



**REEF-Selected Fish Species
(Southern California)**

Program Partner:



This presentation, as well as
additional review material,
will be available online at
www.sdoceans.org

Crystal Bessette
Program Manager
San Diego Oceans Foundation

SAN DIEGO OCEANS FOUNDATION

- Local non-profit organization, founded in 1984
 - » devoted solely to ocean stewardship
- Programs revolve around marine education, resource enhancement and water quality preservation
 - For more information on current volunteer opportunities, talk to me or visit our website at:
www.sdoceans.org

Reef Environmental Education Foundation



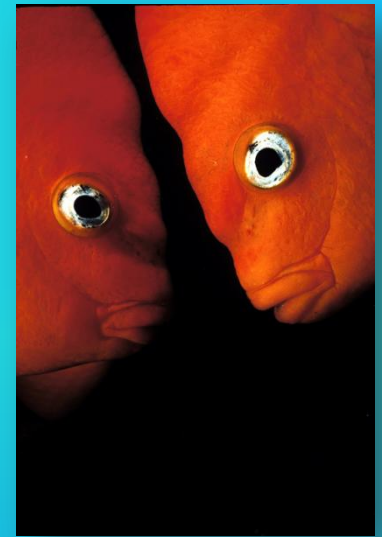
- Non-profit organization, chartered in 1990
 - » transforms recreational divers into “citizen scientists” in order to gather vital information about marine biodiversity
- All coastal U.S. waters, the Bahamas, Caribbean, Canadian West Coast and the Gulf of California
- Database used by government and scientific agencies as well as divers just like YOU!

You will learn how to...

- Complete a “roving diver” survey
- Conduct underwater observations
 - Properly record & submit data
- Identify many fish species important to San Diego



Why REEF?



- Marine Protection, Research and Sanctuaries Act (1972)
 - » promote management of areas in need of special conservation
- Sanctuaries provide secure habitat for many species
- Constant data needs to be collected to manage reserves



...AND THIS IS
WHERE YOU
DIVE IN!!!



The REEF process

- Come to REEF Fish/Invertebrate ID class (CHECK!)
- Optional, but highly recommended REEF survey kit (\$25)
 - » includes 1-year membership to SDOF
- Sign dive/snorkeling waiver
- Conduct surveys
- Record data online



The 'Roving Diver' Method

Go diving ... and don't forget your survey slate!

- Actively seek out marine life during your dive
- Record species and relative abundance
- Keep survey under a 300 ft (100 m) radius



Tips:

- Observe open water species while descending
 - Near the bottom - slowly search for fish
- Keep a rough count of the number of each species you see
 - Record only positively identified species!

Ranking:

Single = 1; Few = 2-10; Many = 11-100; Abundant = 100 + or 'Present'

Survey Type



Species and Abundance

» Provides picture of population fluctuations

* Submit one survey per dive



Ranking:

Single = 1

Few = 2-10

Many = 11-100

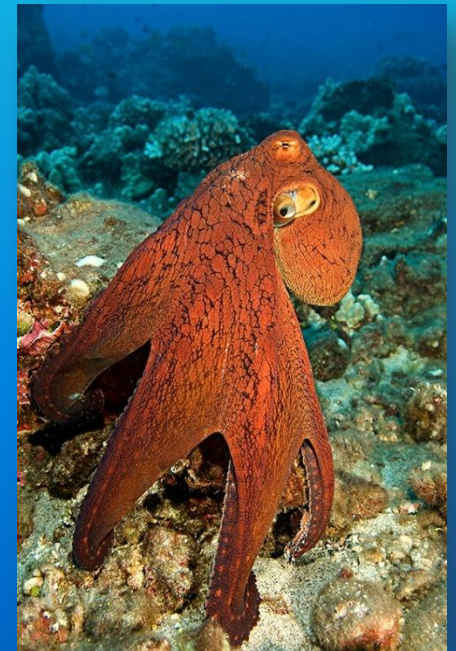
Abundant = 100 +

Present (no estimate required)

Don't stress ... this is FUN!

- Surveying should be an enjoyable addition to your dive
 - Don't get frustrated!
- The more you dive, the more fish you'll be able to identify

EVERY BIT HELPS!



What's THAT?!

If you can't POSITIVELY identify a fish:



- » Don't count it!
- » Sketch a picture on your slate
- » Check your reference card after the dive
- » Don't guess or try to "fit" it into an existing category



Entering Data Online

- Go to www.reef.org
- Under “Database” click “Submit Data Online”
(For your first time logging on, click “New Member” and complete the registration form)
 - » NOTE: Your SDOF member number and REEF numbers are DIFFERENT
- Log into the REEF database




- Enter your 5-digit REEF number
- Enter your last name

REEF Fish Survey - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites

Address <http://www.reef.org/dataentry/login.php>



Volunteer Survey Project Online Data Entry

REEF | An active organization of divers and marine enthusiasts committed to ocean conservation

REEF
www.REEF.org

Welcome REEF Fish Survey

This online form can be used to enter survey data collected from any REEF region, including Hawaii, the Pacific, the Tropical Eastern Pacific (coming soon), and the Tropical Western Atlantic. **Please note that data entered online will not be loaded into the REEF database immediately.**

First time submitting a REEF survey online? Click [here](#) to view information and instructions.

You must have a REEF member number to use this form. If you are not a member yet or you have lost your member number, please use the links below to receive a new number or retrieve your existing number. You can also contact REEF at reefhq@reef.org or 305-852-0030 to receive your member number.

[New Member](#) [Lost ID Number](#)

Please enter Your Member ID and Last Name below.

Member ID	<input type="text" value="99999"/>
Last Name	<input type="text" value="Gruenhagen"/>

Inter


Verify 'Member Demographics' and click 'NEXT'...

REEF Fish Survey - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address <http://www.reef.org/dataentry/demographics.php>



Tropical Western Atlantic
REEF Fish Survey
Online Data Entry Form

THE REEF ENVIRONMENTAL EDUCATION FOUNDATION

Member Demographics

Our records indicate your name and address is: Herb Gruenhagen
11038 Barbados Way
San Diego, CA, 92126
US

hgruenha@nethere.com

Is this address information correct?

Yes

No * Please provide any corrections below:

NEXT

[REEF HOME](#) | [ABOUT REEF](#) | [DATA](#) | [MEMBER SERVICES](#) | [WEB RESOURCES](#) | [SEARCH](#)

Done Internet

start | Internet Explorer | Microsoft PowerPoint

- Survey Type
California (Fish only)
- Date
- Dive Start
- Geographic
Zone Code
 - » Search within box to the left
 - » Look it up beforehand under “Database – Geographic Zone Codes”



SURVEY TYPE

Select the type of survey taken:

Tropical Western Atlantic (TWA)

- Species & Abundance * Species Only **

Pacific Northwest (PAC)

- Fish Only † Invertebrates Only †† Fish & Invertebrates †††

California (PAC)

- Fish Only † Invertebrates Only †† Fish & Invertebrates †††

Hawaii (HAW)

- Species & Abundance * Species Only **

* A **Species & Abundance (S&A)** survey is taken on a single dive and records the species positively identified as well as their abundance.

** A **Species Only (S)** survey is taken over multiple dives and indicates which species were positively identified (by marking the **Single (S)** response for these species).

† A **Fish Only (F)** survey records the presence and relative abundance of all positively identified fish species seen during a dive.

†† An **Invertebrate Only (I)** survey records the presence and relative abundance of all positive identified species seen during a dive from a set list of invertebrate and algae species, which varies by region (California, Pacific Northwest - see <http://www.reef.org/data/pac/invertsp.htm> details).

††† A **Fish & Invertebrate (F&I)** survey records the presence and relative abundance of all fish species and specific invertebrates and algae species that are positively identified during a dive.

DATE OF SURVEY

Select the date of the survey. If you are entering a Species Only survey and the survey spanned multiple days, then enter the date of the first dive.

January - 2008

DIVE START

Select the time at the start of the dive to the nearest hour.

7 a.m.

GEOGRAPHIC ZONE CODE

California Refine Search: La Jolla

Enter a search term in the field above to find the geographic zone code of your dive site. Search results will appear on the left side of the page.

Enter the 8-digit code in the field below.

- Click on + to select a zone code.
Click on a site name to see a map.
- + 41010001 St George Reef Lighth
 - + 41070001 Mendicino Headlands
 - + 41070002 Russian Gulch State Pa
 - + 41080101 Salt Point
 - + 41080102 Gerstle Cove
 - + 41080103 Still Water Cove
 - + 41080104 Casper Cove (between
 - + 41110001 Ruby Tuesday - Fanny
 - + 41110002 Noonday Rock - Fanny
 - + 41110003 Alan's High Spot - Fan
 - + 41110004 Fair to Middling - Mid

- Navigational Coordinates (if known)
- Temperature
- Bottom time
- Visibility
- Average Depth
- Current
- Habitat

REEF Fish Survey - Microsoft Internet Explorer

Address: <http://www.reef.org/dataentry/surveydetails.php>

NAVIGATIONAL COORDINATES

Fill in this section if you can determine the exact longitude and latitude to the minute and to the hundredth of a minute. The correct format is DD MM.MMM, for Degrees and Minutes less than 10 please add a zero (e.g. 09). *Please do not use LORAN coordinates.*

Latitude

North Degree Degree
 South Minutes Minutes
 1 / 100 Minute 1 / 100 Minute

Longitude

Degree Degree
 Minutes Minutes
 1 / 100 Minute 1 / 100 Minute

TEMPERATURE

If you have a thermometer, record the water temperature at the surface and near the bottom.

Surface *Fahrenheit *Celsius
 Bottom

BOTTOM TIME

Fill in the total number of minutes spent surveying. For an S Survey, fill in the total number of minutes of bottom time for all the dives made during this survey.

Minutes

VISIBILITY

Select the estimated or measured horizontal visibility where most of the survey was taken.

under 10' 50' - 74' 100' - 149'
 10' - 24' 75' - 99' over 149'
 25' - 49'

Done

start

REEF Fish Survey - Microsoft Internet Explorer

Address: <http://www.reef.org/dataentry/surveydetails.php>

AVERAGE DEPTH

Fill in the depth range where most of the survey was taken. *For surveys conducting in the PAC region, please report MAXIMUM depth range surveyed.

Snorkel 40' - 49' 90' - 99'
 under 10' 50' - 59' 100' - 109'
 10' - 19' 60' - 69' 110' - 119'
 20' - 29' 70' - 79' 120' - 129'
 30' - 39' 80' - 89'

CURRENT

Fill in the current encountered.

Strong Weak None

Strong indicates a current that is difficult to swim against.
Weak indicates a noticeable current, but one that does not seriously affect your dive;
None indicates slight or no current.

HABITAT

Fill in the habitat over which a majority of the dive was made:

Kelp Forest Rock/Shale Reef Artificial Reef
 Sandy Bottom Open Ocean Eel Grass Bed
 Surf Grass Bed Pinnacle Bull Kelp
 Mud/Silt Bottom Cobblestone/Boulder Field Wall

Kelp Forest consists of giant strands of brown kelp (*Macrocystis pyrifera*) growing from a rocky substrate.
Rock/Shale Reef are where a rocky or shale-like substrate protrudes from the sea floor by no more than 10 feet.
Artificial Reef includes ship wrecks, platforms, dumped debris or other artificially created habitats.
Sandy Bottom is where no vegetation or rocks occur, just sand.
Open Ocean is away from the reef in deep water where the bottom is not visible.
Eel Grass Bed (*Zostera sp.*) are calm water areas composed of sand and eel grass.
Surf Grass Bed (*Thalassia sp.*) are found at the edge of kelp forests or rocky reef areas near shore and are typically associated with high wave energy.
Pinnacle is a large rock or group of rocks that starts in deep water and protrudes toward



- Indicate abundance for each species sighted
 - Single (1)
 - Few (2-10)
 - Many (11-100)
 - Abundant (101+)
- Choose category on left or scroll down page

Display:

Common Scientific

Click on a Family/Category below to go directly to that Family/Category.

- DAMSELFISH
- FLATFISH
- GOBY
- GREENLING
- KELPFISH
- ROCKFISH
- RONQUIL
- SCULPIN
- SEABASS
- SEA CHUB
- SHARK
- SILVERSIDE
- SURFPERCH
- WRASSE
- OTHER
- [Goto Unlisted Species](#)
- [Finished Adding Species](#)

For each species sighted, select the abundance category. Only report species that are positively identified. Species that are shaded in the blue are very rare, often difficult to identify. Please select with care.

	Single (1)	Few (2-10)	Many (11-100)	Abundant (101+)
DAMSELFISH				
005 Blacksmith	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
006 Garibaldi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FLATFISH				
021 California Halibut	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
022 C-O Sole	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
026 Speckled Sanddab	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
369 Unidentified Flatfish	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GOBY				
107 Blackeye Goby	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
108 Bluebanded Goby	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
112 Zebra Goby	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GREENLING				
029 Kelp Greenling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
030 Lingcod	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
032 Painted Greenling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
KELPFISH				
232 Crevice Kelpfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
010 Giant Kelpfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
011 Island Kelpfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
328 Spotted Kelpfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
333 Striped Kelpfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ROCKFISH				
045 Black Rockfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
046 Black-And-Yellow Rockfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
044 Blue Rockfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
047 Bocaccio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
048 Brown Rockfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Optional:
Add additional
species (not on
master list)

Search for:

Display Results

Common Name

Scientific Name

Family Name

Click on a species to select the species.

Species ID	CommonName	ScientificName	Family
201	Albacore	<i>Thunnus alalunga</i>	Mackerel
202	Almaco Jack	<i>Seriola rivoliana</i>	Jack
088	Angel Shark	<i>Squatina californica</i>	Angel Shark
355	Arrow Goby	<i>Clevelandia ios</i>	Goby
203	Bald Sculpin	<i>Clinocottus recalvus</i>	Sculpin
204	Balloonfish	<i>Diodon holocanthus</i>	Puffer
205	Banded Guitarfish	<i>Zapteryx exasperata</i>	Guitarfish
206	Barcheek Pipefish	<i>Syngnathus exilis</i>	Pipefish & Seahorse
207	Barred Pipefish	<i>Syngnathus auliscus</i>	Pipefish & Seahorse
113	Barred Surfperch	<i>Amphistichus argenteus</i>	Surfperch

Error checking
feature let's you
know if
something may
be misidentified

» Only record
POSITIVELY
identified
species!

Our Error Checking has flagged one or more of your sightings.

REMEMBER THAT ALL SPECIES MUST BE POSITIVELY IDENTIFIED! Are you **SURE** you saw these fishes? They are either new records for the area or have been reported in less than 1% of surveys from the location. Please confirm below.

Species	Response	Confirm	Clear
Blacksmith (<i>Chromis punctipinnis</i>)	Single (1)	<input checked="" type="radio"/>	<input type="radio"/>
California Halibut (<i>Paralichthys californicus</i>)	Few (2-10)	<input checked="" type="radio"/>	<input type="radio"/>
Unidentified Flatfish ()	Single (1)	<input checked="" type="radio"/>	<input type="radio"/>

[VIEW SUMMARY PAGE](#)
[REEF HOME](#)

Summary page lets you check entries...

- Submit

Thank you for entering your REEF Fish Survey using our online data entry interface. Please review the summary below and verify that everything is correct. If it is, click on the "SUBMIT" button. If you would like, you can logout now and come back later to submit.

Please note that once you chose "SUBMIT", you will not be able to modify your responses. Also note that the survey data will be reviewed by REEF data management staff and will not be immediately added to the database.

Online Submission Form Number: 5012579i

Survey type: Fish Only
Survey Date: 2008-01-16
Dive start: 7 a.m.

Zone code: 41080104 (CALIFORNIA, S Point Arena - Salmon Creek, Casper Cove (between Salt Point and Gualala))

[Edit Details](#)

Bottom time: 60 minutes

[Edit Details](#)

Listed Species

DAMSELFISH

Blacksmith (*Chromis punctipinnis*) Single

FLATFISH

California Halibut (*Paralichthys californicus*) Few
Unidentified Flatfish () Single

GOBY

Blackeye Goby (*Coryphopterus nicholsi*) Many

[Edit Listed Species](#)

Unlisted Species

[Edit Unlisted Species](#)

THE GREAT ANNUAL



FISH COUNT



www.fishcount.org

AN ANNUAL EVENT EACH JULY TO INTRODUCE
DIVERS AND SNORKELERS TO THE HOBBY OF
FISHWATCHING AND TO EDUCATE THE PUBLIC
ABOUT OUR MARINE RESOURCES

- Started in 1992 in the Channel Islands National Park
 - Group event for conducting REEF surveys
- Introduces new divers/snorkelers to the world of 'fishwatching'
- An EXCELLENT opportunity to put your underwater skills to the test, learn more about local underwater life, meet new people and ... **HAVE A GOOD TIME!**

Reefer Rewards

- SDOF rewards divers for submitting surveys and participating in the program!



- Past rewards include:
 - » Free two tank dive certificates
 - » Free air fills
 - » Special lectures and behind the scenes tours



Continued Training for Reefers

- ***AquaTalk***

- » Monthly event held by SDOF
- » Ocean-related lecture and social
- » Open to the public, free of charge
- » Last Wednesday of each month



- ***REEF dive days***

- » 1st & 3rd Sunday of each month @ La Jolla shores
- » Meet other Reefers, practice and improve your surveying skills and have help identifying REAL marine organisms (they look different underwater!)

- ***Dive-A-Thon***

- » SDOF's annual diving fundraiser during July & August. REEF surveys, great prizes and a good cause!



REEF

MONITORING PROJECT



Available at
www.cafepress.com/reefvol
10% is donated to SDOF

REEF-Selected Fish Species (Southern California)

Herb Gruenhagen
Reef Monitoring Director

Listen Up!

There will be a TEST!!

20 local fish species



* Feel free to take notes on the **back** of your species ID sheet

Fish Basics 101....



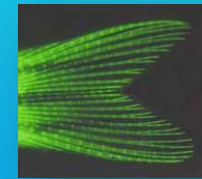
Fish Basics

Grouping fish of similar appearance makes learning fish identification easier!

Markings



Fins



Body Type



Lateral Line

Markings

- Bars - bold, vertical markings
- Stripes - horizontal markings
- Bands - diagonal markings
- Spots - well defined, circular markings
- Oscillated spots - spots with an encircling ring of another color
- Blotches - irregular spots
- Speckles - small, fine dots
- Lines - thin markings



Fins

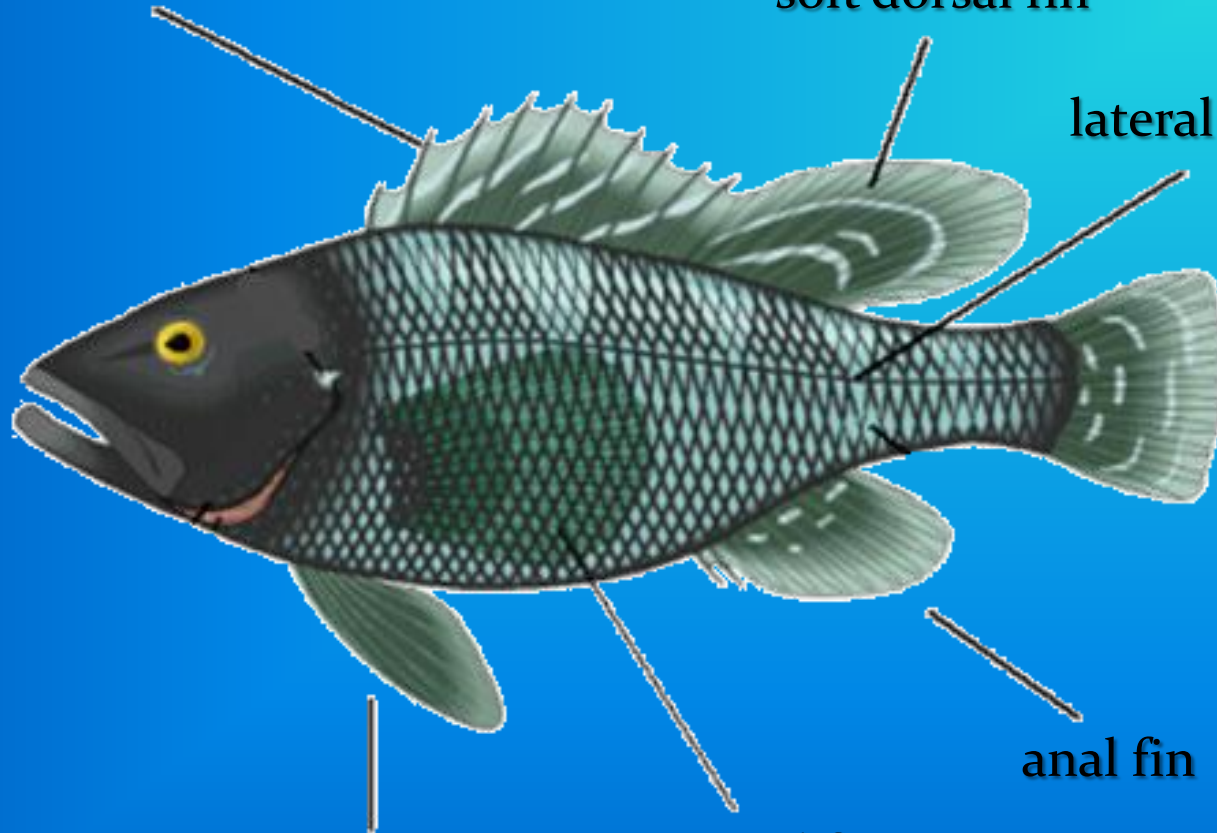
Size, location, shape and markings of fins help identification

spiny dorsal fin

soft dorsal fin

lateral line

caudal fin



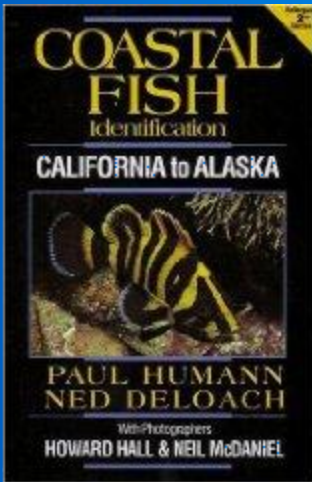
pelvic fins

pectoral fins

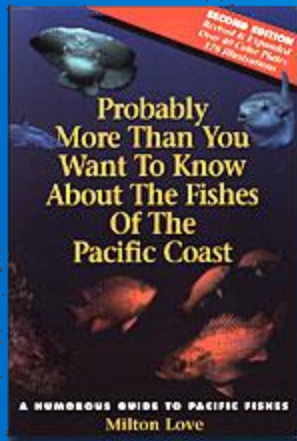
anal fin

Additional References

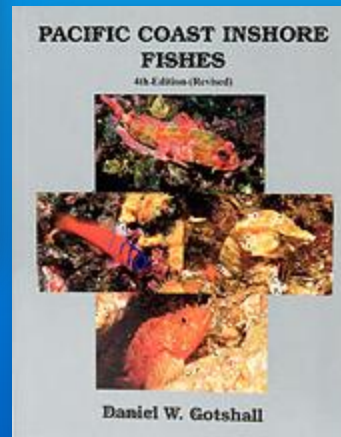
- Coastal Fish Identification, California to Alaska
- Paul Humann



- Probably More Than You Want to Know About the Fishes of the Pacific Coast
- Milton Love



- Pacific Inshore Fishes
- Daniel Gotshall



Level 1 (All new REEF members)

Level 2 (Beginning Surveyor)

80% on Most Common Fishes Quiz (20 species)

2 REEF surveys

Level 3 (Advanced Surveyor)

80% on Most Common Fishes Quiz (50 species)

25 REEF surveys

Level 4 (Expert Surveyor)

90% on Most Common Fishes Quiz (60 species)

35 REEF surveys

Level 5 (Expert Surveyor)

95% on Most Common Fishes Quiz (100 species)

50 REEF surveys

DAMSELFISH

005 Blacksmith

006 Garibaldi

FLATFISH

021 California Halibut

022 C-O Sole

026 Speckled Sanddab

369 Unidentified Flatfish

GOBY

107 Blackeye Goby

108 Bluebanded Goby

112 Zebra Goby

GREENLING

029 Kelp Greenling

030 Lingcod

032 Painted Greenling

KELPFISH /BLENNY

232 Crevice Kelpfish

010 Giant Kelpfish

011 Island Kelpfish

328 Spotted Kelpfish

333 Striped Kelpfish

* 016 Sarcastic Fringhead

ROCKFISH

045 Black Rockfish

046 Black & Yellow Rockfish

044 Blue Rockfish

047 Bocaccio

048 Brown Rockfish

051 China Rockfish

052 Copper Rockfish

053 Gopher Rockfish

054 Grass Rockfish

055 Kelp Rockfish

056 Olive Rockfish

062 Treefish

063 Vermilion Rockfish

353 Juvenile (YOY) Rockfish

- Unidentified

RONQUIL

379 Blue-banded Ronquil

(R. hypoplecta)

111 Stripefin Ronquil

(R. alleni)

SCULPIN

069 Cabezon

071 Coralline Sculpin

076 Red Irish Lord

304 Scalyhead Sculpin

079 Snubnose Sculpin

081 Unidentified Sculpin

SEA BASS

001 Barred Sand Bass

003 Kelp Bass

SEA CHUB

035 Halfmoon

036 Opaleye

SHARK

086 Horn Shark

087 Leopard Shark

SILVERSIDE

097 Jacksmelt

337 Topsmelt

SURFPERCH

114 Black Surfperch

116 Kelp Surfperch

117 Pile Perch

118 Rainbow Surfperch

120 Rubberlip Surfperch

122 Shiner Surfperch

123 Striped Surfperch

124 Walleye Surfperch

125 White Surfperch

WRASSE

127 California Sheephead

129 Rock Wrasse

128 Señorita

OTHER

082 Bat Ray

070 California Scorpionfish

096 Jack Mackerel

* 092 Shovelnose Guitarfish

099 Ocean Whitefish

130 Unidentified Pipefish

285 Pygmy Poacher

039 Sargo

138 Tubesnout

* 007 California Moray

To be covered in Level 2

* Not on original species list

Damselfish

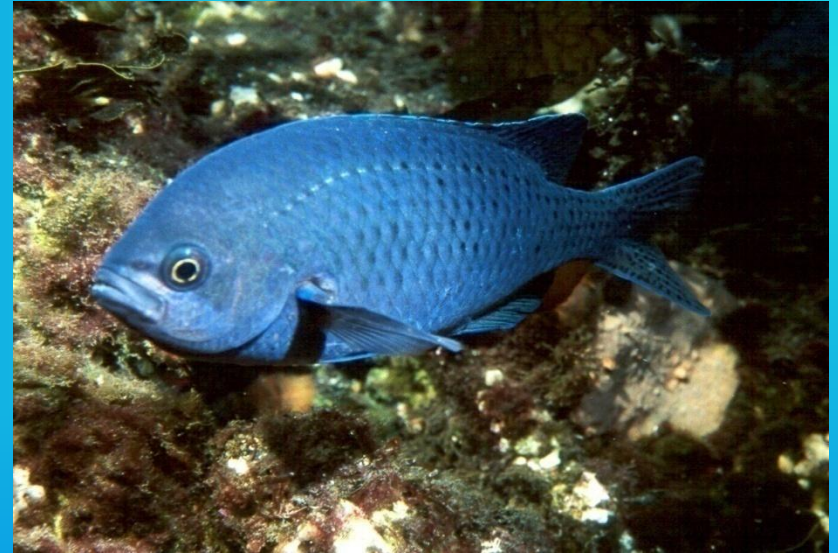
- Blue-gray, oval shaped body
- Key Feature: black spots on scales (from mid-body to tail)
- Males defend eggs in nest
- Rocky reefs, kelp, sand/soft bottoms

Mature: 2 years, 5 ½ inches

Size: 4-8 inches

Max: 12 inches

Blacksmith *Chromis punctipinnis*



» Colored like steel (blue-gray)

» Blacksmiths work with steel

Damselfish

- Brilliant orange
- Thin, oval-shaped body
- Tail deeply notched between large, rounded lobes
- Rocky reefs, kelp
- Males guard nest

Garibaldi

Hypsypops rubicundus



Adult



Juvenile

Size: 5-10 inches
Max: 14 inches

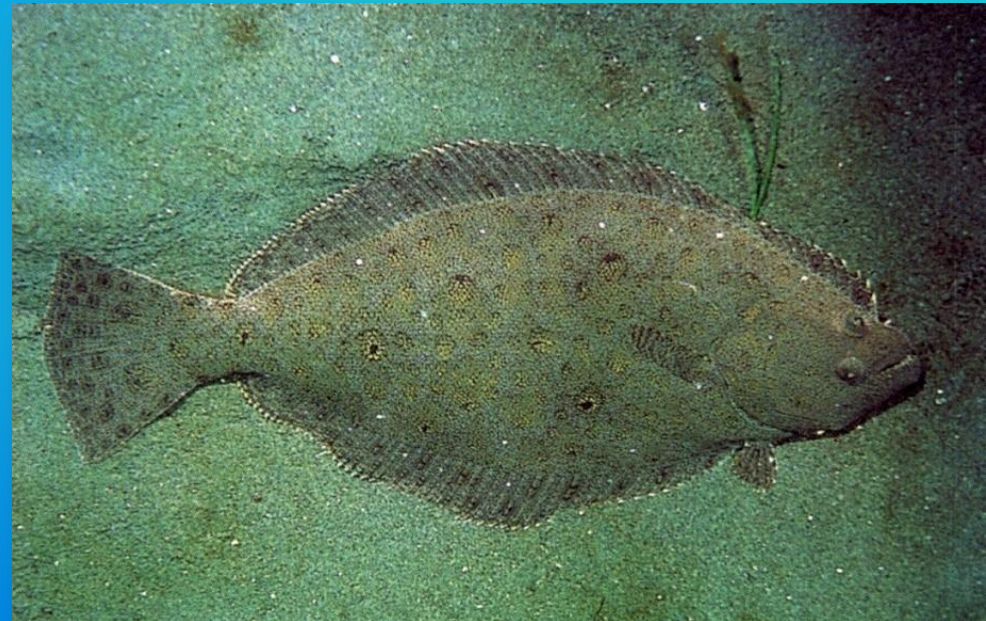
Flatfish

- Key Features:
 - » Tail slightly indented
 - » Large mouth
(upper jaw extends to/behind eye)
 - » Lateral line arches over pectoral fin
- Large flatfish (over 1 ft)
- Found on sand/soft bottoms

California Halibut

(Sand Flounder)

Paralichthys californicus



Size: 15-30 inches
Max: 5 ft

Flatfish

- Key Feature: light, crescent-shaped marking on edge of tail followed by a large spot (C-O)
- Dark spot, usually mid-body w/ pale patch behind
- Bulbous, “popping” eyes
- One of the few flatfishes to occur in kelp beds
- Sand/ soft bottoms

C-O Sole

(Righteye Flounder)

Pleuronichthys coenosus



Flatfish

- Key Feature:
 - » short pectoral fin
- Profuse black speckles
- Small blotches on body
- Only left-eye flounder with straight lateral line
- Abundant in near-shore, soft bottoms
- Smallest flatfish in CA

Speckled Sanddab

(Sand Flounder)

Citharichthys stigmaeus



Size: 3-5 inches
Max: 7 inches

unidentified flatfish



Hornyhead Turbot
Pleuronichthys verticalis



Damselfish,
Blacksmith



Flatfish,
C-O Sole



Flatfish,
Speckled
Sanddab



Damselfish,
Garibaldi



Flatfish,
CA Halibut

Goby

Blackeye Goby *Rhinogobiops nicholsii*

- Key Feature: black eyes
- Black edge on dorsal fin
- Rests on fins
(sandy bottoms)
- Most abundant gobies
on the La Jolla Canyon
walls



Size: 1 ½ - 4 inches
Max: 6 inches

Goby

Bluebanded Goby

Lythrypnus dalli

- Brilliant red body
- 4-9 electric blue bars (become thinner towards rear)
- Tend to perch out in the open
- Sometimes called 'Catalina goby' - as it was discovered there



Size: $\frac{3}{4}$ -2 inches
Max: 2 $\frac{1}{2}$ inches

Goby

- Brilliant red body
- Key Feature:
numerous thin,
bright blue bands
from head to tail
- Thinner, dusky bars
between thicker ones
- Prefer to remain
hidden under rock
caves

Zebra Goby
Lythrypnus zebra



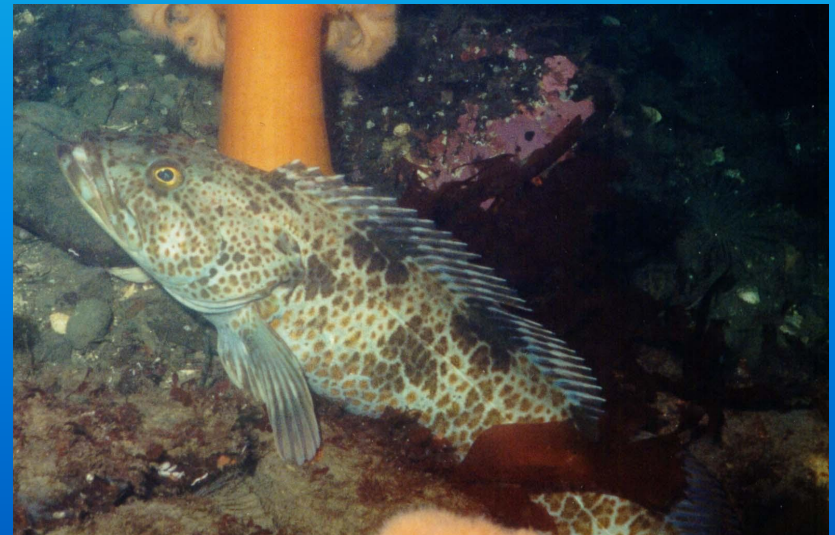
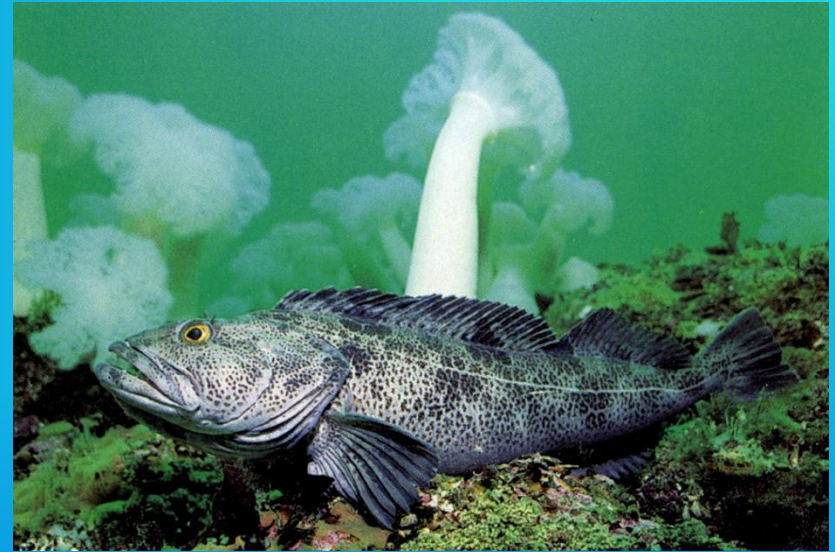
Size: $\frac{3}{4}$ -2 inches
Max: 2 $\frac{1}{4}$ inches

Greenling

- Key Feature: jutting lower jaw
- Large mouth with prominent canine teeth (“snake tooth”)
- Long, even spiny dorsal fin
- Tall, soft rear dorsal fin
- Notch between spiny and soft dorsal fins
- Largest member of the Greenling family
- Rocky reefs, kelp
 - » spawns near shore

Size: 1 ½-3 ½ ft
Max: 5 ft

Lingcod
Ophiodon elongatus

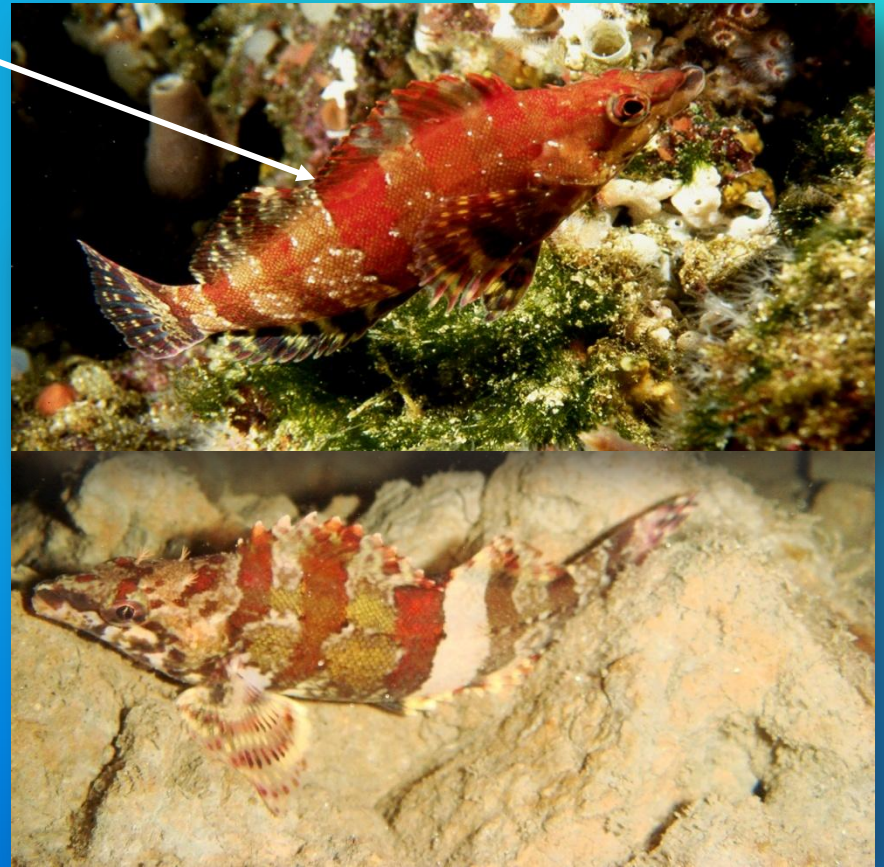


Greenling

- Key Feature: distinct notch between fore dorsal and rear dorsal
- 6 bold, dark bars encircle fins and body
- Two pair of cirri above each eye
- Pointed snout
- Often found on strawberry anemones, rocky reefs, kelp

Painted Greenling

Oxylebius pictus



Size: 4-6 inches; Age: 8 years
Max: 10 inches

Kelp Blenny

- Key Feature: elongated head & pointed, slightly upturned snout
- Long, continuous dorsal fin
- Body color - yellow, green, brown, red and/or lavender
- Found nestling in leafy kelp
- Largest in the Kelpfish family

Giant Kelpfish

Heterostichus rostratus



Tube Blenny

- Key Feature: large mouth with jaws extending almost to gills
- Long, continuous dorsal fin
- Body color -Shades of brown to gray may be lightly blotched or barred
- Inhabit hard sand and mud bottoms; occupy crevices holes, and burrows
- Fearless: will charge, snap and sometimes bite

Sarcastic Fringehead

Neoclinus blanchardi



Size: 3-8 inches; Max: 1 ft

Depth range: 10-240 ft



Goby,
Blackeye Goby



Greenling,
Painted Greenling



Goby,
Zebra Goby



Greenling,
Lingcod



Kelp Blenny,
Giant Kelpfish



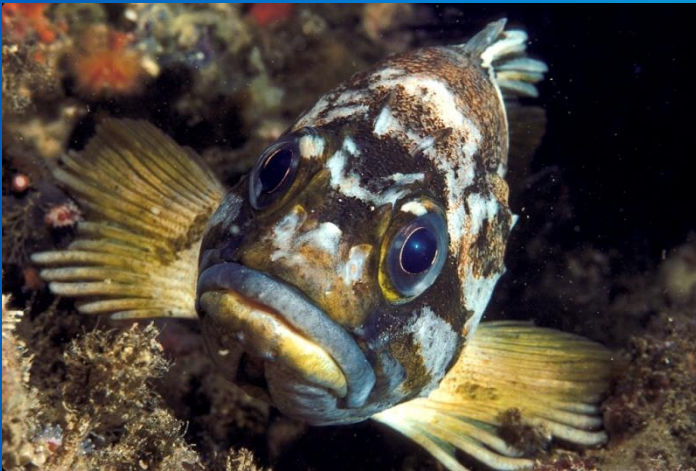
Tube Blenny,
Sarcastic Fringehead



Goby,
Bluebanded Goby

Rockfish

- Large yellow spots/blotches
- Dark, nearly black under
- Key Feature: backward pointing spines distinguish it as a rockfish



Black & Yellow Rockfish

Sebastes chrysomelas



Size: 6-12 inches

Max: 15 ½ inches

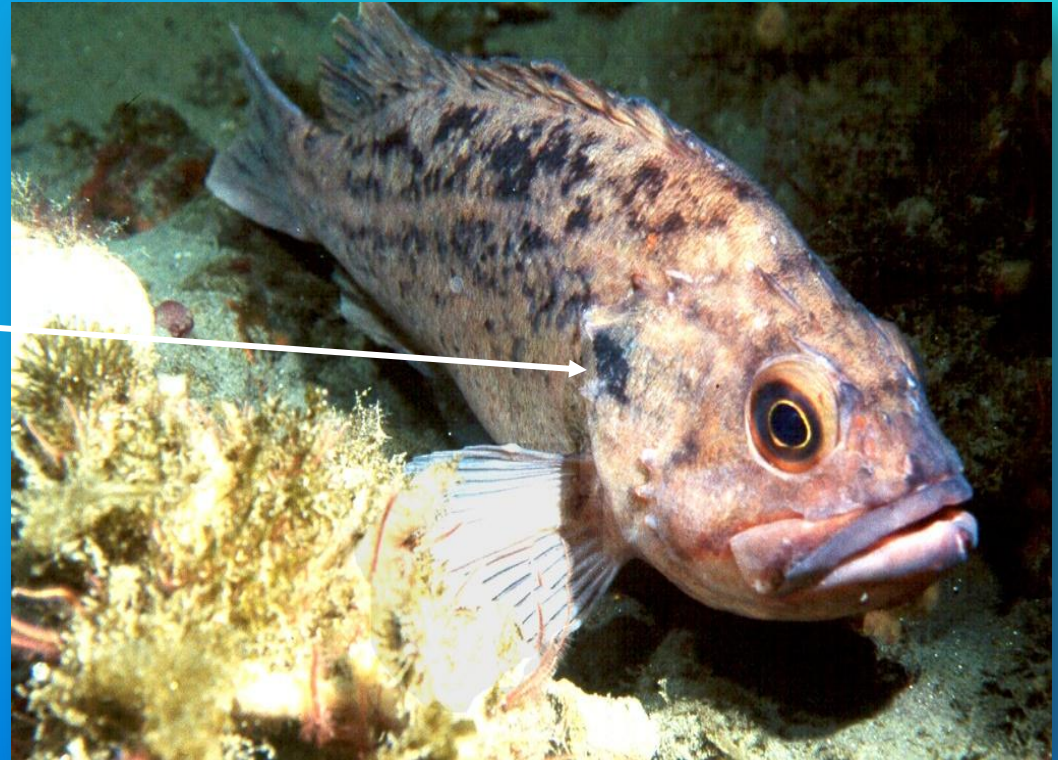
» Often observed in Channel Islands

Rockfish

Brown Rockfish

Sebastes auriculatus

- Mottled and blotched shades of tan, coral or brown
- Key feature: vague dusky blotch on rear gill cover
- Fins light colored
- Typically found in deeper water (>30 ft)



Size: 8-18 inches
Max: 21 inches

Rockfish

- All fins dark edged (except spiny dorsal)
- White lateral line visible from mid-body to tail

Vermilion Rockfish

Sebastes miniatus



Size: 10-20 inches
Max size: 30 inches

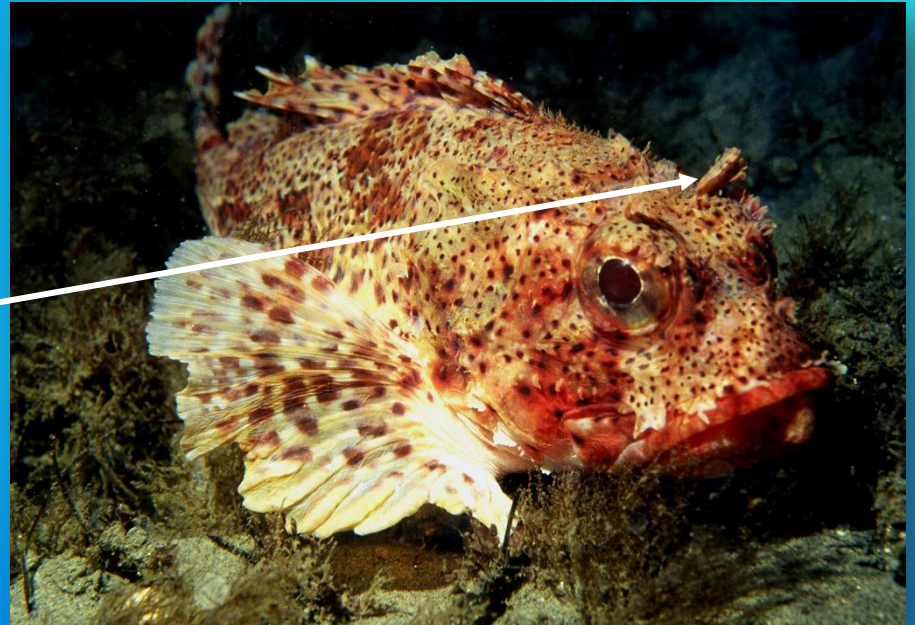
Other:

Scorpionfish

- Key Feature:
numerous brown spots
on head, body and fins
- 12 dorsal spines
- Short barbels and skin
flaps on head
- Rocky reefs, kelp
- Adults aggregate to spawn
» eggs released in gelatinous masses

California Scorpionfish

Scorpaena guttata



Size: 7-14 inches

Max: 17 inches

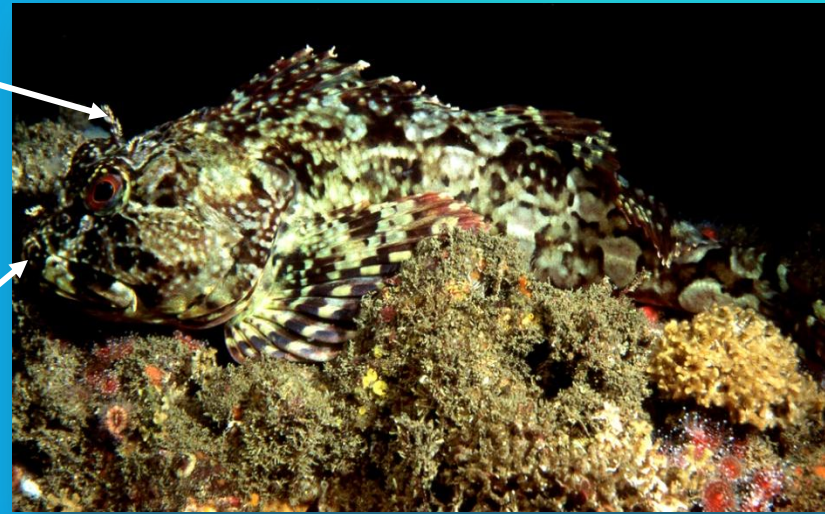
Depth: 101 m

Sculpin

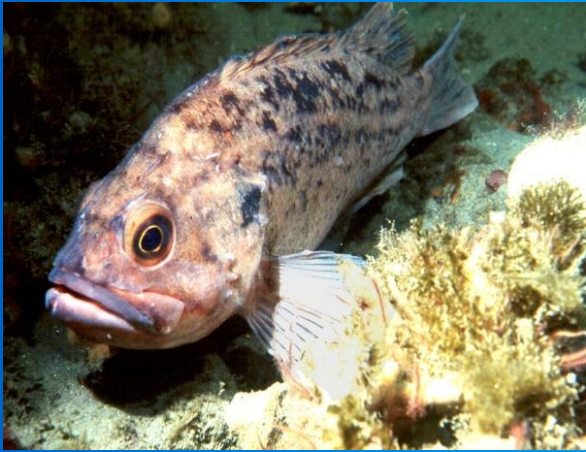
- Key Feature: one large, branching cirrus over each eye
- Short cirrus centered on tip of snout
- Body: marbled earth tones
- Unscaled, bulbous head
- Stout body
- Largest Sculpin in CA
- Rocky reefs, kelp

Cabezon

Scorpaenichthys marmoratus



Size: 16-30 inches
Max: 39 inches



Rockfish,
Brown
Rockfish



Scorpionfish,
California
Scorpionfish



Rockfish,
Black &
Yellow



Sculpin,
Cabezon



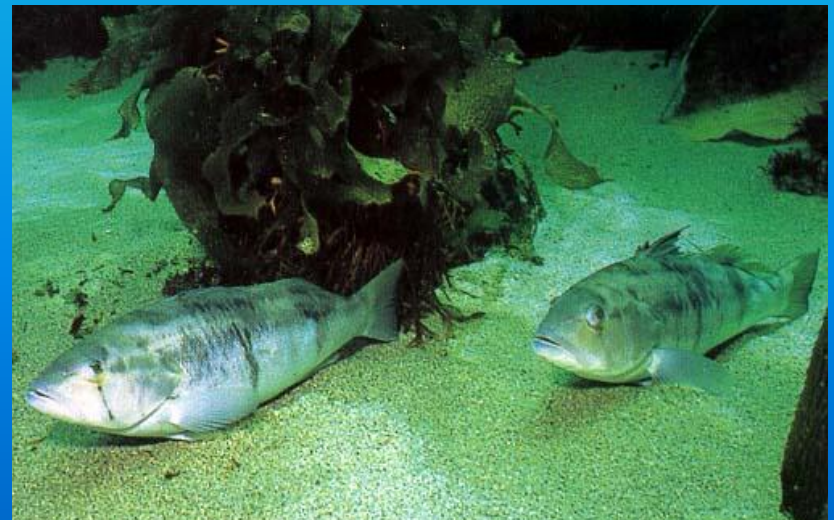
Rockfish,
Vermilion
Rockfish

Sea Bass

- Light gray, olive or brown upper body
- Light underbelly
- Small, yellow-brown spots on head
- Dusky bars on side; pale belly
- Often found resting on the sand, soft bottoms
- Aggregate over sand in summer/early fall for spawning

Barred Sand Bass

Paralabrax nebulifer



Sea Bass

- Stout body, large lips, jutting jaw and no apparent spines
- Key Feature: bold, pale, oval to rectangular spots on back
- Back and sides mottled brown, black and white
- Pale belly, square tail
- Rocky reefs, kelp

Kelp Bass “Calico Bass”

Paralabrax clathratus

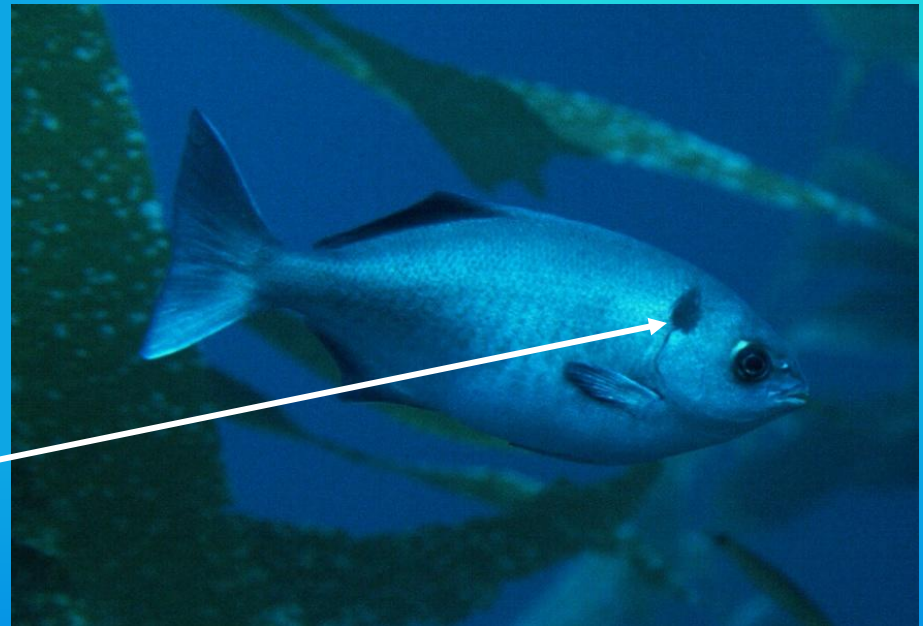


Sea Chub

- Key Feature:
crescent tail shape
- Silvery-blue body; darker on the back with lighter underbelly
- Dusky spot on upper gill cover
- Rock reefs, kelp

Halfmoon

Medialuna californiensis



Size: 6-16 inches
Max: 19 inches

Sea Chub

- Key Feature: 1-3 yellow/white spots on back
- Bright blue/blue-green eyes
- Rounded, football-shaped profile
- Olive-green, blue or gray body
- Rocky reefs/kelp
- May regulate kelp growth by grazing

Opaleye
Girella nigricans



Other: Grunt

- Dark bar below spiny dorsal fin
- Upper gill cover edged in black (squiggly “S” shape)
- Small, dark area at base of pectoral fin
- Silvery, shaded in copper
- No large lips
- No black spot on mouth

Sargo

Anistotremus davidsoni



Size: 8-13 inches
Max: 17 ¼ inches

Shark

- Key Feature: prominent spine in front of each dorsal fin
- Prominent ridges above eyes
- Scattered, black spots over entire body
- Body olive/gray with dark blotches
- Lays egg cases

Horn Shark

Heterodontus francisci



Egg Casing

Size: 1-2 ½ ft
Max: 3 ¼ ft



Sea Chub,
Halfmoon



Shark,
Horn Shark



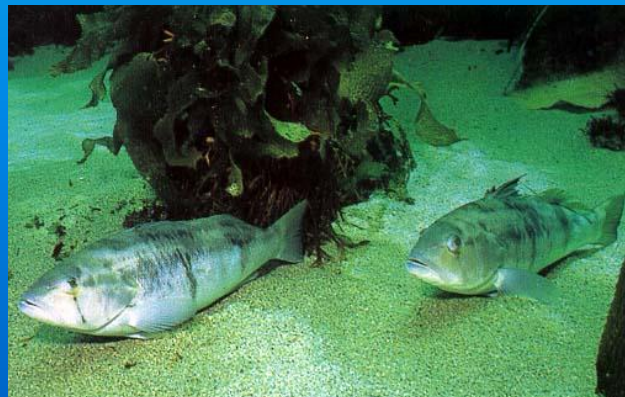
Sea Bass,
Kelp Bass



Grunt,
Sargo



Sea
Chub,
Opaleye



Sea Bass,
Barred
Sandbass

Silverside

- Key Feature: anal fin begins behind first, small dorsal fin
- Bluish-silver body with blue back
- Fins greenish to blue/black
- Tend to form in large schools in shallow water or canopy of kelp forests

Jacksmelt

Atherinopsis californiensis

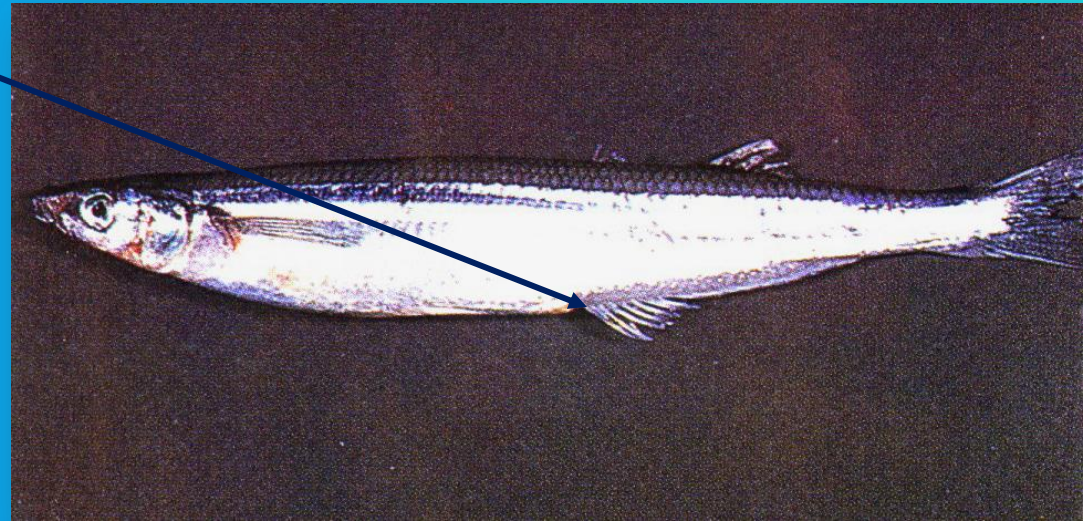


Size: 12-15 inches
Max: 20 inches

Silverside

Topsmelt *Atherinops affinis*

- Key Feature: anal fin begins below first dorsal fin
- Silvery body with greenish colored backs
- Silver stripe along mid-body
- Short, rounded snout
- Spawns in eel grass/algae beds
 - » eggs attach to substrate by adhesive filaments



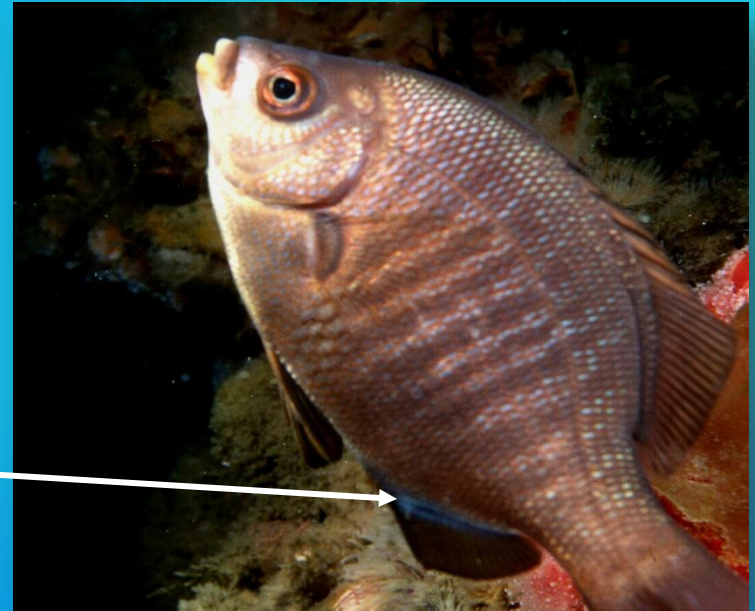
Size: 5-10 inches
Max: 14 ½ inches

Surfperch

- 9 vertical dusky bars
- Patch of large scales between pectoral and pelvic fins
- Key Feature: narrow, blue stripe along base of anal fin
- Never black, but are darker in color than other perch

Size: 5-12 ½ inches
Max: 15 ½ inches

Black Surfperch *Embiotoca jacksoni*



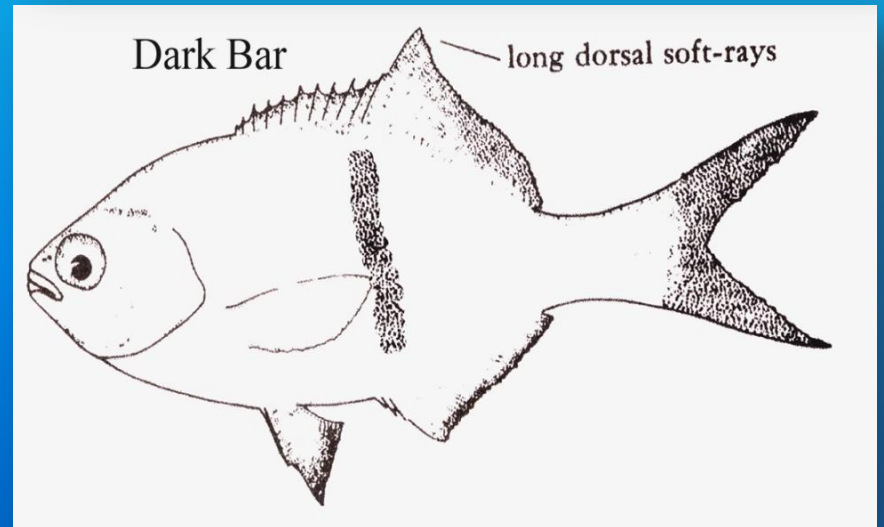
Surfperch

- One dusky bar below front portion of soft dorsal fin
- Long dorsal soft-rays
- Deeply forked caudal fin
- Often found around pilings of docks, kelp forests and rocky areas

Size: 6-14 inches
Max: 17 ¼ inches

Pile Perch

Rhacochilus vacca



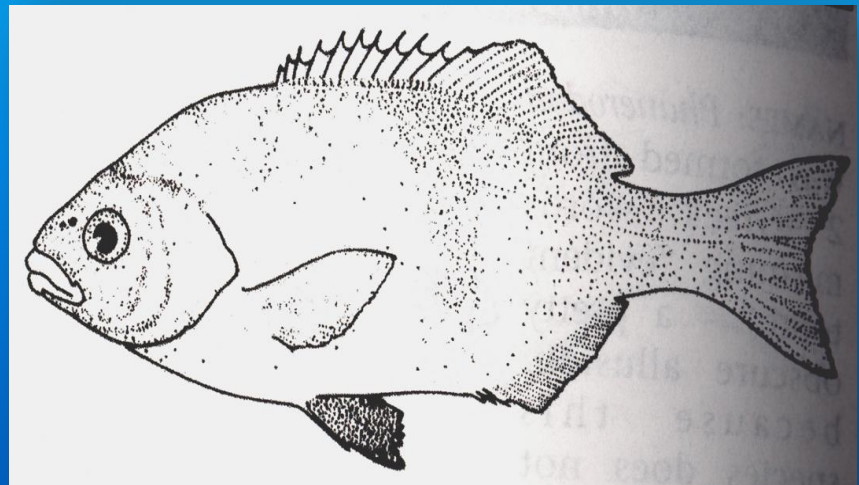
Surfperch

- Dusky bar below front portion of soft dorsal fin
- Key Feature: large, fat lips
- Football shaped profile
- No black spot at corner of mouth

Size: 8-14 inches
Max: 18 inches

Rubberlip Surfperch

Rhacochilus toxotes



Surfperch

- Key Feature: orange, fragmented bars (do not extend to belly)
- Straight abdomen
- Black “beauty mark” at corner of mouth
- Clean amphipods off of ocean sunfish

Rainbow Surfperch

Hypsurus caryi



Size: 5-9 inches

Max: 12 inches



Surfperch,
Rainbow
Surfperch



Silverside,
Jacksmelt



Surfperch,
Black
Surfperch



Surfperch,
Rubberlip
Surfperch



Silverside,
Topsmelt



Surfperch,
Pile Perch

Wrasse

- Male: 1-3 feet
- Female: 6-12 inches
- Use pectoral fins to swim
- Mature at 4 years
 - » change from female to male at 8 years
- Eat hard/encrusting inverts

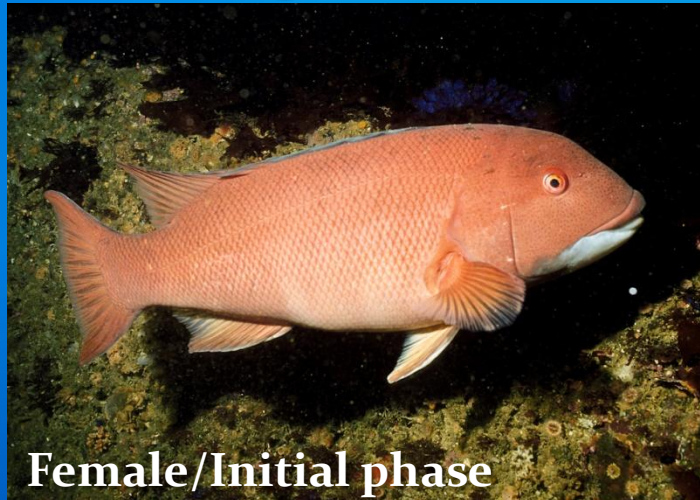
California Sheephead *Semicossyphus pulcher*



Male/Terminal Phase



Juvenile Phase



Female/Initial phase

Max size: 3 ft

Wrasse

Rock Wrasse *Halichoeres semicinctus*

- Male (terminal phase)
 - » dark bar behind pectoral fin
- Female (initial phase)
 - » black speckles all along dorsal fin
- Green to blue-green
- 12 anal soft rays
- Bury in sand when frightened & to sleep at night



Wrasse

- Key Feature: large, black spot on base of tail
- Cigar-shaped body (yellow, orange or brown)
- Bury in sand to sleep at night
- Schooling species

Señorita

Oxyjulis californica



Size: 3-8 inches
Max: 10 inches

Other: Jack

- Key Feature: black spot on gill cover
- Lateral line makes dramatic dip below 2nd dorsal fin
- Large, distinctive scutes along length of body
- Run in large schools
- Found in open water and on edges of kelp forests

Jack Mackerel
Trachurus symmetricus



Size: 6-24 inches

Max: 32 inches

Other: Pipefish

- Long, trumpet-like snout
- Small, fan-shaped tail
- Green or brown
- Often inhabit eelgrass beds in bays

Unidentified Pipefish



Size: 4-7 inches
Max: 13 inches



Wrasse,
CA
Sheephead
(Female)



Wrasse,
Señorita



Wrasse,
Rock
Wrasse
(Male)



Wrasse,
Rock
Wrasse
(Female)



Wrasse,
CA
Sheephead
(Male)



Wrasse,
CA
Sheephead
(Juvenile)



Jack,
Jack Mackerel



Pipefish,
Unidentified Pipefish

Quick Review



Sea Bass,
Kelp Bass



Sea Bass,
Barred
Sandbass



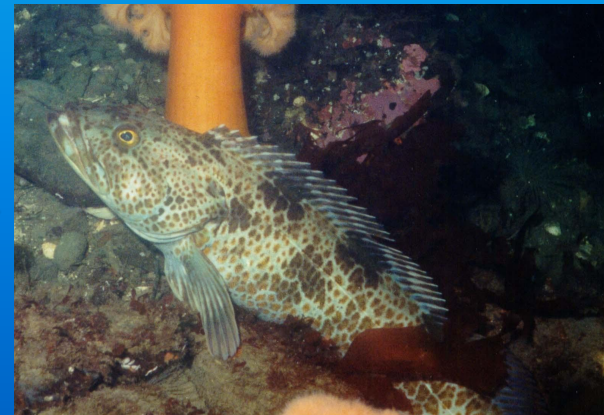
Sea Chub,
Halfmoon



Wrasse,
Rock
Wrasse
(Female)



Goby,
Zebra Goby



Greenling,
Lingcod



Damselfish,
Blacksmith



Wrasse,
Señorita



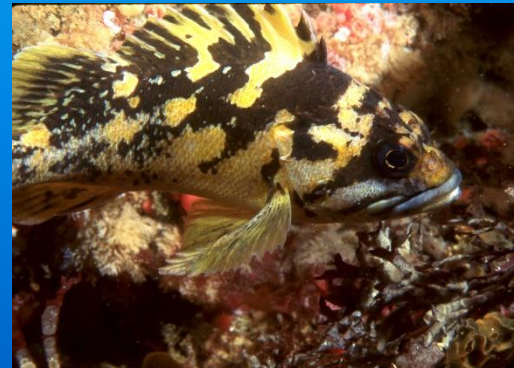
Flatfish,
Speckled
Sanddab



Wrasse,
CA
Sheephead
(Juvenile)



Flatfish,
CA Halibut



Rockfish,
Black &
Yellow



Surfperch,
Black
Surfperch



Grunt,
Sargo



Flatfish,
C-O Sole



Damselfish,
Garibaldi



Surfperch,
Pile Perch



Wrasse,
CA
Sheephead
(Male)



Goby,
Blackeye Goby



Tube
Blenny,
Sarcistic
Fringehead



Surfperch,
Rainbow
Surfperch



Goby,
Bluebanded
Goby



Wrasse,
CA Sheephead
(Female)



Wrasse,
Rock
Wrasse
(Male)



Pipefish,
Un-ID
Pipefish



Shark,
Horn Shark



Rockfish,
Vermilion
Rockfish



Sculpin,
Cabezon



Sea Chub,
Opaleye



Jack,
Jack
Mackerel



Greenling,
Painted
Greenling



Flatfish,
Unidentified
Flatfish



Surfperch,
Rubberlip
Surfperch



Scorpionfish,
California
Scorpionfish



Kelp Blenny,
Giant
Kelpfish



Silverside,
Jacksmelt
Topsmelt



Rockfish,
Brown
Rockfish

Questions?

Test time!

1



2



3



4



5



6



7



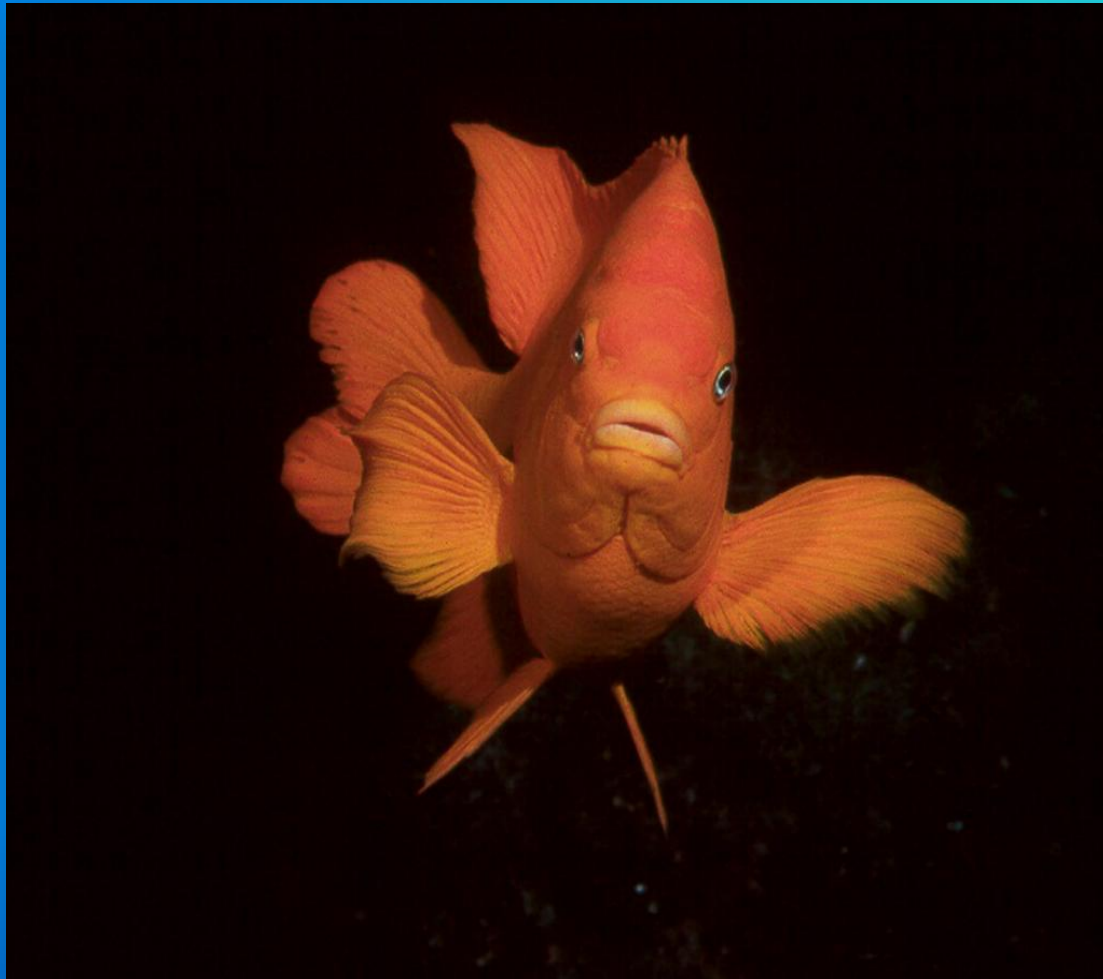
8



9



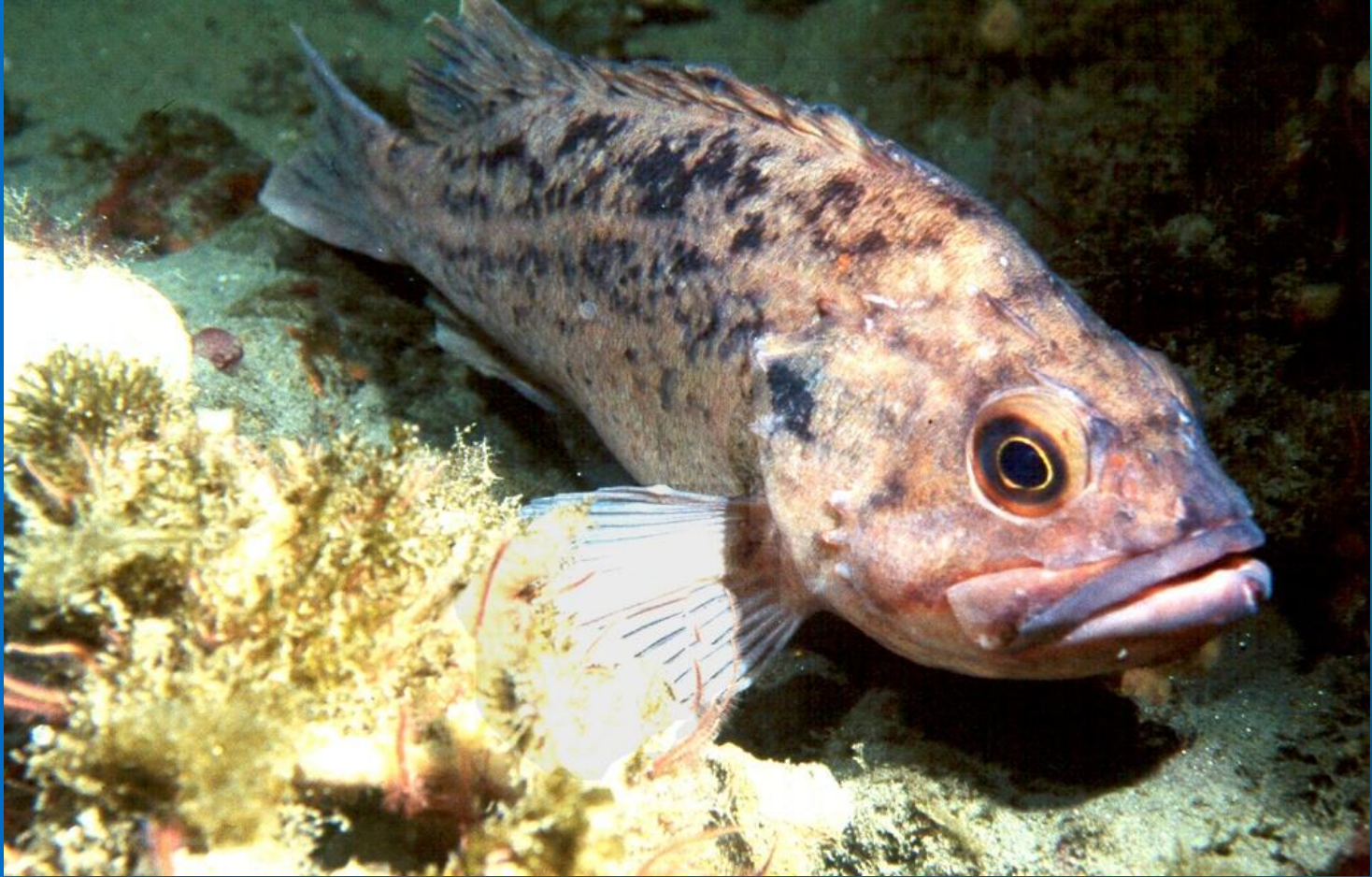
10



11



12



13



14



15



16



17



18



19



20



Bonus



Time to Grade your Test!

- Please trade papers with your neighbor -

Greenling

1



Painted Greenling
Oxylebius pictus

Goby

2

Blackeye Goby
Coryphopterus nicholsi



Damselfish

3



Blacksmith
Chromis punctipinnis

Sea Bass

4



Kelp Bass

Paralabrax clathratus

Surfperch

5

Rainbow Surfperch
Hypsurus caryi



Sea Chub

6

Opaleye
Girella nigricans



Greenling

7

Lingcod
Ophiodon elongatus



Surfperch

8

Black Surfperch
Embiotoca jacksoni



Wrasse

9 California Sheephead
Semicossyphus pulcher



Damselfish

10

Garibaldi

Hypsypops rubicundus



Grunt

11



Sargo

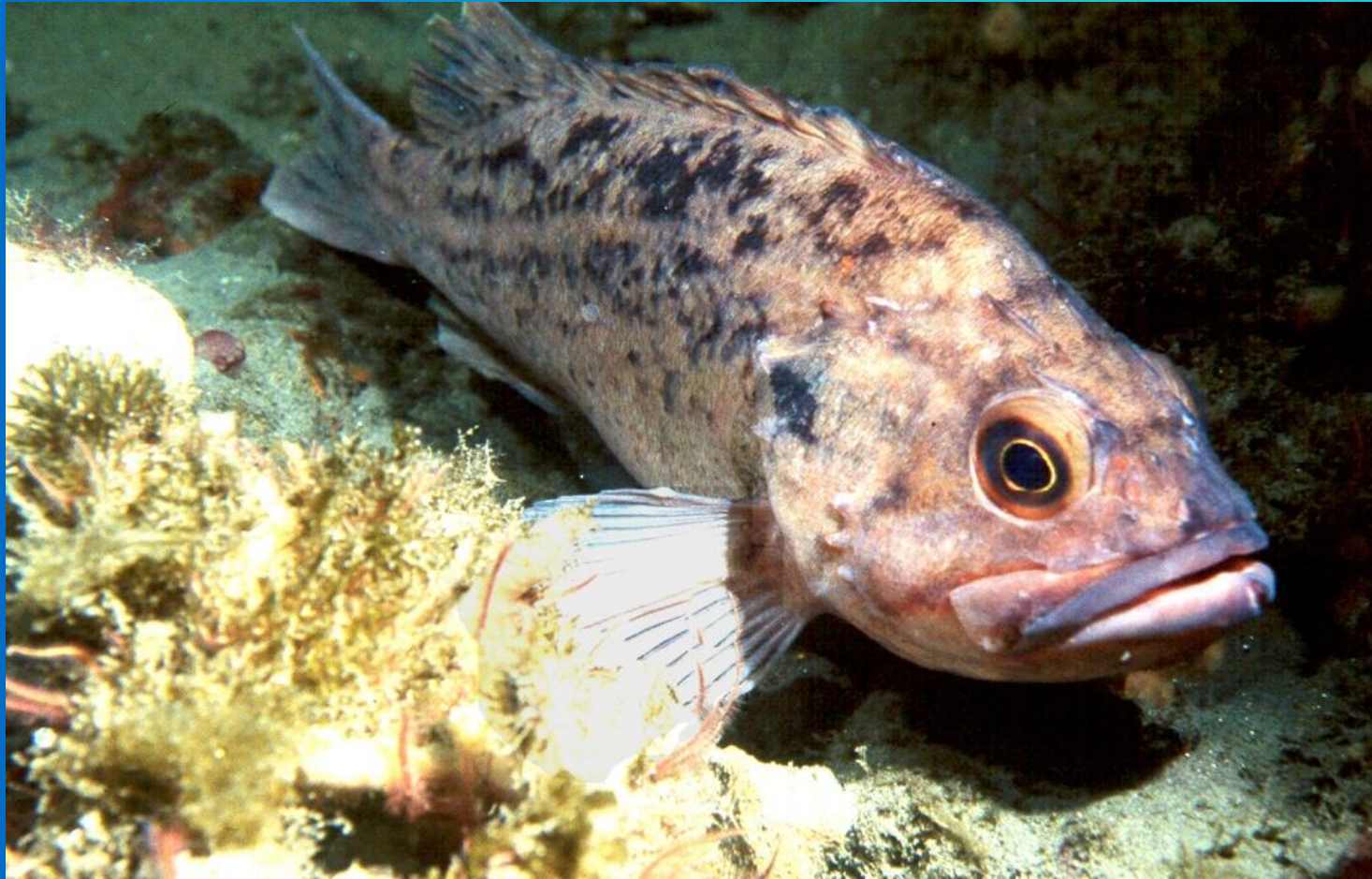
Anistotremus davidsoni

Rockfish

12

Brown Rockfish

Sebastes auriculatus



Wrasse

13



Rock Wrasse

Halichoeres semicinctus

Flatfish

14



Speckled Sanddab
Citharichthys stigmaeus

Rockfish

15

Vermilion Rockfish

Sebastes miniatus



Rockfish

16



Black & Yellow Rockfish
Sebastes chrysomelas

Sea Bass

17



Barred Sand Bass

Paralabrax nebulifer

Kelpfish/Blenny

18

Giant Kelpfish
Heterostichus rostratus



Flatfish

19



C-O Sole

Pleuronichthys coenosus

Wrasse

20



Señorita

Oxyjulis californica

Scorpionfish

Bonus



California Scorpionfish

Scorpaena guttata

Congratulations!

You've just finished Level 2 Fish ID...

If you got 80% (32/40) or higher on your quiz, you are officially a Level 2 REEF surveyor!

Now - just get out, dive, submit some surveys and come back for Level 3!!



Level 1 (All new REEF members)

Level 2 (Beginning Surveyor)

80% on Most Common Fishes Quiz (20 species)

2 REEF surveys

Level 3 (Advanced Surveyor)

80% on Most Common Fishes Quiz (50 species)

25 REEF surveys

Level 4 (Expert Surveyor)

90% on Most Common Fishes Quiz (60 species)

35 REEF surveys

Level 5 (Expert Surveyor)

95% on Most Common Fishes Quiz (100 species)

50 REEF surveys