

Appendix 4:

Sources of Abundance Information

For 65 Unassessed Stocks of West Coast Groundfish

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<u>Common Name</u>	<u>Pages</u>	<u>Scientific Name</u>	<u>Pages</u>
Aurora rockfish	17	<i>Antimora microlepis</i>	59
Bank rockfish	18	<i>Caulolatilus princeps</i>	61
Big skate	56	<i>Citharichthys sordidus</i>	52
Black and yellow rockfish	20	<i>Coryphaenoides acrolepis</i>	58
Black rockfish	19	<i>Coryphaenoides spp.</i>	58
Blackgill rockfish	21	<i>Gadus macrocephalus</i>	63
Bocaccio	22	<i>Galeorhinus zyopterus</i>	16
Bronzespotted rockfish	16	<i>Glyptocephalus zachirus</i>	53
Brown rockfish	16, 23	<i>Hexagrammos decagrammus</i>	16, 63
Butter sole	62	<i>Hippoglossoides elassodon</i>	62
Calico rockfish	24	<i>Hydrolagus colliei</i>	57
California skate	59	<i>Isopsetta isolepis</i>	62
Chameleon rockfish	16	<i>Lepidopsetta bilineata</i>	54
China rockfish	25	<i>Pleuronichthys decurrens</i>	51
Copper rockfish	26	<i>Psettiichthys melanostictus</i>	55
Cowcod	27	<i>Raja binoculata</i>	56
Curlfin sole	51	<i>Raja inornata</i>	59
Dusky rockfish	16	<i>Sebastes aleutianus</i>	39
Finescale codling	59	<i>Sebastes atrovirens</i>	31
Flag rockfish	28	<i>Sebastes auriculatus</i>	16, 23
Flathead sole	62	<i>Sebastes aurora</i>	17
Freckled rockfish	16	<i>Sebastes babcocki</i>	35
Grass rockfish	16, 60	<i>Sebastes borealis</i>	41
Greenblotched rockfish	29	<i>Sebastes brevispinis</i>	61
Halfbanded rockfish	30	<i>Sebastes caurinus</i>	26
Harlequin rockfish	16	<i>Sebastes chrysomelas</i>	20
Honeycomb rockfish	60	<i>Sebastes ciliatus</i>	16
Kelp greenling	16, 63	<i>Sebastes constellatus</i>	44
Kelp rockfish	31	<i>Sebastes crocotulus</i>	48
Leopard shark	63	<i>Sebastes dallii</i>	24
Mexican rockfish	60	<i>Sebastes ensifer</i>	46
Olive rockfish	32	<i>Sebastes eos</i>	60
Pacific cod	63	<i>Sebastes flavidus</i>	50
Pacific flatnose	59	<i>Sebastes gilli</i>	16
Pacific grenadier	58	<i>Sebastes helvomaculatus</i>	37
Pacific rattail	58	<i>Sebastes hopkinsi</i>	43
Pacific sanddab	52	<i>Sebastes lentiginosus</i>	16
Pink rockfish	60	<i>Sebastes levis</i>	27
Pinkrose rockfish	16	<i>Sebastes macdonaldi</i>	60
Pygmy rockfish	33	<i>Sebastes maliger</i>	34
Quillback rockfish	34	<i>Sebastes melanops</i>	19
Ratfish	57	<i>Sebastes melanostomus</i>	21
Redbanded rockfish	35	<i>Sebastes miniatus</i>	48
Redstripe rockfish	36	<i>Sebastes nebulosus</i>	25
Rex sole	53	<i>Sebastes nigrocinctus</i>	61
Rock sole	54	<i>Sebastes ovalis</i>	42
Rosethorn rockfish	37	<i>Sebastes paucispinis</i>	22
Rosy rockfish	38	<i>Sebastes phillipsi</i>	16
Rougheye rockfish	39	<i>Sebastes proriger</i>	36
Sand sole	55	<i>Sebastes rastrelliger</i>	16, 60
Sharpchin rockfish	40	<i>Sebastes reedi</i>	49
Shortraker rockfish	41	<i>Sebastes rosaceus</i>	38
Silvergray rockfish	61	<i>Sebastes rosenblatti</i>	29
Soupin shark	16	<i>Sebastes rubrivinctus</i>	28
Speckled rockfish	42	<i>Sebastes rufus</i>	18
Squarespot rockfish	43	<i>Sebastes saxicola</i>	45
Starry rockfish	44	<i>Sebastes semicinctus</i>	30
Stripetail rockfish	45	<i>Sebastes serranoides</i>	32
Sunset rockfish	48	<i>Sebastes serriceps</i>	47
Swordspine rockfish	46	<i>Sebastes simulator</i>	16
Tiger rockfish	61	<i>Sebastes umbrosus</i>	60
Treefish	47	<i>Sebastes variegatus</i>	16
Vermilion rockfish	48	<i>Sebastes wilsoni</i>	33
Yellowmouth rockfish	49	<i>Sebastes zacentrus</i>	40
Yellowtail rockfish	50	<i>Triakis semifasciata</i>	63

Abstract

This report documents time series of data on abundance of 65 species or stocks of unassessed west coast groundfish managed by the Pacific Fishery Management Council. These data are derived mainly from various fishery-independent bottom trawl surveys conducted since 1977, and various recreational fishery monitoring programs conducted since 1975. By supplementing Depletion-Based Stock Reduction Analyses (previously used for estimation of overfishing limits) with these data on abundance trends, it should be possible to elevate a substantial number of these data-limited stocks to the status of “assessed.”

1. Introduction

Of the approximately 90 species or stocks of west coast groundfish managed by the Pacific Fishery Management Council (PFMC), about 60 remain unassessed. In order to provide the PFMC with a basis for setting Annual Catch Limits, Dick and MacCall (2011a,b) were able to calculate overfishing levels for most of these unassessed stocks using a method they called Depletion-Based Stock Reduction Analysis (DB-SRA). By supplementing DB-SRA with data on trends in abundance, it may be possible to upgrade the status of these analyses, thus providing minimal assessments for many of these stocks. This summary describes and quantifies most of the available sources of historical abundance information, and allows an initial evaluation of the feasibility of conducting DB-SRA assessments.

The sources of information considered in this document are summarized in the following table:

Name	Gear	Spatial Resolution	Time Span
Triennial Shelf Survey	Bottom Trawl	Site	1977-2004
Slope Survey	Bottom Trawl	Site	1984-2001
Combo Survey	Bottom Trawl	Site	1998-2010
RecFIN Monitoring	Hook and Line	County	1980-2003
Southern California Partyboat Observers	Hook and Line	Block	1975-78, 86-89
Northern California Partyboat Observers	Hook and Line	Site	1987-1998

There are additional sources of information that may potentially be useful. The Northwest Fisheries Science center has conducted a hook and line survey since 2004 in Southern California for most of the past decade (described by Harms et al. 2010). The California Cooperative Oceanic Fisheries Investigations ichthyoplankton surveys have been conducted in Southern and Central California waters since 1950, and provide abundance information on some species. In Southern California, entrainment estimates by electrical generating stations, and trawl surveys by some sanitation districts may in some cases provide useful time series of information on relative abundance.

2. Sources

We describe the principal surveys and fishery monitoring programs that are of greatest general utility, summarizing them by the number of positive samples for each year. Geographic and temporal coverage, and sample sizes vary substantially, but surveys covering multidecadal time spans are potentially the most informative. Some of the earlier surveys did not identify all relevant species, in which case no positive samples appear in the individual species summaries for those years. The data have been summarized by major west coast fishery management regions: North is Cape Mendocino to Cape Flattery, Central is Pt. Conception to Cape Mendocino, and South is the Mexican border to Pt. Conception. Pt. Conception is defined as 34.55 N Lat (decimal), and Cape Mendocino is defined as 40.167 N Lat (decimal).

3.1 Scientific Surveys

3.1.1 Triennial Shelf Survey

The Triennial Shelf Survey (or “Triennial”) conducted by the AFSC and NWFSC utilized chartered commercial trawlers to survey North and Central area waters from 1977 to 2004. Coverage of these areas varied substantially among survey years by latitude (Table 1) and by depth (Figure 1). Years 1980, 1983 and 1986 ended near Monterey and did not extend to Pt. Conception (Lat 34.55N).

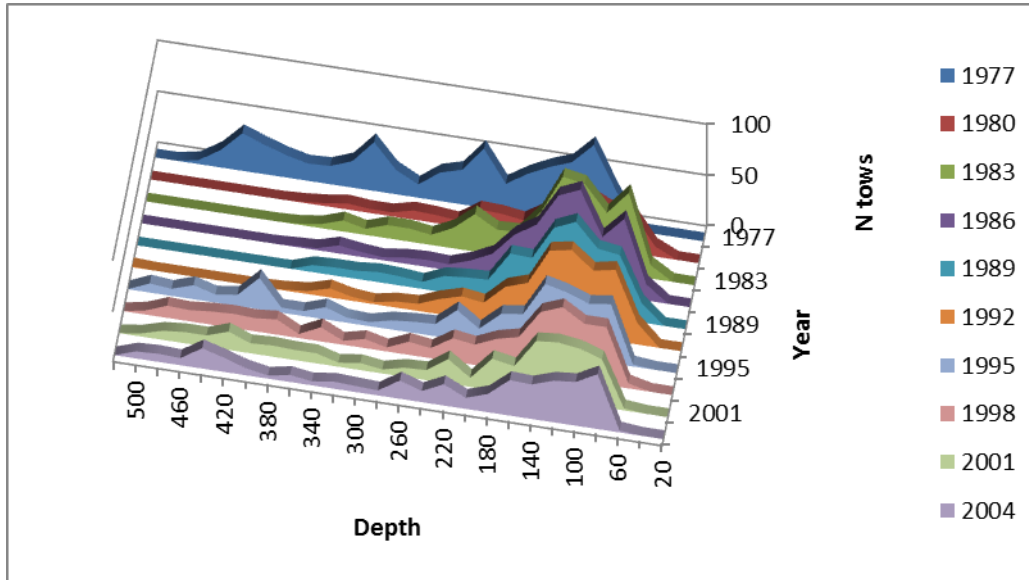


Figure 1. Frequency of Triennial Survey samples by depth (fathoms) and year.

Table 1. Number of trawl hauls conducted by the Triennial Survey.

Year	North	Central
1977	342	323
1980	485	74
1983	468	69
1986	444	71
1989	359	155
1992	356	131
1995	348	151
1998	340	157
2001	290	143
2004	256	127

3.1.2 Slope Survey

The slope survey was conducted irregularly from 1984 to 2001 by the AFSC, but only provides comprehensive coverage of depths and latitudes (Northern and Central Regions) beginning in 1997 (Table 2). The earlier years consisted of local studies (Figure 2). There was an increased sampling of deeper waters (values in fathoms) later in the time series (Figure 3). Earlier years also had an incomplete listing of taxa.

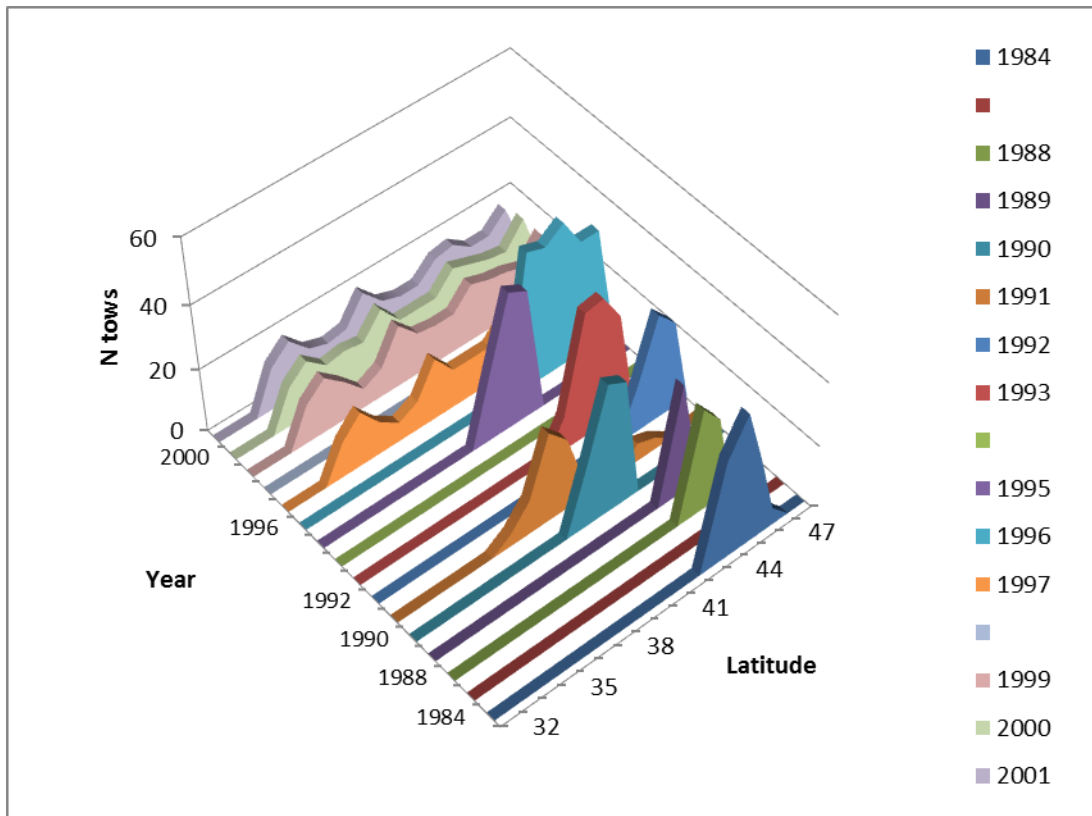


Figure 2. Latitudinal coverage of the Slope Surveys.

Table 2. Number of trawl hauls conducted by the Slope Survey.

Year	North	Central	Year	North	Central
1984	109		1995	105	
1988	61		1996	204	
1989	46		1997	107	73
1990	101		1999	124	76
1991	37	52	2000	120	86
1992	78		2001	115	84
1993	124				

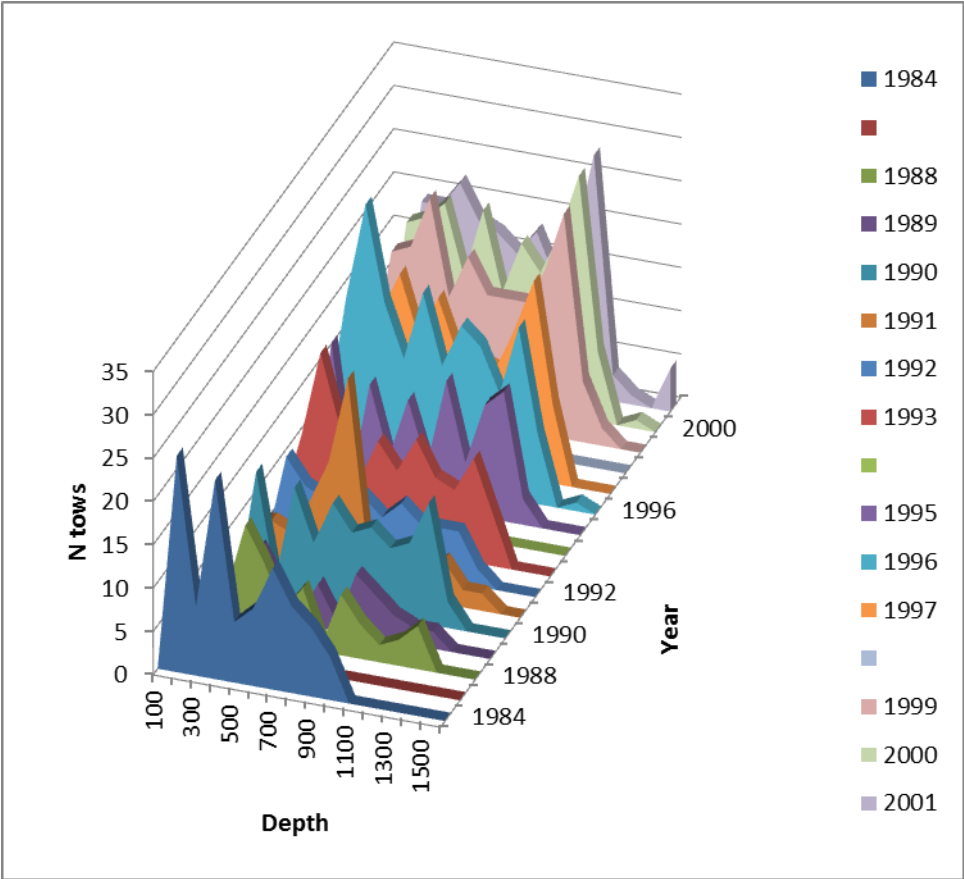


Figure 3. Distributions of depths in the Slope Surveys.

3.1.3 Combo Survey

The West Coast Shelf/Slope Bottom Trawl Surveys (a.k.a, Combo Surveys) were initiated by the NWFSC as a successor to the Slope and Triennial Shelf Surveys that had been inherited from the AFSC (Bradburn et al., 2011). The Combo Surveys achieved a broad and consistent coverage of latitudes and depths (Table 3), and included waters south of Pt. Conception beginning in 2002. The list of identified taxa in 1998 was incomplete.

Table 3. Number of tows by the Combo Survey, by year and latitude. Latitude groups compare approximately to North, Central and Southern Regions.

Lat\Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
50													
49	4		6	3	4	39	22	19	18	24	18	21	22
48	16	23	20	24	20	53	28	36	37	45	45	40	47
47	18	30	18	22	23	39	30	42	33	54	41	40	51
46	25	28	25	31	26	38	41	55	61	62	55	60	52
45	27	28	29	26	30	32	49	66	61	69	68	58	61
44	26	25	26	25	29	26	25	44	51	40	33	43	34
43	24	28	28	24	30	46	27	33	32	38	37	30	34
42	23	30	20	24	29	43	19	38	28	36	36	47	48
41	24	11	29	28	26	31	17	25	28	27	28	28	34
40	25	23	29	27	27	26	18	28	29	15	31	20	26
39	21	30	26	17	29	21	28	27	30	30	30	28	30
38	17	21	18	21	20	19	23	24	32	21	34	45	35
37	24	20	20	26	29	14	15	18	19	22	29	12	24
36	24	26	34	23	29	22	25	42	36	58	52	59	58
35	3	1		12	26	50	52	59	61	57	54	73	66
34					38	28	39	55	66	59	66	56	57
33					10	13	13	24	20	29	22	22	33
32													
40-50	161	162	176	178	263	267	249	340	349	354	382	390	411
36-39	102	109	108	106	115	142	142	198	205	209	193	191	181
32-35	38	53	44	49	47	131	80	97	88	123	104	101	120
total	301	324	328	333	425	540	471	635	642	686	679	682	712

3.2 Recreational Fishery Sampling

3.2.1 Partyboat Trips

The RecFIN database contains data for recreational trips sampled by the MRFSS program beginning in 1980. For most purposes, the most useful samples come from partyboat (a.k.a. “commercial passenger fishing vessels” or CPFVs) trips. The sampling program was conducted in four regions: Washington, Oregon, and north and south of Pt. Conception California. The Washington samples are of little use and are not considered here. The North Region reported here consists of combined samples taken in Oregon and in California north of Cape Mendocino. The Central Region is represented by the remainder of Northern California samples, covering the coast from Pt. Conception to Cape Mendocino (Central Region partyboat data from years 1997 and 1998 are anomalous and have been deleted for the present purpose). Sampling was conducted by two-month “wave” and by county (Tables 4-9). Although recreational fishery sampling is ongoing, the data reported here extend only through 2003 after which the catch rates were severely impacted by restrictive bag limits and area closures. For the present purpose, the unit of sampling is a completed trip (which may have visited multiple fishing sites), and describes the combined catches by all of the sampled fishermen on that trip.

Although the trip-level data used here are based on sample data downloaded from RecFIN (<http://www.recfin.org/>), these trip-level summaries are not easily reconstructed from that source, and required substantial manipulation of the query results. Sample data from Northern California and Oregon have been examined and edited for problematic entries, and are available from CALCOM (URL 128.114.3.187). Southern California data have yet to be “cleaned-up”, but a spreadsheet database can be obtained by request to the senior author (Alec.MacCall@noaa.gov).

3.2.2 On-board Observers

The State of California conducted on-board partyboat sampling in the Southern and Central Regions. Large numbers of Southern California partyboat trips were sampled during 1975-1978, and again during 1986-1989 (sample sizes for individual species are for each four-year period combined). These data are available from the California Department of Fish and Game, but pose some difficulties in defining equivalencies, including locations for the two time periods. The Central Region was sampled from 1987 to 1998, with detailed identification of individual fishing sites, and the data (available from the California Department of Fish and Game) are relatively easy to work with. Because the Central California data are identified by fishing site, there is no convenient general summary statistic for sample size, but the species tables report numbers of fish observed by species.

Table 4. Number of partyboat trips sampled in Northern Region (Northern California and Oregon) by two-month wave.

Year\Wave	1	2	3	4	5	6	Total
1980	15	15		4	24	4	62
1981	7	7		1	21	5	41
1982	7	10	12	1	19	7	56
1983	1	14	23			2	40
1984	4	11	57	2	22	2	98
1985	4	5	38		22	6	75
1986	1	9	45		17	2	74
1987	5	7	19	2	15	10	58
1988	11	27	37		25	5	105
1989	10	21	21	1	46	3	102
1993	11	26	74		31	13	155
1994		58	132	1	54		245
1995		24	71	16	46	6	163
1996	12	22	48	14	39	8	143
1997	7	23	33	75	31	8	177
1998	2	18	64	62	37	2	185
1999	4	21	54	67	49	2	197
2000	8	16	27	20	15	10	96
2001	4	9	24	38	9	12	96
2002	6	19	26	31	23	5	110
2003	6	10	4	34			54
Total	125	372	809	374	545	112	2332

Table 5. Number of partyboat trips sampled in Northern Region (Northern California and Oregon) by county, listed north to south.

Year\County	Clatsop, OR	Tillamook, OR	Lincoln, OR	Lane, OR	Douglas, OR	Coos, OR	Curry, OR	Del Norte, CA	Humboldt, CA	Total
1980		5	45			5	7			62
1981		1	37			2		1		41
1982		4	47			2	2		1	56
1983		6	30				4			40
1984	4	19	34		16	21	4			98
1985	2	13	30		5	17	6	2		75
1986	7	12	26	1	6	15	7			74
1987		8	40			4	4	1	1	58
1988		10	70		6	9	6	3	1	105
1989		1	77		1	11	11		1	102
1993	1	11	117		2	16	8			155
1994	1	36	145	1	2	38	22			245
1995	3	13	79			29	30	4	5	163
1996	6	11	78		1	18	16	2	11	143
1997	3	24	100			25	25			177
1998	5	30	99		3	23	25			185
1999	6	34	114			19	22		2	197
2000	1	27	54		1	4	9			96
2001	7	20	43			8	5	1	12	96
2002	5	13	75		2	9	6			110
2003		1	12		2		3	9	27	54
Total	51	299	1352	2	47	275	222	23	66	2332

Table 6. Number of partyboat trips sampled in Central Region (Pt. Conception to Cape Mendocino) by two-month wave.

Year\Wave	1	2	3	4	5	6	Total
1980	26	17	30	27	31	23	154
1981	7	11	18	16	20	10	82
1982	19	11	31	21	23	6	111
1983	2	8	29	24	18	9	90
1984	38	20	43	48	56	32	237
1985	67	56	80	88	66	41	398
1986		43	58	71	68	33	273
1987	29	19	53	63	67	19	250
1988	17	31	10	72	16	21	167
1989				71	22	31	124
1993	1			1	6	6	14
1994	3	7	1	2	6	1	20
1995		14	23	59		2	98
1996	21	60	89	104	96	19	389
1997	1	14	14	71	44	46	190
1998							
1999							
2000	4	4	22	43	25	14	112
2001	8	10	34	96	50	6	204
2002	47	34	68	247	55	4	455
2003	17	28	62	266	153	37	563
Total	307	387	665	1390	822	360	3931

Table 7. Number of partyboat trips sampled in Central Region (Pt. Conception to Cape Mendocino) by county, listed north to south.

Year\County	Mendocino	Sonoma	Marin	San Francisco	Alameda	Contra Costa	San Joaquin	San Mateo	Santa Cruz	Monterey	San Luis Obispo	Total
1980	8	11	6					15	1	86	27	154
1981	7	11	8	2	1			14	2	23	14	82
1982	30	7	4		1		1	17	7	37	7	111
1983	14	4	3					9	12	41	7	90
1984	21	24	7		6			8	25	89	57	237
1985	25	43	9		13	5		45	36	129	93	398
1986	14	17	7			10		20	35	91	79	273
1987	5	53	15		43	28		22		30	54	250
1988	1	31	9	2	16			26	22	38	22	167
1989	10		18		2	17		29	25	4	19	124
1993											14	14
1994											20	20
1995	21	5	9					8	5	24	26	98
1996	16	91	7		24			68	44	65	74	389
1997		42			12	6		23	15	34	58	190
1998												
1999												
2000	7	10	16	1	7			18	19	6	28	112
2001	11	23	20	20	24			44	40	10	12	204
2002	41	46	20	50	80			67	55	32	64	455
2003	39	79	20	14	63			97	60	82	109	563
Total	270	497	178	89	292	66	1	530	403	821	784	3931

Table 8. Number of partyboat trips sampled in Southern Region, by two-month wave.

Year\Wave	1	2	3	4	5	6	Total
1980	12	25	22	26	24	14	123
1981	25	17	33	24	27	29	155
1982	18	28	45	60	32	22	205
1983	35	46	44	52	41	48	266
1984	52	33	41	53	47	38	264
1985	49	43	50	46	31	33	252
1986	36	48	49	55	37	35	260
1987	8	20	25	30	16	16	115
1988	19	11	22	23	15	12	102
1989			23	30	26	13	92
1993	285	300	442	631	393	344	2395
1994	234	202	450	544	429	188	2047
1995		22	46	49	52	28	197
1996	31	20	71	62	61	39	284
1997	16	18	41	48	47	22	192
1998	38	50	84	84	68	73	397
1999	57	79	117	132	190	136	711
2000	72	90	87	58	66	73	446
2001	50	89	88	77	33	35	372
2002	83	116	102	126	111	72	610
2003	111	119	153	159	136	110	788
Total	1231	1376	2035	2369	1882	1380	10273

Table 9. Number of partyboat trips sampled in Southern Region by county, listed north to south.

Year\County	Santa Barbara	Ventura	Los Angeles	Orange	San Diego	Total
1980	20	19	18	25	41	123
1981	22	16	28	45	44	155
1982	15	19	48	62	61	205
1983	18	26	78	73	71	266
1984	18	28	83	74	61	264
1985	17	28	71	64	72	252
1986	19	28	81	65	67	260
1987	5	3	53	34	20	115
1988	5	8	32	33	24	102
1989	1	14	36	12	29	92
1993	203	304	756	479	653	2395
1994	108	383	507	314	735	2047
1995	14	42	50	32	59	197
1996	10	59	75	75	65	284
1997	2	31	64	39	56	192
1998	16	60	122	52	147	397
1999	22	97	251	96	245	711
2000	11	36	159	62	178	446
2001	12	42	119	80	119	372
2002	14	80	217	108	191	610
2003	16	86	281	142	263	788
Total	568	1409	3129	1966	3201	10273

3. Relative Abundance

The survey and monitoring data require a substantial amount of processing to be useful for stock assessment. Often, filtering the data based on co-occurring species, depth, location, or other consistent habitat attributes (e.g., by the logistic regression method of Stephens and MacCall 2004) allows identification of an appropriate subset of the data for the target species. Although swept-area estimates of abundance are possible and have been produced for some of these trawl surveys, a common statistical approach to developing indexes of relative abundance is to employ a General Linear Model (GLM) with factors such as year, location and season (Maunder and Punt 2004). For sparse data (i.e., containing frequent zeroes), it may be useful to use a delta-GLM approach, where a log-linear model is used for the abundance at positive stations, and a joint logistic (or similar) regression is used to describe the probability of a positive observation. In either case, the values of the “year” effects are a

basis for the desired annual indexes, provided interaction terms involving “year” can be ignored. Importantly for the less common species, the data may be too sparse to estimate index values for individual years in which case it may be appropriate to aggregate the abundance data into time-blocks of years.

4. Additional information

Only partyboat-based sampling is included in these summaries, but other sampled segments of the recreational fisheries such as private boats may be useful in some cases such as brown and grass rockfish and kelp greenling. CalCOFI ichthyoplankton surveys may be useful for Mexican rockfish and for several species of flatfishes. For some deep water Southern California rockfishes such as bronzedspotted and pink it may be possible to develop an absolute estimate of abundance in recent years based on sightings in submersible surveys conducted for cowcod (Yoklavich et al. 2007). No useful source of information was found for soupfin shark. Dusky rockfish are exceeding rare on the US West Coast which is at the southern end of the species’ range, and do not merit consideration. No useful information was found for four small species of rockfishes (chameleon, freckled, harlequin and pinkrose) that are seldom encountered or retained, and may be difficult to identify.

5. References

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6. Acknowledgement

This work was partially supported by the National Marine Fisheries Service “Expand Annual Stock Assessments” program.

7. Tables of positive occurrences (pages 17-63)

Common Name
Aurora rockfish

Scientific Name
Sebastes aurora

Region Source Year	Cape Mendocino			Point Conception			
	Triennial	North Slope	Combo	Triennial	Central Slope	Combo	South Combo
1975							
1976							
1977	28			73			
1978							
1979							
1980	0			1			
1981							
1982							
1983	4			0			
1984		14					
1985							
1986	0			1			
1987							
1988		13					
1989	0	8		0			
1990		19					
1991		2					
1992	1	7		0			
1993		23					
1994							
1995	45	19		44			
1996		30					
1997		14			22		
1998	46			42			
1999		20	25		24	42	
2000		16	25		20	30	
2001	42	17	44	40	19	33	
2002			41			42	15
2003			26			26	14
2004	34		21	29		22	12
2005			33			34	22
2006			38			27	22
2007			45			28	21
2008			42			45	31
2009			38			38	12
2010			28			41	23

Common Name
Bank rockfish

Scientific Name
Sebastes rufus

Region Source Year	Cape Mendocino		Point Conception				Observer	
	North Triennial	Combo	Triennial	Central Slope	Combo	Combo		South RecFIN
1975								93
1976								*
1977	1		57					*
1978								*
1979								
1980	2		7				9	
1981							9	
1982							4	
1983	3		6				11	
1984							12	
1985							12	
1986	4		2				2	88
1987							0	*
1988							0	*
1989	1		6				3	*
1990								
1991								
1992	1		10					
1993							6	
1994							31	
1995	4		29				1	
1996							10	
1997				1			4	
1998	1		8				6	
1999		1		4	14		13	
2000		0		3	9		2	
2001	2	1	16	1	3		2	
2002		2			4	0	2	
2003		3			0	1	4	
2004	14	0	0		5	3		
2005		0			3	8		
2006		1			4	6		
2007		2			4	9		
2008		3			10	4		
2009		1			4	7		
2010		1			6	6		

Common Name

Black rockfish

Scientific Name*Sebastes melanops*

Region Source Year	Central	
	RecFIN	Observer (fish)
1975		
1976		
1977		
1978		
1979		
1980	12	
1981	11	
1982	11	
1983	7	
1984	20	
1985	44	
1986	18	
1987	32	55
1988	14	727
1989	11	736
1990		220
1991		326
1992		366
1993	2	660
1994	1	996
1995	18	586
1996	52	706
1997	44	1235
1998		329
1999		
2000	14	
2001	39	
2002	95	
2003	174	

Common Name

Black and yellow rockfish

Scientific Name*Sebastes chrysomelas*

Point Conception

Region Data Source Year	Central		South
	RecFIN	Observer (fish)	Observer (trips)
1975			40
1976			*
1977			*
1978			*
1979			
1980	2		
1981	1		
1982	0		
1983	0		
1984	1		
1985	5		
1986	2		71
1987	4	4	*
1988	0	26	*
1989	1	10	*
1990		0	
1991		9	
1992		12	
1993	1	9	
1994	1	8	
1995	5	9	
1996	2	10	
1997		8	
1998		18	
1999	6		
2000	6		
2001	7		
2002	10		
2003	19		

Common Name
Blackgill rockfish

Scientific Name
Sebastes melanostomus

Region Source Year	Cape Mendocino		Point Conception	
	North Combo	Slope	Central Combo	South Combo
1997		12		
1998				
1999	2	13	24	
2000	3	12	23	
2001	6	14	19	
2002	4		24	8
2003	3		14	5
2004	6		9	5
2005	4		13	11
2006	4		15	16
2007	3		14	13
2008	9		17	18
2009	3		24	13
2010	3		22	20

Common Name

Bocaccio

Scientific Name

Sebastes paucispinis

Region	North			
Source Year	Triennial	Slope	Combo	RecFIN
1975				
1976				
1977	50			
1978				
1979				
1980	70			3
1981				1
1982				4
1983	91			1
1984		8		8
1985				6
1986	180			1
1987				2
1988				3
1989	31	3		1
1990		3		
1991		1		
1992	17			
1993		2		11
1994				4
1995	11	3		3
1996		3		2
1997		1		2
1998	14			4
1999		2	2	8
2000		1	0	5
2001	10	2	0	2
2002			1	1
2003			9	1
2004	32		0	
2005			5	
2006			4	
2007			5	
2008			5	
2009			0	
2010			1	

Common Name

Brown rockfish

Scientific Name*Sebastes auriculatus*

Cape Mendocino

Region Source Year	Central		Observer (fish)	South	
	Combo	RecFIN		RecFIN	Observer (trips)
1975					199
1976					*
1977					*
1978					*
1979					
1980		17		7	
1981		12		12	
1982		4		14	
1983		8		27	
1984		31		26	
1985		52		19	
1986		27		13	414
1987		27	9	3	*
1988		35	583	10	*
1989		22	641	13	*
1990			210		
1991			365		
1992			323		
1993		4	282	8	
1994		5	321	23	
1995		4	544	11	
1996		55	412	22	
1997				4	
1998				16	
1999		53		33	
2000		18		19	
2001		43		24	
2002		80		36	
2003	5	128		28	
2004	6				
2005	4				
2006	4				
2007	1				
2008	1				
2009	2				
2010	3				

Common Name

Calico rockfish

Scientific Name*Sebastes dallii*

Region Source Year	South		Observer (trips)
	Combo	RecFIN	
1975			151
1976			*
1977			*
1978			*
1979			
1980		2	
1981		8	
1982		2	
1983		7	
1984		5	
1985		18	
1986		17	468
1987		1	*
1988		5	*
1989		6	*
1990			
1991			
1992			
1993		8	
1994		8	
1995		6	
1996		6	
1997		2	
1998		11	
1999		23	
2000		4	
2001		1	
2002		2	
2003	2	2	
2004	5		
2005	7		
2006	7		
2007	9		
2008	3		
2009	6		
2010	3		

Common Name
China rockfish

Scientific Name
Sebastes nebulosus

Cape Mendocino			
Region	North	Central	
Source	RecFIN	RecFIN	Observer
Year			(trips)
1975			
1976			
1977			
1978			
1979			
1980	10	18	
1981	15	8	
1982	9	10	
1983	7	9	
1984	14	9	
1985	19	29	
1986	7	30	
1987	15	34	34
1988	23	18	375
1989	26	27	288
1990			115
1991			111
1992			123
1993	42	3	180
1994	35	5	207
1995	28	25	132
1996	28	57	220
1997	42		149
1998	37		96
1999	52	46	
2000	25	19	
2001	16	34	
2002	22	73	
2003	5	110	

Common Name
Copper (or Whitebelly) rockfish

Scientific Name
Sebastes caurinus

Region Source Year	Cape Mendocino				Point Conception			
	North RecFIN	Triennial	Combo	Central RecFIN	Observer (fish)	Combo	South RecFIN	Observer (trips)
1975								154
1976								*
1977		2						*
1978								*
1979								
1980	2	1		32			20	
1981	1			28			19	
1982	0			31			23	
1983	1	4		27			14	
1984	4			40			25	
1985	3			53			28	
1986	4	1		61			18	501
1987	4			20	39		5	*
1988	3			21	498		12	*
1989	12	13		45	713		29	*
1990					300			
1991					208			
1992		5			681			
1993	14			11	803		29	
1994	19			14	470		29	
1995	4	5		20	443		10	
1996	9			106	388		35	
1997	30				396		6	
1998	30	4			221		29	
1999	45			81			76	
2000	20			18			39	
2001	14	2		32			19	
2002	13			39			30	
2003	5		3	62		5	37	
2004		0	4			1		
2005			2			1		
2006			2			1		
2007			0			4		
2008			6			5		
2009			5			2		
2010			5			4		

Common Name
Cowcod

Scientific Name
Sebastes levis

		Cape Mendocino				Point Conception		
Region	North			Central			South	
Source	Combo	Triennial	Slope	Combo	RecFIN	Observer	Combo	Observer
Year						(fish)		(trips)
1975								148
1976								*
1977		11						*
1978								*
1979								
1980		2			0			
1981					2			
1982					3			
1983		4			4			
1984					1			
1985					4			
1986		0			3			95
1987					1	5		*
1988					6	2		*
1989		19			3	8		*
1990						5		
1991						6		
1992		3				10		
1993					0	6		
1994					0	13		
1995		21			1	5		
1996					0	0		
1997			3			5		
1998		11				0		
1999	0		4	3	10			
2000	0		2	1	0			
2001	1	8	3	1	0			
2002	1			5	2		2	
2003	1			3	0		3	
2004	0	0		16			5	
2005	2			13			6	
2006	0			5			6	
2007	0			3			6	
2008	0			2			9	
2009	0			7			7	
2010	1			11			17	

Common Name
Flag rockfish

Scientific Name
Sebastes rubrivinctus

Point Conception

Region Source Year	Central		Combo	South	
	RecFIN	Observer (fish)		RecFIN	Observer (trips)
1975					273
1976					*
1977					*
1978					*
1979					
1980	9			19	
1981	6			22	
1982	12			24	
1983	7			30	
1984	15			30	
1985	23			33	
1986	16			32	361
1987	3	10		6	*
1988	3	36		9	*
1989	10	104		16	*
1990		29			
1991		38			
1992		120			
1993	5	84		16	
1994	8	85		19	
1995	6	47		4	
1996	19	56		23	
1997		49		9	
1998		22		25	
1999	29			74	
2000	8			46	
2001	12			18	
2002	6			28	
2003	0		6	17	
2004			7		
2005			5		
2006			8		
2007			12		
2008			7		
2009			9		
2010			7		

Common Name
Greenblotched rockfish

Scientific Name
Sebastes rosenblatti

Point Conception

Region Source Year	Central			South	
	Triennial	Combo	RecFIN	Combo	Observer
1975					128
1976					*
1977	0				*
1978					*
1979					
1980	0		0		
1981			0		
1982			0		
1983	1		0		
1984			0		
1985			2		
1986	0		2		113
1987			3		*
1988			11		*
1989	5		4		*
1990					
1991					
1992	7				
1993			0		
1994			0		
1995	1		2		
1996			2		
1997					
1998	3				
1999			2		
2000			1		
2001	3		0		
2002		3	0	1	
2003		1	0	5	
2004	0	1		6	
2005		1		8	
2006		2		12	
2007		4		3	
2008		3		14	
2009		1		10	
2010		3		17	

Common Name
Halfbanded rockfish

Scientific Name
Sebastes semicinctus

Region Source Year	Cape Mendocino		Point Conception			Observer (trips)	
	North Triennial	Combo	Central Triennial	Combo	South Combo		RecFIN
1975						28	
1976						*	
1977	0		6			*	
1978						*	
1979							
1980	0		0			2	
1981						4	
1982						1	
1983	0		0			8	
1984						11	
1985						12	
1986	0		0			12	144
1987						0	*
1988						1	*
1989	2		22			1	*
1990							
1991							
1992	0		44				
1993						5	
1994						17	
1995	1		30			2	
1996						10	
1997						5	
1998	1		27			15	
1999						45	
2000		0		1		13	
2001	1	0	27	1		3	
2002		0		2	1	10	
2003		1		4	16	5	
2004	16	2	0	15	26		
2005		1		19	31		
2006		0		15	30		
2007		1		15	31		
2008		0		19	32		
2009		1		20	38		
2010		0		26	35		

Common Name
Kelp rockfish

Scientific Name
Sebastes atrovirens

Point Conception

Region Source Year	Central		South	
	RecFIN	Observer (fish)	RecFIN	Observer (trips)
1975				112
1976				*
1977				*
1978				*
1979				
1980	1		17	
1981	0		11	
1982	0		11	
1983	3		27	
1984	3		24	
1985	0		23	
1986	1		15	350
1987	3	0	2	*
1988	5	2	1	*
1989	0	8	7	*
1990		0		
1991		5		
1992		12		
1993	0	8	25	
1994	1	34	26	
1995	1	30	6	
1996	2	65	16	
1997		34	5	
1998		83	11	
1999	6		23	
2000	2		13	
2001	1		24	
2002	5		27	
2003	9		23	

Common Name
Olive rockfish

Scientific Name
Sebastes serranoides

Point Conception

Region Source Year	Central		South	
	RecFIN	Observer (fish)	RecFIN	Observer (trips)
1975				637
1976				*
1977				*
1978				*
1979				
1980	53		38	
1981	16		42	
1982	28		45	
1983	39		42	
1984	44		27	
1985	84		27	
1986	48		53	843
1987	30	130	10	*
1988	11	624	13	*
1989	39	819	26	*
1990		174		
1991		516		
1992		1169		
1993	8	885	60	
1994	4	637	33	
1995	28	1687	6	
1996	106	1175	14	
1997		1274	4	
1998		1177	11	
1999	123		24	
2000	21		6	
2001	23		36	
2002	54		59	
2003	97		36	

Common Name
Pygmy rockfish

Scientific Name
Sebastes wilsoni

Region Source Year	Cape Mendocino		Point Conception		
	North Triennial	Combo	Central Triennial	Combo	South Combo
1975					
1976					
1977	3		0		
1978					
1979					
1980	9		0		
1981					
1982					
1983	23		0		
1984					
1985					
1986	101		2		
1987					
1988					
1989	38		1		
1990					
1991					
1992	28		3		
1993					
1994					
1995	20		1		
1996					
1997					
1998	12		2		
1999					
2000					
2001	11		2		
2002		1		0	0
2003		11		3	0
2004	0	5	2	0	0
2005		7		1	2
2006		13		0	2
2007		9		0	7
2008		5		1	3
2009		10		4	5
2010		5		1	1

Common Name
Quillback rockfish

Scientific Name
Sebastes maliger

Cape Mendocino

Region Source Year	North		Central	
	Triennial	RecFIN	RecFIN	Observer (fish)
1975				
1976				
1977	1			
1978				
1979				
1980	2	5	0	
1981		2	2	
1982		7	2	
1983	4	4	5	
1984		5	3	
1985		7	11	
1986	12	2	8	
1987		4	2	7
1988		5	0	90
1989	3	12	17	89
1990				36
1991				6
1992	9			21
1993		23	1	52
1994		23	0	26
1995	2	14	2	104
1996		15	21	59
1997		41		47
1998	7	44		45
1999		50	27	
2000		26	5	
2001	7	18	7	
2002		26	1	
2003		7	12	
2004	0			

Common Name
Redbanded rockfish

Scientific Name
Sebastes babcocki

Region Source Year	Cape Mendocino			Point Conception			
	Triennial	North Slope	Combo	Triennial	Central Slope	Combo	South Combo
1975							
1976							
1977	100			40			
1978							
1979							
1980	57			7			
1981							
1982							
1983	86			4			
1984		31					
1985							
1986	37			6			
1987							
1988		14					
1989	67	13		13			
1990		13					
1991		2					
1992	60	15		7			
1993		23					
1994							
1995	83	13		19			
1996		30					
1997		14			4		
1998	73			11			
1999		17	33		6	17	
2000		19	34		5	16	
2001	69	14	26	19	5	13	
2002			31			10	0
2003			52			8	3
2004	13		31	47		6	0
2005			46			4	4
2006			41			7	0
2007			47			5	0
2008			42			10	2
2009			39			13	1
2010			34			3	0

Common Name
Redstripe rockfish

Scientific Name
Sebastes proriger

Cape Mendocino

Region Source Year	North				Central		
	Triennial	Slope	Combo	RecFIN	Triennial	Combo	RecFIN
1975							
1976							
1977	31				0		
1978							
1979							
1980	66			1	0		0
1981				0			2
1982				0			2
1983	64			1	1		5
1984		4		3			3
1985				2			11
1986	36			2	1		8
1987				0			2
1988		5		0			0
1989	58	4		0	1		17
1990		3					
1991							
1992	60	2			1		
1993		3		1			1
1994				4			0
1995	29	3		6	1		2
1996		12		2			21
1997		4		0			
1998	41			2	0		
1999		10	4	1		3	27
2000		3	1	1		0	5
2001	23	2	0	1	2	4	7
2002			3	1		1	1
2003			24	1		1	12
2004	8		15		12	0	
2005			17			0	
2006			16			0	
2007			9			0	
2008			9			3	
2009			13			1	
2010			11			0	

Common Name
Rosethorn rockfish

Scientific Name
Sebastes helvomaculatus

Region Source Year	Cape Mendocino				Point Conception				South Combo	
	Trienn	North		RecFIN	Trienn	Slope	Central			Obs (fish)
1975										
1976										
1977	47				14					
1978										
1979										
1980	67			2	1			15		
1981				0				5		
1982				7				15		
1983	81			3	2			17		
1984		14		8				2		
1985				7				17		
1986	37			5	1			5		
1987				2				0	9	
1988		7		2				6	28	
1989	69	7		1	9			3	48	
1990		3							20	
1991		0							55	
1992	76	11			7				15	
1993		14		12				0	26	
1994				16				0	54	
1995	51	3		20	9			1	43	
1996		22		10				2	47	
1997		6		10		1			22	
1998	58			15	8				12	
1999		9	13	11		5	10	9		
2000		10	16	6		2	8	0		
2001	35	5	10	1	9	3	4	1		
2002			15	4			5	0		5
2003			56	2			1	0		6
2004	42		32		26		4			5
2005			30				3			14
2006			39				6			13
2007			44				4			5
2008			37				5			2
2009			35				6			17
2010			39				2			15

Common Name
Rosy rockfish

Scientific Name
Sebastes rosaceus

Point Conception

Region Source Year	Central		South	
	RecFIN	Observer (fish)	RecFIN	Observer (trips)
1975				177
1976				*
1977				*
1978				*
1979				
1980	50		9	
1981	21		12	
1982	23		12	
1983	27		25	
1984	92		28	
1985	141		33	
1986	106		26	319
1987	29	432	2	*
1988	33	1631	5	*
1989	38	2284	18	*
1990		1030		
1991		633		
1992		1534		
1993	11	1526	17	
1994	15	1605	16	
1995	39	1564	3	
1996	137	1646	24	
1997		1372	4	
1998		766	23	
1999	118		85	
2000	31		31	
2001	29		14	
2002	24		20	
2003	29		13	

Common Name
Rougheye rockfish

Scientific Name
Sebastes aleutianus

Cape Mendocino

Region Source Year	Triennial	North Slope	Combo	Central Triennial
1975				
1976				
1977	72			0
1978				
1979				
1980	22			0
1981				
1982				
1983	36			0
1984		14		
1985				
1986	100			0
1987				
1988		12		
1989	56	5		1
1990		4		
1991				
1992	60	14		0
1993		17		
1994				
1995	88	2		0
1996		27		
1997		10		
1998	70			6
1999		11	18	
2000		15	13	
2001	68	9	21	1
2002			13	
2003			34	
2004	3		27	45
2005			27	
2006			34	
2007			37	
2008			36	
2009			27	
2010			29	

Common Name
Sharpchin rockfish

Scientific Name
Sebastes zacentrus

Cape Mendocino

Region Source Year	Triennial	North Slope	Combo	Triennial	Central Slope	Combo
1975						
1976						
1977	77			6		
1978						
1979						
1980	83			12		
1981						
1982						
1983	112			5		
1984		16				
1985						
1986	1			10		
1987						
1988		14				
1989	87	13		19		
1990		17				
1991		1				
1992	98	17		13		
1993		29				
1994						
1995	56	15		14		
1996		30				
1997		19			3	
1998	55			10		
1999		19	14		3	10
2000		11	18		5	8
2001	41	14	6	10	5	11
2002			17			3
2003			51			2
2004	14		30	36		3
2005			31			3
2006			34			7
2007			31			4
2008			24			2
2009			30			9
2010			36			5

Common Name
Shorthead rockfish

Scientific Name
Sebastes borealis

Cape Mendocino

Region Source Year	Triennial	North Slope	Combo	Triennial
1975				
1976				
1977	10			2
1978				
1979				
1980	2			0
1981				
1982				
1983	3			0
1984		0		
1985				
1986	13			0
1987				
1988		0		
1989	0	2		0
1990		0		
1991		0		
1992	0	4		1
1993		1		
1994				
1995	10	0		0
1996		6		
1997		2		
1998	6			1
1999		5	1	
2000		2	1	
2001	9	4	4	1
2002			4	
2003			1	
2004	0		3	3
2005			2	
2006			0	
2007			0	
2008			0	
2009			0	
2010			0	

Common Name
Speckled rockfish

Scientific Name
Sebastes ovalis

Point Conception				
Region	Central		South	
Source	RecFIN	Observer	RecFIN	Observer
Year		(fish)		(trips)
1975				106
1976				*
1977				*
1978				*
1979				
1980	10		10	
1981	3		15	
1982	13		10	
1983	13		29	
1984	27		20	
1985	36		17	
1986	11		9	126
1987	1	60	1	*
1988	1	39	0	*
1989	2	134	3	*
1990		20		
1991		75		
1992		166		
1993	0	93	3	
1994	0	78	32	
1995	5	152	1	
1996	20	104	3	
1997		235	3	
1998		115	9	
1999	38		19	
2000	8		18	
2001	5		3	
2002	2		10	
2003	1		4	

Common Name
Squarespot rockfish

Scientific Name
Sebastes hopkinsi

Point Conception

Region Source Year	Central		South	
	RecFIN	Observer (fish)	RecFIN	Observer (trips)
1975				197
1976				*
1977				*
1978				*
1979				
1980	18		3	
1981	15		0	
1982	19		2	
1983	28		1	
1984	38		17	
1985	28		19	
1986	26		2	249
1987	3	98	0	*
1988	6	190	2	*
1989	10	120	0	*
1990		17		
1991		1		
1992		80		
1993	20	55	0	
1994	27	71	1	
1995	4	173	4	
1996	24	64	9	
1997	12	194	34	
1998		168	16	
1999			12	
2000	35		2	
2001	6		0	
2002	18		0	
2003	22		1	

Common Name
Starry rockfish

Scientific Name
Sebastes constellatus

Point Conception

Region Source Year	Central		South	
	RecFIN	Observer (fish)	RecFIN	Observer (trips)
1975				267
1976				*
1977				*
1978				*
1979				
1980	41		21	
1981	19		20	
1982	21		30	
1983	27		54	
1984	64		48	
1985	105		49	
1986	90		46	533
1987	21	266	9	*
1988	20	625	16	*
1989	29	681	23	*
1990		199		
1991		379		
1992		690		
1993	12	707	40	
1994	16	819	63	
1995	23	749	16	
1996	101	936	34	
1997		721	9	
1998		299	48	
1999	130		136	
2000	26		74	
2001	30		29	
2002	30		53	
2003	22		36	

Common Name
Stripetail rockfish

Scientific Name
Sebastes saxicola

Region Source Year	Cape Mendocino						Point Conception	
	North Triennial	Slope	Combo	Triennial	Central Slope	Combo	RecFIN	South Combo
1975								
1976								
1977	48			143				
1978								
1979								
1980	47			30			3	
1981							0	
1982							0	
1983	65			33			1	
1984		14					5	
1985							8	
1986	22			45			8	
1987							0	
1988		2					0	
1989	46	4		97			0	
1990		13						
1991		1						
1992	47	3		73				
1993		7					0	
1994							0	
1995	93	15		81			0	
1996		11					1	
1997		11			9			
1998	55			74				
1999		11	24		10	25	2	
2000		9	17		10	31	0	
2001	53	9	7	59	12	30	0	1
2002			19			29	0	14
2003			41			49	0	32
2004	67		29	38		56		34
2005			40			70		39
2006			56			46		40
2007			62			43		40
2008			30			53		41
2009			46			60		48
2010			47			78		45

Common Name
Swordspine rockfish

Scientific Name
Sebastes ensifer

Point Conception			
Region Source Year	Central RecFIN	South	
		Combo	Observer (trips)
1975			52
1976			*
1977			*
1978			*
1979			
1980	13		
1981	6		
1982	9		
1983	12		
1984	13		
1985	3		
1986	1		85
1987	3		*
1988	2		*
1989	0		*
1990			
1991			
1992			
1993	0		
1994	0		
1995	0		
1996	0		
1997			
1998			
1999	0		
2000	0		
2001	0		
2002	0		
2003	0	1	
2004		2	
2005		1	
2006		3	
2007		8	
2008		5	
2009		3	
2010		4	

Common Name
Treefish

Scientific Name
Sebastes serriceps

Point Conception			
Region	Central	South	
Source	RecFIN	RecFIN	Observer
Year			(trips)
1975			181
1976			*
1977			*
1978			*
1979			
1980	2	20	
1981	0	14	
1982	0	22	
1983	0	45	
1984	0	33	
1985	0	27	
1986	0	30	565
1987	0	11	*
1988	1	10	*
1989	2	17	*
1990			
1991			
1992			
1993	0	55	
1994	0	34	
1995	0	28	
1996	1	34	
1997		21	
1998		48	
1999	6	102	
2000	3	51	
2001	3	41	
2002	10	53	
2003	20	52	

Common Name
 Vermilion rockfish
 Sunset rockfish

Scientific Name
Sebastes miniatus
Sebastes crocotulus

Region Source Year	Cape Mendocino				Point Conception			
	North RecFIN	Triennial	Combo	Central RecFIN	Observer (fish)	Combo	South RecFIN	Observer (trips)
1975								332
1976								*
1977		2						*
1978								*
1979								
1980	0	0		34			21	
1981	2			16			19	
1982	0			28			19	
1983	0	1		19			34	
1984	1			37			46	
1985	4			58			50	
1986	9	0		52			42	690
1987	2			33	64		11	*
1988	6			37	674		19	*
1989	8	10		39	1274		46	*
1990					583			
1991					388			
1992		9			1173			
1993	7			12	1079		46	
1994	11			17	753		74	
1995	13	2		40	968		9	
1996	14			161	630		37	
1997	30				1278		8	
1998	24	0			662		40	
1999	27			162			167	
2000	12			28			97	
2001	15	6		43			58	
2002	13			108			105	
2003	6		1	178		5	103	
2004		0	2			1		
2005			1			4		
2006			2			3		
2007			1			7		
2008			6			7		
2009			9			6		
2010			5			10		

Common Name	Scientific Name
Yellowmouth rockfish	<i>Sebastes reedi</i>

Region Source Year	Triennial	North Slope	Combo
1975			
1976			
1977	7		
1978			
1979			
1980	7		
1981			
1982			
1983	14		
1984		1	
1985		0	
1986	127	0	
1987		0	
1988		2	
1989	10	2	
1990			
1991		0	
1992	13	1	
1993		1	
1994			
1995	6	2	
1996		1	
1997		1	
1998	4		
1999			1
2000			1
2001	2		1
2002			0
2003			5
2004	1		0
2005			2
2006			0
2007			0
2008			0
2009			0
2010			1

Common Name
Yellowtail rockfish

Scientific Name
Sebastes flavidus

Region Source Year	Point Conception			South Observer (trips)
	Triennial	Central RecFIN	Observer (fish)	
1975				53
1976				*
1977	11			*
1978				*
1979				
1980	4	82		
1981		48		
1982		84		
1983	9	74		
1984		144		
1985		250		
1986	12	149		51
1987		89	1848	*
1988		71	5033	*
1989	9	88	7133	*
1990			2215	
1991			2551	
1992	16		6204	
1993		12	5370	
1994		16	4716	
1995	14	68	6240	
1996		231	4827	
1997			6715	
1998	4		4129	
1999		288		
2000		35		
2001	3	57		
2002		95		
2003		91		
2004	48			

Common Name
Curlfin sole

Scientific Name
Pleuronichthys decurrens

Region Source Year	Cape Mendocino		Point Conception		
	North Triennial	Combo	Central Triennial	Combo	South Combo
1975					
1976					
1977	0		6		
1978					
1979					
1980	4		6		
1981					
1982					
1983	8		12		
1984					
1985					
1986	1		14		
1987					
1988					
1989	12		47		
1990					
1991					
1992	14		40		
1993					
1994					
1995	12		36		
1996					
1997					
1998	31		51		
1999					
2000					
2001	27		52		
2002					
2003		17		31	8
2004	37	12	12	33	7
2005		30		34	5
2006		13		24	7
2007		14		23	11
2008		22		23	16
2009		23		40	16
2010		19		28	17

Common Name

Pacific sanddab

Scientific Name

Citharichthys sordidus

Region Source Year	Cape Mendocino					Point Conception			
	North		Central			Obs (fish)	South		
	Triennial	Combo	Triennial	Combo	RecFIN		Combo	RecFIN	Obs (trips)
1975								107	
1976								*	
1977	30		78					*	
1978								*	
1979									
1980	100		36		14		14		
1981					4		11		
1982					1		3		
1983	231		48		4		4		
1984					18		18		
1985					41		22		
1986	349		57		19		21	351	
1987					4	26	3	*	
1988					16	185	9	*	
1989	142		129		3	334	14	*	
1990						61			
1991						129			
1992	191		135			196			
1993					4	325	11		
1994					2	383	22		
1995	165		86		9	304	4		
1996					46	334	19		
1997						307	8		
1998	206		94			85	15		
1999					37		60		
2000					16		31		
2001	162		89		9		24		
2002					13		53		
2003		65		47	38		22	36	
2004	65	82	77	62			24		
2005		116		71			30		
2006		85		64			31		
2007		95		60			35		
2008		95		66			43		
2009		86		86			48		
2010		114		81			46		

Common Name

Rex sole

Scientific Name*Glyptocephalus zachirus*

Region Source Year	Cape Mendocino		Point Conception		South Combo
	North Triennial	Combo	Central Triennial	Combo	
1975					
1976					
1977	300		249		
1978					
1979					
1980	332		58		
1981					
1982					
1983	433		66		
1984					
1985					
1986	1		72		
1987					
1988					
1989	338		147		
1990					
1991					
1992	363		141		
1993					
1994					
1995	366		148		
1996					
1997					
1998	362	90	160	66	
1999		96		67	
2000		108		68	
2001	339	111	160	59	
2002		111		73	23
2003		236		92	22
2004	92	197	159	89	26
2005		269		113	42
2006		247		111	39
2007		282		105	38
2008		257		107	34
2009		247		115	36
2010		290		115	38

Common Name

Rock sole

Scientific Name

Lepidopsetta bilineata

Region Source Year	Cape Mendocino		Point Conception		South Combo
	North Combo	Combo	Central RecFIN	Observer (fish)	
1975					
1976					
1977					
1978					
1979					
1980			2		
1981			0		
1982			0		
1983			2		
1984			7		
1985			11		
1986			5		
1987			4	12	
1988			6	13	
1989			5	37	
1990				23	
1991				3	
1992				15	
1993			1	8	
1994			0	21	
1995			1	14	
1996			6	19	
1997				12	
1998				9	
1999			6		
2000			4		
2001			2		
2002			2		
2003			12		
2004	13	10			1
2005	19	8			2
2006	14	8			3
2007	19	11			7
2008	14	8			8
2009	14	15			5
2010	17	10			6

Common Name
Sand sole

Scientific Name
Psettichthys melanostictus

Cape Mendocino

Region Source Year	North		RecFIN	Central	
	Triennial	Combo		Combo	RecFIN
1975					
1976					
1977	0				
1978					
1979					
1980	6		1		3
1981			0		1
1982			0		0
1983	7		1		0
1984			0		1
1985			1		2
1986	61		0		0
1987			0		1
1988			1		2
1989	6		2		0
1990					
1991					
1992	20				
1993			3		0
1994			10		0
1995	3		0		1
1996			1		1
1997			10		
1998	11		5		
1999			1		1
2000			0		1
2001	6		1		3
2002			0		2
2003		4	0	2	3
2004	2	5		1	
2005		6		0	
2006		3		0	
2007		6		1	
2008		6		6	
2009		7		3	
2010		7		3	

Common Name
Big skate

Scientific Name
Raja binoculata

Region Source Year	Cape Mendocino		Point Conception			
	North Triennial	Combo	Central Triennial	Combo	South RecFIN	Combo
1975						
1976						
1977	10		0			
1978						
1979						
1980	10		2		0	
1981					0	
1982					3	
1983	28		4		3	
1984					3	
1985					3	
1986	79		6		1	
1987					1	
1988					1	
1989	41		14		3	
1990						
1991						
1992	52		18			
1993					1	
1994					1	
1995	22		22		3	
1996					6	
1997					1	
1998	48		12		3	
1999					14	
2000					13	
2001	24		19		2	
2002					15	
2003		48		14	19	1
2004	25	58	32	26		1
2005		85		15		3
2006		47		19		2
2007		61		17		1
2008		42		13		1
2009		60		24		1
2010		99		28		2

Common Name
Ratfish

Scientific Name
Hydrolagus colliei

Region	Cape Mendocino		Point Conception		South Combo
	North Slope	Combo	Central Slope	Combo	
Source Year					
1975					
1976					
1977					
1978					
1979					
1980					
1981					
1982					
1983					
1984	40				
1985					
1986					
1987					
1988	22				
1989	16				
1990	9				
1991	2				
1992	22				
1993	31				
1994					
1995	10				
1996	40				
1997	26		21		
1998		41		48	
1999	23	40	19	52	
2000	18	31	18	54	
2001	15	30	15	43	
2002		32		47	22
2003		156		66	33
2004		151		63	33
2005		200		87	44
2006		191		84	53
2007		209		89	53
2008		184		107	58
2009		146		106	58
2010		200		95	55

Common Name
Pacific rattail
(Pacific grenadier)

Scientific Name
Coryphaenoides acrolepis
Coryphaenoides spp.

Region Source Year	Cape Mendocino		Point Conception		South Combo
	North Slope (multispp)	Combo	Central Slope (multispp)	Combo	
1975					
1976					
1977					
1978					
1979					
1980					
1981					
1982					
1983					
1984	21				
1985					
1986					
1987					
1988	59				
1989	23				
1990	152				
1991	57				
1992	104				
1993	154				
1994					
1995	144				
1996	275				
1997	139		101		
1998					
1999	270	103	98	62	
2000	173	98	115	48	
2001	85	92	64	45	
2002		104		58	8
2003		107		17	3
2004		52		18	10
2005		89		23	12
2006		75		41	14
2007		88		42	16
2008		80		38	10
2009		65		52	15
2010		76		36	15

Common Name
California skate

Scientific Name
Raja inornata

Region Source Year	North Combo	Central Combo	South Combo
2001			
2002			
2003	1	30	19
2004	2	39	17
2005	4	53	21
2006	1	43	20
2007	0	40	18
2008	2	41	19
2009	1	53	19
2010	3	49	22

Common Name
Finescale codling
(Pacific flatnose)

Scientific Name
Antimora microlepis

Region Source Year	North Combo	Central Combo	South Combo
1995			
1996			
1997			
1998	69	73	
1999	110	70	
2000	122	63	
2001	123	59	
2002	118	79	16
2003	108	23	11
2004	53	23	18
2005	71	24	19
2006	70	46	23
2007	74	48	23
2008	51	32	12
2009	23	42	16
2010	35	28	17

Region Source Year	Grass RF		Honeycomb RF		Mexican RF	Pink RF
	<i>S. rastrelliger</i>		<i>S. umbrosus</i>		<i>S. macdonaldi</i>	<i>S. eos</i>
	Central RecFIN	South Observer (trips)	South RecFIN	South Observer (trips)	South Observer (trips)	South Observer (trips)
1975		94		127	30	75
1976		*		*	*	*
1977		*		*	*	*
1978		*		*	*	*
1979						
1980	0		8			
1981	0		5			
1982	1		15			
1983	0		18			
1984	1		26			
1985	0		30			
1986	1	179	35	391	20	23
1987	2	*	1	*	*	*
1988	4	*	9	*	*	*
1989	0	*	6	*	*	*
1990						
1991						
1992						
1993	0		22			
1994	1		17			
1995	0		6			
1996	0		20			
1997			9			
1998			36			
1999	0		114			
2000	1		50			
2001	6		11			
2002	2		44			
2003	1		46			

Region Source Year	Silvergray RF <i>S. brevispinis</i>		Tiger RF <i>S. nigrocinctus</i>	Ocean Whitefish <i>Caulolatilus princeps</i>	
	North RecFIN	Combo	North RecFIN	South RecFIN	Observer (trips)
1975					325
1976					*
1977					*
1978					*
1979					
1980	2		0	8	
1981	0		0	7	
1982	3		0	17	
1983	0		0	33	
1984	0		8	34	
1985	0		0	45	
1986	1		1	44	823
1987	0		0	16	*
1988	0		2	9	*
1989	1		3	23	*
1990					
1991					
1992					
1993	2		4	44	
1994	9		4	109	
1995	5		3	34	
1996	3		3	33	
1997	3		7	26	
1998	4		4	44	
1999	4	2	11	97	
2000	2	1	5	95	
2001	0	1	2	57	
2002	0	0	3	69	
2003	0	9	2	67	
2004		3			
2005		6			
2006		3			
2007		8			
2008		5			
2009		5			
2010		8			

Region Source Year	Butter sole <i>Isopsetta isolepis</i>		Flathead sole <i>Hippoglossoides elassodon</i>	
	North		North	
	Triennial	Combo	Triennial	Combo
1975				
1976				
1977	0		43	
1978				
1979				
1980	2		85	
1981				
1982				
1983	2		76	
1984				
1985				
1986	24		279	
1987				
1988				
1989	4		91	
1990				
1991				
1992	6		79	
1993				
1994				
1995	3		87	
1996				
1997				
1998	3		64	
1999				
2000				
2001	10		159	
2002				
2003		6		52
2004	3	3	1	44
2005		6		41
2006		4		49
2007		9		27
2008		11		24
2009		12		39
2010		11		55

Assessment Methods for Data-Moderate Stocks
Report of the Methodology Review Panel Meeting

National Marine Fisheries Service (NMFS)
Alaska Fisheries Science Center (AFSC)
Seattle, Washington
26-29 June 2012

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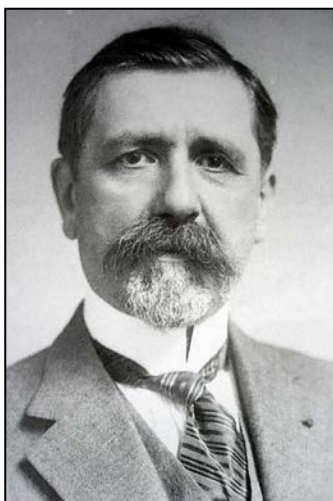
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Émile Borel (1871-1956)