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PHOTOGRAPHIC IDENTIFICATION GUIDE FOR BILLFISH, SHARKS, RAYS, TUNA-LIKE AND NON-TUNA FINFISH TAKEN IN WCPO PELAGIC LONGLINE FISHERIES (V1)

WCPFC-SC3-FT SWG/IP-6

Paper prepared by

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Photographic identification guide for billfish, sharks, rays, tuna-like and non-tuna finfish taken in WCPO pelagic longline fisheries (v1)

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The collection, identification and enumeration of catch data from WCPO fisheries is a fundamental role of the Commission. Continual improvements to information on HMS, non-target, associated and dependent species in the Convention Area is a specific function of the Scientific Committee as noted in the Convention (*Article 12: Functions of the Scientific Committee*). The accurate identification and quantification of total catch from longline fisheries has been problematic due to the wide variety of species across all taxa that can potentially interact with pelagic longline gear. At-sea observer programs are instrumental towards these goals but are often limited in their efficacy by sparse or incomplete training materials. Clear, well illustrated guides for fishermen are far less common and their absence hinders the recording and submission of accurate logbook data.

This illustrated guide has been produced to supplement other identification guides for longline catch, such as the ***Marine species identification manual for horizontal longline fishermen***, developed by the Secretariat of the Pacific Community and submitted for accessibility to SC2 as FT IP-3. The primary difference between these two manuals is that the SPC identification guide is illustrated with paintings while FT IP-6 is illustrated with numerous photographs of fresh specimens with comparison photographs of similar species side by side. Most of the photographs contained in this identification guide were taken by NOAA observers of the Hawaii Longline Observer Program, NMFS, Honolulu, Hawaii while others were contributed by fishery scientists and researchers. The fact that many photographs were taken by seagoing observers on commercial vessels make them particularly useful and representative of what an actual fisherman or observer might see during a normal longline cruise in the central Pacific Ocean. The guide includes categories covering the following groups:

- Tuna-like fishes
- Billfish
- Sharks
  - Carcharhinidae
  - Lamnidae
  - Thresher sharks
  - Hammerhead sharks
  - Other shark species
- Rays
- Sunfishes
- Miscellaneous surface fishes
- Miscellaneous mid-water fishes, including
  - Escolars and Snake mackerels
  - Pomfrets
  - others

[1] http://www.orau.gov/noaa/HollingsScholarship/
[2] http://swr.nmfs.noaa.gov/pir/
[3] http://swr.nmfs.noaa.gov/pir/

A draft version of this guide was presented to the WCPFC SC2 meeting as FT-IP5. The current Version 1 of the guide is now considered complete enough for distribution and use as training material for regional observer and port sampling programs. However, work on these guides will be ongoing to increase the number of species and spatial coverage, present better photographs as they become available and to include improved or more complete species descriptions.

The document can be downloaded from the Pelagic Fisheries Research Program ftp site. To access this site, mouse click on this link or paste into a web browser. ftp://ftp.soest.hawaii.edu/PFRP/Itano or send a request to David Itano dgi@hawaii.edu.

Acknowledgements

The majority of images used in the production of this identification manual were provided by the National Marine Fisheries Service, Hawaii Longline Observer Program. The authors would like to thank the many HLOP observers whose photographs may be included here. Additional photographs were generously donated for specific use within this guide by S. Arceneaux, T. Giacalone, D. Golden, R.D. Grubbs, D. Itano, K. Kawamoto, A.D. Lewis, C. Meyer, T. Ryder, and C. Sepulveda. The paintings of bonito on page 11 by George Mattson originally appeared in Tuna and Billfish, Fish Without a Country (1986).

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The MS Powerpoint version of this ID guide can be made available to fisheries observer programs and agencies for training purposes by contacting the authors directly.

Acknowledgments

The majority of images used in the production of this identification manual were provided by the National Marine Fisheries Service, Hawaii Longline Observer Program. The authors would like to thank the many HLOP observers whose photographs may be included here. Additional photographs were generously donated for specific use within this guide by S. Arceneaux, T. Giacalone, D. Golden, R.D. Grubbs, D. Itano, K. Kawamoto, A.D. Lewis, C. Meyer, T. Ryder, and C. Sepulveda. The paintings of bonito on page 11 by George Mattson originally appeared in *Tuna and Billfish, Fish Without a Country* (1986).

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Tuna-like fishes

Family: Scombridae

Tuna-like species

Wahoo – *Acanthocybium solandri*

Identifying characters

•Many vertical bars along the body that may fade after death

•Nearly vertical trailing edge of caudal fin

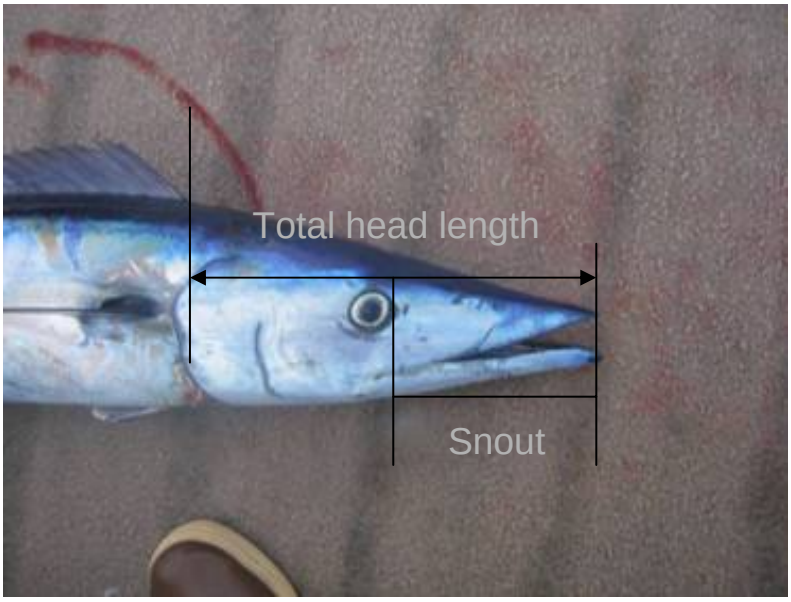
•Close fitting, nearly triangular teeth

•The length of the snout makes up half of the total head length

•Distinctive dip in lateral line underneath (not after) the first dorsal fin

Tuna-like species

Wahoo – *Acanthocybium solandri*



Note:

- Snout and total head lengths
- Snout tip and jaw terminal, unlike barracuda and *Scomberomorus* having extended lower jaw
- Extreme forking of caudal fin
- Prominent caudal keel flanked by two smaller keels on caudal fin base

Tuna-like species

Kawakawa – *Euthynnus affinis*

Identifying characters

•Space between first and second dorsal fin very short

•Coloration: predominantly silver-gray, some dark spots can be found below pectoral fin

•Dorsal coloration: darker gray, rear half of back has a large patch of irregular wavy lines

•Dorsal and anal finlets present

•First dorsal fin spines very high in the front and much lower moving towards the tail

Tuna-like species

Frigate tuna – *Auxis thazard*

Identifying characters

•Coloration: Head dark blackish purple fading to a blue colored back. White ventral surface. Purple pectoral and pelvic fins with black inner sides.

•At least fifteen wavy lines found in area above lateral line where no scales are present

•Corselet extends narrowly along lateral line with fewer than six scales deep below insertion of second dorsal fin

•Dorsal fins broadly separated (unlike kawakawa)

•Pelvic fins separated from one another by a large single flap (interpelvic process)

•Small, conical teeth found in a single series

Tuna-like species

Bullet tuna – *Auxis rochei*

Frigate tuna – *Auxis thazard*

Kawakawa – *Euthynnus affinis*

Bullet tuna – *Auxis rochei*

Identifying and distinguishing characters

•Similar in coloration to Auxis thazard with thicker, more distinct barring pattern above lateral line

•Body shape more slender and round in cross section compared to Auxis thazard

•Corselet continues broadly along lateral line with 10 – 15 scale depth below insertion of second dorsal fin

•Dorsal fins broadly separated (unlike kawakawa)

Tuna-like species

Dogtooth tuna – *Gymnosarda unicolor*

Identifying characters

•Coloration: No markings on the body of any kind. Ventral surface is silver-white, dorsal surface and sides are luminous dark blue to black

•Large mouth with upper jaw ending in line with the middle of the eye

•Possesses a large and single interpelvic process

•Very wavy lateral line

Tuna-like species

Striped bonito – *Sarda orientalis*

California bonito – *Sarda chiliensis*

Image: Mattson

Image: Mattson

Identifying characters for both species

- Narrow and oblique stripes found on back
- Small and two-part interpelvic process
- Body possesses small scales posterior to corselet
- Large mouth with large, distinct conical teeth

Distinguishing characters

- Gill rakers
  - *Sarda orientalis*: 8-13
  - *Sarda chiliensis*: 23-27

Tuna-like species

Butterfly kingfish – *Gasterochisma melampus*

Identifying characters

•Body is elongated and highly flattened

•Pelvic fins are wide with dark to black membrane

•Head with a blunt, may look square-ish in appearance, profile

•Strongly forked tail

•Body covered in dark gray and covered with large, shiny, scales

Tuna-like species

Butterfly kingfish – *Gasterochisma melampus*

Note:

- Dark to black membrane on large pelvic fins
- Blunt head
- Large and shiny scales

Tuna-like species

Slender tuna – *Allothunnus fallai*

Identifying characters

- Extensive gill raker system
- Short, pointed, pectoral fins relative to body size
- Large eyes

Billfish

Families:

Xiphiidae

Istiophoridae

Billfish

Swordfish – *Xiphias gladius <broadbill swordfish>*

Identifying characters

- Flattened bill
- No pelvic fins
- One large, single caudal keel (large) on each side
- Pectoral fins placed low on body
- Prominent falcate dorsal fin with a narrow base
- Large eyes

Billfish

Note: all marlin, sailfish and spearfish species have two caudal keels on each side and a rounded bill

Blue Marlin – *Makaira mazara*

Identifying characters

•First dorsal fin height is ½ to ¾ greatest body depth

•Pectoral fins rotate and fold flat to body

•Pectoral fins nearly straight, not sickle shaped

•Second dorsal fin slightly posterior to second anal fin

•Body coloration: blue-black on dorsal surface and white to silver below with approximately 15 vertical stripes

•Body thick in cross section with grayish-white meat

•The belly will feel smooth if rubbed toward the head

Billfish

Blue Marlin – *Makaira mazara/nigricans*

Note:

•Dorsal fin height relative to body depth

•Blade shaped, slightly recurved pectoral fins that can be easily folded flat to body

Billfish

Striped Marlin – *Tetrapterus audax*

Identifying characters

•First dorsal fin height is equal to or greater than body depth, thin membrane easily torn

•Long, thin, sharp bill

•Long, thin, pelvic fins; longest of all the marlins

•15 to 25 vertical markings on side consisting of blue bars or spots

•Body laterally compressed, much thinner than blue or black marlin

•Meat can be pinkish to orange in color

•The belly will feel like finely rough if rubbed towards the head

Billfish

Striped Marlin – *Tetrapterus audax*

Note:

•Shape and height of dorsal fin (equal or greater than body depth)

•Long, thin bill

Billfish

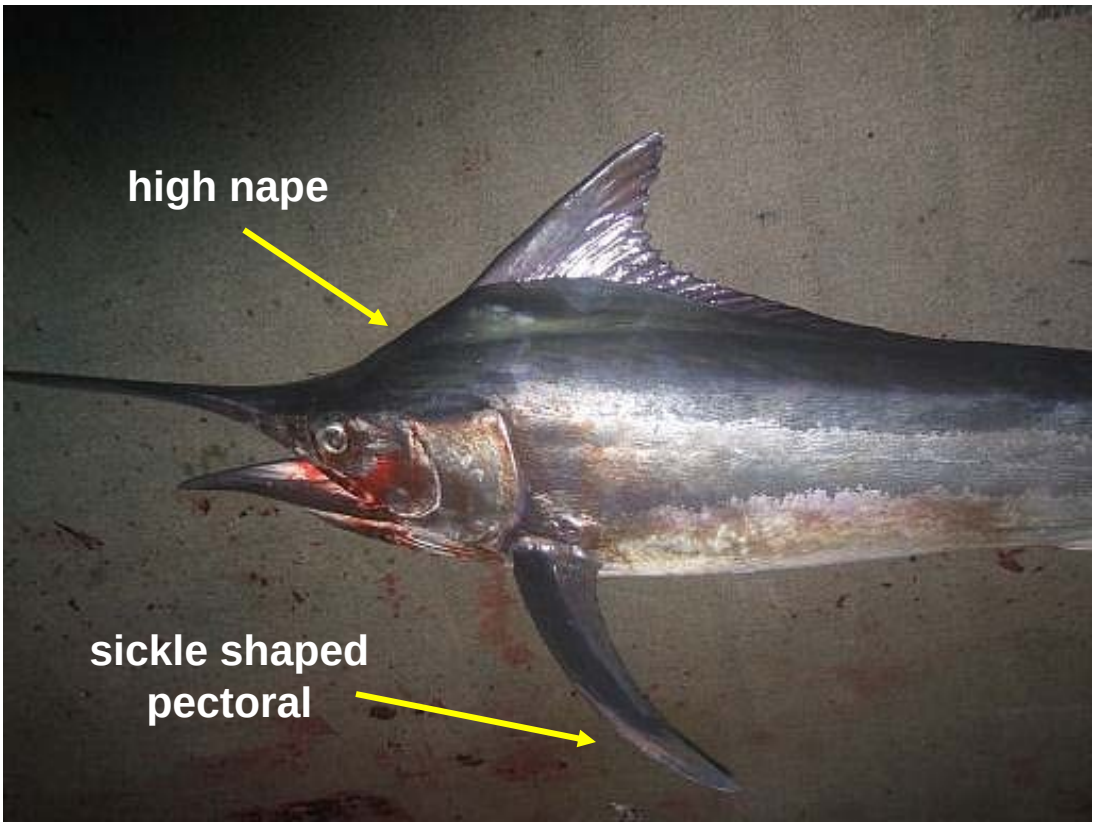
Striped Marlin – *Tetrapterus audax*

Note:

- Bright blue vertical bars along body (fade after death)
- High dorsal fin extending posteriorly in lower form
- Long, thin bill
- Pectoral fin straight, not sickle-shaped

Billfish

Black Marlin – *Makaira indica*



Identifying characters

•First dorsal fin height is ½ or less of the greatest body depth

•Pectoral fins sickle shaped and rigid; can not be folded flat to body

•Second dorsal fin slightly anterior to the second anal fin

•Highly angled nape (area between bill and first dorsal fin)

•Short, stout bill, round in cross section

•Body coloration is black to dark blue on dorsal surface, silvery-white to white below

•Vertical stripes not distinct in life and fade after death

•Short pelvic fins; shortest of all the marlins

Billfish

Black Marlin – *Makaira indica*

Note:

- Low dorsal fin with rounded tip
- Sickle shaped, rigid pectoral fins
- Second dorsal fin slightly anterior to second anal fin

Billfish

Indo-Pacific sailfish – *Istiophorus platypterus*

Identifying characters

•Tall first dorsal fin with long base marked with dark spots

•Body is long and laterally compressed

•Long slender bill, may be slightly upturned at the tip

•Vertical blue bars along the length of the body (approximately 20)

•Dark blue back, light blue and whitish on sides, silvery-white below

•Pelvic fins are very long and narrow

Billfish

Shortbill spearfish – *Tetrapterus angustirostris*

Identifying characters

•Very short, stout bill (little overlap past lower jaw)

•Body very long, slender and laterally compressed

•Elongate, dark blue first dorsal fin, other fins are darker blue

•Dark blue dorsal region cleanly separated from silvery white sides and belly

•Not clearly marked with vertical bars or stripes

•Low sloping nape (between bill and first dorsal fin)

Billfish

Shortbill spearfish – *Tetrapterus angustirostris*

Note:

•Short, stout shape of bill

•Blue dorsal coloration, and silver-white belly

Carcharhinid Sharks

Family: Carcharhinidae

Sharks

Blue shark – *Prionace glauca*

Identifying characters

•Long, narrow snout with long head

•Long, slender “flabby” body

•Very long, slender pectoral fins

•First dorsal fin closer to pelvic fins than pectoral fins

•Small gill slits

•Weak ridge on caudal peduncle

•Dorsal surfaced deep iridescent blue fading to blue with white ventral surfaces

More descriptors on next page

Sharks

Blue shark – *Prionace glauca*

Identifying characters

- Long pectoral fins
- Small, low dorsal fin
- Irridescent blue color

Sharks

Tiger shark – *Galeocerdo cuvier*

Identifying characters

•Dark, vertical barring pattern covering most of body

•Broad, wide and flattened head

•Barring pattern is spotted in juveniles and may fade in large adults

More descriptors on next page

Sharks

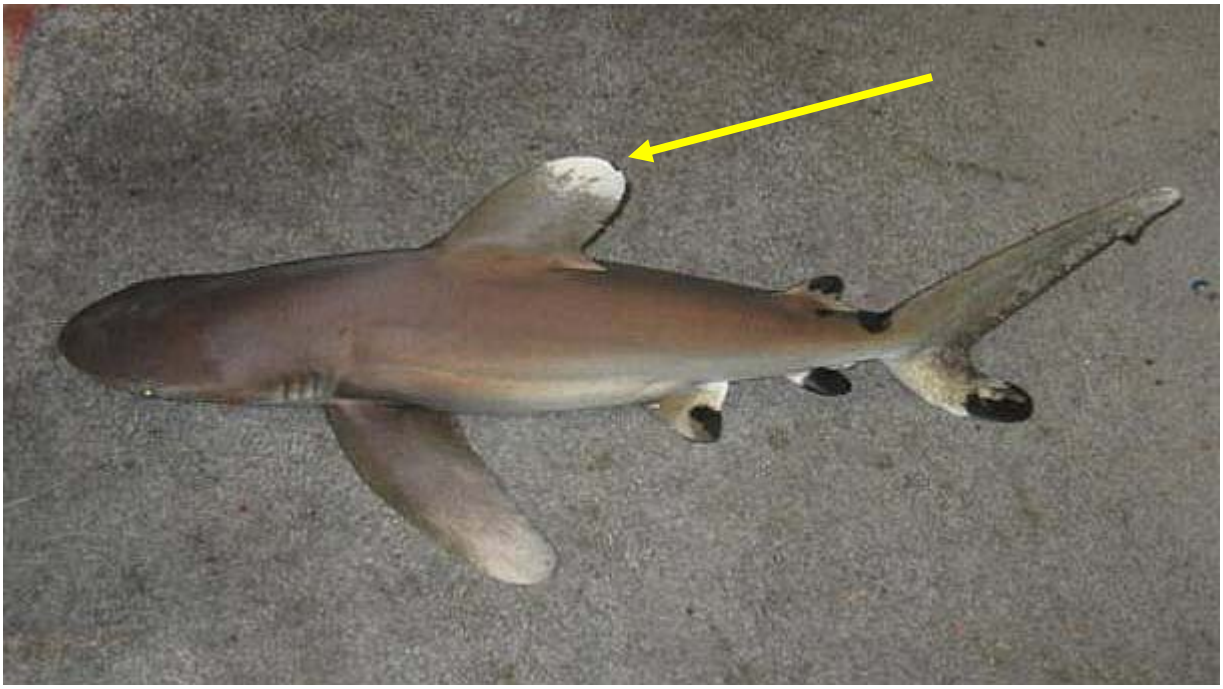
Tiger shark – *Galeocerdo cuvier*

Identifying characters

- Upper teeth are distinctively shaped and strongly serrated
    - Terminal point of each tooth hooks laterally instead of forming a triangular shape
- Wide and very blunt snout
- Juveniles spotted instead of striped

Sharks

Oceanic whitetip shark – *Carcharhinus longimanus*



Identifying characters

•Large pectoral and first dorsal fins with white or mottled tips

•Large individuals have fin spots that are indistinct or faded

•Dorsal fin is fully rounded at tip

•Flattened head and rounded snout

•Body color typically brown, white ventrally

•May have black markings on the tips of pelvic, anal, second dorsal and lower caudal fins and a black patch on the upper caudal peduncle

Sharks

Oceanic whitetip shark – *Carcharhinus longimanus*

Note:

•Rounded white tips of the pectoral fin

•Flattened head and rounded snout

Sharks

Silky shark – *Carcharhinus falciformis*

Identifying characters

- Dorsal fin is small and clearly beyond pectoral fins
- Low Interdorsal ridge
- No ridge or keel on caudal peduncle
- Copper-brown body fading to white, white ventrally
- Body completely clear of markings
- Ventral side of caudal fin tips black or dark

(More descriptors on next page)

Sharks

Silky shark – *Carcharhinus falciformis*

Identifying characters

•Eye pupil small with vertical slits

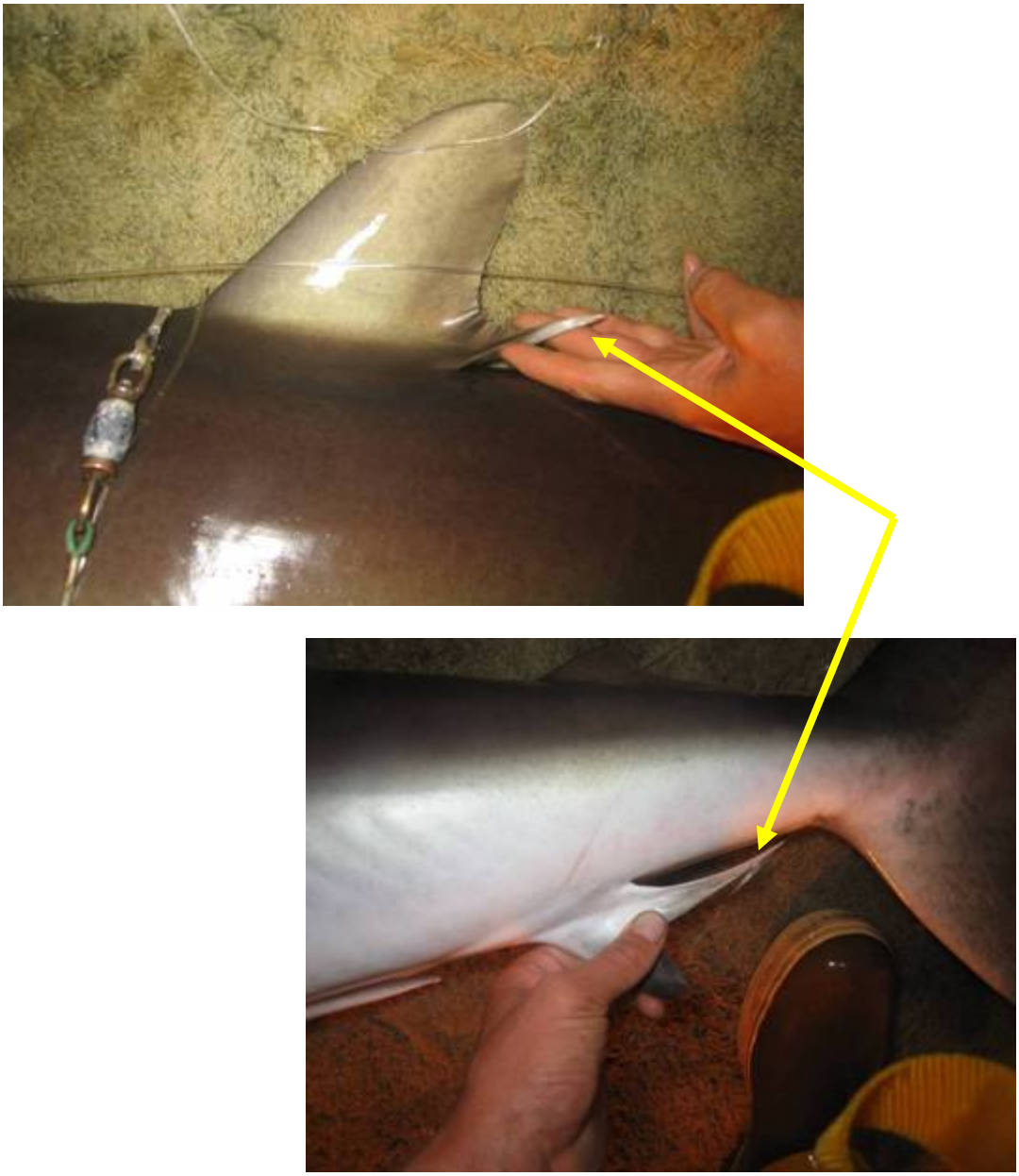
•Dark tip on ventral surface of pectoral fin

•Long pectoral fins

•Dorsal and anal fins possess spines

Sharks

Silky shark – *Carcharhinus falciformis*



Note

•Long free rear tips on first and second dorsal and second anal fin

Sharks

Sandbar shark – *Carcharhinus plumbeus*

Identifying characters

•Very tall, triangular first dorsal fin

•Origin of first dorsal fin over or in front of rear margin of pectoral fins

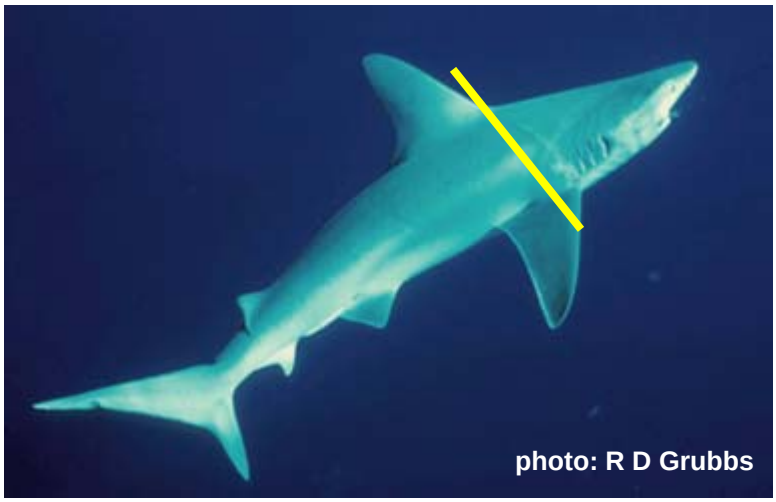
•No interdorsal ridge

•Grey to brown-grey body coloration with no spots or patterns on body or fins

•Short, blunt snout

Sharks

Sandbar shark – *Carcharhinus plumbeus*



Note

•Body coloration

•Large, triangular first dorsal fin

•Origin of first dorsal fin above pectoral fin

Sharks

Galapagos shark – *Carcharhinus galapagensis*

Identifying characters

•Nearly vertical trailing edge of first dorsal fin except at base

•Origin of first dorsal fin barely behind trailing edge of pectoral fin

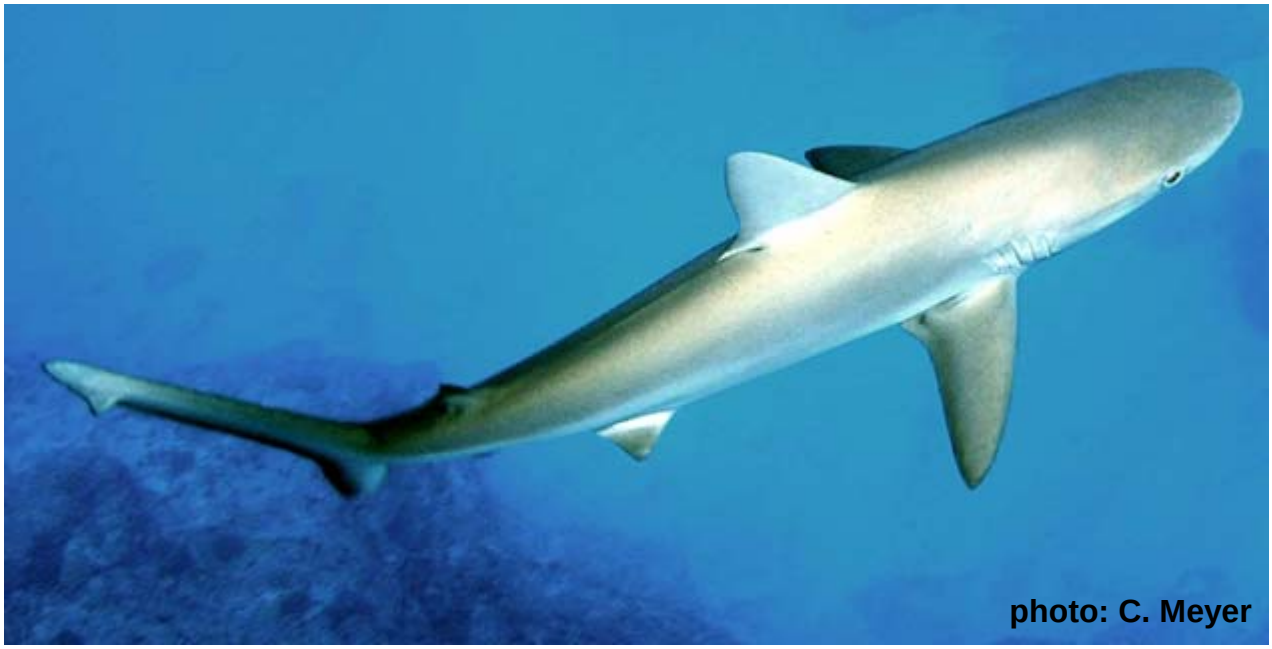
•A low inter-dorsal ridge is present

•Trailing edge of caudal fin marked with an indistinct darkened edge

•Darkened second dorsal fin and anal fin with no distinct spotting

Sharks

Galapagos shark – *Carcharhinus galapagensis*

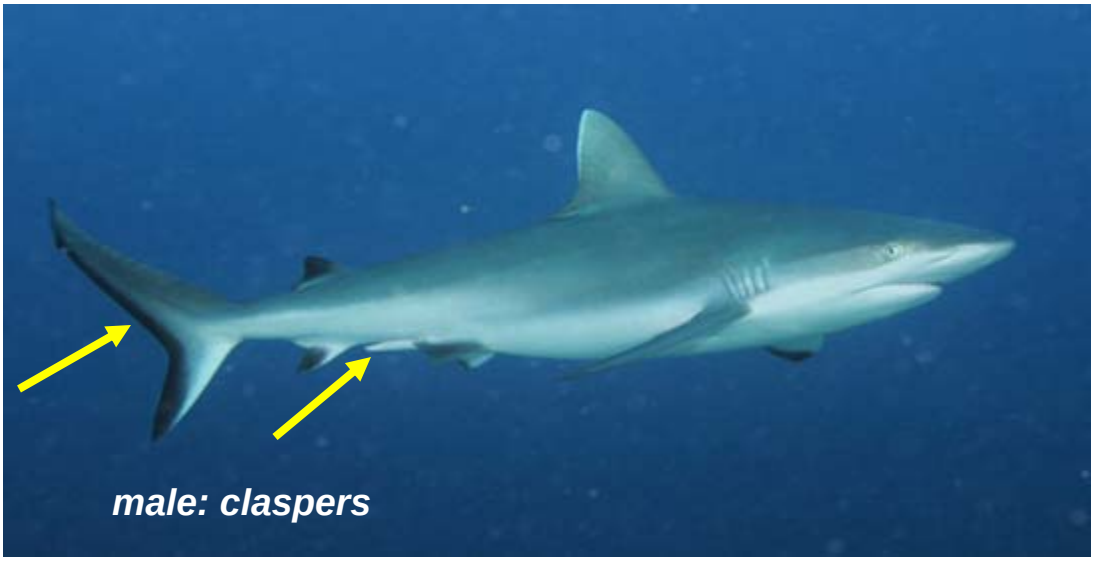


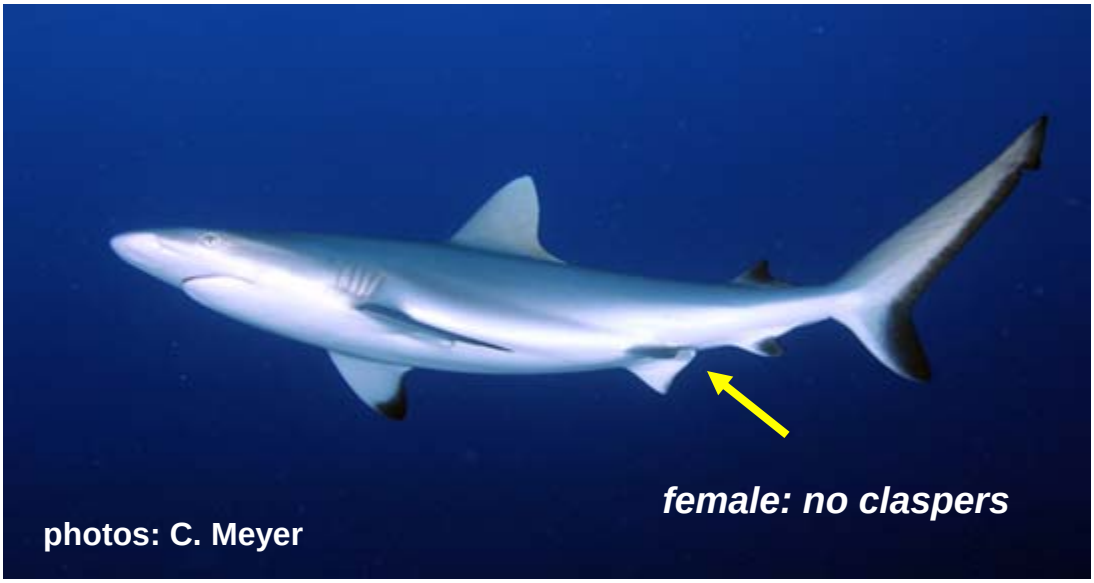
Note:

- Nearly vertical trailing edge of first dorsal fin except at base
- Low inter-dorsal ridge
- Darkened trailing edge of caudal fin

Sharks

Grey Reef shark – *Carcharhinus amblyrhynchus*





Identifying characters

•Distinct dark band on trailing edge of caudal fin (both lobes)

•Insertion of first dorsal fin well behind pectoral fins

•Weakly developed interdorsal ridge

Sharks

Grey Reef shark – *Carcharhinus amblyrhynchus*

Note:

- Grey Reef sharks usually school on reefs and pinnacles
- This species is not typically caught on pelagic longline gear

Sharks

Bignose shark – *Carcharhinus altimus*

Identifying characters

•Long, blunt snout with prominent nasal flaps

•Prominent interdorsal ridge

•Insertion of first dorsal fin is in front of trailing edge of pectoral fins

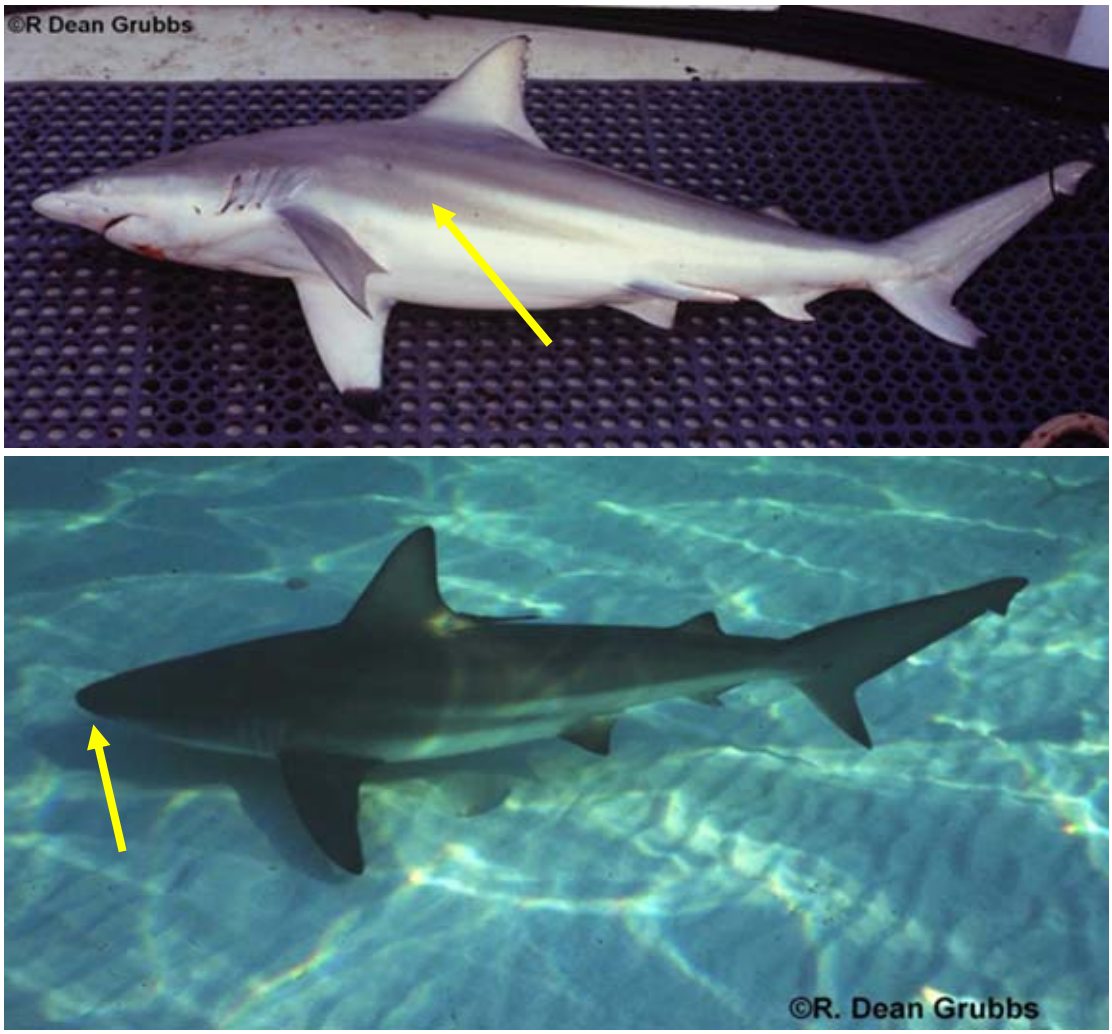
•High triangular first dorsal fin with long, nearly straight pectoral fins

•Triangular, serrated upper teeth

Sharks

Blacktip shark – *Carcharhinus limbatus*

<Note: not blacktip reef shark, C. melanopterus >



Identifying characters

•Indistinct black tips on all fins that may fade in adults

•Dark band of dorsal coloration extends along both flanks

•No interdorsal ridge

•Narrow, pointed snout when viewed from above

•Second dorsal fin origin almost directly above anal fin origin

Lamnid Sharks

Family: Lamnidae

Sharks

Mako sharks

Shortfin mako – *Isurus oxyrinchus*

Identifying characters

•Conical, pointed snout

•Caudal fin crescent shaped with large caudal keels

•Length of pectoral fins is less than head length

•Dark blue to cobalt blue on back, white belly and ventral surfaces

•Long exposed teeth without serrations

•Long gill slits

Sharks

Mako sharks

Shortfin mako – *Isurus oxyrinchus*

Note

- Dark blotch of color found at base of pectoral fins
- Conical, pointed snout
- Long exposed teeth without serrations

Sharks

Mako sharks

Longfin mako – *Isurus paucus*

Identifying characters

•Pectoral fins as long or longer than head length with rounded tips

•Long, conical snout but slightly rounded compared to short finned mako

•Caudal fin strongly crescent shaped with large caudal keels and short secondary keels on the caudal base

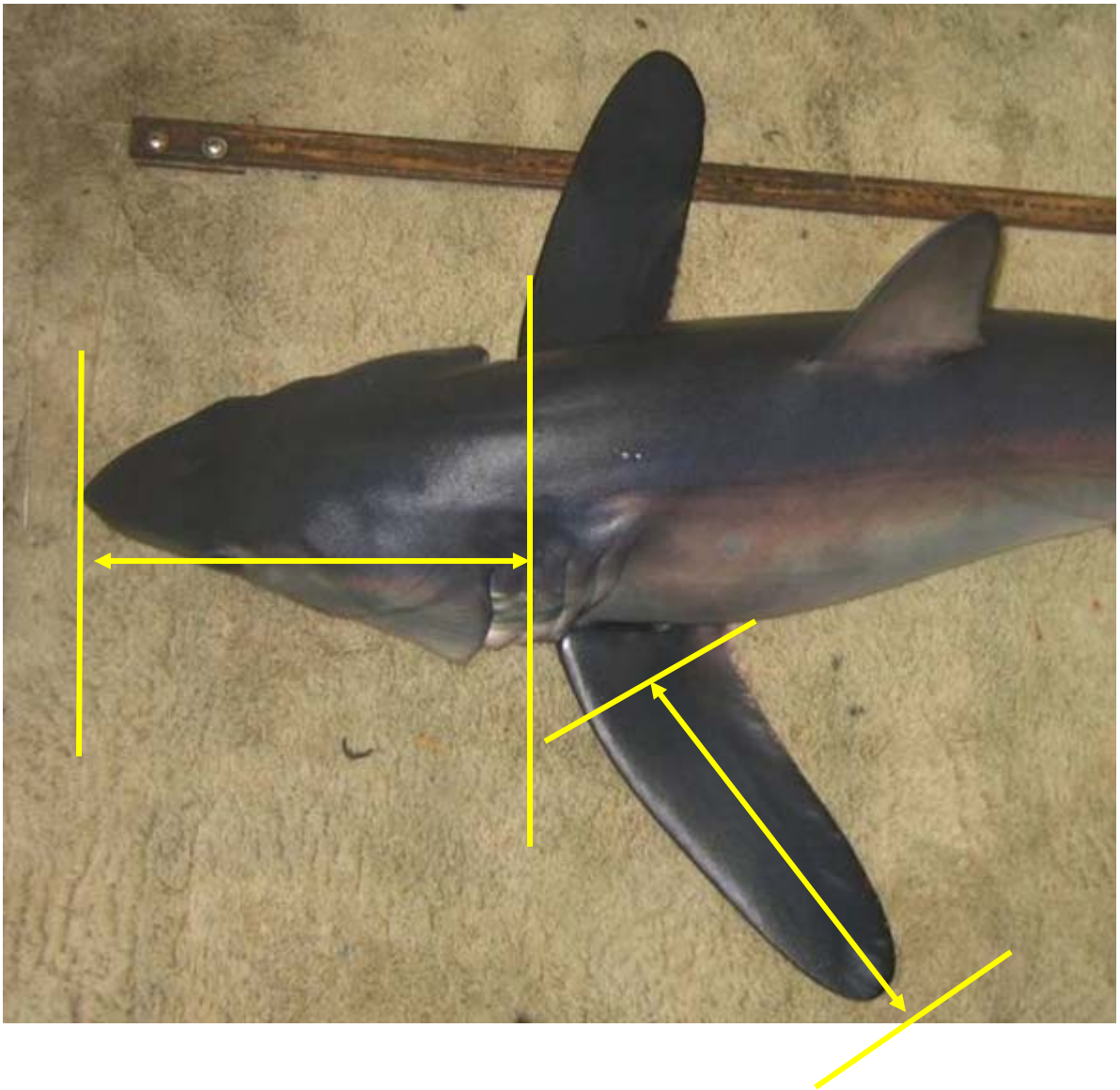
•Grey blue back and dorsal surfaces with grey mottling on mandible

•Long blade-like teeth without serrations

Sharks

Mako sharks

Longfin mako – *Isurus paucus*



Note:

•Head length versus pectoral fin length

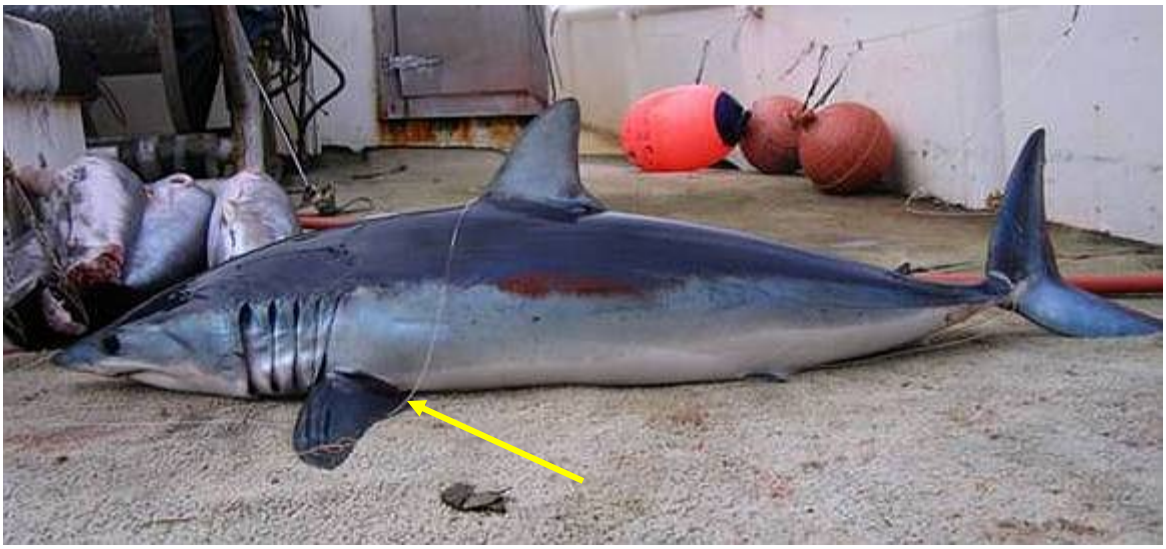
•Grey-blue coloration

Sharks

Mako sharks

Longfin mako – *Isurus paucus*

Shortfin mako – *Isurus oxyrinchus*



Summary of distinguishing characteristics

- Pectoral fins of longfin mako are as long or longer than head
- Shortfin mako has a black spot at base of pectoral fin
- Longfin mako is grey-blue while shortin makos are dark to cobalt blue

Sharks

Salmon shark – *Lamna ditropis*

Identifying characters

•Large first dorsal fin which is uniformly dark gray (no light coloration on rear tip)

•White ventral surface

•Dark blotches found along ventral surface

•Gray blotches and molting on “face”

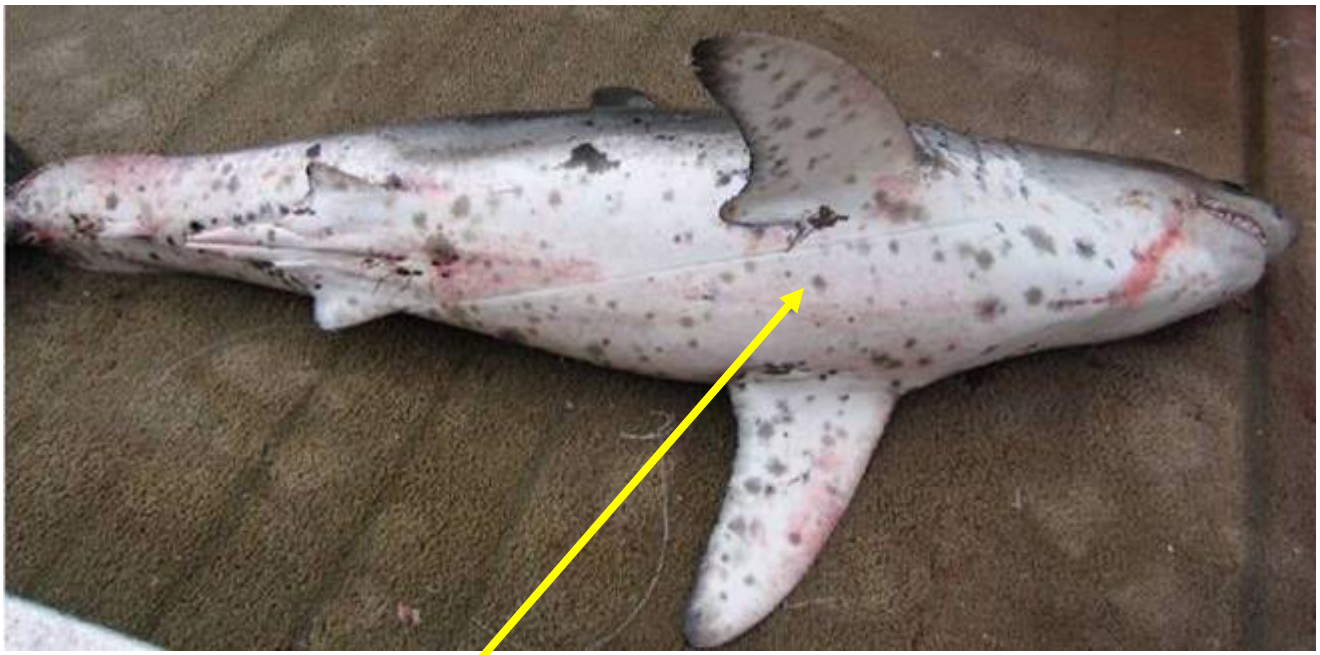
•Thick, heavy body form

•Large, crescent-shaped caudal fin

•Large primary and small secondary caudal keels

Sharks

Salmon shark – *Lamna ditropis*



Note:

•Dark blotches found along ventral surfaces

•Small, elongate front teeth with triangular, finely serrated rear teeth. Tiny lateral cusps may be present.

•Well developed caudal keel with a small secondary keel underneath

Sharks

Salmon shark – *Lamna ditropis (juvenile 76.8 cm fork length)*

Note: juvenile

- White underside, no dark blotching
- Sharp demarcation between dark dorsal and white ventral surfaces
- Distinct secondary caudal keel below large caudal keel

Thresher Sharks

Family: Alopiidae

Sharks

Bigeye thresher shark – *Alopias superciliosus*

Identifying characters

- Prominent groove on the dorsal surface of the head
- Eye sockete extends to the top of the head

Sharks

Bigeye thresher shark – *Alopias superciliosus*

- Note prominent groove
- Notice the socket extended to the top of shark's head

Sharks

Common thresher shark – *Alopias vulpinus*

Identifying characters

•Pectoral fin tips are pointed

•White ventral coloration extends above the pectoral and pelvic fins

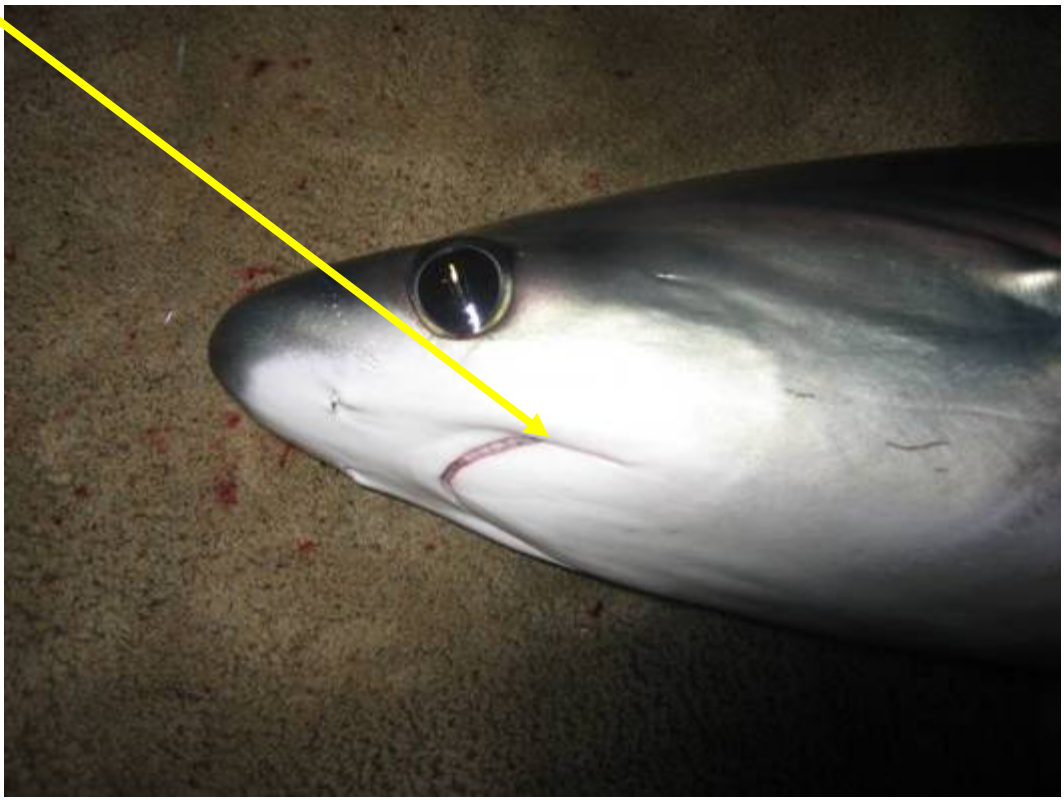
•Labial furrow at the back of the mouth (groove)

•Margin between dark and light colors is irregular

Sharks

Pelagic thresher shark – *Alopias pelagicas*

Note:
Lack of labial furrows



Sharks

Pelagic thresher shark – *Alopias pelagicas*

Identifying characters

•White ventral coloration does not extend above pectoral fin

•Pectoral fins have broadly rounded tips

•Lacks labial furrow

•Eye is not large

•Extremely long, thin upper lobe of caudal fin

Sharks

Thresher shark comparison

Sharks

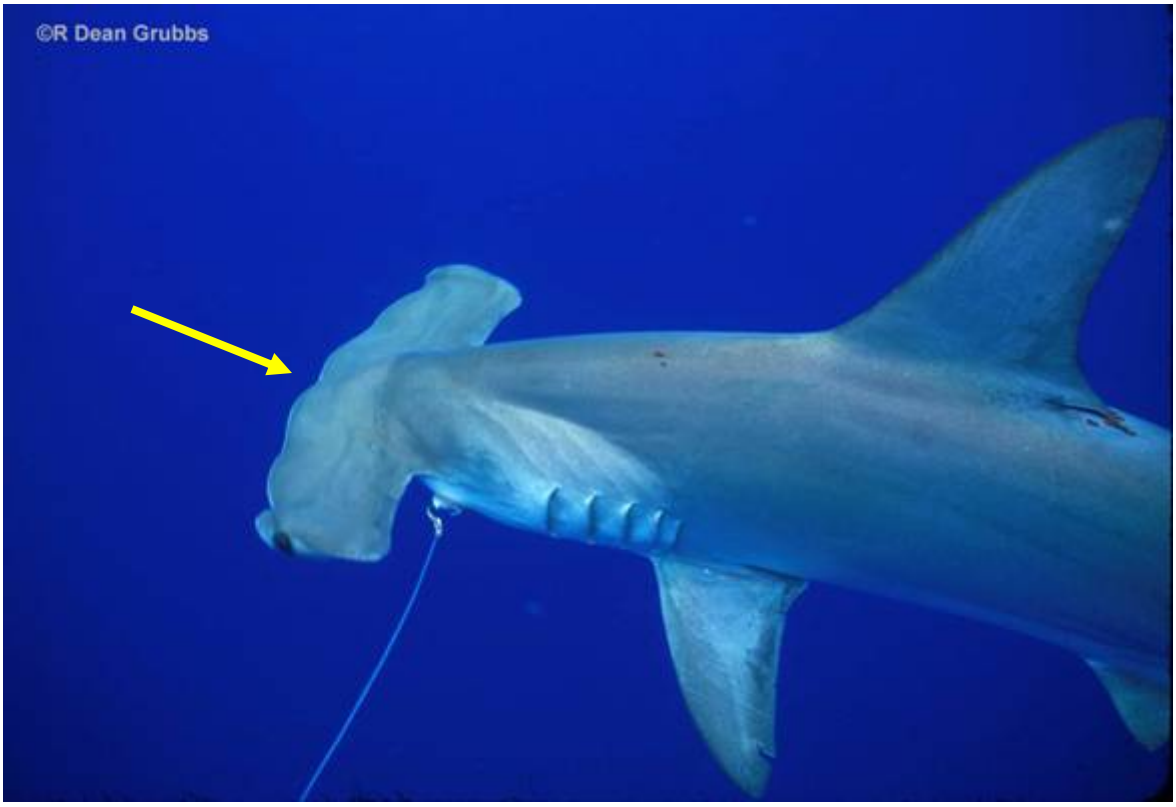
Thresher shark comparison

Hammerhead Sharks

Family: Spyrnidae

Sharks

Scalloped hammerhead shark – *Sphyrna lewini*



Identifying characters

•Five distinct notches in the leading edge of the head that include a prominent central notch

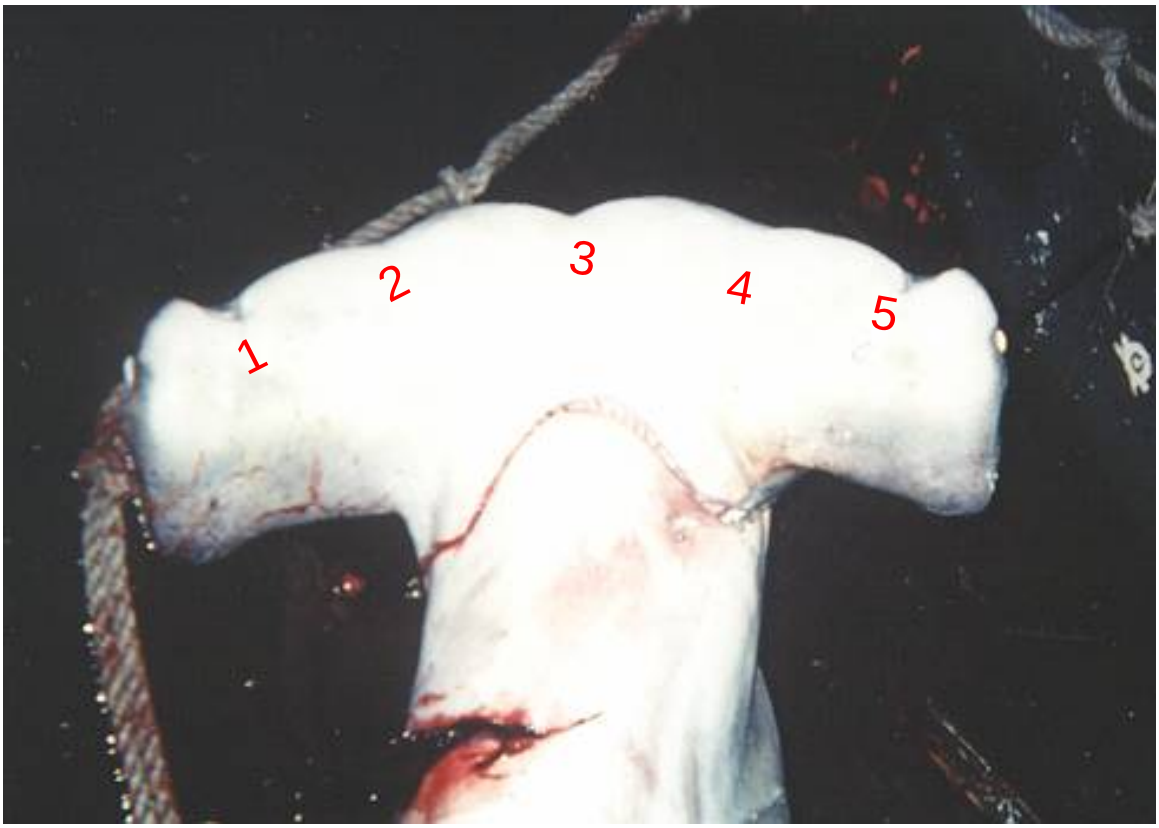
•Head notches create four weak lobes

•The leading edge of the head (hammer) is slightly swept back

•Tall, prominent first dorsal fin

Sharks

Scalloped hammerhead shark – *Sphyrna lewini*



Note:

- Five notches in head with distinct central notch
- Four weak lobes in leading edge of head

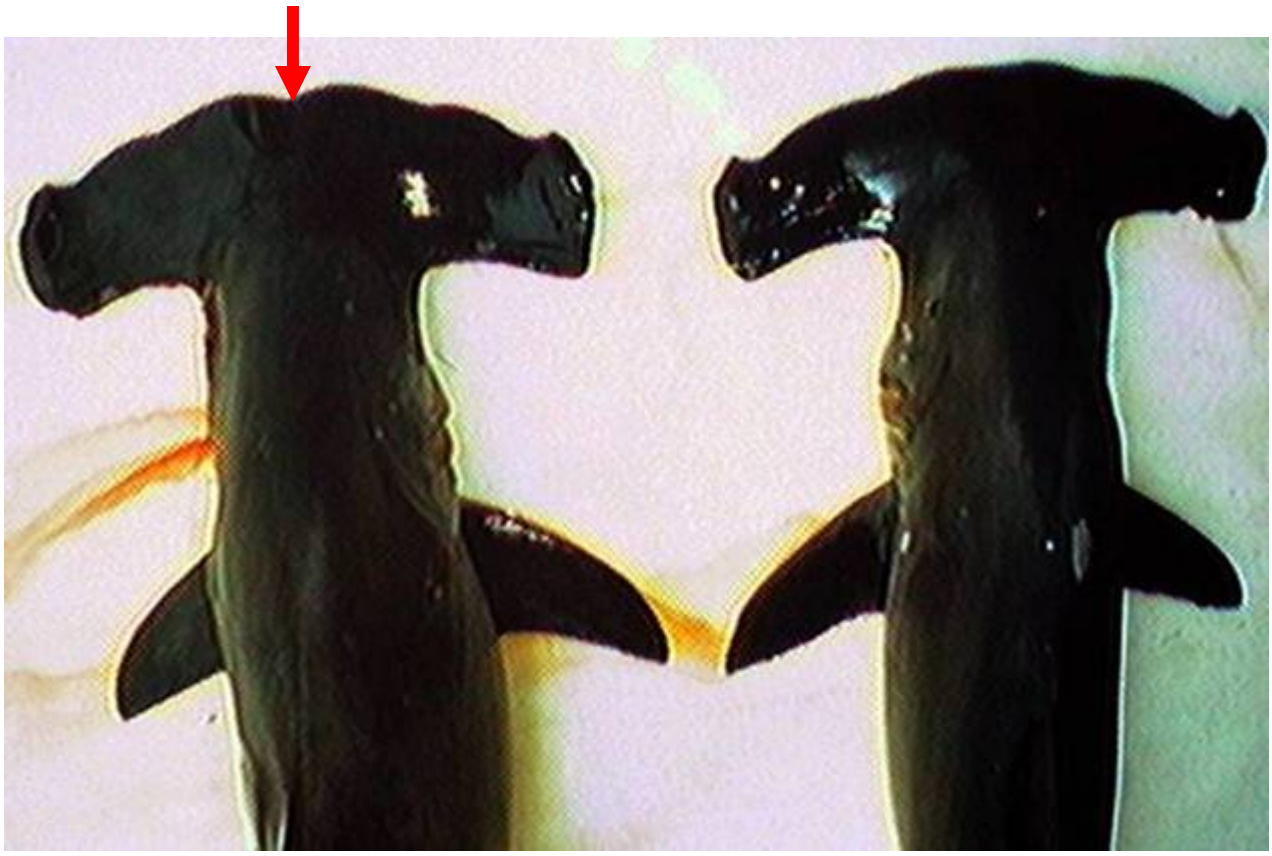
Sharks

Scalloped hammerhead shark – *Sphyrna lewini*

Smooth hammerhead shark – *Sphyrna zygaena*

species comparison:

Scalloped **Smooth**



Note:

•Difference in terminal head structure

Sharks

Smooth hammerhead shark – *Sphyrna zygaena*

Identifying characters

•Three shallow notches in the leading edge of the head with NO central notch

•Head notches create three weak lobes

•Brown or grey dorsal coloration, white ventrally

Sharks

Smooth hammerhead shark – *Sphyrna zygaena*

Note:

•Lack of a median notch in the head

Miscellaneous other shark species

Sharks

Bigeye sandtiger shark – *Odontapsis noronhai*

Identifying characters

•Body coloration: dark uniform chocolate brown

•Long needle-like teeth with a single cusp on each side

More pictures on next page

Sharks

Bigeye sandtiger shark – *Odontapsis noronhai*

Sharks

Cookie cutter shark – *Isistius brasiliensis*

Family: Dalatiidae

Identifying characters

•Dorsal fins are small and set far back on the body

•Insertion of pelvic fins equal with rear edge of first dorsal fin

•No anal fin

•Dark collar stripe

•Body uniformly brown to purple

•Dark pigmentation on tips of both lobes of caudal fin

•Trailing edge of pectoral and both dorsal fins clear or pale

•Extremely small gill slits

Sharks

Cookie cutter shark – *Isistius brasiliensis*

Note:

•Small hook-like upper teeth and fused, triangular lower teeth

•Large spiracles present behind eyes

•Eyes luminous green

Sharks

Velvet dogfish – *Scymnodon squamulosus*

Identifying characters

•First dorsal fin found at mid-portion of body; both dorsal fins possess small spines

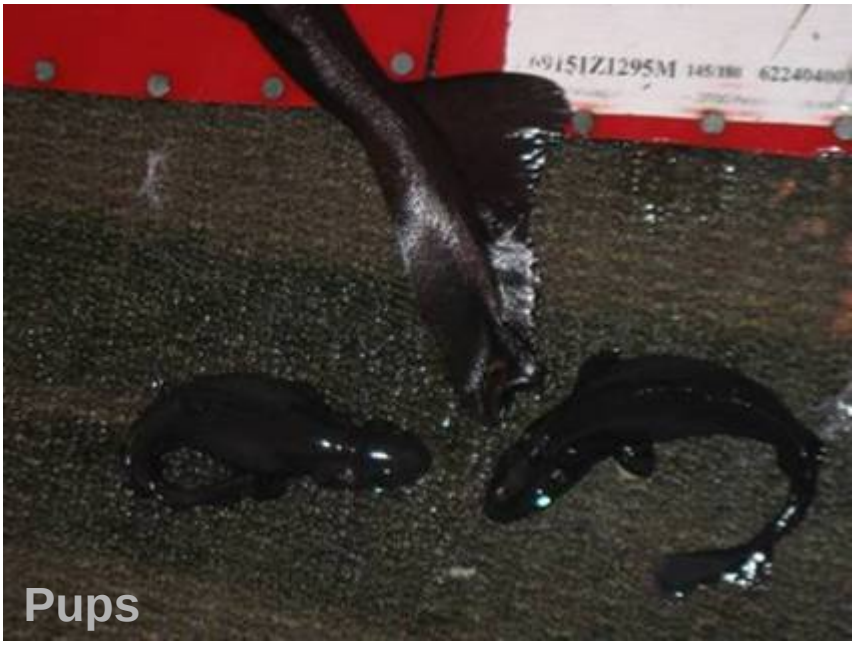
•Dark brown to black body coloration with no counter shading

•Small pelvic fins and no anal fin

•Luminous green eye

Sharks

Velvet dogfish – *Scymnodon squamulosus*



Sharks

Crocodile shark – *Pseudocarcharias kamoharai*

Family Pseudocarchariidae

Identifying characters

•Extremely large eyes

•Small pectoral fins

•Dorsal fins are small, low, and centered on the body

•Grey-brown body color which lightens on ventral surface

More descriptors on next page

Sharks

Crocodile shark – *Pseudocarcharias kamoharai*

Identifying characters

- Cone shaped snout
- Slender, spiky teeth
- Large eye (width ½ or greater than snout length)

Sharks

Sixgill shark – *Hexanchus griseus*

Identifying characters

•Six gill slits instead of the typical five found on most sharks

•Single dorsal fin found very posterior on body

•Broad head with ventral mouth. Teeth are low, serrated, and blade-like

•Coloration: brow to gray dorsally fading to lighter color below

•White stripe can be found along the side of the body

Sharks

Sixgill shark – *Hexanchus griseus*

Note:

•Serrated low shape and location of teeth

•Bluntness of snout

Sharks

Prickly shark – *Echinorhinus cookei*

Identifying characters

•First and second dorsal fins located very posterior on body and are nearly equal in size, starting posterior to the pelvic fin's origin

•Body covered in thorn-like denticles which can be large

•Coloration: gray to brown body with dark fin margins. Some white can be found around the mouth and underneath the snout

•No anal fin

More descriptors on next page

Sharks

Prickly shark – *Echinorhinus cookei*

Identifying characters

•Short labial furrows

•Teeth on the upper and lower jaws look the same

•Spiracles are small

Rays
Order: Rajiformes

Rays

Giant manta ray – *Manta birostris*

Identifying characters

•Short and thin whip-like tail, usually lacks a spine

•Mouth is found at the front of the head

•Very large body (max. size 9.1m) with broad head and terminal mouth

•Head fins are long

•Upper portion of disc black and covered in denticles; disc also has grey edging

•Ventral surface is usually white

Rays

Mobula – *Mobula mobular*

Identifying characters

•Long and thin tail which possess prickly spines

•Wide flattened body with broad head, mouth is sub-terminal

•Head with two prominent flaps below eyes at corners of mouth

•Upper portion of disc black and covered in denticles; disk also has grey edging

•Ventral surface white

Rays

Mobula – *Mobula mobular*

Note:

•Coloration and shape of head extensions (Cephalic fins**)**

•Whip-like tail

Rays

Pelagic stingray – *Pteroplatytrygopn violacea*

Identifying characters

•Grey to purple ventral side, the only stingray with a dark ventral side

•Body is thick with an angular pectoral disk (usually ~24” wide)

•Long, sharp, barbed, and poisonous stinger

•Dorsal coloration: dark gray-brown to purple-gray

•Ventral coloration: grayish, lighter than the dorsal surface but not white

•Rounded snout

Sunfishes
Family: Molidae

Sunfishes

Molas

Common mola – *Mola mola*

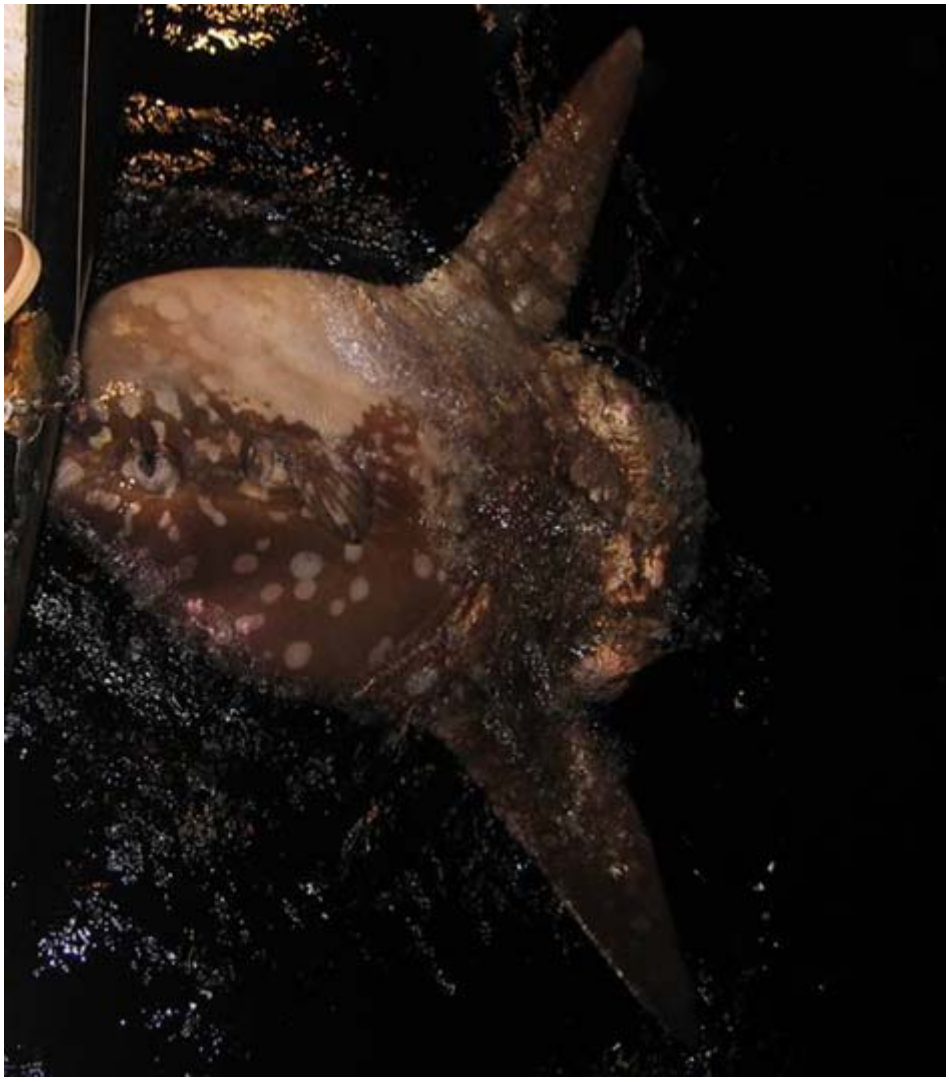
Note lack of tail extension

Sharptail mola – *Masturus lanceolatus*

Note tail extension

Sunfishes

Common mola – *Mola mola*



Identifying characters

•Body is generally disc shaped but lacks a tail

•Small mouth with fused teeth which resemble a parrot beak

•Coloration: gray, darker dorsally often with lighter gray to white spots

More descriptors on next page

Sunfishes

Common mola – *Mola mola*

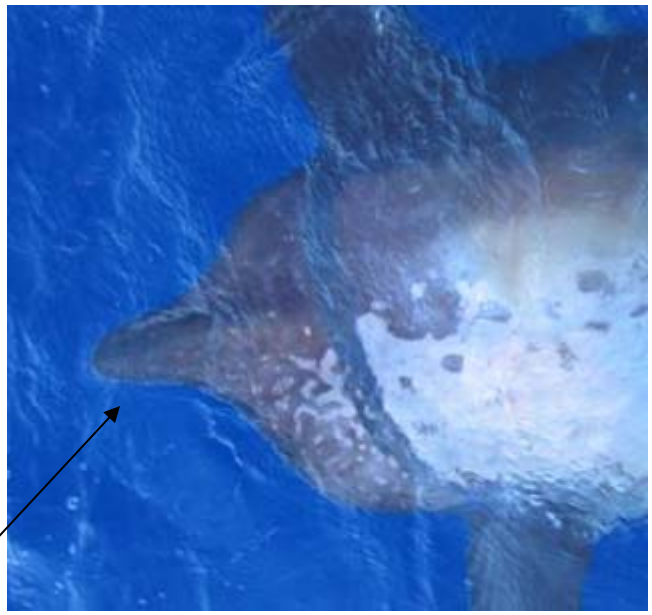
Identifying characters

•Prominent dorsal & anal fins, pectoral fins are small and rounded

•No scales, body is covered with a thick elastic skin

Sunfishes

Sharptail mola – *Masturus lanceolatus*



Identifying characters

- Tail-like projection in center of posterior end
- Two tone color pattern (brown and white/silver)
- Oval/round body shape

Sunfishes

Slender mola – *Ranzania laevis*

Identifying characters

•Body is thin and deep, ventral edge curves upward to small mouth

• Dorsal and anal fins are blue and stiff

•Coloration: Body is dark blue dorsally, silvery on the sides with many darker blue stripes and spots

•Body is “tail-less,” rear edge of body is stiff with brilliant blue-red edge of “flap”

•Mouth is a small open hole with a recessed set of teeth fused into a beak

Miscellaneous surface fishes

Miscellaneous Surface Fishes

Dolphinfish – *Coryphaena hippurus*

Identifying characters

•Body is elongated and highly flattened

•Head with a blunt profile that may appear squared off. Tail is strongly forked

•Dorsal fin is high and runs most of the body length.

•Body color varies from green to blue to silver, scattered small dark spots

•Tail most commonly yellow to gold

•Greatest body depth is anterior to pectoral fin

Miscellaneous Surface Fishes

Dolphinfish – *Coryphaena hippurus*

Note:

- The shape and pattern of the tongue patch
  - When comparing *C. hippurus* (above) with *C. equiselis* (next slide) the shape and pattern of the tongue patch can be used as an indicator

Miscellaneous Surface Fishes

Pompano dolphinfish – *Coryphaena equiselis*

Identifying characters

•Body is elongated and highly flattened.

•Head with a blunt profile that may appear squared off. Tail is strongly forked

•Dorsal fin is high and runs most of the body length

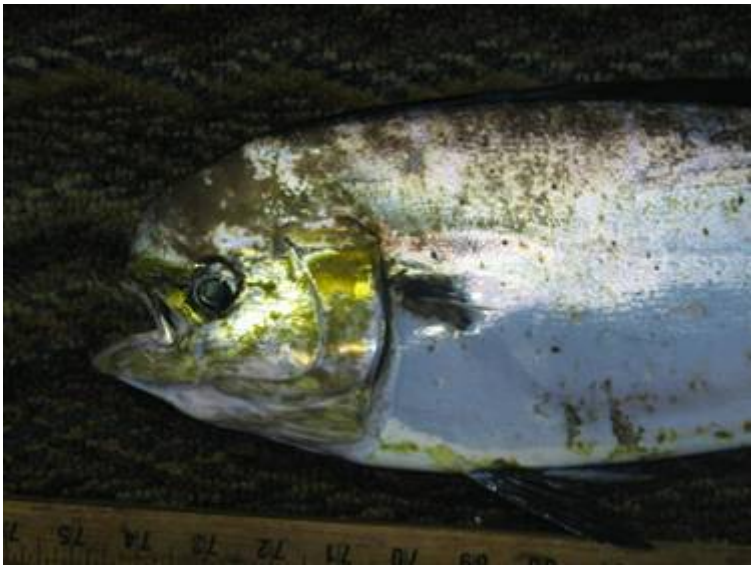
•Body color varies from green to blue to silver, scattered small dark spots

•Tail most commonly yellow to gold

•Greatest body depth is posterior to pectoral fin

Miscellaneous Surface Fishes

Pompano dolphinfish – *Coryphaena equiselis*



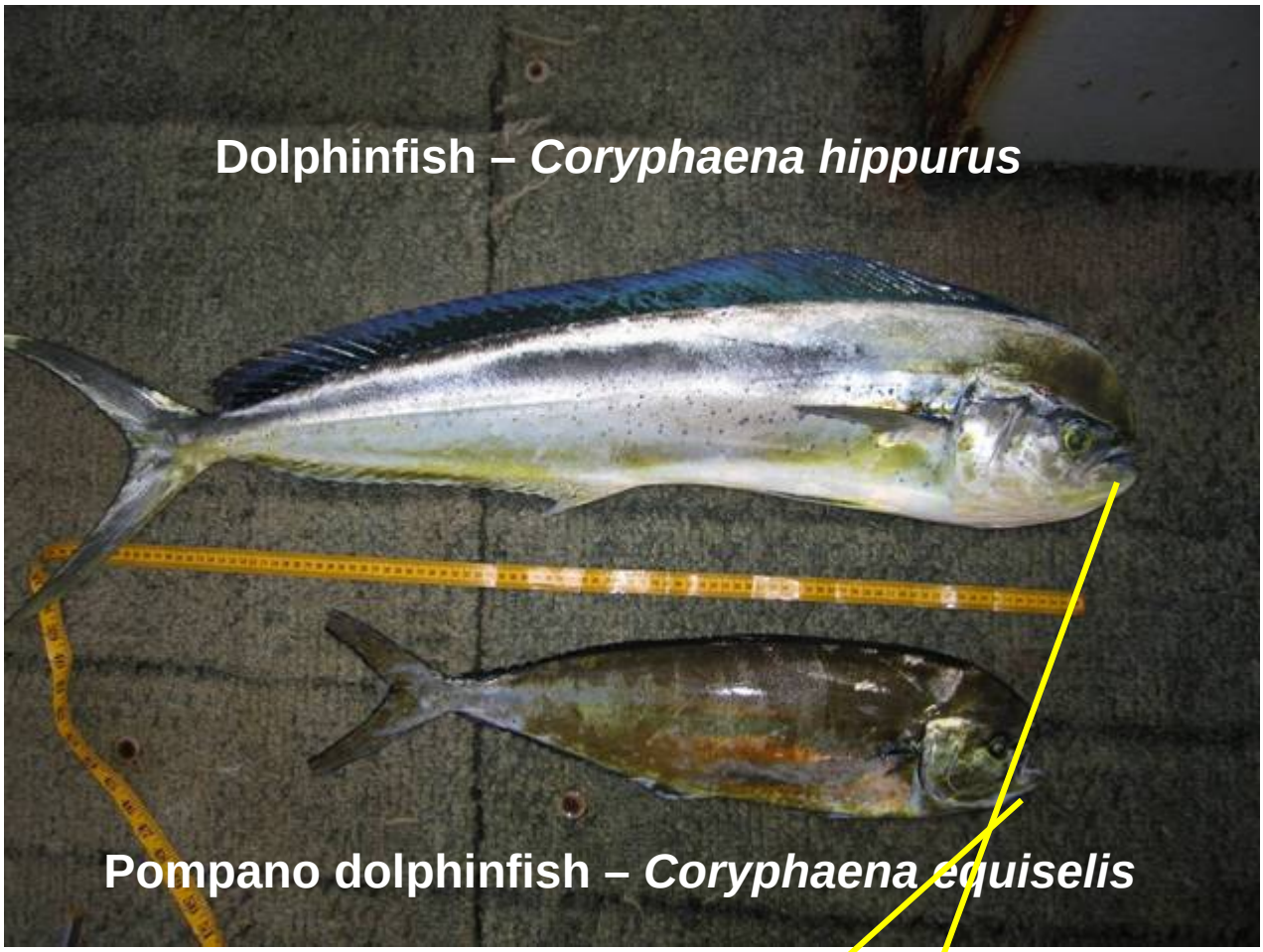
Note:

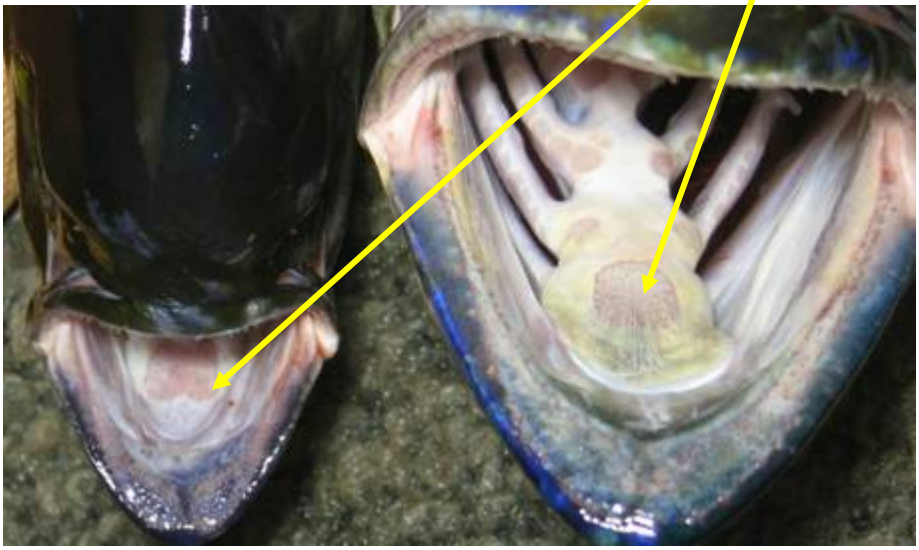
- The shape and pattern of the tongue patch
  - When comparing *C. hippurus* (previous species) with *C. equiselis* (above) the shape and pattern of the tongue patch can be used as an indicator

Miscellaneous Surface Fishes

Dolpinfish and Pompano dolphinfish

a comparison of tongue patches





Miscellaneous Surface Fishes

Great barracuda – *Sphyraena barracuda*

Identifying characters

•Short dark bars which do not extend below the midline of the body

•Lower jaw extends anteriorly beyond upper snout

•Irregular black blotches common (usually found towards the posterior end)

•Wide triangular caudal fin

•Large scales

•Caudal, second dorsal, and anal fins posses white tips, and are otherwise dark

•Large prominent canine teeth with large, blade-like lateral teeth

Miscellaneous Surface Fishes

Great barracuda – *Sphyraena barracuda*

Miscellaneous Surface Fishes

Rainbow runner – *Elagatis bipinnulata*

Identifying characters

•Body shape is elongated. Coloration: blue to blue-green, darker dorsally with white belly

•Sides of body with blue and yellow stripes along length of body

•Two dorsal fins. 1st dorsal fin is low, 2nd dorsal fin is higher ending near the caudal peduncle

•Dark colored and very forked caudal fin

•A single two rayed finlet posterior to second dorsal and anal fins

Miscellaneous Surface Fishes

Rainbow runner – *Elagatis bipinnulata*

Note:

- Deep forking and coloration of caudal fin
- Finlets behind second dorsal and anal fins

Miscellaneous Surface Fishes

Almaco jack – *Seriola rivoliana*

Identifying characters

•Height of 2nd dorsal fin <u>greater than</u> longest rays of pectoral fin

•Body is elongated, somewhat laterally compressed with a forked tail

•Coloration: body is olive green dorsally, purplish gray on sides, light on belly

•Sides with heavy yellow-greenish, yellow stripe along the length of body

•Two dorsal fins, 1st dorsal fin is low, 2nd dorsal fin with extended anterior rays

Miscellaneous Surface Fishes

Almaco jack – *Seriola rivoliana*

Note:

•Both of these are almaco jacks of different sizes and coloration patterns

•Height of dorsal fin compared to length of pectoral fins

Miscellaneous Surface Fishes

Greater amberjack – *Seriola dumerili*

Identifying characters

•Height of 2nd dorsal fin equal or slightly less than the longest rays of pectoral fin

•Body is elongated, somewhat laterally compressed with forked tail

•Coloration: olive-green dorsally with pruplish-gray on sides. Belly is lighter

•Side with heavy yellow-greenish yellow stripe along the length of body

•Two dorsal fins, first is low and second dorsal fin has slightly extended anterior rays

Miscellaneous Surface Fishes

Cottonmouth jack – *Uraspis spp.*

Identifying characters

•Body shape is short and deep, laterally compressed, and has a forked tail

•Inside of mouth and tongue with conspicuous patches of pure white coloration

•Body coloration: sooty dark gray with several lighter vertical bars; fins are dark

•Anterior end of lateral line is arched, 23-40 scutes in the straight area

More descriptors on next page

Miscellaneous Surface Fishes

Cottonmouth jack – *Uraspis spp.*

Identifying characters

•Outside of mouth is dark blue/black contrasting the white inside

•Very round snout

•In juveniles: approximately 6-7 dark vertical bars, each with pale spaces in between

Miscellaneous Surface Fishes

Pilotfish – *Naucrates ductor*

Identifying characters

•5-6 dorsal spines, 3 anal spines

•End of upper jaw is located at the front edge of the eye

•Caudal peduncle possesses prominent fleshy keels

•Body coloration is made of alternating dark and silver bars, usually 6-7 dark bars

•Tips of pelvic, dorsal and anal fin lobes are white in color

Miscellaneous Surface Fishes

Remora – *Echeneidae*

Identifying characters

•Top of head covered with large sucker, with rough texture inside of margin

•Body shape is elongate and anterior portion including head is flat dorsally

•Moderately to weakly forked tail

More descriptors on next page

Miscellaneous Surface Fishes

Remora – *Echeneidae*

Identifying characters

•Mouth extends slightly forward

•Small scales, smooth skin

•Coloration: predominantly gray, dark or light

•Usually found attached to larger fish, sometimes attached to inside of gill covers

Miscellaneous Surface Fishes

Flyingfish – *Exocetidae*

Identifying characters

•Large and wide pectoral fins, length >50% of fork length (wing-like appearance)

•Maximum length 45cm, but typically under 30cm

•Pelvic fins often wide and rounded, located towards rear of body

More descriptors on next page

Miscellaneous Surface Fishes

Flyingfish – *Exocetidae*

Identifying characters

•Strongly forked caudal fin; lower lobe longer than upper lobe

•Body covered with large scales, eyes are large with a small mouth

•Body is elongated, nearly round in cross section

Miscellaneous Surface Fishes

Flyingfish – *Exocetidae*

Note:

•Length of pectoral fins relative to body length

•Forking of caudal fin and the size of the upper and lower lobes

•Eye size relative to head and mouth

Miscellaneous Surface Fishes

Sargassum fish – *Histrio histrio*

Identifying characters

•Body coloration matches that of *Sargassum* seaweed

•Appendages also resemble pieces seaweed

•Second dorsal spine longer than the illicium

•Skin feels smooth

Miscellaneous Surface Fishes

Sargassum fish – *Histrio histrio*

Note:

•Shape of appendages

•Body coloration and texture

Miscellaneous Surface Fishes

Oceanic triggerfish – *Canthidermis maculata*

Identifying characters

•Body is laterally compressed with a forked tail

•Eyes are far from mouth, places high on body

•Snout is long, mouth small with teeth partially fused into beak

•First dorsal fin with stout spine. Second dorsal and anal fins with longer rays than first dorsal

•Coloration: predominantly dark with light blue t whitish spots, scales are small and thick

Miscellaneous Surface Fishes

Oceanic triggerfish – *Canthidermis maculata*

Note:

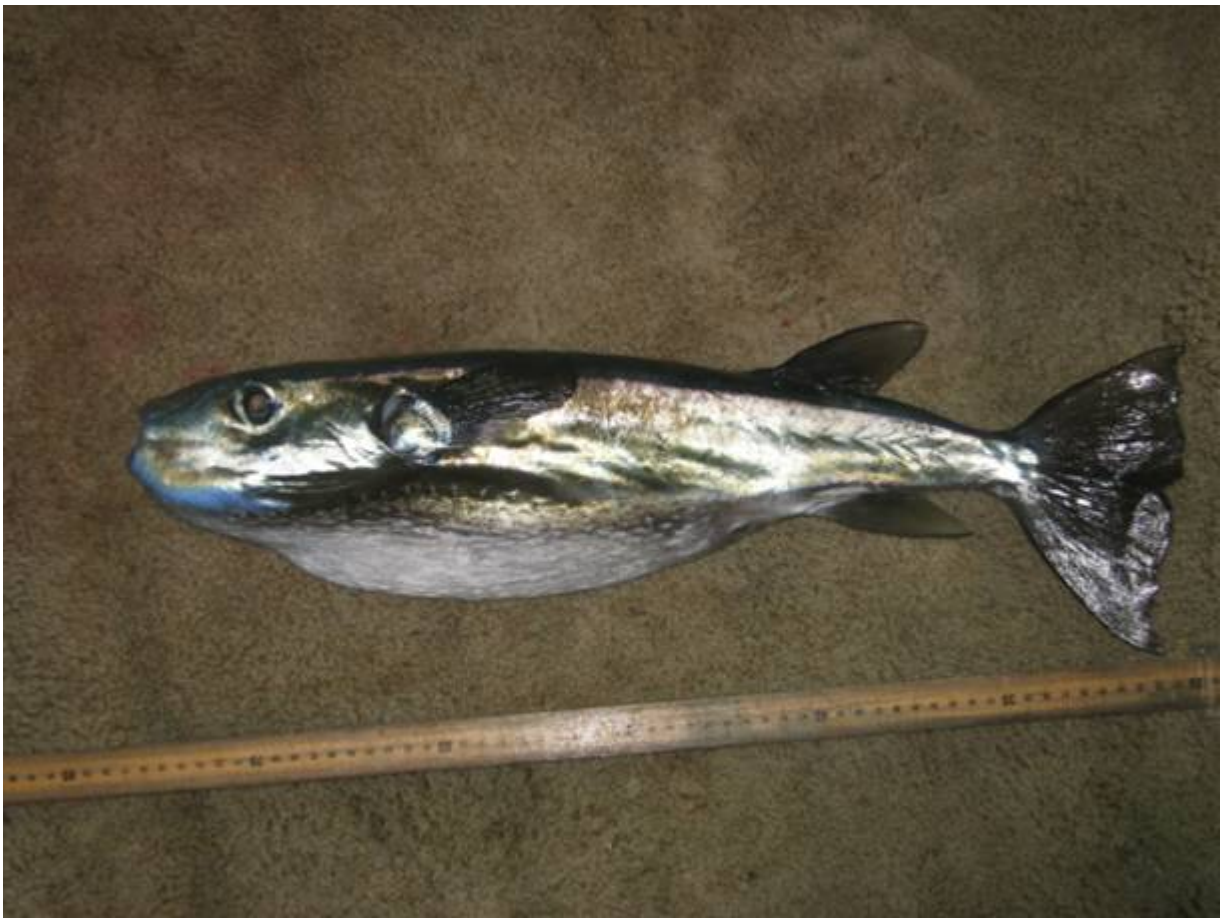
•Stout spine in first dorsal fin

•Length/height of second dorsal and anal fins relative to the first dorsal fin

•Body coloration

Miscellaneous Surface Fishes

Oceanic Puffer– *Lagocephalus lagocephalus*



Identifying characters

•Single dorsal and anal fin (both lacking spines) and roughly in line with one another

•Adult coloration: white belly with grey/blue/green/brown coloration above

•Juveniles have approximately 9 bars on their back (starting at the eye ending near dorsal fin), they may also have dark spots on their bellies

Miscellaneous Surface Fishes

Oceanic Puffer– *Lagocephalus lagocephalus*

Notice:

•The difference in body appearance between an inflated and a relaxed pufferfish

Escolar
and
Snake Mackerels

Family: Gempylidae

Miscellaneous Mid-Water Fishes

Smith's escolar – *Lepidocybium flavobrunneum*

Identifying characters

•Body is fusiform with a thick peduncle, looks like a heavy set tuna

•Many dorsal & anal finlets, caudal peduncle with a caudal keel

•Overall color is dark gray to black, may look dark brown

•Body is covered with small soft scales

•Large teeth present, eyes are large

Miscellaneous Mid-Water Fishes

Roudi's escolar – *Promethichthys prometheus*

Identifying characters

•Dorsal fin runs the length of the body, anterior and posterior fin rays are shorter than mid-dorsal fin rays

•Body is somewhat elongated

•Overall color is silvery-gray, darker on back

•Body is smooth

More descriptors on next page

Miscellaneous Mid-Water Fishes

Roudi's escolar – *Promethichthys prometheus*

Identifying characters

•Head, tail and fins are dark smoky gray to black

•Large teeth present in anterior of mouth, head is long with pointed jaws

Miscellaneous Mid-Water Fishes

Longifn escolar – *Scombrolabrax heterolepis*

Identifying characters

•Overall color is dark gray to black, may look dark brown, fins are dark gray to black

•Body is covered with scales which slough off easily

•Two large teeth present (“fangs’) in angle of upper jaw

•Large eyes and long pectoral fins

•Tail is moderately forked

•Lateral line originates high above base of pectoral fin and runs along the back near base of dorsal fin

Miscellaneous Mid-Water Fishes

Longifn escolar – *Scombrolabrax heterolepis*

Note:

•Length of pectoral fins compared to body length

•Size of eye relative to head

•Coloration

Miscellaneous Mid-Water Fishes

Oilfish – *Ruvettus pretiosus*

Identifying characters

•Body is fusiform with a thick peduncle, looks like a heavy set tuna

•Overall color is dark gray to black, may look dark brown

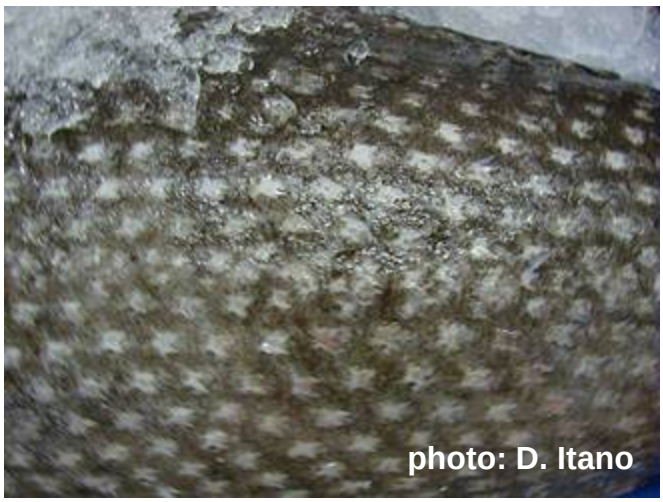
•Two dorsal & anal finlets

•Body is covered with scattered white to clear spines. Prominent ridge of skin on belly

•Large teeth present in anterior portions of mouth

Miscellaneous Mid-Water Fishes

Oilfish – *Ruvettus pretiosus*



Note:

- Only two dorsal and anal finlets
- Thick caudal peduncle
- Shape and pattern of scales

Miscellaneous Mid-Water Fishes

Snake Mackerel – *Gempylus serpens*

Identifying characters

•Body is very elongated, with a forked tail

•Back is dark blue, may look blacker. Dorsal fin is dark colored, low and extends most of body length

•Sides are sliver to silver gray with a series of sub-dermal bones making “chevron-like” pattern along length of body

More descriptors on next page

Miscellaneous Mid-Water Fishes

Snake Mackerel – *Gempylus serpens*

Identifying characters

•Fins are gray to dark gray, dorsal and anal finlets present

•Jaws are elongated, with pointed chin. 2-4 large teeth in anterior angle of upper jaw

•Pelvic fins reduced to a pair of clear to white spines, 2-5mm long located ventral to pectoral fins

Miscellaneous Mid-Water Fishes

Longnose lancetfish – *Alepisaurus ferox*

Identifying characters

•Dorsal fin is silvery gray to darker gray/black, large and “sail-like” and may have darker spots

•Body is very elongated

•Fins are dark gray to black

•Body is smooth with a prominent lateral line

More descriptors on next page

Miscellaneous Mid-Water Fishes

Longnose lancetfish – *Alepisaurus ferox*

Identifying characters

•Tail is forked, black adipose fin present

•Overall color is silvery gray, darker on back

•Large, clear “fang-like” teeth

•Long head with long, pointed jaws

•Soft, flabby flesh

Miscellaneous Mid-Water Fishes

Gemfish – *Thysitops lepidopoides*

Identifying characters

- Body is elongated
- Tail is forked with rounded, not sharply pointed tips
- Pelvic fins are small, often reduced to a single spine
- Two dorsal fins. 2nd dorsal fin is lower than 1st
- Mouth is large with somewhat large teeth in anterior

Miscellaneous Mid-Water Fishes

Gemfish – *Thysitops lepidopoides*

Note:

- Large mouth, elongated canine teeth
- Elongated, laterally compressed body

Pomfrets
Family:
Bramidae

Miscellaneous Mid-Water Fishes

Fanfish – *Pteraclis spp.*

Identifying characters

•Dorsal fin is dark (blue to dark blue/black), large, and tall; origin anterior to eye Eyes are close to front of head, over mouth

•Anal fin similar to dorsal fin with origin posterior of rear edge of gill covers

•Body is laterally compressed with a forked tail

•Body color predominantly silver to gray , scales are large and thick

•Jaw/mouth angles downward

Miscellaneous Mid-Water Fishes

Brama pomfret – *Brama spp.*

Identifying characters

•Elongated upper lobe of caudal fin

•Anterior portion of dorsal fin slightly taller than the rest of the fin

•Anterior portion of the anal fin slightly taller than the rest of the fin

Miscellaneous Mid-Water Fishes

Brama pomfret – *Brama spp.*

•Notice the elongated upper lobe of caudal fin

Miscellaneous Mid-Water Fishes

Dagger pomfret – *Taractes spp.*

Identifying characters

•Dark pelvic fins

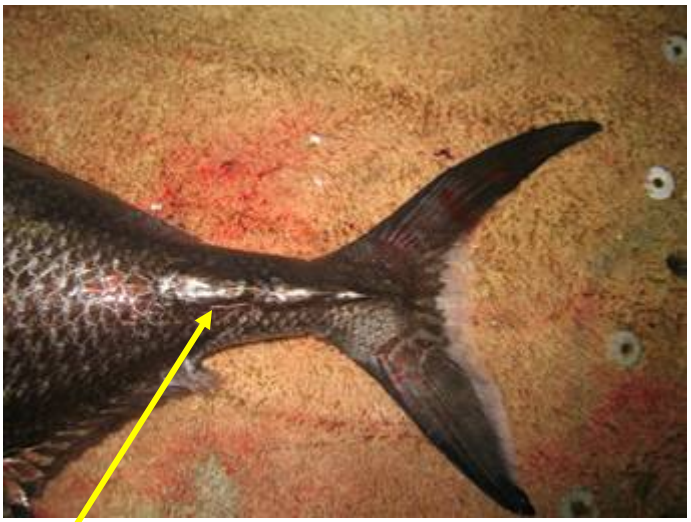
•Asymmetrical caudal fin (lower lobe is wider than the upper lobe)

•Pronounced scutes and spines on caudal peduncle

•Pelvic fins with silver-white tips

Miscellaneous Mid-Water Fishes

Dagger pomfret – *Taractes spp.*



Note: pronounced scutes and spines

Miscellaneous Mid-Water Fishes

Lustrous pomfret – *Eumegistis illustris*

Identifying characters

- Lustrous purple/black coloration
- Cleft of mouth nearly vertical
- Whitish or clear margin of central portion of caudal fin
- Juvenile tail black with whiteish or clear tips
- Dark border of dorsal and anal fins

Miscellaneous Mid-Water Fishes

Lustrous pomfret – *Eumegistis illustris*

Note:

- Whitish or clear margin of central portion of caudal fin
- Dark trailing edge of dorsal and anal fins

Miscellaneous Mid-Water Fishes

Rough pomfret – *Taractes asper*

Identifying characters

•Long face profile compared to other pomfrets

•Looks very similar to a dagger pomfret, but lacks the enlarged tail scutes

Miscellaneous Mid-Water Fishes

Rough pomfret – *Taractes asper*

Note

•Lack of enlarged tail scutes

Miscellaneous Mid-Water Fishes

Sickle pomfret – *Taractichthys steindachneri*

Identifying characters

•Falcate dorsal and anal fins

•White margin on trailing edge of caudal fin

•Silver-white tipped pelvic fins

Miscellaneous Mid-Water Fishes

Sickle pomfret – *Taractichthys steindachneri*


Juvenile


adult

Identifying characters

•Notice the extended points of the dorsal and anal fins of a juvenile.

Miscellaneous Mid-Water Fishes

Sickle pomfret – *Taractichthys steindachneri*

Note: white margin along trailing edge of caudal fin

Miscellaneous mid-water fishes

Miscellaneous Mid-Water Fishes

Opah – *Lampris guttatus*

Identifying characters

•Body is generally disc shaped

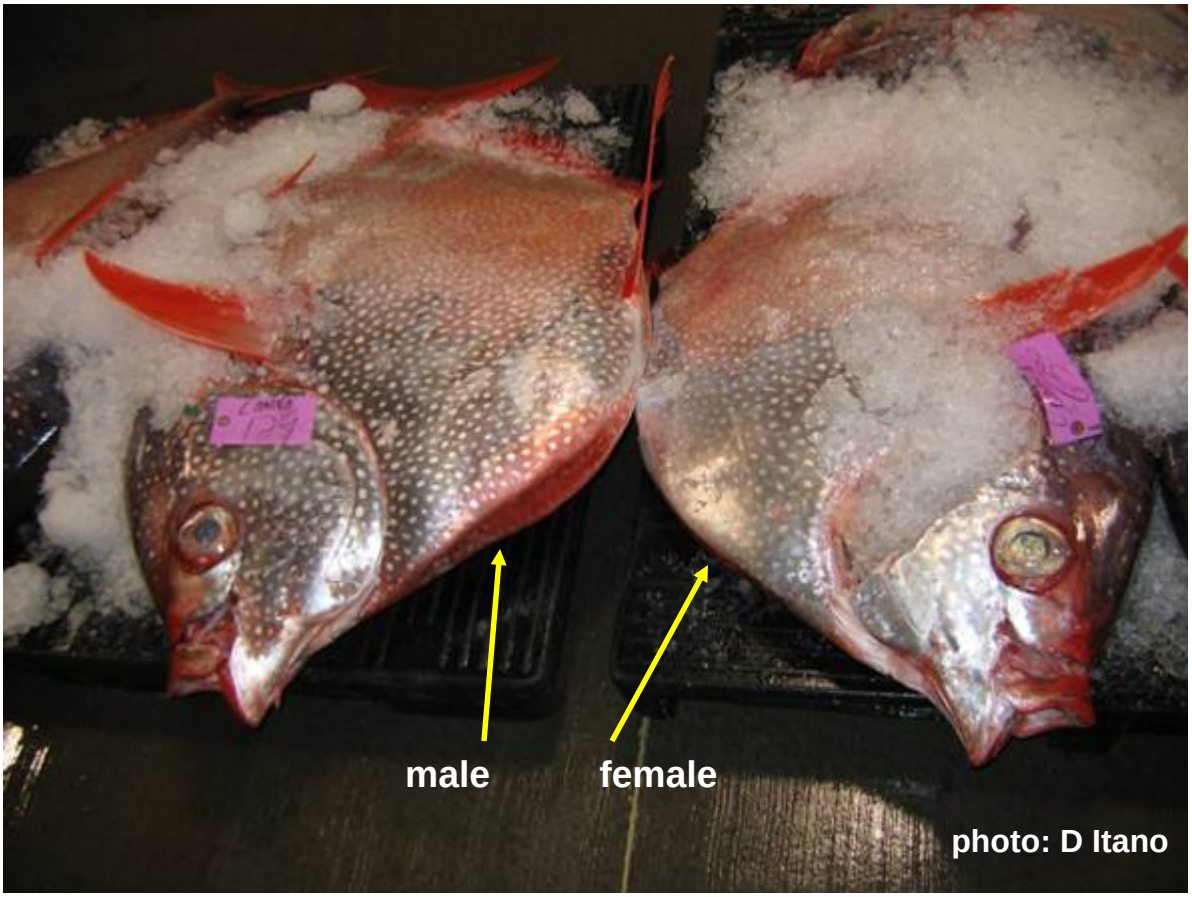
•Body coloration: silvery and covered with white spots, somewhat darker with an orange tone dorsally

•Fins are bright reddish-orange, lips are bright red-orange

•Pelvic fins are long and wide, tail is mildly forked

Miscellaneous Mid-Water Fishes

Opah – *Lampris guttatus*



Note:

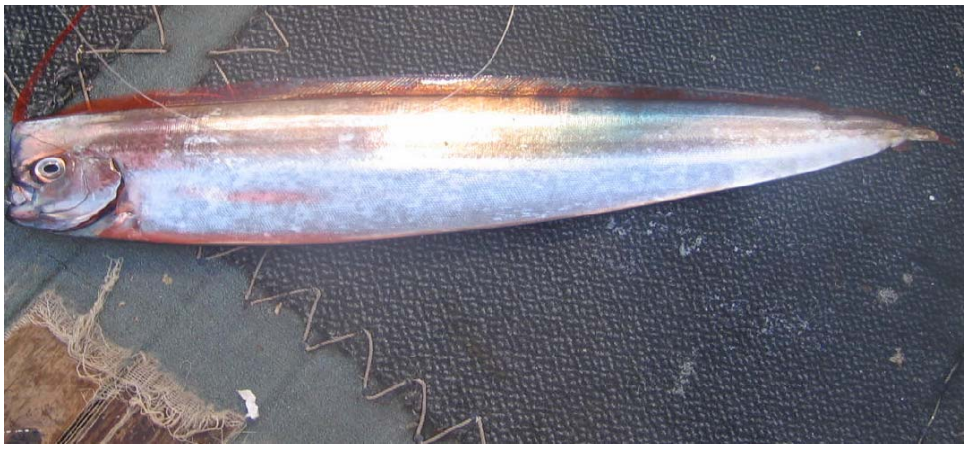
- Opah are sexually dimorphic when mature
- Male opah have a distinct double edged plate between the head and pelvic fins
- This area is smoothly rounded in female opah

Ribbonfishes

A comparison

Tapertail ribbonfish – *Trachipterus fukuzakii*

Crestfish – *Lophotus capellei*



Identifying and distinguishing characters

•Mouth of tapertail ribbonfish is highly protrusible

•Terminal region of crestfish head has a red filamentous extension continuing from the dorsal fin

Miscellaneous Mid-Water Fishes

Crestfish – *Lophotus capellei*

Identifying characters

•Body elongate with tail tapering to a point

•Fins are red in color

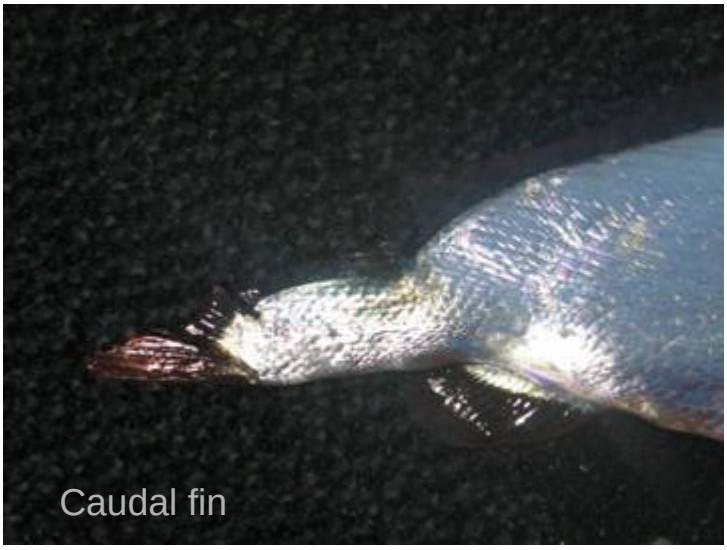
•Body color is silver with occasional areas of spots

•Dorsal fin runs entire length of body, starting with red fin filament at the head

More descriptors on next page

Miscellaneous Mid-Water Fishes

Crestfish – *Lophotus capellei*



Identifying characters

•Head is blunt with small mouth

•Red fin filament extending from the head

•Caudal fin is extremely small and red in color

Miscellaneous Mid-Water Fishes

Tapertail ribbonfish – *Trachipterus fukuzakii*

Identifying characters

•Highly protrusible mouth

•Short pectoral fins, lacks pelvic fins

•Body elongate tapering to a point at the tail

•Reflective silver body with red fins

•Body shape and coloration very similar to the crestfish

Miscellaneous Mid-Water Fishes

Tapertail ribbonfish – *Trachipterus fukuzakii*

Mouth fully extended

Comparison of mouth positioning in the tapertail ribbonfish

Mouth Closed

Miscellaneous Mid-Water Fishes

Tapertail ribbonfish – *Trachipterus fukuzakii*

Note:

•Highly protrusible mouth

•Tail tapering to point

Miscellaneous Mid-Water Fishes

Driftfish – *Cubiceps gracilis*

Identifying characters

•Body color predominantly gray, dark to light, body covered with large scales

•Eyes are large, located on sides of head. Top of head is rounded

•Tail is strongly forked, pectoral fins are long

•Lips are fleshy

Miscellaneous Mid-Water Fishes

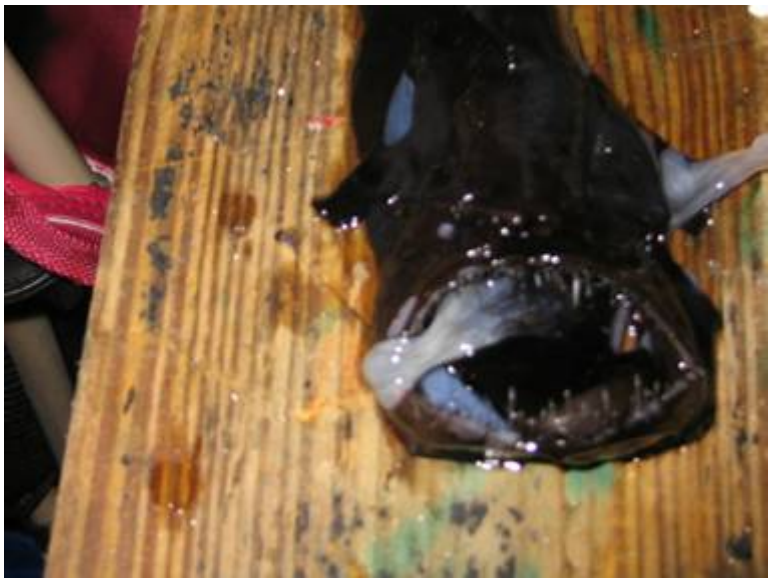
Driftfish – *Cubiceps gracilis*

Note:

- Pectoral fin length/shape
- Fleshy lips
- Roundness of head

Miscellaneous Mid-Water Fishes

Anglerfish – *Lophius piscatorius*



Identifying characters

- Clear sharp looking teeth
- Dorsal fin has modified lure-like extension
- Mouth very large relative to body size

Miscellaneous Mid-Water Fishes

Black swallower – *Chiasmodon niger*

Identifying characters

• Body is elongate and smooth, lacking scales.

• Skin in belly region flabby, may be greatly distended in some specimens with prey items

• Coloration very dark gray to black, may have brownish hues

• Large mouth lined with fine needle like teeth in wide band

• Two dorsal fins, 2nd dorsal fin is longer and higher than 1st

• Fins are soft and easily frayed

• Eye located above midpoint of upper jaw

• Body is smooth and lacks scales, color is very dark gray to black, may have brownish hues

• Large noticible pores along upper & lower jaw lines and behind and above eyes

Miscellaneous Mid-Water Fishes

Black swallower – *Chiasmodon niger*

Note:

- Large mouth lined with fine needle like teeth in wide band
- Dark coloration

Miscellaneous Mid-Water Fishes

Hammerjaw – *Omosudis lowii*

Identifying characters

•Body coloration: brownish dorsal surface with iridescent/silver body

•Black peritoneum is visible through skin

•No dorsal or anal spines

More descriptors on next page

Miscellaneous Mid-Water Fishes

Hammerjaw – *Omosudis lowii*

Identifying characters

•Teeth are strong, pointed, and notably large

•Forked tail

•Body feels smooth due to lack of scales