the conclusion of the dive, you assign each species a relative abundance code, Single (1), Few (2-10), Many (11-100), or Abundant (>100), based on the approximate number you saw. After the dive, fill out REEF's easy to use report form and forward it to REEF Headquarters. Surveys taken even by beginning fishwatchers make a difference.
82. **Mystery Fish Identification** - After the dive, compare your notes and sketches of the “mystery fish” with a reference book to make the identification. Once you have identified a species by this method, you are likely to remember its name on future dives. In this way you will continue to build on the identification skills you have learned in this class, and will soon be able to identify hundreds of fish species.
83. **REEF Report Form** – Here is the REEF Scanform that you submit to REEF, one for each dive that you conduct a survey. Be sure to fill it out in pencil. They are available free of charge from REEF HQ. You can also submit your surveys through an online data entry program on REEF's website.
84. **REEF Website** – This is REEF's Website, www.reef.org. There are many great learning tools, including galleries and quizzes. This is also where all the data can be accessed through summary reports. Visitors can generate reports for a given area or by species. REEF surveyors can also view their own species lifelist and summary of survey effort. There is also an online store where you can order more survey materials.
85. **REEF Program Map** – This map shows all of REEF's project regions where divers can currently conduct REEF surveys. There are separate courses like the one you took today and survey materials for the different areas, but the method is the same. Please consider joining REEF and begin taking surveys. A brochure and a membership card are in your student kit. For more information you can contact REEF directly or visit their website at www.reef.org.
86. **Fagatele Bay National Marine Sanctuary** – Established in 1986, the Sanctuary comprises a fringing coral reef ecosystem nestled within an eroded volcanic crater on the island of Tutuila, American Samoa. The smallest and most remote of all the National Marine Sanctuaries, Fagatele Bay NMS contains many of the species native to this part of the Indo-Pacific biogeographic region. Turtle, hundreds of species of fish, and the giant clam all find refuge in this protected area.. One of the Sanctuary's primary purposes is to use research, education and outreach to heighten public awareness of the cultural and biological significance of this area.

**Reef Environmental Education Foundation (REEF) Introduction to Fish
Identification of American Samoa
SLIDE LIST**

LIST OF SLIDES

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1. **Identification of American Samoan Fishes**
2. **Reef Scene**
3. **Group 1 – Colorful Ovals: Butterflyfish, Angelfish, Surgeonfish, and Moorish Idol**
4. **Pennant Bannerfish**, *Heniochus chrysostomus*
5. **Reticulated Butterflyfish**, *Chaetodon reticulatus*
6. **Saddled Butterflyfish**, *Chaetodon ephippium*
7. **Raccoon Butterflyfish**, *Chaetodon lunula*
8. **Chevroned Butterflyfish**, *Chaetodon trifascialis*
9. **Lemonpeel Angelfish**, *Centropyge flavissimus*
10. **Regal Angelfish**, *Pygoplites diacanthus*
11. **Emperor Angelfish**, *Pomocanthus imperator*
12. **Striped Surgeonfish**, *Acanthurus lineatus*
13. **Convict Tang**, *Acanthurus tristegus*
14. **Brushtail Tang (w/ JP)**, *Zebrasoma scopas*
15. **Lined Bristletooth**, *Ctenochaetus striatus*
16. **Whitecheek Surgeonfish**, *Acanthurus nigricans*
17. **Moorish Idol w/ Longfin Bannerfish**, *Zanclus cornutus*, *H. acuminatus*
18. **Group 2 – Silvery Swimmers: Jack, Mullet, and Chub**
19. **Bluefin Trevally**, *Caranx melampygus*
20. **Diamond-scale Mullet**, *Liza vaigiensis*
21. **Chubs: Topsail Drummer, Lowfin Drummer, Gray Drummer**, *Kyphosus cinerascens*/*K. vaigiensis*/*K. bigibbus*
22. **Group 3 – Snapper & Emperor**
23. **Blacktail Snapper**, *Lutjanus fulvus*
24. **Black/Midnight Snapper**, *Macolor niger*/*Macolor macularis*
25. **Red Snapper**, *Lutjanus bohar*
26. **Smalltooth Jobfish**, *Aphareus furca*
27. **Humpnose Bigeye Bream**, *Monotaxis grandoculis*
28. **Group 4 – Damsel fish**
29. **Philippine Damsel**, *Pomocentrus philippinus*
30. **Blue-green Chromis**, *Chromis viridis*
31. **Pale-tail Chromis vs. Bicolor Chromis vs. Pacific Half and Half Chromis**, *Chromis xanthura*, *C. margaritifer*, *C. iomelas*
32. **Banded Sergeant vs. Blackspot Sergeant**, *Abudefduf septemfasciatus*, *A. sordidus*
33. **South Sea Devill**, *Chrysiptera taupou*
34. **Surge Demoiselle**, *Chrysiptera brownriggi*
35. **Humbug Dascyllus**, *Dascyllus aruanus*
36. **Jewel Damsel fish**, *Plectroglyphidodon lacrymatus*

37. **Princess Damselfish**, *Pomacentrus vaiuli*
38. **Blackbar Damselfish**, *Plectroglyphidodon dickii*
39. **Group 5 – Heavy Bodied Fish: Grouper, Hawkfish & Grunt**
40. **Honeycomb Grouper**, *Epinephelus merra*
41. **Flagtail Grouper**, *Cephalopholis urodeta*
42. **Peacock Grouper**, *Cephalopholis argus*
43. **Freckled Hawkfish**, *Paracirrhites forsteri*
44. **Oriental Sweetlips**, *Plectorhinchus vittatus*
45. **Group 6 – Fish That Swim with Pectorals: Wrasse & Parrotfish**
46. **Checkerboard Wrasse (TP)**, *Halichoeres hortulanus*
47. **Sixbar Wrasse**, *Thalassoma hardwicke*
48. **Slingjaw Wrasse (TP and IP)**, *Epibulus insidiator*
49. **Bluestreak Cleaner Wrasse**, *Labroides dimidiatus*
50. **Bird Wrasse (TP and IP)**, *Gomphosus varius*
51. **Bullethead Parrotfish (TP and IP)**, *Scarus sordidus*
52. **Dark-capped Parrotfish (IP)**, *Scarus oviceps*
53. **Japanese Parrotfish (TP and IP)**, *Chlorurus japanensis*
54. **Group 7 – Reddish with Large Eyes: Squirrelfish**
55. **Spotfin Squirrelfish**, *Neoniphon sammara*
56. **Blotcheye Soldierfish**, *Myripristis murdjan*
57. **Shadowfin Soldierfish**, *Myripristis adusta*
58. **Group 8 – Elongate Bottom Dwellers: Blenny, Goby, Dartfish & Sandperch**
59. **Red-speckled Blenny**, *Cirripectes variolosus*
60. **Bluestreak Goby**, *Valenciennesa strigata*
61. **Twotone Dartfish**, *Ptereleotris evides*
62. **Latticed Sandperch**, *Parapercis clathrata*
63. **Group 10 – Odd-Shaped Swimmers: Goatfish, Triggerfish, Filefish, Pufferfish & Porcupinefish**
64. **Manybar Goatfish**, *Parupeneus multifasciatus*
65. **Goldsaddle Goatfish**, *Parupeneus cyclostomus*
66. **Pinktail Triggerfish**, *Melichthys vidua*
67. **Orange-lined Triggerfish**, *Balistapus undulatus*
68. **Picasso Triggerfish**, *Rhinecanthus aculeatus*
69. **Yelloweye Filefish**, *Cantherhines dumerili*
70. **Longnose Filefish**, *Oxymonacanthus longirostris*
71. **Guineafowl Pufferfish**, *Arothron meleagris*
72. **Porcupinefish**, *Diodon hystrix*
73. **Groups 11&12 – Eels, Sharks & Rays**
74. **Giant Moray**, *Gymnothorax javanicus*
75. **Blacktip Reef Shark**, *Carcharhinus melanopterus*
76. **Spotted Eagle Ray**, *Actobatus narinari*
77. **Sea Turtles Sighting Program**
78. **Green Sea Turtle and Hawksbill Sea Turtle**
79. **Key Invertebrates – Giant Clam and Crown-of-Thorns**
80. **REEF Logo**
81. **REEF Roving Diver Technique Survey Method**
82. **Mystery Fish Identification**
83. **REEF Report Form**
84. **REEF Website**
85. **REEF Program Map**
86. **Fagatele Bay National Marine Sanctuary**

LIST OF SPECIES - FISH IDENTIFICATION QUIZ

1. **Striped Surgeonfish**, *Acanthurus lineatus*
2. **Bird Wrasse (TP)**, *Gomphosus varius*
3. **Blackbar Damselfish**, *Plectroglyphidodon dickii*
4. **Picasso Triggerfish**, *Rhinecanthus aculeatus*
5. **Guineafowl Pufferfish**, *Arothron meleagris*
6. **Dark-capped Parrotfish (IP)**, *Scarus oviceps*
7. **Raccoon Butterflyfish**, *Chaetodon lunula*
8. **Brushtail Tang**, *Zebrasoma scopas*
9. **Goldsaddle Goatfish**, *Parupeneus cyclostomus*
10. **Freckled Hawkfish**, *Paracirrhites forsteri*
11. **Bluefin Trevally**, *Caranx melampygus*
12. **Red-speckled Blenny** (*Cirripectes variolosus*)
13. **Bluestreak Cleaner Wrasse**, *Labroides dimidatus*
14. **Blue-green Chromis**, *Chromis viridis*
15. **Reticulated Butterflyfish**, *Chaetodon reticulatus*
16. **Lined Bristletooth**, *Ctenochaetus striatus*
17. **Convict Tang**, *Acanthurus tristegus*
18. **Blacktail Snapper**, *Lutjanus fulvus*
19. **South Sea Devil**, *Chrysiptera taupou*
20. **Honeycomb Grouper**, *Epinephelus merra*
21. **Bullethead Parrotfish (TP)**, *Scarus sordidus*
22. **Spotfin Squirrelfish**, *Neoniphon sammara*
23. **Regal Angelfish**, *Pygoplites diacanthus*
24. **Philippine Damsel**, *Pomocentrus philippinus*
25. **Orange-lined Triggerfish**, *Balistapus undulatus*

