California Collaborative Fisheries Research Program

Data availability for stock assessments

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1 CCFRP Background

The California Collaborative Fisheries Research Program, CCFRP, is a fishery-independent hook-and-line survey designed to monitor nearshore fish populations at a series of sampling locations both inside and adjacent to California's netowrk of Marine Protect Areas (MPAs) [@Wendt2009; @Starr2015]. The CCFRP survey began in 2007 in collaboration with NMFS scientists and the fishing community. The core area of the survey includes Año Nuevo and Point Lobos sampled by San Jose State University Moss Landing Marine Labs (MLML), and Point Buchon and Piedras Blancas by California Polytechnic University San Luis Obispo (Cal Poly). In 2017, CCFRP expanded coastwide within California, expanding to include four additional partners, Cal Poly Humboldt (CPH; formerly Humboldt State University), University of California Davis' Bodega Marine Lab (BML), University of California Santa Barbara (UCSB) and Scripps Institute of Oceanography (SIO), and xxxx monitored MPA/reference area pairs (Table xx).

Insert a table of which universities monitor which MPAs. Insert a maps of the MPAs with the cells.

The CCFRP survey design is consistent across all partners. Each MPA and reference area consists of a number 500 x 500 m cells. The survey is restricted to xxxx feet to reduce potential effects of barotrauma since the survey was designed as a capture and release survey, with a sub-study tag/recapture program. On any given survey day site cells are randomly selected within a stratum (MPA and/or reference cells). Commercial passenger fishing vessels (CPFVs) are chartered for the survey and the captain is allowed to search within the cell for a fishing location. During a sampling event, each cell is fished for a total of 30-45 minutes by volunteer anglers. Volunteer anglers are allowed to reel up their lines when they believe they've hooked fish, re-bait and continue fishing until the the drop is complete. Each fish encountered can be linked back to an angler. Each anglers fishes one line, with two hooks. The jig and bait type may differ. . . ..

All fish encountered are measured to the nearest centimeter (fork length).
A total of xxxx fish were tagged since 2007, and the majority of fish are released or descended to depth. Starting in 2017, at the request of NMFS, some fish are retained to collect otoliths and fin clips that provide needed biological information for nearshore species. In 2022, the goal will be to collect 50-100 otoliths for commonly enountered species for use in the 2023 stock assessments.

Due to the nature of the fishery in northern California, Humboldt conducts sampling aboard 6-pack vessels, and therefore has fewer total angler hours per year compared to the other regions (). The COVID-19 pandemic also affect the survey effort, but all partners were able to conduct sampling in 2000 and 2001.

Tables of the number of positive drops of a species by university partner, inside and outside the MPA

The number of otoliths collected by university partner and year

2 Available Data

From 2007-2021 a total of 698 fishing trips were taken, consisting of 9634 fishing drops. When the CCFRP expanded in 2017, some MPAs/sites were fished in only one or two years during an exploratory phase. These

included Laguna Beach, the southeast Farallon Islands, Point Conception and Trinidad, which were excluded from the available data. Fishing drops that drifted outside a cell were also excluded. These site filter result in an available 7910. The final filter removed drifts within a cell that were not fished for at least ten minutes within a sampling occasion, resulting in a total of 7889 fishing drops available for analyses for stock assessments.

Cal Poly Humboldt (formerly Humboldt State University) does not collect depth information at each fishing drop. Depths were calculated from the California Seafloor Mapping Project (CSMP) 2 m bathymetry for the start and end locations of each fishing drop. There were also xx fishing drops with missing depth data that were added based on the bathymetry.

Species without a positive identification, e.g., blue and deacon rockfish or yellowtail and olive rockfish, were excluded.

3 Species information

We explored data availability for candidate species for the 2023 stock assessment cycle as well as for any other species within the top 30 rockfish species in the Stock Assessment Prioritiziation spreadsheet provided by the NWFSC. Only one rockfish species within the top 30 species was never observed by observed by CCFRP, . Data summaries are presented for the other 13 species.

Table 1: Total angler hours by institution summed across all active years.

YEAR	Moss Landing	Cal Poly SLO	Cal Poly Humboldt	Bodega	UC Santa Barbara	Scripps
2007	450	277	0	0	0	0
2008	639	455	0	0	0	0
2009	343	339	0	0	0	0
2010	406	440	0	0	0	0
2011	459	393	0	0	0	0
2012	526	422	0	0	0	0
2013	484	376	0	0	0	0
2014	522	473	0	0	0	0
2015	264	272	0	0	0	0
2016	524	532	0	0	0	0
2017	383	507	157	92	137	127
2018	330	373	136	353	230	186
2019	365	340	132	403	222	240
2020	198	222	103	143	227	105
2021	305	246	127	219	271	109

Table 2: Total number of fishing drops by year at each monitored site in the reference areas and inside the MPAs, in parentheses.

YEAR	Año Nuevo	Point Lobos	Piedras Blancas	Point Buchon	South Cape Mendocino	Ten Mile	Stewarts Po
2007	125 (72)	70 (93)	NA	64 (71)	NA	NA	NA
2008	90 (101)	74 (82)	30 (45)	62 (65)	NA	NA	NA
2009	78 (45)	38 (45)	38 (35)	46 (40)	NA	NA	NA
2010	76 (80)	45 (48)	44 (39)	44 (46)	NA	NA	NA
2011	54 (58)	40 (49)	42 (36)	44 (42)	NA	NA	NA
2012	63 (62)	50 (48)	40 (39)	45 (43)	NA	NA	NA
2013	66 (71)	58 (53)	41 (38)	40 (52)	NA	NA	NA
2014	66 (77)	57 (55)	46 (46)	50 (44)	NA	NA	NA
2015	37 (39)	24 (27)	NA	49 (49)	NA	NA	NA
2016	66 (57)	47 (50)	47 (57)	48 (49)	NA	NA	NA
2017	59 (48)	35 (37)	44 (46)	48 (48)	38 (34)	44 (43)	13 (9)
2018	54 (50)	31 (34)	34 (35)	36 (34)	36 (33)	34 (35)	47 (54)
2019	47 (46)	35 (38)	34 (32)	36 (39)	34 (35)	32 (36)	50 (60)
2020	59 (51)	34 (44)	35 (30)	35 (35)	30 (36)	34 (35)	26 (46)
2021	51 (46)	38 (41)	32 (36)	33 (35)	37 (35)	35 (33)	28 (41)

Table 3: Total number of fish encountered by each monitoring group.

Common.Name	Cal Poly Humboldt	Bodega	Moss Landing	Cal Poly SLO	UC Santa Barbara	Scripps
Black Rockfish	1296	1488	13272	1744	2	0
Blue Rockfish	774	5112	32437	28979	1899	10
Brown Rockfish	15	749	563	228	25	51
Canary Rockfish	791	845	970	423	2	0
China Rockfish	164	495	1023	112	0	0
Copper Rockfish	365	509	901	1008	2352	46
Deacon Rockfish	1003	4895	2337	343	0	0
Grass Rockfish	0	0	16	1	1	7
Olive Rockfish	111	701	4411	4229	63	74
Quillback Rockfish	220	39	1	1	0	0
Treefish	0	0	35	197	137	139
Vermilion Rockfish	221	369	1484	2723	271	98
Yellowtail Rockfish	482	979	1828	1029	6	0

Table 4: Total number of fish encountered by species over the entire program.

YEAR