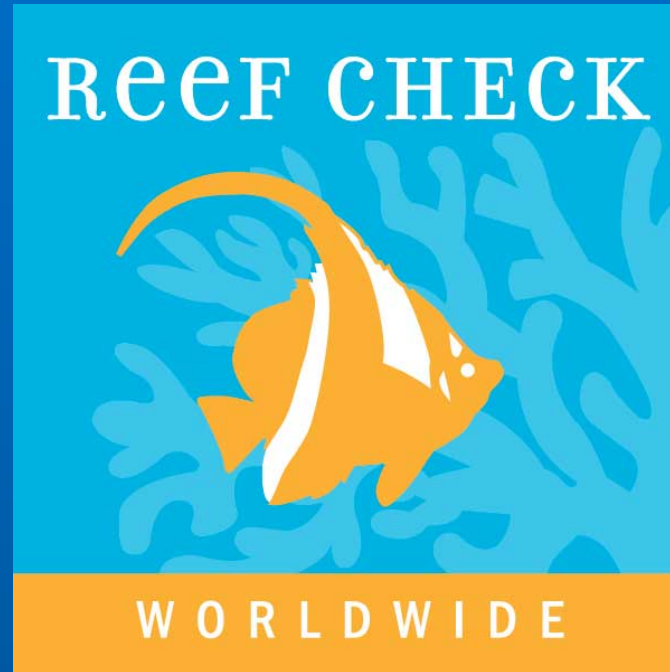


# Indo-Pacific Fish ID Training



**Reef Check  
EcoDiver Course**

# Fish monitoring: What affects reliability of fish counts?

- Diver movements can scare fish
- Water clarity and light
- Spatial scale of survey vs swimming range of fish
- Fish behavior patterns e.g. cryptic
- Swimming speed - more fish will be seen by a diver who swims slowly

# Fish monitoring methods

- Four 5 m wide by 20 m long by 5 m high belt (or tunnel) transects
- First survey done
- Ideal start time 9-10 AM
- Takes about up to 60 minutes to complete

# Fish monitoring methods

To conduct this survey:

1. Deploy the line first
2. Wait 15 minutes until fish resume normal activity
3. Work with a buddy to conduct surveys

# Fish monitoring methods

## *Transect methods:*

- Lay line. Exit water and wait 15 minutes.
- At beginning of line, wait 1 minute. During this time, check width of 2.5 m belt versus your body length.
- Check your 20 cm and 30 cm size estimates against transect line
- Swim at a SLOW and STEADY pace while counting
- At 5 m mark wait again for 1 minute. Continue counting while you wait if new fish enter. Check belt estimations again. Communicate with your buddy.

# Fish monitoring methods

## *Other useful tips:*

- Concentrate on your buoyancy
- Make slow and careful movements
- Coordinate with your buddy - ensure you get frequent eye contact
- Don't count fish twice
- Make notes in comments section of any off transect sightings of humphead wrasse, bumphead parrotfish, or any megafauna (sharks, rays, turtles, etc.)



# Long-term fish monitoring

- For a snapshot, do one Reef Check survey (4 x 20 m replicates) at two depths (2- 6 m, >6 -12 m)
- For detailed long-term monitoring, 3 full Reef Check surveys (24 replicates), up to 4 times each year.

# Fish Belt Transect Form

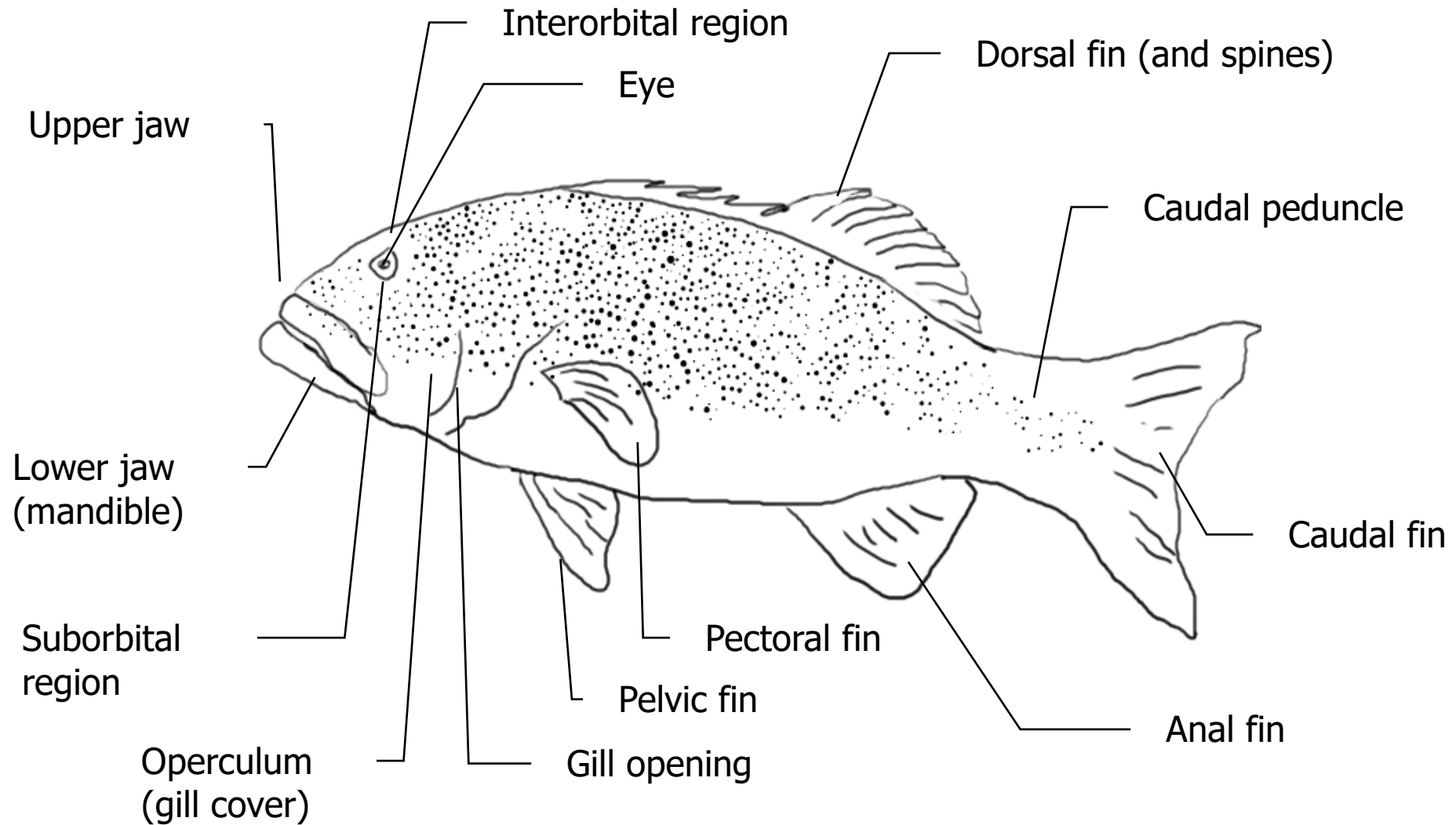
	0-20m	25-45m	50-70m	75-95m
Butterflyfish (Chaetodontidae)				
Sweetlips (Haemulidae)				
Snapper (Lutjanidae)				
Barramundi cod ( <i>Cromileptes altivelis</i> )				
Humphead wrasse ( <i>Cheilinus undulatus</i> )				
Bumphead parrotfish ( <i>Bolbometopon muricatum</i> )				
Other parrotfish (Scaridae) only >20 cm				
Moray eel (Muraenidae)				
Grouper (Serranidae) sizes (cm) (count ONLY >30cm):	0-20m	25-45m	50-70m	75-95m
30-40 cm				
40-50 cm				
50-60 cm				
>60 cm				
Total # grouper				
Rare animals sighted (type/#)				
Comments:				



# Which Fish Do We Count?

- Grouper (all species - count all individuals that are larger than 30 cm and sized to the nearest 10 cm)
- Barramundi cod
- Snapper (all species)
- Sweetlips (all species)
- Butterflyfish (all species)
- Humphead wrasse (off the transect records also)
- Parrotfish (all species over 20 cm)
- Bumphead parrotfish (off the transect records also)
- Moray Eel

# Fish Identification Areas



# Grouper

*Serranidae*



Photograph by Dean Miller



Photograph by Dean Miller

## ID TIPS

- Grow to 30-70 cm. Some to 2 m!
- Carnivorous fish that feed on smaller fish and crustaceans.
- Look for the protruding lower jaw
- Eyes are close to the mouth and the top of the head
- Wedge-shaped tail

# Grouper

*Serranidae*

- Bottom dwellers - flat underside
- Ambush predators - wait motionless
- Eyes on the top of their head

Distinctive spines on their dorsal (top) fin.





# Grouper

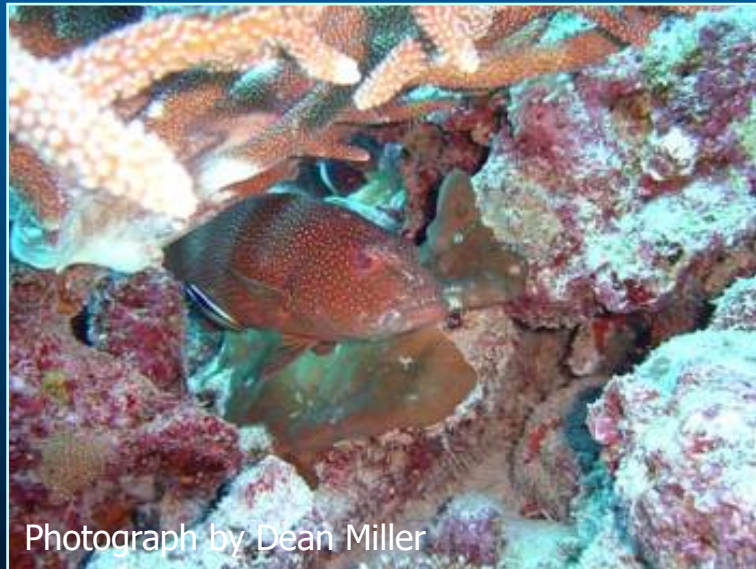
*Serranidae*



Photograph by Undersea Explorer



Photograph by Dean Miller



Photograph by Dean Miller



Photograph by Gareth Stevens

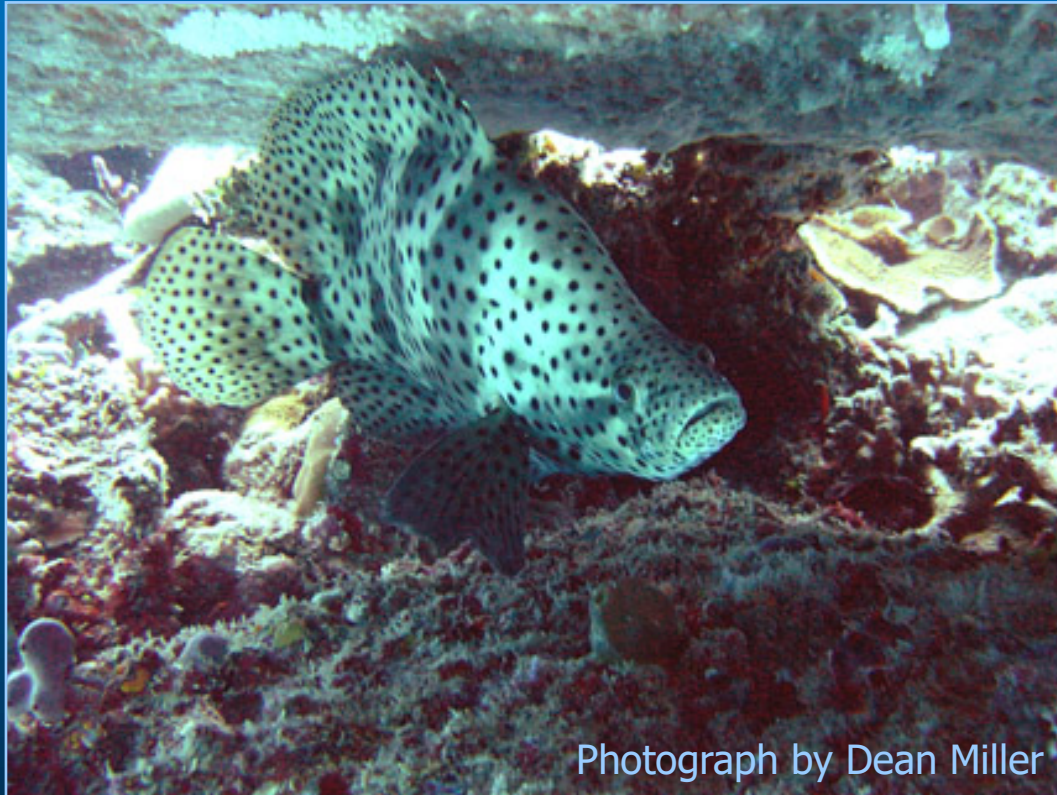


Photograph by Gareth Stevens

Count grouper over 30 cm and size them to the nearest 10 cm

# Barramundi Cod (Grouper)

*Serranidae*



Photograph by Dean Miller

## ID TIPS

- Flattened head profile followed by a hump
- Swim with pectoral fins
- Very friendly not shy

(Also known as the Humpback or Panther Grouper)

*Cromileptes altivelis*



# Sweetlips

*Haemulidae*



Photograph by Jos Hill



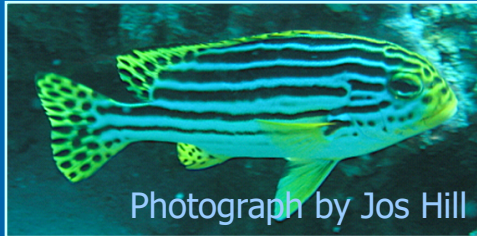
Photograph by Jos Hill

## ID TIPS

- 40-80cm in length
- Low set mouths with thick lips, especially the upper lip, which protrudes over the bottom (the opposite to the grouper)
- Foreheads slope more steeply and appear as a quarter of a circle

# Sweetlips

*Haemulidae*



Photograph by Jos Hill



Photograph by Cori Kane



Photograph by Jos Hill

## ID TIPS

○ Thicker body (top to bottom) than a grouper

○ Top lip over bottom (opposite from grouper)

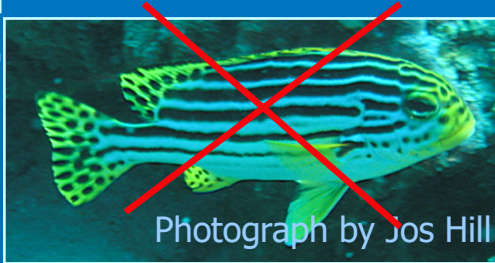


Photograph by Dean Miller



# Snapper

*Lutjanidae*



## ID TIPS

- Often found in large schools
- Many species range between 20-50cm in length
- Shallow sloping forehead
- Thin lips
- Angular shape of head



# Snapper

*Lutjanidae*



Photograph by Dean Miller



Photograph by Dean Miller



Photograph by Dean Miller

Emperors have a more sloping head and tend to be alone



Photograph by Steve Cutler



# Humphead Wrasse

*Labridae*



Photograph by G. Hodgson



Photograph by Dean Miller



Photograph by Dean Miller



Photograph by Dean Miller

## ID TIPS

- Huge fish - up to 2m long
- Hump on their forehead
- Thickened lips
- Eyes can move independently

Off-transect sightings included!

*Cheilinus undulatus*

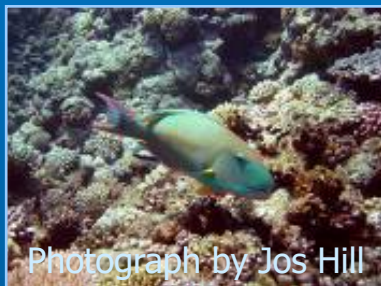
# Parrotfish

REEF CHECK



WORLDWIDE

## *Scaridae*



Photograph by Jos Hill



Photograph by Jos Hill



Photographs by Jos Hill

## ID TIPS

- Large scales
- Swim with pectoral fins
- Fused teeth form a beak
- Often green with blue and pink marks



Photograph by Georg Heiss



# Parrotfish

*Scaridae*



Photographs by Jos Hill



Photographs by Jos Hill



Photographs by Jos Hill

Count parrotfish over 20 cm

# Bumphead Parrotfish

*Scaridae*



Photograph by Undersea Explorer



Photograph from Undersea Explorer

## ID TIPS

- Grow up to 130 cm long
- Large bump!
- Typically feed in schools



Photograph from Undersea Explorer

*Bolbometopon muricatum*



# Bumphead Parrotfish

*Scaridae*

REEF CHECK



WORLDWIDE

Off-transect sightings are included!



*Bolbometopon muricatum*

# Butterflyfish

*Chaetodontidae*



Photograph by Jos Hill



Photograph by Jos Hill

## ID TIPS

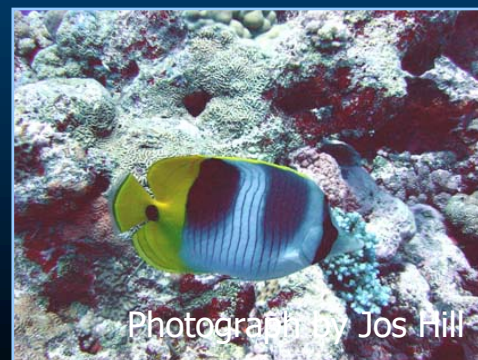
- Small, disc-shaped, laterally compressed
- Small protruding mouths - pick at the reef
- Bright yellow, black, white colours



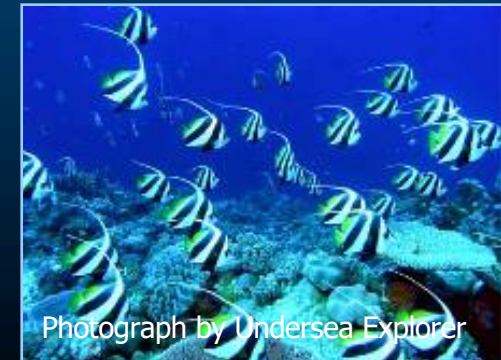
Photograph by Steve Cutler



Photograph by Jos Hill



Photograph by Jos Hill

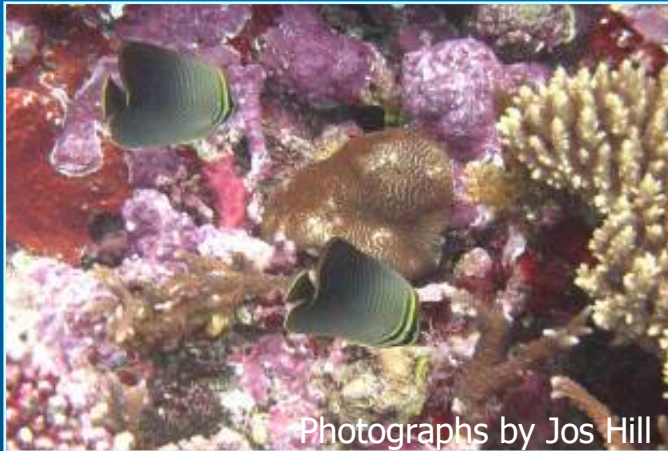


Photograph by Undersea Explorer



# Butterflyfish

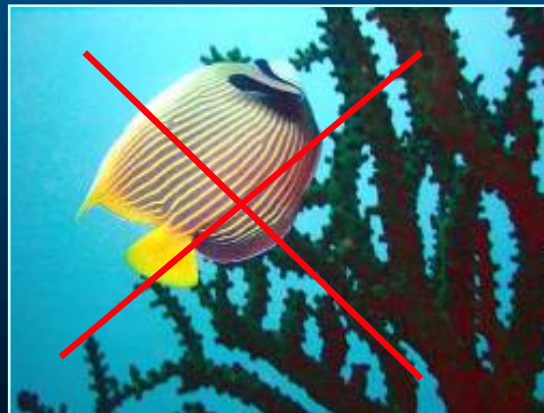
*Chaetodontidae*



Photographs by Jos Hill



Do not confuse  
with angelfish,  
which are more  
colorful, solitary  
and larger



# Butterflyfish

*Chaetodontidae*



Photograph by  
Undersea  
Explorer

DO NOT CONFUSE Moorish Idols (*Zanclus cornutus*) with butterflyfish. THESE SHOULD NOT BE INCLUDED IN THE SURVEY.



Photograph by Gerick Bergsma



# Butterflyfish

*Chaetodontidae*



Butterflyfish



Butterflyfish



Moorish Idol

ID Tips for distinguishing bannerfish (butterflyfish) from Moorish Idol:

- Moorish Idols have elongated, snooty noses with a yellow bridge
- Bannerfish have no yellow on body, only fins
- Moorish Idols have spine-like projections above their eyes and mostly black fins
- Scales on Moorish Idols are not apparent, whereas opposite is true of bannerfish

# Moray Eel

*Muraenidae*




## ID TIPS

- Hide in holes
- Often still with their mouths open







These materials were  
produced by Jos Hill and  
colleagues.

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# THE END!