CA Collaborative Fisheries Research

2019 Volunteer Appreciation Event & Data Workshop







Outline

- Introductions
- Program background
- Update on the statewide expansion
- MLML data summary (2007 – 2018)
- General trends in MPA performance
- 2019 CDFW regulations
- Tag recapture stories
- Updates from CCFRP staff






Introductions

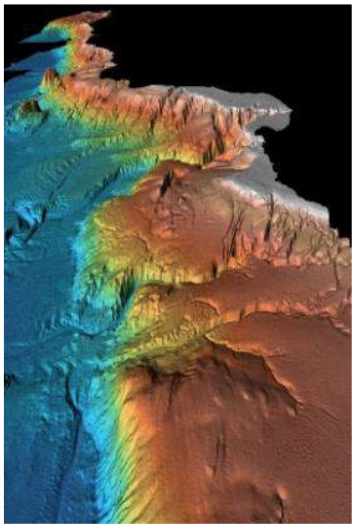
1. Name
2. Affiliation (e.g., captain, deckhand, science crew, volunteer angler, agency staff, interested volunteer)
3. Number of years involved in the project
4. What is your favorite boat snack?

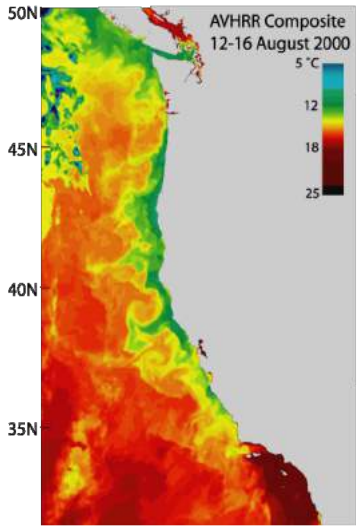
CCFRP BINGO

- Answers given during the presentation
  - wait until the question is revealed…
- 5 in a row – yell BINGO!
- Blackout Bingo prize

Marine Life Protection Act (MLPA)

- Passed in 1999
- Mandated the creation of a network of marine protected areas (MPAs) to protect diversity and ecosystem function





http://www.dfg.ca.gov/mlpa/

California MPA Network

Northern California
20 – est. 2012

North Central California
25 – est. 2010

Central California
29 – est. 2007

Southern California
50 – est. 2012

Why Evaluate MPAs?

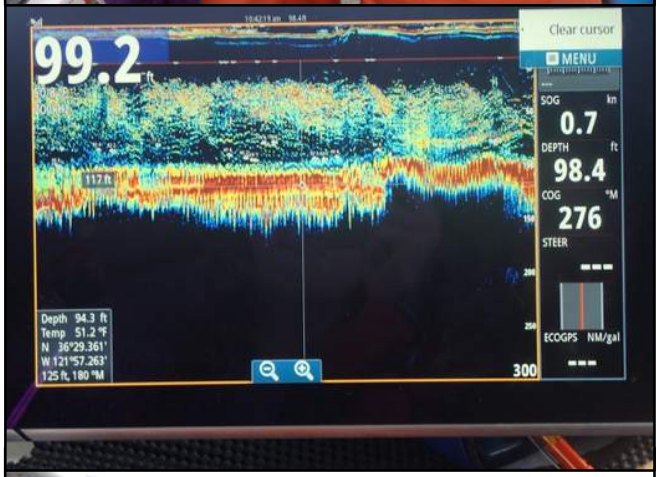
1. It is a priority adopted by Central Coast regional stakeholders

2. It is required by MLPA (ensure MLPA goals are met)

3. Critical to enabling adaptive management

The Benefits of Collaboration

- Engage stakeholders in both science and management
- Utilize different areas of expertise to develop protocols and collect data
- Create a shared understanding of resources and facilitate communication among user groups
- Reduce costs associated with data collection
  - more information gathered for MPA monitoring and fisheries management



California Collaborative Fisheries Research Program (CCFRP)

- fishery-independent (catch-and-release) study that combines the expertise and ideas of:
  - the fishing community
  - academic scientists
  - resource managers

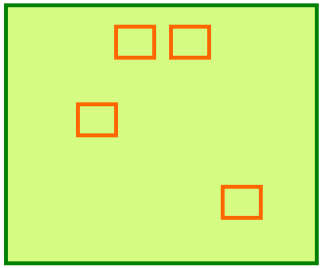
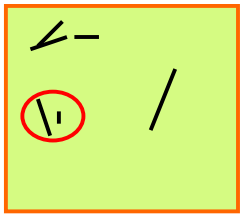
Rick Starr

Dean Wendt

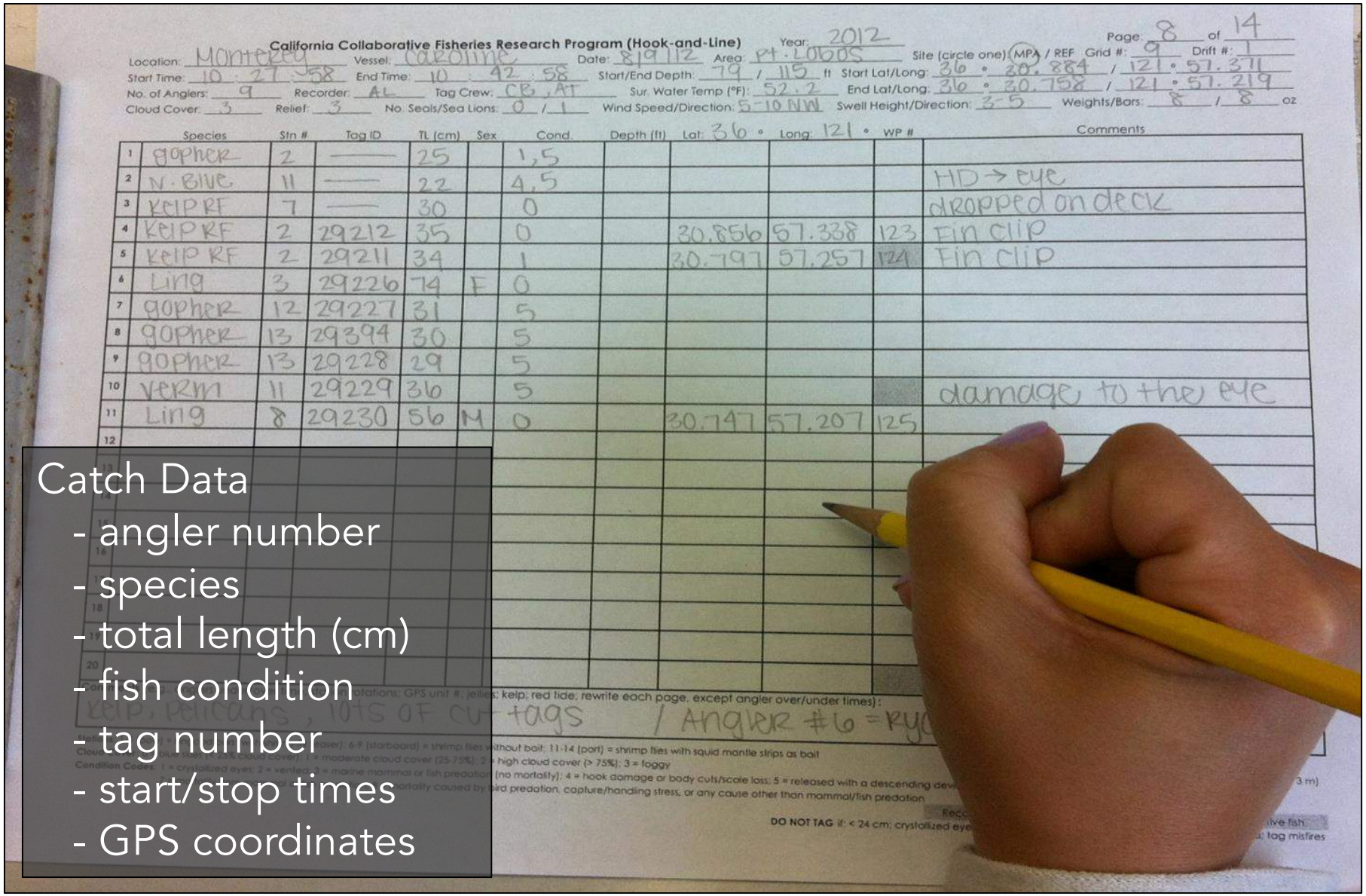
- conducts scientifically rigorous data collection and analyses for MPA monitoring and fisheries management

Center for Coastal Marine Sciences

Sampling Design

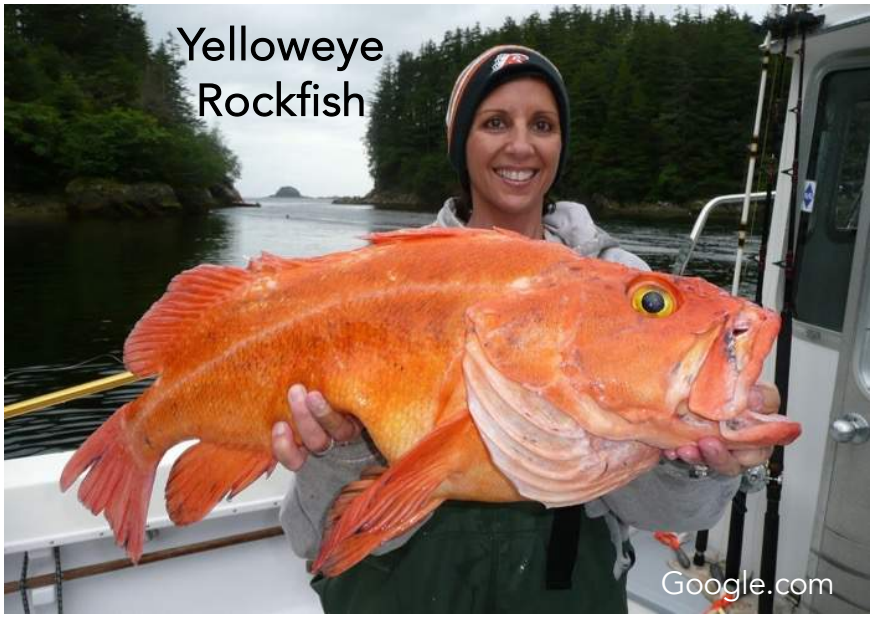
Region	Area	Site	Grid Cell (x4)	Location (x3)
North (MLML)	Año Nuevo SMR	MPA		Drift (15 min / location)
	Point Lobos SMR	REF		
	SE Farallon Islands SMR			
Central CA	Piedras Blancas SMR			
	Point Buchon SMR			
South (CalPoly)				

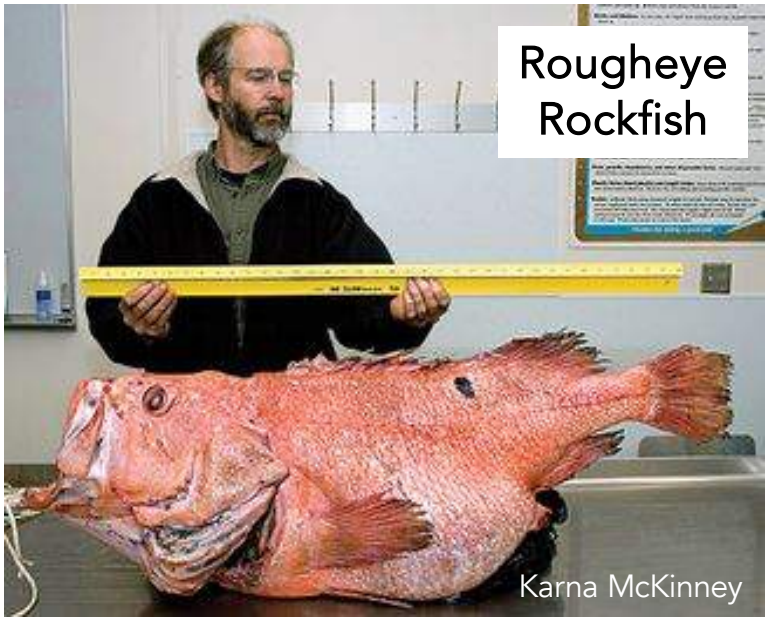
Data collection during fishing



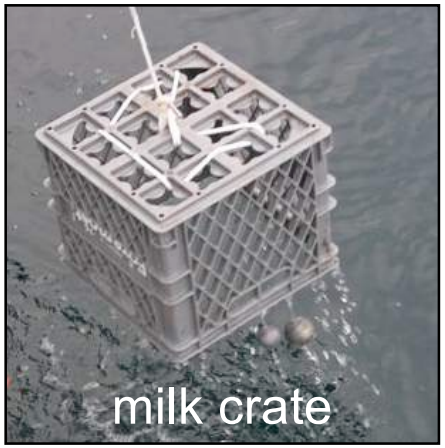
Rockfish are diverse & long-lived!

- ~70 northeast Pacific species
  - 100+ world-wide
- max depth: 2,830 m (9,285 ft)
- Yelloweye Rockfish – 121 years old
- Rougheye Rockfish – 205 years old (oldest known rockfish)





Maximizing Survivorship



- sample ≤ 120 feet
- fish without barbed hooks
- use careful handling techniques
- keep surface time ≤ 5 min
- descend fishes, when necessary
- regularly replace seawater
- only tag fishes in good condition


BML


HSU


SIO

2018 Statewide CCFRP Updates

Region	Academic Institution	Marine Protected Area (MPA) / Reference Sites	Number of Trips	Number of Caught Fishes	Number of Caught Species
North	Humboldt State University	South Cape Mendocino SMR	6	594	15
		Ten Mile SMR	6	535	19
		Trinidad & Patrick's Point REF	6	898	12
		TOTALS	18	2,027	20
North Central	Bodega Marine Laboratory	Bodega Head SMR	6	712	22
		Stewart's Point SMR	6	4,297	20
		TOTALS	12	5,009	25
Central	Moss Landing Marine Laboratories	SE Farallon Islands SMR	6	2,302	18
		Año Nuevo SMR	6	2,736	20
		Point Lobos SMR	6	3,726	20
		TOTALS	18	8,764	27
	Cal Poly, San Luis Obispo	Piedras Blancas SMR	6	4,973	---
		Point Buchon SMR	6	2,751	---
		TOTALS	12	7,724	---
South	UC Santa Barbara	Carrington Point SMR	5	1,996	25
		Anacapa Island SMR & SMCA	5	1,504	21
		Point Conception SMR	6	456	23
		TOTALS	16	3,956	42
	Scripps Institution of Oceanography	Swami's SMCA	4	390	23
		South La Jolla SMR	4	524	22
		TOTALS	8	914	33
			84	28,394	---


BML


UCSB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UCSB


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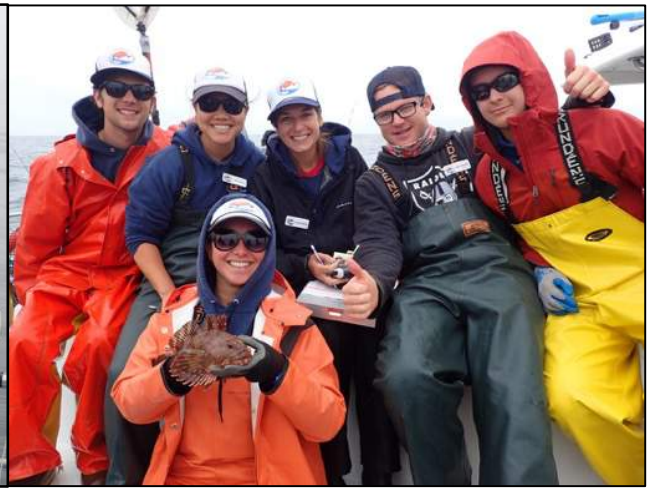
SIO

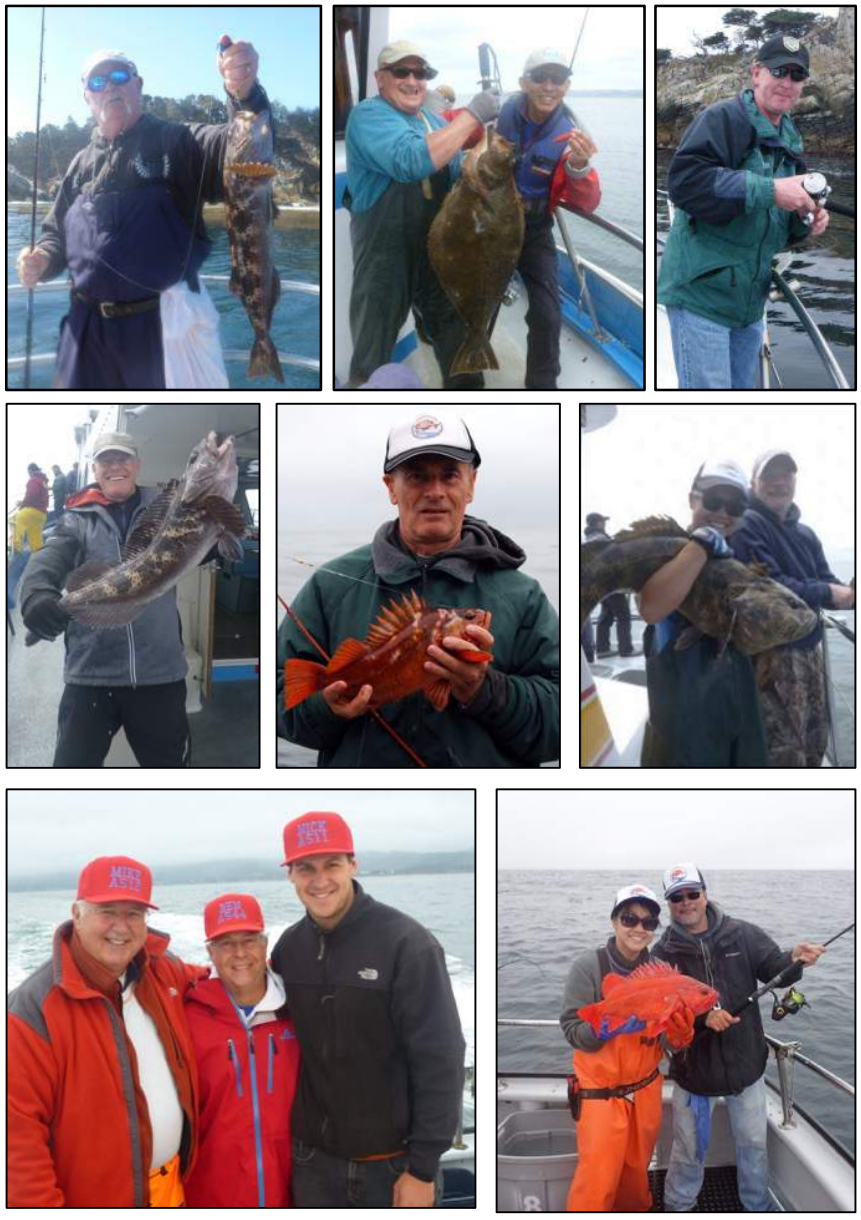
MLML CCFRP Summary (2007 to 2018)

- ☑ 9 CPFVs, 14 skippers, 4 harbors
- ☑ 206 sampling days at sea
- ☑ 800 volunteer anglers
- ☑ 7,000+ hours of fishing
- ☑ 66,807 fishes (51 spp.)
  - ☑ 22,677 fishes tagged and released

CA Collaborative Fisheries Research



Total Number of Caught Fishes (1,000+)



Rank	Name	Total # of Caught Fishes
1	Darrell B.	3,357
2	Dave K.	3,059
3	Nick I.	2,189
4	Lester Y.	1,925
5	Ken Y.	1,912
6	Mike I.	1,594
7	Matt M.	1,470
8	Ben R.	1,460
9	Ed M.	1,174
10	Bob S.	1,168
11	Frank P.	1,121
12	Jim R.	1,081
13	Paul R.	1,035
14	Bill S.	1,032

Top 10: Average No. Fishes Caught per Trip

(All Locations - 5 trips min)

Rank	Name	Avg. # of Fishes / Trip
1	Bill S.	79.4
2	Josh A.	65.3
3	Victor A.	63.4
4	Manny P.	61.3
5	Richard K.	56.7
6	Chris A.	54.6
7	Kris H.	51.4
8	Gary K.	50.8
9	Ben E.	49.1
10	Nick I.	48.6
	Manny L.	

Top 10: Average No. Fishes Caught per Trip

(Año Nuevo Only - 5 trips min)

Rank	Name	Avg. # of Fishes / Trip
1	Bill S.	81.7
2	Manny P.	66.9
3	Richard K.	64.8
4	Ben R.	54.8
5	Kris H.	53.5
6	Manny L.	52.6
7	Nick I.	51.6
8	Andy Y.	49.6
9	Dayton L.	44.9
10	Mike I.	43.8

Top 10: Average No. Fishes Caught per Trip

(Point Lobos Only - 5 trips min)

Rank	Name	Avg. # of Fishes / Trip
1	Josh A.	65.3
2	Lester Y.	54.8
3	Gary K.	51.6
4	Ben E.	49.1
5	EC O.	47.6
6	Nick I.	47.1
7	Eddie G.	44.1
8	Joan B.	39.9
9	Ken Y.	38.1
10	Chris L.	37.8

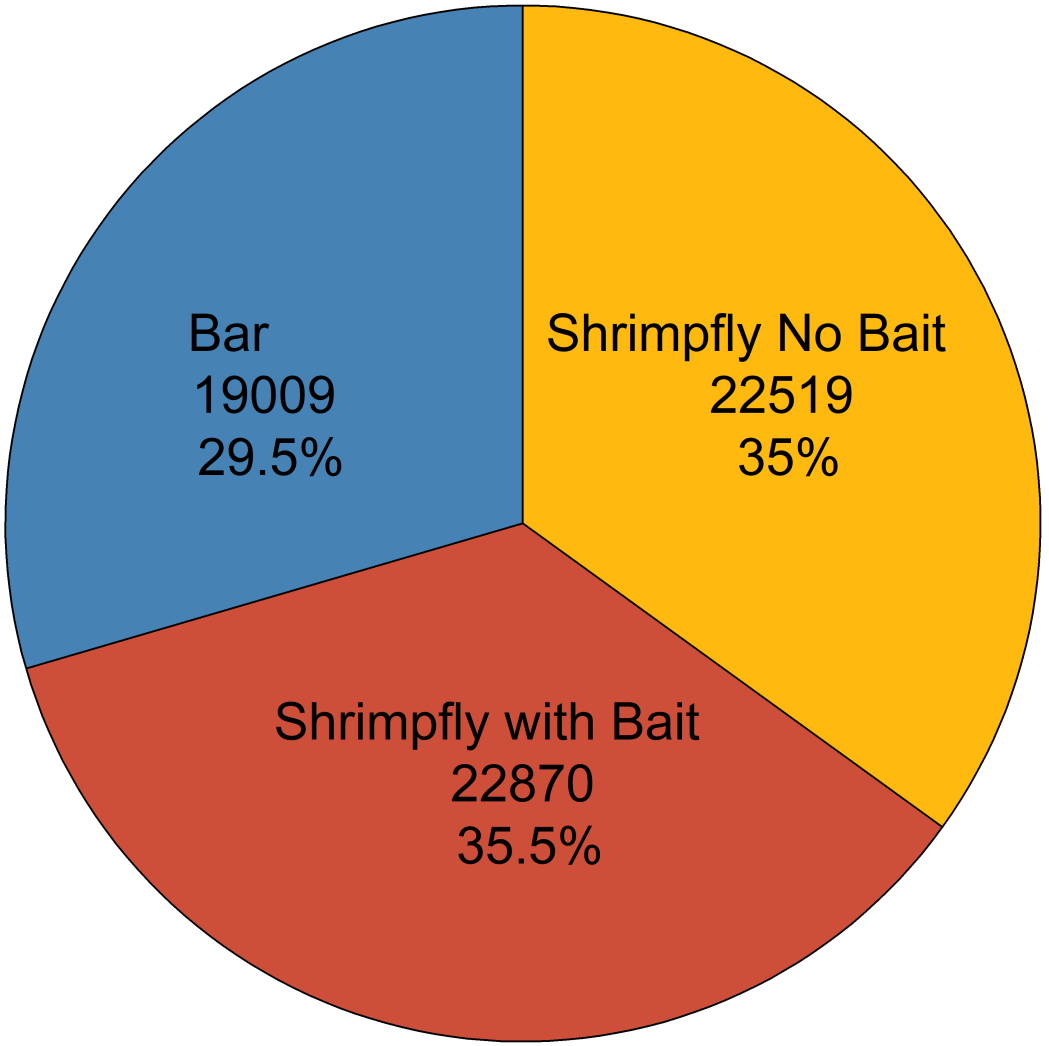
Top 10: Average No. Fishes Caught per Trip

(SE Farallon Islands Only - 2 trips min)

Rank	Name	Avg. # of Fishes / Trip
1	Bill S.	66.5
2	Gary K.	47.4
3	Nick I.	39.0
4	Stanley S.	37.7
5	Kris H.	33.0
6	Mark A.	31.5
7	Jonathan W.	31.0
8	Bob S.	25.5
9	EC O.	25.0
10	Eddie G.	24.5

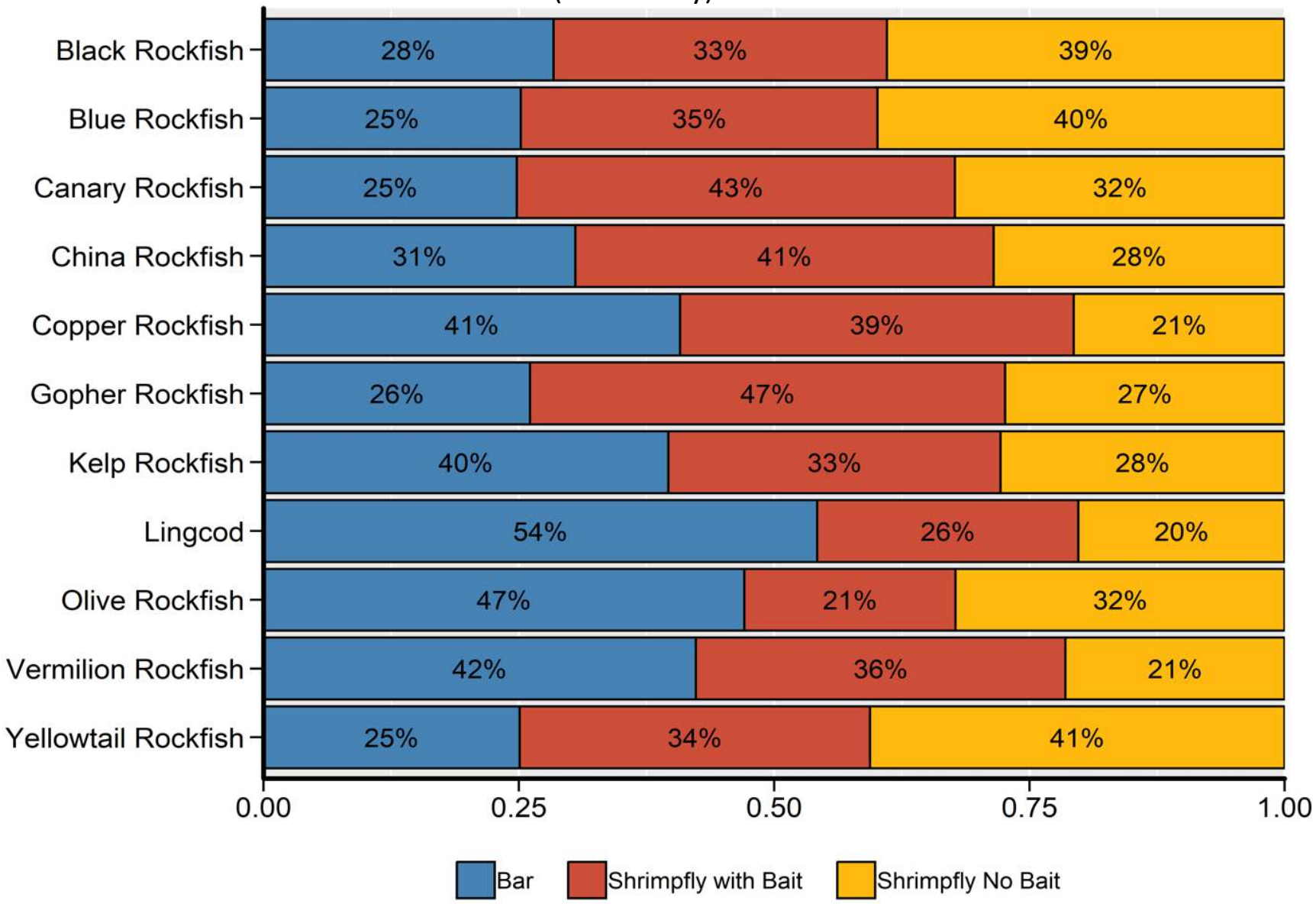
How many fish caught by gear type?

(2007 – 2018; All species combined; MLML sampling areas only)



Species Catch by Gear Type: 2007-2018

(MLML only)



Species Catch by Gear Type: 2007-2018

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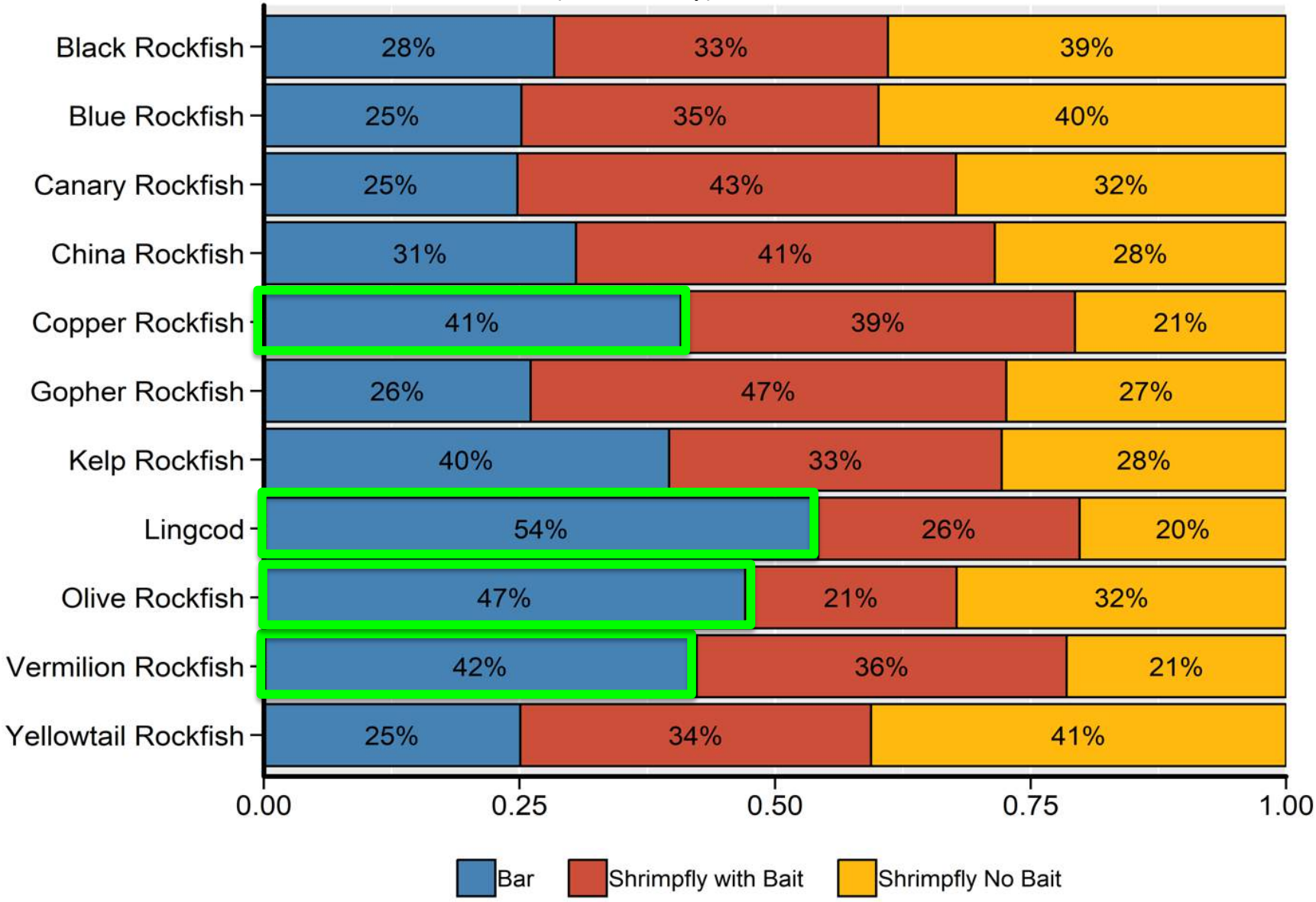

Species Catch by Gear Type: 2007-2018

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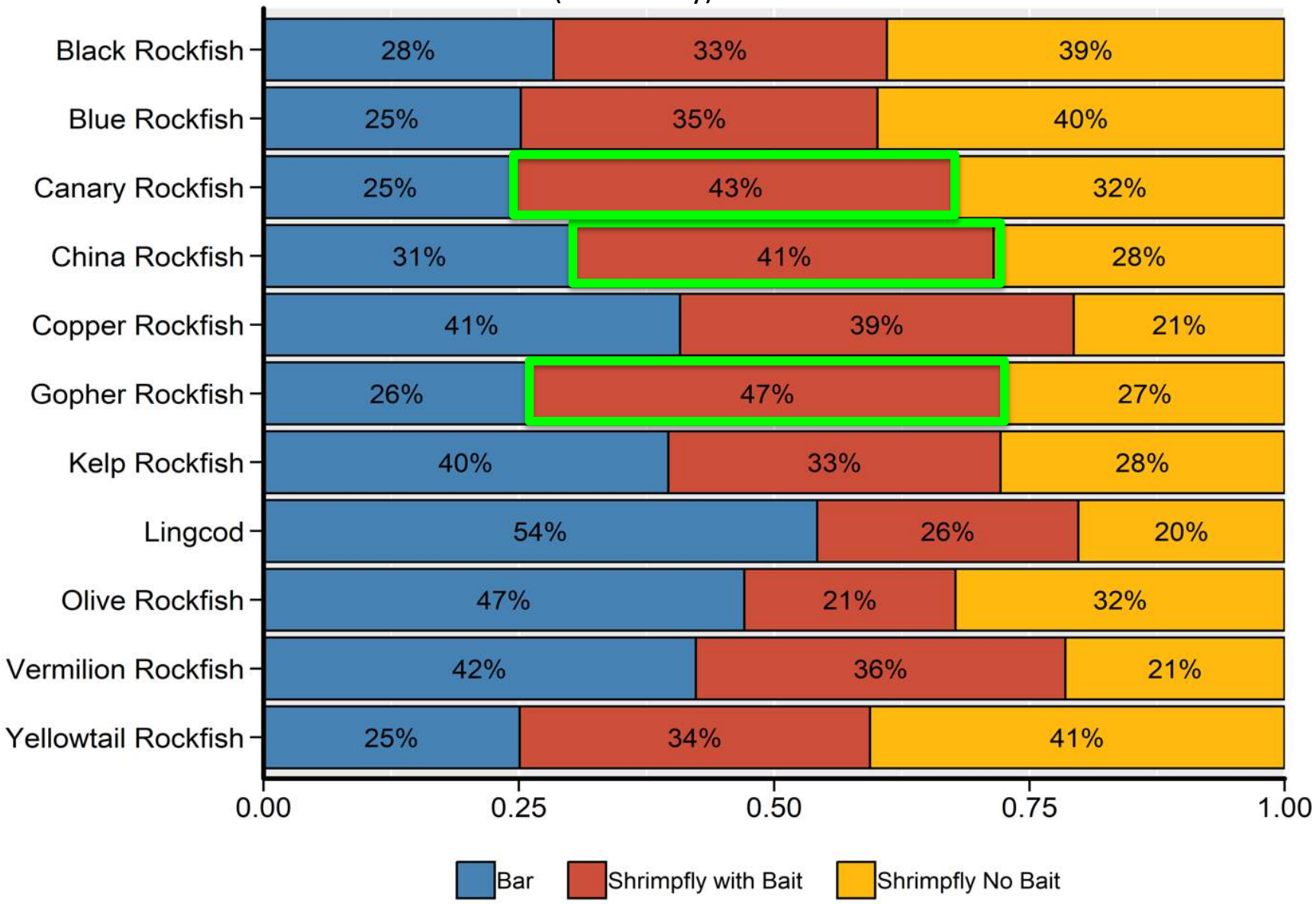
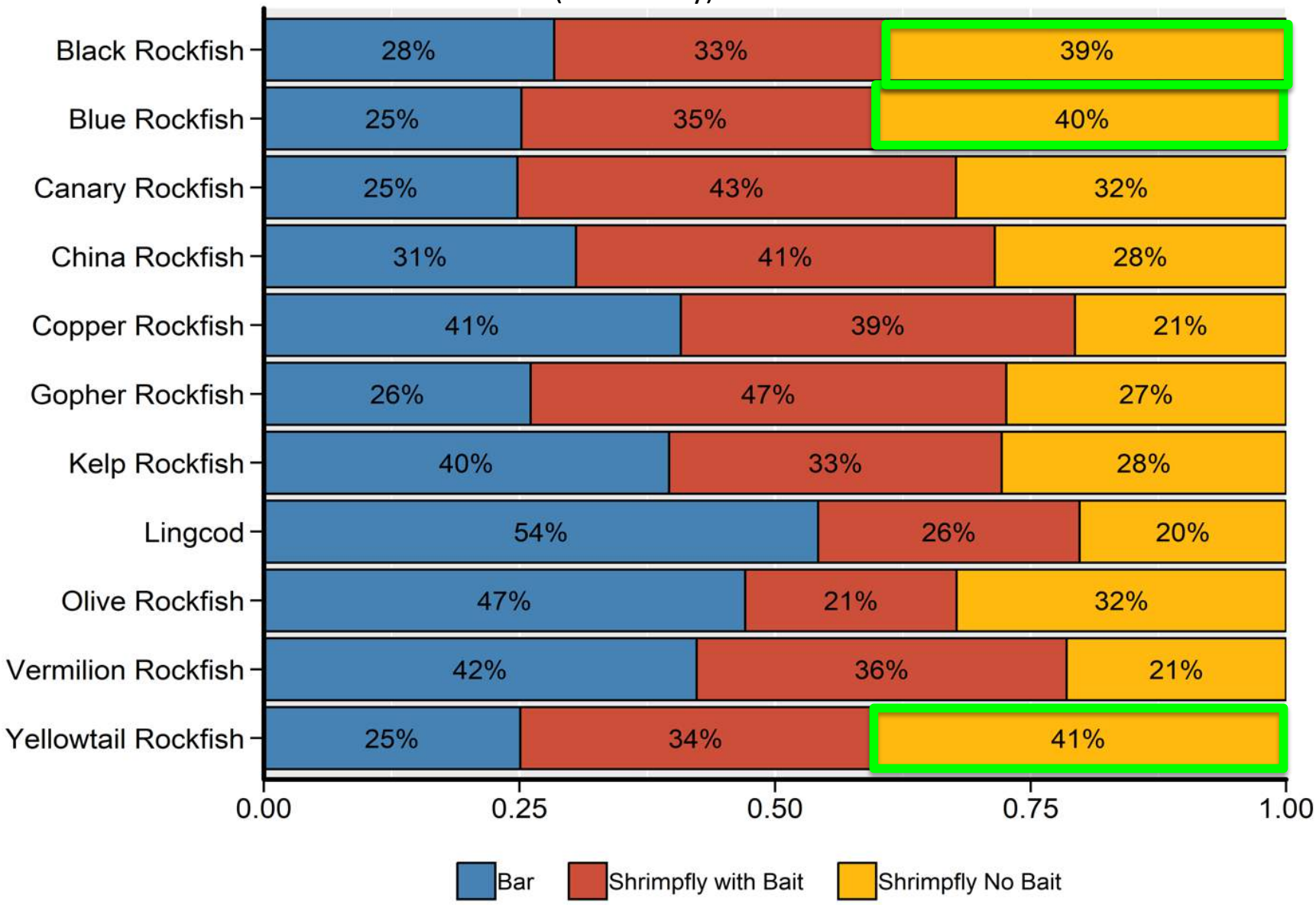


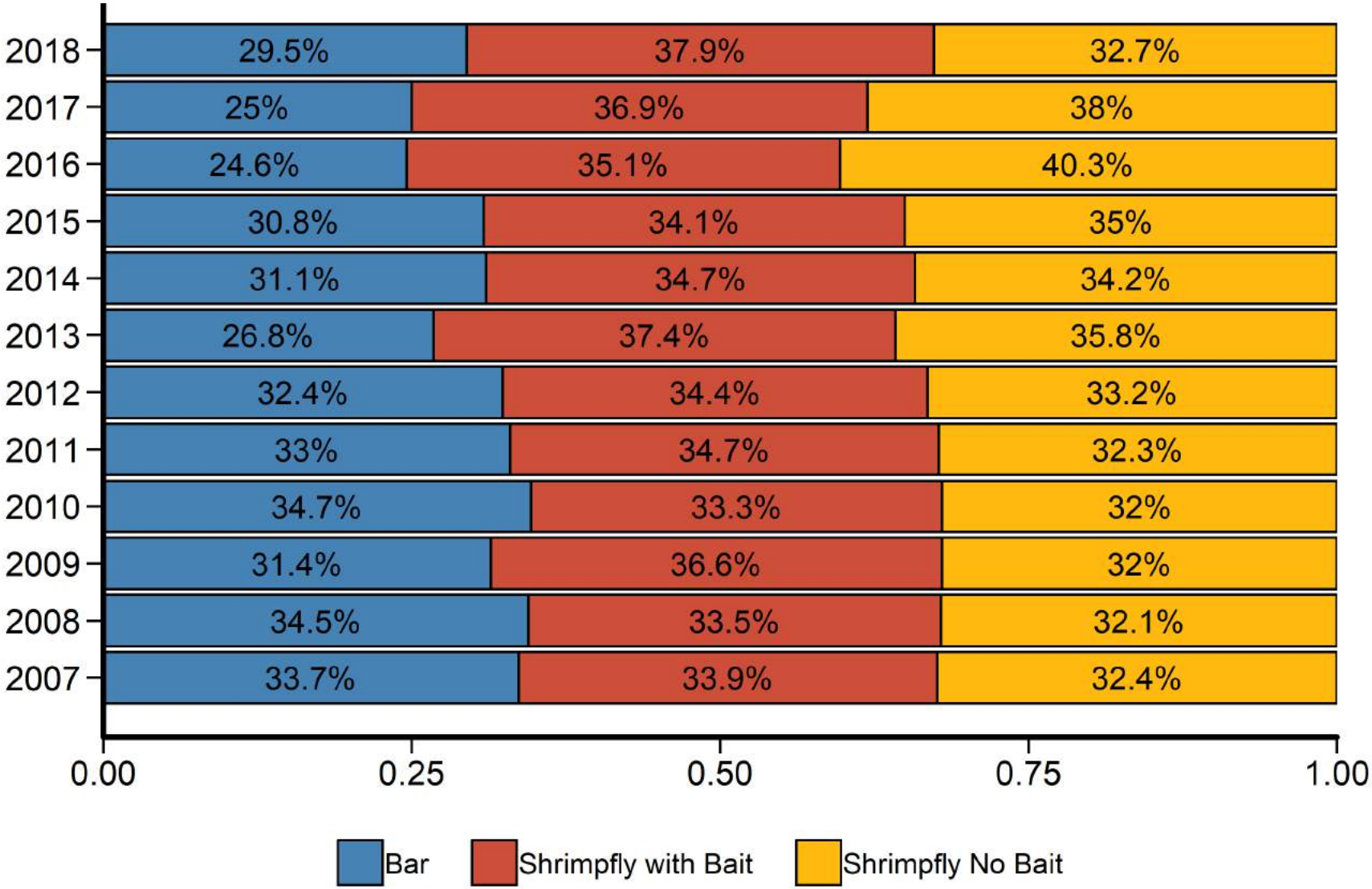
Species Catch by Gear Type: 2007-2018

(MLML only)



Species Catch by Gear Type by Year

(MLML only)

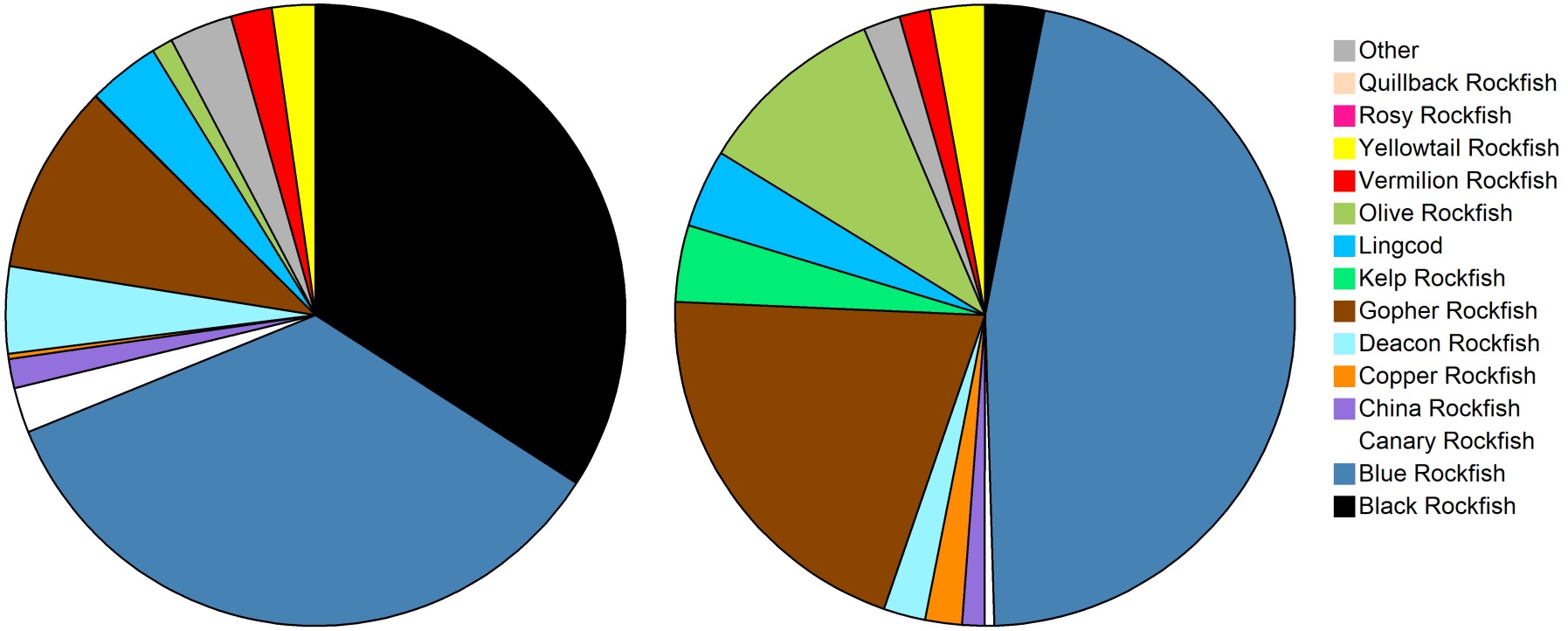


Species Compositions by Area

2007 - 2018

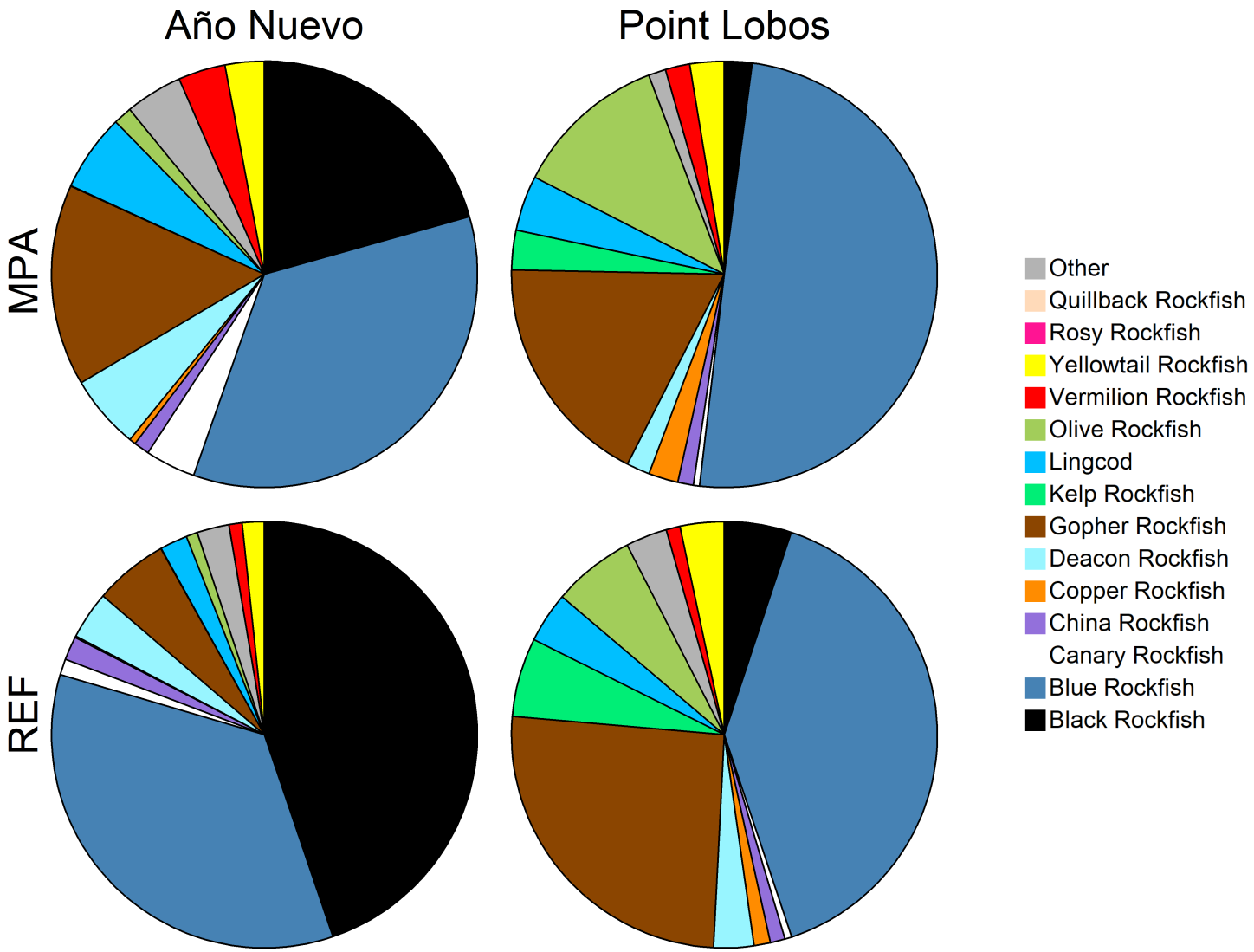
Año Nuevo

Point Lobos

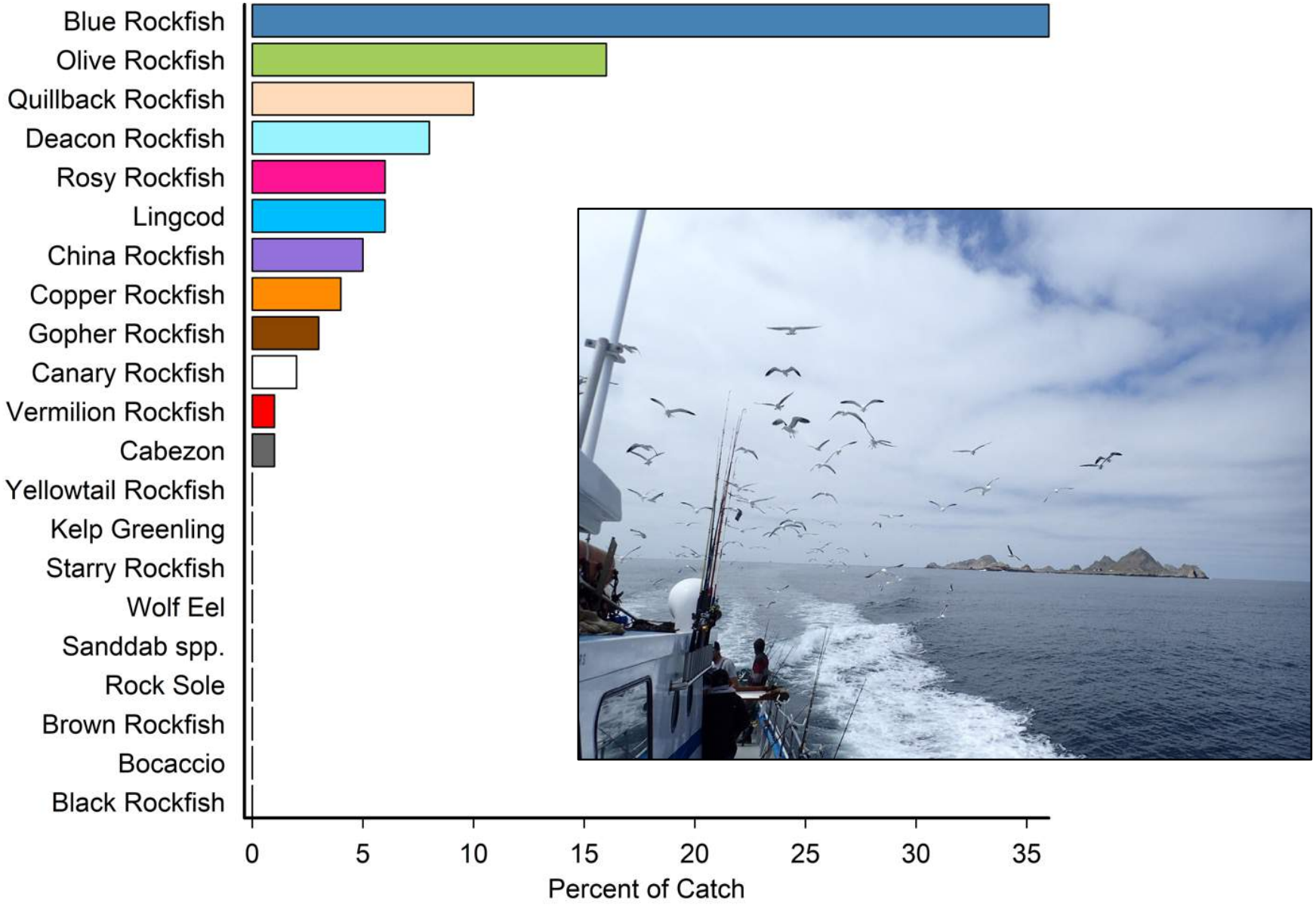


Species Compositions by Area and MPA/REF

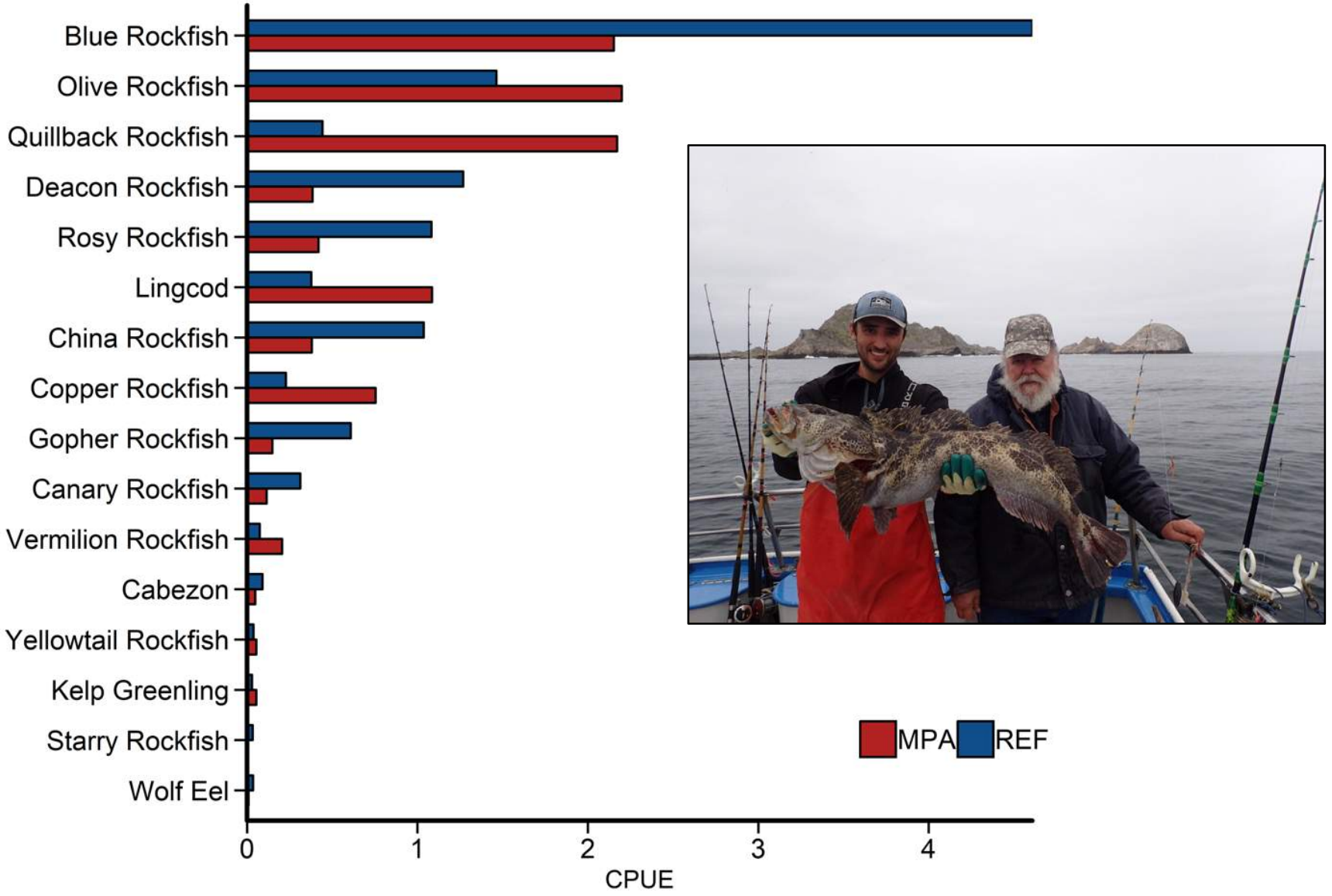
2007 - 2018



Species Compositions: Farallon Islands 2017 and 2018

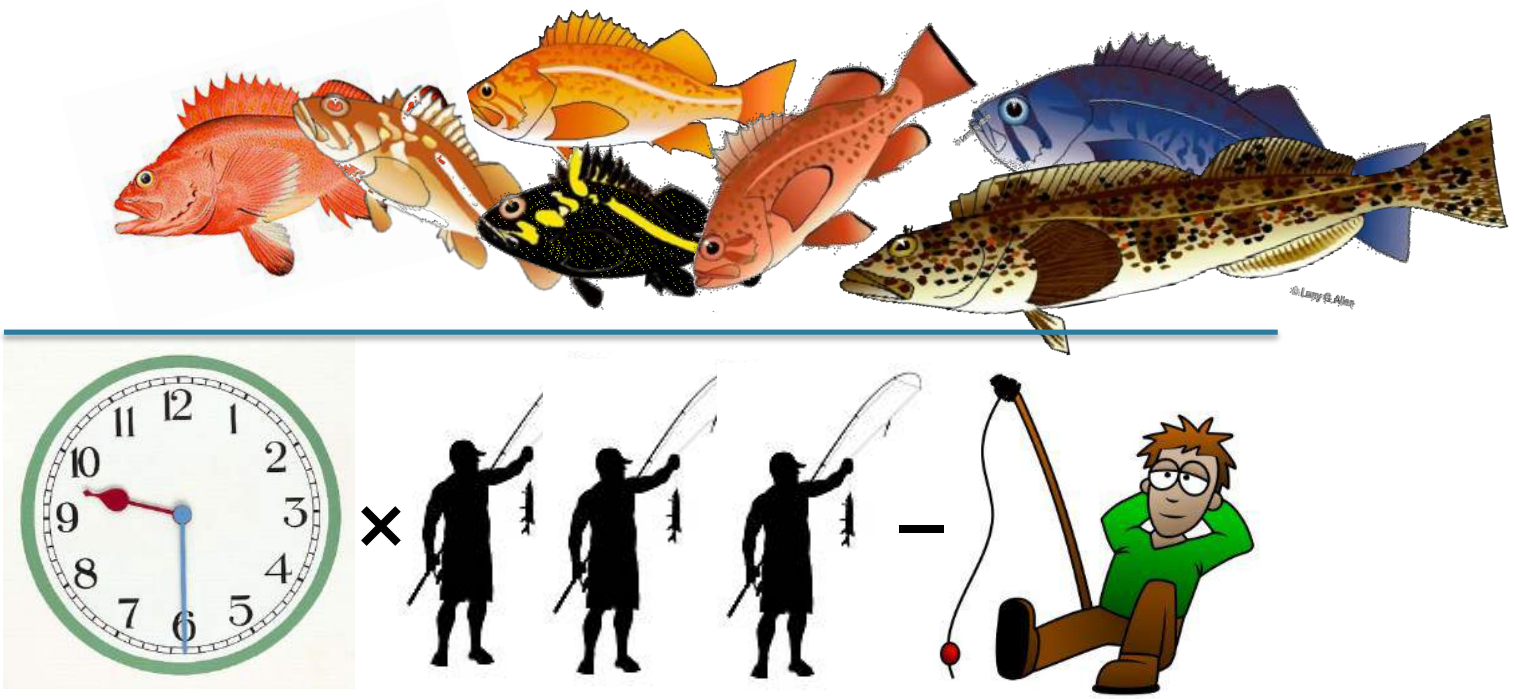


Species CPUE: Farallon Islands 2017 and 2018



How we measure relative abundance: Catch-Per-Unit-Effort (CPUE)

Here, CPUE is <u>catch per *angler-hour*</u>



$$\text{CPUE} = \frac{\text{Number of fishes caught}}{\text{[total drift time]} \times \text{[\# anglers fishing]} - \text{[angler off time]}}$$

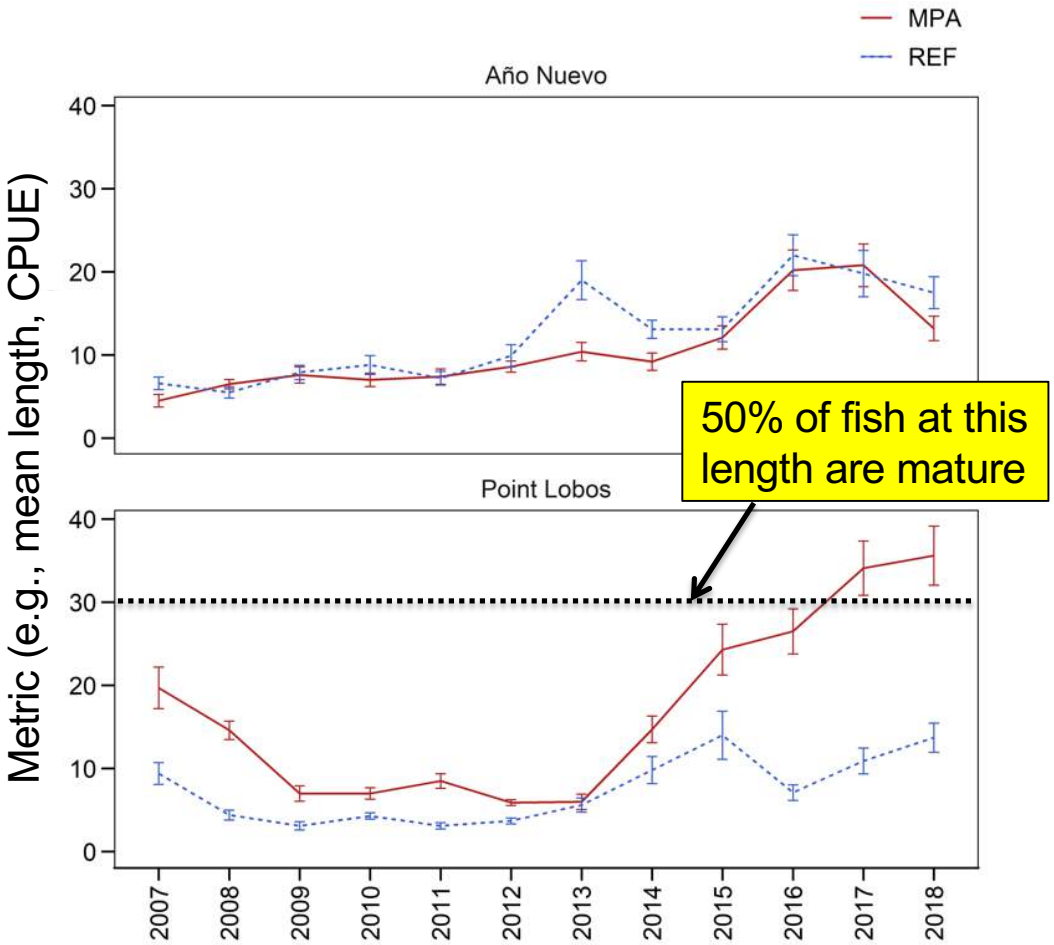
Examples of upcoming graphs and symbols

Catch Rates (CPUE)

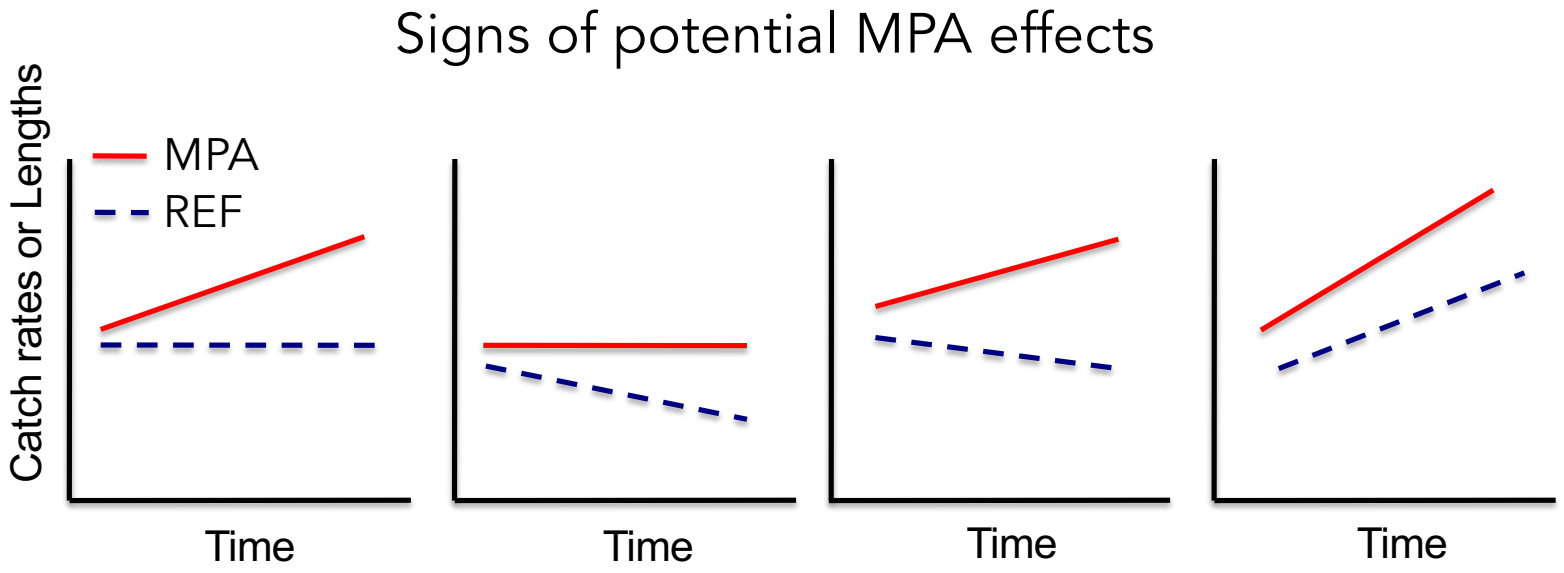
Mean Lengths

Graphs show mean (average) and standard error for:

- area (e.g., Point Lobos)
- site (i.e., MPA and REF)
- year

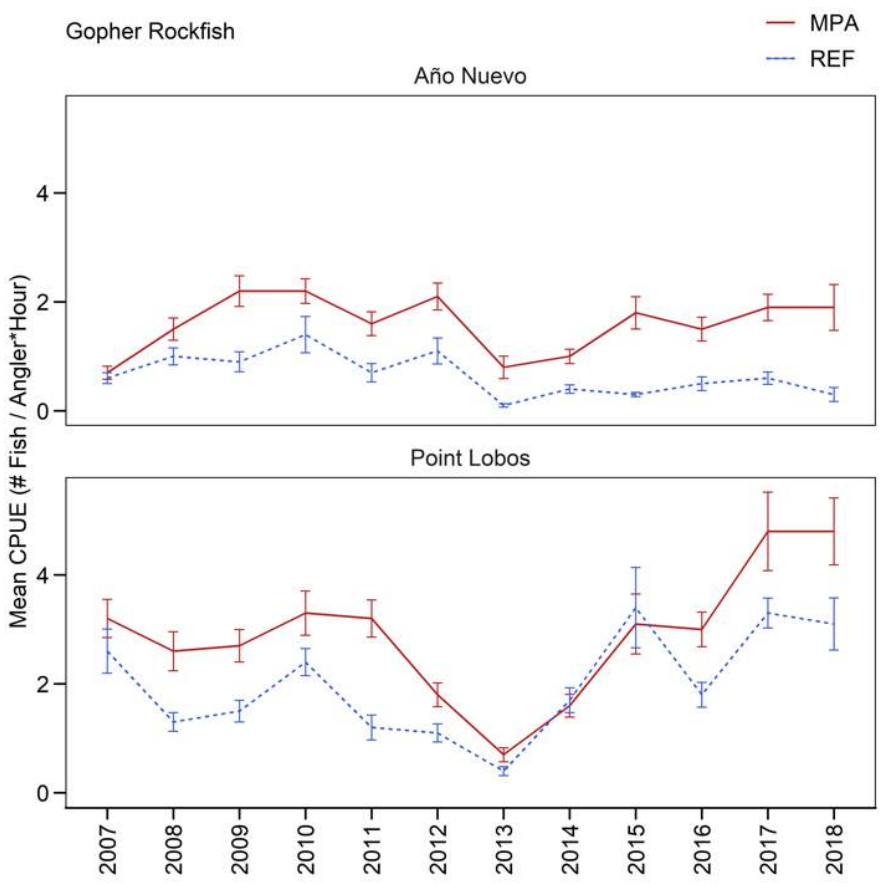


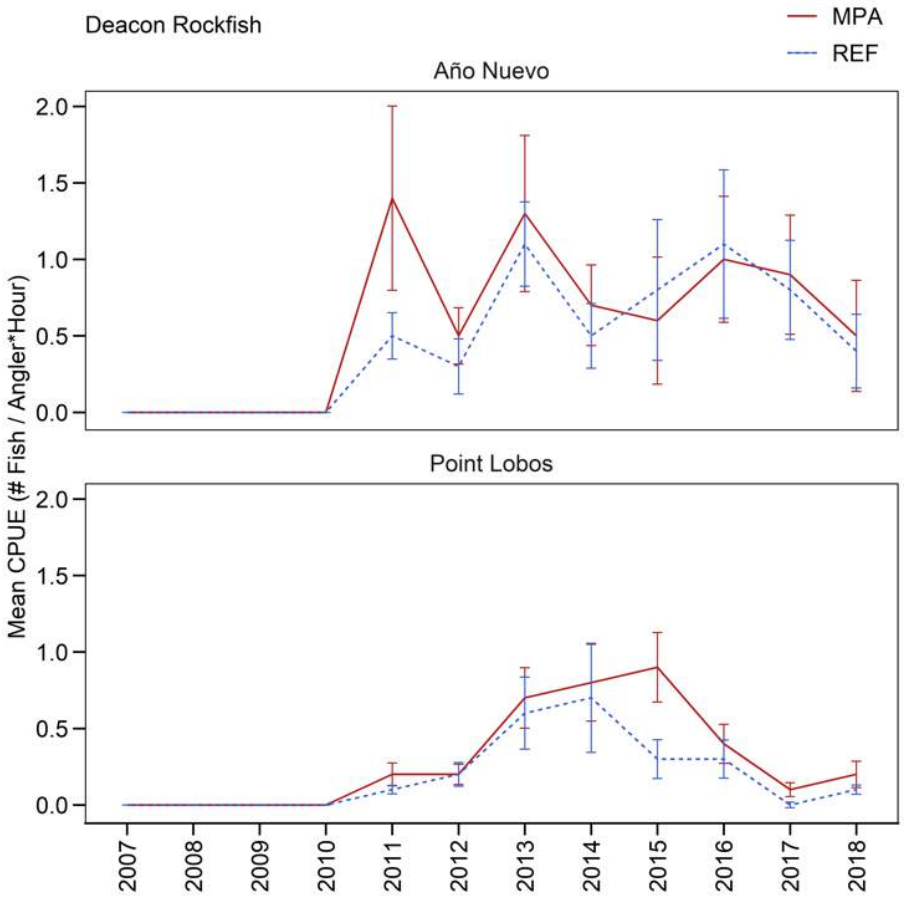
CCFRP Data Analyses

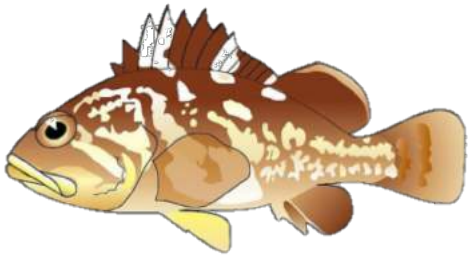


Catch Rates

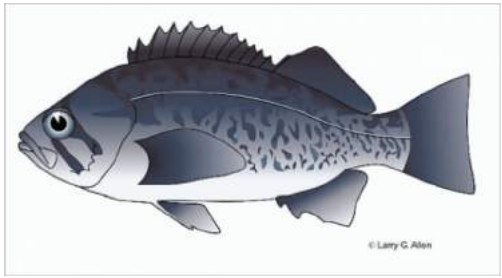
Gopher and Deacon Rockfish







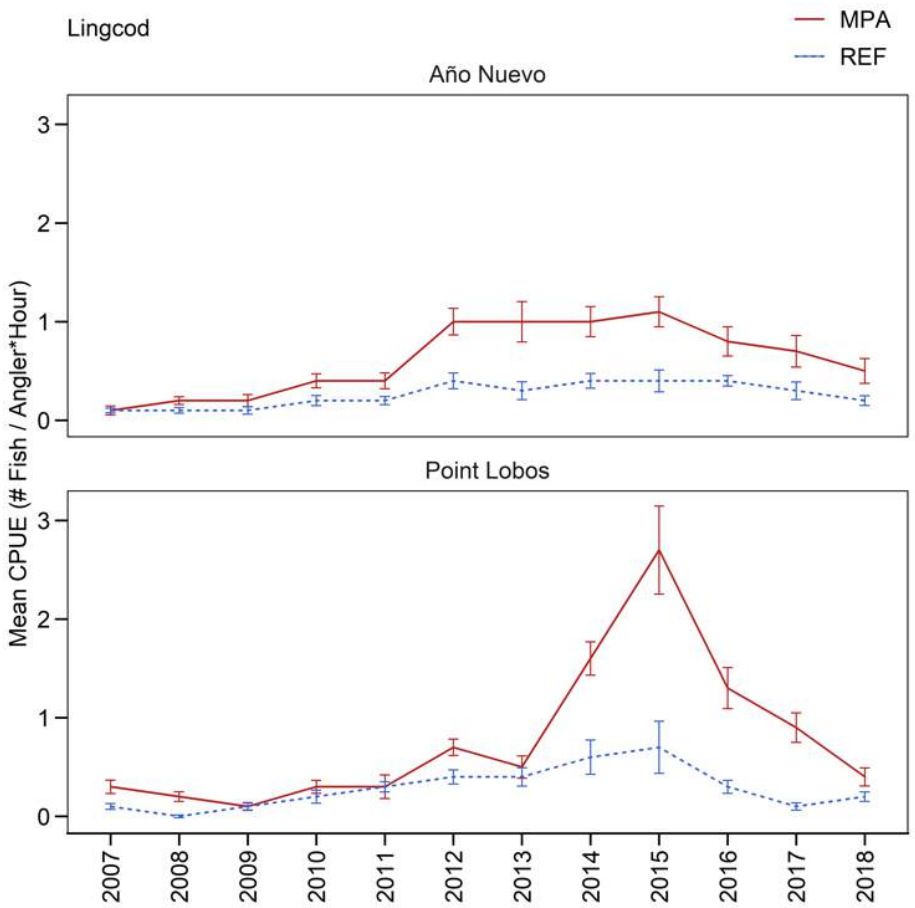
Sebastes carnatus: ≤ 20 yr ; ≤ 43 cm (16.9 in)

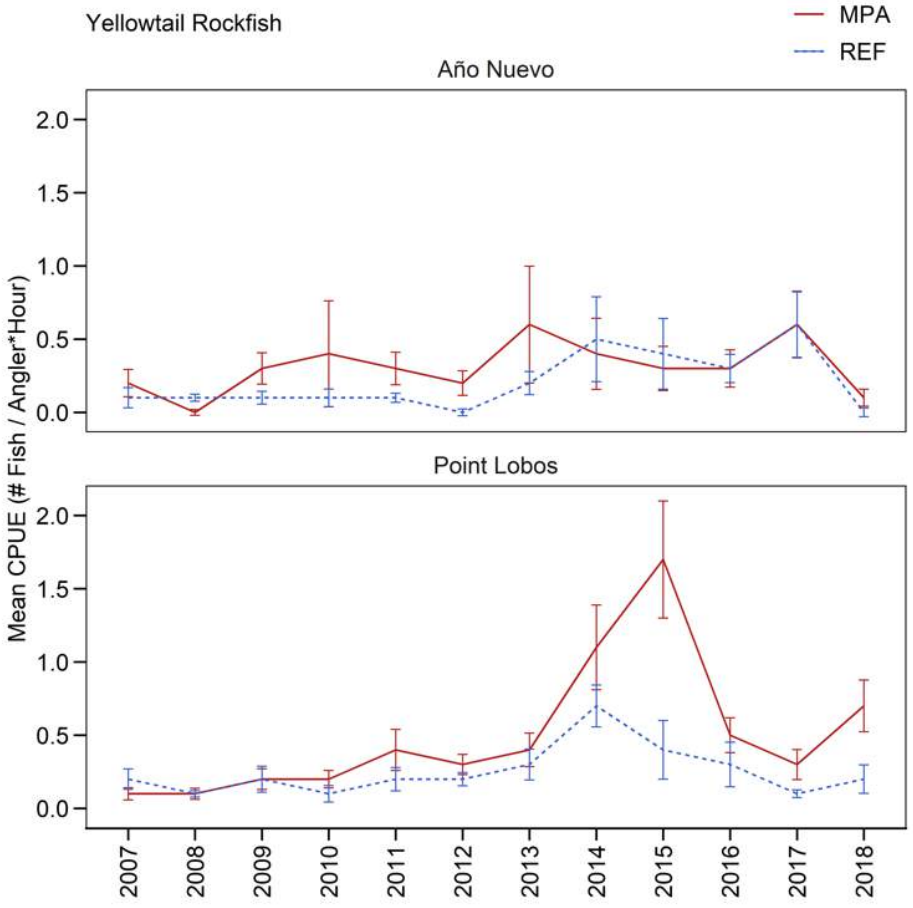


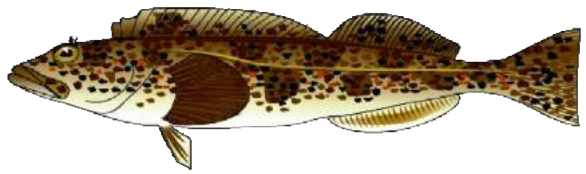
Sebastes diaconus: ≤ 44 yr ; ≤ 53 cm (21 in)

Catch Rates

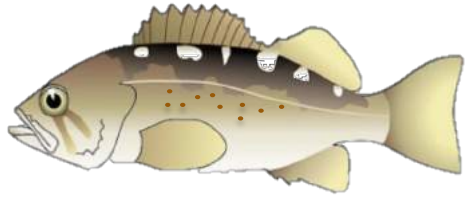
Lingcod, Yellowtail RF, Black RF, Canary RF







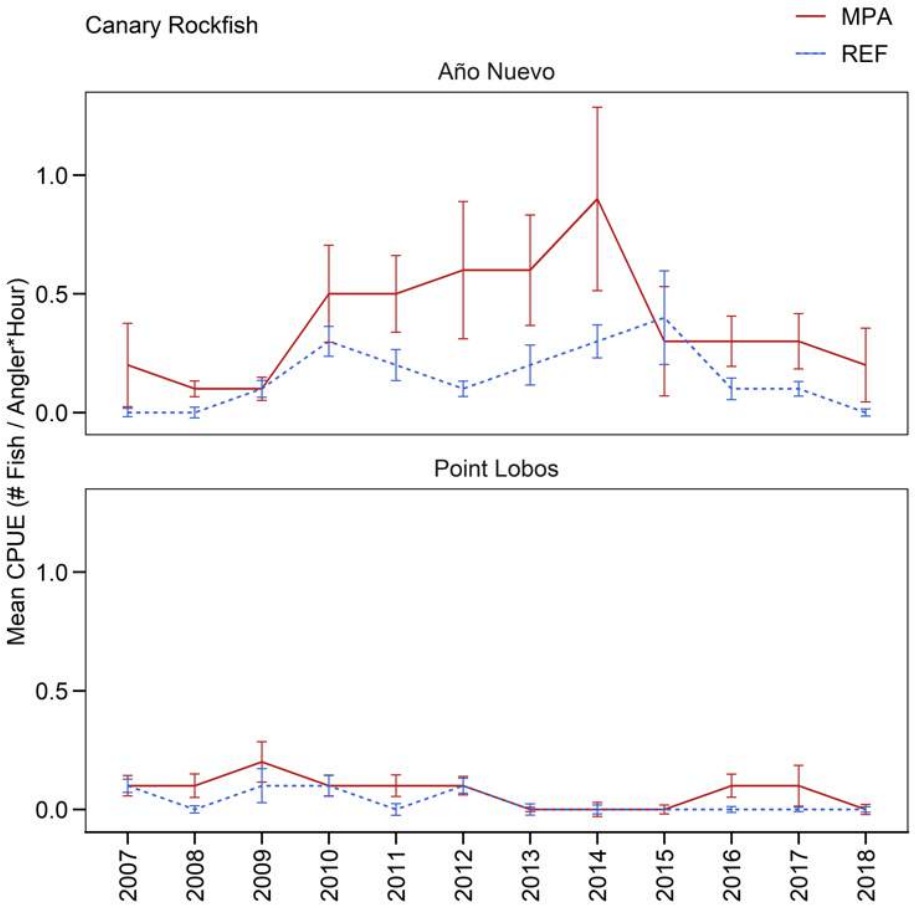
Ophiodon elongatus: ≤ 20 yr ; ≤ 152 cm (59.8 in)

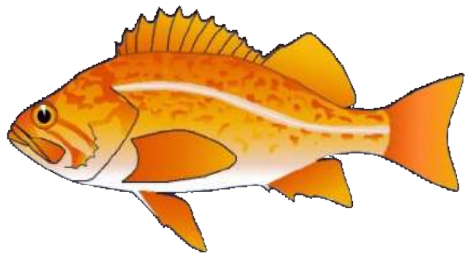


Sebastes flavidus: ≤ 64 yr ; ≤ 66 cm (26.0 in)

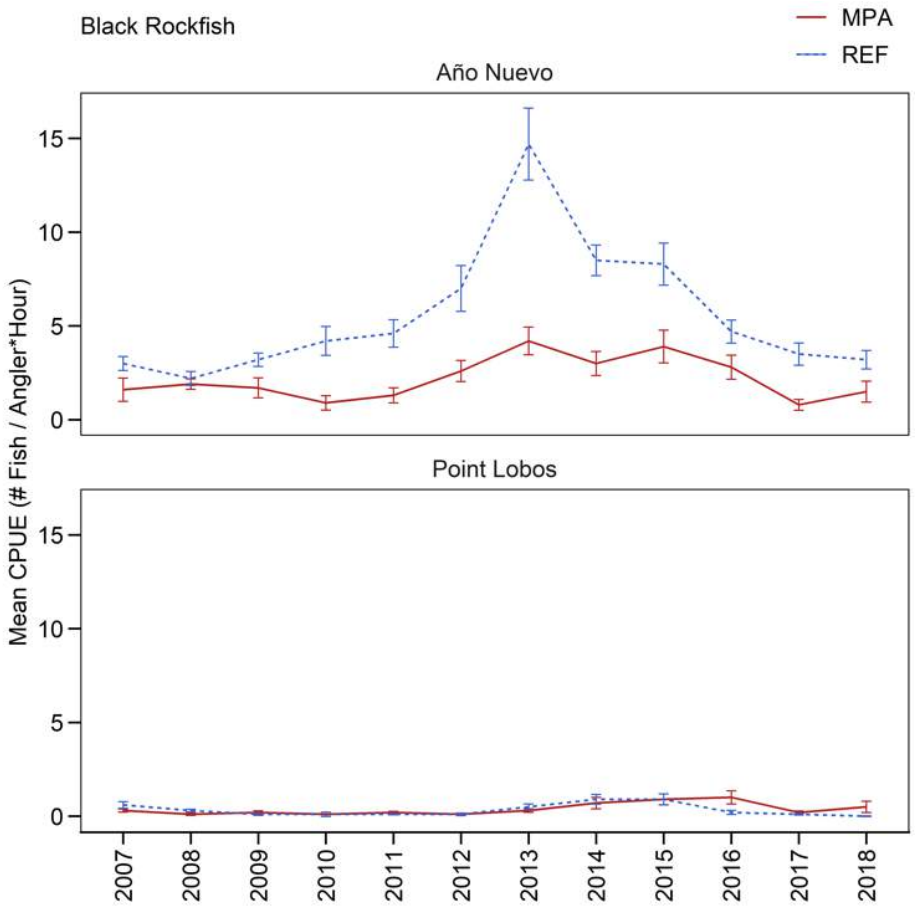
Catch Rates

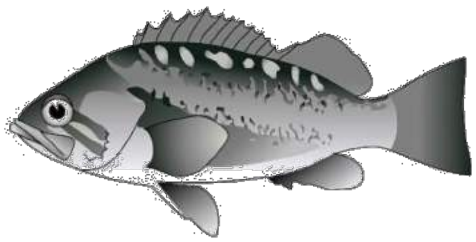
Lingcod, Yellowtail RF, Black RF, Canary RF





Sebastes pinniger: ≤ 84 yr ; ≤ 76 cm (29.9 in)

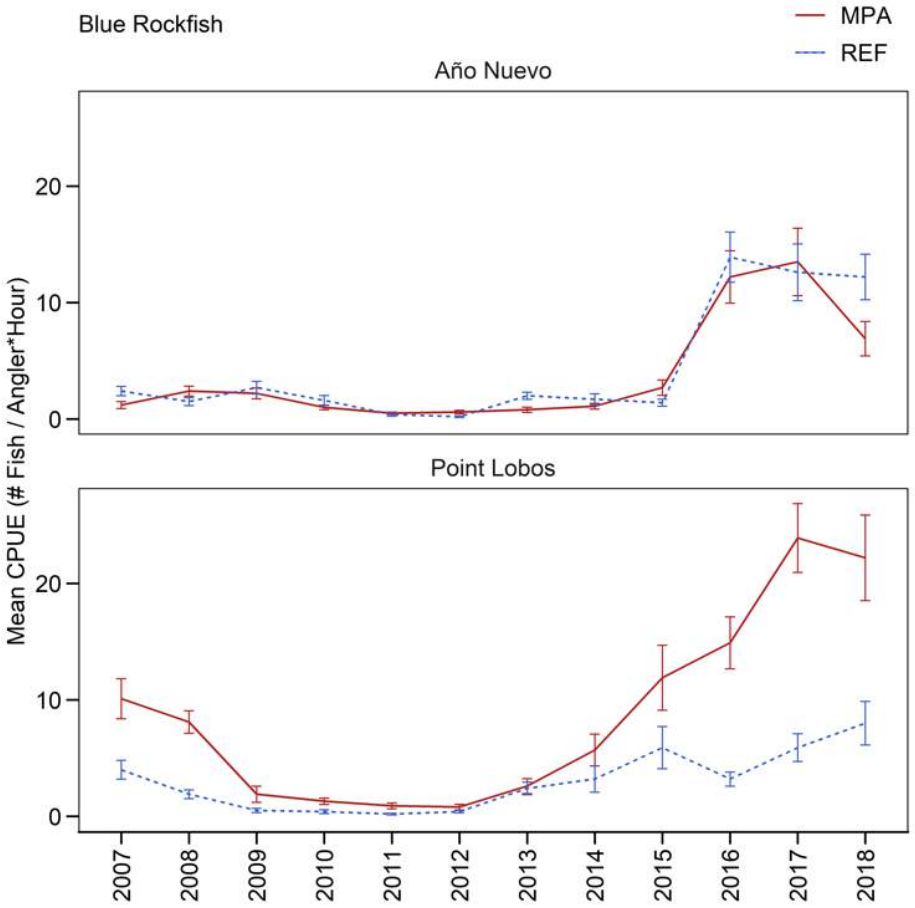


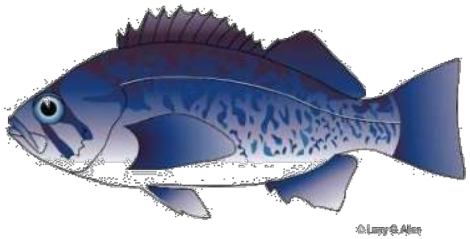


Sebastes melanops: ≤ 50 yr ; ≤ 69 cm (27.2 in)

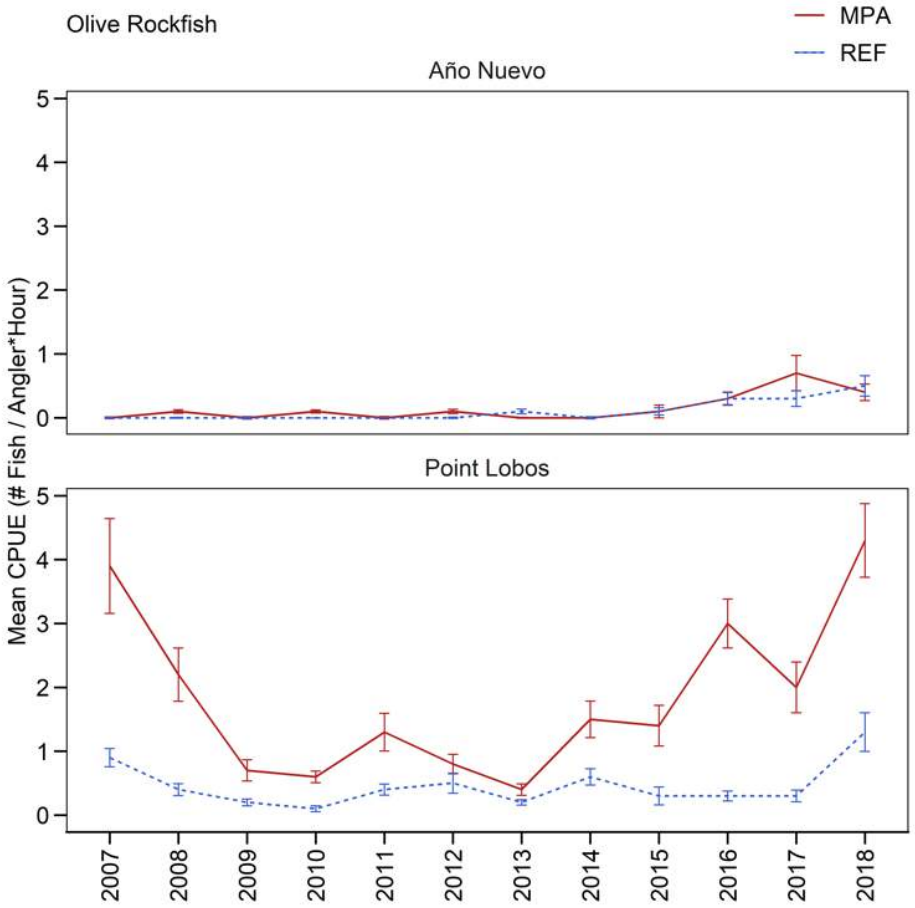
Catch Rates

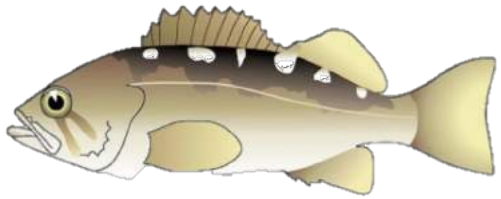
Blue RF, Olive RF, Copper RF, Vermilion RF





Sebastes mystinus: ≤ 44 yr ; ≤ 53 cm (20.9 in)

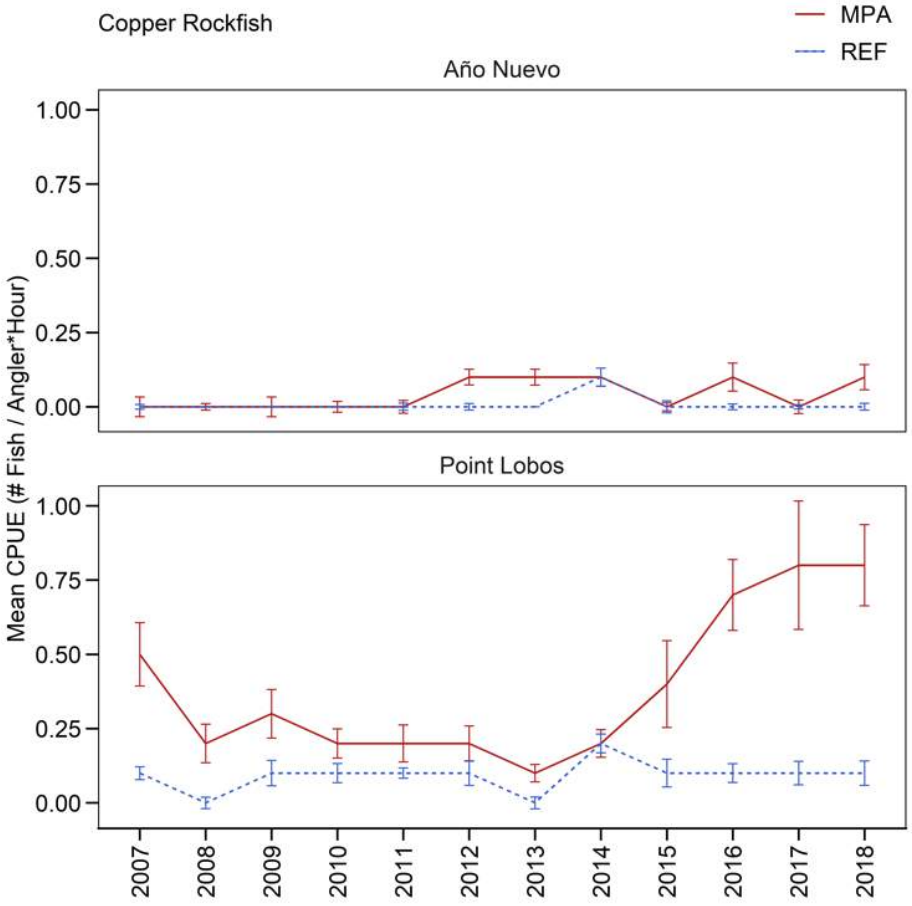


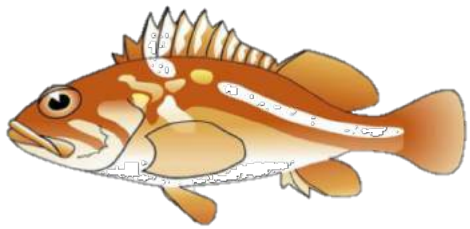


Sebastes serranoides: ≤ 30 yr ; ≤ 61 cm (24.0 in)

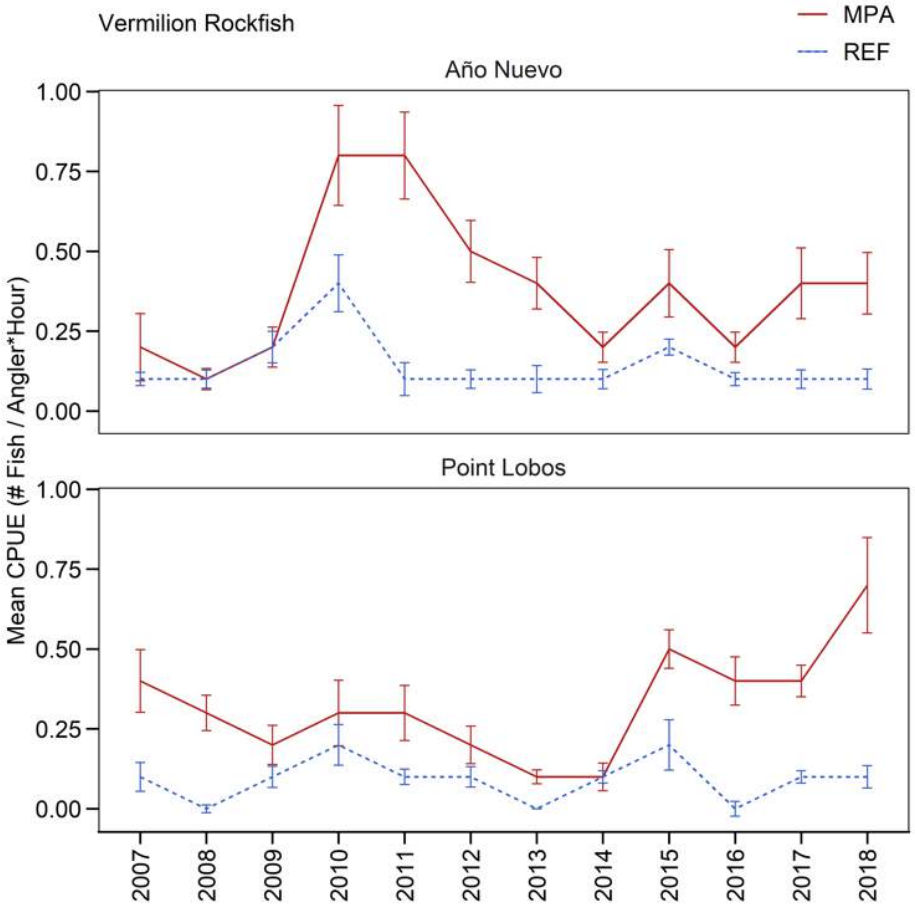
Catch Rates

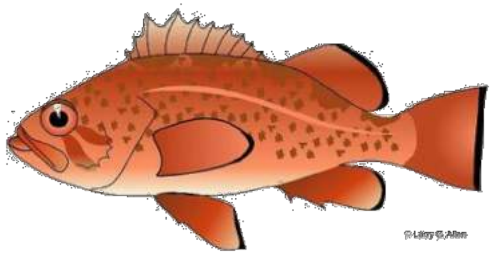
Blue RF, Olive RF, Copper RF, Vermilion RF





Sebastes caurinus: ≤ 50 yr ; ≤ 66 cm (26.0 in)

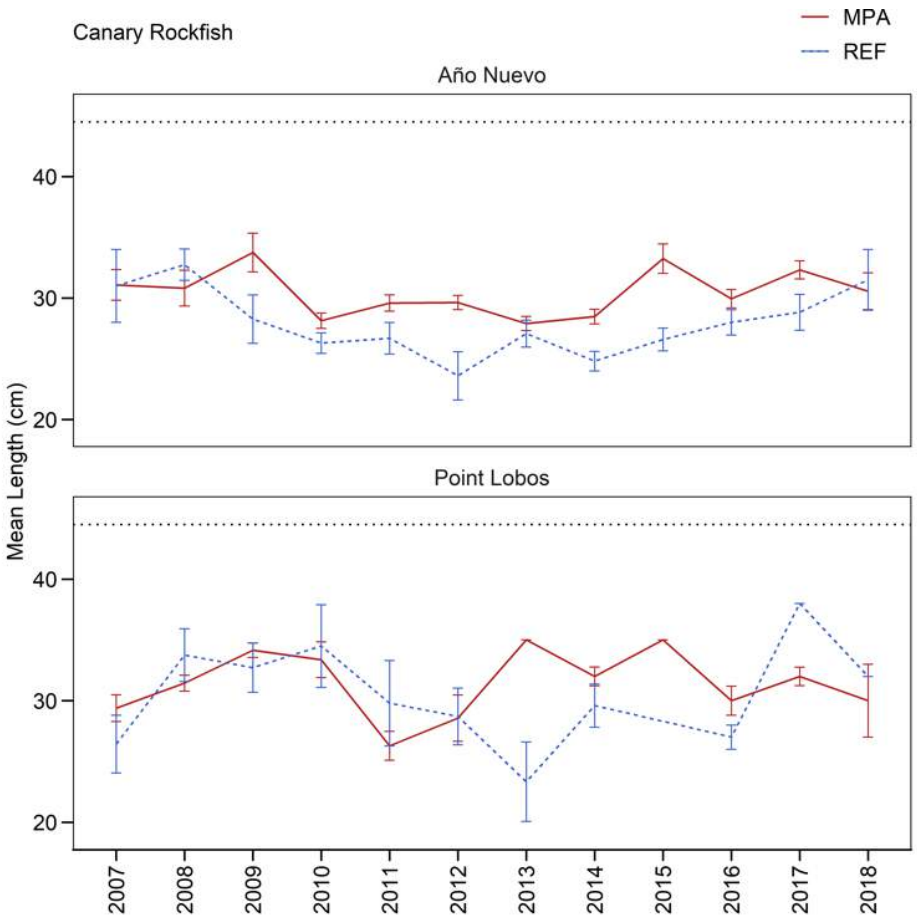


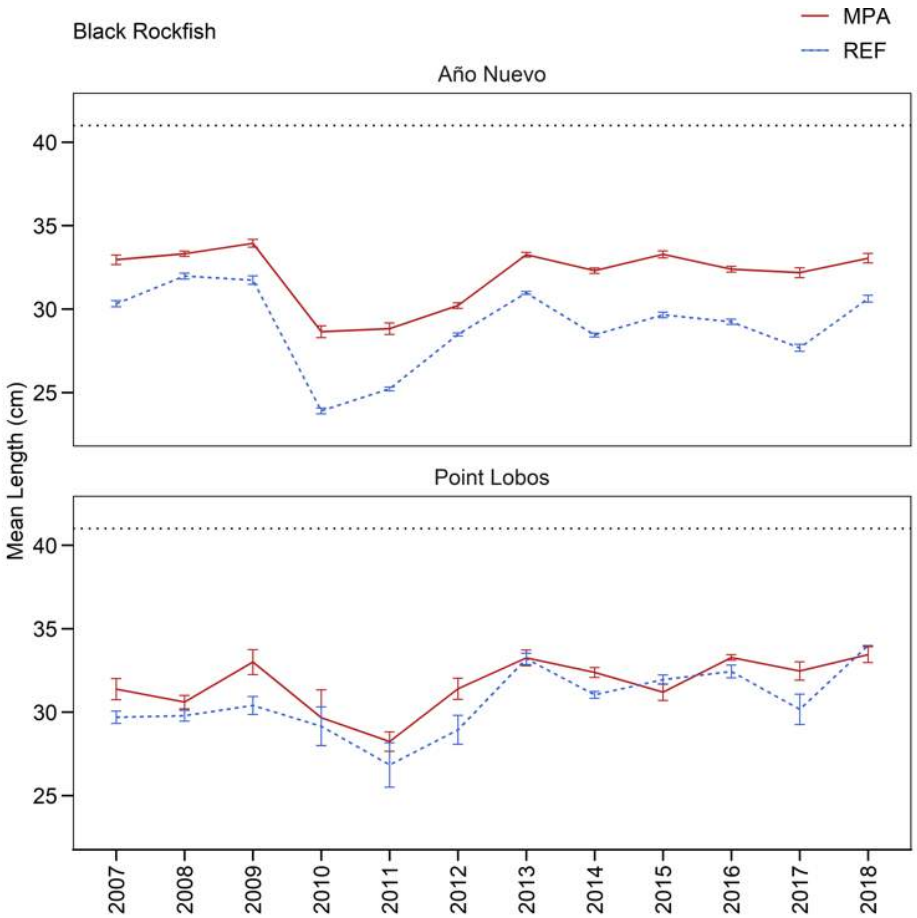


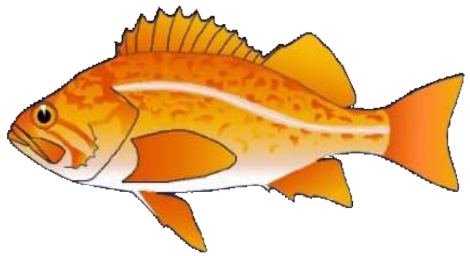
Sebastes miniatus: ≤ 60 yr ; ≤ 76 cm (29.9 in)

Mean Lengths

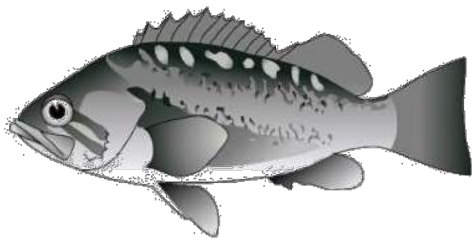
Canary RF, Black RF







Sebastes pinniger: ≤ 84 yr ; ≤ 76 cm (29.9 in)

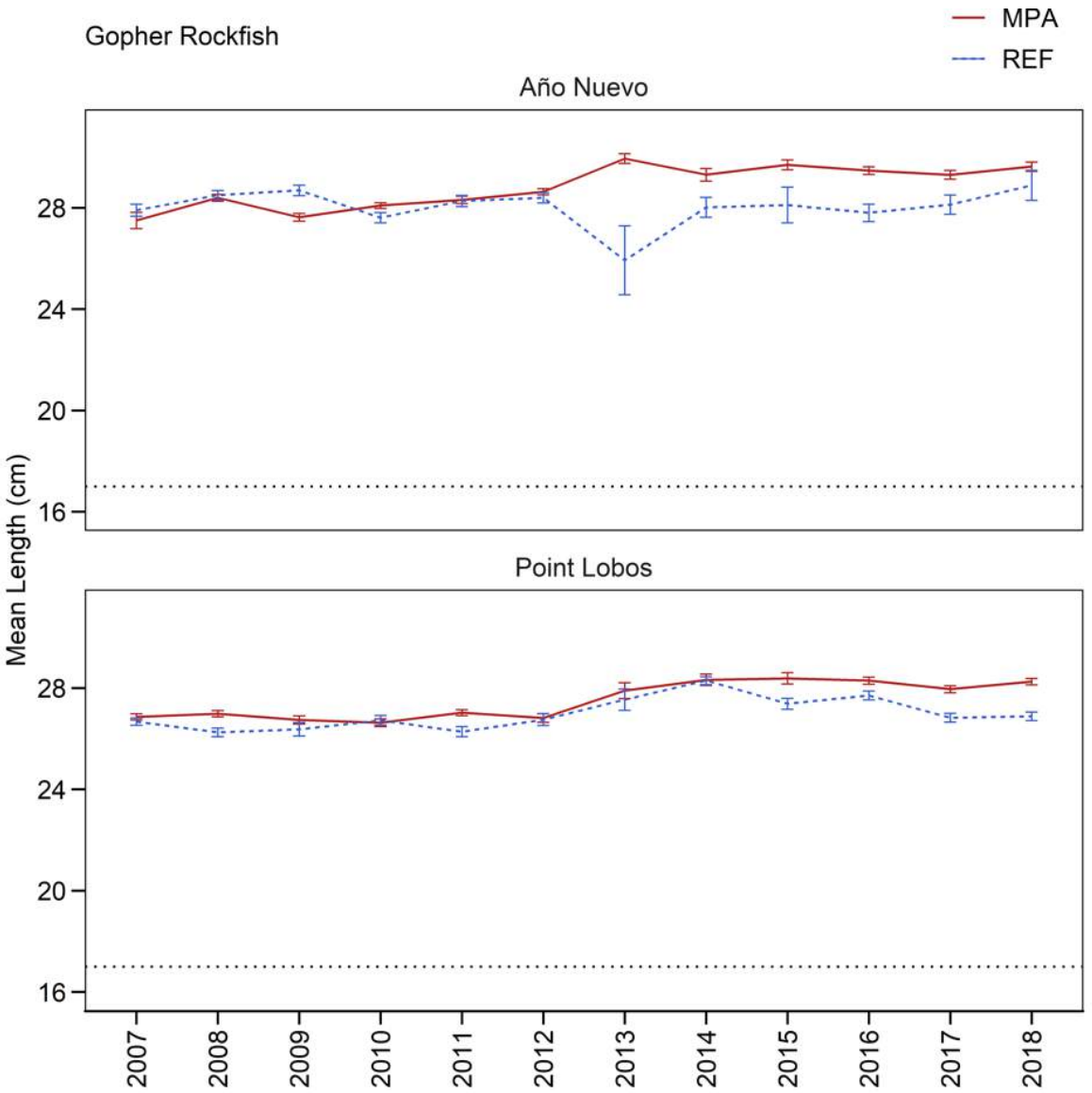


Sebastes melanops: ≤ 50 yr ; ≤ 69 cm (27.2 in)

Mean Lengths

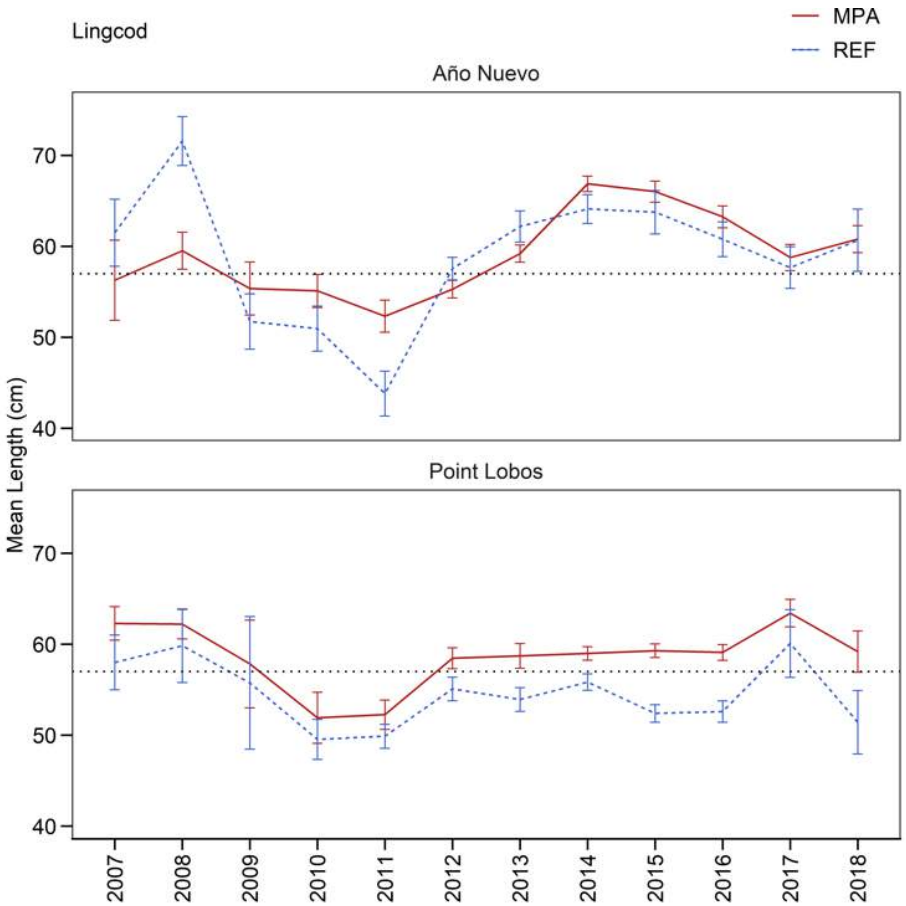
Gopher Rockfish

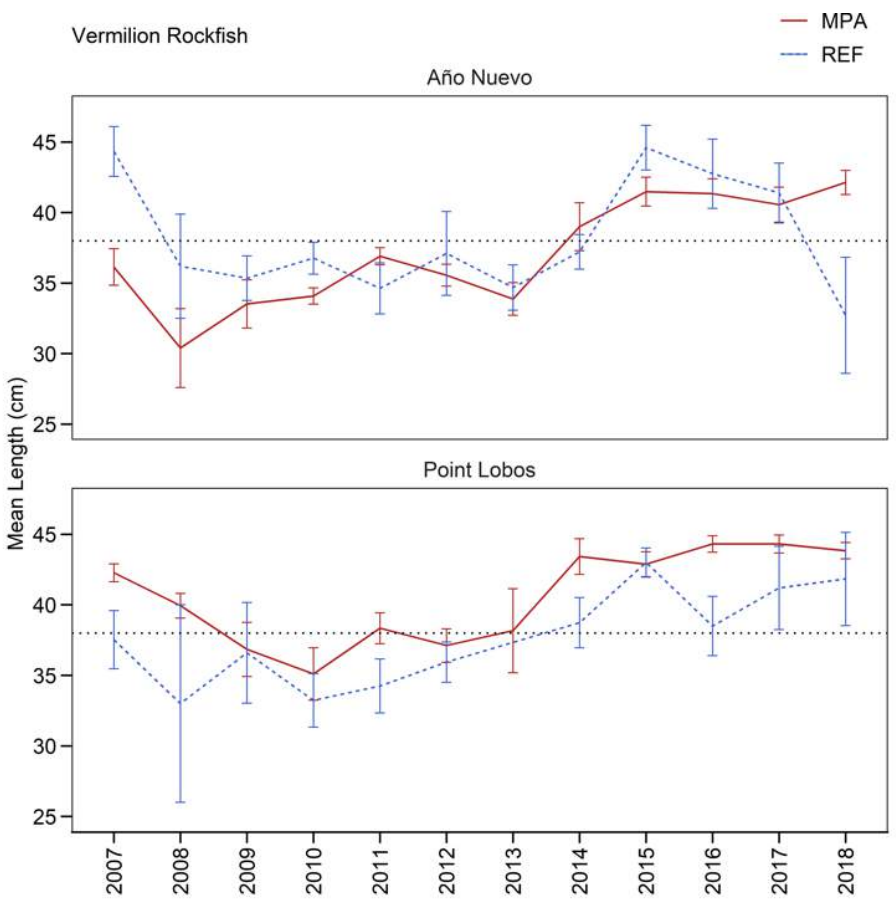
Sebastes carnatus: ≤ 20 yr ;
≤ 43 cm (16.9 in)

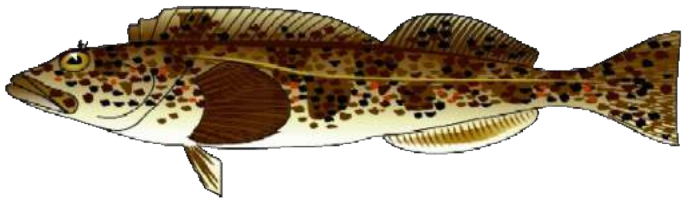


Mean Lengths

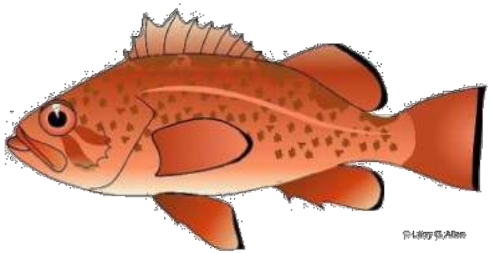
Lingcod, Vermilion RF







Ophiodon elongatus: ≤ 20 yr ; ≤ 152 cm (59.8 in)



Sebastes miniatus: ≤ 60 yr ; ≤ 76 cm (29.9 in)

Smallest Fishes for MLML

Phil E.: Gopher Rockfish, 5 cm (2.0 in)
Point Lobos MPA ‘14

Dave K.: Gopher Rockfish, 6 cm (2.4 in)
Point Lobos REF ‘15

Darrell B.: Blue Rockfish, 6 cm (2.4 in)
Point Lobos REF ‘13

Michael C.: Blue Rockfish, 6 cm (2.4 in)
Point Lobos REF ‘13

Paul R.: Scalyhead Sculpin, 6 cm (2.4 in)
Point Lobos REF ‘12

Bonnie R.: Blue Rockfish, 7 cm (2.8 in)
Point Lobos REF ‘12

Matthew D.: Scalyhead Sculpin, 8 cm (3.1 in)
Año Nuevo MPA ‘18

Joan B.: Yellowtail Rockfish, 8 cm (3.1 in)
Point Lobos REF ‘14

Hernan P.: Blue Rockfish, 8 cm (3.1 in)
Año Nuevo MPA ‘13

Darrell B.: Rosy Rockfish, 8 cm (3.1 in)
Point Lobos MPA ‘13

Largest Rockfishes for MLML

Jonathan P.: Bocaccio, 64 cm (25.2 in)
SE Farallon Islands MPA ‘18

Dan S.: Bocaccio, 59 cm (23.2 in)
Farallon Islands MPA ′17

Ben S.: Vermilion RF, 56 cm (22 in)
Año Nuevo REF ’12

Daniel S.: Vermilion RF, 56 cm (22 in)
Point Lobos MPA ’11

Amy M.: Canary RF, 56 cm (22 in)
Año Nuevo REF ’11

Ben R.: Vermilion RF, 55 cm (21.7 in)
Año Nuevo REF, ‘16

Darrell Bunse: Vermilion RF, 55 cm (21.7 in)
Point Lobos REF ’14

Dylan G.: Vermilion RF, 55 cm (21.7 in)
Año Nuevo REF ’07

Nick Ingram: Vermilion RF, 54cm (21.3 in)
Año Nuevo REF, ‘15

Hernan Paez: Vermilion RF, 54 cm (21.3 in)
Año Nuevo MPA ′11

Largest Cabezon for MLML

EC O.: 64 cm (25.2 in) x2
Año Nuevo REF ‘16

Gary K.: 61 cm (24.0 in)
Año Nuevo MPA ’14

Ed M.: 60 cm (23.6 in)
Año Nuevo Ref ‘13

Ken Y.: 60 cm (23.6 in)
Año Nuevo REF ’09

Scott Y.: 59 cm (23.2 in)
Año Nuevo MPA ‘18

Ed M.: 59 cm (23.2 in)
Año Nuevo REF ‘17

Ben R.: 59 cm (23.2 in)
Año Nuevo REF ‘16

Talal D.: 59 cm (23.2 in)
Año Nuevo MPA ’09

Ken Y.: 58 cm (22.8 in) x2
Año Nuevo MPA ’14 & ‘15

Nick I.: 58 cm (22.8 in)
Año Nuevo REF ‘16

Largest Lingcod for MLML

Ed M.: 102 cm (40.2 in)
Año Nuevo MPA ’14

Ed M.: 100 cm (39.37 in)
Año Nuevo MPA ’16

Scott Y.: 99 cm (39.0 in)
Año Nuevo REF ’18

Nick I.: 99 cm (39.0 in)
Año Nuevo REF ‘14

Andrew T.: 97 cm (38.1 in)
Año Nuevo MPA ’16

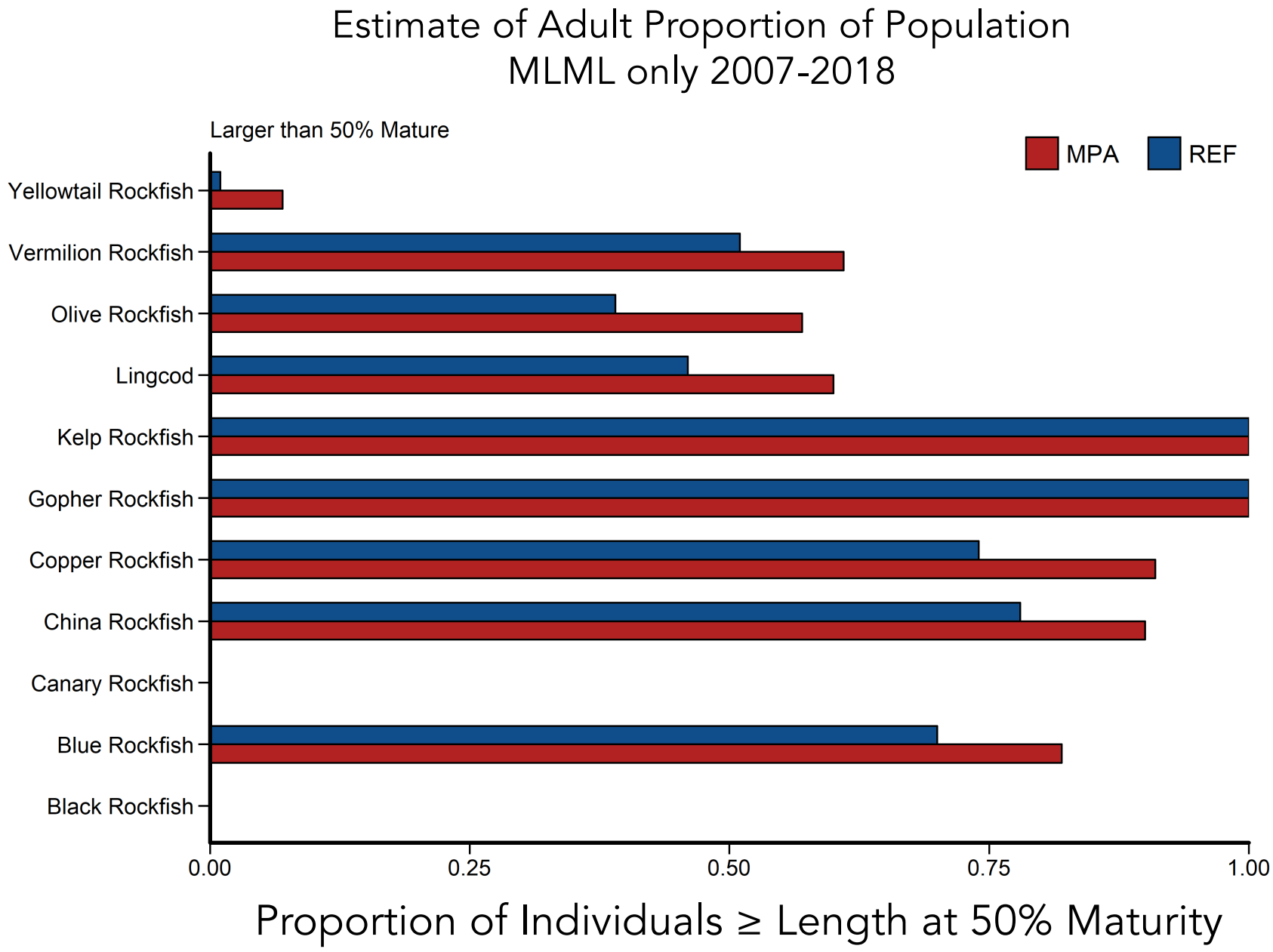
Matt M.: 94 cm (37 cm)
Point Lobos MPA ’17

Nick I.: 93 cm (36.6 in)
SE Farallon Islands REF ‘18

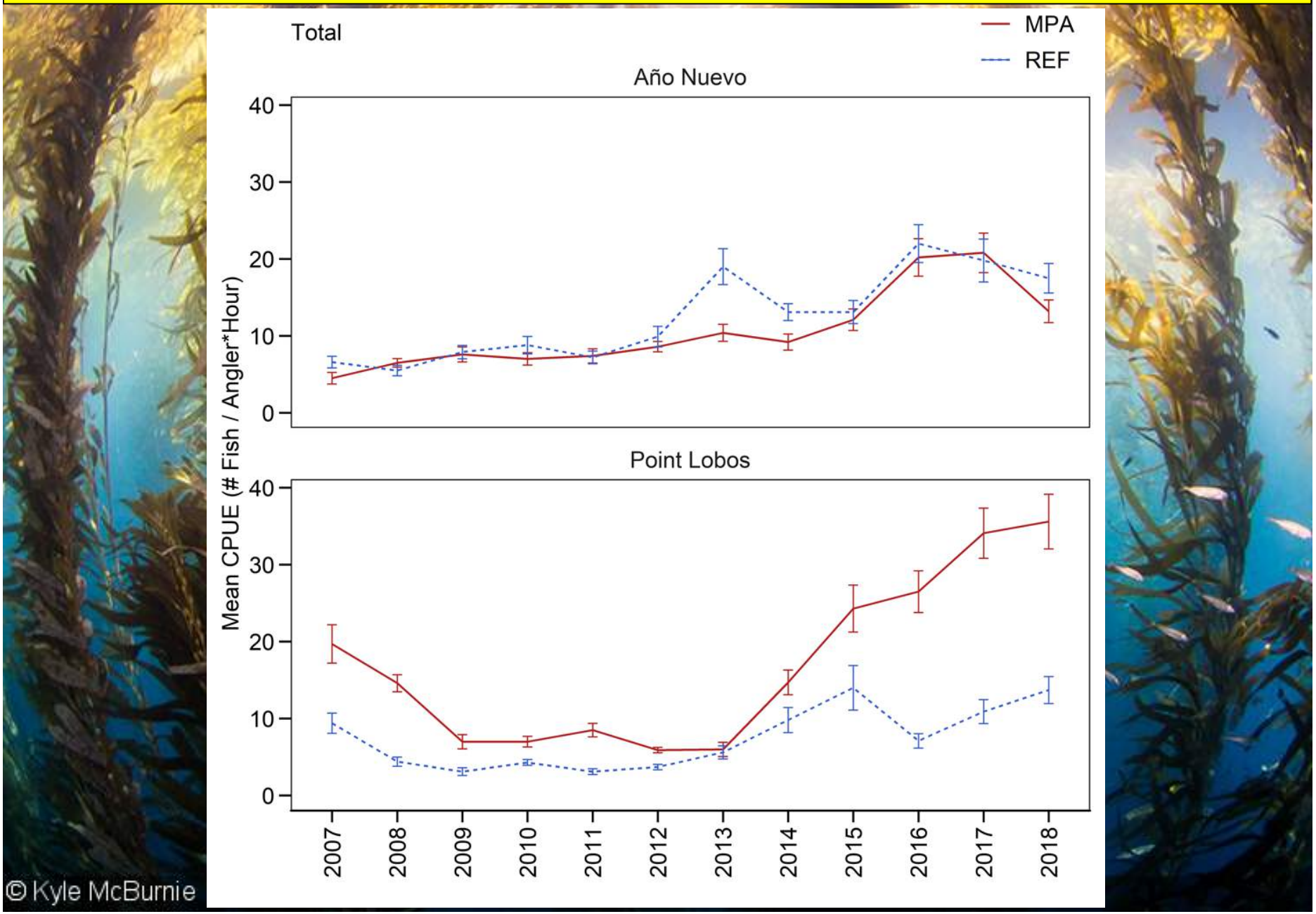
Dayton L.: 93 cm (36.6 in)
Año Nuevo MPA ‘ 15

Bonnie R.: 93 cm (36.6 in)
Pont Lobos REF ’13

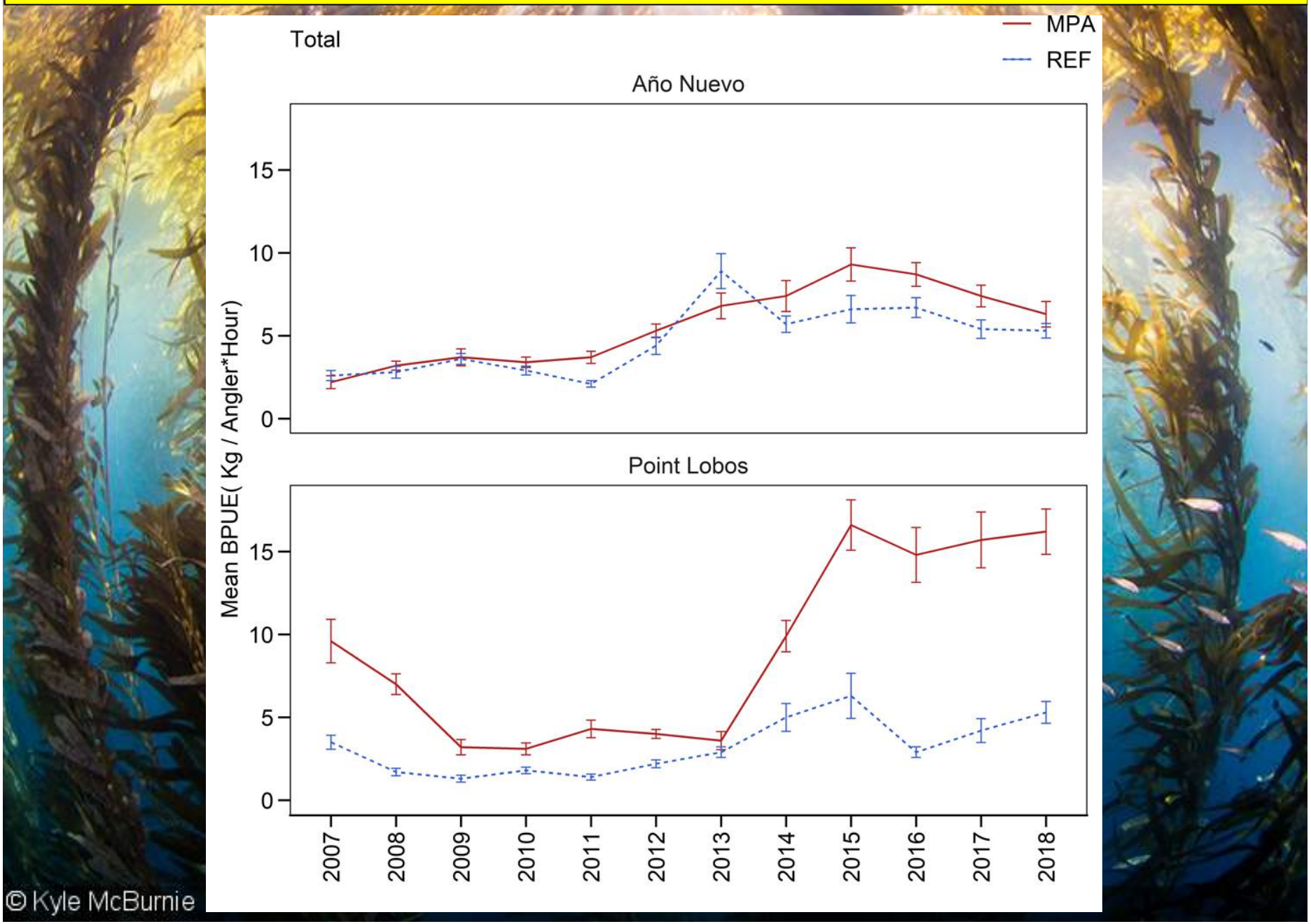
General Trends in MPA Performance



General Trends in MPA Performance - CPUE



General Trends in MPA Performance - Biomass Per Unit Effort (BPUE)



General Trends in MPA Performance

Take Home Messages

- In general, greater catch rates, biomass, size, and reproductive potential inside central California MPAs
- However, species differences in abundances and sizes vary by MPA
- Despite our standardized protocols, we recognize the scope of our data given that we survey in limited depths, during specific times of year, and in specific areas

CDFW Regulations 2019

- Central Management Area = Apr 1 – Dec 31

CDFW Regulations 2019

- RCG Complex (Rockfish, Cabezon, Greenlings)
  - Daily Bag Limit = 10 fish in combination/person
    - Canary RF: 2 fish
    - Black RF: 3 fish
    - Cabezon: 3 fish at 15” total length
    - Kelp/Rock Greenling: 12” total length

CDFW Regulations 2019

NO RETENTION:

Bronzespotted RF

Yelloweye RF

Cowcod

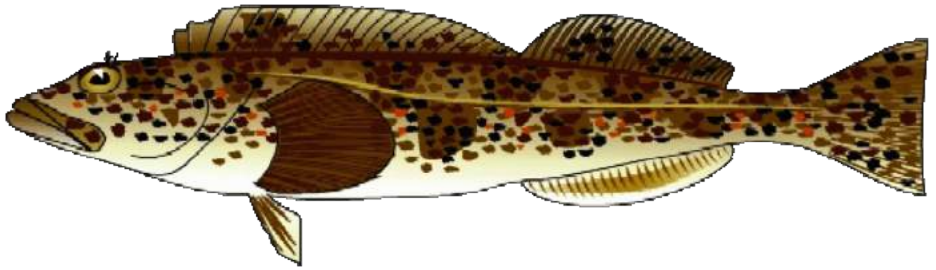
Photos: Milton Love, ODFW, Bonnie Brown

CDFW Regulations 2019

Lingcod

– 1 fish (South of Cape Mendocino) at 22” total length

Why is this?



In 2017 Lingcod were assessed as 2 stocks:

Northern Stock - Healthy

Southern Stock- Precautionary

CDFW Regulations 2019

Lingcod

- “The results of the stock assessment for the southern stock indicated that the population off CA is continuing to grow; however, the assessment changed the perception of how quickly the stock is growing.”
- “…the population is not increasing as quickly as the northern stock.”

CDFW Regulations 2019

CDFW Office & Regulation Booklet

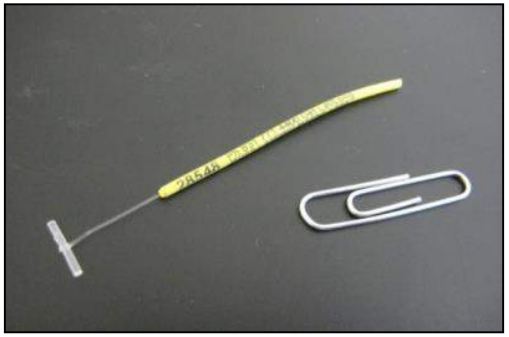
CDFW Website

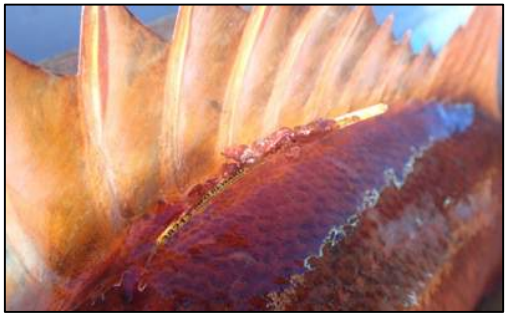
Recreational Groundfish Fishing Regulations Hotline:
831-649-2801

Californians Turn in Poachers and Polluters (CalTIP):
1-888-334-2258

Uses of CCFRP Data

Tracking fine-scale movements of fish species





REWARD

for tag return information

Since 2007, Rick Starr (California Sea Grant Extension Program / Moss Landing Marine Laboratories) and Dean Wendt (California Polytechnic State University, San Luis Obispo) have been working with commercial fishermen, charter boat captains and recreational anglers to tag and release nearshore fishes out of Pillar Point, Monterey, Morro Bay and Port San Luis. The objective of this study is to obtain growth, movement and mortality rates of fishes found near Año Nuevo, Point Lobos, Piedras Blancas and Point Buchon MPAs in order to gain a better understanding of these economically important species.

If you catch a tagged fish (whether you keep it or throw it back), ***please record and report:***

- date caught
- species and condition
- total length (snout to end of tail)
- tag number and whether or not it was bio-fouled
- GPS coordinates
- capture depth

Moss Landing Marine Laboratories
8272 Moss Landing Road
Moss Landing, CA 95039

e: seagrant@mlml.calstate.edu
p: (831) 771-4479

San Luis Obispo Science & Ecosystem Alliance
California Polytechnic State University
San Luis Obispo, CA 93407

e: ccms-fisheries@calpoly.edu
p: (805) 756-1419

To learn more about the California Collaborative Fisheries Research Program, visit:
http://seagrant.mlml.calstate.edu/research/ccfrp/ **or**
http://www.slosea.org/collaborative/

CA Collaborative Fisheries Research Program

Thank you for reporting your tagged fish!

On 14 November 2010, you caught Copper Rockfish #13387. This fish was tagged as part of the CA Collaborative Fisheries Research Program conducted by Rick Starr (Moss Landing Marine Laboratories) and Dean Wendt (CalPoly, San Luis Obispo). The purpose of this project is to monitor central California's marine protected areas (MPAs) and collect information for fisheries management.

Information about your fish:

Tag No. 13387	Tag	Recapture
Date	21 Jul 2008	14 Nov 2010
Latitude	36.557	36.560
Longitude	-121.941	-121.941
Depth	47 ft	65 ft
Length	31 cm / 12.2 in	44.5 cm / 17.5 in

To learn more about this program, visit:
http://seagrant.mlml.calstate.edu/research/ccfrp/

Copper Rockfish (*Sebastes caurinus*)

Maximum Length: 67 cm (26.4 in); females get larger than males

Lifespan: 50 years

Range: Gulf of Alaska (USA) to Islas San Benito, Baja California (MX)

Life History: A.K.A. "whitebelly"and "chucklehead"; young fish settle around algae and move to the bottom as they grow. Subadults and adults can be found on boulder fields or other rocky habitats, in aggregations or as solitary individuals. Copper Rockfish are relatively sedentary, remaining at a particular rocky outcrop for extended periods of time.

Your fish was tagged and released near Point Lobos State Marine Reserve, spent 846 days at liberty, and moved approximately 0.18 miles (net distance traveled).

Reference: Love, M.S., M. Yoklavich, and L. Thorsteinson. 2002. The Rockfishes of the Northeast Pacific. University of California Press, Berkeley and Los Angeles, CA. pp. 204-206.

Uses of CCFRP Data

Tracking fine-scale movements of fish species for 2018

- In 2018, we had **9** recaptured fishes: 4 Copper Rockfish, 2 Black Rockfish, 2 Lingcod, and 1 Gopher Rockfish.
- 1 was recaptured by a recreational angler on a party boat, and 8 were recaptured on our CCFRP trips this season.
- All of the fishes recaptured on CCFRP trips were from the Año Nuevo and Point Lobos MPAs, and all were recaptured in the cells they were originally tagged in!

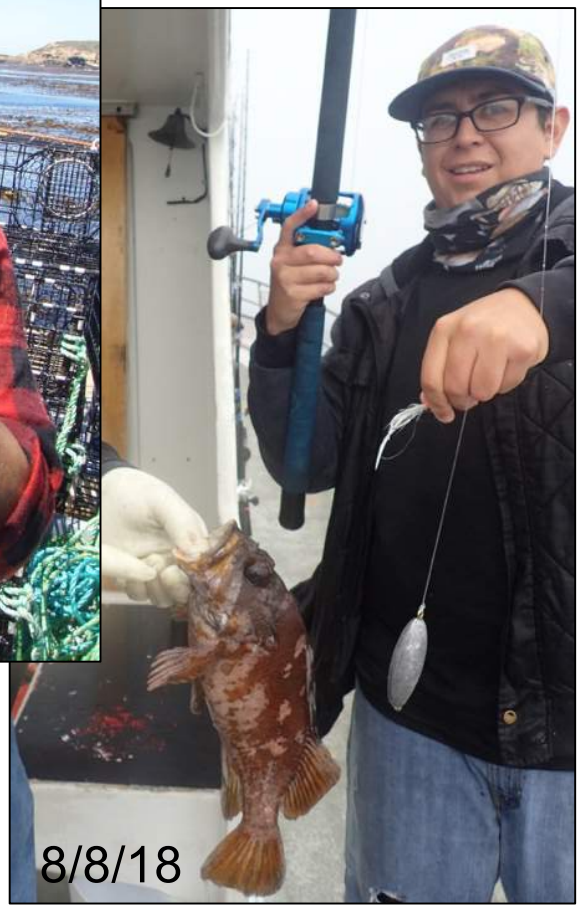
Tag Return Highlights From 2018!

A Copper Rockfish, originally caught by Eddie G. on 9/7/16, was recaptured by Matthew D. *exactly* 2 years later on 9/7/18! It grew 1cm (40cm to 41cm) in its 730 days at liberty.

Tag Return Highlights From 2018!

A Copper Rockfish that was originally caught by Bob S. on 9/9/16 was recaptured by Noah W. on 9/6/18. This 41cm fish did not grow in its 727 days at liberty.

Tag Return Highlights From 2018!



CCFRP conducted trapping surveys in the early 2010's, and a Gopher Rockfish from that project was recaptured this year! It was initially tagged on 8/31/12, and was recaptured by Victor A. on 8/8/18. During its nearly 6 years (2,168 days) at liberty, it grew just 1cm (30cm to 31cm).

Tag Return Highlights From 2018!

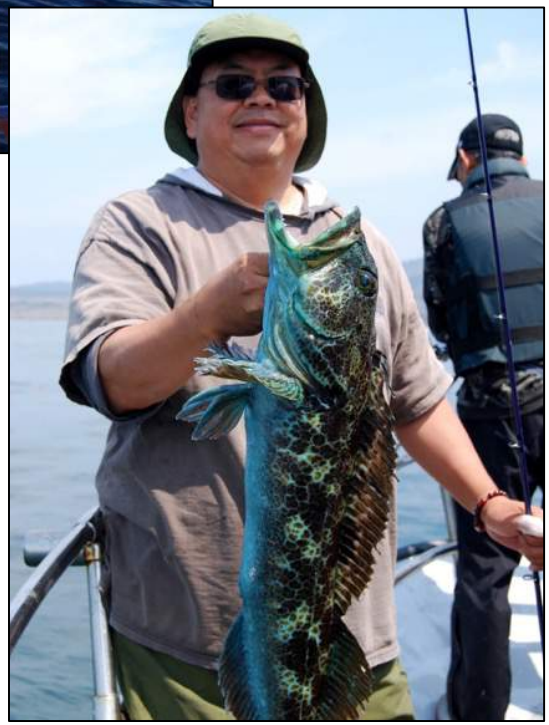
Black Rockfish Recaptures:

1) On 7/19/17, Zach G. caught a 32cm Black Rockfish in the Año Nuevo MPA. This fish was recaptured 391 days later by Bev S. in the same grid cell. It grew 3cm (to 35cm) in its 1+ year at liberty.

2) Ed M. caught a Black Rockfish on 8/16/16 in the Año Nuevo MPA, and it was recaptured on 8/14/18 by Enea A. (728 days at liberty). This fish grew 4cm (30cm to 34cm) in its nearly 2 years away from us.

Tag Return Highlights From 2018!

On 9/26/16, Manny P. caught a 71cm Lingcod in the Año Nuevo MPA. This fish was recaptured 688 days later on 8/15/18 by Scott Y. in the same grid cell. It grew 1cm (to 72cm) in its nearly 2 years at liberty.



Tag Return Highlights From 2018!

Copper Rockfish #1509 was originally tagged by CDFW on 9/10/09 near Carmel Pinnacles SMR. It was 37cm. This fish was recaptured by Nick I. on 8/9/18 near Cypress Point, and grew 9cm (to 46cm) in its 3,255 days (nearly 9 years) at liberty!

Tag Return Highlights From 2018!

2018 MLML CCFRP Science Crew

- Jen Chiu (Technician in Starr Lab) – GRADUATED! Statewide CCFRP Coordinator
- Ryan Fields (Technician in Starr Lab) – BOSS, CCFRP, data analysis extraordinaire
- Anne Tagini (Environmental Consultant) – GRADUATED! Working in U.S. Virgin Islands
- Bonnie Brown (Grad student) – Lingcod diet along the U.S. West Coast
- Jimmy Williamson (Grad Student) – Survey techniques between SCUBA and video lander
- Jackie Mohay (Grad Student): Fish habitat associations in soft bottom sediments
- Katie Cieri (Grad Student): Fish assemblages in Cap de Creus Natural Park

Follow Us!
@CCFRP

CA Collaborative Fisheries Research Program
8272 Moss Landing Road | Moss Landing, CA 95039
p: (831) 771-4443 e: CCFRP@mlml.calstate.edu f: (831) 632-4403

The California Collaborative Fisheries Research Program is a collaborative effort among researchers from Moss Landing Marine Laboratories, Cal Poly San Luis Obispo, Humboldt State University, Bodega Marine Laboratory, UC Santa Barbara, and Scripps Institution of Oceanography.
MLML would like to thank the volunteer anglers, science crews, and captains and crews of F/Vs *Caroline, Chubasco, Huli Cat, Kahuna, New Captain Pete, Queen of Hearts, Sur Randy, and Tigerfish for their continued support*.

For more information, like us on Facebook and Instagram, or visit us at https://www.mlml.calstate.edu/ccfrp/