

Detailed summary of available data to support West
Coast groundfish stock assessments in 2023

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Preface

This document includes several updates from the version included in the March 2022 Pacific Fishery Management Council Briefing Book. The changes are as follows:

1. Data collected in 2021 from commercial and recreational fisheries along with data collected by the Northwest Fisheries Science Center (NWFSC) West Coast Groundfish Bottom Trawl (WCGBT) survey and the NWFSC Hook-and-Line (HKL) survey have been added to the species-specific data tables.
2. Species-specific indices of abundance and length composition figures from the NWFSC WCGBT and NWFSC HKL surveys have been added for species commonly observed by these surveys.
3. The numbers of aged fish and available otoliths that could be read for the NWFSC HKL survey do not reflect fish that were aged in 2020 and 2021 for copper rockfish, squarespot rockfish, and vermilion/sunset rockfish.

1 Introduction

This document provides a detailed summary of available data that may be used to support assessments in 2023. In previous assessment prioritizations, data summaries have only been available in the Assessment Prioritization Workbook (in excel) on the tab called “Data Availability” where summaries of average sample available across select years and data sources were detailed by species. This summary attempts to provide the same data but in more detail. A detailed summary of data available by year and across sources call allow the Pacific Fishery Management Council (the Council) and advisory bodies to understand the coverage of data across time (e.g., are data available across many years or only recent years?) in a more comprehensive fashion than can be gleaned from summaries of average samples per year.

Data from Pacific Fisheries Information Network (PacFIN), Recreational Fisheries Information Network (RecFIN), and the Northwest Fisheries Science Center (NWFSC) West Coast Groundfish Bottom Trawl Survey (WCGBT) and NWFSC Hook-and-Line (HKL) surveys are summarized. There may be additional data, not summarized here, from additional data collection programs that could be used to support stock assessments of specific species (e.g., California Collaborative Fisheries Research Program).

Commercial data summaries were obtained and downloaded from PacFIN on November 22, 2021 with 2021 data updated on April 19, 2022 via the BDS501 report. The number of sexed and unsexed fish, length samples, read ages, and otoliths samples by species, state, and year were summarized. Otolith collection data was summarized using separately provided state sample summaries, generally for more recent years, and then combined with otolith sample records available in PacFIN (e.g., AGE_STRUCTURE_CODE) for earlier years. Otolith records were provide directly from the Washington Department of Fish and Wildlife (WDFW) for 2002-2021 and California Department of Fish and Wildlife (CDFW) for 1960 - 2021 (only samples from 1980 - 2021 are summarize). Oregon Department of Fish and Wildlife (ODFW) confirmed that otolith records in PacFIN were correct and recommended using these data directly. Summaries of otoliths from early data years (e.g., 1980 - 2001) for Oregon and Washington were based on PacFIN records. Summaries of otolith collections across all years were provided for completeness. However, there are a number of reasons why otolith counts in early years (e.g., 1980) may not reflect actual otoliths that could be effectively aged (e.g., unable to locate, otolith degradation).

Recreational data summaries were obtained and downloaded from RecFIN on December 2, 2021 with 2021 data updated on April 19, 2022 via the BDS501 report which includes

data for the following range or years by state: Oregon 1999-2021, and California 2003-2021. Recreational sample data for Washington was provided directly by WDFW with data ranging from 2002 - 2021. The number of sexed and unsexed fish, length samples, and read ages samples by species, state, and available years were summarized from each data source. Otolith collection counts by species and year were provided separately by each state: WDFW 2002-2021, ODFW 2001-2021, and CDFW 2016-2021.

Data collected by the two surveys conducted by the NWFSC are summarized: the WCGBT and HKL surveys. Data collected by the NWFSC WCGBT survey between 2003-2021 and 2004-2021 by the NWFSC HKL survey by species are summarized. Similar to the summaries provided for the commercial and recreational fisheries; sexed and unsexed fish, lengths, read ages, and otoliths collected are available by year. Additionally, the number of tows (NWFSC WCGBT survey) or the sites (NWFSC HKL survey) that observed each species by year are provided.

Indices of abundance were calculated using VAST, a spatiotemporal model, for species well-observed by the NWFSC WCGBT survey and presented as area-wide estimates (i.e., coastwide for many species) along with area-specific (e.g., state boundaries) based on species. VAST was run using a generalized set-up across species using the Tweedie distribution, with the dispersion parameter held constant across years with 500 knots used to create the mesh for most species. Due to extreme catch events observed along with other species-specific data attributes, VAST was run assuming the lognormal distribution for Pacific spiny dogfish, petrale sole, widow rockfish, and longspine thornyhead. Future species-specific indices of abundance created with VAST would likely select a more tailored approach for model settings (e.g., knots, distributions) which could result in slight changes in year-by-year values for the indices of abundance. The indices of abundance presented here should only be considered illustrative of potential trends in abundance across time.

The length data collected by the NWFSC WCGBT survey were expanded using a generalized stratification. The composition data were expanded using a design-based approach with strata based on state latitudes with two depth strata: 55 - 183 m and 183 - 549 m, for all species except for three. The three exceptions were species with considerable biomass at depths greater than 549 m: Dover sole, longspine thornyhead, and shortspine thornyhead. These three species had an additional depth strata that included deeper waters, 549 - 1280 m, for each state area. The expanded length composition data were summarized using either a 2 or 4 cm bin structure depending upon the range between maximum and minimum lengths observed within the survey data. Species where the range between the maximum and minimum lengths observed by the survey were less than 60 cm, 2 cm data bins were used, and for species where the range was 60 cm or greater the data bins were set at 4 cm.

All length observations were treated as unsexed fish for simplicity and for ease of observing potential trends in length observations across time. The generalized stratification and bin structure selected here provides a simple summary of the data that can be useful for decision making, but will likely differ from a species specific approach that would be selected in a future assessment. Additionally, the NWFSC WCGBT survey selectivity for each species will impact the lengths observed and has not been explicitly accounted for in this analysis.

Indices of abundance were estimated from the NWFSC HKL survey for well-observed species using a Bayesian Generalized Linear Model that accounted for site, angler, drop number, and hook number. Additional covariates that would typically be explored when developing species-specific indices for use in stock assessments were not explored in this analysis for simplicity. The NWFSC HKL extended sampling in the Cowcod Conservation Areas (CCA) starting in 2014. Indices of abundance for this survey are often explored by splitting the data three alternative ways: 1) all data outside and within CCAs across all years, 2) outside the CCAs for all years, and 3) inside the CCAs only starting in 2014. Once again, for simplicity, indices were calculated for all species using all available data outside and within the CCAs combined.

The length data collected by the NWFSC HKL survey were summarized to reflect the proportion of observations by species, length bin, and year. Similar to the index data, observation outside and within the CCAs were combined. The length composition data were summarized using either a 2 or 4 cm bin structure depending upon the range between maximum and minimum lengths observed within the survey data. Species where the range between the maximum and minimum lengths observed by the survey were less than 60 cm, 2 cm data bins were used, and for species where the range was 60 cm or greater the data bins were set at 4 cm. All length observations were treated as unsexed fish for simplicity and for ease of observing potential trends in length observations across time. Similar to the NWFSC WCGTB survey, the selectivity of the NWFSC HKL survey for each species will impact the lengths observed and has not been explicitly accounted for in this analysis.

2 Arrowtooth flounder

The most recent assessment of Arrowtooth flounder was a update assessment conducted in 2017. Across available data, Arrowtooth flounder have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 55,789 length observations, 913 age readings, and 23,976 otoliths that are available to be aged. In California, since 2000, a total of 7,576 length observations, 0 age readings, and 689 otoliths have been collected. In Oregon, since 2000, a total of 20,099 length observations, 0 age readings, and 17,065 otoliths have been collected. In Washington, since 2000, a total of 13,292 length observations, 763 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 53,623 length observations, 4,324 age readings, and 11,420 otoliths that are available to be aged.

2.1 commercial fisheries

Table 1: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	129	24	153	0	0
C	2005	160	1	161	0	0
C	2006	549	0	549	0	0
C	2007	362	6	368	0	0
C	2008	320	1	321	0	0
C	2009	288	16	304	0	0
C	2010	326	11	337	0	0
C	2011	647	103	750	0	215
C	2012	862	120	982	0	141

Table 1: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2013	833	29	862	0	44
C	2014	539	42	581	0	47
C	2015	573	63	636	0	135
C	2016	563	139	702	0	105
C	2017	368	21	389	0	2
C	2018	126	0	126	0	0
C	2019	127	35	162	0	0
C	2020	102	22	124	0	0
C	2021	21	48	69	0	0

Table 2: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1987	150	0	150	0	0
O	1990	374	0	374	0	374
O	1991	550	0	550	0	550
O	1992	650	0	650	0	650
O	2006	534	0	534	0	490
O	2007	1561	0	1561	0	1231
O	2008	1488	1	1489	0	1189
O	2009	1418	2	1420	0	1269
O	2010	2225	7	2232	0	1412
O	2011	1893	0	1893	0	1863
O	2012	1219	0	1219	0	1149
O	2013	1025	4	1029	0	999
O	2014	1259	1	1260	0	1230
O	2015	1257	0	1257	0	1062
O	2016	1384	0	1384	0	1258
O	2017	1307	0	1307	0	1162
O	2018	1228	3	1231	0	1061
O	2019	1065	1	1066	0	838
O	2020	438	0	438	0	348
O	2021	727	52	779	0	504

Table 3: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1986	950	0	950	0	847
W	1987	1050	0	1050	0	995
W	1988	800	0	800	0	729
W	1989	850	0	850	0	778
W	1990	600	0	600	0	599
W	1991	1100	0	1100	0	550
W	1992	849	1	850	0	0
W	1993	900	0	900	0	0
W	1994	1000	0	1000	0	0
W	1995	1098	0	1098	0	0
W	1996	900	0	900	0	0
W	1997	895	5	900	0	0
W	1998	999	2	1001	150	150
W	1999	1098	1	1099	0	0
W	2000	1050	0	1050	0	0
W	2001	800	0	800	0	0
W	2002	499	1	500	0	0
W	2003	300	0	300	299	0
W	2004	300	0	300	266	0
W	2005	199	1	200	198	0
W	2006	604	1	605	0	0
W	2007	1050	0	1050	0	0
W	2008	900	0	900	0	0
W	2009	1365	0	1365	0	0
W	2010	833	0	833	0	0
W	2011	899	0	899	0	0
W	2012	1098	2	1100	0	0
W	2013	500	0	500	0	0
W	2014	600	0	600	0	0
W	2015	599	1	600	0	0
W	2016	177	25	202	0	0
W	2017	250	0	250	0	0
W	2018	703	0	703	0	0
W	2019	259	0	259	0	0
W	2020	76	0	76	0	0
W	2021	200	0	200	0	0

2.2 NWFSC WCGBT

Table 4: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	191	4502	0	4502	512	857
2004	168	2713	0	2713	485	202
2005	215	3932	3	3935	853	4
2006	189	3030	6	3036	475	260
2007	227	3520	32	3552	0	894
2008	228	3221	6	3227	0	874
2009	232	3448	21	3469	0	956
2010	265	3697	6	3703	0	1134
2011	264	3057	3	3060	0	1043
2012	248	3027	18	3045	399	627
2013	184	2519	15	2534	400	285
2014	272	3526	124	3650	400	523
2015	277	3846	5	3851	400	567
2016	285	3257	0	3257	400	574
2017	266	2200	5	2205	0	862
2018	232	1761	0	1761	0	761
2019	123	754	0	754	0	376
2021	201	1342	27	1369	0	621

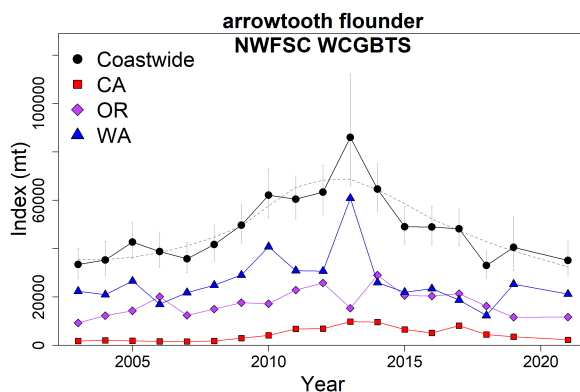


Figure 1: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

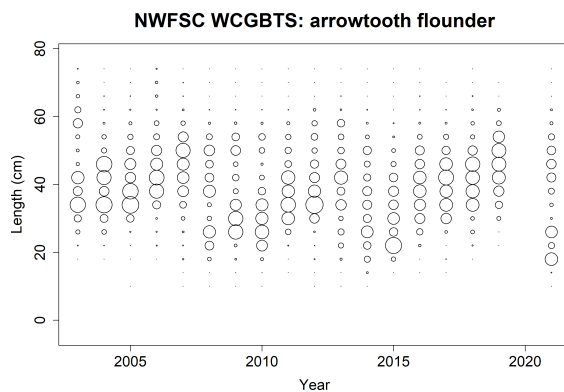


Figure 2: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

3 Aurora rockfish

The most recent assessment of Aurora rockfish was a full assessment conducted in 2013. Across available data, Aurora rockfish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 43,319 length observations, 1,361 age readings, and 19,029 otoliths that are available to be aged. In California, since 2000, a total of 22,210 length observations, 881 age readings, and 5,280 otoliths have been collected. In Oregon, since 2000, a total of 12,533 length observations, 480 age readings, and 11,783 otoliths have been collected. In Washington, since 2000, a total of 1,262 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 28,140 length observations, 3,089 age readings, and 9,114 otoliths that are available to be aged.

3.1 commercial fisheries

Table 5: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	34	1	35	0	33
C	1981	83	0	83	0	39
C	1982	94	0	94	0	43
C	1983	542	0	542	0	524
C	1984	415	0	415	0	414
C	1985	791	7	798	0	847
C	1986	574	1	575	0	66
C	1987	178	1	179	0	0
C	1988	215	3	218	0	0

Table 5: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1989	231	34	265	0	0
C	1990	282	204	486	0	0
C	1991	115	1	116	0	0
C	1992	105	264	369	0	0
C	1993	158	86	244	0	0
C	1994	343	78	421	0	0
C	1995	441	48	489	0	0
C	1996	421	350	771	0	0
C	1997	330	224	554	0	0
C	1998	235	61	296	0	0
C	1999	233	77	310	0	0
C	2000	245	40	285	0	22
C	2001	246	243	489	0	0
C	2002	1029	323	1352	0	620
C	2003	1452	623	2075	497	413
C	2004	337	145	482	0	235
C	2005	682	278	960	0	382
C	2006	725	605	1330	0	381
C	2007	745	185	930	0	240
C	2008	1493	152	1645	229	0
C	2009	1087	268	1355	155	196
C	2010	780	162	942	0	69
C	2011	1428	717	2145	0	795
C	2012	939	520	1459	0	744
C	2013	431	303	734	0	364
C	2014	178	355	533	0	115
C	2015	550	329	879	0	458
C	2016	524	752	1276	0	161
C	2017	1276	219	1495	0	63
C	2018	509	94	603	0	22
C	2019	380	57	437	0	0
C	2020	162	38	200	0	0
C	2021	578	26	604	0	0

Table 6: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	154	0	154	0	114
O	2003	90	0	90	85	3
O	2004	260	0	260	0	258
O	2005	176	0	176	0	176
O	2006	316	0	316	0	301
O	2007	765	0	765	0	713
O	2008	621	0	621	196	423
O	2009	754	0	754	199	551
O	2010	591	2	593	0	536
O	2011	1282	0	1282	0	1272
O	2012	1265	1	1266	0	1238
O	2013	1154	0	1154	0	1113
O	2014	1251	0	1251	0	1251
O	2015	834	0	834	0	834
O	2016	783	0	783	0	783
O	2017	853	0	853	0	853
O	2018	755	1	756	0	741
O	2019	390	0	390	0	388
O	2020	96	1	97	0	97
O	2021	134	4	138	0	138

Table 7: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	10	10	0	0
W	1997	2	16	18	0	0
W	1998	13	3	16	0	0
W	1999	7	3	10	0	0
W	2000	3	10	13	0	0
W	2001	11	1	12	0	0
W	2002	11	0	11	0	0
W	2003	76	7	83	0	0
W	2004	118	0	118	0	0
W	2005	51	0	51	0	0
W	2006	30	0	30	0	0
W	2007	15	0	15	0	0

Table 7: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2008	18	0	18	0	0
W	2009	36	4	40	0	0
W	2010	16	0	16	0	0
W	2011	134	0	134	0	0
W	2012	180	6	186	0	0
W	2013	24	0	24	0	0
W	2014	73	5	78	0	0
W	2015	101	5	106	0	0
W	2016	31	1	32	0	0
W	2017	53	0	53	0	0
W	2018	101	1	102	0	0
W	2019	57	0	57	0	0
W	2020	1	0	1	0	0
W	2021	82	0	82	0	0

3.2 NWFSC WCGBT

Table 8: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	67	1105	15	1120	404	155
2004	55	1087	0	1087	0	354
2005	89	1669	16	1685	428	139
2006	87	1713	3	1716	0	599
2007	92	1679	15	1694	395	191
2008	118	1702	6	1708	0	706
2009	87	1889	8	1897	403	184
2010	91	1605	29	1634	487	318
2011	94	1481	41	1522	502	282
2012	101	1659	25	1684	470	408
2013	58	849	2	851	0	515

Table 8: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2014	83	1489	8	1497	0	665
2015	89	2050	9	2059	0	793
2016	91	1947	26	1973	0	944
2017	90	2062	8	2070	0	843
2018	100	1756	3	1759	0	906
2019	36	629	1	630	0	332
2021	89	1545	9	1554	0	780

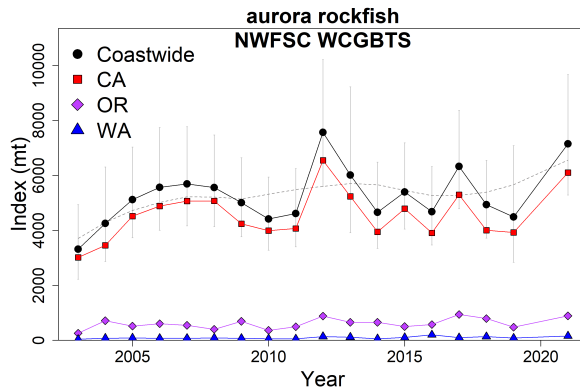


Figure 3: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

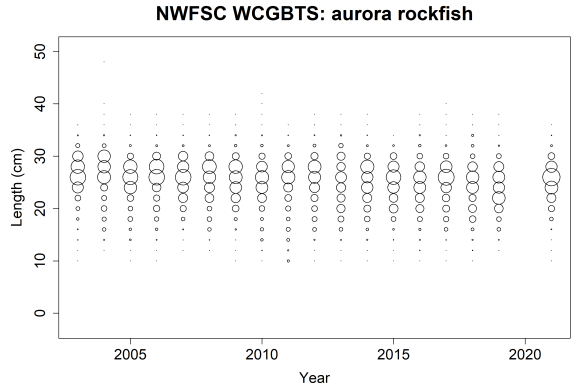


Figure 4: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

4 Bank rockfish

The most recent assessment of Bank rockfish was a data-limited assessment conducted in 2010. Across available data, Bank rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 48,960 length observations, 5,064 age readings, and 24,968 otoliths that are available to be aged. In California, since 2000, a total of 10,240 length observations, 0 age readings, and 3,394 otoliths have been collected. In Oregon, since 2000, a total of 1,451 length observations, 0 age readings, and 1,412 otoliths have been collected. In Washington, since 2000, a total of 242 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 616 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 616 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 2,048 length observations, 0 age readings, and 1,319 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 2,841 length observations, 0 age readings, and 2,828 otoliths that are available to be aged.

4.1 commercial fisheries

Table 9: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	20	8	28	23	1
C	1981	334	36	370	235	0
C	1982	556	17	573	513	292
C	1983	913	370	1283	0	226
C	1984	1978	1337	3315	249	1592
C	1985	3819	1989	5808	93	4231
C	1986	5962	332	6294	457	2385
C	1987	3237	391	3628	219	1017
C	1988	1904	120	2024	486	1633
C	1989	1486	62	1548	379	461
C	1990	1610	64	1674	399	1260
C	1991	1713	91	1804	405	1897
C	1992	981	386	1367	6	1081
C	1993	501	406	907	382	770
C	1994	508	408	916	292	435
C	1995	272	532	804	271	281
C	1996	638	615	1253	238	606
C	1997	1175	495	1670	415	1063
C	1998	822	520	1342	2	671
C	1999	342	77	419	0	260
C	2000	392	243	635	0	140
C	2001	469	732	1201	0	372
C	2002	651	649	1300	0	510
C	2003	748	73	821	0	573
C	2004	455	276	731	0	368
C	2005	112	114	226	0	79
C	2006	103	131	234	0	127
C	2007	132	98	230	0	100
C	2008	347	452	799	0	250
C	2009	122	237	359	0	58
C	2010	210	64	274	0	81
C	2011	81	144	225	0	74
C	2012	66	301	367	0	63
C	2013	176	236	412	0	176
C	2014	49	120	169	0	46
C	2015	148	272	420	0	134
C	2016	84	483	567	0	81
C	2017	141	186	327	0	126
C	2018	36	282	318	0	36
C	2019	140	68	208	0	0

Table 9: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	55	174	229	0	0
C	2021	54	134	188	0	0

Table 10: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	2	0	2	0	2
O	2004	21	0	21	0	21
O	2005	26	0	26	0	26
O	2006	8	0	8	0	8
O	2007	61	0	61	0	59
O	2008	131	0	131	0	105
O	2009	43	0	43	0	43
O	2010	44	0	44	0	43
O	2011	65	0	65	0	65
O	2012	42	0	42	0	42
O	2013	97	0	97	0	97
O	2014	91	0	91	0	90
O	2015	61	0	61	0	61
O	2016	102	0	102	0	102
O	2017	92	0	92	0	86
O	2018	159	0	159	0	158
O	2019	145	0	145	0	145
O	2020	128	0	128	0	128
O	2021	133	0	133	0	131

Table 11: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2004	2	0	2	0	0
W	2011	2	0	2	0	0

Table 11: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2014	2	0	2	0	0
W	2015	4	0	4	0	0
W	2016	2	0	2	0	0
W	2017	1	0	1	0	0
W	2019	193	0	193	0	0
W	2020	22	0	22	0	0
W	2021	14	0	14	0	0

4.2 recreational fisheries

Table 12: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	1	1	0	0
C	2004	0	50	50	0	0
C	2005	0	38	38	0	0
C	2006	0	3	3	0	0
C	2007	0	19	19	0	0
C	2008	0	13	13	0	0
C	2009	0	11	11	0	0
C	2010	0	10	10	0	0
C	2011	0	51	51	0	0
C	2012	0	19	19	0	0
C	2013	0	27	27	0	0
C	2014	0	30	30	0	0
C	2015	0	193	193	0	0
C	2016	0	95	95	0	0
C	2017	0	19	19	0	0
C	2018	0	6	6	0	0
C	2019	0	16	16	0	0
C	2021	0	15	15	0	0

4.3 NWFSC WCGBT

Table 13: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	4	6	0	6	0	4
2004	8	106	0	106	0	60
2005	11	70	26	96	0	50
2006	11	255	0	255	0	62
2007	14	59	16	75	0	55
2008	17	31	0	31	0	31
2009	12	82	2	84	0	74
2010	13	169	1	170	0	71
2011	16	134	4	138	0	52
2012	9	31	0	31	0	30
2013	14	32	0	32	0	32
2014	18	142	3	145	0	111
2015	18	60	0	60	0	60
2016	16	68	132	200	0	155
2017	14	39	0	39	0	39
2018	13	295	16	311	0	187
2019	6	243	2	245	0	222
2021	7	24	0	24	0	24

4.4 NWFSC HKL

Table 14: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	8	12	0	12	0	12
2005	10	24	0	24	0	23
2006	12	49	0	49	0	49
2007	8	15	0	15	0	15
2008	10	39	0	39	0	40
2009	11	30	0	30	0	30
2010	13	75	0	75	0	75
2011	8	32	0	32	0	31
2012	16	25	0	25	0	25
2013	11	38	0	38	0	38
2014	30	132	1	133	0	131
2015	48	385	2	387	0	387
2016	43	312	0	312	0	312
2017	42	382	1	383	0	378
2018	55	560	0	560	0	560
2019	49	418	0	418	0	414
2021	50	307	2	309	0	308

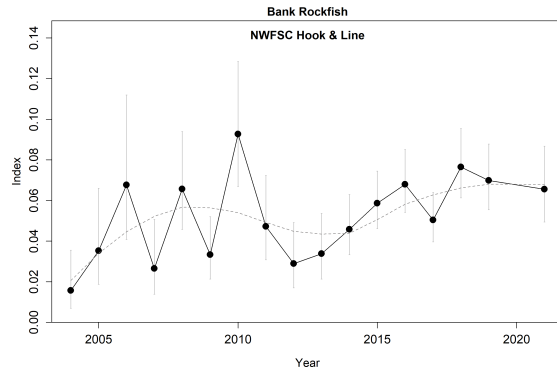


Figure 5: Index of abundance from the NWFS HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

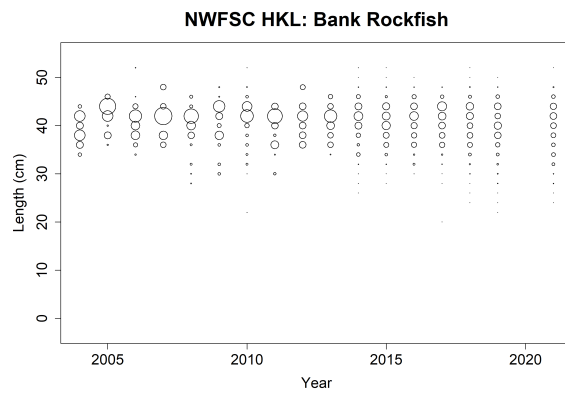


Figure 6: Length (cm) composition data from the NWFS HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

5 Big skate

The most recent assessment of Big skate was a full assessment conducted in 2019. Across available data, Big skate have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 9,050 length observations, 654 age readings, and 1,340 otoliths that are available to be aged. In California, since 2000, a total of 1,539 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 6,003 length observations, 654 age readings, and 1,214 otoliths have been collected. In Washington, since 2000, a total of 1,421 length observations, 0 age readings, and 126 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 5,744 length observations, 1,034 age readings, and 251 otoliths that are available to be aged.

5.1 commercial fisheries

Table 15: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2007	1	0	1	0	0
C	2009	32	0	32	0	0
C	2010	8	0	8	0	0
C	2011	2	0	2	0	0
C	2012	43	0	43	0	0
C	2013	201	6	207	0	0
C	2014	217	1	218	0	0
C	2015	237	0	237	0	0
C	2016	181	0	181	0	0

Table 15: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2017	239	0	239	0	0
C	2018	157	0	157	0	0
C	2019	98	0	98	0	0
C	2020	33	3	36	0	0
C	2021	80	0	80	0	0

Table 16: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1995	55	0	55	0	0
O	1996	8	0	8	0	0
O	1997	14	0	14	0	0
O	1998	2	0	2	0	0
O	1999	8	0	8	0	0
O	2001	43	0	43	0	0
O	2002	199	0	199	0	0
O	2003	202	0	202	0	0
O	2004	27	0	27	0	0
O	2005	123	0	123	0	0
O	2006	310	0	310	0	0
O	2007	127	0	127	23	29
O	2008	94	0	94	80	0
O	2009	235	0	235	87	0
O	2010	186	0	186	103	3
O	2011	419	0	419	202	0
O	2012	477	0	477	120	7
O	2013	252	0	252	0	0
O	2014	237	0	237	0	0
O	2015	411	0	411	0	0
O	2016	444	0	444	0	0
O	2017	668	0	668	0	57
O	2018	553	0	553	39	423
O	2019	550	0	550	0	394
O	2020	96	0	96	0	47
O	2021	350	0	350	0	254

Table 17: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2004	15	0	15	0	14
W	2005	87	0	87	0	0
W	2006	191	1	192	0	0
W	2007	173	0	173	0	0
W	2008	94	0	94	0	0
W	2009	18	0	18	0	0
W	2010	15	0	15	0	0
W	2011	9	0	9	0	0
W	2012	38	0	38	0	0
W	2013	168	0	168	0	0
W	2014	249	0	249	0	0
W	2015	8	2	10	0	0
W	2016	107	0	107	0	0
W	2017	56	0	56	0	0
W	2018	121	0	121	0	112
W	2019	20	0	20	0	0
W	2020	4	0	4	0	0
W	2021	45	0	45	0	0

5.2 NWFSC WCGBT

Table 18: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	60	195	2	197	0	0
2004	81	259	3	262	0	0
2005	99	328	0	328	0	0
2006	67	0	0	0	0	0
2007	76	95	0	95	0	0

Table 18: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2008	53	159	0	159	0	0
2009	82	302	3	305	230	0
2010	130	466	0	466	333	3
2011	99	360	0	360	0	0
2012	104	395	0	395	0	0
2013	84	316	0	316	0	0
2014	149	552	0	552	0	0
2015	135	546	0	546	0	0
2016	105	422	0	422	138	2
2017	125	496	0	496	164	23
2018	123	331	0	331	169	2
2019	56	180	0	180	0	82
2021	92	334	0	334	0	139

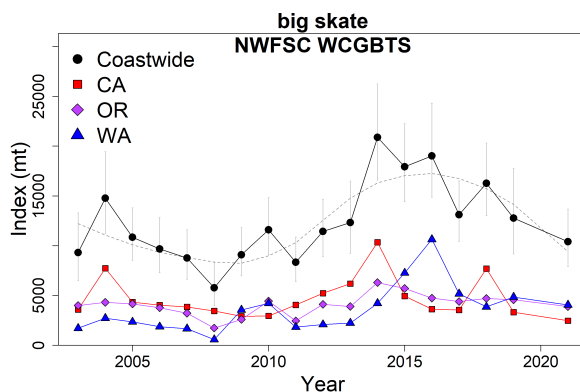


Figure 7: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

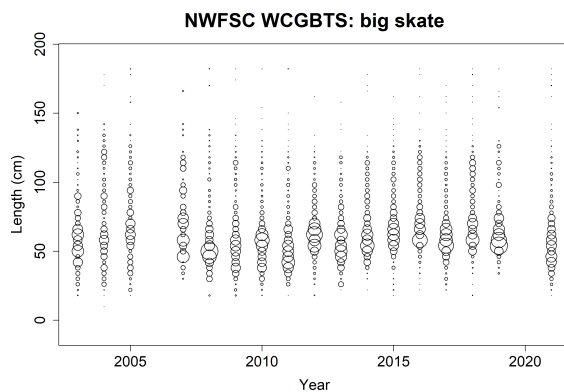


Figure 8: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

6 Black rockfish

The most recent assessment of Black rockfish was a full assessment conducted in 2015. Across available data, Black rockfish have been observed and sampled generally by both commercial and recreational fisheries.

Across all years of available data, commercial fisheries have collected a total of 121,081 length observations, 20,281 age readings, and 22,318 otoliths that are available to be aged. In California, since 2000, a total of 13,344 length observations, 287 age readings, and 668 otoliths have been collected. In Oregon, since 2000, a total of 80,760 length observations, 10,735 age readings, and 20,424 otoliths have been collected. In Washington, since 2000, a total of 94 length observations, 19 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 419,026 length observations, 55,734 age readings, and 14,600 otoliths that are available to be aged. In California, since 2003, a total of 133,711 length observations, 0 age readings, and 462 otoliths have been collected. In Oregon, since 2003, a total of 208,666 length observations, 17,262 age readings, and 10,107 otoliths have been collected. In Washington, since 2003, a total of 49,157 length observations, 30,029 age readings, and 3,661 otoliths have been collected.

6.1 commercial fisheries

Table 19: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	121	11	132	28	71
C	1981	130	0	130	129	130
C	1982	368	0	368	16	261
C	1983	283	0	283	0	288
C	1984	233	0	233	226	226

Table 19: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1985	188	0	188	144	172
C	1986	27	0	27	0	0
C	1987	184	0	184	0	0
C	1988	125	0	125	0	0
C	1989	80	0	80	0	0
C	1990	5	0	5	0	0
C	1991	36	0	36	0	0
C	1992	138	875	1013	0	0
C	1993	3	2410	2413	0	0
C	1994	0	2836	2836	0	0
C	1995	0	2145	2145	0	0
C	1996	25	1953	1978	0	0
C	1997	52	997	1049	0	0
C	1998	6	300	306	0	0
C	1999	25	2360	2385	0	0
C	2000	25	571	596	0	0
C	2001	47	952	999	32	32
C	2002	27	574	601	13	13
C	2003	19	123	142	19	19
C	2004	9	257	266	9	9
C	2005	1	219	220	1	1
C	2006	0	641	641	0	0
C	2007	37	522	559	28	28
C	2008	0	283	283	0	0
C	2009	136	547	683	96	97
C	2010	0	174	174	0	0
C	2011	44	305	349	44	44
C	2012	44	651	695	44	44
C	2013	1	589	590	1	1
C	2014	0	1172	1172	0	0
C	2015	12	1700	1712	0	12
C	2016	9	915	924	0	9
C	2017	0	478	478	0	0
C	2018	39	529	568	0	39
C	2019	55	34	89	0	320
C	2020	498	1	499	0	0
C	2021	1077	27	1104	0	0

Table 20: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1985	355	0	355	0	0
O	1992	203	0	203	143	0
O	1994	41	0	41	41	0
O	1995	434	5	439	0	0
O	1996	228	0	228	0	0
O	1997	441	0	441	0	28
O	1998	381	0	381	194	50
O	1999	152	0	152	0	0
O	2000	603	0	603	287	5
O	2001	1049	0	1049	205	0
O	2002	1239	93	1332	316	14
O	2003	1368	46	1414	489	8
O	2004	3566	0	3566	453	162
O	2005	2261	0	2261	310	1
O	2006	4531	49	4580	772	30
O	2007	3819	24	3843	635	13
O	2008	2916	5	2921	619	53
O	2009	2868	76	2944	839	47
O	2010	4033	224	4257	864	151
O	2011	4590	0	4590	880	500
O	2012	3530	53	3583	789	738
O	2013	4243	61	4304	440	1484
O	2014	6819	57	6876	935	2298
O	2015	6406	18	6424	951	1920
O	2016	6292	11	6303	951	1894
O	2017	5290	4	5294	0	2909
O	2018	5072	22	5094	0	2976
O	2019	4626	31	4657	0	2541
O	2020	1665	13	1678	0	964
O	2021	3185	2	3187	0	1716

Table 21: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	100	96	196	99	0
W	1981	400	0	400	394	0

Table 21: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1982	400	29	429	295	0
W	1983	900	24	924	894	0
W	1984	400	0	400	397	0
W	1986	849	0	849	846	0
W	1987	1122	1	1123	1121	0
W	1988	524	0	524	515	0
W	1989	524	0	524	521	0
W	1990	349	0	349	349	0
W	1991	777	25	802	801	0
W	1992	573	2	575	575	0
W	1993	665	1	666	664	0
W	1994	444	0	444	443	0
W	1995	406	0	406	405	0
W	1997	0	31	31	0	0
W	1998	85	0	85	0	0
W	2000	3	0	3	0	0
W	2001	0	1	1	0	0
W	2002	50	0	50	0	0
W	2003	3	0	3	0	0
W	2004	14	1	15	0	0
W	2005	1	0	1	0	0
W	2006	20	0	20	19	0
W	2021	1	0	1	0	0

6.2 recreational fisheries

Table 22: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	37	37	0	0
C	2004	0	3402	3402	0	0

Table 22: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2005	0	5449	5449	0	0
C	2006	0	5366	5366	0	0
C	2007	0	6950	6950	0	0
C	2008	0	8416	8416	0	0
C	2009	2	11549	11551	0	0
C	2010	0	5859	5859	0	0
C	2011	0	8124	8124	0	0
C	2012	1	9914	9915	0	0
C	2013	20	17723	17743	0	0
C	2014	0	12088	12088	0	0
C	2015	1	11817	11818	0	0
C	2016	0	9077	9077	0	0
C	2017	0	5883	5883	0	0
C	2018	1	5422	5423	0	212
C	2019	1	3668	3669	0	250
C	2020	0	2	2	0	0
C	2021	1	2938	2939	0	0

Table 23: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1999	3608	158	3766	0	0
O	2000	4833	23	4856	0	0
O	2001	3101	5671	8772	3086	71
O	2002	3757	3712	7469	3463	294
O	2003	3461	3637	7098	2230	1214
O	2004	3261	2754	6015	2287	1020
O	2005	3125	3954	7079	1787	1331
O	2006	2173	7295	9468	2247	0
O	2007	2052	10741	12793	1988	40
O	2008	1	11764	11765	0	0
O	2009	1093	11344	12437	969	113
O	2010	1161	11901	13062	1177	0
O	2011	1107	11750	12857	861	263
O	2012	1067	12394	13461	543	544
O	2013	1038	12652	13690	526	520

Table 23: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2014	1083	11708	12791	549	543
O	2015	1078	12784	13862	1074	0
O	2016	1098	10596	11694	530	554
O	2017	991	10233	11224	494	485
O	2018	1203	11825	13028	0	1203
O	2019	1154	11727	12881	0	1159
O	2020	1110	989	2099	0	1118
O	2021	0	11362	11362	0	0

Table 24: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	1850	779	2629	1894	5
W	2003	1853	470	2323	1841	12
W	2004	1657	343	2000	1645	12
W	2005	1664	563	2227	1653	11
W	2006	1608	1244	2852	1484	16
W	2007	2311	612	2923	2300	13
W	2008	1987	505	2492	1920	69
W	2009	1696	1034	2730	1671	16
W	2010	1598	982	2580	1586	12
W	2011	1181	1302	2483	1171	10
W	2012	1263	1122	2385	1038	52
W	2013	1767	1090	2857	1762	5
W	2014	1608	678	2286	1564	25
W	2015	2666	484	3150	2152	7
W	2016	1732	439	2171	1713	20
W	2017	2299	1047	3346	2254	9
W	2018	1827	966	2793	1761	59
W	2019	2552	1321	3873	2514	15
W	2020	1374	75	1449	0	1374
W	2021	1992	245	2237	0	1924

7 Blackgill rockfish

The most recent assessment of Blackgill rockfish was a update assessment conducted in 2017. Across available data, Blackgill rockfish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 59,397 length observations, 1,858 age readings, and 13,079 otoliths that are available to be aged. In California, since 2000, a total of 20,893 length observations, 1,309 age readings, and 3,764 otoliths have been collected. In Oregon, since 2000, a total of 6,666 length observations, 0 age readings, and 6,536 otoliths have been collected. In Washington, since 2000, a total of 699 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 9,096 length observations, 1,948 age readings, and 4,476 otoliths that are available to be aged.

7.1 commercial fisheries

Table 25: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	36	4	40	0	30
C	1981	33	149	182	0	33
C	1982	156	0	156	17	39
C	1983	270	367	637	185	227
C	1984	343	794	1137	127	325
C	1985	1749	1238	2987	86	1613
C	1986	4216	937	5153	134	309
C	1987	2961	548	3509	0	9
C	1988	2327	312	2639	0	42

Table 25: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1989	628	531	1159	0	0
C	1990	953	65	1018	0	0
C	1991	929	13	942	0	0
C	1992	734	1631	2365	0	108
C	1993	509	82	591	0	0
C	1994	245	642	887	0	0
C	1995	653	750	1403	0	23
C	1996	778	1494	2272	0	0
C	1997	749	1046	1795	0	0
C	1998	695	482	1177	0	10
C	1999	507	98	605	0	11
C	2000	459	245	704	0	0
C	2001	324	495	819	64	92
C	2002	637	705	1342	169	225
C	2003	335	685	1020	157	390
C	2004	161	167	328	21	84
C	2005	274	349	623	176	324
C	2006	230	572	802	221	357
C	2007	150	365	515	101	193
C	2008	440	1120	1560	230	242
C	2009	238	1164	1402	131	306
C	2010	280	1004	1284	39	175
C	2011	365	1000	1365	0	242
C	2012	365	995	1360	0	323
C	2013	262	420	682	0	203
C	2014	192	483	675	0	154
C	2015	213	1092	1305	0	178
C	2016	158	1385	1543	0	93
C	2017	220	577	797	0	100
C	2018	118	424	542	0	0
C	2019	259	462	721	0	83
C	2020	306	363	669	0	0
C	2021	377	458	835	0	0

Table 26: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1997	32	27	59	0	0
O	2002	6	0	6	0	5
O	2003	82	0	82	0	76
O	2004	22	0	22	0	22
O	2005	19	0	19	0	19
O	2006	124	0	124	0	123
O	2007	204	0	204	0	190
O	2008	341	0	341	0	328
O	2009	472	0	472	0	468
O	2010	594	0	594	0	582
O	2011	435	0	435	0	428
O	2012	823	0	823	0	791
O	2013	665	0	665	0	627
O	2014	818	0	818	0	817
O	2015	531	0	531	0	531
O	2016	253	0	253	0	253
O	2017	490	0	490	0	490
O	2018	402	0	402	0	401
O	2019	288	0	288	0	288
O	2020	53	0	53	0	53
O	2021	44	0	44	0	44

Table 27: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	31	31	0	0
W	1997	0	182	182	0	0
W	1998	125	12	137	0	0
W	1999	55	21	76	0	0
W	2000	93	60	153	0	0
W	2001	21	14	35	0	0
W	2002	18	9	27	0	0
W	2003	65	9	74	0	0
W	2004	29	3	32	0	0
W	2005	39	1	40	0	0
W	2006	22	0	22	0	0

Table 27: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2007	28	0	28	0	0
W	2008	27	1	28	0	0
W	2009	30	0	30	0	0
W	2010	22	0	22	0	0
W	2011	47	1	48	0	0
W	2012	48	0	48	0	0
W	2013	26	0	26	0	0
W	2014	29	2	31	0	0
W	2015	5	0	5	0	0
W	2016	16	0	16	0	0
W	2017	11	0	11	0	0
W	2018	3	0	3	0	0
W	2019	13	0	13	0	0
W	2021	7	0	7	0	0

7.2 NWFSC WCGBT

Table 28: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	21	129	0	129	0	89
2004	20	449	0	449	0	175
2005	28	397	1	398	0	191
2006	35	750	2	752	0	200
2007	29	298	0	298	0	194
2008	44	339	0	339	0	243
2009	40	535	18	553	0	430
2010	43	514	8	522	0	461
2011	44	362	3	365	311	0
2012	43	503	5	508	419	0
2013	31	415	4	419	0	348

Table 28: Data collected annually from the NWFSC WCGBT survey. *(continued)*

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2014	38	847	7	854	638	0
2015	39	717	2	719	580	0
2016	34	379	0	379	0	361
2017	38	594	2	596	0	442
2018	44	968	2	970	0	693
2019	16	239	1	240	0	226
2021	39	606	0	606	0	423

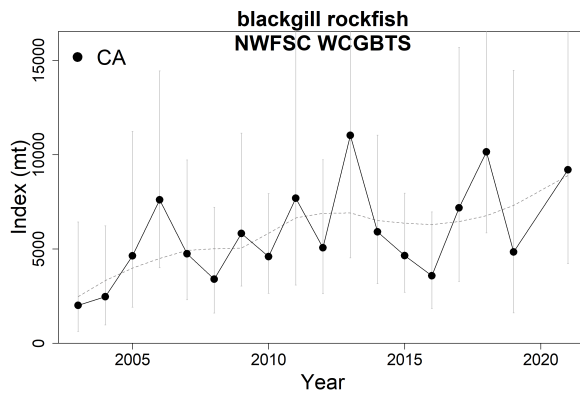


Figure 9: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

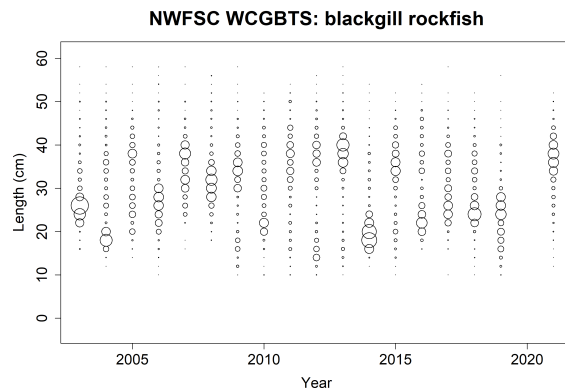


Figure 10: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

8 Blue and deacon rockfish

The most recent assessment of Blue and deacon rockfish was a full assessment conducted in 2017. Across available data, Blue and deacon rockfish have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC HKL survey.

Across all years of available data, commercial fisheries have collected a total of 23,390 length observations, 2,297 age readings, and 3,386 otoliths that are available to be aged. In California, since 2000, a total of 6,447 length observations, 119 age readings, and 1,346 otoliths have been collected. In Oregon, since 2000, a total of 5,383 length observations, 2,178 age readings, and 1,689 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 491,514 length observations, 3,959 age readings, and 17,950 otoliths that are available to be aged. In California, since 2003, a total of 301,998 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 164,494 length observations, 3,959 age readings, and 10,066 otoliths have been collected. In Washington, since 2003, a total of 8,576 length observations, 0 age readings, and 5,752 otoliths have been collected.

Across all years of available data, the NWFSC HKL survey has collected a total of 687 length observations, 0 age readings, and 662 otoliths that are available to be aged.

8.1 commercial fisheries

Table 29: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	3	0	3	0	0
C	1981	1	7	8	0	0
C	1982	16	0	16	0	0
C	1983	9	2	11	0	0
C	1984	3	0	3	0	300
C	1985	44	32	76	0	0
C	1986	17	6	23	0	38
C	1987	0	2	2	0	0
C	1988	3	0	3	0	0
C	1989	16	8	24	0	0
C	1990	4	9	13	0	0
C	1991	35	54	89	0	0
C	1992	103	1205	1308	0	0
C	1993	55	3640	3695	0	0
C	1994	0	1833	1833	0	0
C	1995	0	638	638	0	0
C	1996	0	1103	1103	0	0
C	1997	71	948	1019	0	0
C	1998	32	511	543	0	0
C	1999	0	1052	1052	0	0
C	2000	0	126	126	0	0
C	2001	0	135	135	0	0
C	2002	3	255	258	0	6
C	2003	0	41	41	0	0
C	2004	0	110	110	0	0
C	2005	32	141	173	0	64
C	2006	0	140	140	0	0
C	2007	4	304	308	0	54
C	2008	0	154	154	0	0
C	2009	2	183	185	0	4
C	2010	0	95	95	0	0
C	2011	70	289	359	67	118
C	2012	48	768	816	50	50
C	2013	0	482	482	0	0
C	2014	0	310	310	0	0
C	2015	2	805	807	2	2
C	2016	1	232	233	0	2
C	2017	0	193	193	0	0
C	2018	0	121	121	0	0
C	2019	116	175	291	0	1046

Table 29: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	198	58	256	0	0
C	2021	699	155	854	0	0

Table 30: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1992	64	0	64	0	13
O	1999	13	0	13	0	0
O	2000	243	0	243	32	0
O	2001	97	0	97	0	0
O	2002	78	0	78	0	15
O	2003	172	0	172	56	8
O	2004	227	0	227	0	81
O	2005	166	3	169	32	0
O	2006	183	3	186	0	54
O	2007	375	0	375	159	1
O	2008	128	0	128	0	75
O	2009	163	2	165	145	5
O	2010	425	2	427	0	349
O	2011	531	41	572	265	200
O	2012	478	18	496	0	440
O	2013	670	3	673	637	12
O	2014	624	1	625	592	14
O	2015	265	2	267	260	4
O	2016	68	0	68	0	68
O	2017	45	0	45	0	45
O	2018	65	0	65	0	65
O	2019	147	0	147	0	138
O	2020	35	0	35	0	24
O	2021	123	0	123	0	91

Table 31: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	0	21	21	0	0

8.2 recreational fisheries

Table 32: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	568	568	0	0
C	2004	0	19468	19468	0	0
C	2005	2	21838	21840	0	0
C	2006	0	29602	29602	0	0
C	2007	0	21056	21056	0	0
C	2008	0	16030	16030	0	0
C	2009	2	8506	8508	0	0
C	2010	0	8702	8702	0	0
C	2011	0	9546	9546	0	0
C	2012	0	10174	10174	0	0
C	2013	6	19398	19404	0	0
C	2014	2	21590	21592	0	0
C	2015	0	25714	25714	0	0
C	2016	8	19358	19366	0	0
C	2017	6	20294	20300	0	0
C	2018	6	19600	19606	0	0
C	2019	8	20420	20428	0	0
C	2020	0	110	110	0	0
C	2021	4	9980	9984	0	0

Table 33: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1999	1422	30	1452	0	0
O	2000	1132	0	1132	0	0
O	2001	2718	5698	8416	0	1393
O	2002	1474	3888	5362	0	739
O	2003	1568	5094	6662	0	785
O	2004	1002	3538	4540	146	352
O	2005	956	6122	7078	0	477
O	2006	1796	6950	8746	0	899
O	2007	1726	8340	10066	0	863
O	2008	1852	9608	11460	526	395
O	2009	2096	8710	10806	461	584
O	2010	1878	10626	12504	409	542
O	2011	1662	9038	10700	436	405
O	2012	1926	10024	11950	519	467
O	2013	1414	7962	9376	458	249
O	2014	1502	6540	8042	493	252
O	2015	1586	8122	9708	511	281
O	2016	1486	7718	9204	0	747
O	2017	1194	6684	7878	0	597
O	2018	1268	5408	6676	0	635
O	2019	1772	8218	9990	0	892
O	2020	1278	706	1984	0	644
O	2021	0	7124	7124	0	0

Table 34: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	20	64	84	0	0
W	2003	8	50	58	0	0
W	2004	310	32	342	0	288
W	2005	594	372	966	0	404
W	2006	162	294	456	0	66
W	2007	276	54	330	0	178
W	2008	178	78	256	0	118
W	2009	176	70	246	0	78
W	2010	264	76	340	0	120

Table 34: Data collected annually from the recreational fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2011	84	198	282	0	72
W	2012	38	76	114	0	34
W	2013	26	120	146	0	46
W	2014	338	2	340	0	338
W	2015	472	16	488	0	472
W	2016	1224	10	1234	0	1224
W	2017	770	218	988	0	768
W	2018	222	158	380	0	222
W	2019	590	264	854	0	588
W	2020	414	6	420	0	414
W	2021	322	14	336	0	322

8.3 NWFSC HKL

Table 35: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	6	47	0	47	0	47
2005	9	64	0	64	0	65
2006	9	40	0	40	0	40
2007	5	21	0	21	0	21
2008	7	39	0	39	0	39
2009	6	17	0	17	0	15
2010	4	27	0	27	0	27
2011	5	36	0	36	0	36
2012	3	4	0	4	0	3
2013	6	10	0	10	0	10
2014	14	38	0	38	0	36
2015	16	61	0	61	0	60
2016	19	64	0	64	0	61
2017	14	92	0	92	0	89

Table 35: Data collected annually from the NWFSC HKL survey. (*continued*)

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2018	16	65	0	65	0	62
2019	15	48	2	50	0	45
2021	10	12	0	12	0	6

9 Bocaccio

The most recent assessment of Bocaccio was a update assessment conducted in 2017. Across available data, Bocaccio have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 78,845 length observations, 6,421 age readings, and 46,661 otoliths that are available to be aged. In California, since 2000, a total of 12,745 length observations, 181 age readings, and 1,559 otoliths have been collected. In Oregon, since 2000, a total of 3,916 length observations, 0 age readings, and 3,794 otoliths have been collected. In Washington, since 2000, a total of 2,044 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 46,032 length observations, 0 age readings, and 343 otoliths that are available to be aged. In California, since 2003, a total of 44,984 length observations, 0 age readings, and 103 otoliths have been collected. In Oregon, since 2003, a total of 467 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 377 length observations, 0 age readings, and 240 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 9,540 length observations, 2,855 age readings, and 3,263 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 17,396 length observations, 0 age readings, and 12,359 otoliths that are available to be aged.

9.1 commercial fisheries

Table 36: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1833	274	2107	252	1490
C	1981	1427	266	1693	0	1341
C	1982	2685	245	2930	0	1851
C	1983	2860	536	3396	0	2478
C	1984	2791	1209	4000	0	2577
C	1985	2773	1316	4089	434	3210
C	1986	4037	640	4677	506	3576
C	1987	4231	370	4601	577	3396
C	1988	2961	338	3299	416	3044
C	1989	2737	453	3190	499	3309
C	1990	3072	229	3301	254	2734
C	1991	3066	348	3414	636	2879
C	1992	3187	625	3812	554	3104
C	1993	2123	1385	3508	639	1856
C	1994	1110	1565	2675	630	1024
C	1995	688	1030	1718	0	651
C	1996	847	968	1815	0	831
C	1997	787	946	1733	0	761
C	1998	705	472	1177	0	631
C	1999	715	56	771	598	448
C	2000	212	70	282	0	135
C	2001	619	282	901	0	331
C	2002	306	169	475	0	219
C	2003	2	0	2	0	2
C	2004	195	5	200	181	122
C	2005	14	5	19	0	17
C	2006	35	45	80	0	16
C	2007	33	43	76	0	29
C	2008	50	21	71	0	17
C	2009	17	57	74	0	14
C	2010	16	52	68	0	16
C	2011	2	68	70	0	15
C	2012	123	233	356	0	75
C	2013	51	382	433	0	18
C	2014	46	413	459	0	28
C	2015	232	708	940	0	225
C	2016	353	602	955	0	156
C	2017	454	636	1090	0	124
C	2018	405	1222	1627	0	0
C	2019	557	809	1366	0	0

Table 36: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	612	819	1431	0	0
C	2021	871	899	1770	0	0

Table 37: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1983	100	0	100	0	100
O	1992	1	0	1	0	1
O	1993	1	0	1	0	1
O	1997	15	0	15	0	15
O	1998	47	0	47	0	0
O	1999	12	0	12	0	0
O	2000	15	0	15	0	15
O	2002	5	0	5	0	5
O	2004	1	0	1	0	1
O	2005	16	0	16	0	15
O	2006	5	0	5	0	5
O	2007	7	0	7	0	6
O	2008	36	0	36	0	36
O	2009	24	0	24	0	24
O	2010	22	0	22	0	22
O	2011	25	0	25	0	25
O	2012	34	0	34	0	34
O	2013	30	0	30	0	30
O	2014	39	0	39	0	39
O	2015	22	0	22	0	22
O	2016	73	0	73	0	73
O	2017	673	1	674	0	670
O	2018	820	1	821	0	821
O	2019	1095	0	1095	0	999
O	2020	412	0	412	0	404
O	2021	560	0	560	0	548

Table 38: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	6	0	6	0	0
W	1995	245	0	245	245	0
W	1996	275	166	441	0	0
W	1997	380	246	626	0	0
W	1998	482	36	518	0	0
W	1999	222	0	222	0	0
W	2000	198	2	200	0	0
W	2001	117	7	124	0	0
W	2002	298	0	298	0	0
W	2003	272	0	272	0	0
W	2004	74	0	74	0	0
W	2005	88	0	88	0	0
W	2006	15	0	15	0	0
W	2008	1	0	1	0	0
W	2009	1	0	1	0	0
W	2011	4	0	4	0	0
W	2012	13	0	13	0	0
W	2013	2	0	2	0	0
W	2014	12	0	12	0	0
W	2016	5	0	5	0	0
W	2017	144	0	144	0	0
W	2018	171	0	171	0	0
W	2019	272	0	272	0	0
W	2020	157	0	157	0	0
W	2021	190	1	191	0	0

9.2 recreational fisheries

Table 39: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	2	36	38	0	0
C	2004	1	1029	1030	0	0
C	2005	0	1783	1783	0	0
C	2006	0	2271	2271	0	0
C	2007	0	2450	2450	0	0
C	2008	0	1987	1987	0	0
C	2009	0	2336	2336	0	0
C	2010	1	2116	2117	0	0
C	2011	1	3479	3480	0	0
C	2012	0	4336	4336	0	0
C	2013	0	4676	4676	0	0
C	2014	0	3330	3330	0	0
C	2015	0	2772	2772	0	0
C	2016	2	1771	1773	0	0
C	2017	1	2566	2567	0	0
C	2018	0	3083	3083	0	71
C	2019	2	3730	3732	0	32
C	2020	0	139	139	0	0
C	2021	2	1082	1084	0	0

Table 40: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	47	47	0	0
O	2002	0	157	157	0	0
O	2003	0	64	64	0	0
O	2004	0	20	20	0	0
O	2005	0	14	14	0	0
O	2006	0	11	11	0	0
O	2007	0	16	16	0	0
O	2008	0	7	7	0	0
O	2009	0	11	11	0	0
O	2011	0	8	8	0	0
O	2012	0	14	14	0	0
O	2013	0	7	7	0	0
O	2014	0	8	8	0	0

Table 40: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2015	0	1	1	0	0
O	2016	0	2	2	0	0
O	2017	0	5	5	0	0
O	2018	0	130	130	0	0
O	2019	0	75	75	0	0
O	2020	0	2	2	0	0
O	2021	0	72	72	0	0

Table 41: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2003	0	1	1	0	0
W	2004	0	14	14	0	0
W	2005	1	0	1	0	0
W	2009	0	7	7	0	0
W	2011	0	24	24	0	0
W	2012	0	18	18	0	0
W	2014	12	0	12	0	12
W	2015	2	1	3	0	2
W	2016	7	2	9	0	7
W	2017	11	3	14	0	11
W	2018	25	11	36	0	25
W	2019	95	50	145	0	95
W	2020	2	1	3	0	2
W	2021	86	4	90	0	86

9.3 NWFSC WCGBT

Table 42: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	38	102	5	107	105	2
2004	29	480	0	480	209	0
2005	40	270	0	270	146	1
2006	38	262	0	262	127	8
2007	30	157	0	157	94	4
2008	25	109	1	110	85	0
2009	24	100	0	100	95	5
2010	37	162	110	272	188	1
2011	22	105	0	105	105	0
2012	48	816	1	817	513	3
2013	46	539	199	738	493	2
2014	97	995	25	1020	695	16
2015	58	687	9	696	0	383
2016	81	1338	109	1447	0	695
2017	74	952	0	952	0	621
2018	76	806	0	806	0	601
2019	42	539	0	539	0	383
2021	92	654	8	662	0	538

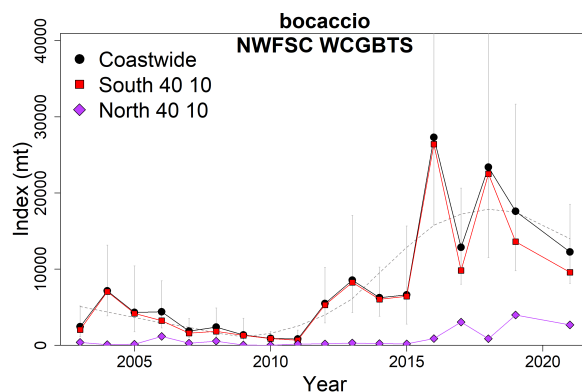


Figure 11: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

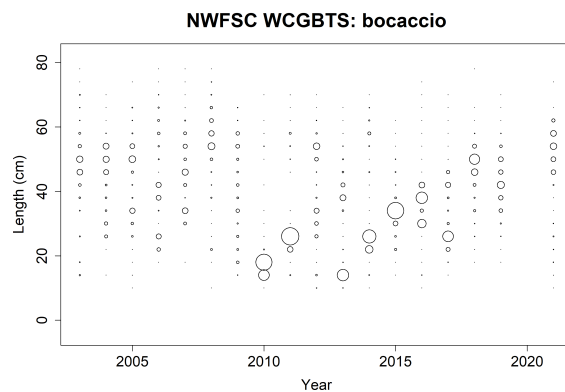


Figure 12: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

9.4 NWFSC HKL

Table 43: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	59	780	0	780	0	725
2005	69	658	6	664	0	665
2006	73	729	1	730	0	733
2007	79	641	2	643	0	640
2008	91	652	0	652	0	649
2009	80	586	0	586	0	583
2010	64	268	3	271	0	268
2011	87	767	4	771	0	765
2012	103	1071	1	1072	0	1067
2013	95	1126	1	1127	0	1123
2014	138	1788	1	1789	0	1790
2015	159	1945	2	1947	0	806
2016	152	1255	1	1256	0	536
2017	161	1348	1	1349	0	554
2018	161	1416	0	1416	0	581
2019	165	1369	7	1376	0	498
2021	141	966	1	967	0	376

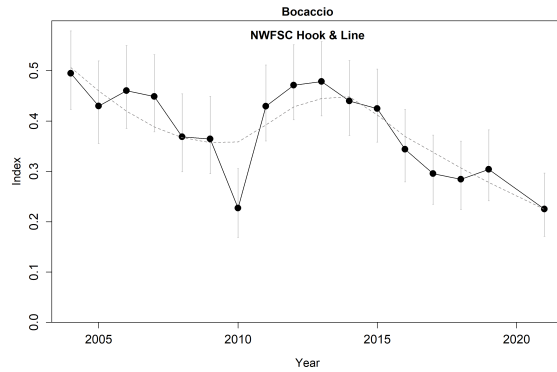


Figure 13: Index of abundance from the NWFS HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

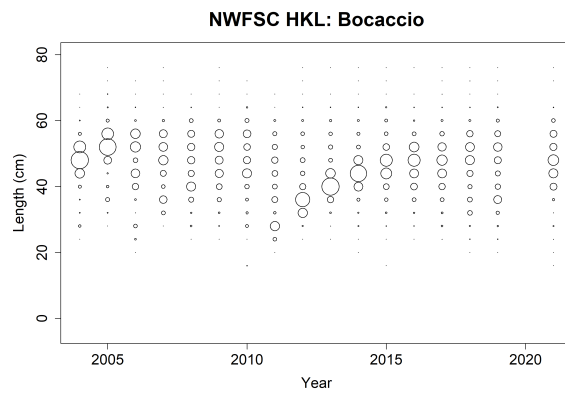


Figure 14: Length (cm) composition data from the NWFS HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

10 Brown rockfish

The most recent assessment of Brown rockfish was a data-moderate assessment conducted in 2013. Across available data, Brown rockfish have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 11,553 length observations, 0 age readings, and 549 otoliths that are available to be aged. In California, since 2000, a total of 4,883 length observations, 0 age readings, and 477 otoliths have been collected. In Oregon, since 2000, a total of 7 length observations, 0 age readings, and 3 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 75,366 length observations, 13 age readings, and 89 otoliths that are available to be aged. In California, since 2003, a total of 74,935 length observations, 0 age readings, and 25 otoliths have been collected. In Oregon, since 2003, a total of 357 length observations, 13 age readings, and 25 otoliths have been collected. In Washington, since 2003, a total of 56 length observations, 0 age readings, and 39 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 550 length observations, 0 age readings, and 412 otoliths that are available to be aged.

10.1 commercial fisheries

Table 44: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	20	0	20	0	25
C	1981	10	0	10	0	1
C	1982	17	0	17	0	0
C	1983	6	0	6	0	7
C	1984	0	15	15	0	2
C	1985	2	9	11	0	34
C	1986	2	0	2	0	0
C	1988	1	0	1	0	0
C	1990	1	0	1	0	0
C	1991	0	51	51	0	0
C	1992	0	1852	1852	0	0
C	1993	0	515	515	0	0
C	1994	0	623	623	0	0
C	1995	1	405	406	0	0
C	1996	1	848	849	0	0
C	1997	1	1114	1115	0	0
C	1998	0	133	133	0	0
C	1999	0	1036	1036	0	0
C	2000	7	594	601	0	0
C	2001	24	867	891	0	23
C	2002	48	310	358	0	47
C	2003	0	81	81	0	0
C	2004	4	71	75	0	4
C	2005	0	60	60	0	0
C	2006	0	7	7	0	0
C	2007	20	29	49	0	19
C	2008	2	25	27	0	1
C	2009	23	132	155	0	16
C	2010	0	465	465	0	0
C	2011	0	244	244	0	0
C	2012	0	203	203	0	0
C	2013	0	101	101	0	0
C	2014	7	78	85	0	7
C	2015	0	197	197	0	0
C	2016	0	192	192	0	0
C	2017	0	234	234	0	0
C	2018	2	202	204	0	0
C	2019	0	228	228	0	355
C	2020	5	246	251	0	0
C	2021	7	168	175	0	5

Table 45: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2012	1	0	1	0	1
O	2014	1	0	1	0	1
O	2017	1	0	1	0	0
O	2021	4	0	4	0	1

10.2 recreational fisheries

Table 46: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	2	65	67	0	0
C	2004	0	1794	1794	0	0
C	2005	0	3841	3841	0	0
C	2006	0	4910	4910	0	0
C	2007	2	4158	4160	0	0
C	2008	0	4113	4113	0	0
C	2009	0	4572	4572	0	0
C	2010	7	4805	4812	0	0
C	2011	0	4390	4390	0	0
C	2012	0	3913	3913	0	0
C	2013	1	5534	5535	0	0
C	2014	0	7824	7824	0	0
C	2015	0	6150	6150	0	0
C	2016	1	4840	4841	0	0
C	2017	1	3690	3691	0	0
C	2018	1	4030	4031	0	24
C	2019	2	3620	3622	0	1
C	2020	0	16	16	0	0
C	2021	0	2653	2653	0	0

Table 47: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	11	11	0	0
O	2002	0	7	7	0	0
O	2003	0	10	10	0	0
O	2004	0	2	2	0	0
O	2005	2	11	13	2	0
O	2006	0	21	21	0	0
O	2007	0	9	9	0	0
O	2008	4	18	22	4	0
O	2009	1	20	21	1	0
O	2010	1	44	45	1	0
O	2011	1	34	35	1	0
O	2012	1	5	6	1	0
O	2013	3	9	12	3	0
O	2014	0	7	7	0	0
O	2015	0	10	10	0	0
O	2016	0	7	7	0	0
O	2017	1	13	14	0	1
O	2018	0	11	11	0	0
O	2019	3	35	38	0	3
O	2020	21	6	27	0	21
O	2021	0	47	47	0	0

Table 48: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2011	0	1	1	0	0
W	2012	0	1	1	0	0
W	2013	0	1	1	0	0
W	2016	0	3	3	0	0
W	2017	8	2	10	0	8
W	2018	0	3	3	0	0
W	2019	12	3	15	0	12
W	2020	10	0	10	0	10
W	2021	9	3	12	0	9

10.3 NWFSC WCGBT

Table 49: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	8	46	2	48	0	0
2004	6	28	0	28	0	28
2005	5	42	1	43	0	20
2006	4	13	0	13	0	13
2007	1	1	0	1	0	1
2008	2	3	1	4	0	4
2009	2	9	0	9	0	9
2010	3	15	0	15	0	14
2011	7	13	2	15	0	15
2012	8	39	0	39	0	29
2013	4	39	0	39	0	30
2014	5	83	0	83	0	37
2015	7	51	0	51	0	50
2016	6	7	0	7	0	7
2017	6	35	0	35	0	35
2018	12	62	0	62	0	62
2019	4	32	0	32	0	32
2021	9	26	0	26	0	26

11 Cabezon

The most recent assessment of Cabezon was a full assessment conducted in 2019. Across available data, Cabezon have been observed and sampled generally by both commercial and recreational fisheries.

Across all years of available data, commercial fisheries have collected a total of 29,863 length observations, 366 age readings, and 273 otoliths that are available to be aged. In California, since 2000, a total of 7,778 length observations, 0 age readings, and 25 otoliths have been collected. In Oregon, since 2000, a total of 16,319 length observations, 366 age readings, and 248 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 46,384 length observations, 2,328 age readings, and 2,795 otoliths that are available to be aged. In California, since 2003, a total of 15,123 length observations, 0 age readings, and 8 otoliths have been collected. In Oregon, since 2003, a total of 25,366 length observations, 2,328 age readings, and 812 otoliths have been collected. In Washington, since 2003, a total of 4,031 length observations, 0 age readings, and 1,951 otoliths have been collected.

11.1 commercial fisheries

Table 50: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1993	0	30	30	0	0
C	1994	0	9	9	0	0
C	1995	0	206	206	0	0
C	1996	0	1696	1696	0	0
C	1997	0	904	904	0	0
C	1998	0	1345	1345	0	0

Table 50: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1999	0	1479	1479	0	0
C	2000	35	2465	2500	0	0
C	2001	11	1069	1080	0	0
C	2002	0	297	297	0	0
C	2003	0	83	83	0	0
C	2004	0	228	228	0	0
C	2005	0	129	129	0	0
C	2006	1	219	220	0	1
C	2007	0	283	283	0	0
C	2008	0	256	256	0	0
C	2009	0	185	185	0	0
C	2010	0	280	280	0	0
C	2011	0	148	148	0	0
C	2012	0	247	247	0	0
C	2013	0	102	102	0	0
C	2014	0	55	55	0	0
C	2015	18	300	318	0	0
C	2016	140	207	347	0	0
C	2017	4	184	188	0	0
C	2018	0	105	105	0	0
C	2019	164	83	247	0	24
C	2020	234	2	236	0	0
C	2021	241	3	244	0	0

Table 51: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1998	0	57	57	0	0
O	1999	31	9	40	0	0
O	2000	184	618	802	0	0
O	2001	14	1214	1228	0	0
O	2002	50	1245	1295	0	0
O	2003	11	766	777	8	0
O	2004	0	775	775	0	0
O	2005	1	598	599	0	0
O	2006	0	595	595	0	0

Table 51: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2007	1	812	813	1	0
O	2008	9	391	400	1	0
O	2009	342	73	415	20	1
O	2010	626	152	778	9	0
O	2011	820	21	841	32	8
O	2012	492	173	665	43	12
O	2013	426	175	601	24	10
O	2014	641	37	678	29	11
O	2015	521	85	606	16	3
O	2016	535	216	751	56	8
O	2017	787	157	944	68	10
O	2018	659	83	742	59	4
O	2019	917	2	919	0	95
O	2020	288	9	297	0	18
O	2021	796	2	798	0	68

11.2 recreational fisheries

Table 52: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	49	49	0	0
C	2004	1	715	716	0	0
C	2005	1	1085	1086	0	0
C	2006	0	944	944	0	0
C	2007	10	743	753	0	0
C	2008	11	672	683	0	0
C	2009	12	882	894	0	0
C	2010	0	740	740	0	0
C	2011	13	943	956	0	0
C	2012	57	888	945	0	0

Table 52: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2013	239	710	949	0	0
C	2014	639	402	1041	0	0
C	2015	1238	227	1465	0	0
C	2016	881	239	1120	0	0
C	2017	844	100	944	0	0
C	2018	788	99	887	0	3
C	2019	619	76	695	0	5
C	2020	1	3	4	0	0
C	2021	150	102	252	0	0

Table 53: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	520	520	0	0
O	2002	0	1260	1260	0	0
O	2003	0	1199	1199	0	0
O	2004	0	1019	1019	0	0
O	2005	73	1480	1553	68	0
O	2006	337	1598	1935	313	1
O	2007	229	1512	1741	177	0
O	2008	383	1902	2285	327	0
O	2009	431	1967	2398	423	0
O	2010	349	1672	2021	6	345
O	2011	332	1403	1735	329	0
O	2012	278	1280	1558	5	273
O	2013	152	916	1068	148	0
O	2014	73	640	713	71	0
O	2015	92	691	783	92	0
O	2016	119	880	999	118	0
O	2017	137	1165	1302	136	0
O	2018	117	894	1011	115	0
O	2019	115	866	981	0	115
O	2020	78	4	82	0	78
O	2021	0	983	983	0	0

Table 54: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	48	36	84	0	24
W	2003	21	72	93	0	0
W	2004	30	73	103	0	0
W	2005	38	174	212	0	0
W	2006	44	86	130	0	0
W	2007	33	74	107	0	0
W	2008	8	41	49	0	0
W	2009	39	65	104	0	0
W	2010	37	85	122	0	2
W	2011	11	146	157	0	0
W	2012	13	75	88	0	0
W	2013	20	42	62	0	0
W	2014	139	68	207	0	153
W	2015	78	36	114	0	78
W	2016	259	23	282	0	259
W	2017	253	191	444	0	248
W	2018	310	197	507	0	300
W	2019	509	303	812	0	505
W	2020	180	9	189	0	180
W	2021	228	21	249	0	226

12 California scorpionfish

The most recent assessment of California scorpionfish was a full assessment conducted in 2017. Across available data, California scorpionfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 847 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2000, a total of 768 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 57,567 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 57,567 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 3,227 length observations, 883 age readings, and 573 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 24 length observations, 0 age readings, and 6 otoliths that are available to be aged.

12.1 commercial fisheries

Table 55: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1999	0	79	79	0	0
C	2006	0	33	33	0	0
C	2012	0	1	1	0	0
C	2013	0	244	244	0	0
C	2014	0	51	51	0	0
C	2015	0	164	164	0	0
C	2016	0	252	252	0	0
C	2018	0	23	23	0	0

12.2 recreational fisheries

Table 56: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	136	136	0	0
C	2004	0	1926	1926	0	0
C	2005	2	2208	2210	0	0
C	2006	0	4073	4073	0	0
C	2007	0	4910	4910	0	0
C	2008	0	6193	6193	0	0
C	2009	0	5652	5653	0	0
C	2010	5	6341	6346	0	0
C	2011	0	3196	3196	0	0
C	2012	0	3683	3683	0	0
C	2013	0	3675	3675	0	0
C	2014	0	2835	2835	0	0
C	2015	0	1871	1871	0	0
C	2016	0	2032	2032	0	0
C	2017	0	2398	2398	0	0
C	2018	0	2125	2125	0	0
C	2019	1	2576	2577	0	0
C	2020	0	800	800	0	0
C	2021	0	928	928	0	0

12.3 NWFSC WCGBT

Table 57: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	7	69	5	74	0	0
2004	12	115	41	156	0	0
2005	8	169	0	169	75	0
2006	11	46	1	47	45	1
2007	12	191	0	191	68	0

Table 57: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2008	12	50	0	50	49	1
2009	11	346	1	347	130	0
2010	10	58	0	58	42	0
2011	16	239	0	239	116	1
2012	9	94	0	94	66	0
2013	7	259	0	259	67	0
2014	6	91	2	93	73	0
2015	14	160	3	163	57	1
2016	12	127	12	139	95	2
2017	13	275	34	309	0	140
2018	23	287	2	289	0	128
2019	13	215	0	215	0	88
2021	24	334	1	335	0	211

12.4 NWFSC HKL

Table 58: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2005	1	0	1	1	0	0
2006	2	0	1	1	0	1
2007	1	0	1	1	0	0
2010	1	0	1	1	0	0
2014	2	0	2	2	0	0
2015	5	0	7	7	0	0
2017	2	0	3	3	0	0
2018	2	3	1	4	0	3
2021	3	3	1	4	0	2

13 Canary rockfish

The most recent assessment of Canary rockfish was a full assessment conducted in 2015. Across available data, Canary rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 116,424 length observations, 69,363 age readings, and 20,010 otoliths that are available to be aged. In California, since 2000, a total of 8,232 length observations, 346 age readings, and 1,184 otoliths have been collected. In Oregon, since 2000, a total of 22,416 length observations, 9,478 age readings, and 11,091 otoliths have been collected. In Washington, since 2000, a total of 11,567 length observations, 9,250 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 54,272 length observations, 1,569 age readings, and 6,394 otoliths that are available to be aged. In California, since 2003, a total of 18,051 length observations, 0 age readings, and 163 otoliths have been collected. In Oregon, since 2003, a total of 27,194 length observations, 0 age readings, and 3,565 otoliths have been collected. In Washington, since 2003, a total of 5,506 length observations, 1,569 age readings, and 2,648 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 12,610 length observations, 5,421 age readings, and 2,549 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 315 length observations, 192 age readings, and 122 otoliths that are available to be aged.

13.1 commercial fisheries

Table 59: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	323	40	363	263	332
C	1981	197	74	271	166	202
C	1982	478	29	507	222	420
C	1983	427	30	457	402	498
C	1984	374	32	406	364	376
C	1985	484	52	536	430	567
C	1986	410	86	496	0	28
C	1987	420	6	426	1	0
C	1988	333	33	366	0	0
C	1989	489	88	577	0	0
C	1990	321	112	433	0	7
C	1991	175	223	398	0	0
C	1992	189	1881	2070	0	0
C	1993	45	1622	1667	0	0
C	1994	87	2121	2208	0	0
C	1995	213	1383	1596	0	0
C	1996	218	1614	1832	0	0
C	1997	165	1297	1462	0	0
C	1998	129	468	597	0	0
C	1999	339	754	1093	0	0
C	2000	105	130	235	0	0
C	2001	110	336	446	28	31
C	2002	256	60	316	98	105
C	2003	47	0	47	44	44
C	2004	37	1	38	17	12
C	2005	162	13	175	64	54
C	2006	96	20	116	41	55
C	2007	63	46	109	27	40
C	2008	7	16	23	0	2
C	2009	27	79	106	27	41
C	2010	8	49	57	0	10
C	2011	0	12	12	0	0
C	2012	1	166	167	0	0
C	2013	165	145	310	0	156
C	2014	90	112	202	0	78
C	2015	169	257	426	0	176
C	2016	109	252	361	0	41
C	2017	322	663	985	0	144
C	2018	413	375	788	0	46
C	2019	379	291	670	0	149

Table 59: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	383	589	972	0	0
C	2021	1379	292	1671	0	0

Table 60: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1981	603	0	603	428	175
O	1982	1142	0	1142	457	685
O	1983	2153	0	2153	2041	112
O	1984	1364	0	1364	1257	5
O	1985	1588	0	1588	1053	100
O	1986	1152	0	1152	607	545
O	1987	1751	0	1751	1448	303
O	1988	1435	0	1435	459	976
O	1989	1130	0	1130	1055	75
O	1990	1199	0	1199	998	101
O	1991	869	0	869	850	19
O	1992	1364	0	1364	1280	84
O	1993	1113	0	1113	1110	3
O	1994	750	0	750	200	45
O	1995	847	0	847	794	2
O	1996	1199	0	1199	1093	69
O	1997	2083	46	2129	1554	8
O	1998	1895	0	1895	1641	59
O	1999	1685	0	1685	1516	1
O	2000	671	1	672	491	5
O	2001	1070	0	1070	772	16
O	2002	1173	0	1173	1008	4
O	2003	272	1	273	241	0
O	2004	354	0	354	333	3
O	2005	350	0	350	342	1
O	2006	358	2	360	240	79
O	2007	121	1	122	108	8
O	2008	202	0	202	195	8
O	2009	483	4	487	485	1
O	2010	365	0	365	340	0

Table 60: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2011	418	0	418	390	7
O	2012	494	0	494	493	1
O	2013	1173	2	1175	1150	7
O	2014	1322	0	1322	1319	4
O	2015	1909	3	1912	1571	69
O	2016	1289	1	1290	0	1237
O	2017	3037	0	3037	0	2849
O	2018	2335	7	2342	0	2117
O	2019	2350	1	2351	0	2179
O	2020	1138	3	1141	0	1106
O	2021	1506	0	1506	0	1390

Table 61: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	2106	0	2106	921	1140
W	1981	2232	0	2232	1633	594
W	1982	1461	0	1461	1337	104
W	1983	1833	0	1833	1775	0
W	1984	2719	0	2719	2660	0
W	1985	1892	0	1892	1689	100
W	1986	2644	2	2646	2644	0
W	1987	1684	0	1684	1631	0
W	1988	1418	0	1418	1416	0
W	1989	1016	0	1016	1003	0
W	1990	902	0	902	902	0
W	1991	2618	0	2618	2502	0
W	1992	1508	1	1509	1509	0
W	1993	1854	0	1854	1848	0
W	1994	750	0	750	749	0
W	1995	1100	0	1100	1100	0
W	1996	788	1	789	787	0
W	1997	847	23	870	846	0
W	1998	921	1	922	905	0
W	1999	749	10	759	743	0
W	2000	239	3	242	237	0

Table 61: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2001	320	136	456	453	0
W	2002	671	40	711	708	0
W	2003	297	0	297	297	0
W	2004	393	1	394	378	0
W	2005	426	0	426	424	0
W	2006	490	0	490	488	0
W	2007	504	0	504	502	0
W	2008	437	4	441	441	0
W	2009	401	0	401	396	0
W	2010	315	0	315	310	0
W	2011	372	0	372	343	0
W	2012	441	14	455	436	0
W	2013	396	0	396	344	0
W	2014	127	0	127	81	0
W	2015	551	3	554	547	0
W	2016	444	0	444	444	0
W	2017	1615	2	1617	1581	0
W	2018	1029	1	1030	840	0
W	2019	769	1	770	0	0
W	2020	370	0	370	0	0
W	2021	754	1	755	0	0

13.2 recreational fisheries

Table 62: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	35	35	0	0
C	2004	0	243	243	0	0
C	2005	0	406	406	0	0
C	2006	0	606	606	0	0

Table 62: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2007	0	357	357	0	0
C	2008	0	176	176	0	0
C	2009	0	407	407	0	0
C	2010	0	389	389	0	0
C	2011	1	894	895	0	0
C	2012	0	548	548	0	0
C	2013	0	575	575	0	0
C	2014	0	488	488	0	0
C	2015	0	829	829	0	0
C	2016	0	577	577	0	0
C	2017	0	3393	3393	0	0
C	2018	0	2902	2902	0	122
C	2019	1	3037	3038	0	41
C	2021	0	2187	2187	0	0

Table 63: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1999	393	0	393	0	0
O	2000	367	0	367	0	0
O	2001	18	1005	1023	0	18
O	2002	0	1540	1540	0	0
O	2003	0	1885	1885	0	0
O	2004	0	139	139	0	0
O	2005	0	207	207	0	0
O	2006	1	216	217	0	0
O	2007	1	138	139	0	0
O	2008	0	206	206	0	0
O	2009	1	218	219	0	0
O	2010	0	194	194	0	0
O	2011	0	137	137	0	0
O	2012	1	213	214	0	0
O	2013	0	202	202	0	0
O	2014	0	244	244	0	0
O	2015	615	2291	2906	0	618
O	2016	500	1875	2375	0	506

Table 63: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2017	699	3423	4122	0	703
O	2018	559	4114	4673	0	559
O	2019	584	3958	4542	0	592
O	2020	575	359	934	0	587
O	2021	0	3639	3639	0	0

Table 64: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	142	56	198	0	0
W	2003	201	28	229	0	0
W	2004	40	4	44	40	0
W	2005	44	7	51	44	0
W	2006	4	11	15	4	0
W	2007	7	3	10	7	0
W	2008	10	3	13	9	1
W	2009	8	5	13	8	0
W	2010	11	1	12	11	0
W	2011	1	10	11	1	0
W	2012	7	2	9	7	0
W	2013	0	6	6	0	0
W	2014	8	0	8	8	0
W	2015	5	32	37	5	0
W	2016	4	27	31	4	0
W	2017	1194	109	1303	1193	1
W	2018	436	267	703	228	204
W	2019	935	520	1455	0	934
W	2020	450	12	462	0	449
W	2021	1066	28	1094	0	1059

13.3 NWFSC WCGBT

Table 65: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	50	423	0	423	262	16
2004	37	482	0	482	254	1
2005	53	529	1	530	231	0
2006	32	622	1	623	247	0
2007	48	672	1	673	497	0
2008	35	701	91	792	452	0
2009	32	301	5	306	239	1
2010	51	432	63	495	397	0
2011	45	569	4	573	364	1
2012	56	799	53	852	596	1
2013	38	480	32	512	376	1
2014	75	1457	10	1467	901	9
2015	77	1061	3	1064	0	738
2016	80	1046	9	1055	605	0
2017	84	955	15	970	0	528
2018	65	716	3	719	0	475
2019	40	544	0	544	0	360
2021	52	417	113	530	0	418

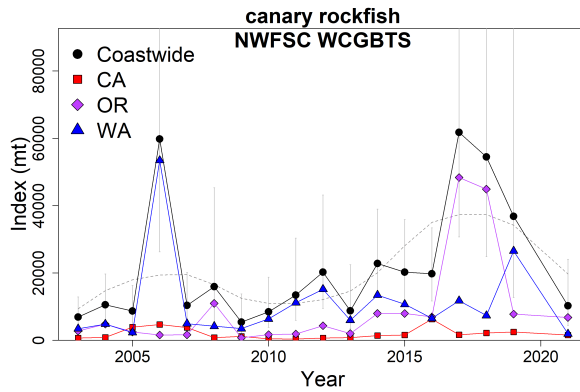


Figure 15: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

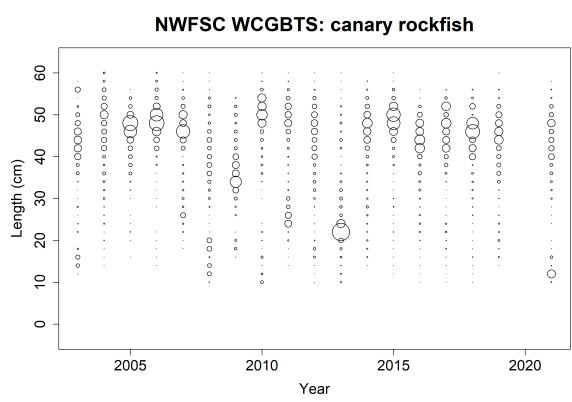


Figure 16: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

13.4 NWFSC HKL

Table 66: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	12	21	0	21	21	0
2005	6	20	0	20	20	0
2006	7	11	0	11	11	0
2007	8	21	0	21	21	0
2008	3	4	0	4	4	0
2009	8	20	0	20	20	0
2010	7	16	0	16	16	0
2011	5	11	0	11	10	1
2012	4	12	0	12	12	0
2013	4	12	0	12	12	0
2014	7	26	0	26	26	0
2015	9	21	0	21	19	1
2016	7	11	0	11	0	11
2017	9	15	0	15	0	15
2018	12	41	0	41	0	41
2019	9	41	0	41	0	41
2021	6	12	0	12	0	12

14 Chilipepper rockfish

The most recent assessment of Chilipepper rockfish was a update assessment conducted in 2015. Across available data, Chilipepper rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 155,220 length observations, 53,454 age readings, and 2,990 otoliths that are available to be aged. In California, since 2000, a total of 42,389 length observations, 8,784 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 3,095 length observations, 0 age readings, and 2,990 otoliths have been collected. In Washington, since 2000, a total of 75 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 6,990 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 6,939 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 39 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 1 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 32,973 length observations, 8,654 age readings, and 3,574 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 2,243 length observations, 0 age readings, and 2,027 otoliths that are available to be aged.

14.1 commercial fisheries

Table 67: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1649	100	1749	1079	0
C	1981	981	112	1093	701	0
C	1982	2206	227	2433	1220	0
C	1983	2704	287	2991	2384	0
C	1984	5163	777	5940	3618	0
C	1985	8143	456	8599	3640	0
C	1986	5016	97	5113	2598	0
C	1987	5078	190	5268	2932	0
C	1988	5144	198	5342	2653	0
C	1989	5237	279	5516	2906	0
C	1990	5898	161	6059	2152	0
C	1991	9242	674	9916	2120	0
C	1992	6032	1692	7724	3232	0
C	1993	4777	4402	9179	2650	0
C	1994	2969	5475	8444	1248	0
C	1995	2541	2789	5330	1712	0
C	1996	2801	2006	4807	1029	0
C	1997	3322	3021	6343	1990	0
C	1998	3440	824	4264	2550	0
C	1999	3115	350	3465	2256	0
C	2000	1620	450	2070	1159	0
C	2001	1685	712	2397	896	0
C	2002	1734	163	1897	1068	0
C	2003	406	133	539	312	0
C	2004	1439	400	1839	1045	0
C	2005	405	72	477	349	0
C	2006	554	166	720	0	0
C	2007	1839	347	2186	725	0
C	2008	1409	432	1841	567	0
C	2009	2354	777	3131	892	0
C	2010	1405	686	2091	491	0
C	2011	9	565	574	8	0
C	2012	499	860	1359	427	0
C	2013	709	506	1215	487	0
C	2014	786	478	1264	358	0
C	2015	367	1157	1524	0	0
C	2016	330	1055	1385	0	0
C	2017	687	621	1308	0	0
C	2018	1823	1169	2992	0	0
C	2019	2903	1728	4631	0	0

Table 67: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	2480	1180	3660	0	0
C	2021	1615	1674	3289	0	0

Table 68: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1998	82	0	82	0	0
O	2001	18	0	18	0	18
O	2003	15	0	15	0	15
O	2005	30	0	30	0	30
O	2007	3	0	3	0	1
O	2009	224	0	224	0	224
O	2010	77	0	77	0	77
O	2011	36	0	36	0	5
O	2012	46	0	46	0	46
O	2013	42	0	42	0	42
O	2014	41	0	41	0	41
O	2015	162	0	162	0	162
O	2016	140	0	140	0	140
O	2017	678	0	678	0	678
O	2018	452	0	452	0	438
O	2019	645	0	645	0	596
O	2020	176	0	176	0	176
O	2021	310	0	310	0	301

Table 69: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1997	0	1	1	0	0
W	1999	0	3	3	0	0
W	2017	33	0	33	0	0

Table 69: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2018	5	0	5	0	0
W	2019	4	0	4	0	0
W	2020	4	0	4	0	0
W	2021	29	0	29	0	0

14.2 recreational fisheries

Table 70: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	298	298	0	0
C	2005	0	293	293	0	0
C	2006	0	333	333	0	0
C	2007	0	487	487	0	0
C	2008	1	300	301	0	0
C	2009	0	231	231	0	0
C	2010	0	358	358	0	0
C	2011	0	635	635	0	0
C	2012	0	707	707	0	0
C	2013	0	738	738	0	0
C	2014	0	669	669	0	0
C	2015	0	442	442	0	0
C	2016	0	435	435	0	0
C	2017	0	204	204	0	0
C	2018	0	239	239	0	0
C	2019	0	331	331	0	0
C	2020	0	54	54	0	0
C	2021	0	184	184	0	0

Table 71: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	8	8	0	0
O	2002	0	3	3	0	0
O	2003	0	2	2	0	0
O	2004	0	1	1	0	0
O	2007	0	2	2	0	0
O	2008	0	2	2	0	0
O	2009	0	2	2	0	0
O	2012	0	1	1	0	0
O	2013	0	3	3	0	0
O	2018	0	6	6	0	0
O	2021	0	20	20	0	0

Table 72: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2019	0	1	1	0	0

14.3 NWFSC WCGBT

Table 73: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	85	2472	136	2608	677	17
2004	80	3214	251	3465	758	5
2005	86	3576	128	3704	833	1
2006	70	2630	66	2696	611	0

Table 73: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2007	68	2472	23	2495	590	1
2008	80	2192	17	2209	698	2
2009	79	1757	358	2115	619	0
2010	106	1666	425	2091	806	15
2011	81	980	78	1058	647	2
2012	102	1145	132	1277	847	0
2013	94	891	193	1084	684	0
2014	126	1619	121	1740	884	2
2015	103	912	140	1052	0	619
2016	111	1176	269	1445	0	720
2017	93	867	38	905	0	540
2018	94	980	7	987	0	530
2019	52	658	1	659	0	350
2021	127	1022	361	1383	0	770

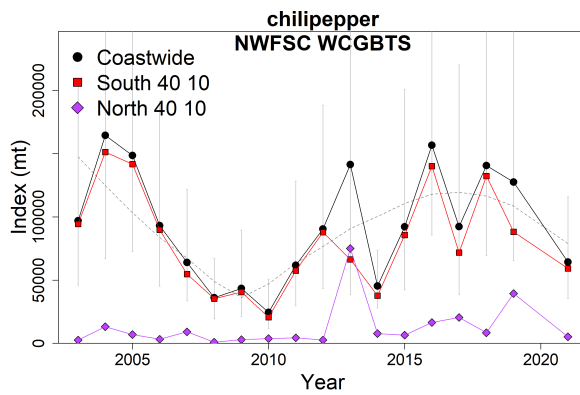


Figure 17: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

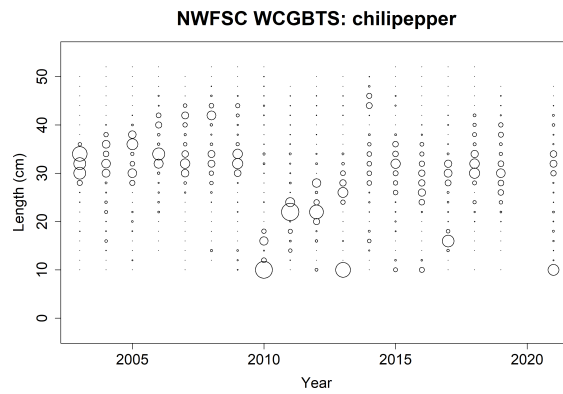


Figure 18: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

14.4 NWFSC HKL

Table 74: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	13	67	0	67	0	67
2005	14	71	3	74	0	74
2006	12	44	0	44	0	44
2007	14	82	1	83	0	80
2008	16	89	0	89	0	83
2009	13	86	0	86	0	82
2010	15	50	0	50	0	0
2011	22	122	12	134	0	56
2012	23	75	2	77	0	77
2013	13	72	1	73	0	73
2014	32	167	5	172	0	172
2015	34	169	0	169	0	168
2016	30	143	0	143	0	142
2017	43	306	0	306	0	296
2018	34	263	0	263	0	261
2019	36	265	15	280	0	223
2021	25	133	0	133	0	129

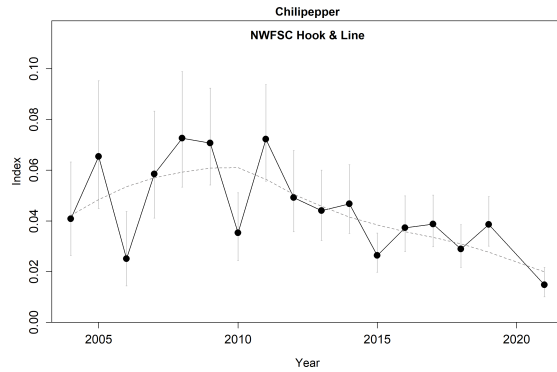


Figure 19: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

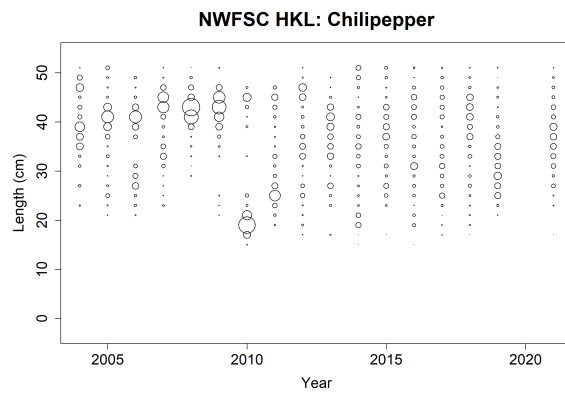


Figure 20: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

15 China rockfish

The most recent assessment of China rockfish was a full assessment conducted in 2015. Across available data, China rockfish have been observed and sampled generally by both commercial and recreational fisheries.

Across all years of available data, commercial fisheries have collected a total of 19,660 length observations, 1,395 age readings, and 1,110 otoliths that are available to be aged. In California, since 2000, a total of 1,649 length observations, 0 age readings, and 4 otoliths have been collected. In Oregon, since 2000, a total of 15,798 length observations, 1,395 age readings, and 1,106 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 34,032 length observations, 2,254 age readings, and 2,564 otoliths that are available to be aged. In California, since 2003, a total of 16,500 length observations, 0 age readings, and 20 otoliths have been collected. In Oregon, since 2003, a total of 12,239 length observations, 1,042 age readings, and 1,226 otoliths have been collected. In Washington, since 2003, a total of 4,207 length observations, 1,201 age readings, and 1,318 otoliths have been collected.

15.1 commercial fisheries

Table 75: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1985	0	2	2	0	0
C	1991	0	2	2	0	0
C	1992	0	314	314	0	0
C	1993	0	185	185	0	0
C	1994	0	352	352	0	0
C	1995	0	142	142	0	0

Table 75: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1996	1	172	173	0	0
C	1997	0	181	181	0	0
C	1998	0	47	47	0	0
C	1999	0	324	324	0	0
C	2000	0	152	152	0	0
C	2001	0	164	164	0	0
C	2002	1	96	97	0	0
C	2003	0	26	26	0	0
C	2004	0	95	95	0	0
C	2005	0	103	103	0	0
C	2006	0	73	73	0	0
C	2007	0	247	247	0	0
C	2008	2	185	187	0	0
C	2009	1	208	209	0	1
C	2010	2	127	129	0	1
C	2011	0	18	18	0	0
C	2012	0	13	13	0	0
C	2013	0	8	8	0	0
C	2014	0	3	3	0	0
C	2015	0	23	23	0	0
C	2016	0	67	67	0	0
C	2017	1	14	15	0	1
C	2018	0	10	10	0	0
C	2019	0	2	2	0	0
C	2020	0	2	2	0	0
C	2021	0	6	6	0	1

Table 76: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1995	10	92	102	0	0
O	1996	118	0	118	0	0
O	1998	138	0	138	0	0
O	1999	130	0	130	0	0
O	2000	1232	0	1232	0	1
O	2001	2053	0	2053	63	9

Table 76: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2002	1588	4	1592	123	2
O	2003	987	0	987	181	4
O	2004	701	0	701	55	3
O	2005	217	0	217	14	2
O	2006	430	8	438	29	1
O	2007	724	0	724	40	0
O	2008	376	0	376	26	8
O	2009	430	0	430	80	0
O	2010	528	1	529	65	2
O	2011	993	0	993	307	2
O	2012	602	1	603	152	1
O	2013	676	12	688	260	8
O	2014	520	0	520	0	166
O	2015	473	2	475	0	97
O	2016	473	0	473	0	84
O	2017	441	1	442	0	83
O	2018	520	0	520	0	125
O	2019	826	2	828	0	321
O	2020	374	4	378	0	83
O	2021	599	0	599	0	104

Table 77: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	0	3	3	0	0

15.2 recreational fisheries

Table 78: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	6	6	0	0
C	2004	0	498	498	0	0
C	2005	0	747	747	0	0
C	2006	0	957	957	0	0
C	2007	0	1076	1076	0	0
C	2008	0	1445	1445	0	0
C	2009	0	1601	1601	0	0
C	2010	0	1308	1308	0	0
C	2011	0	1408	1408	0	0
C	2012	0	1137	1137	0	0
C	2013	2	773	775	0	0
C	2014	0	772	772	0	0
C	2015	0	1006	1006	0	0
C	2016	1	1084	1085	0	0
C	2017	0	855	855	0	0
C	2018	0	749	749	0	8
C	2019	0	680	680	0	11
C	2021	0	395	395	0	1

Table 79: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	373	373	0	0
O	2002	0	644	644	0	0
O	2003	0	685	685	0	0
O	2004	0	398	398	0	0
O	2005	56	621	677	110	0
O	2006	190	719	909	248	0
O	2007	264	901	1165	60	204
O	2008	266	913	1179	60	209
O	2009	180	658	838	62	121
O	2010	173	744	917	60	115
O	2011	232	892	1124	236	1
O	2012	208	848	1056	60	148
O	2013	147	792	939	146	1
O	2014	73	322	395	0	73

Table 79: Data collected annually from the recreational fisheries in Oregon. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2015	0	28	28	0	0
O	2016	0	13	13	0	0
O	2017	67	320	387	0	68
O	2018	107	476	583	0	108
O	2019	131	454	585	0	132
O	2020	46	39	85	0	46
O	2021	0	276	276	0	0

Table 80: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	35	34	69	11	0
W	2003	18	42	60	0	0
W	2004	181	42	223	171	4
W	2005	211	152	363	206	3
W	2006	103	174	277	89	0
W	2007	151	69	220	119	0
W	2008	78	65	143	73	0
W	2009	38	80	118	22	0
W	2010	36	42	78	22	0
W	2011	53	129	182	50	0
W	2012	14	63	77	24	1
W	2013	22	150	172	11	0
W	2014	439	2	441	414	2
W	2015	260	10	270	0	260
W	2016	236	2	238	0	236
W	2017	114	163	277	0	112
W	2018	191	151	342	0	189
W	2019	304	201	505	0	302
W	2020	85	1	86	0	85
W	2021	124	11	135	0	124

16 Copper rockfish

The most recent assessment of Copper rockfish was a data-moderate assessment conducted in 2021. Across available data, Copper rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 9,181 length observations, 354 age readings, and 200 otoliths that are available to be aged. In California, since 2000, a total of 2,613 length observations, 0 age readings, and 16 otoliths have been collected. In Oregon, since 2000, a total of 1,540 length observations, 352 age readings, and 97 otoliths have been collected. In Washington, since 2000, a total of 7 length observations, 2 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 78,236 length observations, 3,992 age readings, and 427 otoliths that are available to be aged. In California, since 2003, a total of 60,903 length observations, 0 age readings, and 46 otoliths have been collected. In Oregon, since 2003, a total of 13,178 length observations, 2,298 age readings, and 89 otoliths have been collected. In Washington, since 2003, a total of 3,235 length observations, 1,675 age readings, and 292 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 1,142 length observations, 187 age readings, and 595 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 1,141 length observations, 0 age readings, and 1,110 otoliths that are available to be aged.

16.1 commercial fisheries

Table 81: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	7	27	34	0	14
C	1981	0	4	4	0	0
C	1982	6	0	6	0	7
C	1983	7	8	15	0	12
C	1984	25	18	43	0	28
C	1985	1	27	28	0	23
C	1986	5	31	36	0	2
C	1987	8	14	22	0	1
C	1988	2	25	27	0	0
C	1989	0	24	24	0	0
C	1990	1	1	2	0	0
C	1991	1	125	126	0	0
C	1992	0	664	664	0	0
C	1993	11	797	808	0	0
C	1994	0	354	354	0	0
C	1995	0	450	450	0	0
C	1996	0	479	479	0	0
C	1997	0	525	525	0	0
C	1998	1	578	579	0	0
C	1999	29	538	567	0	0
C	2000	0	91	91	0	0
C	2001	0	245	245	0	0
C	2002	0	76	76	0	0
C	2003	5	85	90	0	1
C	2004	14	22	36	0	6
C	2005	0	19	19	0	0
C	2006	0	19	19	0	0
C	2007	5	69	74	0	5
C	2008	0	72	72	0	0
C	2009	0	52	52	0	0
C	2010	0	83	83	0	0
C	2011	0	67	67	0	0
C	2012	1	72	73	0	1
C	2013	0	47	47	0	0
C	2014	1	79	80	0	1
C	2015	0	234	234	0	0
C	2016	0	265	265	0	0
C	2017	0	323	323	0	0
C	2018	5	165	170	0	0
C	2019	45	88	133	0	0

Table 81: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	40	49	89	0	0
C	2021	102	173	275	0	2

Table 82: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1999	9	0	9	0	0
O	2000	85	0	85	0	0
O	2001	92	0	92	0	0
O	2002	28	0	28	1	0
O	2003	39	0	39	9	0
O	2004	52	0	52	26	0
O	2005	11	0	11	0	0
O	2006	41	0	41	1	0
O	2007	31	1	32	1	1
O	2008	19	0	19	1	0
O	2009	14	0	14	0	1
O	2010	42	0	42	6	0
O	2011	79	0	79	18	0
O	2012	59	0	59	11	0
O	2013	63	0	63	31	0
O	2014	74	1	75	25	0
O	2015	26	0	26	10	0
O	2016	78	0	78	25	0
O	2017	101	1	102	40	1
O	2018	112	0	112	45	1
O	2019	218	1	219	102	3
O	2020	126	0	126	0	49
O	2021	146	0	146	0	41

Table 83: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1982	0	1	1	0	0
W	1989	0	118	118	0	0
W	1990	0	100	100	0	0
W	2004	1	0	1	0	0
W	2006	4	0	4	0	0
W	2017	2	0	2	2	0

16.2 recreational fisheries

Table 84: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	9	9	0	0
C	2004	0	977	977	0	0
C	2005	0	2050	2050	0	0
C	2006	1	3010	3011	0	0
C	2007	0	3760	3760	0	0
C	2008	0	3310	3310	0	0
C	2009	1	2781	2782	0	0
C	2010	0	2200	2200	0	0
C	2011	0	2864	2864	0	0
C	2012	0	3962	3962	0	0
C	2013	2	5630	5632	0	0
C	2014	1	4107	4108	0	0
C	2015	0	5114	5114	0	0
C	2016	0	4973	4973	0	0
C	2017	2	5702	5704	0	0
C	2018	3	4621	4624	0	27
C	2019	3	4240	4243	0	14
C	2020	0	95	95	0	0

Table 84: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2021	0	1485	1485	0	5

Table 85: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	196	196	0	0
O	2002	0	641	641	0	0
O	2003	0	518	518	0	0
O	2004	0	325	325	0	0
O	2005	59	696	755	58	0
O	2006	149	764	913	150	0
O	2007	189	799	988	188	0
O	2008	217	836	1053	217	0
O	2009	156	569	725	156	0
O	2010	274	790	1064	273	0
O	2011	233	867	1100	235	0
O	2012	216	944	1160	216	0
O	2013	158	570	728	158	0
O	2014	121	338	459	121	0
O	2015	0	32	32	0	0
O	2016	0	28	28	0	0
O	2017	176	566	742	177	0
O	2018	175	983	1158	175	0
O	2019	173	792	965	174	0
O	2020	89	34	123	0	89
O	2021	0	342	342	0	0

Table 86: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	61	22	83	19	0

Table 86: Data collected annually from the recreational fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2003	18	28	46	0	0
W	2004	203	41	244	188	0
W	2005	265	178	443	225	1
W	2006	96	73	169	65	0
W	2007	110	42	152	86	0
W	2008	71	20	91	65	0
W	2009	52	19	71	35	0
W	2010	38	19	57	24	0
W	2011	28	99	127	27	0
W	2012	38	43	81	35	0
W	2013	14	57	71	8	2
W	2014	132	4	136	123	9
W	2015	83	1	84	74	4
W	2016	158	21	179	169	5
W	2017	110	102	212	101	7
W	2018	190	125	315	176	3
W	2019	275	188	463	274	1
W	2020	76	1	77	0	76
W	2021	184	33	217	0	184

16.3 NWFSC WCGBT

Table 87: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	7	25	0	25	0	0
2004	5	71	0	71	20	51
2005	5	19	3	22	1	21
2006	3	10	0	10	2	8
2007	5	13	0	13	8	5
2008	11	44	0	44	14	30

Table 87: Data collected annually from the NWFSC WCGBT survey. *(continued)*

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2009	7	27	0	27	20	7
2010	10	17	1	18	1	17
2011	4	12	0	12	9	3
2012	19	234	7	241	42	61
2013	9	98	0	98	2	32
2014	8	40	0	40	4	29
2015	9	111	2	113	16	23
2016	9	53	43	96	28	49
2017	12	125	1	126	20	82
2018	11	62	0	62	0	53
2019	7	32	0	32	0	32
2021	17	91	1	92	0	92

16.4 NWFSC HKL

Table 88: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	11	33	0	33	0	33
2005	14	70	0	70	0	69
2006	12	58	0	58	0	58
2007	18	77	0	77	0	76
2008	22	67	0	67	0	67
2009	21	104	0	104	0	101
2010	14	24	0	24	0	23
2011	23	56	0	56	0	53
2012	22	63	0	63	0	62
2013	29	46	0	46	0	46
2014	29	52	1	53	0	48
2015	38	99	0	99	0	98
2016	39	108	1	109	0	108
2017	31	75	0	75	0	69
2018	30	108	0	108	0	105
2019	32	64	1	65	0	63
2021	24	34	0	34	0	31

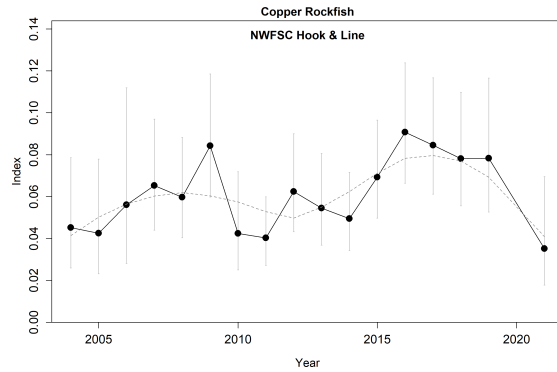


Figure 21: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

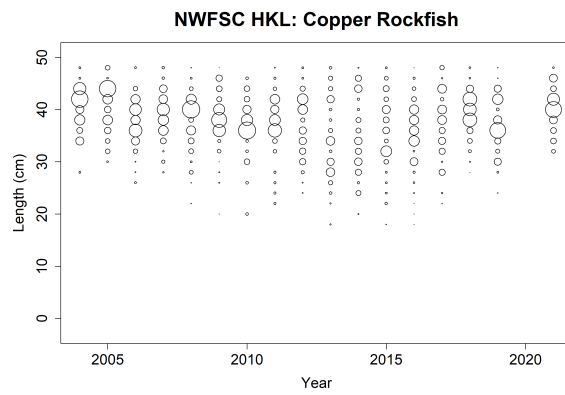


Figure 22: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

17 Cowcod

The most recent assessment of Cowcod was a full assessment conducted in 2019. Across available data, Cowcod have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 4,413 length observations, 108 age readings, and 43 otoliths that are available to be aged. In California, since 2000, a total of 1,259 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 45 length observations, 0 age readings, and 43 otoliths have been collected. In Washington, since 2000, a total of 1 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 190 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 190 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 828 length observations, 468 age readings, and 349 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 760 length observations, 440 age readings, and 293 otoliths that are available to be aged.

17.1 commercial fisheries

Table 89: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1	40	41	0	0
C	1981	4	15	19	0	0
C	1982	6	2	8	4	0
C	1983	13	222	235	3	0
C	1984	56	430	486	25	0
C	1985	49	483	532	45	0
C	1986	172	278	450	31	0
C	1987	99	91	190	0	0
C	1988	33	42	75	0	0
C	1989	12	54	66	0	0
C	1990	21	16	37	0	0
C	1991	80	25	105	0	0
C	1992	23	150	173	0	0
C	1993	8	65	73	0	0
C	1994	2	53	55	0	0
C	1995	1	125	126	0	0
C	1996	6	142	148	0	0
C	1997	28	131	159	0	0
C	1998	25	32	57	0	0
C	1999	21	52	73	0	0
C	2000	0	7	7	0	0
C	2001	12	2	14	0	0
C	2002	10	0	10	0	0
C	2003	4	0	4	0	0
C	2004	27	2	29	0	0
C	2005	2	0	2	0	0
C	2007	2	1	3	0	0
C	2011	0	1	1	0	0
C	2012	32	14	46	0	0
C	2013	19	5	24	0	0
C	2014	26	28	54	0	0
C	2015	58	103	161	0	0
C	2016	59	21	80	0	0
C	2017	16	39	55	0	0
C	2018	31	90	121	0	0
C	2019	12	101	113	0	0
C	2020	7	151	158	0	0
C	2021	149	228	377	0	0

Table 90: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2000	2	0	2	0	0
O	2012	1	0	1	0	1
O	2018	7	0	7	0	7
O	2019	12	0	12	0	12
O	2020	14	0	14	0	14
O	2021	9	0	9	0	9

Table 91: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2009	1	0	1	0	0

17.2 recreational fisheries

Table 92: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	8	8	0	0
C	2005	0	4	4	0	0
C	2006	0	10	10	0	0
C	2007	0	3	3	0	0
C	2008	0	6	6	0	0
C	2009	0	12	12	0	0
C	2010	0	8	8	0	0
C	2011	0	32	32	0	0
C	2012	0	11	11	0	0

Table 92: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2013	0	18	18	0	0
C	2014	0	4	4	0	0
C	2015	0	7	7	0	0
C	2016	0	12	12	0	0
C	2017	0	18	18	0	0
C	2018	0	14	14	0	0
C	2019	1	11	12	0	0
C	2020	0	2	2	0	0
C	2021	0	9	9	0	0

17.3 NWFSC WCGBT

Table 93: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	7	13	0	13	13	0
2004	20	64	0	64	24	40
2005	21	27	3	30	25	5
2006	11	25	0	25	25	0
2007	9	25	0	25	21	4
2008	11	13	3	16	16	0
2009	14	20	3	23	22	1
2010	29	45	15	60	58	2
2011	20	26	3	29	29	0
2012	24	72	1	73	73	0
2013	12	15	11	26	23	1
2014	22	74	3	77	75	2
2015	17	30	0	30	30	0
2016	32	62	3	65	0	65
2017	17	31	3	34	34	0
2018	32	113	3	116	0	107

Table 93: Data collected annually from the NWFSC WCGBT survey. *(continued)*

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2019	16	89	0	89	0	89
2021	20	31	2	33	0	33

17.4 NWFSC HKL

Table 94: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	4	5	0	5	5	0
2005	10	17	0	17	17	0
2006	8	10	0	10	10	0
2007	13	23	0	23	23	0
2008	12	22	0	22	21	0
2009	17	30	0	30	30	0
2010	10	21	0	21	21	0
2011	8	24	0	24	22	2
2012	15	35	1	36	35	1
2013	10	31	0	31	31	0
2014	20	30	0	30	24	1
2015	43	110	0	110	95	0
2016	27	48	0	48	46	0
2017	29	62	0	62	60	1
2018	41	100	0	100	0	101
2019	33	93	0	93	0	93
2021	38	98	0	98	0	94

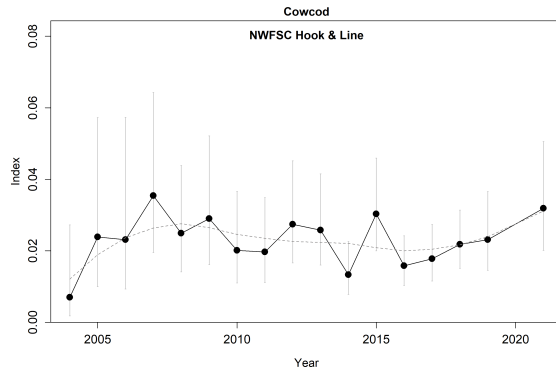


Figure 23: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

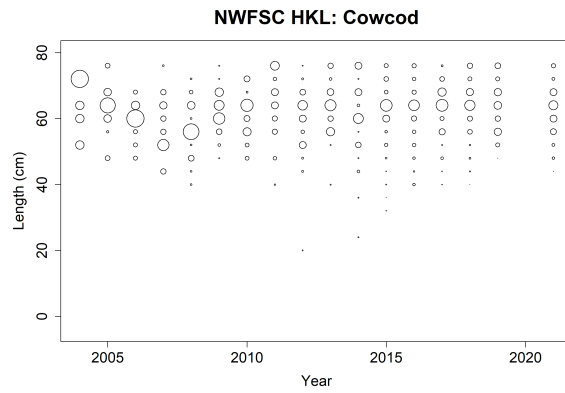


Figure 24: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

18 Curlfin sole

To date, no assessment or analysis has been conducted on Curlfin sole. Across available data, Curlfin sole have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 1,873 length observations, 0 age readings, and 289 otoliths that are available to be aged. In California, since 2000, a total of 1,498 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 374 length observations, 0 age readings, and 289 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 9,808 length observations, 0 age readings, and 1,611 otoliths that are available to be aged.

18.1 commercial fisheries

Table 95: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1999	0	1	1	0	0
C	2003	4	0	4	0	0
C	2004	0	27	27	0	0
C	2005	1	1	2	0	0
C	2006	79	0	79	0	0
C	2007	15	0	15	0	0
C	2008	9	0	9	0	0
C	2009	23	0	23	0	0
C	2010	32	14	46	0	0
C	2011	2	2	4	0	0

Table 95: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2013	19	0	19	0	0
C	2014	140	13	153	0	0
C	2015	67	78	145	0	0
C	2016	155	63	218	0	0
C	2017	83	250	333	0	0
C	2018	228	0	228	0	0
C	2019	22	5	27	0	0
C	2020	1	17	18	0	0
C	2021	148	0	148	0	0

Table 96: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2004	44	0	44	0	31
O	2009	73	0	73	0	43
O	2010	32	0	32	0	0
O	2011	5	0	5	0	2
O	2012	54	0	54	0	54
O	2013	44	0	44	0	44
O	2014	55	0	55	0	55
O	2015	3	0	3	0	3
O	2016	24	0	24	0	24
O	2017	7	0	7	0	0
O	2018	30	0	30	0	30
O	2019	3	0	3	0	3

18.2 NWFSC WCGBT

Table 97: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	55	556	1	557	0	0
2004	49	546	1	547	0	0
2005	69	439	0	439	0	0
2006	42	288	1	289	0	0
2007	47	180	0	180	0	0
2008	60	294	2	296	0	262
2009	76	302	0	302	0	297
2010	64	317	0	317	0	0
2011	86	505	1	506	0	0
2012	108	1018	1	1019	0	0
2013	73	777	0	777	0	0
2014	96	1182	1	1183	0	0
2015	97	835	2	837	0	359
2016	99	806	14	820	0	344
2017	89	597	5	602	0	0
2018	86	482	0	482	0	0
2019	33	179	0	179	0	104
2021	81	476	0	476	0	245

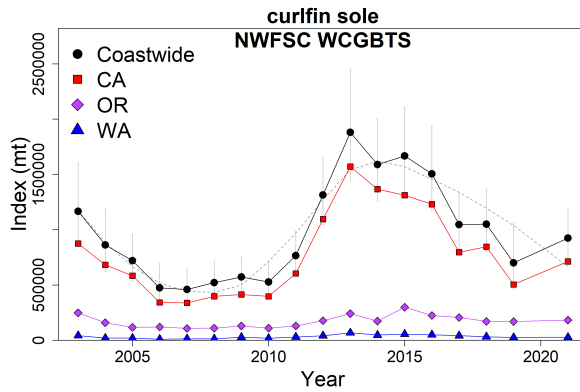


Figure 25: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

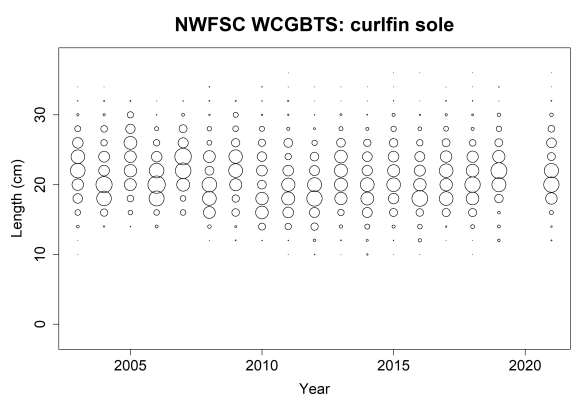


Figure 26: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

19 Darkblotched rockfish

The most recent assessment of Darkblotched rockfish was a update assessment conducted in 2017. Across available data, Darkblotched rockfish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 110,758 length observations, 48,775 age readings, and 44,207 otoliths that are available to be aged. In California, since 2000, a total of 26,058 length observations, 7,662 age readings, and 6,897 otoliths have been collected. In Oregon, since 2000, a total of 43,543 length observations, 24,288 age readings, and 15,571 otoliths have been collected. In Washington, since 2000, a total of 12,213 length observations, 4,521 age readings, and 150 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 32,207 length observations, 11,727 age readings, and 2,243 otoliths that are available to be aged.

19.1 commercial fisheries

Table 98: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	222	19	241	199	121
C	1981	231	3	234	198	197
C	1982	473	1	474	414	440
C	1983	792	0	792	527	765
C	1984	1925	0	1925	1	1798
C	1985	3555	7	3562	3450	4185
C	1986	2490	1	2491	223	2373
C	1987	2645	60	2705	1072	2225
C	1988	1339	4	1343	376	1673

Table 98: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1989	1098	9	1107	0	1082
C	1990	927	11	938	865	818
C	1991	809	8	817	407	287
C	1992	421	8	429	0	431
C	1993	550	57	607	510	473
C	1994	450	160	610	436	423
C	1995	787	48	835	396	559
C	1996	1052	41	1093	829	781
C	1997	979	38	1017	861	810
C	1998	1312	121	1433	934	927
C	1999	761	61	822	549	500
C	2000	869	37	906	575	570
C	2001	1932	213	2145	625	479
C	2002	990	132	1122	773	645
C	2003	494	99	593	379	293
C	2004	566	57	623	289	438
C	2005	772	4	776	699	494
C	2006	1582	180	1762	1309	834
C	2007	1629	362	1991	668	556
C	2008	1877	395	2272	394	310
C	2009	1304	250	1554	537	452
C	2010	793	351	1144	284	238
C	2011	633	323	956	443	330
C	2012	782	345	1127	511	426
C	2013	380	160	540	176	176
C	2014	405	262	667	0	110
C	2015	364	625	989	0	149
C	2016	848	407	1255	0	289
C	2017	1537	420	1957	0	108
C	2018	945	169	1114	0	0
C	2019	464	176	640	0	0
C	2020	566	252	818	0	0
C	2021	1033	74	1107	0	0

Table 99: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1982	150	0	150	0	150
O	1984	70	0	70	0	70
O	1985	0	201	201	0	201
O	1990	100	0	100	0	100
O	1991	200	0	200	0	200
O	1994	200	0	200	0	0
O	1995	188	0	188	0	0
O	1996	833	0	833	0	0
O	1997	802	0	802	33	0
O	1998	541	0	541	0	0
O	1999	430	0	430	24	0
O	2000	224	0	224	183	3
O	2001	1005	0	1005	843	1
O	2002	611	0	611	610	1
O	2003	1398	49	1447	1211	5
O	2004	1305	0	1305	753	302
O	2005	1275	0	1275	912	1
O	2006	1457	0	1457	1219	87
O	2007	2155	0	2155	1773	34
O	2008	2689	0	2689	2349	6
O	2009	2828	1	2829	2622	9
O	2010	2855	1	2856	2302	50
O	2011	2570	0	2570	2434	34
O	2012	2309	0	2309	2263	11
O	2013	2319	0	2319	927	1327
O	2014	2470	3	2473	2369	4
O	2015	3189	0	3189	1406	1530
O	2016	2467	3	2470	112	2274
O	2017	2620	1	2621	0	2452
O	2018	2492	6	2498	0	2373
O	2019	2305	3	2308	0	2268
O	2020	1297	0	1297	0	1165
O	2021	1608	28	1636	0	1634

Table 100: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	370	370	0	0
W	1997	0	586	586	0	0
W	1998	317	139	456	0	0
W	1999	332	10	342	0	0
W	2000	652	1	653	0	0
W	2001	660	232	892	0	0
W	2002	1124	5	1129	389	0
W	2003	580	0	580	369	0
W	2004	605	11	616	365	50
W	2005	117	0	117	103	0
W	2006	397	108	505	294	0
W	2007	529	50	579	423	0
W	2008	350	0	350	243	0
W	2009	350	9	359	281	0
W	2010	206	3	209	120	0
W	2011	869	0	869	535	0
W	2012	739	29	768	466	0
W	2013	701	0	701	300	100
W	2014	409	1	410	237	0
W	2015	577	1	578	396	0
W	2016	487	0	487	0	0
W	2017	723	0	723	0	0
W	2018	543	0	543	0	0
W	2019	618	1	619	0	0
W	2020	263	7	270	0	0
W	2021	255	1	256	0	0

19.2 NWFSC WCGBT

Table 101: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	100	2371	4	2375	748	24
2004	90	1055	7	1062	595	0
2005	110	1972	11	1983	804	0
2006	130	1910	15	1925	940	4
2007	132	2060	26	2086	987	0
2008	111	1632	15	1647	762	0
2009	126	2268	30	2298	1159	0
2010	117	2224	15	2239	912	0
2011	108	1824	4	1828	796	2
2012	102	2166	39	2205	791	2
2013	89	1543	5	1548	687	3
2014	114	1420	97	1517	767	0
2015	132	2391	67	2458	1066	2
2016	118	2094	3	2097	713	1
2017	124	1696	34	1730	0	669
2018	105	1268	1	1269	0	585
2019	57	822	0	822	0	329
2021	122	1017	101	1118	0	622

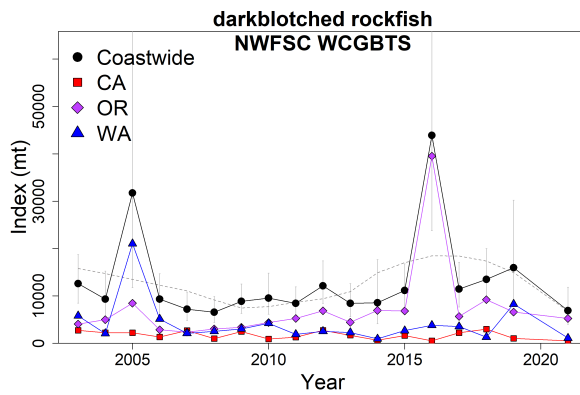


Figure 27: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

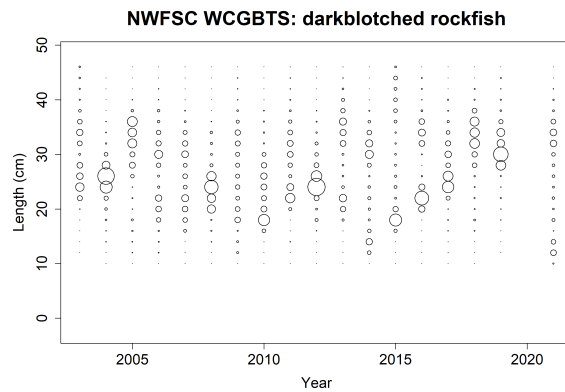


Figure 28: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

20 Dover sole

The most recent assessment of Dover sole was a full assessment conducted in 2021. Across available data, Dover sole have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 221,453 length observations, 87,738 age readings, and 54,066 otoliths that are available to be aged. In California, since 2000, a total of 46,968 length observations, 11,604 age readings, and 8,454 otoliths have been collected. In Oregon, since 2000, a total of 59,920 length observations, 10,194 age readings, and 32,214 otoliths have been collected. In Washington, since 2000, a total of 25,584 length observations, 8,560 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 171,580 length observations, 16,922 age readings, and 8,835 otoliths that are available to be aged.

20.1 commercial fisheries

Table 102: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1989	672	1	673	0	1525
C	1990	4069	0	4069	859	461
C	1991	5564	82	5646	1241	872
C	1992	5081	0	5081	1562	1174
C	1993	3316	10	3326	1105	946
C	1994	2887	42	2929	1083	1076
C	1995	3507	28	3535	1353	1460
C	1996	3591	29	3620	1649	871

Table 102: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1997	3537	16	3553	1742	1376
C	1998	3635	24	3659	1979	1244
C	1999	3366	23	3389	1779	1228
C	2000	2754	120	2874	2470	0
C	2001	2945	43	2988	2118	0
C	2002	4123	36	4159	2396	0
C	2003	3941	46	3987	2178	0
C	2004	3174	28	3202	388	0
C	2005	3254	32	3286	0	0
C	2006	2426	115	2541	423	0
C	2007	2347	147	2494	1010	1042
C	2008	2497	222	2719	270	975
C	2009	2507	426	2933	351	917
C	2010	983	209	1192	0	348
C	2011	1296	233	1529	0	349
C	2012	2180	248	2428	0	962
C	2013	2508	49	2557	0	772
C	2014	1863	133	1996	0	703
C	2015	1416	89	1505	0	732
C	2016	1007	172	1179	0	848
C	2017	532	41	573	0	339
C	2018	666	38	704	0	467
C	2019	562	130	692	0	0
C	2020	783	92	875	0	0
C	2021	520	35	555	0	0

Table 103: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1987	3926	0	3926	3706	220
O	1988	3090	0	3090	2990	100
O	1989	3165	0	3165	3063	102
O	1990	3250	0	3250	3099	151
O	1991	4687	0	4687	4675	12
O	1992	4124	0	4124	4026	49
O	1993	1608	0	1608	1602	6

Table 103: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1994	1887	1	1888	1880	8
O	1995	1702	0	1702	1615	87
O	1996	1204	38	1242	1229	13
O	1997	1795	0	1795	1650	78
O	1998	2129	0	2129	1721	312
O	1999	2197	0	2197	1923	27
O	2000	2137	1	2138	1711	20
O	2001	1684	0	1684	310	1301
O	2002	2264	0	2264	350	1218
O	2003	2789	0	2789	2163	125
O	2004	2889	0	2889	1188	1213
O	2005	2928	0	2928	624	1274
O	2006	3792	0	3792	749	1573
O	2007	3059	1	3060	899	949
O	2008	4004	1	4005	782	1783
O	2009	3146	0	3146	743	1584
O	2010	3161	31	3192	0	2007
O	2011	3099	0	3099	0	1894
O	2012	3173	0	3173	0	2337
O	2013	2825	0	2825	0	2015
O	2014	2712	4	2716	0	1885
O	2015	2488	0	2488	219	1659
O	2016	3069	30	3099	0	2098
O	2017	3302	0	3302	202	2077
O	2018	2469	1	2470	49	1765
O	2019	2093	0	2093	205	1507
O	2020	1417	0	1417	0	1112
O	2021	1349	2	1351	0	818

Table 104: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1985	1100	0	1100	589	0
W	1986	1099	0	1099	690	0
W	1987	949	1	950	693	0
W	1988	1100	0	1100	827	0

Table 104: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1989	999	0	999	554	0
W	1990	799	1	800	593	0
W	1991	900	0	900	434	0
W	1992	849	0	849	838	0
W	1993	850	0	850	745	0
W	1994	848	2	850	843	0
W	1995	1049	1	1050	1045	0
W	1996	999	1	1000	993	0
W	1997	994	6	1000	396	0
W	1998	951	1	952	302	0
W	1999	1198	1	1199	307	0
W	2000	1150	0	1150	300	0
W	2001	950	0	950	597	0
W	2002	899	2	901	440	0
W	2003	1131	0	1131	629	0
W	2004	949	1	950	919	0
W	2005	850	0	850	344	0
W	2006	800	350	1150	573	0
W	2007	2100	50	2150	637	0
W	2008	2130	4	2134	0	0
W	2009	1000	0	1000	0	0
W	2010	1193	7	1200	0	0
W	2011	1628	24	1652	889	0
W	2012	954	1	955	552	0
W	2013	1807	0	1807	898	0
W	2014	598	1	599	347	0
W	2015	1569	1	1570	417	0
W	2016	807	2	809	208	0
W	2017	2051	1	2052	278	0
W	2018	1223	0	1223	532	0
W	2019	803	5	808	0	0
W	2020	107	0	107	0	0
W	2021	436	0	436	0	0

20.2 NWFSC WCGBT

Table 105: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	440	22866	32	22898	957	2024
2004	402	17309	40	17349	952	1546
2005	547	17659	5	17664	989	1513
2006	528	13496	23	13519	970	1011
2007	577	11255	10	11265	984	1157
2008	553	6230	4	6234	948	124
2009	541	3566	7	3573	1034	20
2010	600	3206	33	3239	996	176
2011	570	8396	27	8423	1075	10
2012	559	8761	15	8776	1088	6
2013	413	7316	12	7328	809	9
2014	576	10152	25	10177	1123	7
2015	567	10010	60	10070	1088	9
2016	580	10126	34	10160	1120	6
2017	586	6210	13	6223	1141	15
2018	592	6015	16	6031	1161	5
2019	291	3033	1	3034	487	79
2021	576	5613	4	5617	0	1118

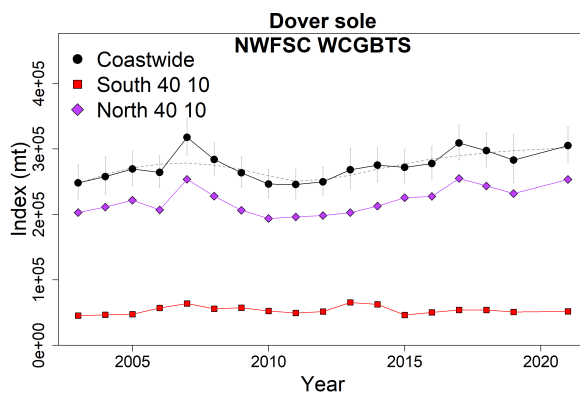


Figure 29: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

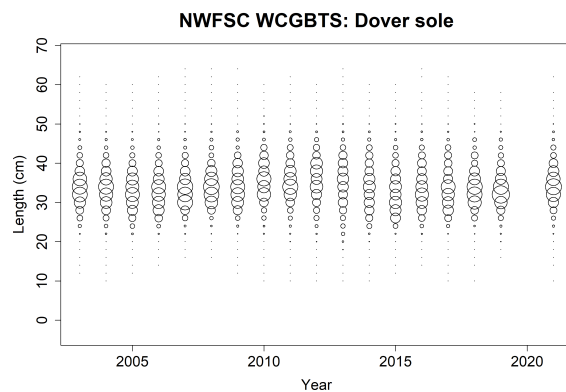


Figure 30: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

21 English sole

The most recent assessment of English sole was a data-moderate assessment conducted in 2013. Across available data, English sole have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 131,293 length observations, 7,970 age readings, and 26,999 otoliths that are available to be aged. In California, since 2000, a total of 23,701 length observations, 0 age readings, and 1,630 otoliths have been collected. In Oregon, since 2000, a total of 30,238 length observations, 0 age readings, and 14,308 otoliths have been collected. In Washington, since 2000, a total of 25,150 length observations, 5,404 age readings, and 5,525 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 82,093 length observations, 898 age readings, and 15,479 otoliths that are available to be aged.

21.1 commercial fisheries

Table 106: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1	0	1	0	3365
C	1982	1	0	1	0	1521
C	1991	62	0	62	0	0
C	2001	157	77	234	0	0
C	2002	116	0	116	0	0
C	2003	621	9	630	0	74
C	2004	991	1	992	0	56
C	2005	1135	62	1197	0	280
C	2006	1723	199	1922	0	60

Table 106: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2007	1774	87	1861	0	0
C	2008	1655	272	1927	0	187
C	2009	1251	256	1507	0	71
C	2010	641	303	944	0	20
C	2011	252	50	302	0	72
C	2012	604	273	877	0	32
C	2013	1243	265	1508	0	149
C	2014	821	100	921	0	142
C	2015	1714	302	2016	0	293
C	2016	1494	137	1631	0	134
C	2017	1750	133	1883	0	60
C	2018	728	94	822	0	0
C	2019	553	136	689	0	0
C	2020	675	192	867	0	0
C	2021	710	145	855	0	0

Table 107: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1987	1558	0	1558	1194	364
O	1988	954	0	954	668	286
O	1989	1301	0	1301	0	0
O	1990	1049	0	1049	0	0
O	1991	949	0	949	0	0
O	1992	803	0	803	0	0
O	1993	845	0	845	0	0
O	1994	838	0	838	0	0
O	1995	587	0	587	0	0
O	1996	863	0	863	0	0
O	1997	2170	0	2170	0	0
O	1998	1756	0	1756	0	0
O	1999	1775	0	1775	0	0
O	2000	1469	0	1469	0	0
O	2001	2412	0	2412	0	0
O	2002	2533	0	2533	0	0
O	2003	1589	0	1589	0	0

Table 107: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2004	1496	0	1496	0	0
O	2005	1954	0	1954	0	0
O	2006	2261	0	2261	0	60
O	2007	1079	0	1079	0	1019
O	2008	840	0	840	0	840
O	2009	1045	0	1045	0	955
O	2010	1377	2	1379	0	990
O	2011	990	0	990	0	960
O	2012	750	0	750	0	750
O	2013	1109	1	1110	0	1110
O	2014	1235	0	1235	0	1237
O	2015	1409	0	1409	0	1200
O	2016	1400	0	1400	0	1160
O	2017	1668	0	1668	0	1301
O	2018	1330	0	1330	0	1011
O	2019	1039	0	1039	0	759
O	2020	504	0	504	0	390
O	2021	746	0	746	0	566

Table 108: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	4749	0	4749	0	0
W	1981	2188	107	2295	0	0
W	1982	2937	100	3037	0	0
W	1983	1834	100	1934	0	0
W	1984	1645	0	1645	0	0
W	1985	2210	0	2210	0	0
W	1986	783	0	783	0	0
W	1987	1226	0	1226	0	0
W	1988	1121	0	1121	0	0
W	1989	1435	1	1436	0	0
W	1990	2078	93	2171	0	0
W	1991	2898	0	2898	0	0
W	1992	2144	100	2244	2	0
W	1993	2092	0	2092	454	0

Table 108: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1994	1149	0	1149	138	0
W	1995	1228	0	1228	18	0
W	1996	729	107	836	39	0
W	1997	1237	98	1335	43	0
W	1998	1303	2	1305	10	0
W	1999	996	2	998	0	0
W	2000	999	1	1000	0	0
W	2001	1008	1	1009	10	0
W	2002	400	0	400	0	0
W	2003	850	0	850	0	0
W	2004	762	0	762	21	0
W	2005	975	0	975	0	0
W	2006	1510	89	1599	10	0
W	2007	2791	0	2791	1141	1144
W	2008	2144	0	2144	746	747
W	2009	2041	150	2191	741	693
W	2010	1195	0	1195	395	395
W	2011	2022	0	2022	672	700
W	2012	1014	16	1030	349	350
W	2013	1878	1	1879	522	699
W	2014	1489	1	1490	497	497
W	2015	1100	0	1100	300	300
W	2016	450	0	450	0	0
W	2017	1330	0	1330	0	0
W	2018	375	50	425	0	0
W	2019	308	0	308	0	0
W	2021	200	0	200	0	0

21.2 NWFSC WCGBT

Table 109: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	221	8124	0	8124	182	1584
2004	210	8206	4	8210	360	563
2005	286	8366	0	8366	356	873
2006	229	5383	6	5389	0	980
2007	239	3935	10	3945	0	926
2008	235	3477	1	3478	0	834
2009	242	3346	21	3367	0	893
2010	286	2476	1	2477	0	1046
2011	299	4448	6	4454	0	1062
2012	299	4637	0	4637	0	1078
2013	204	3542	3	3545	0	748
2014	311	5241	1	5242	0	1138
2015	305	5105	0	5105	0	1091
2016	310	5223	0	5223	0	622
2017	321	3542	7	3549	0	623
2018	285	2914	1	2915	0	559
2019	148	1413	0	1413	0	282
2021	295	2654	0	2654	0	577

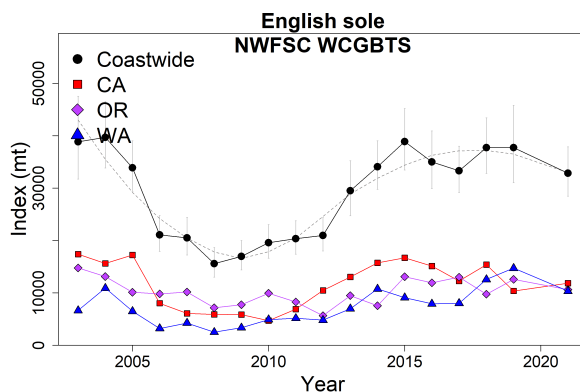


Figure 31: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

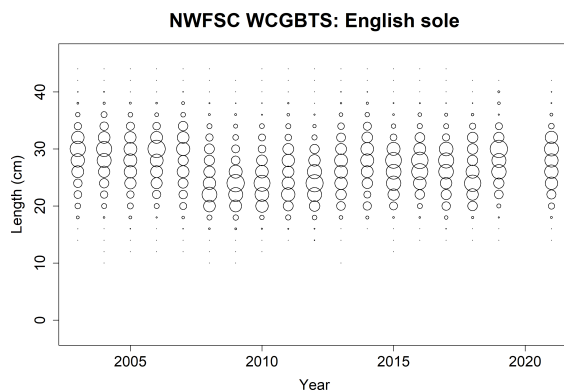


Figure 32: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

22 Flag rockfish

The most recent assessment of Flag rockfish was a data-limited assessment conducted in 2010. Across available data, Flag rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 1,264 length observations, 0 age readings, and 44 otoliths that are available to be aged. In California, since 2000, a total of 294 length observations, 0 age readings, and 13 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 11,280 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 11,272 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 8 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 456 length observations, 3 age readings, and 328 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 190 length observations, 0 age readings, and 168 otoliths that are available to be aged.

22.1 commercial fisheries

Table 110: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1	2	3	0	1
C	1981	2	3	5	0	1
C	1982	2	1	3	0	0
C	1983	6	35	41	0	9
C	1984	3	90	93	0	8
C	1985	6	48	54	0	9
C	1986	20	28	48	0	3
C	1987	12	37	49	0	0
C	1988	16	7	23	0	0
C	1989	8	16	24	0	0
C	1990	4	0	4	0	0
C	1991	2	0	2	0	0
C	1992	0	49	49	0	0
C	1993	1	68	69	0	0
C	1994	1	58	59	0	0
C	1995	0	61	61	0	0
C	1996	0	117	117	0	0
C	1997	0	78	78	0	0
C	1998	1	134	135	0	0
C	1999	2	51	53	0	0
C	2000	0	16	16	0	0
C	2001	1	6	7	0	0
C	2002	0	14	14	0	0
C	2003	1	0	1	0	1
C	2004	6	1	7	0	3
C	2006	0	13	13	0	0
C	2008	15	22	37	0	7
C	2009	0	18	18	0	0
C	2010	0	17	17	0	0
C	2011	0	27	27	0	0
C	2012	0	14	14	0	0
C	2013	0	7	7	0	0
C	2014	0	9	9	0	0
C	2015	0	25	25	0	0
C	2016	1	49	50	0	2
C	2017	1	2	3	0	0
C	2018	0	8	8	0	0
C	2019	0	2	2	0	0
C	2020	0	14	14	0	0
C	2021	0	5	5	0	0

22.2 recreational fisheries

Table 111: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	324	324	0	0
C	2005	1	564	565	0	0
C	2006	0	641	641	0	0
C	2007	2	849	851	0	0
C	2008	0	885	885	0	0
C	2009	1	781	782	0	0
C	2010	2	594	596	0	0
C	2011	1	792	793	0	0
C	2012	0	885	885	0	0
C	2013	1	1187	1188	0	0
C	2014	0	607	607	0	0
C	2015	0	634	634	0	0
C	2016	1	521	522	0	0
C	2017	0	581	581	0	0
C	2018	0	510	510	0	0
C	2019	3	628	631	0	0
C	2020	0	26	26	0	0
C	2021	1	250	251	0	0

Table 112: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2005	0	1	1	0	0
O	2010	0	3	3	0	0
O	2013	0	1	1	0	0
O	2019	0	3	3	0	0

22.3 NWFSC WCGBT

Table 113: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	6	77	0	77	0	0
2004	8	14	0	14	0	14
2005	5	6	1	7	0	7
2006	9	25	0	25	0	25
2007	13	54	1	55	0	49
2008	8	8	0	8	0	8
2009	11	29	1	30	3	27
2010	8	16	0	16	0	16
2011	4	5	0	5	0	5
2012	6	69	0	69	0	35
2013	4	11	0	11	0	11
2014	5	19	0	19	0	19
2015	5	18	0	18	0	17
2016	8	11	1	12	0	12
2017	7	36	0	36	0	29
2018	9	34	0	34	0	34
2019	3	19	0	19	0	19
2021	1	1	0	1	0	1

22.4 NWFSC HKL

Table 114: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	8	10	0	10	0	10
2005	4	6	0	6	0	6
2006	9	11	0	11	0	11
2007	10	12	0	12	0	11
2008	11	14	0	14	0	13
2009	9	14	0	14	0	12
2010	11	15	2	17	0	13
2011	11	14	0	14	0	13
2012	7	8	0	8	0	6
2013	4	4	0	4	0	4
2014	12	17	0	17	0	13
2015	13	21	0	21	0	18
2016	6	6	0	6	0	6
2017	6	8	0	8	0	8
2018	9	11	0	11	0	10
2019	8	9	0	9	0	6
2021	8	8	0	8	0	8

23 Flathead sole

To date, no assessment or analysis has been conducted on Flathead sole. Across available data, Flathead sole have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 1,201 length observations, 0 age readings, and 1,051 otoliths that are available to be aged. In California, since 2000, a total of 1 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 1,171 length observations, 0 age readings, and 1,051 otoliths have been collected. In Washington, since 2000, a total of 1 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 10,592 length observations, 0 age readings, and 2,953 otoliths that are available to be aged.

23.1 commercial fisheries

Table 115: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2017	1	0	1	0	0

Table 116: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2007	47	0	47	0	47
O	2010	10	0	10	0	10
O	2012	30	0	30	0	30
O	2013	129	0	129	0	129
O	2014	32	0	32	0	32
O	2015	120	0	120	0	90
O	2016	90	0	90	0	90
O	2017	130	0	130	0	130
O	2018	151	0	151	0	121
O	2019	116	0	116	0	86
O	2020	124	0	124	0	94
O	2021	191	1	192	0	192

Table 117: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	0	28	28	0	0
W	2021	1	0	1	0	0

23.2 NWFSC WCGBT

Table 118: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	52	1521	0	1521	0	0
2004	41	507	0	507	0	0

Table 118: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2005	42	593	0	593	0	0
2006	50	421	0	421	0	0
2007	27	137	0	137	0	0
2008	25	156	1	157	0	0
2009	38	191	0	191	0	0
2010	55	393	13	406	0	0
2011	52	549	5	554	0	203
2012	49	253	3	256	0	136
2013	33	289	2	291	0	160
2014	77	945	35	980	0	519
2015	100	1649	5	1654	0	659
2016	75	1236	1	1237	0	517
2017	76	653	0	653	0	256
2018	65	515	1	516	0	229
2019	30	202	0	202	0	85
2021	48	314	2	316	0	189

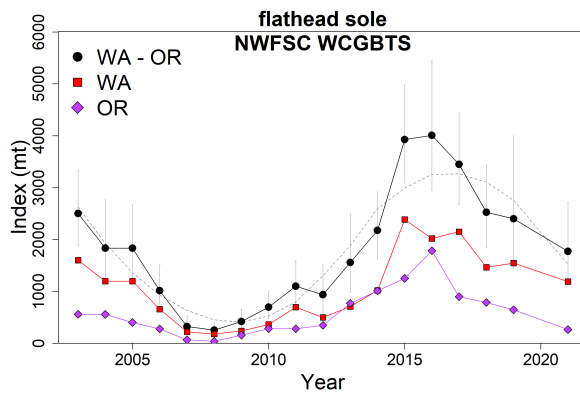


Figure 33: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

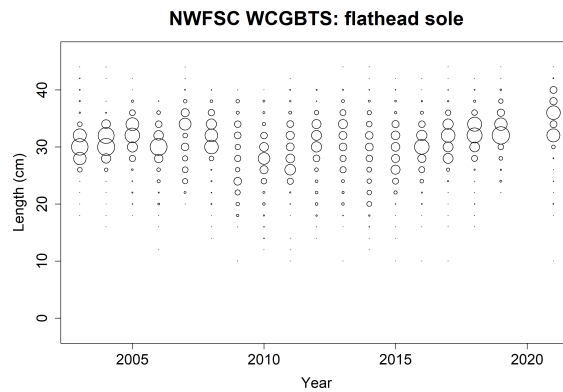


Figure 34: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

24 Gopher and black and yellow rockfish

The most recent assessment of Gopher and black and yellow rockfish was a full assessment conducted in 2019. Across available data, Gopher and black and yellow rockfish have been observed and sampled generally by both commercial and recreational fisheries.

Across all years of available data, commercial fisheries have collected a total of 42,378 length observations, 45 age readings, and 198 otoliths that are available to be aged. In California, since 2000, a total of 26,309 length observations, 45 age readings, and 180 otoliths have been collected. In Oregon, since 2000, a total of 159 length observations, 0 age readings, and 16 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 187,378 length observations, 0 age readings, and 15 otoliths that are available to be aged. In California, since 2003, a total of 187,088 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 288 length observations, 0 age readings, and 15 otoliths have been collected.

24.1 commercial fisheries

Table 119: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1985	0	8	8	0	2
C	1987	0	82	82	0	0
C	1988	1	0	1	0	0
C	1992	0	767	767	0	0
C	1993	0	1649	1649	0	0
C	1994	0	1392	1392	0	0
C	1995	0	1547	1547	0	0

Table 119: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1996	0	3283	3283	0	0
C	1997	0	1325	1325	0	0
C	1998	0	2565	2565	0	0
C	1999	0	3291	3291	0	0
C	2000	18	4905	4923	0	0
C	2001	1	2275	2276	0	0
C	2002	0	1021	1021	0	0
C	2003	0	625	625	0	0
C	2004	0	770	770	0	0
C	2005	0	700	700	0	0
C	2006	1	477	478	0	0
C	2007	0	1165	1165	0	0
C	2008	54	506	560	0	0
C	2009	20	834	854	8	16
C	2010	62	863	925	7	30
C	2011	4	854	858	2	6
C	2012	1	708	709	0	0
C	2013	0	581	581	0	0
C	2014	0	184	184	0	0
C	2015	0	578	578	0	0
C	2016	2	927	929	2	4
C	2017	0	1583	1583	0	0
C	2018	32	1179	1211	26	54
C	2019	126	1378	1504	0	10
C	2020	32	1378	1410	0	0
C	2021	53	2412	2465	0	60

Table 120: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2000	3	0	3	0	0
O	2001	9	0	9	0	0
O	2002	13	0	13	0	0
O	2003	11	0	11	0	0
O	2004	10	0	10	0	2
O	2005	2	0	2	0	0

Table 120: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2006	11	0	11	0	0
O	2007	13	0	13	0	1
O	2008	13	0	13	0	0
O	2009	5	0	5	0	1
O	2010	8	0	8	0	1
O	2011	5	0	5	0	1
O	2012	9	0	9	0	0
O	2013	2	0	2	0	2
O	2014	6	0	6	0	3
O	2015	7	0	7	0	1
O	2016	7	0	7	0	1
O	2017	4	0	4	0	1
O	2018	6	0	6	0	0
O	2019	3	0	3	0	1
O	2020	4	0	4	0	0
O	2021	8	0	8	0	1

24.2 recreational fisheries

Table 121: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	468	468	0	0
C	2004	2	7278	7280	0	0
C	2005	0	8784	8784	0	0
C	2006	4	10258	10262	0	0
C	2007	0	9390	9390	0	0
C	2008	6	12206	12212	0	0
C	2009	4	14060	14064	0	0
C	2010	2	16826	16828	0	0
C	2011	4	15406	15410	0	0

Table 121: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2012	4	12198	12202	0	0
C	2013	2	10694	10696	0	0
C	2014	2	10810	10812	0	0
C	2015	0	12514	12514	0	0
C	2016	6	13446	13452	0	0
C	2017	6	10376	10382	0	0
C	2018	0	7806	7806	0	0
C	2019	10	8778	8788	0	0
C	2020	0	44	44	0	0
C	2021	2	5692	5694	0	0

Table 122: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2002	0	2	2	0	0
O	2003	0	26	26	0	0
O	2004	0	10	10	0	0
O	2005	0	14	14	0	0
O	2006	0	8	8	0	0
O	2007	0	6	6	0	0
O	2008	4	2	6	0	2
O	2009	0	12	12	0	0
O	2010	8	26	34	0	4
O	2011	2	12	14	0	1
O	2012	0	10	10	0	0
O	2013	4	38	42	0	2
O	2014	8	12	20	0	4
O	2016	0	2	2	0	0
O	2017	0	4	4	0	0
O	2018	4	14	18	0	2
O	2019	0	22	22	0	0
O	2020	0	4	4	0	0
O	2021	0	36	36	0	0

25 Grass rockfish

The most recent assessment of Grass rockfish was a data-limited assessment conducted in 2010. Across available data, Grass rockfish have been observed and sampled generally by both commercial and recreational fisheries.

Across all years of available data, commercial fisheries have collected a total of 8,212 length observations, 0 age readings, and 15 otoliths that are available to be aged. In California, since 2000, a total of 4,934 length observations, 0 age readings, and 8 otoliths have been collected. In Oregon, since 2000, a total of 888 length observations, 0 age readings, and 7 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 5,365 length observations, 0 age readings, and 16 otoliths that are available to be aged. In California, since 2003, a total of 5,214 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 131 length observations, 0 age readings, and 7 otoliths have been collected. In Washington, since 2003, a total of 11 length observations, 0 age readings, and 9 otoliths have been collected.

25.1 commercial fisheries

Table 123: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1982	3	0	3	0	0
C	1985	0	5	5	0	0
C	1987	0	2	2	0	0
C	1992	0	16	16	0	0
C	1993	0	8	8	0	0
C	1994	0	17	17	0	0

Table 123: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1995	0	98	98	0	0
C	1996	0	523	523	0	0
C	1997	0	494	494	0	0
C	1998	0	515	515	0	0
C	1999	0	709	709	0	0
C	2000	0	818	818	0	0
C	2001	0	439	439	0	0
C	2002	0	158	158	0	0
C	2003	0	121	121	0	0
C	2004	0	74	74	0	0
C	2005	0	35	35	0	0
C	2006	0	116	116	0	0
C	2007	0	172	172	0	0
C	2008	0	242	242	0	0
C	2009	0	151	151	0	0
C	2010	1	357	358	0	1
C	2011	0	242	242	0	0
C	2012	0	305	305	0	0
C	2013	0	143	143	0	0
C	2014	0	104	104	0	0
C	2015	0	284	284	0	0
C	2016	0	243	243	0	0
C	2017	0	188	188	0	0
C	2018	0	78	78	0	0
C	2019	0	127	127	0	7
C	2020	0	162	162	0	0
C	2021	0	374	374	0	0

Table 124: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2000	165	6	171	0	0
O	2001	71	0	71	0	0
O	2002	188	0	188	0	0
O	2003	27	0	27	0	6
O	2004	44	0	44	0	1

Table 124: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2005	80	0	80	0	0
O	2006	85	6	91	0	0
O	2007	29	0	29	0	0
O	2008	28	0	28	0	0
O	2009	19	0	19	0	0
O	2010	15	0	15	0	0
O	2011	2	0	2	0	0
O	2012	9	0	9	0	0
O	2013	13	0	13	0	0
O	2014	9	0	9	0	0
O	2015	20	0	20	0	0
O	2016	1	0	1	0	0
O	2017	4	0	4	0	0
O	2018	1	0	1	0	0
O	2020	4	0	4	0	0
O	2021	62	0	62	0	0

25.2 recreational fisheries

Table 125: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	5	5	0	0
C	2004	0	180	180	0	0
C	2005	0	302	302	0	0
C	2006	0	467	467	0	0
C	2007	0	322	322	0	0
C	2008	0	446	446	0	0
C	2009	0	439	439	0	0
C	2010	0	342	342	0	0
C	2011	0	413	413	0	0

Table 125: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2012	0	313	313	0	0
C	2013	1	451	452	0	0
C	2014	0	352	352	0	0
C	2015	1	229	230	0	0
C	2016	0	248	248	0	0
C	2017	1	243	244	0	0
C	2018	0	190	190	0	0
C	2019	0	124	124	0	0
C	2020	0	9	9	0	0
C	2021	0	136	136	0	0

Table 126: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	6	6	0	0
O	2002	0	2	2	0	0
O	2003	0	5	5	0	0
O	2004	0	3	3	0	0
O	2005	1	10	11	0	1
O	2006	0	3	3	0	0
O	2007	0	2	2	0	0
O	2008	1	3	4	0	1
O	2009	0	9	9	0	0
O	2010	0	13	13	0	0
O	2011	0	7	7	0	0
O	2012	0	4	4	0	0
O	2013	2	3	5	0	2
O	2014	3	6	9	0	3
O	2015	0	1	1	0	0
O	2016	0	5	5	0	0
O	2017	0	7	7	0	0
O	2018	0	6	6	0	0
O	2019	0	22	22	0	0
O	2020	0	2	2	0	0
O	2021	0	13	13	0	0

Table 127: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	1	0	1	0	0
W	2004	1	0	1	0	0
W	2015	1	0	1	0	1
W	2018	6	1	7	0	6
W	2021	2	0	2	0	2

26 Greenspotted rockfish

The most recent assessment of Greenspotted rockfish was a full assessment conducted in 2011. Across available data, Greenspotted rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 14,951 length observations, 0 age readings, and 1,823 otoliths that are available to be aged. In California, since 2000, a total of 3,806 length observations, 0 age readings, and 323 otoliths have been collected. In Oregon, since 2000, a total of 561 length observations, 0 age readings, and 553 otoliths have been collected. In Washington, since 2000, a total of 11 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 18,385 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 18,352 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 33 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 7,922 length observations, 701 age readings, and 3,879 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 4,812 length observations, 843 age readings, and 3,867 otoliths that are available to be aged.

26.1 commercial fisheries

Table 128: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	88	56	144	0	95
C	1981	84	123	207	0	83
C	1982	83	41	124	0	103
C	1983	114	179	293	0	112
C	1984	133	174	307	0	138
C	1985	274	234	508	0	370
C	1986	145	407	552	0	43
C	1987	223	140	363	0	1
C	1988	164	111	275	0	0
C	1989	123	161	284	0	0
C	1990	95	97	192	0	0
C	1991	74	422	496	0	1
C	1992	67	966	1033	0	0
C	1993	29	925	954	0	0
C	1994	39	780	819	0	0
C	1995	24	680	704	0	0
C	1996	35	849	884	0	1
C	1997	36	827	863	0	0
C	1998	40	1361	1401	0	0
C	1999	45	125	170	0	0
C	2000	90	47	137	0	0
C	2001	163	164	327	0	55
C	2002	72	31	103	0	71
C	2003	72	0	72	0	47
C	2004	64	2	66	0	52
C	2005	1	0	1	0	1
C	2006	1	27	28	0	1

Table 128: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2007	3	19	22	0	4
C	2008	4	141	145	0	0
C	2009	3	202	205	0	1
C	2010	1	293	294	0	1
C	2011	0	208	208	0	0
C	2012	15	87	102	0	13
C	2013	5	8	13	0	4
C	2014	4	100	104	0	4
C	2015	20	203	223	0	25
C	2016	11	454	465	0	22
C	2017	21	105	126	0	22
C	2018	16	309	325	0	0
C	2019	19	205	224	0	0
C	2020	102	115	217	0	0
C	2021	153	246	399	0	0

Table 129: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2000	3	0	3	0	0
O	2001	34	0	34	0	34
O	2002	11	0	11	0	11
O	2003	4	0	4	0	4
O	2004	1	0	1	0	1
O	2005	9	0	9	0	9
O	2006	4	0	4	0	0
O	2007	10	0	10	0	10
O	2008	1	0	1	0	1
O	2009	64	0	64	0	64
O	2010	39	0	39	0	39
O	2011	31	0	31	0	31
O	2012	11	0	11	0	11
O	2013	18	0	18	0	18
O	2014	3	0	3	0	3
O	2015	4	0	4	0	4
O	2016	6	0	6	0	6

Table 129: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2017	100	0	100	0	99
O	2018	58	0	58	0	58
O	2019	65	0	65	0	65
O	2020	11	0	11	0	11
O	2021	74	0	74	0	74

Table 130: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2001	0	1	1	0	0
W	2002	1	1	2	0	0
W	2003	2	0	2	0	0
W	2018	2	0	2	0	0
W	2019	3	0	3	0	0
W	2021	1	0	1	0	0

26.2 recreational fisheries

Table 131: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	3	3	0	0
C	2004	1	808	809	0	0
C	2005	1	948	949	0	0
C	2006	1	1426	1427	0	0
C	2007	0	1317	1317	0	0

Table 131: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2008	4	1427	1431	0	0
C	2009	2	1603	1605	0	0
C	2010	5	1343	1348	0	0
C	2011	1	1750	1751	0	0
C	2012	1	1258	1259	0	0
C	2013	0	1011	1011	0	0
C	2014	0	731	731	0	0
C	2015	0	639	639	0	0
C	2016	0	536	536	0	0
C	2017	0	813	813	0	0
C	2018	4	826	830	0	0
C	2019	7	1095	1102	0	0
C	2020	0	79	79	0	0
C	2021	0	712	712	0	0

Table 132: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2004	0	10	10	0	0
O	2019	0	10	10	0	0
O	2021	0	13	13	0	0

26.3 NWFSC WCGBT

Table 133: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	33	420	0	420	0	0
2004	26	553	9	562	0	278
2005	29	216	9	225	85	42
2006	43	459	4	463	0	261
2007	40	622	31	653	265	42
2008	41	512	45	557	0	244
2009	49	650	28	678	351	26
2010	37	670	41	711	0	395
2011	34	259	9	268	0	225
2012	35	393	8	401	0	235
2013	25	245	1	246	0	218
2014	36	290	6	296	0	221
2015	26	243	6	249	0	209
2016	40	883	16	899	0	464
2017	28	333	1	334	0	213
2018	36	377	21	398	0	322
2019	17	207	1	208	0	164
2021	46	344	10	354	0	320

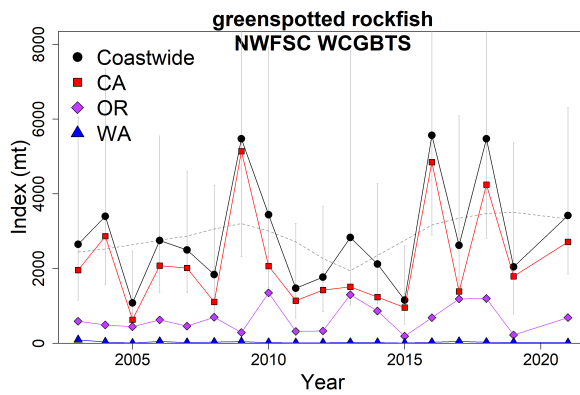


Figure 35: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

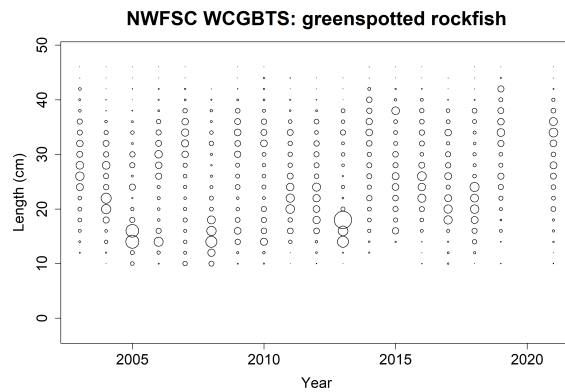


Figure 36: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

26.4 NWFSC HKL

Table 134: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	38	223	0	223	200	0
2005	45	124	4	128	0	129
2006	51	208	2	210	206	6
2007	45	189	0	189	0	187
2008	58	232	2	234	230	2
2009	59	271	2	273	0	273
2010	55	208	0	208	207	0
2011	47	244	0	244	0	242
2012	48	221	2	223	0	222
2013	52	271	0	271	0	268
2014	70	446	3	449	0	446
2015	74	378	0	378	0	375
2016	68	272	2	274	0	268
2017	75	377	0	377	0	362
2018	83	381	0	381	0	372
2019	78	344	3	347	0	331
2021	78	403	0	403	0	384

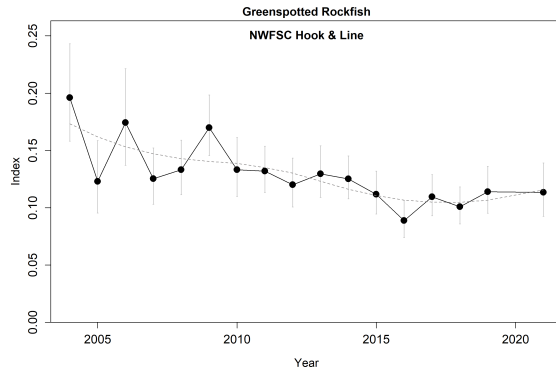


Figure 37: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

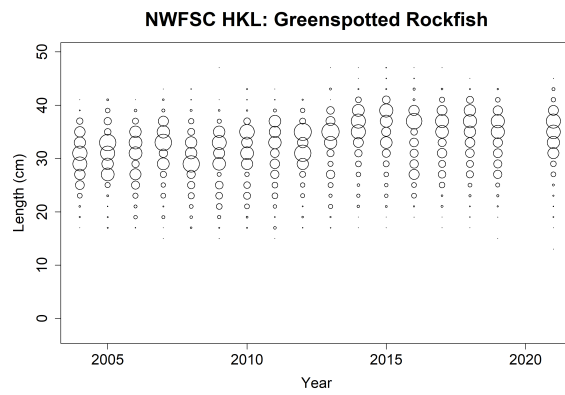


Figure 38: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

27 Greenstriped rockfish

The most recent assessment of Greenstriped rockfish was a full assessment conducted in 2009. Across available data, Greenstriped rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 22,204 length observations, 0 age readings, and 7,436 otoliths that are available to be aged. In California, since 2000, a total of 3,073 length observations, 0 age readings, and 335 otoliths have been collected. In Oregon, since 2000, a total of 6,798 length observations, 0 age readings, and 6,120 otoliths have been collected. In Washington, since 2000, a total of 5,324 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 3,010 length observations, 0 age readings, and 67 otoliths that are available to be aged. In California, since 2003, a total of 2,353 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 362 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 107 length observations, 0 age readings, and 67 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 41,381 length observations, 3,413 age readings, and 8,137 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 822 length observations, 0 age readings, and 810 otoliths that are available to be aged.

27.1 commercial fisheries

Table 135: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	51	7	58	0	42
C	1981	24	5	29	0	26
C	1982	122	0	122	0	58
C	1983	195	7	202	0	194
C	1984	163	31	194	0	161
C	1985	418	35	453	0	428
C	1986	147	10	157	0	58
C	1987	159	23	182	0	6
C	1988	115	17	132	0	0
C	1989	144	120	264	0	2
C	1990	139	8	147	0	1
C	1991	135	8	143	0	2
C	1992	45	77	122	0	0
C	1993	62	63	125	0	0
C	1994	82	187	269	0	0
C	1995	149	96	245	0	0
C	1996	89	238	327	0	0
C	1997	263	143	406	0	0
C	1998	246	231	477	0	0
C	1999	198	62	260	0	1
C	2000	401	3	404	0	0
C	2001	297	23	320	0	110
C	2002	122	7	129	0	44
C	2003	10	70	80	0	9
C	2004	37	181	218	0	36
C	2005	37	1	38	0	36
C	2006	44	5	49	0	22
C	2007	41	1	42	0	4
C	2008	1	18	19	0	0
C	2009	5	67	72	0	5
C	2010	0	21	21	0	0
C	2011	1	25	26	0	1
C	2012	0	8	8	0	0
C	2013	29	11	40	0	24
C	2014	24	53	77	0	7
C	2015	16	80	96	0	7
C	2016	263	100	363	0	25
C	2017	108	166	274	0	5
C	2018	225	32	257	0	0
C	2019	107	6	113	0	0

Table 135: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	20	132	152	0	0
C	2021	101	174	275	0	0

Table 136: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1995	2	0	2	0	2
O	1996	264	0	264	0	0
O	1997	368	0	368	0	0
O	1998	121	0	121	0	0
O	1999	359	0	359	0	0
O	2000	95	0	95	0	78
O	2001	275	0	275	0	98
O	2002	35	0	35	0	30
O	2003	114	0	114	0	114
O	2004	56	0	56	0	50
O	2005	30	0	30	0	30
O	2006	192	0	192	0	155
O	2007	86	0	86	0	85
O	2008	109	0	109	0	109
O	2009	347	0	347	0	324
O	2010	162	0	162	0	102
O	2011	310	3	313	0	309
O	2012	491	7	498	0	485
O	2013	451	7	458	0	450
O	2014	576	0	576	0	543
O	2015	475	2	477	0	448
O	2016	572	0	572	0	506
O	2017	608	0	608	0	546
O	2018	513	1	514	0	438
O	2019	612	1	613	0	609
O	2020	198	1	199	0	199
O	2021	468	1	469	0	412

Table 137: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	539	539	0	0
W	1997	0	386	386	0	0
W	1998	514	3	517	0	0
W	1999	137	2	139	0	0
W	2000	175	3	178	0	0
W	2001	216	166	382	0	0
W	2002	2187	65	2252	0	0
W	2003	435	21	456	0	0
W	2004	300	2	302	0	0
W	2005	86	0	86	0	0
W	2006	90	0	90	0	0
W	2007	3	0	3	0	0
W	2009	62	0	62	0	0
W	2010	21	0	21	0	0
W	2011	12	0	12	0	0
W	2012	184	1	185	0	0
W	2013	161	1	162	0	0
W	2014	151	9	160	0	0
W	2015	28	0	28	0	0
W	2016	2	1	3	0	0
W	2017	105	0	105	0	0
W	2018	187	0	187	0	0
W	2019	267	1	268	0	0
W	2020	143	7	150	0	0
W	2021	232	0	232	0	0

27.2 recreational fisheries

Table 138: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	42	42	0	0
C	2005	0	53	53	0	0
C	2006	0	100	100	0	0
C	2007	0	129	129	0	0
C	2008	0	142	142	0	0
C	2009	0	263	263	0	0
C	2010	1	165	166	0	0
C	2011	1	254	255	0	0
C	2012	0	129	129	0	0
C	2013	0	164	164	0	0
C	2014	0	120	120	0	0
C	2015	0	88	88	0	0
C	2016	0	145	145	0	0
C	2017	0	98	98	0	0
C	2018	0	82	82	0	0
C	2019	0	165	165	0	0
C	2020	0	7	7	0	0
C	2021	0	205	205	0	0

Table 139: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	79	79	0	0
O	2002	0	109	109	0	0
O	2003	0	141	141	0	0
O	2004	0	45	45	0	0
O	2005	0	24	24	0	0
O	2006	0	22	22	0	0
O	2007	0	2	2	0	0
O	2008	0	3	3	0	0
O	2009	0	3	3	0	0
O	2011	0	8	8	0	0
O	2012	0	3	3	0	0
O	2013	0	10	10	0	0
O	2015	0	1	1	0	0
O	2016	0	3	3	0	0

Table 139: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2017	0	12	12	0	0
O	2018	0	14	14	0	0
O	2019	0	40	40	0	0
O	2020	0	3	3	0	0
O	2021	0	28	28	0	0

Table 140: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2003	4	0	4	0	0
W	2004	2	3	5	0	0
W	2005	0	1	1	0	0
W	2011	1	1	2	0	1
W	2012	0	1	1	0	0
W	2014	2	0	2	0	2
W	2016	4	0	4	0	4
W	2017	29	1	30	0	29
W	2018	5	4	9	0	5
W	2019	16	23	39	0	16
W	2020	1	0	1	0	1
W	2021	9	0	9	0	9

27.3 NWFSC WCGBT

Table 141: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	131	3489	37	3526	577	33
2004	136	2654	13	2667	522	7
2005	175	3871	27	3898	568	131
2006	179	3116	16	3132	524	155
2007	167	2325	34	2359	657	5
2008	149	1805	60	1865	565	3
2009	164	1718	82	1800	0	614
2010	189	2156	166	2322	0	747
2011	184	1810	123	1933	0	646
2012	186	2099	117	2216	0	753
2013	125	1449	23	1472	0	494
2014	180	2259	15	2274	0	682
2015	174	1988	30	2018	0	693
2016	164	2302	17	2319	0	736
2017	169	1890	29	1919	0	646
2018	198	2395	82	2477	0	786
2019	96	1163	4	1167	0	382
2021	164	2009	8	2017	0	624

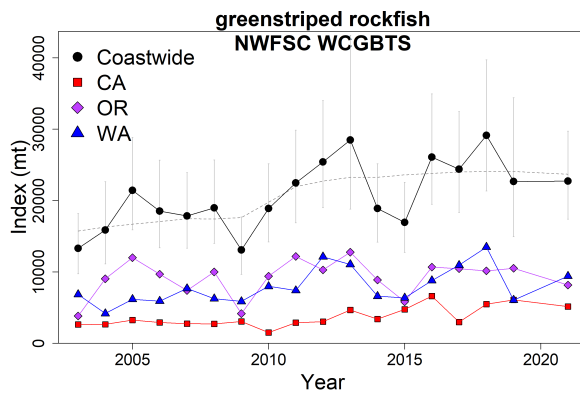


Figure 39: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

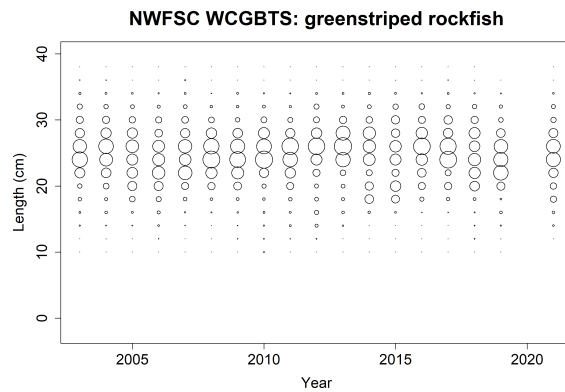


Figure 40: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

27.4 NWFSC HKL

Table 142: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	6	8	0	8	0	7
2005	7	8	0	8	0	8
2006	8	15	0	15	0	15
2007	11	19	0	19	0	19
2008	12	22	0	22	0	22
2009	16	26	0	26	0	24
2010	15	31	0	31	0	31
2011	10	19	0	19	0	17
2012	13	24	0	24	0	24
2013	16	27	0	27	0	27
2014	28	46	0	46	0	46
2015	33	66	0	66	0	65
2016	23	41	0	41	0	41
2017	43	111	0	111	0	111
2018	44	124	0	124	0	124
2019	44	99	0	99	0	93
2021	59	136	0	136	0	136

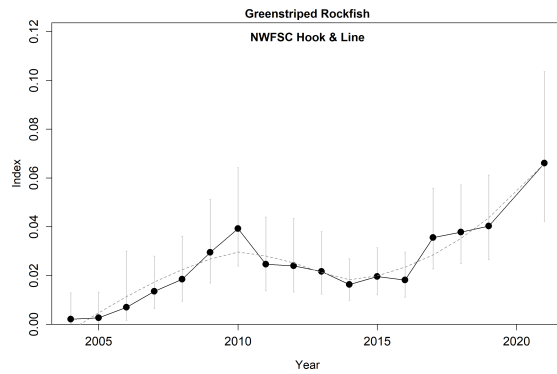


Figure 41: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

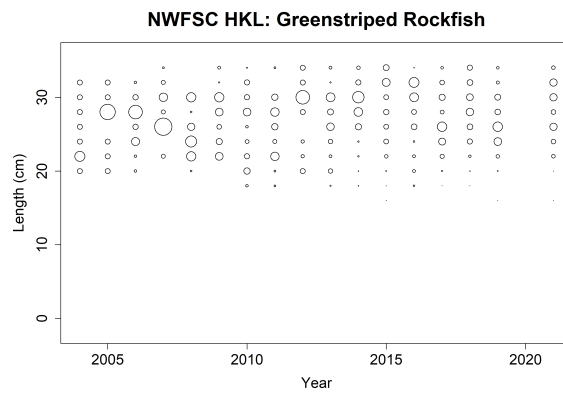


Figure 42: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

28 Honeycomb rockfish

The most recent assessment of Honeycomb rockfish was a data-limited assessment conducted in 2010. Across available data, Honeycomb rockfish have been observed and sampled generally by recreational fisheries and the both the NWFSC WCGBT and HKL surveys.

Across all years of available data, recreational fisheries have collected a total of 14,265 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 14,265 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 296 length observations, 0 age readings, and 183 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 219 length observations, 0 age readings, and 190 otoliths that are available to be aged.

28.1 recreational fisheries

Table 143: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	54	54	0	0
C	2004	0	492	492	0	0
C	2005	6	907	913	0	0
C	2006	1	812	813	0	0
C	2007	4	957	961	0	0
C	2008	1	1100	1101	0	0
C	2009	15	1221	1236	0	0
C	2010	16	1613	1629	0	0
C	2011	11	1490	1501	0	0
C	2012	0	849	849	0	0

Table 143: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2013	0	1340	1340	0	0
C	2014	1	652	653	0	0
C	2015	0	558	558	0	0
C	2016	0	496	496	0	0
C	2017	0	606	606	0	0
C	2018	0	366	366	0	0
C	2019	4	443	447	0	0
C	2020	0	27	27	0	0
C	2021	0	223	223	0	0

28.2 NWFSC WCGBT

Table 144: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	1	1	0	1	0	0
2005	1	14	0	14	0	14
2006	2	14	0	14	0	14
2007	3	68	0	68	0	31
2008	1	1	0	1	0	1
2009	1	90	0	90	0	15
2010	1	22	0	22	0	22
2012	3	6	0	6	0	6
2013	3	36	0	36	0	36
2014	1	1	0	1	0	1
2016	1	2	2	4	0	4
2017	2	4	0	4	0	4
2018	1	14	0	14	0	14
2019	1	14	0	14	0	14
2021	3	7	0	7	0	7

28.3 NWFSC HKL

Table 145: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	3	3	0	3	0	3
2005	4	7	0	7	0	7
2006	4	5	1	6	0	6
2007	4	9	0	9	0	9
2008	8	28	0	28	0	23
2009	12	21	0	21	0	19
2010	11	19	1	20	0	13
2011	7	12	1	13	0	12
2012	3	3	0	3	0	2
2013	9	25	1	26	0	25
2014	4	7	0	7	0	7
2015	7	17	1	18	0	14
2016	7	16	0	16	0	13
2017	6	11	0	11	0	8
2018	8	9	0	9	0	9
2019	4	7	0	7	0	7
2021	5	14	1	15	0	13

29 Kelp greenling

The most recent assessment of Kelp greenling was a full assessment conducted in 2015. Across available data, Kelp greenling have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 43,591 length observations, 282 age readings, and 575 otoliths that are available to be aged. In California, since 2000, a total of 3,021 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 38,293 length observations, 282 age readings, and 575 otoliths have been collected. In Washington, since 2000, a total of 1 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 49,495 length observations, 4,094 age readings, and 3,920 otoliths that are available to be aged. In California, since 2003, a total of 10,477 length observations, 0 age readings, and 7 otoliths have been collected. In Oregon, since 2003, a total of 31,916 length observations, 2,786 age readings, and 2,929 otoliths have been collected. In Washington, since 2003, a total of 5,205 length observations, 1,308 age readings, and 984 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 832 length observations, 0 age readings, and 650 otoliths that are available to be aged.

29.1 commercial fisheries

Table 146: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1992	0	9	9	0	0
C	1993	0	24	24	0	0
C	1994	0	18	18	0	0
C	1995	0	90	90	0	0
C	1996	0	266	266	0	0
C	1997	83	263	346	0	0
C	1998	0	148	148	0	0
C	1999	14	1004	1018	0	0
C	2000	748	486	1234	0	0
C	2001	327	239	566	0	0
C	2002	154	18	172	0	0
C	2003	1	40	41	0	0
C	2004	65	0	65	0	0
C	2005	55	29	84	0	0
C	2006	34	1	35	0	0
C	2007	82	12	94	0	0
C	2008	47	0	47	0	0
C	2009	54	6	60	0	0
C	2010	67	4	71	0	0
C	2011	50	2	52	0	0
C	2012	47	0	47	0	0
C	2013	38	0	38	0	0
C	2014	13	4	17	0	0
C	2015	68	1	69	0	0
C	2016	119	0	119	0	0
C	2017	67	5	72	0	0
C	2018	20	10	30	0	0
C	2019	39	0	39	0	0
C	2020	34	0	34	0	0
C	2021	35	0	35	0	0

Table 147: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1998	165	0	165	0	0
O	1999	192	0	192	0	0

Table 147: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2000	1442	0	1442	0	0
O	2001	2898	0	2898	0	0
O	2002	3868	0	3868	0	0
O	2003	1695	0	1695	20	11
O	2004	2561	0	2561	2	0
O	2005	1638	0	1638	0	0
O	2006	1992	1	1993	0	0
O	2007	2068	0	2068	10	7
O	2008	1539	0	1539	4	0
O	2009	1146	0	1146	20	3
O	2010	1823	5	1828	29	13
O	2011	2546	0	2546	56	35
O	2012	1597	0	1597	84	16
O	2013	2365	17	2382	57	42
O	2014	1904	0	1904	0	115
O	2015	1463	0	1463	0	56
O	2016	1242	0	1242	0	57
O	2017	977	0	977	0	99
O	2018	1239	0	1239	0	28
O	2019	899	0	899	0	67
O	2020	606	0	606	0	11
O	2021	762	0	762	0	15

Table 148: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2018	1	0	1	0	0

29.2 recreational fisheries

Table 149: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	13	18	31	0	0
C	2004	120	400	520	0	0
C	2005	153	298	451	0	0
C	2006	352	255	607	0	0
C	2007	224	190	414	0	0
C	2008	309	353	663	0	0
C	2009	455	492	948	0	0
C	2010	413	341	754	0	0
C	2011	616	272	888	0	0
C	2012	490	250	740	0	0
C	2013	655	105	760	0	0
C	2014	574	66	640	0	0
C	2015	908	59	967	0	0
C	2016	634	44	678	0	0
C	2017	512	28	540	0	0
C	2018	442	29	471	0	6
C	2019	258	12	270	0	1
C	2020	15	0	15	0	0
C	2021	116	4	120	0	0

Table 150: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	515	515	0	0
O	2002	0	1280	1280	0	0
O	2003	2	1369	1371	0	0
O	2004	2	1092	1094	0	0
O	2005	153	1560	1713	294	0
O	2006	381	1355	1736	467	0
O	2007	338	1314	1652	334	0
O	2008	480	1835	2315	470	0
O	2009	520	1825	2345	257	259
O	2010	559	2583	3142	271	273
O	2011	703	2499	3202	289	405
O	2012	663	2431	3094	220	441
O	2013	560	2308	2868	184	367

Table 150: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2014	270	1050	1320	0	269
O	2015	171	961	1132	0	170
O	2016	164	783	947	0	164
O	2017	125	708	833	0	123
O	2018	131	865	996	0	122
O	2019	187	848	1035	0	183
O	2020	153	66	219	0	153
O	2021	0	902	902	0	0

Table 151: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	9	93	102	0	0
W	2003	7	147	154	0	0
W	2004	279	164	443	55	14
W	2005	270	282	552	232	20
W	2006	123	226	349	105	5
W	2007	102	67	169	96	5
W	2008	96	109	205	92	4
W	2009	83	131	214	51	0
W	2010	78	117	195	44	18
W	2011	50	172	222	39	1
W	2012	30	162	192	22	0
W	2013	31	114	145	10	0
W	2014	165	120	285	165	0
W	2015	117	40	157	106	11
W	2016	319	40	359	291	28
W	2017	212	192	404	0	210
W	2018	229	190	419	0	227
W	2019	205	264	469	0	204
W	2020	115	8	123	0	114
W	2021	123	26	149	0	123

29.3 NWFSC WCGBT

Table 152: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	10	61	0	61	0	0
2004	12	97	0	97	0	0
2005	9	42	0	42	0	41
2006	7	23	0	23	0	23
2007	7	39	0	39	0	39
2008	4	19	0	19	0	19
2009	9	27	0	27	0	27
2010	16	46	0	46	0	46
2011	21	105	0	105	0	103
2012	11	28	0	28	0	27
2013	14	25	1	26	0	26
2014	14	42	0	42	0	39
2015	8	38	0	38	0	37
2016	10	80	0	80	0	72
2017	13	49	0	49	0	45
2018	16	72	0	72	0	68
2019	2	6	0	6	0	6
2021	10	32	0	32	0	32

30 Kelp rockfish

The most recent assessment of Kelp rockfish was a data-limited assessment conducted in 2010. Across available data, Kelp rockfish have been observed and sampled generally by both commercial and recreational fisheries.

Across all years of available data, commercial fisheries have collected a total of 1,738 length observations, 0 age readings, and 1 otoliths that are available to be aged. In California, since 2000, a total of 886 length observations, 0 age readings, and 1 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 13,428 length observations, 0 age readings, and 1 otoliths that are available to be aged. In California, since 2003, a total of 13,428 length observations, 0 age readings, and 1 otoliths have been collected.

30.1 commercial fisheries

Table 153: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1987	0	19	19	0	0
C	1992	0	28	28	0	0
C	1993	0	148	148	0	0
C	1994	0	92	92	0	0
C	1995	0	114	114	0	0
C	1996	0	95	95	0	0
C	1997	0	66	66	0	0
C	1998	0	140	140	0	0
C	1999	0	150	150	0	0
C	2000	1	73	74	0	0
C	2001	0	17	17	0	0

Table 153: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2002	0	13	13	0	0
C	2003	0	47	47	0	0
C	2004	0	5	5	0	0
C	2005	0	3	3	0	0
C	2006	0	4	4	0	0
C	2007	0	22	22	0	0
C	2008	0	1	1	0	0
C	2009	0	30	30	0	0
C	2010	0	44	44	0	0
C	2011	0	26	26	0	0
C	2012	0	2	2	0	0
C	2013	0	23	23	0	0
C	2014	0	3	3	0	0
C	2015	0	47	47	0	0
C	2016	0	85	85	0	0
C	2017	1	84	85	0	1
C	2018	0	82	82	0	0
C	2019	2	17	19	0	0
C	2020	0	53	53	0	0
C	2021	4	197	201	0	0

30.2 recreational fisheries

Table 154: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	14	14	0	0
C	2004	0	393	393	0	0
C	2005	0	521	521	0	0
C	2006	1	740	741	0	0
C	2007	2	499	501	0	0

Table 154: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2008	0	650	650	0	0
C	2009	0	601	601	0	0
C	2010	0	666	666	0	0
C	2011	3	1154	1157	0	0
C	2012	1	1332	1333	0	0
C	2013	1	1383	1384	0	0
C	2014	1	1284	1285	0	0
C	2015	0	931	931	0	0
C	2016	1	779	780	0	0
C	2017	0	1130	1130	0	0
C	2018	3	623	626	0	0
C	2019	0	416	416	0	1
C	2020	0	3	3	0	0
C	2021	0	296	296	0	0

31 Leopard shark

The most recent assessment of Leopard shark was a data-limited assessment conducted in 2010. Across available data, Leopard shark have been observed and sampled generally by only recreational fisheries.

Across all years of available data, recreational fisheries have collected a total of 2,096 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 2,096 length observations, 0 age readings, and 0 otoliths have been collected.

31.1 recreational fisheries

Table 155: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	2	1	3	0	0
C	2004	4	178	182	0	0
C	2005	4	155	159	0	0
C	2006	7	308	315	0	0
C	2007	19	173	192	0	0
C	2008	13	83	96	0	0
C	2009	159	100	259	0	0
C	2010	66	62	128	0	0
C	2011	8	68	76	0	0
C	2012	1	74	75	0	0
C	2013	7	81	88	0	0
C	2014	41	43	84	0	0
C	2015	60	18	78	0	0
C	2016	73	30	103	0	0
C	2017	101	13	114	0	0
C	2018	64	24	88	0	0
C	2019	48	5	53	0	0
C	2021	3	0	3	0	0

32 Lingcod

The most recent assessment of Lingcod was a full assessment conducted in 2021. Across available data, Lingcod have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 97,467 length observations, 14,008 age readings, and 4,352 otoliths that are available to be aged. In California, since 2000, a total of 11,321 length observations, 681 age readings, and 113 otoliths have been collected. In Oregon, since 2000, a total of 32,586 length observations, 5,302 age readings, and 2,283 otoliths have been collected. In Washington, since 2000, a total of 10,564 length observations, 453 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 258,753 length observations, 24,540 age readings, and 14,150 otoliths that are available to be aged. In California, since 2003, a total of 93,914 length observations, 0 age readings, and 328 otoliths have been collected. In Oregon, since 2003, a total of 124,639 length observations, 7,176 age readings, and 10,234 otoliths have been collected. In Washington, since 2003, a total of 27,623 length observations, 14,793 age readings, and 2,420 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 26,750 length observations, 9,056 age readings, and 5,198 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 848 length observations, 0 age readings, and 51 otoliths that are available to be aged.

32.1 commercial fisheries

Table 156: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1611	5	1616	0	0
C	1981	1835	0	1835	0	0
C	1982	412	0	412	0	0
C	1983	369	14	383	0	0
C	1984	238	0	238	0	0
C	1985	70	0	70	0	0
C	1986	84	1	85	0	0
C	1987	146	0	146	0	0
C	1988	261	0	261	0	0
C	1989	106	12	118	0	0
C	1990	0	3	3	0	0
C	1992	117	2	119	0	0
C	1993	1339	240	1579	1070	0
C	1994	881	62	943	791	0
C	1995	559	51	610	345	0

Table 156: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1996	481	265	746	417	0
C	1997	984	180	1164	873	0
C	1998	348	78	426	319	0
C	1999	295	322	617	0	0
C	2000	181	93	274	0	0
C	2001	214	172	386	183	0
C	2002	290	56	346	247	0
C	2003	155	23	178	98	0
C	2004	320	21	341	153	0
C	2005	168	7	175	0	0
C	2006	294	61	355	0	0
C	2007	555	13	568	0	0
C	2008	484	10	494	0	0
C	2009	265	24	289	0	0
C	2010	347	28	375	0	0
C	2011	137	88	225	0	0
C	2012	167	63	230	0	0
C	2013	421	38	459	0	0
C	2014	418	92	510	0	0
C	2015	866	57	923	0	0
C	2016	1271	10	1281	0	0
C	2017	949	47	996	0	0
C	2018	730	53	783	0	0
C	2019	760	14	774	0	113
C	2020	445	7	452	0	0
C	2021	903	4	907	0	0

Table 157: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1992	1278	0	1278	1259	19
O	1993	1358	51	1409	1306	10
O	1994	1751	0	1751	494	2
O	1995	506	0	506	330	75
O	1996	339	0	339	306	0
O	1997	722	52	774	0	744

Table 157: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1998	501	15	516	0	443
O	1999	679	4	683	0	663
O	2000	540	2	542	118	265
O	2001	757	0	757	389	28
O	2002	712	9	721	335	125
O	2003	607	1	608	341	1
O	2004	900	14	914	328	24
O	2005	488	0	488	260	5
O	2006	674	9	683	343	15
O	2007	1401	16	1417	401	53
O	2008	1099	15	1114	309	76
O	2009	1014	34	1048	207	34
O	2010	1152	11	1163	179	37
O	2011	1102	10	1112	216	25
O	2012	1444	50	1494	208	7
O	2013	1706	3	1709	265	62
O	2014	1855	3	1858	282	42
O	2015	2821	1	2822	99	152
O	2016	2352	12	2364	54	116
O	2017	3101	0	3101	295	149
O	2018	2381	12	2393	370	106
O	2019	2802	17	2819	303	148
O	2020	1405	2	1407	0	299
O	2021	2051	1	2052	0	514

Table 158: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	2180	119	2299	0	0
W	1981	1463	14	1477	0	0
W	1982	1284	81	1365	0	0
W	1983	890	0	890	0	0
W	1984	756	0	756	0	0
W	1985	912	0	912	0	0
W	1986	1292	2	1294	0	0
W	1987	1138	46	1184	0	0

Table 158: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1988	1163	0	1163	0	0
W	1989	1250	73	1323	0	0
W	1990	1291	1	1292	0	0
W	1991	1210	18	1228	0	0
W	1992	1156	61	1217	0	0
W	1993	1336	10	1346	0	0
W	1994	1362	12	1374	12	0
W	1995	1381	0	1381	0	0
W	1996	1150	0	1150	0	0
W	1997	945	65	1010	50	0
W	1998	858	0	858	0	0
W	1999	825	25	850	0	0
W	2000	469	0	469	75	0
W	2001	446	0	446	74	0
W	2002	431	0	431	0	0
W	2003	514	0	514	0	0
W	2004	276	0	276	10	0
W	2005	410	0	410	77	0
W	2006	460	0	460	80	0
W	2007	634	0	634	137	0
W	2008	496	0	496	0	0
W	2009	386	0	386	0	0
W	2010	199	2	201	0	0
W	2011	462	3	465	0	0
W	2012	479	0	479	0	0
W	2013	726	105	831	0	0
W	2014	276	6	282	0	0
W	2015	269	13	282	0	0
W	2016	412	15	427	0	0
W	2017	1004	20	1024	0	0
W	2018	777	27	804	0	0
W	2019	519	10	529	0	0
W	2020	187	32	219	0	0
W	2021	469	30	499	0	0

32.2 recreational fisheries

Table 159: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	421	421	0	0
C	2004	51	1375	1426	0	0
C	2005	223	4432	4655	0	0
C	2006	508	3975	4483	0	0
C	2007	652	2697	3349	0	0
C	2008	850	1848	2698	0	0
C	2009	990	1769	2759	0	0
C	2010	864	1045	1909	0	0
C	2011	1579	3016	4595	0	0
C	2012	1680	4090	5770	0	0
C	2013	4906	3037	7943	0	0
C	2014	8088	939	9027	0	0
C	2015	12155	679	12834	0	0
C	2016	9887	450	10337	0	0
C	2017	8278	286	8564	0	51
C	2018	6172	220	6392	0	225
C	2019	4169	233	4402	0	52
C	2020	6	4	10	0	0
C	2021	2071	269	2340	0	0

Table 160: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1999	1649	73	1722	0	0
O	2000	2246	15	2261	0	0
O	2001	1948	1465	3413	791	1163
O	2002	860	2933	3793	858	3
O	2003	891	3886	4777	807	12
O	2004	942	2238	3180	653	45
O	2005	775	3285	4060	541	22

Table 160: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2006	1392	4812	6204	799	371
O	2007	1149	5477	6626	788	250
O	2008	1180	5641	6821	740	294
O	2009	1138	4970	6108	258	771
O	2010	1153	5879	7032	260	759
O	2011	1217	6641	7858	258	799
O	2012	1216	8139	9355	260	786
O	2013	1157	8136	9293	258	774
O	2014	1090	6456	7546	259	754
O	2015	1129	7064	8193	259	769
O	2016	1087	5430	6517	260	730
O	2017	1010	5632	6642	260	691
O	2018	1162	7530	8692	258	814
O	2019	1081	6645	7726	258	737
O	2020	858	726	1584	0	856
O	2021	0	6425	6425	0	0

Table 161: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	1224	164	1388	922	2
W	2003	1641	397	2038	1167	10
W	2004	1369	215	1584	849	0
W	2005	1701	332	2033	911	70
W	2006	1215	254	1469	701	8
W	2007	1290	144	1434	811	25
W	2008	841	127	968	812	10
W	2009	1070	184	1254	698	59
W	2010	535	287	822	401	12
W	2011	418	652	1070	302	8
W	2012	431	621	1052	269	3
W	2013	362	291	653	352	0
W	2014	711	332	1043	701	10
W	2015	515	247	762	501	15
W	2016	870	214	1084	805	65
W	2017	1568	770	2338	1627	76

Table 161: Data collected annually from the recreational fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2018	919	802	1721	1002	47
W	2019	1702	1200	2902	1623	175
W	2020	1340	257	1597	1261	214
W	2021	1322	477	1799	0	1613

32.3 NWFSC WCGBT

Table 162: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	185	1244	86	1330	875	17
2004	170	1343	24	1367	827	25
2005	196	1067	30	1097	840	24
2006	171	1011	1	1012	697	14
2007	169	631	14	645	483	69
2008	190	883	277	1160	838	19
2009	221	933	174	1107	484	483
2010	235	1623	307	1930	518	516
2011	266	1768	85	1853	519	526
2012	250	1940	247	2187	410	418
2013	189	1295	48	1343	365	262
2014	263	2855	69	2924	478	438
2015	245	1787	51	1838	437	323
2016	230	1716	37	1753	366	359
2017	250	1565	60	1625	286	478
2018	224	1537	17	1554	399	319
2019	124	551	1	552	234	209
2021	224	1375	98	1473	0	699

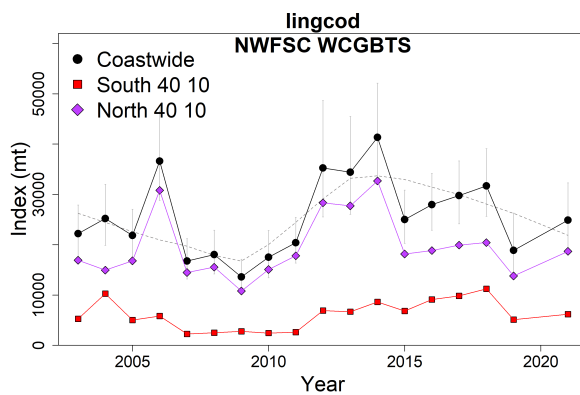


Figure 43: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

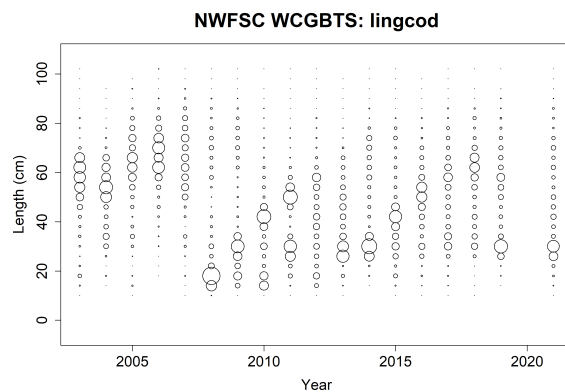


Figure 44: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

32.4 NWFSC HKL

Table 163: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	19	30	2	32	0	0
2005	19	27	12	39	0	0
2006	13	11	3	14	0	0
2007	19	23	3	26	0	0
2008	9	12	0	12	0	0
2009	11	19	0	19	0	0
2010	5	14	1	15	0	0
2011	27	28	3	31	0	0
2012	36	27	39	66	0	0
2013	36	71	23	94	0	2
2014	40	50	38	88	0	0
2015	52	51	32	83	0	0
2016	48	103	2	105	0	15
2017	47	78	0	78	0	31
2018	42	79	0	79	0	0
2019	30	44	0	44	0	2
2021	19	22	1	23	0	1

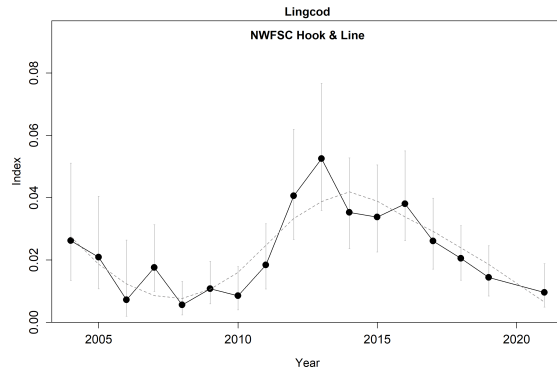


Figure 45: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

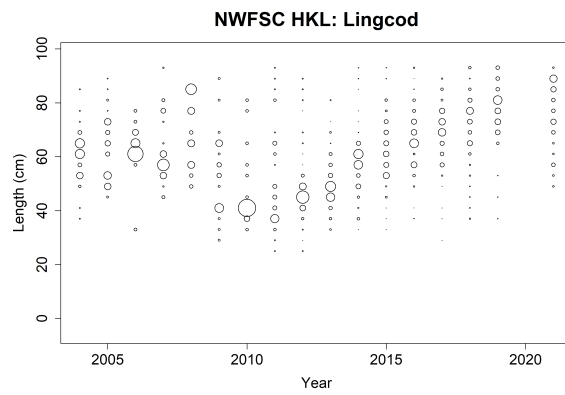


Figure 46: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

33 Longnose skate

The most recent assessment of Longnose skate was a full assessment conducted in 2019. Across available data, Longnose skate have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 35,178 length observations, 0 age readings, and 5,636 otoliths that are available to be aged. In California, since 2000, a total of 9,977 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 16,749 length observations, 0 age readings, and 5,636 otoliths have been collected. In Washington, since 2000, a total of 7,308 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 52,429 length observations, 649 age readings, and 2,048 otoliths that are available to be aged.

33.1 commercial fisheries

Table 164: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2009	727	0	727	0	0
C	2010	638	0	638	0	0
C	2011	1272	0	1272	0	0
C	2012	1157	39	1196	0	0
C	2013	948	0	948	0	0
C	2014	606	56	662	0	0
C	2015	806	25	831	0	0
C	2016	952	17	969	0	0
C	2017	1037	2	1039	0	0

Table 164: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2018	546	8	554	0	0
C	2019	496	16	512	0	0
C	2020	250	0	250	0	0
C	2021	379	0	379	0	0

Table 165: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1995	174	0	174	0	0
O	1996	99	0	99	0	0
O	1997	492	0	492	0	0
O	1998	84	0	84	0	0
O	1999	295	0	295	0	0
O	2000	356	0	356	0	0
O	2001	332	0	332	0	0
O	2002	235	0	235	0	0
O	2003	521	0	521	0	0
O	2004	92	0	92	0	0
O	2005	233	0	233	0	0
O	2006	870	0	870	0	254
O	2007	1079	0	1079	0	702
O	2008	693	0	693	0	573
O	2009	685	0	685	0	477
O	2010	1110	0	1110	0	539
O	2011	889	0	889	0	527
O	2012	1118	0	1118	0	623
O	2013	942	1	943	0	30
O	2014	991	0	991	0	0
O	2015	917	0	917	0	0
O	2016	892	0	892	0	0
O	2017	1240	0	1240	0	80
O	2018	865	0	865	0	504
O	2019	1285	0	1285	0	611
O	2020	480	0	480	0	229
O	2021	923	0	923	0	487

Table 166: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2004	49	0	49	0	0
W	2005	15	0	15	0	0
W	2006	255	0	255	0	0
W	2007	381	0	381	0	0
W	2008	972	0	972	0	0
W	2009	456	0	456	0	0
W	2010	147	3	150	0	0
W	2011	735	0	735	0	0
W	2012	549	51	600	0	0
W	2013	1012	0	1012	0	0
W	2014	401	0	401	0	0
W	2015	448	0	448	0	0
W	2016	722	24	746	0	0
W	2017	543	0	543	0	0
W	2018	260	0	260	0	0
W	2019	147	1	148	0	0
W	2020	23	0	23	0	0
W	2021	114	0	114	0	0

33.2 NWFSC WCGBT

Table 167: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	289	2653	2	2655	0	0
2004	273	2598	1	2599	0	0
2005	382	3257	2	3259	0	0
2006	385	0	0	0	0	0
2007	413	860	1	861	0	0

Table 167: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2008	395	3383	0	3383	0	0
2009	364	3113	3	3116	0	0
2010	408	3462	0	3462	0	0
2011	423	2987	4	2991	321	104
2012	427	3647	3	3650	328	40
2013	297	2491	1	2492	0	0
2014	421	3722	0	3722	0	0
2015	429	4053	14	4067	0	0
2016	428	4003	1	4004	0	420
2017	437	3679	0	3679	0	442
2018	426	3610	0	3610	0	421
2019	223	1655	0	1655	0	220
2021	405	3224	0	3224	0	401

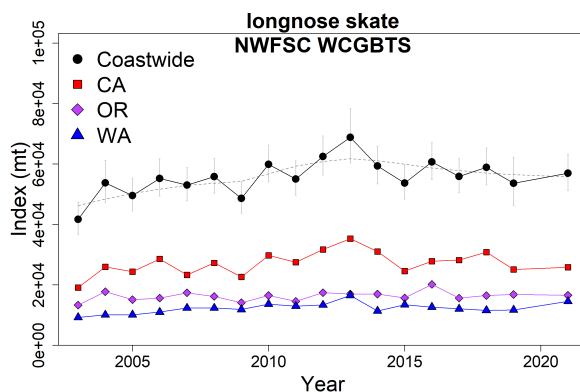


Figure 47: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

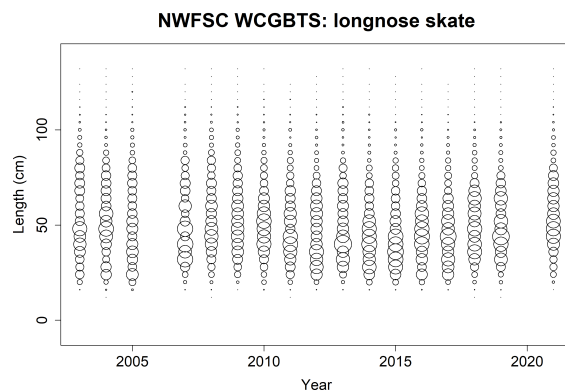


Figure 48: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

34 Longspine thornyhead

The most recent assessment of Longspine thornyhead was a full assessment conducted in 2013. Across available data, Longspine thornyhead have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 181,499 length observations, 30 age readings, and 37,425 otoliths that are available to be aged. In California, since 2000, a total of 77,068 length observations, 0 age readings, and 54 otoliths have been collected. In Oregon, since 2000, a total of 28,252 length observations, 30 age readings, and 21,760 otoliths have been collected. In Washington, since 2000, a total of 5,934 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 109,145 length observations, 0 age readings, and 14,279 otoliths that are available to be aged.

34.1 commercial fisheries

Table 168: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	716	13	729	0	101
C	1981	587	1	588	0	20
C	1982	340	1	341	0	284
C	1983	300	0	300	0	294
C	1984	806	4	810	0	795
C	1985	1441	2	1443	0	1430
C	1986	599	14	613	0	122
C	1987	591	1	592	0	0
C	1988	56	0	56	0	0

Table 168: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1989	1159	75	1234	0	0
C	1990	1512	66	1578	0	67
C	1991	2350	119	2469	0	0
C	1992	2539	153	2692	0	0
C	1993	1038	1753	2791	0	0
C	1994	1171	2704	3875	0	0
C	1995	3636	4295	7931	0	0
C	1996	2766	4032	6798	0	0
C	1997	1429	4549	5978	0	0
C	1998	1591	2661	4252	0	0
C	1999	1156	2261	3417	0	0
C	2000	1602	1736	3338	0	0
C	2001	1306	1939	3245	0	0
C	2002	2855	2585	5440	0	0
C	2003	1527	1854	3381	0	0
C	2004	526	1897	2423	0	0
C	2005	1245	1253	2498	0	0
C	2006	2391	2205	4596	0	0
C	2007	1370	1583	2953	0	0
C	2008	2035	2739	4774	0	0
C	2009	2903	1366	4269	0	11
C	2010	2269	2233	4502	0	0
C	2011	2552	2305	4857	0	3
C	2012	2157	2719	4876	0	40
C	2013	1794	2823	4617	0	0
C	2014	607	4250	4857	0	0
C	2015	0	4156	4156	0	0
C	2016	0	4646	4646	0	0
C	2017	0	3172	3172	0	0
C	2018	266	1215	1481	0	0
C	2019	1023	595	1618	0	0
C	2020	414	302	716	0	0
C	2021	386	267	653	0	0

Table 169: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1990	3812	0	3812	0	3812
O	1991	2162	1	2163	0	2149
O	1992	4158	1	4159	0	3427
O	1993	1272	0	1272	0	1099
O	1994	150	0	150	0	0
O	1996	1925	47	1972	0	0
O	1997	0	6189	6189	0	0
O	1998	879	21	900	0	900
O	1999	1134	7	1141	0	1111
O	2000	805	5	810	30	630
O	2001	1193	6	1199	0	870
O	2002	1256	5	1261	0	961
O	2003	1341	9	1350	0	990
O	2004	1174	25	1199	0	899
O	2005	868	42	910	0	820
O	2006	1194	36	1230	0	990
O	2007	1671	190	1861	0	1501
O	2008	1789	251	2040	0	1650
O	2009	1700	160	1860	0	1590
O	2010	2207	102	2309	0	1620
O	2011	1512	78	1590	0	1380
O	2012	1683	57	1740	0	1500
O	2013	1828	134	1962	0	1452
O	2014	1232	67	1299	0	879
O	2015	914	78	992	0	752
O	2016	977	53	1030	0	791
O	2017	1055	67	1122	0	851
O	2018	853	35	888	0	620
O	2019	673	46	719	0	510
O	2020	409	44	453	0	273
O	2021	399	29	428	0	231

Table 170: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2001	132	255	387	0	0

Table 170: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	78	55	133	0	0
W	2003	390	147	537	0	0
W	2004	84	59	143	0	0
W	2005	54	15	69	0	0
W	2006	50	3	53	0	0
W	2007	211	105	316	0	0
W	2008	266	104	370	0	0
W	2009	344	110	454	0	0
W	2010	506	110	616	0	0
W	2011	448	348	796	0	0
W	2012	285	67	352	0	0
W	2013	509	96	605	0	0
W	2014	315	36	351	0	0
W	2015	47	3	50	0	0
W	2016	0	17	17	0	0
W	2017	93	51	144	0	0
W	2018	167	44	211	0	0
W	2019	187	24	211	0	0
W	2021	102	17	119	0	0

34.2 NWFSC WCGBT

Table 171: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	195	0	15475	15475	0	955
2004	151	2790	8383	11173	0	742
2005	228	9044	4486	13530	0	1103
2006	237	6407	2674	9081	0	930
2007	250	4567	1631	6198	0	958
2008	261	2775	860	3635	0	989

Table 171: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2009	242	2333	777	3110	0	956
2010	264	2297	785	3082	0	1032
2011	254	4074	1114	5188	0	1002
2012	248	3572	1388	4960	0	980
2013	162	2643	642	3285	0	621
2014	240	3938	947	4885	0	922
2015	238	4051	771	4822	0	919
2016	245	3837	1026	4863	0	529
2017	236	3912	728	4640	0	478
2018	248	3841	1039	4880	0	495
2019	112	1664	298	1962	0	221
2021	226	3672	704	4376	0	447

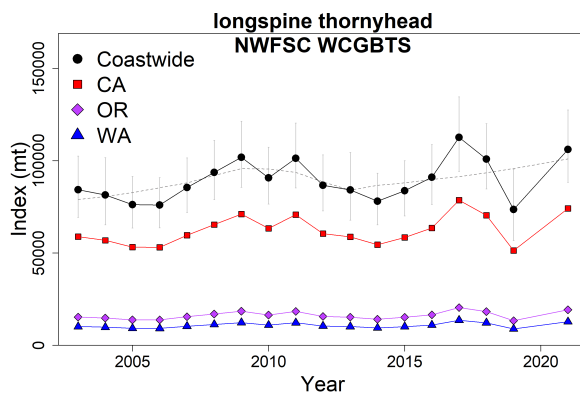


Figure 49: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

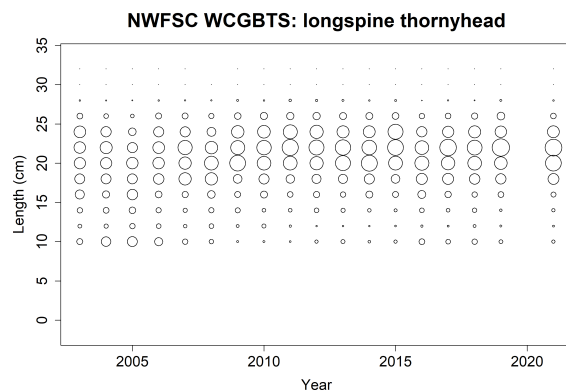


Figure 50: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

35 Olive rockfish

The most recent assessment of Olive rockfish was a data-limited assessment conducted in 2010. Across available data, Olive rockfish have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC HKL survey.

Across all years of available data, commercial fisheries have collected a total of 2,012 length observations, 0 age readings, and 139 otoliths that are available to be aged. In California, since 2000, a total of 368 length observations, 0 age readings, and 62 otoliths have been collected. In Oregon, since 2000, a total of 6 length observations, 0 age readings, and 4 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 38,002 length observations, 0 age readings, and 137 otoliths that are available to be aged. In California, since 2003, a total of 37,961 length observations, 0 age readings, and 137 otoliths have been collected. In Oregon, since 2003, a total of 41 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC HKL survey has collected a total of 582 length observations, 0 age readings, and 546 otoliths that are available to be aged.

35.1 commercial fisheries

Table 172: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1	1	2	0	0
C	1981	0	1	1	0	0

Table 172: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1982	2	26	28	0	2
C	1983	6	1	7	0	4
C	1984	0	5	5	0	6
C	1985	18	30	48	0	35
C	1986	68	44	112	0	23
C	1987	25	1	26	0	3
C	1988	9	0	9	0	0
C	1989	0	33	33	0	0
C	1990	0	1	1	0	0
C	1991	12	2	14	0	0
C	1992	23	128	151	0	0
C	1993	15	385	400	0	0
C	1994	0	270	270	0	0
C	1995	4	178	182	0	0
C	1996	1	172	173	0	0
C	1997	3	65	68	0	0
C	1998	9	19	28	0	0
C	1999	3	77	80	0	0
C	2000	0	26	26	0	0
C	2001	0	3	3	0	0
C	2002	1	8	9	0	0
C	2004	0	1	1	0	0
C	2005	26	10	36	0	26
C	2006	14	7	21	0	13
C	2007	0	67	67	0	16
C	2009	0	24	24	0	0
C	2010	0	9	9	0	0
C	2011	0	9	9	0	0
C	2012	6	25	31	0	6
C	2013	0	24	24	0	0
C	2014	0	5	5	0	0
C	2015	0	3	3	0	0
C	2016	0	12	12	0	0
C	2017	0	11	11	0	0
C	2018	0	23	23	0	0
C	2019	10	4	14	0	0
C	2020	3	1	4	0	0
C	2021	20	16	36	0	1

Table 173: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2010	1	0	1	0	0
O	2011	1	0	1	0	0
O	2014	1	0	1	0	1
O	2017	3	0	3	0	3

35.2 recreational fisheries

Table 174: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	51	51	0	0
C	2004	0	2786	2786	0	0
C	2005	0	3451	3451	0	0
C	2006	0	3331	3331	0	0
C	2007	0	2953	2953	0	0
C	2008	0	2644	2644	0	0
C	2009	0	1401	1401	0	0
C	2010	0	737	737	0	0
C	2011	0	1321	1321	0	0
C	2012	0	2147	2147	0	0
C	2013	0	1517	1517	0	0
C	2014	0	2101	2101	0	0
C	2015	0	3013	3013	0	0
C	2016	0	2675	2675	0	0
C	2017	0	1935	1935	0	0
C	2018	0	2280	2280	0	100
C	2019	1	2790	2791	0	37
C	2020	0	34	34	0	0
C	2021	0	793	793	0	0

Table 175: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2008	0	1	1	0	0
O	2009	0	2	2	0	0
O	2010	0	3	3	0	0
O	2011	0	2	2	0	0
O	2012	0	2	2	0	0
O	2013	0	9	9	0	0
O	2014	0	2	2	0	0
O	2015	0	6	6	0	0
O	2016	0	9	9	0	0
O	2017	0	1	1	0	0
O	2021	0	4	4	0	0

35.3 NWFSC HKL

Table 176: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	8	15	0	15	0	15
2005	2	3	0	3	0	3
2006	7	21	0	21	0	21
2007	7	20	0	20	0	19
2008	12	52	0	52	0	52
2009	4	8	0	8	0	8
2010	3	5	0	5	0	5
2011	5	7	0	7	0	6
2012	9	13	0	13	0	13
2013	7	12	0	12	0	9
2014	14	60	0	60	0	60
2015	20	64	0	64	0	61
2016	20	46	0	46	0	44

Table 176: Data collected annually from the NWFSC HKL survey. *(continued)*

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2017	28	80	0	80	0	78
2018	18	59	0	59	0	57
2019	22	72	0	72	0	57
2021	17	45	0	45	0	38

36 Pacific cod

To date, no assessment or analysis has been conducted on Pacific cod. Across available data, Pacific cod have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 65,698 length observations, 943 age readings, and 3,722 otoliths that are available to be aged. In California, since 2000, a total of 28 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 3,930 length observations, 0 age readings, and 3,722 otoliths have been collected. In Washington, since 2000, a total of 16,551 length observations, 943 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 386 length observations, 0 age readings, and 82 otoliths that are available to be aged. In Oregon, since 2003, a total of 49 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 327 length observations, 0 age readings, and 82 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 3,874 length observations, 0 age readings, and 1,290 otoliths that are available to be aged.

36.1 commercial fisheries

Table 177: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2008	9	0	9	0	0
C	2014	1	0	1	0	0
C	2015	17	1	18	0	0

Table 178: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2003	26	0	26	0	26
O	2008	16	0	16	0	16
O	2009	36	0	36	0	34
O	2010	370	4	374	0	342
O	2011	349	0	349	0	349
O	2012	420	0	420	0	420
O	2013	493	0	493	0	433
O	2014	315	0	315	0	315
O	2015	407	0	407	0	375
O	2016	432	0	432	0	372
O	2017	410	0	410	0	394
O	2018	222	0	222	0	216
O	2019	212	1	213	0	213
O	2020	137	0	137	0	137
O	2021	80	0	80	0	80

Table 179: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	4983	41	5024	0	0
W	1981	3979	343	4322	0	0
W	1982	1599	1362	2961	0	0
W	1983	1203	1102	2305	0	0
W	1984	1200	600	1800	0	0

Table 179: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1985	1757	0	1757	0	0
W	1986	2300	0	2300	0	0
W	1987	4100	0	4100	0	0
W	1988	3963	0	3963	0	0
W	1989	2499	127	2626	0	0
W	1990	1251	294	1545	0	0
W	1991	2214	50	2264	0	0
W	1992	2025	5	2030	0	0
W	1993	1470	180	1650	0	0
W	1994	735	65	800	0	0
W	1995	1097	301	1398	0	0
W	1996	790	0	790	0	0
W	1997	1097	3	1100	0	0
W	1998	1400	0	1400	0	0
W	1999	1054	0	1054	0	0
W	2000	900	0	900	0	0
W	2001	1097	0	1097	0	0
W	2002	1079	0	1079	100	0
W	2003	1497	2	1499	200	0
W	2004	1020	1	1021	123	0
W	2005	1181	0	1181	50	0
W	2006	920	0	920	0	0
W	2007	699	1	700	0	0
W	2008	300	0	300	0	0
W	2009	898	2	900	0	0
W	2010	1300	0	1300	0	0
W	2011	800	0	800	0	0
W	2012	478	0	478	0	0
W	2013	400	0	400	0	0
W	2014	453	4	457	0	0
W	2015	227	9	236	0	0
W	2016	143	168	311	0	0
W	2017	986	105	1091	470	0
W	2018	818	3	821	0	0
W	2019	704	69	773	0	0
W	2020	70	15	85	0	0
W	2021	185	17	202	0	0

36.2 recreational fisheries

Table 180: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2002	0	7	7	0	0
O	2003	0	20	20	0	0
O	2004	0	1	1	0	0
O	2009	0	2	2	0	0
O	2011	0	1	1	0	0
O	2012	0	20	20	0	0
O	2017	0	3	3	0	0
O	2019	0	2	2	0	0

Table 181: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	0	3	3	0	0
W	2003	1	18	19	0	0
W	2004	159	5	164	0	0
W	2005	17	14	31	0	0
W	2006	11	7	18	0	0
W	2011	0	2	2	0	0
W	2013	0	1	1	0	0
W	2018	33	8	41	0	32
W	2019	6	1	7	0	6
W	2020	10	0	10	0	10
W	2021	34	0	34	0	34

36.3 NWFSC WCGBT

Table 182: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	68	783	0	783	0	0
2004	46	290	0	290	0	0
2005	27	199	0	199	0	0
2006	15	166	0	166	0	0
2007	24	177	0	177	0	0
2008	19	72	0	72	0	0
2009	17	123	0	123	0	0
2010	48	404	0	404	0	221
2011	34	294	7	301	0	150
2012	21	154	0	154	0	89
2013	27	173	2	175	0	33
2014	39	240	0	240	0	185
2015	62	328	0	328	0	270
2016	31	231	0	231	0	148
2017	25	93	0	93	0	92
2018	10	45	0	45	0	45
2019	10	69	0	69	0	33
2021	7	24	0	24	0	24

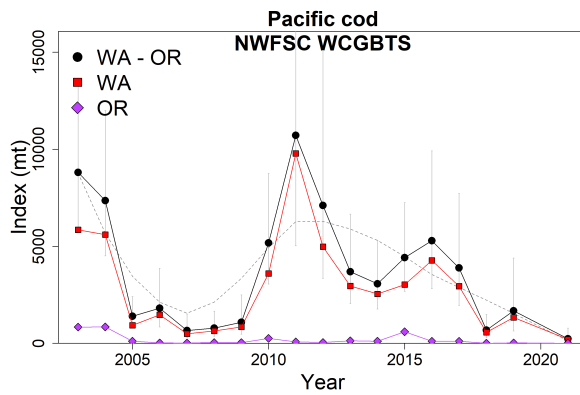


Figure 51: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

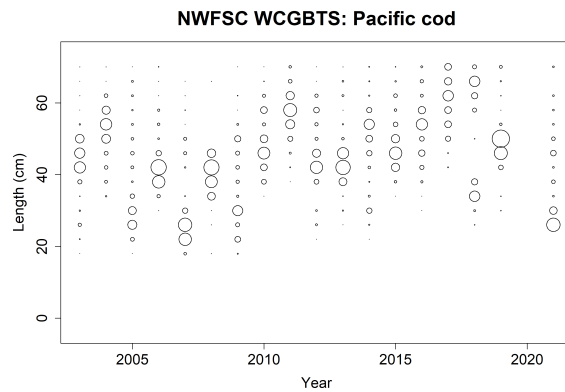


Figure 52: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

37 Pacific ocean perch

The most recent assessment of Pacific ocean perch was a full assessment conducted in 2017. Across available data, Pacific ocean perch have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 95,650 length observations, 35,040 age readings, and 32,962 otoliths that are available to be aged. In California, since 2000, a total of 792 length observations, 0 age readings, and 435 otoliths have been collected. In Oregon, since 2000, a total of 33,738 length observations, 11,949 age readings, and 17,961 otoliths have been collected. In Washington, since 2000, a total of 12,953 length observations, 7,028 age readings, and 192 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 14,645 length observations, 5,881 age readings, and 3,558 otoliths that are available to be aged.

37.1 commercial fisheries

Table 183: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1981	2	0	2	0	2
C	1982	1	0	1	0	133
C	1985	1	0	1	0	277
C	2007	22	0	22	0	14
C	2008	53	4	57	0	35
C	2009	62	2	64	0	60
C	2010	45	2	47	0	26
C	2011	63	18	81	0	60
C	2012	33	23	56	0	26

Table 183: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2013	36	1	37	0	32
C	2014	34	12	46	0	20
C	2015	52	3	55	0	48
C	2016	85	11	96	0	84
C	2017	85	9	94	0	30
C	2018	18	1	19	0	0
C	2019	47	0	47	0	0
C	2020	61	7	68	0	0
C	2021	2	1	3	0	0

Table 184: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1981	1306	0	1306	149	1157
O	1982	2219	0	2219	1343	876
O	1983	1637	0	1637	1430	207
O	1984	401	0	401	289	10
O	1985	1710	0	1710	0	1710
O	1986	1703	0	1703	0	1703
O	1987	1855	0	1855	0	1855
O	1988	402	0	402	0	402
O	1989	798	0	798	0	798
O	1990	599	0	599	0	599
O	1991	216	0	216	0	216
O	1994	898	0	898	238	0
O	1995	856	0	856	0	0
O	1996	1193	0	1193	0	23
O	1997	1543	24	1567	0	0
O	1998	1069	0	1069	0	0
O	1999	1496	0	1496	39	0
O	2000	1301	0	1301	414	4
O	2001	1052	0	1052	724	114
O	2002	811	0	811	683	2
O	2003	839	0	839	534	0
O	2004	864	0	864	554	0
O	2005	957	0	957	720	1

Table 184: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2006	1092	0	1092	1041	0
O	2007	1339	0	1339	1221	37
O	2008	2186	0	2186	667	1511
O	2009	2127	0	2127	963	989
O	2010	2442	0	2442	1068	903
O	2011	1483	1	1484	929	547
O	2012	1300	0	1300	1008	247
O	2013	1644	1	1645	589	1026
O	2014	2234	0	2234	295	1837
O	2015	2068	0	2068	309	1610
O	2016	1879	0	1879	230	1604
O	2017	1739	0	1739	0	1636
O	2018	1890	2	1892	0	1742
O	2019	1881	0	1881	0	1710
O	2020	1282	0	1282	0	1120
O	2021	1324	0	1324	0	1321

Table 185: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	3301	0	3301	0	3109
W	1981	1984	0	1984	1753	100
W	1982	2194	2	2196	1291	897
W	1983	1898	0	1898	1482	300
W	1984	1900	0	1900	1859	0
W	1985	2099	0	2099	2097	0
W	1986	1799	0	1799	1795	0
W	1987	1200	1	1201	1196	0
W	1988	200	0	200	200	0
W	1994	1677	33	1710	0	0
W	1995	2304	1	2305	0	0
W	1996	1800	92	1892	0	0
W	1997	1898	105	2003	0	0
W	1998	2359	22	2381	0	0
W	1999	1357	12	1369	902	0
W	2000	723	2	725	285	0

Table 185: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2001	722	1	723	704	0
W	2002	887	56	943	819	0
W	2003	792	54	846	799	0
W	2004	331	7	338	300	0
W	2005	323	0	323	300	0
W	2006	345	50	395	218	0
W	2007	809	101	910	605	0
W	2008	870	2	872	462	0
W	2009	1178	0	1178	634	96
W	2010	522	0	522	240	96
W	2011	459	1	460	303	0
W	2012	573	0	573	331	0
W	2013	507	16	523	266	0
W	2014	609	7	616	295	0
W	2015	425	11	436	213	0
W	2016	311	0	311	254	0
W	2017	570	0	570	0	0
W	2018	351	0	351	0	0
W	2019	600	1	601	0	0
W	2020	336	1	337	0	0
W	2021	400	0	400	0	0

37.2 NWFSC WCGBT

Table 186: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	46	1425	1	1426	432	2
2004	34	565	0	565	219	0
2005	38	525	1	526	257	0
2006	33	659	0	659	254	1

Table 186: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2007	50	627	1	628	439	0
2008	39	505	34	539	328	0
2009	46	435	36	471	331	2
2010	53	903	4	907	579	0
2011	53	849	72	921	674	3
2012	50	1166	9	1175	0	699
2013	45	730	2	732	199	354
2014	52	902	89	991	626	0
2015	69	1143	22	1165	840	5
2016	50	1150	0	1150	703	67
2017	56	968	8	976	0	778
2018	40	642	6	648	0	537
2019	19	345	0	345	0	291
2021	59	632	189	821	0	819

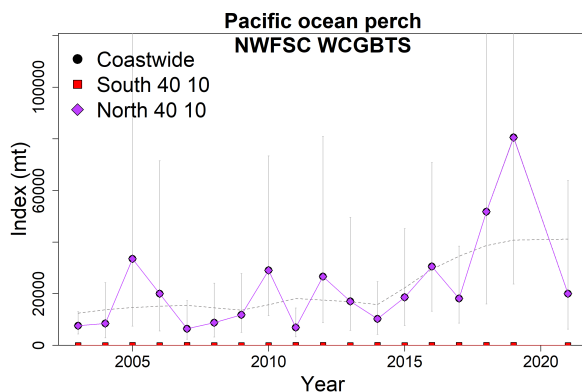


Figure 53: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

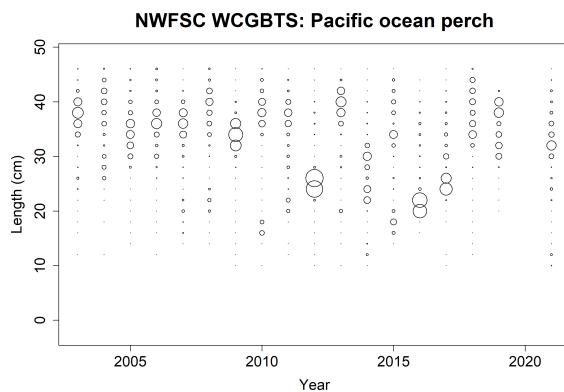


Figure 54: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

38 Pacific sanddab

The most recent assessment of Pacific sanddab was a data-limited assessment conducted in 2010. Across available data, Pacific sanddab have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 39,914 length observations, 159 age readings, and 16,600 otoliths that are available to be aged. In California, since 2000, a total of 24,425 length observations, 0 age readings, and 2,552 otoliths have been collected. In Oregon, since 2000, a total of 13,440 length observations, 0 age readings, and 12,425 otoliths have been collected. In Washington, since 2000, a total of 100 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 47,156 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 45,596 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 1,516 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 8 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 85,291 length observations, 7,986 age readings, and 5,722 otoliths that are available to be aged.

38.1 commercial fisheries

Table 187: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2002	0	46	46	0	0
C	2003	1304	0	1304	0	409
C	2004	757	125	882	0	72
C	2005	994	30	1024	0	112
C	2006	1979	125	2104	0	184
C	2007	1516	116	1632	0	770
C	2008	1319	203	1522	0	860
C	2009	759	190	949	0	0
C	2010	688	390	1078	0	60
C	2011	246	163	409	0	0
C	2012	355	230	585	0	5
C	2013	1077	302	1379	0	0
C	2014	961	278	1239	0	0
C	2015	1672	151	1823	0	0
C	2016	2203	100	2303	0	80
C	2017	1607	16	1623	0	0
C	2018	1454	10	1464	0	0
C	2019	829	547	1376	0	0
C	2020	231	155	386	0	0
C	2021	1173	124	1297	0	0

Table 188: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1994	147	0	147	145	2
O	1995	215	0	215	9	206
O	1996	160	0	160	0	61
O	1997	585	0	585	5	515
O	1998	588	0	588	0	588
O	1999	251	0	251	0	251
O	2000	414	0	414	0	414
O	2001	399	104	503	0	400
O	2002	538	0	538	0	379
O	2003	340	0	340	0	340
O	2004	481	0	481	0	481
O	2005	566	0	566	0	566

Table 188: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2006	804	0	804	0	804
O	2007	630	0	630	0	540
O	2008	470	0	470	0	410
O	2009	930	0	930	0	830
O	2010	834	0	834	0	804
O	2011	830	0	830	0	730
O	2012	709	0	709	0	709
O	2013	851	0	851	0	852
O	2014	835	0	835	0	835
O	2015	759	1	760	0	670
O	2016	649	1	650	0	530
O	2017	699	2	701	0	685
O	2018	664	2	666	0	578
O	2019	550	0	550	0	490
O	2020	160	0	160	0	160
O	2021	207	11	218	0	218

Table 189: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	0	3	3	0	0
W	2021	100	0	100	0	0

38.2 recreational fisheries

Table 190: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	21	21	0	0
C	2004	0	1742	1742	0	0
C	2005	1	1833	1834	0	0
C	2006	0	2864	2864	0	0
C	2007	0	2105	2105	0	0
C	2008	0	4007	4007	0	0
C	2009	11	2971	2982	0	0
C	2010	0	3739	3739	0	0
C	2011	70	3372	3442	0	0
C	2012	211	4480	4691	0	0
C	2013	1038	3891	4929	0	0
C	2014	1393	2461	3854	0	0
C	2015	779	1007	1786	0	0
C	2016	980	971	1951	0	0
C	2017	867	790	1657	0	0
C	2018	782	833	1615	0	0
C	2019	651	533	1184	0	0
C	2020	270	321	591	0	0
C	2021	182	420	602	0	0

Table 191: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	18	18	0	0
O	2002	0	18	18	0	0
O	2003	0	56	56	0	0
O	2004	0	339	339	0	0
O	2005	0	82	82	0	0
O	2006	0	29	29	0	0
O	2007	0	7	7	0	0
O	2008	0	46	46	0	0
O	2009	0	13	13	0	0
O	2010	0	85	85	0	0
O	2011	0	49	49	0	0
O	2012	0	151	151	0	0
O	2013	0	69	69	0	0

Table 191: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2014	0	82	82	0	0
O	2015	0	32	32	0	0
O	2016	0	39	39	0	0
O	2017	0	277	277	0	0
O	2018	0	59	59	0	0
O	2019	0	65	65	0	0
O	2020	0	12	12	0	0
O	2021	0	24	24	0	0

Table 192: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2008	0	1	1	0	0
W	2019	0	1	1	0	0
W	2021	0	6	6	0	0

38.3 NWFSC WCGBT

Table 193: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	133	8853	74	8927	787	8
2004	165	10755	0	10755	1419	8
2005	219	10126	0	10126	993	14
2006	178	5902	2	5904	704	15
2007	190	4293	26	4319	725	10

Table 193: Data collected annually from the NWFSC WCGBT survey. *(continued)*

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2008	202	4527	9	4536	768	6
2009	216	2815	6	2821	0	813
2010	242	1501	11	1512	1018	133
2011	240	4486	90	4576	752	96
2012	241	4536	78	4614	820	106
2013	160	3275	52	3327	0	618
2014	242	4992	47	5039	0	929
2015	246	4992	34	5026	0	926
2016	223	4565	6	4571	0	463
2017	242	3057	6	3063	0	466
2018	225	2590	7	2597	0	436
2019	110	1230	5	1235	0	215
2021	234	2333	10	2343	0	460

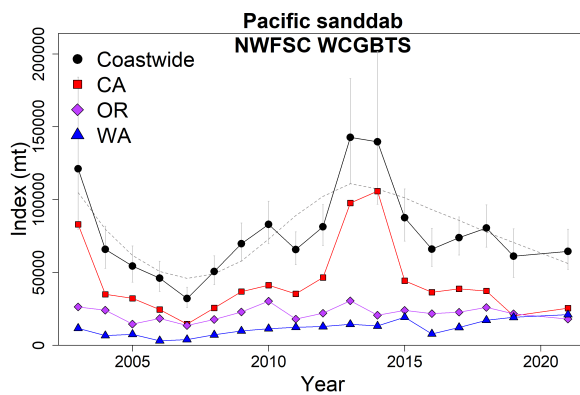


Figure 55: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

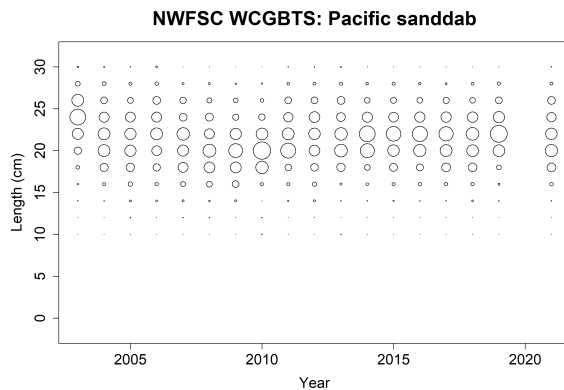


Figure 56: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

39 Pacific spiny dogfish

The most recent assessment of Pacific spiny dogfish was a full assessment conducted in 2021. Across available data, Pacific spiny dogfish have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 16,764 length observations, 2,956 age readings, and 684 otoliths that are available to be aged. In California, since 2000, a total of 330 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 3,177 length observations, 0 age readings, and 684 otoliths have been collected. In Washington, since 2000, a total of 12,344 length observations, 2,956 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 1,146 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 1,092 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 52 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 31,645 length observations, 591 age readings, and 9,219 otoliths that are available to be aged.

39.1 commercial fisheries

Table 194: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2009	176	0	176	0	0
C	2011	1	0	1	0	0
C	2012	3	0	3	0	0
C	2014	97	0	97	0	0
C	2015	2	30	32	0	0
C	2017	3	0	3	0	0
C	2018	17	0	17	0	0
C	2020	1	0	1	0	0

Table 195: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2008	4	0	4	0	4
O	2009	6	0	6	0	6
O	2010	113	0	113	0	50
O	2011	113	0	113	0	30
O	2012	143	0	143	0	30
O	2013	96	0	96	0	0
O	2014	194	0	194	0	0
O	2015	377	0	377	0	0
O	2016	501	0	501	0	0
O	2017	283	0	283	0	1
O	2018	285	0	285	0	21
O	2019	266	0	266	0	10
O	2020	463	0	463	0	306
O	2021	333	0	333	0	226

Table 196: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	200	0	200	0	0

Table 196: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1981	532	0	532	0	0
W	1991	181	0	181	0	0
W	2003	125	0	125	0	0
W	2004	93	1	94	0	0
W	2005	388	0	388	188	0
W	2006	1701	91	1792	220	0
W	2007	3210	33	3243	1154	0
W	2008	1809	0	1809	824	0
W	2009	800	0	800	399	0
W	2010	649	0	649	171	0
W	2011	748	1	749	0	0
W	2012	280	0	280	0	0
W	2013	419	0	419	0	0
W	2014	399	26	425	0	0
W	2015	674	0	674	0	0
W	2016	208	0	208	0	0
W	2017	200	0	200	0	0
W	2018	237	1	238	0	0
W	2019	75	0	75	0	0
W	2020	25	0	25	0	0
W	2021	151	0	151	0	0

39.2 recreational fisheries

Table 197: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	2	2	4	0	0
C	2004	0	46	46	0	0
C	2005	8	100	108	0	0
C	2006	36	166	202	0	0

Table 197: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2007	34	72	106	0	0
C	2008	40	46	86	0	0
C	2009	44	32	76	0	0
C	2010	30	18	48	0	0
C	2011	6	72	78	0	0
C	2012	8	34	42	0	0
C	2013	16	34	50	0	0
C	2014	22	18	40	0	0
C	2015	20	18	38	0	0
C	2016	10	4	14	0	0
C	2017	52	4	56	0	0
C	2018	26	8	34	0	0
C	2019	44	4	48	0	0
C	2021	14	2	16	0	0

Table 198: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2002	0	2	2	0	0
O	2003	0	6	6	0	0
O	2004	0	4	4	0	0
O	2005	0	2	2	0	0
O	2006	0	4	4	0	0
O	2007	0	4	4	0	0
O	2009	0	10	10	0	0
O	2010	0	4	4	0	0
O	2012	0	8	8	0	0
O	2014	0	4	4	0	0
O	2015	0	2	2	0	0
O	2017	0	2	2	0	0
O	2018	0	2	2	0	0

39.3 NWFSC WCGBT

Table 199: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	178	3787	2	3789	0	673
2004	160	2480	1	2481	0	540
2005	251	3565	1	3566	0	864
2006	224	3882	18	3900	0	786
2007	224	2419	2	2421	0	749
2008	249	2847	27	2874	0	887
2009	205	1658	3	1661	0	632
2010	226	1723	4	1727	591	440
2011	200	1635	2	1637	0	639
2012	173	1507	2	1509	0	563
2013	95	613	0	613	0	287
2014	154	1474	2	1476	0	470
2015	145	669	1	670	0	350
2016	119	771	0	771	0	291
2017	100	532	0	532	0	223
2018	135	774	0	774	0	330
2019	65	489	0	489	0	187
2021	119	755	0	755	0	308

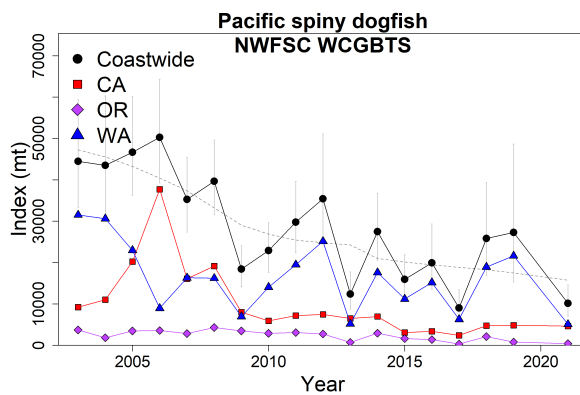


Figure 57: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

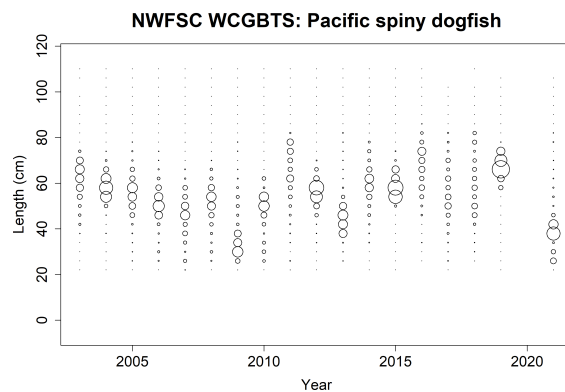


Figure 58: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

40 Petrale sole

The most recent assessment of Petrale sole was a update assessment conducted in 2019. Across available data, Petrale sole have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 142,354 length observations, 18,591 age readings, and 50,803 otoliths that are available to be aged. In California, since 2000, a total of 58,453 length observations, 2,163 age readings, and 2,593 otoliths have been collected. In Oregon, since 2000, a total of 42,335 length observations, 7,345 age readings, and 28,410 otoliths have been collected. In Washington, since 2000, a total of 27,461 length observations, 6,244 age readings, and 9,959 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 72,307 length observations, 12,551 age readings, and 8,546 otoliths that are available to be aged.

40.1 commercial fisheries

Table 200: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1990	484	0	484	321	200
C	1991	467	0	467	294	200
C	1992	88	0	88	0	0
C	1994	0	1	1	0	0
C	2001	478	116	594	0	0
C	2002	305	156	461	0	0
C	2003	719	30	749	116	196
C	2004	894	71	965	182	273
C	2005	1330	77	1407	300	274

Table 200: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2006	1987	297	2284	231	206
C	2007	4708	269	4977	210	177
C	2008	4285	577	4862	440	403
C	2009	2034	468	2502	78	78
C	2010	1620	391	2011	0	6
C	2011	1542	236	1778	253	239
C	2012	2024	350	2374	183	154
C	2013	3589	234	3823	170	148
C	2014	2859	105	2964	0	97
C	2015	2166	922	3088	0	0
C	2016	2599	1018	3617	0	176
C	2017	3108	670	3778	0	166
C	2018	3105	381	3486	0	0
C	2019	3556	940	4496	0	0
C	2020	3654	619	4273	0	0
C	2021	3903	61	3964	0	0

Table 201: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1987	1105	0	1105	348	757
O	1988	900	0	900	91	809
O	1989	803	0	803	651	152
O	1990	803	0	803	410	393
O	1991	633	0	633	8	625
O	1992	741	0	741	55	686
O	1993	532	0	532	0	532
O	1994	629	0	629	46	583
O	1995	296	0	296	0	296
O	1996	235	0	235	0	235
O	1997	748	0	748	6	742
O	1998	555	0	555	344	211
O	1999	466	0	466	265	130
O	2000	777	0	777	0	750
O	2001	504	0	504	0	426
O	2002	919	0	919	0	781

Table 201: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2003	1092	0	1092	0	987
O	2004	939	0	939	0	873
O	2005	945	0	945	0	810
O	2006	2045	0	2045	0	1634
O	2007	1940	0	1940	455	1114
O	2008	2409	0	2409	483	1506
O	2009	2952	0	2952	537	1134
O	2010	2692	61	2753	506	1503
O	2011	1748	1	1749	529	1068
O	2012	1872	0	1872	621	1161
O	2013	2537	0	2537	715	1597
O	2014	3379	0	3379	745	2455
O	2015	2984	0	2984	718	1861
O	2016	1916	0	1916	523	1273
O	2017	2985	1	2986	761	1894
O	2018	2336	0	2336	752	1224
O	2019	2348	37	2385	0	2032
O	2020	1336	0	1336	0	1186
O	2021	1502	78	1580	0	1141

Table 202: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	2858	2	2860	0	1747
W	1981	400	0	400	0	195
W	1998	639	11	650	0	648
W	1999	708	1	709	0	700
W	2000	878	0	878	0	829
W	2001	743	7	750	0	736
W	2002	887	4	891	0	697
W	2003	1186	1	1187	0	1139
W	2004	1179	0	1179	0	1174
W	2005	1333	0	1333	0	1325
W	2006	1847	2	1849	0	1043
W	2007	2138	4	2142	0	1099
W	2008	1872	1	1873	0	1031

Table 202: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2009	1671	0	1671	543	547
W	2010	995	0	995	389	339
W	2011	1123	0	1123	643	0
W	2012	1141	0	1141	599	0
W	2013	1906	2	1908	840	0
W	2014	1200	0	1200	549	0
W	2015	1430	1	1431	725	0
W	2016	220	0	220	115	0
W	2017	2095	0	2095	755	0
W	2018	1722	50	1772	813	0
W	2019	1112	28	1140	273	0
W	2020	111	0	111	0	0
W	2021	572	0	572	0	0

40.2 NWFSC WCGBT

Table 203: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	197	2833	4	2837	765	835
2004	212	3345	1	3346	723	1133
2005	278	4539	16	4555	752	1093
2006	247	3664	4	3668	774	201
2007	257	3403	6	3409	690	289
2008	257	3042	5	3047	746	279
2009	277	3385	2	3387	777	283
2010	325	6049	3	6052	801	593
2011	320	6172	4	6176	799	561
2012	295	5366	6	5372	777	510
2013	218	3440	5	3445	843	1
2014	332	4805	17	4822	766	472

Table 203: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2015	312	4232	4	4236	751	406
2016	309	4383	2	4385	893	23
2017	314	4260	1	4261	884	4
2018	291	3782	1	3783	810	6
2019	155	1795	2	1797	0	624
2021	290	3727	2	3729	0	1233

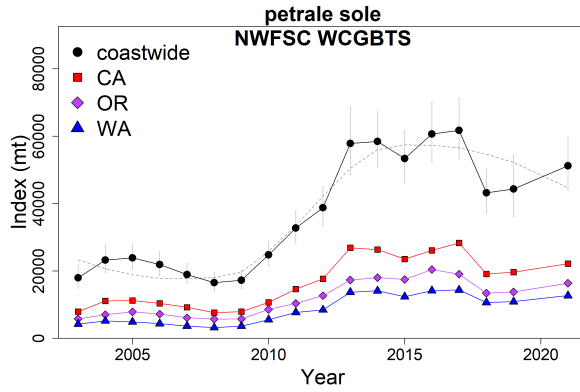


Figure 59: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

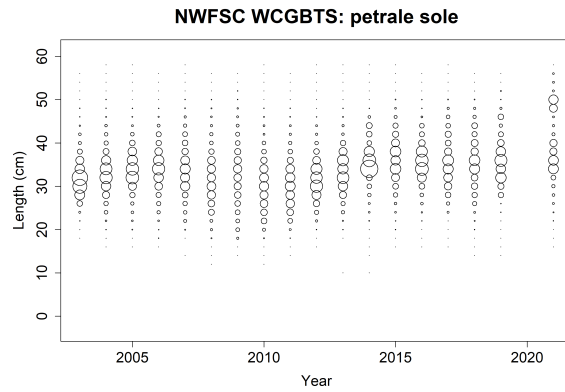


Figure 60: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

41 Quillback rockfish

The most recent assessment of Quillback rockfish was a data-moderate assessment conducted in 2021. Across available data, Quillback rockfish have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 6,942 length observations, 185 age readings, and 1,202 otoliths that are available to be aged. In California, since 2000, a total of 1,096 length observations, 0 age readings, and 36 otoliths have been collected. In Oregon, since 2000, a total of 3,354 length observations, 138 age readings, and 1,166 otoliths have been collected. In Washington, since 2000, a total of 188 length observations, 47 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 30,061 length observations, 2,895 age readings, and 3,748 otoliths that are available to be aged. In California, since 2003, a total of 5,311 length observations, 0 age readings, and 62 otoliths have been collected. In Oregon, since 2003, a total of 18,829 length observations, 783 age readings, and 3,344 otoliths have been collected. In Washington, since 2003, a total of 4,579 length observations, 2,103 age readings, and 342 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 231 length observations, 175 age readings, and 13 otoliths that are available to be aged.

41.1 commercial fisheries

Table 204: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1984	1	0	1	0	0
C	1987	1	0	1	0	0
C	1991	3	155	158	0	0
C	1992	0	260	260	0	0
C	1993	0	97	97	0	0
C	1994	0	295	295	0	0
C	1995	2	124	126	0	0
C	1996	0	132	132	0	0
C	1997	0	150	150	0	0
C	1998	0	16	16	0	0
C	1999	1	579	580	0	0
C	2000	0	41	41	0	0
C	2001	1	321	322	0	0
C	2002	0	17	17	0	0
C	2004	4	10	14	0	4
C	2005	0	16	16	0	0
C	2006	0	19	19	0	0
C	2007	27	111	138	0	27
C	2008	0	108	108	0	0
C	2009	0	39	39	0	0
C	2010	0	16	16	0	0
C	2011	2	5	7	0	1
C	2012	5	10	15	0	4
C	2013	0	13	13	0	0
C	2014	0	5	5	0	0
C	2015	0	20	20	0	0
C	2016	0	16	16	0	0
C	2017	0	49	49	0	0
C	2018	0	31	31	0	0
C	2019	75	11	86	0	0
C	2020	74	0	74	0	0
C	2021	50	0	50	0	0

Table 205: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1998	4	0	4	0	0
O	1999	25	0	25	0	0
O	2000	200	0	200	0	0
O	2001	214	0	214	0	0
O	2002	59	0	59	2	1
O	2003	48	0	48	9	0
O	2004	134	0	134	63	0
O	2005	20	0	20	1	0
O	2006	140	0	140	63	0
O	2007	127	0	127	0	2
O	2008	55	2	57	0	12
O	2009	64	0	64	0	17
O	2010	69	0	69	0	14
O	2011	191	0	191	0	97
O	2012	151	0	151	0	102
O	2013	214	0	214	0	117
O	2014	184	6	190	0	120
O	2015	102	0	102	0	59
O	2016	75	2	77	0	35
O	2017	181	33	214	0	112
O	2018	198	1	199	0	85
O	2019	354	1	355	0	194
O	2020	216	0	216	0	103
O	2021	311	2	313	0	96

Table 206: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	0	3	3	0	0
W	1982	275	38	313	0	0
W	1983	22	0	22	0	0
W	1989	0	20	20	0	0
W	1990	0	100	100	0	0
W	1996	0	1	1	0	0
W	2000	0	4	4	0	0
W	2002	10	6	16	0	0

Table 206: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2003	4	0	4	0	0
W	2004	2	0	2	0	0
W	2005	1	0	1	0	0
W	2006	105	0	105	0	0
W	2014	19	0	19	15	0
W	2017	9	0	9	9	0
W	2018	9	0	9	4	0
W	2019	19	0	19	19	0

41.2 recreational fisheries

Table 207: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	120	120	0	0
C	2005	0	215	215	0	0
C	2006	0	418	418	0	0
C	2007	0	552	552	0	0
C	2008	1	330	331	0	0
C	2009	0	321	321	0	0
C	2010	0	144	144	0	0
C	2011	0	207	207	0	0
C	2012	0	271	271	0	0
C	2013	3	186	189	0	0
C	2014	0	129	129	0	0
C	2015	0	376	376	0	0
C	2016	0	440	440	0	0
C	2017	0	457	457	0	0
C	2018	0	423	423	0	11
C	2019	0	464	464	0	18
C	2021	0	254	254	0	33

Table 208: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	321	321	0	0
O	2002	0	757	757	0	0
O	2003	0	876	876	0	0
O	2004	0	500	500	0	0
O	2005	91	931	1022	91	0
O	2006	343	1033	1376	336	3
O	2007	309	1075	1384	0	311
O	2008	363	1120	1483	356	0
O	2009	245	825	1070	0	245
O	2010	372	919	1291	0	374
O	2011	333	1048	1381	0	337
O	2012	475	1241	1716	0	475
O	2013	283	753	1036	0	284
O	2014	193	484	677	0	193
O	2015	0	43	43	0	0
O	2016	0	27	27	0	0
O	2017	227	737	964	0	228
O	2018	349	1352	1701	0	349
O	2019	392	1235	1627	0	392
O	2020	153	39	192	0	153
O	2021	0	463	463	0	0

Table 209: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	235	29	264	9	0
W	2003	260	30	290	0	0
W	2004	287	35	322	157	1
W	2005	337	74	411	181	0
W	2006	235	91	326	52	0
W	2007	218	48	266	89	4
W	2008	131	45	176	59	0
W	2009	135	25	160	27	1
W	2010	70	3	73	6	7

Table 209: Data collected annually from the recreational fisheries in Washington. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2011	63	45	108	32	0
W	2012	55	29	84	14	0
W	2013	72	65	137	8	0
W	2014	240	76	316	288	2
W	2015	208	35	243	236	0
W	2016	325	14	339	273	52
W	2017	223	108	331	222	0
W	2018	200	88	288	199	0
W	2019	260	168	428	260	0
W	2020	161	1	162	0	161
W	2021	114	5	119	0	114

41.3 NWFSC WCGBT

Table 210: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	2	3	0	3	0	0
2005	2	2	0	2	2	0
2006	2	3	0	3	3	0
2007	2	20	0	20	16	0
2008	3	37	0	37	22	0
2009	2	3	0	3	3	0
2010	2	2	0	2	2	0
2011	4	6	0	6	6	0
2012	4	46	0	46	26	0
2013	2	1	1	2	1	0
2014	9	25	0	25	24	1
2015	6	7	1	8	8	0
2016	4	9	0	9	9	0
2017	7	15	1	16	16	0

Table 210: Data collected annually from the NWFSC WCGBT survey. *(continued)*

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2018	8	21	0	21	21	0
2019	3	16	0	16	16	0
2021	6	12	0	12	0	12

42 Redbanded rockfish

The most recent assessment of Redbanded rockfish was a data-limited assessment conducted in 2010. Across available data, Redbanded rockfish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 34,461 length observations, 279 age readings, and 13,548 otoliths that are available to be aged. In California, since 2000, a total of 5,344 length observations, 1 age readings, and 1,564 otoliths have been collected. In Oregon, since 2000, a total of 12,064 length observations, 278 age readings, and 11,412 otoliths have been collected. In Washington, since 2000, a total of 14,176 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 3,346 length observations, 0 age readings, and 3,158 otoliths that are available to be aged.

42.1 commercial fisheries

Table 211: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	34	8	42	0	34
C	1981	48	2	50	0	48
C	1982	38	1	39	0	27
C	1983	117	1	118	0	115
C	1984	253	0	253	0	0
C	1985	327	9	336	0	342
C	1986	102	0	102	0	5
C	1987	48	0	48	0	0
C	1988	38	0	38	0	0

Table 211: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1989	56	10	66	0	0
C	1990	29	2	31	0	0
C	1991	37	7	44	0	0
C	1992	48	32	80	0	0
C	1993	12	44	56	0	0
C	1994	46	8	54	0	0
C	1995	32	37	69	0	0
C	1996	109	128	237	0	0
C	1997	32	18	50	0	0
C	1998	37	24	61	0	0
C	1999	34	18	52	0	0
C	2000	71	3	74	0	0
C	2001	24	26	50	0	9
C	2002	48	45	93	0	53
C	2003	46	12	58	0	44
C	2004	17	6	23	1	11
C	2005	77	15	92	0	52
C	2006	258	11	269	0	141
C	2007	240	3	243	0	110
C	2008	343	46	389	0	118
C	2009	128	64	192	0	51
C	2010	249	70	319	0	115
C	2011	320	54	374	0	280
C	2012	152	46	198	0	92
C	2013	131	40	171	0	100
C	2014	115	131	246	0	54
C	2015	216	280	496	0	141
C	2016	258	174	432	0	148
C	2017	270	141	411	0	45
C	2018	115	162	277	0	0
C	2019	115	43	158	0	0
C	2020	154	105	259	0	0
C	2021	470	50	520	0	0

Table 212: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1995	1	0	1	0	1
O	2000	14	0	14	0	14
O	2001	24	0	24	0	24
O	2002	44	0	44	0	0
O	2003	120	0	120	6	103
O	2004	142	0	142	0	128
O	2005	95	0	95	24	71
O	2006	158	0	158	0	150
O	2007	442	0	442	38	379
O	2008	453	14	467	51	359
O	2009	349	0	349	6	343
O	2010	647	1	648	7	610
O	2011	1007	3	1010	22	980
O	2012	1205	1	1206	58	1148
O	2013	733	0	733	21	712
O	2014	686	0	686	45	639
O	2015	957	0	957	0	957
O	2016	1000	0	1000	0	943
O	2017	1023	0	1023	0	946
O	2018	940	1	941	0	915
O	2019	857	2	859	0	852
O	2020	446	0	446	0	446
O	2021	700	0	700	0	693

Table 213: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	240	240	0	0
W	1997	0	314	314	0	0
W	1998	165	13	178	0	0
W	1999	290	28	318	0	0
W	2000	227	298	525	0	0
W	2001	278	115	393	0	0
W	2002	448	53	501	0	0
W	2003	574	30	604	0	0
W	2004	306	38	344	0	0

Table 213: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2005	102	0	102	0	0
W	2006	264	0	264	0	0
W	2007	400	19	419	0	0
W	2008	374	25	399	0	0
W	2009	342	4	346	0	0
W	2010	300	6	306	0	0
W	2011	500	14	514	0	0
W	2012	431	12	443	0	0
W	2013	598	5	603	0	0
W	2014	688	18	706	0	0
W	2015	724	63	787	0	0
W	2016	1169	44	1213	0	0
W	2017	995	2	997	0	0
W	2018	1369	2	1371	0	0
W	2019	1552	1	1553	0	0
W	2020	632	1	633	0	0
W	2021	1149	4	1153	0	0

42.2 NWFSC WCGBT

Table 214: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	62	272	0	272	0	179
2004	36	156	2	158	0	144
2005	54	168	3	171	0	171
2006	48	145	7	152	0	145
2007	52	166	12	178	0	178
2008	52	142	4	146	0	146
2009	53	135	7	142	0	142
2010	37	166	1	167	0	167

Table 214: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2011	52	208	3	211	0	203
2012	61	143	6	149	0	149
2013	49	180	9	189	0	189
2014	58	219	4	223	0	203
2015	55	187	2	189	0	189
2016	48	111	3	114	0	114
2017	68	262	8	270	0	268
2018	53	266	7	273	0	236
2019	30	114	2	116	0	109
2021	71	219	7	226	0	226

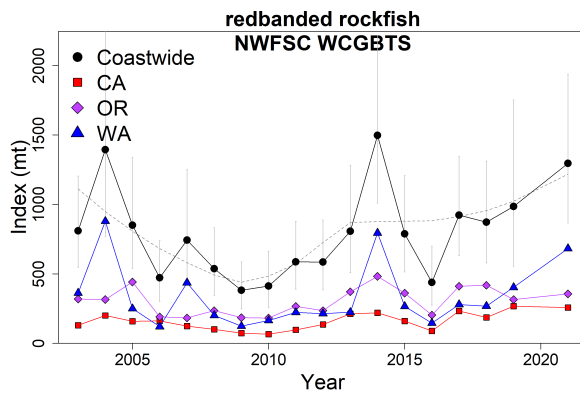


Figure 61: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

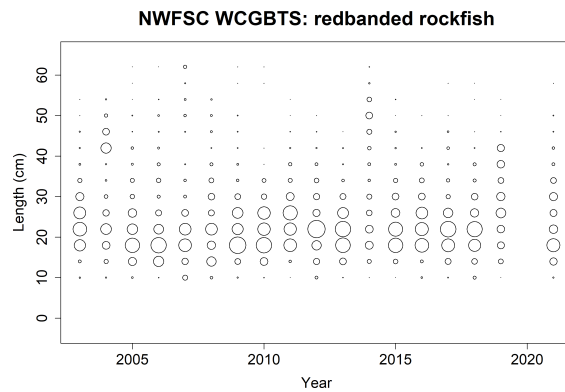


Figure 62: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

43 Redstripe rockfish

The most recent assessment of Redstripe rockfish was a data-limited assessment conducted in 2010. Across available data, Redstripe rockfish have been observed and sampled generally by recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, recreational fisheries have collected a total of 274 length observations, 0 age readings, and 5 otoliths that are available to be aged. In California, since 2003, a total of 9 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 171 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 5 length observations, 0 age readings, and 5 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 7,148 length observations, 0 age readings, and 3,302 otoliths that are available to be aged.

43.1 recreational fisheries

Table 215: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2012	0	3	3	0	0
C	2019	0	1	1	0	0
C	2021	0	5	5	0	0

Table 216: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	57	57	0	0
O	2002	0	32	32	0	0
O	2003	0	51	51	0	0
O	2004	0	14	14	0	0
O	2005	0	32	32	0	0
O	2008	0	1	1	0	0
O	2011	0	6	6	0	0
O	2012	0	4	4	0	0
O	2013	0	2	2	0	0
O	2014	0	6	6	0	0
O	2015	0	14	14	0	0
O	2016	0	2	2	0	0
O	2017	0	13	13	0	0
O	2018	0	9	9	0	0
O	2019	0	12	12	0	0
O	2021	0	5	5	0	0

Table 217: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2015	2	0	2	0	2
W	2016	2	0	2	0	2
W	2019	1	0	1	0	1

43.2 NWFSC WCGBT

Table 218: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	24	766	302	1068	0	246
2004	15	521	6	527	0	179
2005	17	238	2	240	0	113
2006	16	507	0	507	0	131
2007	9	352	4	356	0	102
2008	13	326	7	333	0	131
2009	14	394	13	407	0	265
2010	11	61	0	61	0	61
2011	14	597	0	597	0	295
2012	9	224	0	224	0	113
2013	10	408	0	408	0	210
2014	14	505	0	505	0	314
2015	15	242	63	305	0	147
2016	17	569	78	647	0	324
2017	16	317	0	317	0	201
2018	10	259	0	259	0	190
2019	5	168	0	168	0	123
2021	7	219	0	219	0	157

44 Rex sole

The most recent assessment of Rex sole was a data-moderate assessment conducted in 2013. Across available data, Rex sole have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 51,874 length observations, 0 age readings, and 19,799 otoliths that are available to be aged. In California, since 2000, a total of 27,390 length observations, 0 age readings, and 1,162 otoliths have been collected. In Oregon, since 2000, a total of 22,778 length observations, 0 age readings, and 18,637 otoliths have been collected. In Washington, since 2000, a total of 1,705 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 138,574 length observations, 0 age readings, and 10,943 otoliths that are available to be aged.

44.1 commercial fisheries

Table 219: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2007	2639	49	2688	0	80
C	2008	2945	161	3106	0	302
C	2009	1407	157	1564	0	118
C	2010	1460	82	1542	0	2
C	2011	2348	13	2361	0	235
C	2012	1948	98	2046	0	172
C	2013	2231	58	2289	0	37
C	2014	1441	5	1446	0	12
C	2015	1470	1	1471	0	11

Table 219: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2016	2042	3	2045	0	153
C	2017	2187	42	2229	0	40
C	2018	906	99	1005	0	0
C	2019	1341	2	1343	0	0
C	2020	1455	84	1539	0	0
C	2021	681	35	716	0	0

Table 220: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2006	218	0	218	0	218
O	2007	1613	7	1620	0	1260
O	2008	1438	1	1439	0	1140
O	2009	1809	1	1810	0	1570
O	2010	2280	1	2281	0	1710
O	2011	2037	0	2037	0	1350
O	2012	1575	0	1575	0	1455
O	2013	1449	7	1456	0	1456
O	2014	1490	0	1490	0	1490
O	2015	1371	0	1371	0	1221
O	2016	1390	0	1390	0	1240
O	2017	1535	0	1535	0	1175
O	2018	1503	0	1503	0	979
O	2019	1442	3	1445	0	1115
O	2020	708	0	708	0	588
O	2021	898	2	900	0	670

Table 221: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	0	1	1	0	0

Table 221: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2017	430	0	430	0	0
W	2018	450	100	550	0	0
W	2019	300	0	300	0	0
W	2020	50	0	50	0	0
W	2021	374	1	375	0	0

44.2 NWFSC WCGBT

Table 222: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	171	10843	0	10843	0	0
2004	305	13884	48	13932	0	0
2005	425	15980	27	16007	0	0
2006	396	11580	0	11580	0	0
2007	423	9608	13	9621	0	801
2008	399	7166	61	7227	0	763
2009	395	4088	26	4114	0	780
2010	442	2611	47	2658	0	885
2011	424	6921	67	6988	0	838
2012	432	7399	27	7426	0	850
2013	305	5720	9	5729	0	600
2014	432	8667	15	8682	0	852
2015	418	8500	17	8517	0	818
2016	426	8643	24	8667	0	841
2017	427	5203	28	5231	0	829
2018	431	4822	9	4831	0	850
2019	210	2423	1	2424	0	415
2021	420	4087	10	4097	0	821

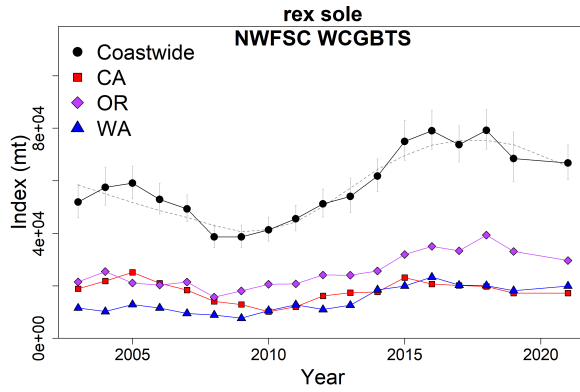


Figure 63: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

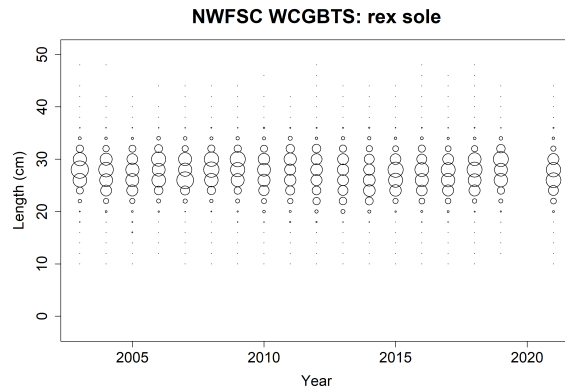


Figure 64: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

45 Rock sole

The most recent assessment of Rock sole was a data-limited assessment conducted in 2010. Across available data, Rock sole have been observed and sampled generally by both commercial and recreational fisheries.

Across all years of available data, commercial fisheries have collected a total of 2,249 length observations, 0 age readings, and 812 otoliths that are available to be aged. In California, since 2000, a total of 1,062 length observations, 0 age readings, and 107 otoliths have been collected. In Oregon, since 2000, a total of 713 length observations, 0 age readings, and 705 otoliths have been collected. In Washington, since 2000, a total of 5 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 971 length observations, 0 age readings, and 15 otoliths that are available to be aged. In California, since 2003, a total of 874 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 72 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 24 length observations, 0 age readings, and 15 otoliths have been collected.

45.1 commercial fisheries

Table 223: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	55	29	84	0	2
C	2004	1	3	4	0	0
C	2006	0	0	0	0	0
C	2007	57	0	57	0	0
C	2008	73	1	74	0	93

Table 223: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2009	89	43	132	0	0
C	2010	31	71	102	0	0
C	2011	0	27	27	0	0
C	2012	42	99	141	0	0
C	2013	26	67	93	0	12
C	2014	0	2	2	0	0
C	2015	0	24	24	0	0
C	2016	7	59	66	0	0
C	2017	94	23	117	0	0
C	2018	39	53	92	0	0
C	2019	2	24	26	0	0
C	2020	1	12	13	0	0
C	2021	0	8	8	0	0

Table 224: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2004	51	0	51	0	51
O	2005	26	0	26	0	26
O	2008	16	0	16	0	16
O	2009	72	0	72	0	72
O	2011	12	0	12	0	12
O	2012	60	0	60	0	60
O	2013	43	0	43	0	43
O	2014	16	0	16	0	16
O	2015	91	0	91	0	91
O	2016	71	0	71	0	71
O	2017	97	0	97	0	91
O	2018	79	0	79	0	79
O	2019	55	0	55	0	53
O	2020	24	0	24	0	24

Table 225: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1982	50	0	50	0	0
W	1983	177	0	177	0	0
W	1984	242	0	242	0	0
W	2021	5	0	5	0	0

45.2 recreational fisheries

Table 226: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	38	38	0	0
C	2005	0	33	33	0	0
C	2006	0	32	32	0	0
C	2007	0	43	43	0	0
C	2008	0	33	33	0	0
C	2009	0	43	43	0	0
C	2010	0	40	40	0	0
C	2011	1	54	55	0	0
C	2012	0	59	59	0	0
C	2013	2	65	67	0	0
C	2014	2	51	53	0	0
C	2015	2	55	57	0	0
C	2016	0	55	55	0	0
C	2017	1	70	71	0	0
C	2018	0	76	76	0	0
C	2019	0	79	79	0	0
C	2020	0	2	2	0	0
C	2021	0	38	38	0	0

Table 227: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	1	1	0	0
O	2004	0	4	4	0	0
O	2005	0	15	15	0	0
O	2006	0	5	5	0	0
O	2007	0	2	2	0	0
O	2008	0	1	1	0	0
O	2009	0	2	2	0	0
O	2010	0	5	5	0	0
O	2011	0	2	2	0	0
O	2012	0	3	3	0	0
O	2013	0	2	2	0	0
O	2014	0	3	3	0	0
O	2015	0	5	5	0	0
O	2016	0	1	1	0	0
O	2017	0	7	7	0	0
O	2018	0	3	3	0	0
O	2019	0	5	5	0	0
O	2021	0	7	7	0	0

Table 228: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2005	0	2	2	0	0
W	2006	0	1	1	0	0
W	2012	0	1	1	0	0
W	2018	1	4	5	0	0
W	2019	6	0	6	0	6
W	2020	6	0	6	0	6
W	2021	3	0	3	0	3

46 Rosethorn rockfish

The most recent assessment of Rosethorn rockfish was a data-limited assessment conducted in 2010. Across available data, Rosethorn rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 4,770 length observations, 0 age readings, and 2,144 otoliths that are available to be aged. In California, since 2000, a total of 202 length observations, 0 age readings, and 66 otoliths have been collected. In Oregon, since 2000, a total of 2,015 length observations, 0 age readings, and 1,932 otoliths have been collected. In Washington, since 2000, a total of 1,386 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 569 length observations, 0 age readings, and 5 otoliths that are available to be aged. In California, since 2003, a total of 25 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 353 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 7 length observations, 0 age readings, and 5 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 18,258 length observations, 0 age readings, and 7,417 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 37 length observations, 0 age readings, and 27 otoliths that are available to be aged.

46.1 commercial fisheries

Table 229: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	0	1	1	0	0
C	1982	15	0	15	0	7
C	1983	10	0	10	0	56
C	1984	15	0	15	0	34
C	1985	56	4	60	0	46
C	1986	37	1	38	0	3
C	1987	18	0	18	0	0
C	1988	19	1	20	0	0
C	1989	13	76	89	0	0
C	1990	18	7	25	0	0
C	1991	12	102	114	0	0
C	1992	7	18	25	0	0
C	1993	12	17	29	0	0
C	1994	9	45	54	0	0
C	1995	16	79	95	0	0
C	1996	50	151	201	0	0
C	1997	9	71	80	0	0
C	1998	14	3	17	0	0
C	1999	62	3	65	0	0
C	2000	3	0	3	0	0
C	2001	2	0	2	0	0
C	2002	5	1	6	0	0
C	2003	2	0	2	0	0
C	2004	1	0	1	0	1
C	2005	2	0	2	0	9
C	2006	1	0	1	0	1
C	2007	1	0	1	0	0
C	2008	0	4	4	0	0
C	2009	0	1	1	0	0
C	2010	3	0	3	0	2
C	2011	0	5	5	0	0
C	2012	29	84	113	0	30
C	2013	4	4	8	0	3
C	2014	2	2	4	0	1
C	2015	15	13	28	0	15
C	2016	1	4	5	0	0
C	2017	4	4	8	0	4
C	2018	0	1	1	0	0
C	2020	3	0	3	0	0
C	2021	1	0	1	0	0

Table 230: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1997	90	0	90	0	0
O	2000	51	0	51	0	0
O	2003	7	0	7	0	7
O	2004	7	0	7	0	4
O	2006	2	0	2	0	2
O	2007	38	0	38	0	34
O	2008	70	0	70	0	68
O	2009	64	0	64	0	64
O	2010	52	0	52	0	50
O	2011	101	0	101	0	98
O	2012	95	2	97	0	98
O	2013	242	1	243	0	243
O	2014	148	0	148	0	146
O	2015	92	0	92	0	92
O	2016	96	1	97	0	96
O	2017	316	1	317	0	317
O	2018	180	1	181	0	169
O	2019	277	2	279	0	279
O	2020	116	0	116	0	114
O	2021	53	0	53	0	51

Table 231: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	51	51	0	0
W	1997	0	23	23	0	0
W	1998	25	0	25	0	0
W	1999	7	0	7	0	0
W	2000	3	17	20	0	0
W	2001	0	3	3	0	0
W	2002	233	4	237	0	0
W	2003	132	3	135	0	0
W	2004	7	0	7	0	0
W	2005	9	0	9	0	0

Table 231: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2006	8	0	8	0	0
W	2008	3	0	3	0	0
W	2009	3	1	4	0	0
W	2010	2	0	2	0	0
W	2011	50	1	51	0	0
W	2012	50	1	51	0	0
W	2013	56	0	56	0	0
W	2014	65	5	70	0	0
W	2015	59	0	59	0	0
W	2016	60	2	62	0	0
W	2017	178	1	179	0	0
W	2018	160	0	160	0	0
W	2019	142	0	142	0	0
W	2020	25	1	26	0	0
W	2021	102	0	102	0	0

46.2 recreational fisheries

Table 232: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	4	4	0	0
C	2005	0	2	2	0	0
C	2008	0	1	1	0	0
C	2010	0	11	11	0	0
C	2013	0	1	1	0	0
C	2019	0	1	1	0	0
C	2021	0	5	5	0	0

Table 233: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	63	63	0	0
O	2002	0	121	121	0	0
O	2003	0	58	58	0	0
O	2004	0	16	16	0	0
O	2005	0	24	24	0	0
O	2006	0	12	12	0	0
O	2007	0	20	20	0	0
O	2008	0	6	6	0	0
O	2009	0	17	17	0	0
O	2011	0	6	6	0	0
O	2012	0	15	15	0	0
O	2013	0	38	38	0	0
O	2014	0	15	15	0	0
O	2015	0	16	16	0	0
O	2016	0	24	24	0	0
O	2017	0	12	12	0	0
O	2018	0	11	11	0	0
O	2019	0	45	45	0	0
O	2020	0	2	2	0	0
O	2021	0	16	16	0	0

Table 234: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2005	1	0	1	0	0
W	2017	3	0	3	0	3
W	2018	1	0	1	0	1
W	2019	0	1	1	0	0
W	2021	1	0	1	0	1

46.3 NWFSC WCGBT

Table 235: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	62	1592	10	1602	0	382
2004	40	990	13	1003	0	353
2005	43	923	5	928	0	322
2006	58	1577	1	1578	0	496
2007	53	1277	43	1320	0	507
2008	44	807	4	811	0	366
2009	57	1114	30	1144	0	481
2010	55	1204	36	1240	0	507
2011	61	1265	13	1278	0	527
2012	44	726	35	761	0	360
2013	39	793	16	809	0	345
2014	54	978	32	1010	0	508
2015	39	723	2	725	0	333
2016	65	1164	4	1168	0	538
2017	47	1206	24	1230	0	423
2018	48	663	12	675	0	410
2019	18	227	0	227	0	131
2021	53	730	19	749	0	428

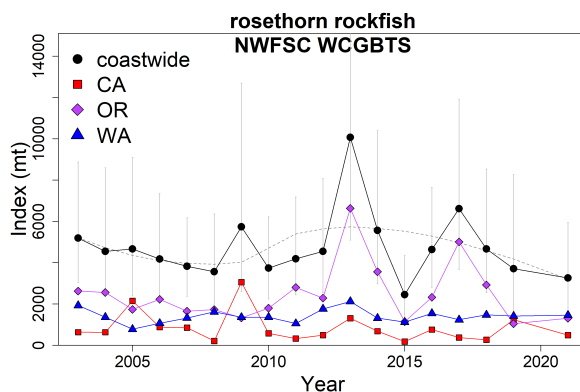


Figure 65: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

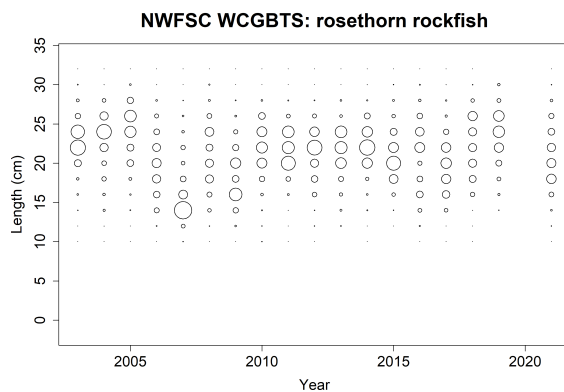


Figure 66: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

46.4 NWFSC HKL

Table 236: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	3	33	0	33	0	25
2012	1	1	0	1	0	1
2019	2	2	0	2	0	1
2021	1	1	0	1	0	0

47 Rosy rockfish

The most recent assessment of Rosy rockfish was a data-limited assessment conducted in 2010. Across available data, Rosy rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 2,420 length observations, 0 age readings, and 213 otoliths that are available to be aged. In California, since 2000, a total of 296 length observations, 0 age readings, and 2 otoliths have been collected. In Oregon, since 2000, a total of 39 length observations, 0 age readings, and 10 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 19,759 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 19,540 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 82 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 342 length observations, 0 age readings, and 162 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 891 length observations, 0 age readings, and 820 otoliths that are available to be aged.

47.1 commercial fisheries

Table 237: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	0	7	7	0	104
C	1981	0	4	4	0	19
C	1982	0	1	1	0	0
C	1983	0	1	1	0	0
C	1984	0	6	6	0	14
C	1985	0	12	12	0	25
C	1986	4	1	5	0	3
C	1987	5	0	5	0	0
C	1988	6	31	37	0	0
C	1989	9	6	15	0	0
C	1990	3	13	16	0	0
C	1991	1	174	175	0	0
C	1992	2	652	654	0	0
C	1993	1	138	139	0	0
C	1994	0	459	459	0	0
C	1995	1	72	73	0	0
C	1996	5	231	236	0	0
C	1997	6	115	121	0	0
C	1998	1	20	21	0	0
C	1999	1	30	31	0	0
C	2000	0	1	1	0	0
C	2002	0	1	1	0	0
C	2008	0	25	25	0	0
C	2009	0	36	36	0	0
C	2010	0	24	24	0	0
C	2011	0	3	3	0	0
C	2012	0	14	14	0	0
C	2013	0	17	17	0	0
C	2014	0	41	41	0	0
C	2015	0	4	4	0	0
C	2016	1	12	13	0	2
C	2017	0	12	12	0	0
C	2018	0	27	27	0	0
C	2019	2	12	14	0	0
C	2020	0	58	58	0	0
C	2021	2	4	6	0	0

Table 238: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1992	36	0	36	0	36
O	1993	31	0	31	0	0
O	2001	29	0	29	0	0
O	2003	2	0	2	0	2
O	2011	1	0	1	0	1
O	2014	1	0	1	0	1
O	2017	1	0	1	0	1
O	2018	2	0	2	0	2
O	2019	3	0	3	0	3

47.2 recreational fisheries

Table 239: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	1	16	17	0	0
C	2004	1	604	605	0	0
C	2005	1	663	664	0	0
C	2006	0	1039	1039	0	0
C	2007	0	1295	1295	0	0
C	2008	0	1166	1166	0	0
C	2009	0	1657	1657	0	0
C	2010	0	1469	1469	0	0
C	2011	0	1294	1294	0	0
C	2012	0	1041	1041	0	0
C	2013	1	1185	1186	0	0
C	2014	0	655	655	0	0
C	2015	0	1009	1009	0	0
C	2016	1	1044	1045	0	0
C	2017	0	1329	1329	0	0

Table 239: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2018	0	1696	1696	0	0
C	2019	0	1633	1633	0	0
C	2020	0	43	43	0	0
C	2021	0	697	697	0	0

Table 240: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	96	96	0	0
O	2002	0	41	41	0	0
O	2003	0	23	23	0	0
O	2004	0	3	3	0	0
O	2005	0	7	7	0	0
O	2006	0	6	6	0	0
O	2007	0	3	3	0	0
O	2009	0	2	2	0	0
O	2011	0	4	4	0	0
O	2012	0	9	9	0	0
O	2013	0	4	4	0	0
O	2015	0	2	2	0	0
O	2017	0	6	6	0	0
O	2018	0	4	4	0	0
O	2019	0	8	8	0	0
O	2021	0	1	1	0	0

47.3 NWFSC WCGBT

Table 241: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	1	3	0	3	0	3
2005	5	8	3	11	0	11
2007	2	41	0	41	0	16
2008	7	199	23	222	0	70
2009	2	1	1	2	0	2
2010	2	5	0	5	0	5
2011	1	1	0	1	0	1
2013	1	3	0	3	0	0
2014	1	1	0	1	0	1
2016	3	9	0	9	0	9
2017	4	14	0	14	0	14
2018	2	4	0	4	0	4
2019	4	23	1	24	0	24
2021	1	2	0	2	0	2

47.4 NWFSC HKL

Table 242: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	9	21	0	21	0	21
2005	7	11	0	11	0	11
2006	8	13	0	13	0	13
2007	14	48	5	53	0	45
2008	24	50	1	51	0	50
2009	27	62	0	62	0	44
2010	12	31	0	31	0	31
2011	11	28	0	28	0	26
2012	9	15	0	15	0	10
2013	8	21	0	21	0	18
2014	23	53	8	61	0	58
2015	28	68	0	68	0	66
2016	27	44	0	44	0	43
2017	29	77	0	77	0	72
2018	36	104	0	104	0	94
2019	36	103	0	103	0	97
2021	44	127	1	128	0	121

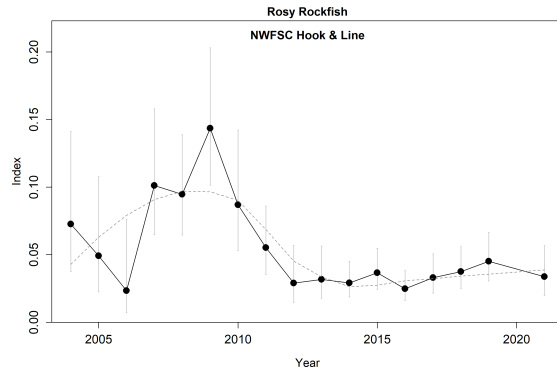


Figure 67: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

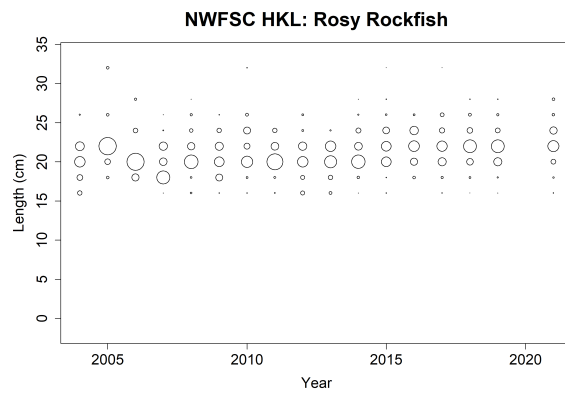


Figure 68: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

48 Rougheye and blackspotted rockfish

The most recent assessment of Rougheye and blackspotted rockfish was a full assessment conducted in 2013. Across available data, Rougheye and blackspotted rockfish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 51,863 length observations, 2,487 age readings, and 16,398 otoliths that are available to be aged. In California, since 2000, a total of 1,169 length observations, 0 age readings, and 914 otoliths have been collected. In Oregon, since 2000, a total of 17,053 length observations, 724 age readings, and 15,459 otoliths have been collected. In Washington, since 2000, a total of 29,765 length observations, 1,763 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 2,107 length observations, 962 age readings, and 824 otoliths that are available to be aged.

48.1 commercial fisheries

Table 243: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1981	0	1	1	0	0
C	1985	1	0	1	0	2
C	1986	1	0	1	0	0
C	1987	6	0	6	0	2
C	1990	1	0	1	0	0
C	1991	4	0	4	0	0
C	1992	2	15	17	0	0
C	1994	15	0	15	0	0
C	1995	4	5	9	0	0

Table 243: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1996	15	7	22	0	0
C	1997	1	2	3	0	0
C	1998	0	11	11	0	0
C	1999	3	0	3	0	0
C	2000	20	0	20	0	0
C	2001	1	6	7	0	2
C	2002	16	4	20	0	32
C	2003	13	2	15	0	22
C	2004	1	0	1	0	2
C	2005	58	0	58	0	112
C	2006	118	0	118	0	10
C	2007	26	0	26	0	18
C	2008	79	0	79	0	52
C	2009	108	3	111	0	136
C	2010	105	16	121	0	56
C	2011	72	9	81	0	112
C	2012	42	4	46	0	64
C	2013	41	2	43	0	72
C	2014	17	15	32	0	22
C	2015	20	43	63	0	40
C	2016	43	98	141	0	106
C	2017	38	4	42	0	46
C	2018	19	7	26	0	10
C	2019	59	4	63	0	0
C	2020	4	1	5	0	0
C	2021	50	1	51	0	0

Table 244: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1995	43	0	43	0	21
O	1996	167	0	167	0	0
O	1997	24	31	55	0	0
O	1998	44	0	44	0	0
O	1999	102	0	102	0	0
O	2000	63	0	63	0	63

Table 244: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	135	0	135	0	80
O	2002	5	0	5	0	5
O	2003	48	0	48	0	46
O	2004	318	0	318	0	299
O	2005	280	0	280	0	238
O	2006	431	0	431	0	408
O	2007	903	0	903	0	764
O	2008	793	1	794	329	399
O	2009	1148	0	1148	0	1086
O	2010	1322	1	1323	0	1209
O	2011	951	0	951	395	550
O	2012	1188	0	1188	0	1187
O	2013	1040	1	1041	0	1040
O	2014	705	0	705	0	703
O	2015	1444	0	1444	0	1323
O	2016	1227	0	1227	0	1188
O	2017	1232	0	1232	0	1167
O	2018	1171	3	1174	0	1134
O	2019	1133	0	1133	0	1087
O	2020	747	0	747	0	742
O	2021	763	0	763	0	741

Table 245: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	163	163	0	0
W	1997	0	828	828	0	0
W	1998	1187	82	1269	0	0
W	1999	796	315	1111	0	0
W	2000	573	815	1388	0	0
W	2001	398	463	861	0	0
W	2002	646	155	801	0	0
W	2003	1761	91	1852	0	0
W	2004	1042	73	1115	0	0
W	2005	1351	6	1357	0	0
W	2006	1620	15	1635	0	0

Table 245: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2007	1463	5	1468	0	0
W	2008	1639	37	1676	0	0
W	2009	1572	18	1590	0	0
W	2010	1110	2	1112	0	0
W	2011	1457	169	1626	430	0
W	2012	1523	250	1773	791	0
W	2013	1399	35	1434	542	0
W	2014	999	10	1009	0	0
W	2015	1392	42	1434	0	0
W	2016	1445	68	1513	0	0
W	2017	1246	1	1247	0	0
W	2018	1506	1	1507	0	0
W	2019	1625	6	1631	0	0
W	2020	597	1	598	0	0
W	2021	1136	2	1138	0	0

48.2 NWFSC WCGBT

Table 246: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	34	112	0	112	56	0
2004	27	113	2	115	78	0
2005	27	259	0	259	139	1
2006	36	101	1	102	94	6
2007	37	107	1	108	107	0
2008	36	120	2	122	121	1
2009	27	126	0	126	91	5
2010	29	89	0	89	88	1
2011	30	115	0	115	109	6
2012	25	85	2	87	79	6

Table 246: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2013	21	67	1	68	0	68
2014	22	40	2	42	0	23
2015	37	182	3	185	0	174
2016	32	103	2	105	0	105
2017	28	165	3	168	0	124
2018	25	97	0	97	0	97
2019	10	57	1	58	0	58
2021	30	139	10	149	0	149

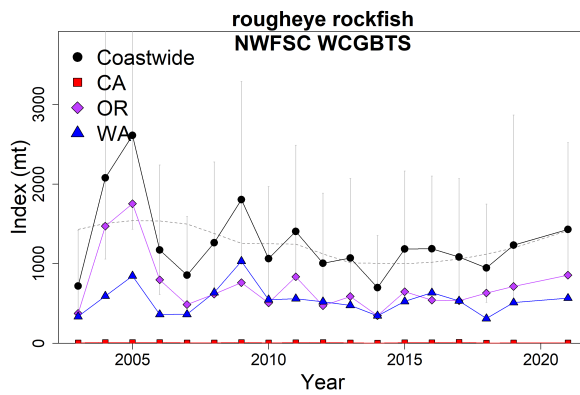


Figure 69: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

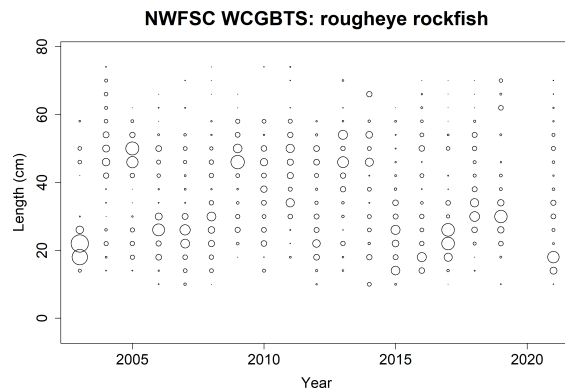


Figure 70: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

49 Sablefish

The most recent assessment of Sablefish was a update assessment conducted in 2021. Across available data, Sablefish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 354,887 length observations, 42,664 age readings, and 88,951 otoliths that are available to be aged. In California, since 2000, a total of 92,030 length observations, 7,833 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 76,644 length observations, 12,697 age readings, and 61,034 otoliths have been collected. In Washington, since 2000, a total of 64,803 length observations, 3,481 age readings, and 946 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 81,385 length observations, 20,775 age readings, and 13,397 otoliths that are available to be aged.

49.1 commercial fisheries

Table 247: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	0	2724	2724	0	0
C	1981	0	1739	1739	0	0
C	1985	2	0	2	0	0
C	1986	2451	343	2794	747	0
C	1987	8101	450	8551	5530	0
C	1988	4047	209	4256	2294	0
C	1989	4214	616	4830	1793	0
C	1990	4093	451	4544	1589	0
C	1991	2745	219	2964	417	0

Table 247: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1993	2761	2591	5352	349	0
C	1994	1307	3112	4419	306	0
C	1995	1257	1642	2899	372	0
C	1996	1068	1175	2243	738	0
C	1997	1077	777	1854	982	0
C	1998	964	199	1163	230	0
C	1999	1557	946	2503	0	0
C	2000	1161	1144	2305	741	0
C	2001	1200	1313	2513	598	0
C	2002	1555	1205	2760	503	0
C	2003	1694	1615	3309	249	0
C	2004	1216	739	1955	580	0
C	2005	2181	1045	3226	616	0
C	2006	2609	1018	3627	501	0
C	2007	1669	1414	3083	1482	0
C	2008	1563	3038	4601	0	0
C	2009	1176	3344	4520	520	0
C	2010	847	4086	4933	521	0
C	2011	1166	3709	4875	484	0
C	2012	1171	5722	6893	462	0
C	2013	1004	4883	5887	113	0
C	2014	669	5861	6530	0	0
C	2015	613	8159	8772	0	0
C	2016	1297	7101	8398	187	0
C	2017	1113	4137	5250	144	0
C	2018	484	2820	3304	132	0
C	2019	591	1544	2135	0	0
C	2020	230	1057	1287	0	0
C	2021	664	1203	1867	0	0

Table 248: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1980	383	184	567	0	567
O	1981	100	449	549	0	549
O	1982	159	0	159	0	159

Table 248: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1983	50	0	50	0	50
O	1985	0	966	966	0	966
O	1986	1087	0	1087	12	1075
O	1987	2247	1	2248	19	2229
O	1988	1380	0	1380	168	1212
O	1989	2138	93	2231	10	2128
O	1990	2119	297	2416	10	2406
O	1991	2083	700	2783	0	2743
O	1992	0	179	179	0	0
O	1993	1504	1974	3478	371	1075
O	1994	1948	994	2942	425	1275
O	1995	1809	779	2588	0	1728
O	1996	1475	134	1609	0	1405
O	1997	2681	157	2838	109	2552
O	1998	2104	73	2177	0	2041
O	1999	2152	31	2183	75	1971
O	2000	2472	22	2494	96	2325
O	2001	2025	83	2108	78	2030
O	2002	1614	6	1620	0	1620
O	2003	1827	20	1847	34	1752
O	2004	1834	0	1834	0	1814
O	2005	1581	1	1582	707	833
O	2006	2058	1	2059	92	1945
O	2007	3048	1	3049	1097	1692
O	2008	4318	0	4318	120	4165
O	2009	3737	174	3911	1205	2446
O	2010	4234	19	4253	1062	2682
O	2011	4797	32	4829	791	3671
O	2012	4511	6	4517	398	3963
O	2013	3976	6	3982	803	2995
O	2014	3832	6	3838	787	3021
O	2015	5022	6	5028	1222	3666
O	2016	4818	21	4839	537	4137
O	2017	4878	17	4895	1141	3664
O	2018	4971	2	4973	1354	3459
O	2019	4937	4	4941	561	4167
O	2020	2594	0	2594	612	1982
O	2021	3132	1	3133	0	3005

Table 249: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	700	500	1200	0	0
W	1981	700	100	800	0	0
W	1983	80	2168	2248	0	0
W	1984	100	0	100	0	0
W	1986	1148	269	1417	0	275
W	1987	680	345	1025	0	159
W	1988	186	347	533	23	67
W	1989	286	687	973	0	0
W	1990	129	500	629	0	36
W	1991	702	1201	1903	593	45
W	1992	669	1363	2032	694	0
W	1993	409	2303	2712	192	57
W	1994	134	2300	2434	77	0
W	1995	34	3736	3770	0	0
W	1996	0	3005	3005	33	0
W	1997	347	3359	3706	264	70
W	1998	268	3182	3450	20	75
W	1999	399	3807	4206	211	56
W	2000	190	3989	4179	126	0
W	2001	282	2677	2959	88	60
W	2002	193	2688	2881	41	140
W	2003	203	2920	3123	175	21
W	2004	129	2830	2959	92	0
W	2005	469	2068	2537	311	131
W	2006	840	1763	2603	463	334
W	2007	629	1255	1884	597	25
W	2008	629	1110	1739	122	0
W	2009	623	1337	1960	132	113
W	2010	272	1817	2089	104	103
W	2011	731	2173	2904	344	19
W	2012	590	1565	2155	182	0
W	2013	677	1469	2146	656	0
W	2014	691	1980	2671	0	0
W	2015	409	2230	2639	0	0
W	2016	449	2918	3367	0	0
W	2017	839	3347	4186	48	0
W	2018	872	3437	4309	0	0
W	2019	619	4868	5487	0	0
W	2020	150	1709	1859	0	0
W	2021	833	3334	4167	0	0

49.2 NWFSC WCGBT

Table 250: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	420	5779	20	5799	1389	992
2004	329	4536	4	4540	1086	1053
2005	445	5543	24	5567	1575	1295
2006	398	4831	2	4833	1363	1306
2007	422	4460	10	4470	1259	857
2008	420	3430	543	3973	1190	995
2009	419	3659	29	3688	1181	669
2010	458	3828	404	4232	1271	876
2011	455	4624	50	4674	1193	600
2012	428	4366	15	4381	1091	606
2013	307	3146	134	3280	992	212
2014	461	4312	7	4319	1200	600
2015	420	4889	21	4910	1197	528
2016	438	4425	119	4544	1213	256
2017	459	4866	17	4883	1219	354
2018	435	4780	5	4785	1482	11
2019	226	2223	3	2226	874	10
2021	518	5996	285	6281	0	2177

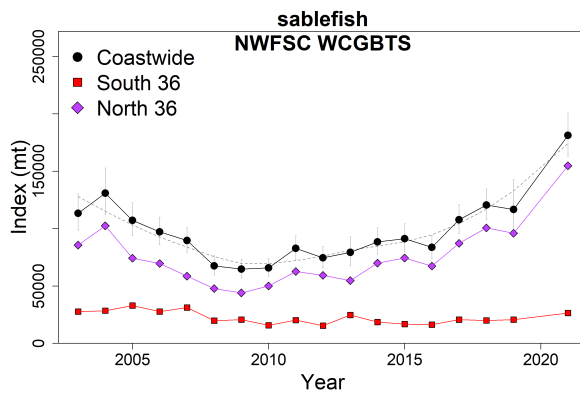


Figure 71: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

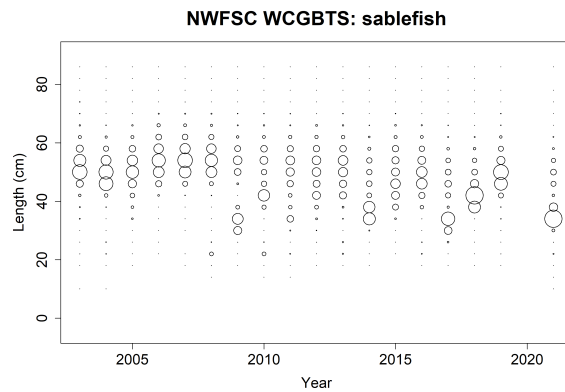


Figure 72: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

50 Sand sole

The most recent assessment of Sand sole was a data-limited assessment conducted in 2010. Across available data, Sand sole have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 8,295 length observations, 0 age readings, and 3,352 otoliths that are available to be aged. In California, since 2000, a total of 4,644 length observations, 0 age readings, and 50 otoliths have been collected. In Oregon, since 2000, a total of 3,532 length observations, 0 age readings, and 3,302 otoliths have been collected. In Washington, since 2000, a total of 4 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 1,487 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 606 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 841 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 2 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 1,043 length observations, 0 age readings, and 592 otoliths that are available to be aged.

50.1 commercial fisheries

Table 251: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2001	36	0	36	0	0
C	2002	16	0	16	0	0
C	2003	86	16	102	0	0
C	2004	0	1	1	0	0
C	2005	31	34	65	0	5
C	2006	31	9	40	0	0
C	2007	58	0	58	0	1
C	2008	89	2	91	0	44
C	2009	111	85	196	0	0
C	2010	41	71	112	0	0
C	2011	58	223	281	0	0
C	2012	23	387	410	0	0
C	2013	125	373	498	0	0
C	2014	36	213	249	0	0
C	2015	175	63	238	0	0
C	2016	326	37	363	0	0
C	2017	276	257	533	0	0
C	2018	375	0	375	0	0
C	2019	166	273	439	0	0
C	2020	272	21	293	0	0
C	2021	205	43	248	0	0

Table 252: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	42	42	0	0
O	2003	30	0	30	0	30
O	2004	21	0	21	0	21
O	2005	29	0	29	0	29
O	2006	0	2	2	0	0
O	2007	360	1	361	0	360
O	2008	360	0	360	0	360
O	2009	440	0	440	0	440
O	2010	661	0	661	0	601
O	2011	273	0	273	0	273
O	2012	150	0	150	0	150

Table 252: Data collected annually from the commercial fisheries in Oregon. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2013	135	0	135	0	135
O	2014	176	0	176	0	146
O	2015	345	0	345	0	315
O	2016	210	0	210	0	180
O	2017	152	0	152	0	152
O	2018	117	0	117	0	82
O	2019	16	0	16	0	16
O	2021	12	0	12	0	12

Table 253: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1984	115	0	115	0	0
W	2021	4	0	4	0	0

50.2 recreational fisheries

Table 254: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	22	22	0	0
C	2005	0	19	19	0	0
C	2006	0	11	11	0	0
C	2007	0	12	12	0	0
C	2008	0	8	8	0	0
C	2009	0	32	32	0	0

Table 254: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2010	0	48	48	0	0
C	2011	0	105	105	0	0
C	2012	0	93	93	0	0
C	2013	6	84	90	0	0
C	2014	1	64	65	0	0
C	2015	0	24	24	0	0
C	2016	0	13	13	0	0
C	2017	0	12	12	0	0
C	2018	0	23	23	0	0
C	2019	0	18	18	0	0
C	2020	0	1	1	0	0
C	2021	0	10	10	0	0

Table 255: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	7	7	0	0
O	2002	0	31	31	0	0
O	2003	0	20	20	0	0
O	2004	0	42	42	0	0
O	2005	0	38	38	0	0
O	2006	0	15	15	0	0
O	2007	0	11	11	0	0
O	2008	0	20	20	0	0
O	2009	0	61	61	0	0
O	2010	0	109	109	0	0
O	2011	0	67	67	0	0
O	2012	0	37	37	0	0
O	2013	0	50	50	0	0
O	2014	0	51	51	0	0
O	2015	0	61	61	0	0
O	2016	0	81	81	0	0
O	2017	0	89	89	0	0
O	2018	0	41	41	0	0
O	2019	0	30	30	0	0
O	2021	0	18	18	0	0

Table 256: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2009	0	1	1	0	0
W	2019	0	1	1	0	0

50.3 NWFSC WCGBT

Table 257: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	6	79	0	79	0	0
2004	5	29	0	29	0	0
2005	6	31	0	31	0	0
2006	3	11	1	12	0	0
2007	7	37	0	37	0	0
2008	12	62	0	62	0	62
2009	9	48	0	48	0	38
2010	10	93	0	93	0	93
2011	18	123	0	123	0	122
2012	9	37	0	37	0	34
2013	13	47	0	47	0	43
2014	9	50	0	50	0	50
2015	9	74	0	74	0	0
2016	10	26	0	26	0	0
2017	16	83	0	83	0	0
2018	7	36	0	36	0	0
2019	6	42	0	42	0	42
2021	19	133	1	134	0	108

51 Sharpchin rockfish

The most recent assessment of Sharpchin rockfish was a data-moderate assessment conducted in NA. Across available data, Sharpchin rockfish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 11,646 length observations, 0 age readings, and 2,735 otoliths that are available to be aged. In California, since 2000, a total of 182 length observations, 0 age readings, and 48 otoliths have been collected. In Oregon, since 2000, a total of 2,242 length observations, 0 age readings, and 2,194 otoliths have been collected. In Washington, since 2000, a total of 2,118 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 18,510 length observations, 0 age readings, and 7,856 otoliths that are available to be aged.

51.1 commercial fisheries

Table 258: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1982	13	0	13	0	13
C	1983	144	0	144	0	135
C	1984	90	0	90	0	90
C	1985	213	0	213	0	224
C	1986	134	0	134	0	26
C	1987	291	0	291	0	0
C	1988	356	0	356	0	0
C	1989	101	0	101	0	0
C	1990	280	0	280	0	0

Table 258: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1991	188	4	192	0	1
C	1992	130	17	147	0	0
C	1993	111	14	125	0	0
C	1994	520	42	562	0	0
C	1995	368	13	381	0	0
C	1996	425	33	458	0	0
C	1997	357	20	377	0	0
C	1998	212	3	215	0	0
C	1999	159	3	162	0	0
C	2000	35	0	35	0	0
C	2001	41	0	41	0	1
C	2002	45	0	45	0	2
C	2005	26	1	27	0	27
C	2007	4	0	4	0	2
C	2013	4	0	4	0	4
C	2014	11	0	11	0	10
C	2015	2	1	3	0	2
C	2016	1	6	7	0	0
C	2017	0	2	2	0	0
C	2018	1	0	1	0	0
C	2020	0	0	0	0	0
C	2021	2	0	2	0	0

Table 259: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1995	26	0	26	0	4
O	1996	283	0	283	0	0
O	1997	526	0	526	0	0
O	1999	127	0	127	0	0
O	2001	19	0	19	0	0
O	2003	15	0	15	0	15
O	2004	146	0	146	0	146
O	2005	46	0	46	0	46
O	2007	22	0	22	0	22
O	2008	30	0	30	0	30

Table 259: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2009	30	0	30	0	30
O	2010	46	0	46	0	46
O	2011	32	0	32	0	32
O	2012	4	0	4	0	4
O	2013	113	0	113	0	113
O	2014	193	1	194	0	194
O	2015	196	0	196	0	166
O	2016	37	0	37	0	37
O	2017	202	0	202	0	203
O	2018	163	0	163	0	163
O	2019	349	0	349	0	349
O	2020	148	0	148	0	148
O	2021	449	1	450	0	450

Table 260: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	612	612	0	0
W	1997	0	685	685	0	0
W	1998	453	22	475	0	0
W	1999	117	12	129	0	0
W	2000	77	20	97	0	0
W	2001	165	4	169	0	0
W	2002	646	5	651	0	0
W	2003	334	1	335	0	0
W	2004	6	0	6	0	0
W	2005	2	0	2	0	0
W	2006	9	0	9	0	0
W	2007	11	0	11	0	0
W	2008	2	0	2	0	0
W	2009	2	0	2	0	0
W	2010	4	0	4	0	0
W	2011	4	29	33	0	0
W	2012	344	32	376	0	0
W	2013	94	1	95	0	0
W	2014	34	2	36	0	0

Table 260: Data collected annually from the commercial fisheries in Washington. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2015	8	1	9	0	0
W	2016	22	0	22	0	0
W	2017	50	0	50	0	0
W	2018	25	0	25	0	0
W	2019	85	0	85	0	0
W	2020	3	0	3	0	0
W	2021	95	1	96	0	0

51.2 NWFSC WCGBT

Table 261: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	51	2350	5	2355	0	553
2004	33	1173	3	1176	0	199
2005	35	864	7	871	0	153
2006	43	1283	0	1283	0	239
2007	35	975	0	975	0	204
2008	26	919	4	923	0	365
2009	39	934	4	938	0	593
2010	43	568	6	574	0	381
2011	48	1304	3	1307	0	781
2012	41	954	43	997	0	478
2013	38	874	0	874	0	375
2014	54	1357	64	1421	0	606
2015	53	1052	41	1093	0	620
2016	56	844	10	854	0	501
2017	52	830	16	846	0	535
2018	47	720	3	723	0	437
2019	33	443	0	443	0	289
2021	56	848	9	857	0	547

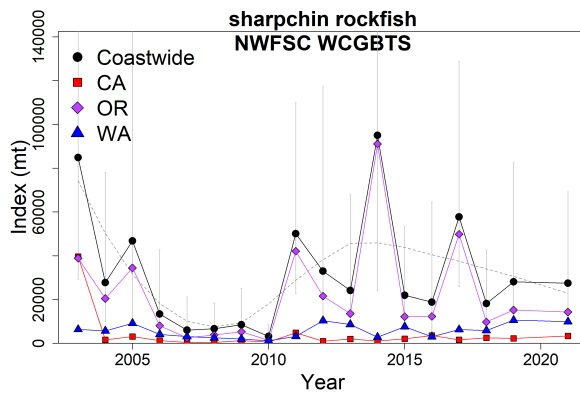


Figure 73: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

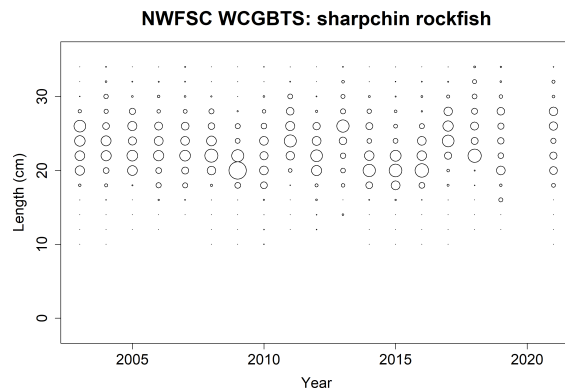


Figure 74: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

52 Shortraker rockfish

The most recent assessment of Shortraker rockfish was a data-limited assessment conducted in 2010. Across available data, Shortraker rockfish have been observed and sampled generally by only commercial fisheries.

Across all years of available data, commercial fisheries have collected a total of 6,508 length observations, 20 age readings, and 2,981 otoliths that are available to be aged. In California, since 2000, a total of 68 length observations, 0 age readings, and 17 otoliths have been collected. In Oregon, since 2000, a total of 2,929 length observations, 20 age readings, and 2,884 otoliths have been collected. In Washington, since 2000, a total of 2,880 length observations, 0 age readings, and 0 otoliths have been collected.

52.1 commercial fisheries

Table 262: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1983	1	0	1	0	1
C	1996	4	0	4	0	0
C	1997	1	0	1	0	0
C	1999	2	0	2	0	0
C	2002	1	0	1	0	0
C	2003	2	0	2	0	2
C	2007	1	0	1	0	0
C	2008	2	0	2	0	2
C	2009	1	7	8	0	1
C	2010	6	2	8	0	0
C	2011	2	0	2	0	0
C	2012	3	0	3	0	1
C	2013	1	0	1	0	0
C	2014	3	0	3	0	0

Table 262: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2015	4	0	4	0	3
C	2016	4	1	5	0	4
C	2017	5	0	5	0	4
C	2018	2	1	3	0	0
C	2019	3	0	3	0	0
C	2020	5	0	5	0	0
C	2021	8	4	12	0	0

Table 263: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1983	16	0	16	0	16
O	1987	30	0	30	0	30
O	1990	30	0	30	0	30
O	1996	5	0	5	0	0
O	1999	3	0	3	0	3
O	2000	2	0	2	0	2
O	2001	10	0	10	1	9
O	2002	1	0	1	0	1
O	2003	7	0	7	4	3
O	2004	10	0	10	0	10
O	2005	64	0	64	15	49
O	2006	40	0	40	0	38
O	2007	95	0	95	0	95
O	2008	140	0	140	0	138
O	2009	194	0	194	0	194
O	2010	140	0	140	0	140
O	2011	156	4	160	0	160
O	2012	112	1	113	0	114
O	2013	258	1	259	0	259
O	2014	306	0	306	0	307
O	2015	309	0	309	0	309
O	2016	138	0	138	0	136
O	2017	225	0	225	0	205
O	2018	289	0	289	0	288
O	2019	190	0	190	0	190

Table 263: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2020	151	0	151	0	151
O	2021	86	0	86	0	86

Table 264: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	91	91	0	0
W	1997	0	88	88	0	0
W	1998	157	3	160	0	0
W	1999	191	9	200	0	0
W	2000	127	90	217	0	0
W	2001	74	29	103	0	0
W	2002	61	37	98	0	0
W	2003	202	35	237	0	0
W	2004	49	4	53	0	0
W	2005	60	0	60	0	0
W	2006	50	1	51	0	0
W	2007	99	0	99	0	0
W	2008	151	0	151	0	0
W	2009	129	2	131	0	0
W	2010	124	0	124	0	0
W	2011	207	1	208	0	0
W	2012	128	0	128	0	0
W	2013	60	0	60	0	0
W	2014	87	3	90	0	0
W	2015	163	4	167	0	0
W	2016	125	0	125	0	0
W	2017	141	0	141	0	0
W	2018	271	3	274	0	0
W	2019	187	0	187	0	0
W	2020	34	1	35	0	0
W	2021	141	0	141	0	0

53 Shortspine thornyhead

The most recent assessment of Shortspine thornyhead was a full assessment conducted in 2013. Across available data, Shortspine thornyhead have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 149,006 length observations, 0 age readings, and 30,633 otoliths that are available to be aged. In California, since 2000, a total of 62,137 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 34,100 length observations, 0 age readings, and 26,244 otoliths have been collected. In Washington, since 2000, a total of 18,918 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 89,855 length observations, 0 age readings, and 20,250 otoliths that are available to be aged.

53.1 commercial fisheries

Table 265: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1059	76	1135	0	0
C	1981	736	4	740	0	0
C	1982	716	7	723	0	0
C	1983	1227	3	1230	0	0
C	1984	2741	14	2755	0	0
C	1985	3134	45	3179	0	0
C	1986	947	40	987	0	0
C	1987	390	7	397	0	0
C	1988	68	80	148	0	0

Table 265: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1989	693	66	759	0	0
C	1990	468	73	541	0	0
C	1991	480	52	532	0	0
C	1992	428	95	523	0	0
C	1993	400	596	996	0	0
C	1994	356	1057	1413	0	0
C	1995	788	1496	2284	0	0
C	1996	416	1688	2104	0	0
C	1997	530	1226	1756	0	0
C	1998	168	1092	1260	0	0
C	1999	195	2478	2673	0	0
C	2000	505	966	1471	0	0
C	2001	724	791	1515	0	0
C	2002	1579	1767	3346	0	0
C	2003	1137	1606	2743	0	0
C	2004	352	853	1205	0	0
C	2005	931	1082	2013	0	0
C	2006	2651	1052	3703	0	0
C	2007	1317	854	2171	0	0
C	2008	1496	2502	3998	0	0
C	2009	838	2467	3305	0	0
C	2010	360	2496	2856	0	0
C	2011	906	4806	5712	0	0
C	2012	423	3881	4304	0	0
C	2013	890	3192	4082	0	0
C	2014	217	3870	4087	0	0
C	2015	83	3992	4075	0	0
C	2016	549	3737	4286	0	0
C	2017	370	2696	3066	0	0
C	2018	416	1266	1682	0	0
C	2019	557	420	977	0	0
C	2020	196	860	1056	0	0
C	2021	366	118	484	0	0

Table 266: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1981	30	0	30	0	30
O	1982	150	0	150	0	150
O	1990	510	0	510	0	510
O	1991	1059	0	1059	0	1059
O	1992	1227	0	1227	0	898
O	1993	281	0	281	0	233
O	1994	40	0	40	0	0
O	1995	7	17	24	0	0
O	1996	375	115	490	0	0
O	1997	0	2321	2321	0	0
O	1998	738	15	753	0	690
O	1999	819	0	819	0	819
O	2000	659	0	659	0	507
O	2001	1063	0	1063	0	883
O	2002	1000	0	1000	0	760
O	2003	1451	1	1452	0	973
O	2004	1256	0	1256	0	835
O	2005	1229	41	1270	0	940
O	2006	1466	9	1475	0	1146
O	2007	1876	14	1890	0	1410
O	2008	2409	28	2437	0	1867
O	2009	2031	13	2044	0	1624
O	2010	2416	32	2448	0	1848
O	2011	1758	8	1766	0	1555
O	2012	1797	6	1803	0	1547
O	2013	1899	63	1962	0	1537
O	2014	1604	79	1683	0	1285
O	2015	1569	46	1615	0	1328
O	2016	1508	23	1531	0	1095
O	2017	1598	53	1651	0	1377
O	2018	1496	26	1522	0	1167
O	2019	1346	18	1364	0	1010
O	2020	933	14	947	0	616
O	2021	1233	29	1262	0	934

Table 267: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	7	7	0	0
W	1997	0	1	1	0	0
W	1998	2	2	4	0	0
W	2000	1	3	4	0	0
W	2001	409	190	599	0	0
W	2002	1266	57	1323	0	0
W	2003	955	24	979	0	0
W	2004	193	61	254	0	0
W	2005	377	2	379	0	0
W	2006	100	0	100	0	0
W	2007	696	11	707	0	0
W	2008	328	147	475	0	0
W	2009	915	25	940	0	0
W	2010	875	17	892	0	0
W	2011	947	183	1130	0	0
W	2012	765	232	997	0	0
W	2013	618	372	990	0	0
W	2014	325	714	1039	0	0
W	2015	482	329	811	0	0
W	2016	67	1060	1127	0	0
W	2017	918	598	1516	0	0
W	2018	522	661	1183	0	0
W	2019	416	1224	1640	0	0
W	2020	29	512	541	0	0
W	2021	211	1081	1292	0	0

53.2 NWFSC WCGBT

Table 268: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	293	59	7634	7693	0	1255
2004	214	2187	4507	6694	0	1671
2005	315	6736	1311	8047	0	1374
2006	332	5280	918	6198	0	1244
2007	367	4779	720	5499	0	1294
2008	362	4040	657	4697	0	1301
2009	340	3554	641	4195	0	1229
2010	360	3200	659	3859	0	1272
2011	347	3896	801	4697	0	1236
2012	349	3670	1008	4678	0	1243
2013	247	2455	634	3089	0	891
2014	346	3825	767	4592	0	1256
2015	332	3707	789	4496	0	1220
2016	355	3991	613	4604	0	1000
2017	363	4328	402	4730	0	1009
2018	368	4489	507	4996	0	733
2019	175	2263	138	2401	0	340
2021	345	4455	235	4690	0	682

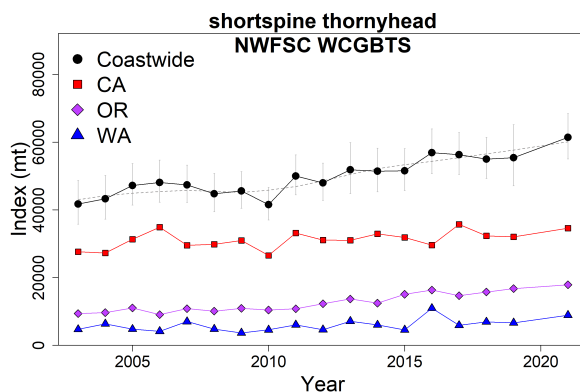


Figure 75: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

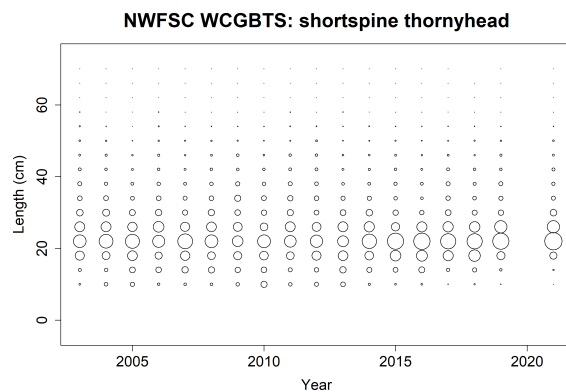


Figure 76: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

54 Silvergray rockfish

The most recent assessment of Silvergray rockfish was a data-limited assessment conducted in 2010. Across available data, Silvergray rockfish have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 7,321 length observations, 0 age readings, and 2,660 otoliths that are available to be aged. In California, since 2000, a total of 17 length observations, 0 age readings, and 6 otoliths have been collected. In Oregon, since 2000, a total of 2,512 length observations, 0 age readings, and 2,448 otoliths have been collected. In Washington, since 2000, a total of 1,172 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 423 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 1 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 389 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 758 length observations, 0 age readings, and 643 otoliths that are available to be aged.

54.1 commercial fisheries

Table 269: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1984	3	2	5	0	3
C	1985	7	1	8	0	7
C	1986	4	0	4	0	1
C	1987	1	0	1	0	0
C	1988	2	0	2	0	0
C	1989	2	0	2	0	0
C	1990	2	0	2	0	0
C	1992	1	7	8	0	0
C	1993	5	4	9	0	0
C	1994	4	1	5	0	0
C	1995	0	1	1	0	0
C	1996	0	1	1	0	0
C	1997	1	0	1	0	0
C	1999	4	0	4	0	0
C	2000	3	1	4	0	0
C	2007	1	1	2	0	1
C	2009	1	0	1	0	1
C	2011	1	0	1	0	0
C	2013	1	0	1	0	0
C	2016	1	3	4	0	4
C	2017	0	1	1	0	0
C	2018	1	0	1	0	0
C	2020	2	0	2	0	0

Table 270: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1990	100	0	100	0	100
O	1998	44	0	44	0	0
O	1999	27	0	27	0	0
O	2000	14	0	14	0	14
O	2001	1	0	1	0	0
O	2002	40	0	40	0	0
O	2003	6	0	6	0	6
O	2004	1	0	1	0	0
O	2005	34	0	34	0	34

Table 270: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2007	9	0	9	0	9
O	2008	108	0	108	0	108
O	2009	70	0	70	0	70
O	2010	31	0	31	0	31
O	2011	81	0	81	0	81
O	2012	106	0	106	0	106
O	2013	119	0	119	0	118
O	2014	107	0	107	0	104
O	2015	37	0	37	0	37
O	2016	172	0	172	0	172
O	2017	222	0	222	0	222
O	2018	357	0	357	0	357
O	2019	339	0	339	0	333
O	2020	280	0	280	0	270
O	2021	378	0	378	0	376

Table 271: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	552	1	553	0	95
W	1981	700	0	700	0	0
W	1982	100	0	100	0	0
W	1996	0	508	508	0	0
W	1997	0	691	691	0	0
W	1998	478	72	550	0	0
W	1999	273	21	294	0	0
W	2000	6	3	9	0	0
W	2001	16	12	28	0	0
W	2002	76	0	76	0	0
W	2003	95	0	95	0	0
W	2004	9	0	9	0	0
W	2005	2	0	2	0	0
W	2006	42	0	42	0	0
W	2007	3	0	3	0	0
W	2008	10	0	10	0	0
W	2009	8	0	8	0	0

Table 271: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2011	23	0	23	0	0
W	2012	12	0	12	0	0
W	2013	106	1	107	0	0
W	2014	44	1	45	0	0
W	2015	3	0	3	0	0
W	2016	24	0	24	0	0
W	2017	158	0	158	0	0
W	2018	123	0	123	0	0
W	2019	291	0	291	0	0
W	2020	37	0	37	0	0
W	2021	67	0	67	0	0

54.2 recreational fisheries

Table 272: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2019	0	1	1	0	0

Table 273: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	9	9	0	0
O	2002	0	24	24	0	0
O	2003	0	20	20	0	0
O	2004	0	3	3	0	0

Table 273: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2005	0	14	14	0	0
O	2006	0	2	2	0	0
O	2007	0	4	4	0	0
O	2008	0	4	4	0	0
O	2009	0	25	25	0	0
O	2011	0	90	90	0	0
O	2012	0	42	42	0	0
O	2013	0	22	22	0	0
O	2014	0	42	42	0	0
O	2015	0	7	7	0	0
O	2016	0	1	1	0	0
O	2017	0	9	9	0	0
O	2018	0	29	29	0	0
O	2019	0	14	14	0	0
O	2021	0	61	61	0	0

54.3 NWFSC WCGBT

Table 274: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	9	34	0	34	0	34
2004	3	19	0	19	0	19
2005	6	51	0	51	0	46
2006	3	7	0	7	0	7
2007	8	22	0	22	0	22
2008	6	20	0	20	0	20
2009	5	36	0	36	0	36
2010	8	47	0	47	0	47
2011	14	116	0	116	0	81
2012	8	46	0	46	0	46

Table 274: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2013	6	44	0	44	0	26
2014	5	16	0	16	0	16
2015	4	80	0	80	0	23
2016	3	5	0	5	0	5
2017	8	75	0	75	0	75
2018	8	30	0	30	0	30
2019	7	105	0	105	0	105
2021	5	5	0	5	0	5

55 Speckled rockfish

The most recent assessment of Speckled rockfish was a data-limited assessment conducted in 2010. Across available data, Speckled rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 3,029 length observations, 0 age readings, and 235 otoliths that are available to be aged. In California, since 2000, a total of 383 length observations, 0 age readings, and 3 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 9,828 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 9,827 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 1 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 255 length observations, 0 age readings, and 127 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 3,757 length observations, 0 age readings, and 3,631 otoliths that are available to be aged.

55.1 commercial fisheries

Table 275: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	0	5	5	0	0
C	1981	5	21	26	0	12
C	1982	18	15	33	0	7
C	1983	33	54	87	0	33
C	1984	15	28	43	0	16
C	1985	74	153	227	0	98
C	1986	128	8	136	0	46
C	1987	88	13	101	0	2
C	1988	22	17	39	0	0
C	1989	127	76	203	0	0
C	1990	21	6	27	0	0
C	1991	51	10	61	0	12
C	1992	10	205	215	0	4
C	1993	19	96	115	0	2
C	1994	30	211	241	0	0
C	1995	41	57	98	0	0
C	1996	48	184	232	0	0
C	1997	109	198	307	0	0
C	1998	9	423	432	0	0
C	1999	1	17	18	0	0
C	2000	7	0	7	0	0
C	2001	1	0	1	0	0
C	2004	1	0	1	0	1
C	2006	1	2	3	0	1
C	2007	1	1	2	0	0
C	2008	0	25	25	0	0
C	2009	0	32	32	0	0
C	2010	0	170	170	0	0
C	2012	0	1	1	0	0
C	2014	0	6	6	0	0
C	2015	1	14	15	0	1
C	2016	0	32	32	0	0
C	2017	0	15	15	0	0
C	2018	0	30	30	0	0
C	2019	0	15	15	0	0
C	2020	0	2	2	0	0
C	2021	0	26	26	0	0

55.2 recreational fisheries

Table 276: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	261	261	0	0
C	2005	0	403	403	0	0
C	2006	1	596	597	0	0
C	2007	0	542	542	0	0
C	2008	0	709	709	0	0
C	2009	0	977	977	0	0
C	2010	2	674	676	0	0
C	2011	0	655	655	0	0
C	2012	0	460	460	0	0
C	2013	0	1022	1022	0	0
C	2014	0	487	487	0	0
C	2015	0	1097	1097	0	0
C	2016	0	612	612	0	0
C	2017	0	413	413	0	0
C	2018	0	385	385	0	0
C	2019	0	378	378	0	0
C	2020	0	29	29	0	0
C	2021	0	124	124	0	0

Table 277: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2019	0	1	1	0	0

55.3 NWFSC WCGBT

Table 278: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2006	2	17	0	17	0	17
2007	3	106	0	106	0	25
2009	6	19	0	19	0	19
2010	3	4	3	7	0	7
2012	1	1	0	1	0	1
2013	5	70	0	70	0	23
2014	1	11	0	11	0	11
2016	1	11	0	11	0	11
2017	1	8	0	8	0	8
2018	1	1	0	1	0	1
2019	2	4	0	4	0	4

55.4 NWFSC HKL

Table 279: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	15	42	0	42	0	41
2005	10	28	0	28	0	27
2006	33	112	0	112	0	113
2007	20	42	0	42	0	39
2008	44	138	0	138	0	137
2009	35	86	0	86	0	85
2010	20	87	3	90	0	85
2011	30	70	0	70	0	68
2012	24	58	0	58	0	54
2013	26	59	0	59	0	59
2014	48	302	0	302	0	298
2015	87	541	0	541	0	534
2016	78	559	0	559	0	553
2017	66	362	0	362	0	351
2018	88	621	0	621	0	573
2019	73	344	1	345	0	326
2021	77	301	1	302	0	288

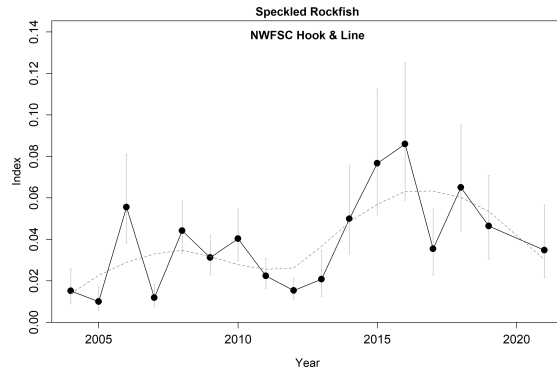


Figure 77: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

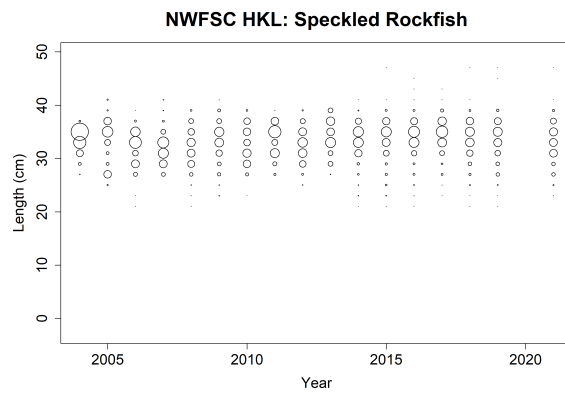


Figure 78: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

56 Splitnose rockfish

The most recent assessment of Splitnose rockfish was a full assessment conducted in 2009. Across available data, Splitnose rockfish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 65,857 length observations, 1,647 age readings, and 24,730 otoliths that are available to be aged. In California, since 2000, a total of 17,372 length observations, 0 age readings, and 3,147 otoliths have been collected. In Oregon, since 2000, a total of 11,582 length observations, 0 age readings, and 11,341 otoliths have been collected. In Washington, since 2000, a total of 2,968 length observations, 3 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 49,052 length observations, 2,906 age readings, and 9,056 otoliths that are available to be aged.

56.1 commercial fisheries

Table 280: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	338	6	344	114	184
C	1981	457	2	459	92	364
C	1982	528	6	534	0	368
C	1983	2112	25	2137	460	2061
C	1984	3630	42	3672	502	3574
C	1985	4017	366	4383	475	3204
C	1986	2375	38	2413	0	335
C	1987	1605	95	1700	0	3
C	1988	602	21	623	0	4

Table 280: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1989	536	92	628	1	0
C	1990	651	210	861	0	0
C	1991	477	151	628	0	0
C	1992	373	782	1155	0	0
C	1993	1575	551	2126	0	0
C	1994	1051	495	1546	0	0
C	1995	850	676	1526	0	0
C	1996	929	687	1616	0	0
C	1997	1365	469	1834	0	0
C	1998	2257	864	3121	0	145
C	1999	1148	260	1408	0	0
C	2000	563	326	889	0	38
C	2001	800	499	1299	0	37
C	2002	1155	524	1679	0	191
C	2003	1084	378	1462	0	407
C	2004	831	311	1142	0	331
C	2005	468	417	885	0	339
C	2006	590	409	999	0	404
C	2007	702	445	1147	0	262
C	2008	850	590	1440	0	318
C	2009	477	701	1178	0	106
C	2010	292	707	999	0	33
C	2011	60	376	436	0	48
C	2012	121	534	655	0	93
C	2013	208	165	373	0	203
C	2014	73	267	340	0	21
C	2015	183	292	475	0	153
C	2016	215	248	463	0	70
C	2017	383	13	396	0	93
C	2018	119	270	389	0	0
C	2019	90	27	117	0	0
C	2020	262	48	310	0	0
C	2021	222	77	299	0	0

Table 281: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1995	63	0	63	0	0
O	1996	380	0	380	0	0
O	1997	65	0	65	0	0
O	1998	100	0	100	0	0
O	2001	84	0	84	0	84
O	2002	7	0	7	0	0
O	2003	141	0	141	0	134
O	2004	286	0	286	0	275
O	2005	265	0	265	0	258
O	2006	190	0	190	0	190
O	2007	703	0	703	0	665
O	2008	335	0	335	0	333
O	2009	431	0	431	0	431
O	2010	515	0	515	0	485
O	2011	530	0	530	0	528
O	2012	668	0	668	0	626
O	2013	1045	0	1045	0	1040
O	2014	1147	1	1148	0	1148
O	2015	1188	0	1188	0	1128
O	2016	662	0	662	0	662
O	2017	863	0	863	0	863
O	2018	759	1	760	0	760
O	2019	785	1	786	0	756
O	2020	389	0	389	0	389
O	2021	582	4	586	0	586

Table 282: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	80	80	0	0
W	1997	0	355	355	0	0
W	1998	150	4	154	0	0
W	1999	19	5	24	0	0
W	2000	104	13	117	0	0
W	2001	64	5	69	0	0
W	2002	298	17	315	0	0

Table 282: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2003	147	10	157	0	0
W	2004	44	0	44	0	0
W	2005	4	0	4	0	0
W	2006	54	0	54	0	0
W	2007	83	2	85	0	0
W	2008	62	0	62	0	0
W	2009	163	0	163	0	0
W	2010	9	0	9	3	0
W	2011	94	2	96	0	0
W	2012	290	23	313	0	0
W	2013	364	13	377	0	0
W	2014	285	21	306	0	0
W	2015	223	6	229	0	0
W	2016	82	10	92	0	0
W	2017	15	0	15	0	0
W	2018	104	0	104	0	0
W	2019	142	0	142	0	0
W	2020	97	1	98	0	0
W	2021	117	0	117	0	0

56.2 NWFSC WCGBT

Table 283: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	134	6216	417	6633	513	555
2004	98	4821	314	5135	418	9
2005	126	4052	415	4467	498	45
2006	146	3181	380	3561	494	120
2007	158	2775	588	3363	495	389
2008	153	2539	379	2918	488	342

Table 283: Data collected annually from the NWFSC WCGBT survey. *(continued)*

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2009	153	2447	520	2967	0	895
2010	129	1525	496	2021	0	710
2011	132	1678	473	2151	0	725
2012	136	1658	257	1915	0	745
2013	102	1185	222	1407	0	555
2014	140	1614	345	1959	0	701
2015	132	1616	265	1881	0	697
2016	129	1758	165	1923	0	729
2017	129	1587	304	1891	0	520
2018	114	1579	212	1791	0	470
2019	74	969	101	1070	0	294
2021	130	1606	393	1999	0	555

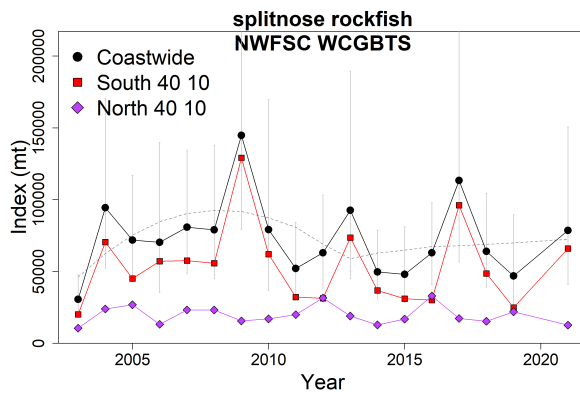


Figure 79: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

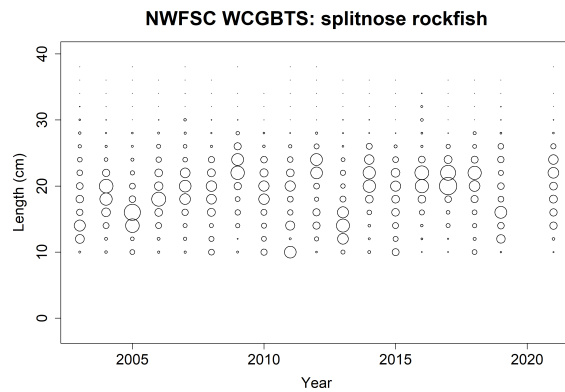


Figure 80: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

57 Squarespot rockfish

The most recent assessment of Squarespot rockfish was a data-moderate assessment conducted in 2021. Across available data, Squarespot rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 155 length observations, 0 age readings, and 6 otoliths that are available to be aged. In California, since 2000, a total of 116 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 16,710 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 16,710 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 4,317 length observations, 408 age readings, and 920 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 1,797 length observations, 344 age readings, and 1,360 otoliths that are available to be aged.

57.1 commercial fisheries

Table 284: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1985	0	16	16	0	1
C	1986	2	0	2	0	5
C	1992	0	1	1	0	0
C	1993	0	3	3	0	0

Table 284: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1994	0	5	5	0	0
C	1995	0	2	2	0	0
C	1997	0	3	3	0	0
C	1998	4	2	6	0	0
C	1999	0	1	1	0	0
C	2008	1	2	3	0	0
C	2009	0	19	19	0	0
C	2010	0	22	22	0	0
C	2011	0	1	1	0	0
C	2014	0	5	5	0	0
C	2015	0	7	7	0	0
C	2016	0	43	43	0	0
C	2017	0	2	2	0	0
C	2020	0	14	14	0	0

57.2 recreational fisheries

Table 285: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	9	9	0	0
C	2004	3	321	324	0	0
C	2005	1	424	425	0	0
C	2006	0	401	401	0	0
C	2007	1	413	414	0	0
C	2008	1	976	977	0	0
C	2009	1	933	934	0	0
C	2010	4	588	592	0	0
C	2011	6	619	625	0	0
C	2012	0	571	571	0	0
C	2013	0	1738	1738	0	0

Table 285: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2014	1	1503	1504	0	0
C	2015	0	1721	1721	0	0
C	2016	0	1401	1401	0	0
C	2017	0	1256	1256	0	0
C	2018	0	1243	1243	0	0
C	2019	0	1540	1540	0	0
C	2020	0	41	41	0	0
C	2021	0	994	994	0	0

57.3 NWFSC WCGBT

Table 286: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	2	30	0	30	0	0
2004	5	141	18	159	0	25
2005	13	219	26	245	41	26
2006	6	151	1	152	10	39
2007	13	333	91	424	33	60
2008	10	234	5	239	36	44
2009	16	487	3	490	34	74
2010	13	181	4	185	17	46
2011	6	64	13	77	11	24
2012	6	28	4	32	5	27
2013	10	517	7	524	21	73
2014	9	17	215	232	6	40
2015	9	223	24	247	34	52
2016	18	172	157	329	59	79
2017	11	277	45	322	62	66
2018	11	193	47	240	17	91
2019	6	187	19	206	22	43

Table 286: Data collected annually from the NWFSC WCGBT survey. *(continued)*

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2021	10	183	1	184	0	111

57.4 NWFSC HKL

Table 287: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	4	6	0	6	1	5
2005	17	26	2	28	4	21
2006	13	35	0	35	7	27
2007	8	10	0	10	7	3
2008	21	63	1	64	7	52
2009	12	20	0	20	4	15
2010	8	28	0	28	3	23
2011	13	24	0	24	2	19
2012	4	4	0	4	0	4
2013	7	8	0	8	2	6
2014	27	81	5	86	20	60
2015	36	145	0	145	16	128
2016	45	220	1	221	25	191
2017	56	265	0	265	45	213
2018	67	343	0	343	174	144
2019	60	191	0	191	27	154
2021	63	318	1	319	0	295

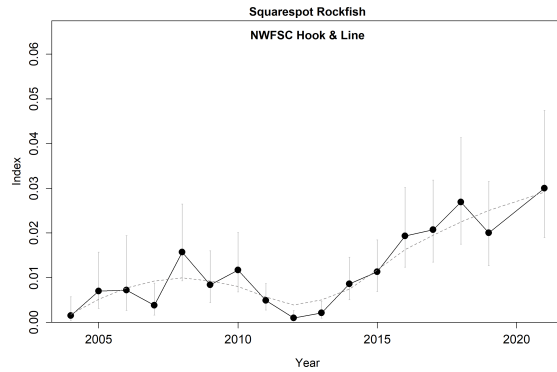


Figure 81: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

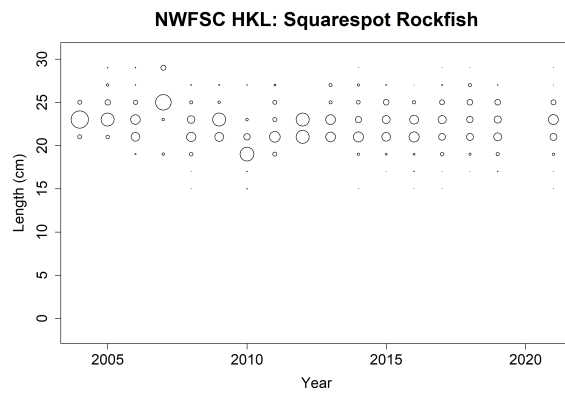


Figure 82: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

58 Starry flounder

The most recent assessment of Starry flounder was a data-limited assessment conducted in 2010. Across available data, Starry flounder have been observed and sampled generally by both the commercial and recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 8,921 length observations, 0 age readings, and 3,027 otoliths that are available to be aged. In California, since 2000, a total of 4,108 length observations, 0 age readings, and 70 otoliths have been collected. In Oregon, since 2000, a total of 2,911 length observations, 0 age readings, and 2,766 otoliths have been collected. In Washington, since 2000, a total of 11 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 1,019 length observations, 0 age readings, and 7 otoliths that are available to be aged. In California, since 2003, a total of 656 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 252 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 82 length observations, 0 age readings, and 4 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 475 length observations, 0 age readings, and 423 otoliths that are available to be aged.

58.1 commercial fisheries

Table 288: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2001	0	7	7	0	0
C	2002	11	19	30	0	0
C	2003	0	24	24	0	0
C	2004	31	6	37	0	0
C	2005	115	17	132	0	10
C	2006	182	4	186	0	0
C	2007	89	26	115	0	0
C	2008	132	15	147	0	60
C	2009	172	192	364	0	0
C	2010	77	116	193	0	0
C	2011	27	203	230	0	0
C	2012	38	116	154	0	0
C	2013	107	114	221	0	0
C	2014	141	103	244	0	0
C	2015	55	125	180	0	0
C	2016	8	288	296	0	0
C	2017	3	275	278	0	0
C	2018	24	223	247	0	0
C	2019	0	475	475	0	0
C	2020	0	367	367	0	0
C	2021	2	179	181	0	0

Table 289: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1987	150	0	150	0	150
O	1996	41	0	41	0	41
O	2001	3	0	3	0	0
O	2003	12	0	12	0	12
O	2004	31	7	38	0	30
O	2005	72	0	72	0	72
O	2007	385	0	385	0	385
O	2008	337	0	337	0	337
O	2009	253	0	253	0	253
O	2010	294	6	300	0	259
O	2011	332	0	332	0	332

Table 289: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2012	180	0	180	0	180
O	2013	156	0	156	0	156
O	2014	159	0	159	0	159
O	2015	295	0	295	0	234
O	2016	122	0	122	0	120
O	2017	78	0	78	0	78
O	2018	150	2	152	0	122
O	2019	36	0	36	0	36
O	2020	1	0	1	0	1

Table 290: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	100	0	100	0	0
W	1981	300	0	300	0	0
W	1982	150	0	150	0	0
W	1983	450	0	450	0	0
W	1984	400	0	400	0	0
W	1985	250	0	250	0	0
W	1986	50	0	50	0	0
W	2021	11	0	11	0	0

58.2 recreational fisheries

Table 291: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	50	50	0	0
C	2005	0	110	110	0	0
C	2006	0	51	51	0	0
C	2007	0	43	43	0	0
C	2008	0	42	42	0	0
C	2009	0	30	30	0	0
C	2010	0	22	22	0	0
C	2011	0	21	21	0	0
C	2012	0	48	48	0	0
C	2013	1	39	40	0	0
C	2014	0	76	76	0	0
C	2015	0	45	45	0	0
C	2016	0	14	14	0	0
C	2017	0	16	16	0	0
C	2018	0	11	11	0	0
C	2019	0	31	31	0	0
C	2021	0	6	6	0	0

Table 292: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	3	3	0	0
O	2002	0	17	17	0	0
O	2003	0	62	62	0	0
O	2004	0	34	34	0	0
O	2005	0	26	26	0	0
O	2006	0	15	15	0	0
O	2007	0	4	4	0	0
O	2008	0	16	16	0	0
O	2009	0	5	5	0	0
O	2010	0	2	2	0	0
O	2011	0	24	24	0	0
O	2012	0	7	7	0	0
O	2013	0	3	3	0	0
O	2014	0	5	5	0	0
O	2015	0	9	9	0	0

Table 292: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2016	0	9	9	0	0
O	2017	0	16	16	0	0
O	2018	0	4	4	0	0
O	2019	0	4	4	0	0
O	2021	0	7	7	0	0

Table 293: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	9	0	9	0	3
W	2003	8	0	8	0	0
W	2004	13	8	21	0	0
W	2005	1	0	1	0	0
W	2006	0	1	1	0	0
W	2007	2	5	7	0	0
W	2008	0	1	1	0	0
W	2009	0	7	7	0	0
W	2010	2	3	5	0	1
W	2011	0	2	2	0	0
W	2012	0	2	2	0	0
W	2013	0	2	2	0	0
W	2014	0	5	5	0	0
W	2015	1	3	4	0	0
W	2017	0	9	9	0	0
W	2018	2	1	3	0	2
W	2019	1	3	4	0	1

58.3 NWFSC WCGBT

Table 294: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	4	36	0	36	0	30
2005	7	41	1	42	0	31
2006	4	7	0	7	0	7
2007	6	15	0	15	0	15
2008	9	22	0	22	0	22
2009	11	21	0	21	0	21
2010	13	27	0	27	0	27
2011	18	62	0	62	0	62
2012	7	15	0	15	0	15
2013	10	26	0	26	0	0
2014	8	36	0	36	0	36
2015	10	42	0	42	0	33
2016	10	43	0	43	0	43
2017	16	29	0	29	0	29
2018	6	23	0	23	0	23
2019	6	13	0	13	0	13
2021	11	16	0	16	0	16

59 Starry rockfish

The most recent assessment of Starry rockfish was a data-limited assessment conducted in 2010. Across available data, Starry rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 4,990 length observations, 0 age readings, and 83 otoliths that are available to be aged. In California, since 2000, a total of 666 length observations, 0 age readings, and 5 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 32,356 length observations, 0 age readings, and 36 otoliths that are available to be aged. In California, since 2003, a total of 32,356 length observations, 0 age readings, and 36 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 79 length observations, 0 age readings, and 73 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 2,226 length observations, 0 age readings, and 2,138 otoliths that are available to be aged.

59.1 commercial fisheries

Table 295: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	1	1	2	0	8
C	1981	0	9	9	0	3
C	1982	0	2	2	0	0

Table 295: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1983	0	41	41	0	0
C	1984	1	57	58	0	10
C	1985	4	89	93	0	46
C	1986	19	198	217	0	11
C	1987	45	83	128	0	0
C	1988	4	33	37	0	0
C	1989	29	202	231	0	0
C	1990	5	13	18	0	0
C	1991	1	25	26	0	0
C	1992	0	399	399	0	0
C	1993	4	378	382	0	0
C	1994	0	463	463	0	0
C	1995	0	351	351	0	0
C	1996	0	667	667	0	0
C	1997	1	382	383	0	0
C	1998	2	678	680	0	0
C	1999	0	137	137	0	0
C	2000	0	12	12	0	0
C	2001	0	36	36	0	0
C	2002	0	5	5	0	0
C	2006	0	17	17	0	0
C	2007	0	12	12	0	0
C	2008	0	27	27	0	0
C	2009	1	30	31	0	0
C	2010	0	21	21	0	0
C	2011	0	15	15	0	0
C	2012	0	10	10	0	0
C	2013	0	23	23	0	0
C	2014	0	35	35	0	0
C	2015	0	30	30	0	0
C	2016	3	69	72	0	3
C	2017	0	18	18	0	0
C	2018	0	76	76	0	0
C	2019	0	71	71	0	2
C	2020	0	104	104	0	0
C	2021	2	49	51	0	0

59.2 recreational fisheries

Table 296: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	12	12	0	0
C	2004	0	833	833	0	0
C	2005	0	1549	1549	0	0
C	2006	3	1810	1813	0	0
C	2007	7	2976	2983	0	0
C	2008	1	2665	2666	0	0
C	2009	4	2449	2453	0	0
C	2010	15	1968	1983	0	0
C	2011	2	2016	2018	0	0
C	2012	0	1690	1690	0	0
C	2013	2	1889	1891	0	0
C	2014	0	941	941	0	0
C	2015	1	1326	1327	0	0
C	2016	0	1396	1396	0	0
C	2017	6	2471	2477	0	0
C	2018	10	2118	2128	0	7
C	2019	11	2617	2628	0	29
C	2020	0	74	74	0	0
C	2021	0	1494	1494	0	0

59.3 NWFSC WCGBT

Table 297: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	1	1	0	1	0	0
2004	3	3	0	3	0	3
2005	2	3	0	3	0	3
2006	1	1	0	1	0	1
2007	3	6	0	6	0	6
2008	2	2	0	2	0	2
2009	6	17	1	18	0	18
2010	2	2	0	2	0	2
2011	1	1	0	1	0	1
2012	2	3	0	3	0	3
2013	1	2	0	2	0	0
2016	2	2	0	2	0	2
2017	5	9	0	9	0	6
2018	4	9	1	10	0	10
2019	4	16	0	16	0	16

59.4 NWFSC HKL

Table 298: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	13	24	0	24	0	24
2005	15	32	0	32	0	32
2006	27	60	1	61	0	62
2007	29	63	0	63	0	61
2008	50	117	0	117	0	115
2009	39	85	0	85	0	80
2010	37	93	0	93	0	89
2011	23	39	0	39	0	35
2012	30	69	0	69	0	63
2013	29	55	0	55	0	54
2014	47	124	0	124	0	122
2015	59	189	0	189	0	188
2016	51	120	0	120	0	112
2017	60	152	1	153	0	144
2018	80	252	1	253	0	237
2019	85	323	5	328	0	308
2021	106	420	1	421	0	412

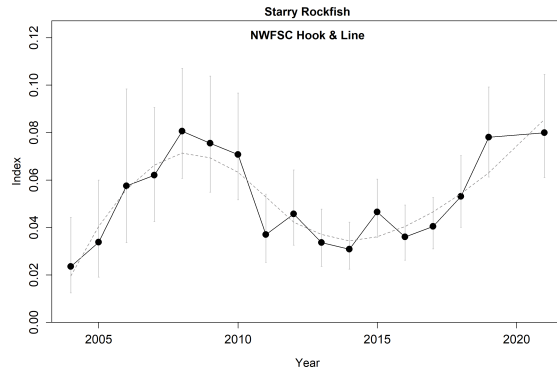


Figure 83: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

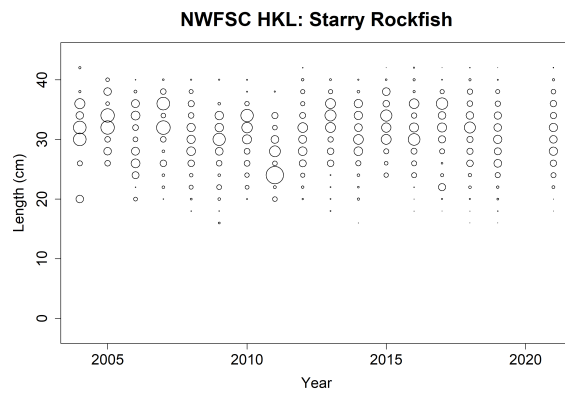


Figure 84: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

60 Stripetail rockfish

The most recent assessment of Stripetail rockfish was a data-limited assessment conducted in 2010. Across available data, Stripetail rockfish have been observed and sampled generally by recreational fisheries and the NWFSC WCGBT survey.

Across all years of available data, recreational fisheries have collected a total of 74 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 74 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 47,180 length observations, 0 age readings, and 10,219 otoliths that are available to be aged.

60.1 recreational fisheries

Table 299: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	21	21	0	0
C	2005	0	4	4	0	0
C	2006	0	5	5	0	0
C	2007	0	8	8	0	0
C	2009	0	1	1	0	0
C	2010	0	7	7	0	0
C	2011	0	5	5	0	0
C	2012	0	10	10	0	0
C	2013	0	6	6	0	0
C	2014	0	1	1	0	0
C	2016	0	6	6	0	0

60.2 NWFSC WCGBT

Table 300: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	112	5303	610	5913	0	0
2004	113	4267	390	4657	0	488
2005	136	3903	399	4302	0	540
2006	136	3204	66	3270	0	526
2007	138	2182	52	2234	0	545
2008	120	1655	154	1809	0	434
2009	148	1886	171	2057	0	731
2010	166	1668	437	2105	0	894
2011	156	1826	790	2616	0	834
2012	149	1685	454	2139	0	603
2013	93	1139	61	1200	0	375
2014	146	1696	496	2192	0	601
2015	163	1823	294	2117	0	641
2016	147	1804	261	2065	0	589
2017	178	1966	457	2423	0	695
2018	163	1984	219	2203	0	656
2019	82	1286	78	1364	0	349
2021	164	1920	594	2514	0	718

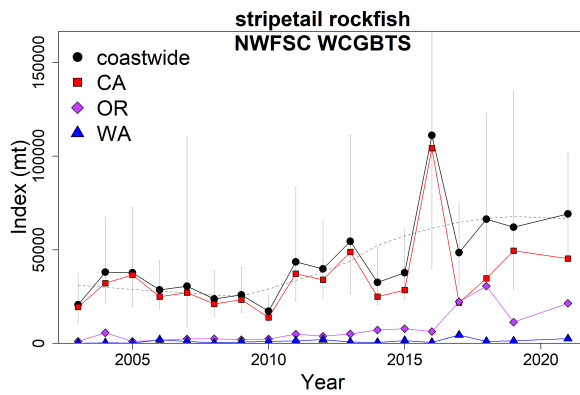


Figure 85: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

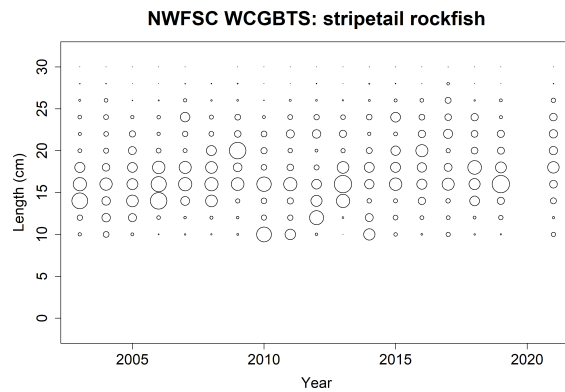


Figure 86: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

61 Treefish

The most recent assessment of Treefish was a data-limited assessment conducted in 2010. Across available data, Treefish have been observed and sampled generally by both commercial and recreational fisheries.

Across all years of available data, commercial fisheries have collected a total of 1,157 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2000, a total of 937 length observations, 0 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 10,636 length observations, 0 age readings, and 0 otoliths that are available to be aged. In California, since 2003, a total of 10,636 length observations, 0 age readings, and 0 otoliths have been collected.

61.1 commercial fisheries

Table 301: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1985	0	1	1	0	0
C	1986	1	0	1	0	0
C	1987	0	5	5	0	0
C	1989	0	14	14	0	0
C	1993	0	5	5	0	0
C	1994	0	10	10	0	0
C	1995	0	17	17	0	0
C	1996	0	46	46	0	0
C	1997	0	52	52	0	0
C	1998	0	30	30	0	0
C	1999	0	39	39	0	0

Table 301: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2000	1	117	118	0	0
C	2001	0	108	108	0	0
C	2002	0	15	15	0	0
C	2003	0	14	14	0	0
C	2004	0	3	3	0	0
C	2005	0	0	0	0	0
C	2006	0	0	0	0	0
C	2007	0	2	2	0	0
C	2008	0	3	3	0	0
C	2009	0	18	18	0	0
C	2010	0	69	69	0	0
C	2011	0	56	56	0	0
C	2012	0	37	37	0	0
C	2013	0	23	23	0	0
C	2014	0	14	14	0	0
C	2015	0	76	76	0	0
C	2016	1	87	88	0	0
C	2017	0	76	76	0	0
C	2018	1	36	37	0	0
C	2019	0	68	68	0	0
C	2020	0	30	30	0	0
C	2021	1	81	82	0	0

61.2 recreational fisheries

Table 302: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	30	30	0	0
C	2004	0	278	278	0	0
C	2005	0	400	400	0	0

Table 302: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2006	1	497	498	0	0
C	2007	0	664	664	0	0
C	2008	1	669	670	0	0
C	2009	0	869	869	0	0
C	2010	1	550	552	0	0
C	2011	1	813	814	0	0
C	2012	0	834	834	0	0
C	2013	0	973	973	0	0
C	2014	0	621	621	0	0
C	2015	0	688	688	0	0
C	2016	0	764	764	0	0
C	2017	0	559	559	0	0
C	2018	0	497	497	0	0
C	2019	4	599	603	0	0
C	2020	0	54	54	0	0
C	2021	0	268	268	0	0

62 Vermilion and sunset rockfish

The most recent assessment of Vermilion and sunset rockfish was a full assessment conducted in 2021. Across available data, Vermilion and sunset rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 23,531 length observations, 1,233 age readings, and 2,852 otoliths that are available to be aged. In California, since 2000, a total of 7,703 length observations, 0 age readings, and 1,032 otoliths have been collected. In Oregon, since 2000, a total of 2,475 length observations, 1,122 age readings, and 992 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 296,720 length observations, 2,966 age readings, and 1,219 otoliths that are available to be aged. In California, since 2003, a total of 266,116 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2003, a total of 26,376 length observations, 1,450 age readings, and 943 otoliths have been collected. In Washington, since 2003, a total of 2,864 length observations, 1,510 age readings, and 276 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 2,832 length observations, 776 age readings, and 1,184 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 25,311 length observations, 2,565 age readings, and 16,601 otoliths that are available to be aged.

62.1 commercial fisheries

Table 303: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	44	768	812	5	30
C	1981	11	898	909	0	26
C	1982	16	408	424	3	106
C	1983	40	216	256	17	238
C	1984	121	168	289	56	258
C	1985	54	427	481	30	132
C	1986	63	514	577	0	38
C	1987	106	142	248	0	0
C	1988	21	151	172	0	0
C	1989	19	405	424	0	0
C	1990	13	179	192	0	0
C	1991	1	127	128	0	0
C	1992	27	634	661	0	0
C	1993	33	1475	1508	0	0
C	1994	0	789	789	0	0
C	1995	2	1079	1081	0	0
C	1996	1	1141	1142	0	0

Table 303: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1997	3	1223	1226	0	0
C	1998	50	1202	1252	0	0
C	1999	64	699	763	0	0
C	2000	3	195	198	0	0
C	2001	0	167	167	0	42
C	2002	18	170	188	0	2
C	2003	9	41	50	0	18
C	2004	9	68	77	0	4
C	2005	1	71	72	0	2
C	2006	8	149	157	0	16
C	2007	11	245	256	0	0
C	2008	11	170	181	0	4
C	2009	7	244	251	0	10
C	2010	5	142	147	0	8
C	2011	0	238	238	0	0
C	2012	7	163	170	0	12
C	2013	2	236	238	0	4
C	2014	37	659	696	0	6
C	2015	52	630	682	0	108
C	2016	43	753	796	0	82
C	2017	14	532	546	0	28
C	2018	50	461	511	0	0
C	2019	45	525	570	0	672
C	2020	87	517	604	0	0
C	2021	129	779	908	0	14

Table 304: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1999	19	0	19	0	0
O	2000	68	0	68	0	0
O	2001	107	0	107	14	0
O	2002	38	0	38	12	5
O	2003	63	0	63	50	3
O	2004	83	0	83	65	0
O	2005	57	0	57	47	0

Table 304: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2006	54	2	56	39	0
O	2007	59	1	60	20	23
O	2008	38	0	38	13	12
O	2009	118	0	118	56	58
O	2010	87	0	87	38	42
O	2011	202	0	202	106	96
O	2012	118	0	118	58	55
O	2013	177	1	178	87	86
O	2014	138	0	138	69	69
O	2015	72	0	72	35	37
O	2016	125	0	125	63	61
O	2017	192	0	192	97	95
O	2018	123	0	123	64	59
O	2019	318	0	318	149	141
O	2020	94	0	94	40	39
O	2021	140	0	140	0	111

62.2 recreational fisheries

Table 305: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	68	68	0	0
C	2004	6	12942	12948	0	0
C	2005	4	18326	18330	0	0
C	2006	0	20046	20046	0	0
C	2007	4	19110	19114	0	0
C	2008	6	12460	12466	0	0
C	2009	2	10982	10984	0	0
C	2010	12	13360	13372	0	0
C	2011	12	16694	16706	0	0

Table 305: Data collected annually from the recreational fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2012	8	17280	17288	0	0
C	2013	10	19896	19906	0	0
C	2014	4	14478	14482	0	0
C	2015	2	18438	18440	0	0
C	2016	10	16932	16942	0	0
C	2017	18	13930	13948	0	0
C	2018	14	14408	14422	0	0
C	2019	40	18702	18742	0	0
C	2020	0	774	774	0	0
C	2021	16	7122	7138	0	0

Table 306: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	448	448	0	0
O	2002	0	900	900	0	0
O	2003	0	1486	1486	0	0
O	2004	0	826	826	0	0
O	2005	214	1920	2134	115	16
O	2006	372	1218	1590	284	0
O	2007	412	1646	2058	109	99
O	2008	654	1478	2132	179	156
O	2009	376	1002	1378	97	92
O	2010	314	1266	1580	85	74
O	2011	382	1448	1830	101	90
O	2012	348	1856	2204	89	85
O	2013	340	1294	1634	87	82
O	2014	168	746	914	43	43
O	2015	120	592	712	32	30
O	2016	98	542	640	29	21
O	2017	104	1086	1190	29	23
O	2018	94	1150	1244	29	18
O	2019	284	1222	1506	75	66
O	2020	230	128	358	67	48
O	2021	0	960	960	0	0

Table 307: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	6	10	16	6	0
W	2003	2	6	8	0	0
W	2004	30	0	30	22	8
W	2005	54	56	110	46	6
W	2006	54	60	114	50	4
W	2007	72	66	138	70	2
W	2008	56	30	86	56	0
W	2009	18	14	32	18	0
W	2010	6	12	18	6	0
W	2011	22	48	70	22	0
W	2012	34	70	104	32	2
W	2013	10	98	108	10	0
W	2014	120	4	124	116	4
W	2015	260	22	282	254	6
W	2016	182	6	188	174	8
W	2017	164	130	294	162	0
W	2018	206	200	406	172	20
W	2019	320	210	530	300	20
W	2020	36	4	40	0	36
W	2021	162	20	182	0	160

62.3 NWFSC WCGBT

Table 308: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	6	61	1	62	0	0
2004	3	8	1	9	8	0
2005	6	48	1	49	11	17

Table 308: Data collected annually from the NWFSC WCGBT survey. (*continued*)

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2006	5	27	0	27	18	9
2007	8	120	0	120	56	0
2008	12	73	1	74	39	26
2009	13	223	0	223	114	15
2010	15	78	28	106	93	13
2011	4	28	0	28	4	24
2012	15	467	4	471	106	204
2013	11	396	9	405	70	165
2014	14	35	2	37	26	11
2015	12	226	0	226	9	138
2016	20	75	25	100	56	44
2017	16	199	44	243	75	132
2018	12	196	1	197	47	93
2019	7	172	0	172	44	89
2021	20	91	192	283	0	204

62.4 NWFSC HKL

Table 309: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	53	736	1	737	73	552
2005	72	838	26	864	142	673
2006	65	577	2	579	555	24
2007	71	904	3	907	129	776
2008	78	857	0	857	90	766
2009	74	1062	5	1067	203	863
2010	79	1151	0	1151	250	897
2011	73	1325	3	1328	152	1166
2012	91	1182	2	1184	169	1013
2013	93	1224	6	1230	267	961
2014	114	1697	9	1706	0	1696
2015	146	1903	8	1911	0	1904
2016	142	1903	1	1904	0	1863
2017	157	2638	11	2649	0	1027
2018	158	2645	3	2648	535	538
2019	148	2233	31	2264	0	950
2021	150	2324	1	2325	0	932

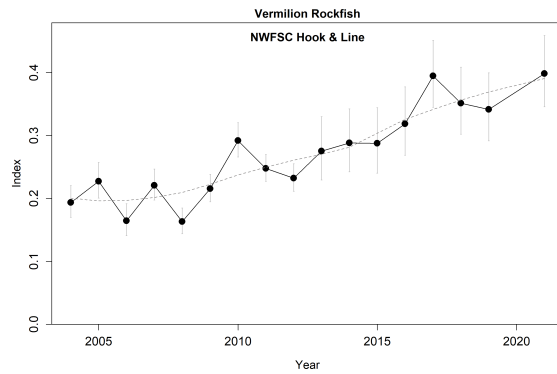


Figure 87: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

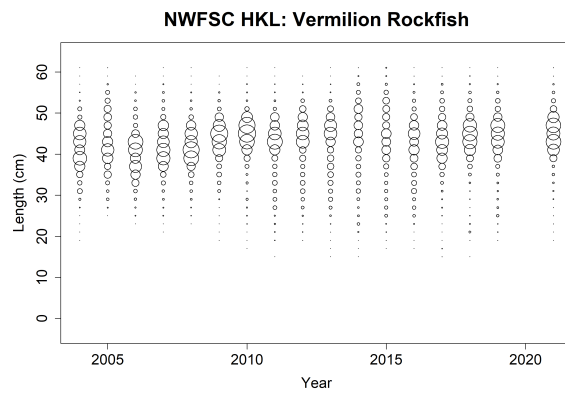


Figure 88: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

63 Widow rockfish

The most recent assessment of Widow rockfish was a update assessment conducted in 2019. Across available data, Widow rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 206,402 length observations, 89,194 age readings, and 125,766 otoliths that are available to be aged. In California, since 2000, a total of 9,657 length observations, 1,884 age readings, and 3,278 otoliths have been collected. In Oregon, since 2000, a total of 29,638 length observations, 9,848 age readings, and 16,924 otoliths have been collected. In Washington, since 2000, a total of 17,987 length observations, 9,327 age readings, and 1,583 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 16,438 length observations, 2,328 age readings, and 704 otoliths that are available to be aged. In California, since 2003, a total of 6,862 length observations, 0 age readings, and 27 otoliths have been collected. In Oregon, since 2003, a total of 5,394 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 3,685 length observations, 2,328 age readings, and 677 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 4,289 length observations, 2,508 age readings, and 240 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 825 length observations, 0 age readings, and 811 otoliths that are available to be aged.

63.1 commercial fisheries

Table 310: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	680	60	740	404	751
C	1981	1777	24	1801	803	1622
C	1982	4118	67	4185	3247	2931
C	1983	2775	111	2886	2706	3047
C	1984	3090	47	3137	3050	3302
C	1985	4449	92	4541	4364	2409
C	1986	3147	160	3307	2904	3032
C	1987	3011	17	3028	2910	2253
C	1988	2318	18	2336	2123	2232
C	1989	2739	43	2782	2649	2579
C	1990	3334	113	3447	2987	3186
C	1991	2521	179	2700	2256	2218
C	1992	1947	665	2612	936	1513
C	1993	1895	636	2531	564	1548
C	1994	1081	1488	2569	629	1146
C	1995	1734	602	2336	235	1534
C	1996	1619	566	2185	1131	1203
C	1997	2230	590	2820	1157	2242
C	1998	1740	407	2147	1327	500
C	1999	1581	184	1765	1159	1372
C	2000	925	119	1044	562	571
C	2001	485	43	528	211	182
C	2002	369	80	449	333	333
C	2003	233	21	254	87	80
C	2004	115	0	115	96	19
C	2005	30	1	31	0	30
C	2006	102	13	115	79	145
C	2007	103	3	106	63	83
C	2008	179	17	196	169	356
C	2009	255	89	344	194	409
C	2010	204	107	311	90	190
C	2011	5	44	49	0	5
C	2012	103	42	145	0	96
C	2013	119	136	255	0	93
C	2014	80	297	377	0	78
C	2015	130	122	252	0	132
C	2016	57	125	182	0	35
C	2017	451	104	555	0	326
C	2018	1069	118	1187	0	115
C	2019	622	119	741	0	0

Table 310: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	436	401	837	0	0
C	2021	1465	119	1584	0	0

Table 311: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1981	2026	0	2026	51	1975
O	1982	4749	3	4752	0	4752
O	1983	799	0	799	0	799
O	1984	3919	0	3919	0	3919
O	1985	6204	0	6204	0	6204
O	1986	4213	0	4213	0	4213
O	1987	3063	0	3063	0	3063
O	1988	2155	0	2155	0	2155
O	1989	2942	0	2942	28	2914
O	1990	2774	0	2774	2757	17
O	1991	3011	0	3011	2979	32
O	1992	3744	0	3744	2463	1141
O	1993	3631	0	3631	2516	1092
O	1994	2099	0	2099	2097	2
O	1995	1927	5	1932	1873	1
O	1996	1700	1	1701	1657	2
O	1997	2729	0	2729	2516	154
O	1998	2200	0	2200	1278	899
O	1999	2911	1	2912	1935	841
O	2000	2063	14	2077	642	1434
O	2001	1618	0	1618	1469	48
O	2002	558	0	558	531	27
O	2004	198	0	198	0	198
O	2005	48	0	48	0	48
O	2006	590	13	603	48	555
O	2007	681	23	704	221	432
O	2008	1029	0	1029	724	218
O	2009	937	0	937	744	192
O	2010	1376	0	1376	1220	74
O	2011	1510	2	1512	707	728

Table 311: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2012	1515	0	1515	408	1049
O	2013	1546	0	1546	520	1025
O	2014	1672	0	1672	509	1163
O	2015	1590	0	1590	349	1116
O	2016	1385	1	1386	377	1008
O	2017	2455	2	2457	581	1786
O	2018	2753	0	2753	798	1143
O	2019	2613	1	2614	0	1875
O	2020	1540	1	1541	0	1325
O	2021	1904	0	1904	0	1480

Table 312: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	1900	2	1902	0	1775
W	1981	3100	0	3100	0	3050
W	1982	4000	100	4100	0	3944
W	1983	2500	0	2500	0	2480
W	1984	2198	1	2199	0	2194
W	1985	1600	0	1600	0	1591
W	1986	2648	2	2650	0	2594
W	1987	1941	1	1942	0	1940
W	1988	1050	0	1050	0	993
W	1989	1499	0	1499	0	1494
W	1990	2050	0	2050	0	2047
W	1991	1747	0	1747	0	1739
W	1992	1550	0	1550	0	1547
W	1993	1799	1	1800	0	1798
W	1994	1491	1	1492	1399	0
W	1995	1650	0	1650	1650	0
W	1996	1349	5	1354	1348	0
W	1997	1499	8	1507	1498	0
W	1998	1259	6	1265	1099	0
W	1999	1499	3	1502	1450	0
W	2000	1050	1	1051	1048	0
W	2001	551	1	552	485	0

Table 312: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	635	1	636	587	0
W	2003	256	4	260	208	0
W	2004	521	1	522	520	0
W	2005	448	1	449	449	0
W	2006	418	100	518	156	261
W	2007	669	143	812	221	395
W	2008	826	386	1212	290	435
W	2009	1048	321	1369	745	244
W	2010	844	349	1193	531	248
W	2011	443	250	693	384	0
W	2012	821	340	1161	310	0
W	2013	571	154	725	311	0
W	2014	1123	100	1223	618	0
W	2015	808	250	1058	652	0
W	2016	621	50	671	547	0
W	2017	880	0	880	854	0
W	2018	562	0	562	411	0
W	2019	1090	0	1090	0	0
W	2020	534	0	534	0	0
W	2021	816	0	816	0	0

63.2 recreational fisheries

Table 313: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	557	557	0	0
C	2005	0	171	171	0	0
C	2006	0	325	325	0	0
C	2007	0	461	461	0	0
C	2008	0	338	338	0	0

Table 313: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2009	0	99	99	0	0
C	2010	0	53	53	0	0
C	2011	0	95	95	0	0
C	2012	0	343	343	0	0
C	2013	0	916	916	0	0
C	2014	0	918	918	0	0
C	2015	0	342	342	0	0
C	2016	0	136	136	0	0
C	2017	0	359	359	0	0
C	2018	0	715	715	0	24
C	2019	0	871	871	0	3
C	2020	0	6	6	0	0
C	2021	0	157	157	0	0

Table 314: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	237	237	0	0
O	2002	0	260	260	0	0
O	2003	0	351	351	0	0
O	2004	0	124	124	0	0
O	2005	0	393	393	0	0
O	2006	0	179	179	0	0
O	2007	0	193	193	0	0
O	2008	0	230	230	0	0
O	2009	0	182	182	0	0
O	2010	0	119	119	0	0
O	2011	0	149	149	0	0
O	2012	0	276	276	0	0
O	2013	0	268	268	0	0
O	2014	0	159	159	0	0
O	2015	0	216	216	0	0
O	2016	0	64	64	0	0
O	2017	0	257	257	0	0
O	2018	0	966	966	0	0
O	2019	0	726	726	0	0

Table 314: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2020	0	21	21	0	0
O	2021	0	521	521	0	0

Table 315: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2003	20	0	20	0	0
W	2004	4	1	5	0	0
W	2005	13	3	16	0	0
W	2006	0	1	1	0	0
W	2007	4	0	4	0	0
W	2008	7	0	7	0	0
W	2009	70	4	74	0	0
W	2010	30	3	33	0	0
W	2011	8	116	124	0	0
W	2012	0	29	29	0	0
W	2013	127	19	146	0	0
W	2014	405	86	491	405	0
W	2015	334	1	335	334	0
W	2016	556	5	561	551	5
W	2017	777	23	800	776	1
W	2018	266	66	332	262	0
W	2019	103	32	135	0	103
W	2020	459	3	462	0	458
W	2021	110	0	110	0	110

63.3 NWFSC WCGBT

Table 316: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	18	212	4	216	0	10
2004	12	84	0	84	43	0
2005	20	78	0	78	65	2
2006	26	172	0	172	89	0
2007	27	91	1	92	83	0
2008	17	26	0	26	20	6
2009	32	142	0	142	124	0
2010	28	240	0	240	116	2
2011	31	313	0	313	152	0
2012	32	181	0	181	91	2
2013	18	361	3	364	246	0
2014	28	349	0	349	264	0
2015	21	149	0	149	93	0
2016	40	888	0	888	556	0
2017	30	310	0	310	213	1
2018	34	410	0	410	353	0
2019	23	219	0	219	0	161
2021	16	55	1	56	0	56

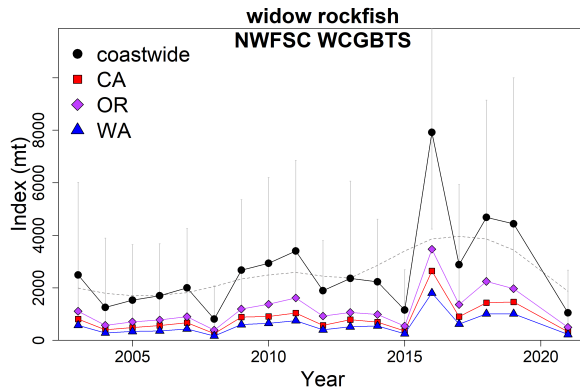


Figure 89: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

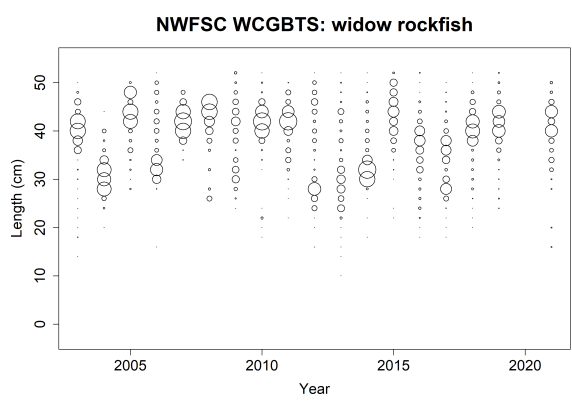


Figure 90: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

63.4 NWFSC HKL

Table 317: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	13	56	0	56	0	55
2005	14	73	2	75	0	74
2006	15	68	0	68	0	68
2007	12	43	0	43	0	43
2008	33	173	1	174	0	173
2009	14	39	0	39	0	39
2010	9	15	0	15	0	15
2011	8	13	0	13	0	13
2012	3	3	0	3	0	3
2013	13	16	0	16	0	16
2014	26	69	0	69	0	70
2015	12	19	0	19	0	19
2016	18	39	0	39	0	37
2017	25	56	0	56	0	50
2018	25	69	0	69	0	66
2019	11	21	2	23	0	23
2021	16	47	1	48	0	47

64 Yelloweye rockfish

The most recent assessment of Yelloweye rockfish was a full assessment conducted in 2017. Across available data, Yelloweye rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 9,478 length observations, 2,116 age readings, and 432 otoliths that are available to be aged. In California, since 2000, a total of 259 length observations, 0 age readings, and 17 otoliths have been collected. In Oregon, since 2000, a total of 1,096 length observations, 449 age readings, and 292 otoliths have been collected. In Washington, since 2000, a total of 2,509 length observations, 1,648 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 3,503 length observations, 52 age readings, and 365 otoliths that are available to be aged. In California, since 2003, a total of 947 length observations, 0 age readings, and 253 otoliths have been collected. In Oregon, since 2003, a total of 1,550 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 190 length observations, 52 age readings, and 112 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 879 length observations, 684 age readings, and 194 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 110 length observations, 0 age readings, and 103 otoliths that are available to be aged.

64.1 commercial fisheries

Table 318: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	17	18	35	0	17
C	1981	5	57	62	0	11
C	1982	11	11	22	0	10
C	1983	22	21	43	0	12
C	1984	18	12	30	0	20
C	1985	11	16	27	0	34
C	1986	16	7	23	0	4
C	1987	26	0	26	0	0
C	1988	15	6	21	0	0
C	1989	9	42	51	0	0
C	1990	9	19	28	0	0
C	1991	12	212	224	0	0
C	1992	9	484	493	0	0
C	1993	6	704	710	0	0
C	1994	8	728	736	0	0
C	1995	10	368	378	0	0
C	1996	50	476	526	0	0
C	1997	3	287	290	0	0
C	1998	5	57	62	0	0
C	1999	23	485	508	0	1
C	2000	3	23	26	0	0
C	2001	7	125	132	0	2
C	2002	3	1	4	0	2
C	2003	1	0	1	0	1
C	2004	7	0	7	0	7
C	2012	1	0	1	0	0
C	2013	3	0	3	0	3
C	2014	0	1	1	0	0
C	2015	1	0	1	0	1
C	2017	1	2	3	0	1
C	2019	11	0	11	0	0
C	2020	24	4	28	0	0
C	2021	31	10	41	0	0

Table 319: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1992	13	0	13	0	13
O	1993	20	0	20	19	1
O	1995	73	25	98	0	0
O	1996	161	0	161	0	0
O	1997	256	0	256	0	0
O	1998	118	0	118	0	0
O	1999	166	0	166	0	0
O	2000	141	0	141	0	0
O	2001	233	0	233	23	0
O	2002	4	0	4	4	0
O	2003	29	0	29	29	0
O	2004	8	0	8	4	3
O	2005	4	0	4	4	0
O	2006	19	1	20	19	0
O	2007	1	0	1	0	1
O	2008	16	0	16	16	0
O	2009	22	0	22	22	0
O	2010	2	0	2	2	0
O	2011	12	0	12	10	0
O	2012	14	0	14	14	0
O	2013	13	0	13	13	0
O	2014	9	0	9	9	0
O	2015	17	0	17	16	1
O	2016	16	0	16	16	0
O	2017	84	0	84	69	15
O	2018	47	0	47	46	1
O	2019	215	1	216	133	83
O	2020	86	0	86	0	86
O	2021	101	1	102	0	102

Table 320: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	0	4	4	0	0
W	1982	14	0	14	0	0
W	1996	0	266	266	0	0

Table 320: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1997	0	118	118	0	0
W	1998	25	15	40	0	0
W	1999	17	28	45	0	0
W	2000	18	343	361	0	0
W	2001	325	488	813	493	0
W	2002	266	4	270	270	0
W	2003	29	0	29	20	0
W	2004	78	0	78	76	0
W	2006	152	0	152	155	0
W	2007	32	0	32	32	0
W	2008	2	0	2	2	0
W	2009	23	0	23	22	0
W	2010	54	0	54	54	0
W	2011	16	1	17	14	0
W	2012	30	36	66	66	0
W	2013	42	0	42	42	0
W	2014	18	0	18	18	0
W	2015	61	0	61	61	0
W	2016	11	0	11	11	0
W	2017	29	1	30	28	0
W	2018	123	1	124	122	0
W	2019	170	1	171	162	0
W	2020	2	0	2	0	0
W	2021	153	0	153	0	0

64.2 recreational fisheries

Table 321: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2004	0	17	17	0	0
C	2005	0	60	60	0	0
C	2006	0	95	95	0	0
C	2007	0	57	57	0	0
C	2008	0	31	31	0	0
C	2009	1	57	58	0	0
C	2010	1	21	22	0	0
C	2011	0	23	23	0	0
C	2012	0	26	26	0	0
C	2013	0	17	17	0	0
C	2014	0	24	24	0	0
C	2015	0	42	42	0	0
C	2016	0	36	36	0	1
C	2017	0	112	112	0	67
C	2018	0	115	115	0	70
C	2019	0	127	127	0	73
C	2020	0	1	1	0	0
C	2021	0	84	84	0	42

Table 322: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2001	0	368	368	0	0
O	2002	0	448	448	0	0
O	2003	0	492	492	0	0
O	2004	0	23	23	0	0
O	2005	1	25	26	0	0
O	2006	0	49	49	0	0
O	2007	0	62	62	0	0
O	2008	0	74	74	0	0
O	2009	0	39	39	0	0
O	2010	0	28	28	0	0
O	2011	0	49	49	0	0
O	2012	0	112	112	0	0
O	2013	0	57	57	0	0
O	2014	0	89	89	0	0

Table 322: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2015	0	42	42	0	0
O	2016	0	34	34	0	0
O	2017	0	102	102	0	0
O	2018	0	120	120	0	0
O	2019	0	120	120	0	0
O	2020	0	12	12	0	0
O	2021	0	20	20	0	0

Table 323: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2003	0	2	2	0	0
W	2004	12	0	12	10	2
W	2005	4	0	4	4	0
W	2006	1	0	1	1	0
W	2008	6	3	9	6	0
W	2010	1	0	1	1	0
W	2011	2	0	2	2	0
W	2012	3	2	5	3	0
W	2014	0	1	1	0	0
W	2015	2	0	2	2	0
W	2017	5	3	8	5	0
W	2018	7	1	8	6	0
W	2019	13	13	26	12	1
W	2020	7	0	7	0	7
W	2021	102	0	102	0	102

64.3 NWFSC WCGBT

Table 324: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	19	68	0	68	67	1
2004	8	21	0	21	21	0
2005	13	40	0	40	40	0
2006	13	42	1	43	43	0
2007	12	24	2	26	19	7
2008	15	43	0	43	43	0
2009	11	39	0	39	39	0
2010	15	52	0	52	52	0
2011	13	47	0	47	47	0
2012	14	44	0	44	44	0
2013	14	38	0	38	35	2
2014	19	92	0	92	92	0
2015	13	51	0	51	51	0
2016	25	91	0	91	91	0
2017	19	45	0	45	0	45
2018	24	50	0	50	0	50
2019	9	34	0	34	0	34
2021	19	55	0	55	0	55

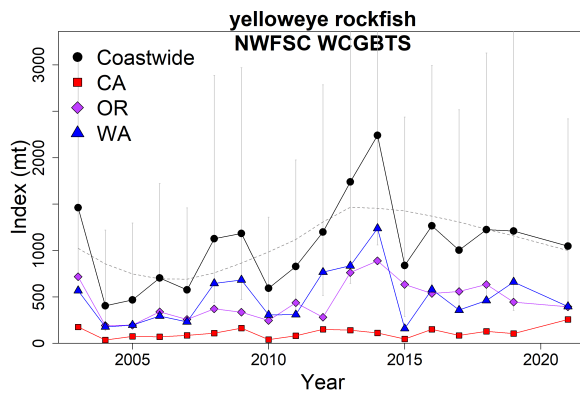


Figure 91: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

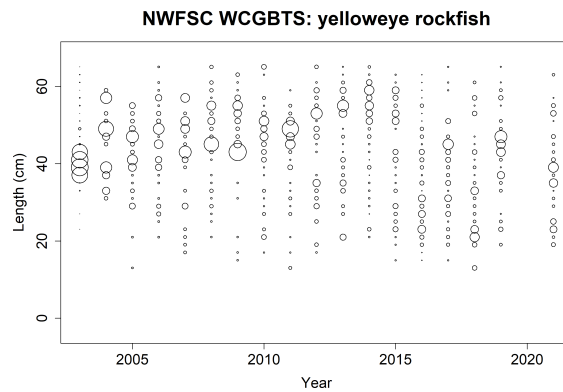


Figure 92: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

64.4 NWFSC HKL

Table 325: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	1	1	0	1	0	1
2006	1	1	0	1	0	1
2007	3	3	0	3	0	3
2009	2	5	0	5	0	5
2010	2	2	0	2	0	2
2012	1	1	0	1	0	1
2015	7	13	0	13	0	13
2016	7	15	0	15	0	10
2017	7	15	0	15	0	15
2018	8	13	0	13	0	13
2019	11	17	0	17	0	16
2021	13	24	0	24	0	23

65 Yellowmouth rockfish

The most recent assessment of Yellowmouth rockfish was a data-limited assessment conducted in 2010. Across available data, Yellowmouth rockfish have been observed and sampled generally by commercial fisheries and the NWFSC WCGBT survey.

Across all years of available data, commercial fisheries have collected a total of 4,441 length observations, 1 age readings, and 2,691 otoliths that are available to be aged. In California, since 2000, a total of 23 length observations, 0 age readings, and 0 otoliths have been collected. In Oregon, since 2000, a total of 2,514 length observations, 0 age readings, and 2,500 otoliths have been collected. In Washington, since 2000, a total of 444 length observations, 1 age readings, and 0 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 509 length observations, 0 age readings, and 279 otoliths that are available to be aged.

65.1 commercial fisheries

Table 326: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1983	5	0	5	0	6
C	1984	6	0	6	0	6
C	1985	13	3	16	0	12
C	1986	18	0	18	0	0
C	1987	3	0	3	0	0
C	1989	1	0	1	0	0
C	1990	2	0	2	0	0
C	1992	1	34	35	0	0
C	1993	2	10	12	0	0

Table 326: Data collected annually from the commercial fisheries in California. *(continued)*

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1994	1	0	1	0	0
C	1996	5	0	5	0	0
C	1997	0	20	20	0	0
C	1998	1	0	1	0	0
C	2006	1	0	1	0	0
C	2007	1	0	1	0	0
C	2009	0	1	1	0	0
C	2012	0	1	1	0	0
C	2016	0	1	1	0	0
C	2019	0	2	2	0	0
C	2020	16	0	16	0	0

Table 327: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1981	107	0	107	0	107
O	1982	60	0	60	0	60
O	1995	56	0	56	0	0
O	1996	226	0	226	0	0
O	1997	100	0	100	0	0
O	1998	41	0	41	0	0
O	2001	16	0	16	0	16
O	2004	93	0	93	0	93
O	2005	61	0	61	0	61
O	2006	45	0	45	0	45
O	2007	213	0	213	0	213
O	2008	95	0	95	0	95
O	2009	271	0	271	0	269
O	2010	104	0	104	0	104
O	2011	44	0	44	0	44
O	2012	114	0	114	0	114
O	2013	162	0	162	0	162
O	2014	85	0	85	0	85
O	2015	129	0	129	0	129
O	2016	75	0	75	0	75
O	2017	109	0	109	0	109

Table 327: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2018	163	0	163	0	163
O	2019	225	0	225	0	225
O	2020	179	0	179	0	167
O	2021	331	0	331	0	331

Table 328: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1996	0	312	312	0	0
W	1997	0	307	307	0	0
W	1998	23	7	30	0	0
W	1999	93	3	96	0	0
W	2000	11	0	11	0	0
W	2001	3	1	4	0	0
W	2002	1	0	1	0	0
W	2003	3	2	5	0	0
W	2004	4	0	4	0	0
W	2005	1	0	1	0	0
W	2007	7	0	7	0	0
W	2008	57	0	57	0	0
W	2011	1	0	1	1	0
W	2012	6	0	6	0	0
W	2013	21	0	21	0	0
W	2014	7	0	7	0	0
W	2015	26	0	26	0	0
W	2016	18	0	18	0	0
W	2017	9	0	9	0	0
W	2018	29	0	29	0	0
W	2019	218	0	218	0	0
W	2021	19	0	19	0	0

65.2 NWFSC WCGBT

Table 329: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	5	141	0	141	0	34
2005	2	23	0	23	0	23
2010	1	1	0	1	0	1
2011	5	54	0	54	0	54
2012	3	3	0	3	0	3
2013	4	10	0	10	0	10
2014	1	1	0	1	0	1
2015	2	13	0	13	0	13
2016	6	85	0	85	0	57
2017	5	29	0	29	0	29
2018	4	149	0	149	0	54

66 Yellowtail rockfish

The most recent assessment of Yellowtail rockfish was a full assessment conducted in 2017. Across available data, Yellowtail rockfish have been observed and sampled generally by both commercial and recreational fisheries and the NWFSC WCGBT and HKL surveys.

Across all years of available data, commercial fisheries have collected a total of 203,209 length observations, 139,646 age readings, and 31,981 otoliths that are available to be aged. In California, since 2000, a total of 5,272 length observations, 802 age readings, and 1,411 otoliths have been collected. In Oregon, since 2000, a total of 40,858 length observations, 26,044 age readings, and 7,412 otoliths have been collected. In Washington, since 2000, a total of 38,197 length observations, 28,595 age readings, and 0 otoliths have been collected.

Across all years of available data, recreational fisheries have collected a total of 116,285 length observations, 5,775 age readings, and 1,236 otoliths that are available to be aged. In California, since 2003, a total of 63,625 length observations, 0 age readings, and 217 otoliths have been collected. In Oregon, since 2003, a total of 36,956 length observations, 0 age readings, and 0 otoliths have been collected. In Washington, since 2003, a total of 12,831 length observations, 5,775 age readings, and 1,007 otoliths have been collected.

Across all years of available data, the NWFSC WCGBT survey has collected a total of 16,533 length observations, 5,193 age readings, and 3,356 otoliths that are available to be aged. Across all years of available data, the NWFSC HKL survey has collected a total of 1,623 length observations, 124 age readings, and 1,283 otoliths that are available to be aged.

66.1 commercial fisheries

Table 330: Data collected annually from the commercial fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	1980	138	22	160	127	103
C	1981	175	148	323	174	194
C	1982	355	27	382	276	262
C	1983	529	47	576	474	1033
C	1984	895	55	950	846	1517
C	1985	780	366	1146	642	883
C	1986	707	81	788	664	624
C	1987	250	79	329	162	781
C	1988	315	6	321	177	302
C	1989	700	201	901	687	698
C	1990	425	167	592	400	346
C	1991	555	415	970	528	515
C	1992	679	2660	3339	529	537
C	1993	257	1806	2063	141	233
C	1994	364	2793	3157	355	441
C	1995	382	837	1219	167	146
C	1996	659	830	1489	576	575
C	1997	385	758	1143	245	247
C	1998	474	870	1344	169	341
C	1999	407	251	658	251	253
C	2000	152	151	303	35	33
C	2001	192	161	353	179	180
C	2002	100	9	109	71	91
C	2003	55	20	75	0	59
C	2004	64	31	95	32	96
C	2005	74	34	108	78	160
C	2006	97	86	183	93	186
C	2007	121	75	196	0	0
C	2008	82	37	119	72	150
C	2009	22	105	127	6	6
C	2010	4	3	7	4	4
C	2011	58	16	74	26	29
C	2012	41	121	162	28	28
C	2013	12	206	218	12	12
C	2014	111	132	243	110	111
C	2015	117	125	242	56	56
C	2016	146	105	251	0	38
C	2017	267	153	420	0	27
C	2018	276	119	395	0	0
C	2019	277	86	363	0	138

Table 330: Data collected annually from the commercial fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2020	181	17	198	0	0
C	2021	1014	17	1031	0	7

Table 331: Data collected annually from the commercial fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1981	607	0	607	0	607
O	1982	1499	0	1499	0	1397
O	1983	199	0	199	0	199
O	1984	1098	0	1098	0	1099
O	1985	2104	0	2104	0	2004
O	1986	1156	0	1156	0	1004
O	1987	1891	0	1891	0	1891
O	1988	1670	0	1670	0	1670
O	1989	2055	0	2055	0	2055
O	1990	1802	0	1802	1792	10
O	1991	1296	0	1296	1289	7
O	1992	2490	0	2490	2424	66
O	1993	2022	0	2022	1981	3
O	1994	2641	0	2641	2637	4
O	1995	2242	0	2242	2203	9
O	1996	2259	0	2259	2161	47
O	1997	4092	0	4092	3735	32
O	1998	3235	0	3235	2263	915
O	1999	3577	1	3578	3383	9
O	2000	3003	3	3006	2863	20
O	2001	2832	0	2832	2749	26
O	2002	1536	2	1538	1470	66
O	2003	701	0	701	44	655
O	2004	1341	0	1341	0	1331
O	2005	916	64	980	522	453
O	2006	1236	15	1251	350	880
O	2007	1189	7	1196	376	99
O	2008	584	1	585	575	2
O	2009	855	0	855	638	9
O	2010	1618	0	1618	1080	4

Table 331: Data collected annually from the commercial fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2011	1816	0	1816	1005	6
O	2012	1914	1	1915	1307	74
O	2013	1263	6	1269	1103	53
O	2014	1893	5	1898	1828	10
O	2015	2391	2	2393	2158	20
O	2016	3141	4	3145	2202	13
O	2017	3037	3	3040	2465	135
O	2018	2948	2	2950	2081	146
O	2019	2782	0	2782	1228	593
O	2020	1926	6	1932	0	1465
O	2021	1815	0	1815	0	1352

Table 332: Data collected annually from the commercial fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	1980	3800	105	3905	3727	0
W	1981	3900	0	3900	3741	0
W	1982	3496	0	3496	3331	99
W	1983	2366	0	2366	2350	0
W	1984	3200	0	3200	3192	0
W	1985	3500	0	3500	3498	0
W	1986	2992	0	2992	2985	0
W	1987	2046	0	2046	2092	0
W	1988	1650	0	1650	1645	0
W	1989	1650	0	1650	1643	0
W	1990	1874	51	1925	1872	0
W	1991	2296	1	2297	2191	0
W	1992	2197	0	2197	2193	0
W	1993	2743	0	2743	2741	0
W	1994	4406	0	4406	2591	0
W	1995	4567	0	4567	2962	0
W	1996	3938	6	3944	2436	0
W	1997	3316	11	3327	2600	0
W	1998	2571	1	2572	2559	0
W	1999	2411	2	2413	2398	0
W	2000	2737	1	2738	2704	0

Table 332: Data collected annually from the commercial fisheries in Washington. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2001	2173	55	2228	2226	0
W	2002	1660	3	1663	1654	0
W	2003	1942	5	1947	1941	0
W	2004	2082	5	2087	2059	0
W	2005	1173	0	1173	1169	0
W	2006	899	69	968	749	0
W	2007	1610	905	2515	1397	0
W	2008	1499	342	1841	1077	0
W	2009	1174	508	1682	1172	0
W	2010	1059	651	1710	977	0
W	2011	1093	435	1528	924	0
W	2012	1741	700	2441	1489	0
W	2013	1023	300	1323	797	0
W	2014	1158	151	1309	713	0
W	2015	1058	702	1760	900	0
W	2016	1321	266	1587	1184	0
W	2017	2667	0	2667	1771	0
W	2018	1898	0	1898	1391	0
W	2019	1411	0	1411	1279	0
W	2020	549	2	551	497	0
W	2021	1170	0	1170	525	0

66.2 recreational fisheries

Table 333: Data collected annually from the recreational fisheries in California.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2003	0	41	41	0	0
C	2004	1	919	920	0	0
C	2005	0	881	881	0	0
C	2006	0	2001	2001	0	0

Table 333: Data collected annually from the recreational fisheries in California. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
C	2007	0	4780	4780	0	0
C	2008	0	2032	2032	0	0
C	2009	0	3534	3534	0	0
C	2010	0	2192	2192	0	0
C	2011	0	4718	4718	0	0
C	2012	2	5641	5643	0	0
C	2013	0	6753	6753	0	0
C	2014	0	6354	6354	0	0
C	2015	0	6980	6980	0	0
C	2016	0	2738	2738	0	0
C	2017	0	3209	3209	0	0
C	2018	0	3374	3374	0	96
C	2019	0	4125	4125	0	121
C	2020	0	3	3	0	0
C	2021	0	3347	3347	0	0

Table 334: Data collected annually from the recreational fisheries in Oregon.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	1999	326	0	326	0	0
O	2000	192	0	192	0	0
O	2001	12	692	704	0	12
O	2002	0	1457	1457	0	0
O	2003	0	1740	1740	0	0
O	2004	1	1394	1395	0	0
O	2005	0	1916	1916	0	0
O	2006	0	1585	1585	0	0
O	2007	0	1721	1721	0	0
O	2008	0	2043	2043	0	0
O	2009	0	2678	2678	0	0
O	2010	0	2462	2462	0	0
O	2011	0	2318	2318	0	0
O	2012	1	2753	2754	0	0
O	2013	0	2182	2182	0	0
O	2014	0	1936	1936	0	0
O	2015	0	2018	2018	0	0

Table 334: Data collected annually from the recreational fisheries in Oregon. (*continued*)

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
O	2016	0	870	870	0	0
O	2017	0	1347	1347	0	0
O	2018	0	2607	2607	0	0
O	2019	0	2866	2866	0	0
O	2020	0	129	129	0	0
O	2021	0	2389	2389	0	0

Table 335: Data collected annually from the recreational fisheries in Washington.

State	Year	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
W	2002	172	22	194	0	0
W	2003	745	55	800	0	0
W	2004	606	69	675	0	0
W	2005	719	150	869	0	0
W	2006	274	88	362	18	0
W	2007	235	78	313	0	0
W	2008	118	71	189	0	0
W	2009	329	135	464	6	1
W	2010	148	70	218	17	0
W	2011	55	336	391	15	0
W	2012	92	136	228	0	0
W	2013	234	122	356	0	4
W	2014	533	147	680	533	0
W	2015	624	59	683	624	0
W	2016	836	92	928	836	0
W	2017	1152	176	1328	1150	2
W	2018	652	256	908	641	4
W	2019	1311	489	1800	1306	5
W	2020	883	8	891	629	253
W	2021	738	10	748	0	738

66.3 NWFSC WCGBT

Table 336: Data collected annually from the NWFSC WCGBT survey.

Year	Positive Tows	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2003	35	815	34	849	275	0
2004	26	626	0	626	187	1
2005	45	1047	0	1047	348	2
2006	35	386	0	386	169	0
2007	45	946	12	958	277	2
2008	37	682	8	690	355	0
2009	40	457	0	457	333	0
2010	46	1130	1	1131	486	432
2011	48	788	0	788	469	0
2012	46	906	1	907	354	0
2013	30	407	0	407	177	0
2014	55	1527	1	1528	651	1
2015	59	820	0	820	541	1
2016	80	2261	0	2261	571	837
2017	71	1701	0	1701	0	724
2018	61	916	0	916	0	628
2019	32	568	0	568	0	345
2021	35	493	0	493	0	383

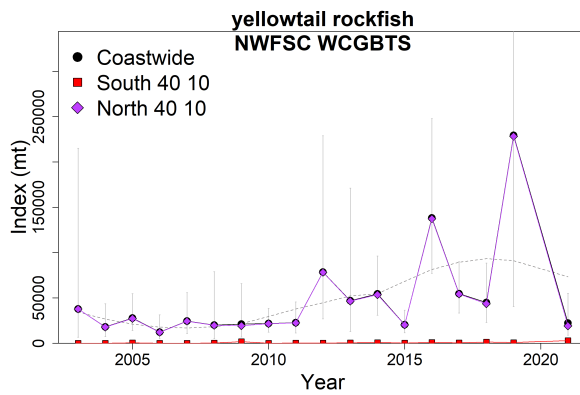


Figure 93: Index of abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red, purple, or blue). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

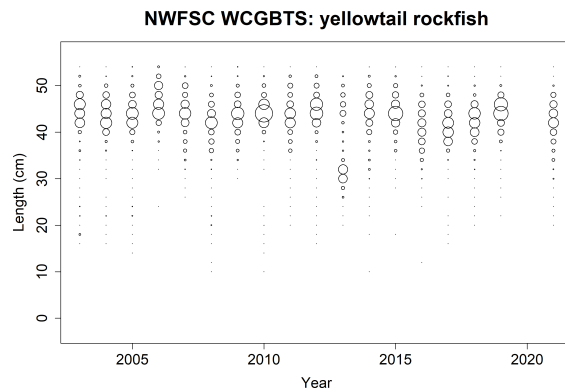


Figure 94: Length (cm) composition data from the NWFSC WCGBT survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

66.4 NWFSC HKL

Table 337: Data collected annually from the NWFSC HKL survey.

Year	Positive Sites	Sexed Fish	Unsexed Fish	Lengths	Ages	Unread Otoliths
2004	14	126	0	126	124	0
2005	14	107	15	122	0	122
2006	6	88	0	88	0	88
2007	18	119	0	119	0	119
2008	15	139	0	139	0	139
2009	16	79	1	80	0	80
2010	12	60	0	60	0	0
2011	13	78	48	126	0	1
2012	11	106	0	106	0	106
2013	13	93	3	96	0	95
2014	17	105	5	110	0	110
2015	13	78	0	78	0	78
2016	14	87	2	89	0	87
2017	12	46	0	46	0	40
2018	12	76	1	77	0	66
2019	13	67	2	69	0	61
2021	11	92	0	92	0	91

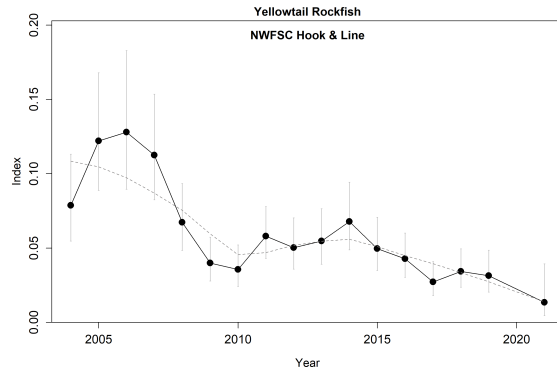


Figure 95: Index of abundance from the NWFSC HKL survey from 2003-2021 (excluding 2020). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.

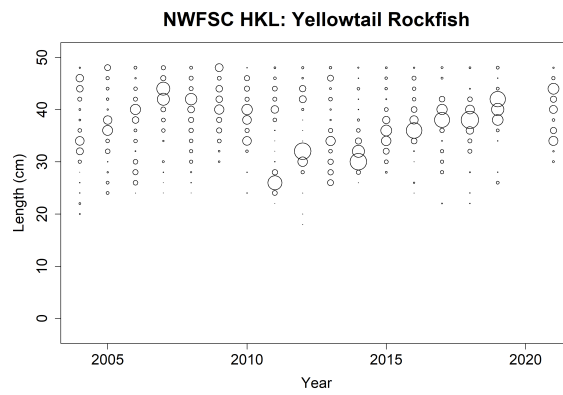


Figure 96: Length (cm) composition data from the NWFSC HKL survey. Size of the circles within a year indicate higher (larger circles) and lower (smaller circles) proportion observed by length bin.

67 Maturity data

Maturity samples for a wide range of West Coast groundfish species have been across a range of sources: NWFSC WCGBT survey, NWFSC HKL survey, Pacific hake survey, at-sea sampling of the Pacific hake fishery, and port sampling in Oregon and Washington. Samples have been collected between 2009 - 2019. A summary of maturity samples collected and read maturity samples by species is provided below.

The following summary does not include collection from the 2021 NWFSC WCGBT or HKL surveys. Additionally, the data summary has not been updated to reflect maturity reading efforts conducted in 2021 (e.g., Dover sole, copper rockfish).

Table 338: Summary of collected and read maturity samples by species.

Species	Total Collected	Total Read
Arrowtooth flounder	217	0
Aurora rockfish	567	567
Bank rockfish	432	62
Big skate	180	180
Black rockfish	599	599
Blackgill rockfish	126	126
Blue rockfish	155	0
Bocaccio	837	737
Brown rockfish	12	0
Canary rockfish	1179	1169
Chilipepper rockfish	157	157
Copper rockfish	160	49
Cowcod	217	102
Darkblotched rockfish	898	898
Deacon rockfish	23	0
Dover sole	573	106
Greenspotted rockfish	175	175
Greenstriped rockfish	73	73
Kelp greenling	8	8
Lingcod	1325	760
Longnose skate	508	508
Longspine thornyhead	31	0

Table 338: Summary of collected and read maturity samples by species. *(continued)*

Species	Total Collected	Total Read
Mexico rockfish	1	1
Olive rockfish	1	1
Pacific cod	51	0
Pacific hake	3914	2947
Pacific ocean perch	583	583
Petrable sole	545	394
Rosy rockfish	59	39
Rougheye rockfish	90	86
Sablefish	978	876
Shortspine thornyhead	1350	591
Speckled rockfish	401	301
Squarespot rockfish	118	118
Stripetail rockfish	67	67
Swordspine rockfish	89	89
Vermilion and sunset rockfish	1481	1139
Widow rockfish	306	50
Yelloweye rockfish	221	97
Yellowtail rockfish	726	468

68 Acknowledgement

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