

14: ASSESSMENT OF THE DEMERSAL SHELF ROCKFISH STOCK COMPLEX IN THE SOUTHEAST OUTSIDE SUBDISTRICT OF THE GULF OF ALASKA

Kellii Wood (kellii.wood@alaska.gov), Rhea Ehresmann, and Mike Jaenicke

Executive Summary

The demersal shelf rockfish (DSR) complex (yelloweye, quillback, copper, rosethorn, China, canary, and tiger rockfish) is a Tier 4 complex and assessed on a triennial cycle. A full stock assessment is typically conducted every third year; therefore, the authors are presenting an assessment summary this year and a full assessment will be presented in 2021. A preliminary statistical age-structured assessment model (ASA) will not be presented this year due to loss of biometric support staff at Alaska Department of Fish and Game (ADF&G). The ASA will continue to be evaluated, and along with a risk assessment, preliminary results will be presented in a full assessment in 2021. The DSR complex assessment is based on relative abundance estimates from a remotely operated vehicle (ROV), which prior to 2012, estimates were made via a manned submersible (*Delta*). One management area (EYKT) was surveyed in 2019 (Figures 14.1 and 14.2). The recommended acceptable biological catch (ABC) and overfishing level (OFL) for this assessment includes results from the 2019 survey as well as updates to the status quo methodology.

Summary of Changes in Assessment Inputs

The following updates have been made to last year's assessment:

Changes in the input data:

Due to a regionwide closure of the directed commercial DSR fishery in 2020 and lack of port sampling support due to COVID-19 measures, there were not enough 2020 yelloweye rockfish weight samples to quantify an accurate biomass estimate; therefore, the authors chose to use more comprehensive weight data from 2019. The average weight of yelloweye rockfish caught in the commercial fishery are presented in Table 14.1. DSR catch information is presented in Table 14.2 and Figures 14.5 to 14.8. It is important to note that the directed commercial and recreational DSR fisheries were closed to harvest in Southeast Alaskan marine waters in 2020 due to a continuous general decline in the relative abundance estimates produced from the annual ROV surveys in the Southeast Outside Subdistrict (SEO). The relative abundance estimate was updated for the EYKT management area using ROV survey data collected in August of 2019.

Changes in the assessment methodology:

There were no changes in the assessment methodology due to a loss of biometric support staff for the Groundfish Project in 2020.

Summary of Results

The yelloweye rockfish biomass estimate increased from 10,903 t to 11,852 t for the lower 90% confidence interval and 15,085 t to 16,693 t for the biomass point estimate for 2020 to 2021, respectively (Table 14.3, Figure 14.3). The increase in biomass is driven by an increase in the yelloweye density

estimate (1,072 YE/km² in 2017 to 1,562 YE/km² in 2019) from the 2019 EYKT ROV survey (Table 14.4, Figure 14.4).

Yelloweye rockfish comprise the largest component of the DSR complex and are managed using the Tier 4 harvest rule. The ABC and OFL for non-yelloweye DSR are calculated using the Tier 6 harvest rule. The Tier 6 ABC and OFL are added to the Tier 4 values for yelloweye rockfish to determine the ABC and OFL for the DSR complex. The Tier 6 values for non-yelloweye DSR utilizes catch data from 2010–2014, as this is the only time period with data available from the commercial, sport, and subsistence fisheries. As per correspondence with the Division of Subsistence on August 28, 2020, the subsistence catch data has not been updated since 2015 due to lack of funding.

The maximum allowable ABC for DSR in 2021 is 328 t (308 t yelloweye + 20 t non-yelloweye). The DSR species are particularly vulnerable to overfishing given their longevity, late maturation, and habitat-specific residency. As in previous years, we recommend a harvest rate lower than the maximum allowed under Tier 4; $F=M=0.02$. This results in an author’s recommended ABC of 257 t (237 t yelloweye + 20 t non-yelloweye DSR Tier 6) for 2021. The OFL is set using $F_{35\%}=0.032$; which is 405 t for 2021.

State of Alaska regulations at 5 AAC 28.160(c)(1)(A) dictate that subsistence DSR removals be deducted from the ABC prior to allocating the TAC to the commercial (84%) and recreational (16%) fisheries. In the current assessment, 7 t were deducted from the ABC for DSR caught in the subsistence fisheries for a TAC of 250 t; 210 t is allocated to commercial fisheries and 40 t is allocated to recreational fisheries for 2021. Historic catch guidelines and total catch from 1988 to 2021 can be seen in Figure 14.5.

Reference values for DSR are summarized in the following table, with the recommended ABC and OFL values in bold. The stock was not subjected to overfishing last year.

Quantity	An estimated or <i>specified</i> last year for:		As estimated or <i>recommended</i> this year for:	
	2020	2021	2021	2022
<i>M</i> (natural mortality rate)	0.02	0.02	0.02	0.02
Tier	4	4	4	4
Yelloweye Biomass (t)	10,903		11,852	
$F_{OFL}=F_{35\%}$	0.032	0.032	0.032	0.032
$maxF_{ABC}$	0.026	0.026	0.026	0.026
F_{ABC}	0.02	0.02	0.02	0.02
DSR OFL (t)	375	375	405	405
DSR max ABC (t)	303	303	328	328
ABC (t)	238	238	257	257
Status	As determined last year for:		As determined this year for:	
	2018	2019	2019	2020
Overfishing	No	n/a	No	n/a

The non-yelloweye DSR ABC and OFL are calculated using Tier 6 methodology. Non-yelloweye Tier 6 ABC and OFL are added to Tier 4 yelloweye ABC and OFL for total DSR values.

Quantity (Tier 6 for other DSR only)	As estimated or <i>specified last year and recommended this year</i> for:	
	2020	2021
OFL (t)	26	26
ABC (t)	20	20

Area Apportionment

The ABC and OFL for DSR are for the SEO Subdistrict. The State of Alaska manages DSR in the Eastern regulatory area with Council oversight and any further apportionment within the SEO Subdistrict is at the discretion of the State. Updated catch data (t) for DSR in the SEO Subdistrict as of October 12, 2020, NMFS Alaska Regional Office Catch Accounting System via the Alaska Fisheries Information Network (AKFIN) database, <http://www.akfin.org> are summarized in the following table.

Summaries for Plan Team

Species	Year	Biomass	OFL	ABC	TAC ¹	Commercial catch ²	Recreational harvest ³	Total catch ⁴
DSR	2015	10,933	361	225	217	107	48	163
	2016	10,559	364	231	224	117	48	172
	2017	10,347	357	227	220	129	45	181
	2018	11,508	394	250	243	136	40	183
	2019	12,032	411	261	254	131	47	185
	2020	10,903	375	238	231	93	7	107
	2021	11,852	405	257	250	-	-	-

¹TAC is for the commercial and recreational fisheries and is calculated after the subsistence estimated harvest is deducted from the ABC.

²Assignment of ADF&G groundfish management areas for DSR bycatch landed in the commercial salmon troll fishery began in 2015.

Commercial catch is updated through October 5, 2020. Commercial catch includes IPHC research test fishery.

³Updated recreational harvest for SEO is for release mortality estimate only, as retention of DSR in 2020 was prohibited. This information was updated through October 12, 2020.

⁴Total catch is from the commercial (incidental and direct), recreational, subsistence, and research fisheries.

Responses to SSC and Plan Team Comments Specific to this Assessment

The SSC encourages the authors to explore alternatives that are more in line with current practice, including further consideration of the risk table to account for uncertainty in this stock. Ultimately, the SSC fully agrees with the authors and GPT that an age-structured assessment is very desirable for this stock and the SSC continues to encourage its development. The Team agreed with SSC comments that an age-structured model would be welcome. As mentioned last year, ADF&G has met biannually as part of the department’s Statewide Rockfish Initiative (SRI) group with the goal of addressing concerns regarding research and management of yelloweye and black rockfish throughout the State. This group has been exploring various models that would improve upon both the Tier 4 and Tier 6 methods currently being utilized for yelloweye and non-DSR species.

The Southeast region has met and will continue to meet to identify more accurate methods for stock assessment and management of these species. ADF&G has a continued interest in exploring an ASA model for this species complex; however, there has been a substantial changeover and loss of biometric support staff at ADF&G in 2020. More time will be needed for new biometric staff to gain an understanding of this fishery and evaluate alternative assessment frameworks. The authors will create and present a risk assessment for the full DSR assessment in 2021.

Table 14.1. The average weights (round lb), number of yelloweye rockfish sampled, and the standard deviation of weights from 1984 to 2020 (through October 5, 2020) for each management area (East Yakutat (EYKT), Northern Southeast Outside (NSEO), Central Southeast Outside (CSEO), and Southern Southeast Outside (SSEO)). The directed demersal shelf rockfish (DSR) commercial fishery was closed in all management areas in 2020.

Year	EYKT			NSEO			CSEO			SSEO		
	Average weight	# YE	SD	Average weight	# YE	SD	Average weight	# YE	SD	Average weight	# YE	SD
1984	-	-	-	-	-	-	5.4	124	0.82	-	-	-
1985	-	-	-	-	-	-	1.31	160	0.49	4.58	191	1.00
1986	-	-	-	-	-	-	-	-	-	-	-	-
1987	-	-	-	-	-	-	-	-	-	2.96	30	1.51
1988	-	-	-	3.49	445	1.62	3.17	2,890	1.43	3.39	4,558	1.51
1989	-	-	-	3.15	160	0.98	3.15	1,808	1.44	3.53	323	1.23
1990	-	-	-	-	-	-	3.12	886	1.56	-	-	-
1991	4.11	150	1.35	3.73	252	1.64	2.98	1,200	1.25	2.84	963	1.25
1992	3.56	90	1.18	3.38	50	1.70	3.12	1,410	1.49	3.58	1,900	1.46
1993	3.85	194	1.46	-	-	-	3.54	378	1.62	3.47	1,832	1.79
1994	3.65	427	1.39	3	167	1.23	2.79	679	1.16	3.69	1,822	1.27
1995	3.72	400	1.33	14.06	1	-	3.09	533	1.34	3.54	272	1.21
1996	3.52	476	1.17	-	-	-	3.11	710	1.27	3.29	1,387	1.36
1997	3.8	398	1.31	-	-	-	2.76	690	1.23	3.12	462	1.2
1998	3.99	479	1.38	-	-	-	2.82	247	1.36	3.04	482	1.16
1999	3.78	360	1.01	-	-	-	3.05	778	1.18	3.08	357	1.25
2000	3.85	370	1.29	-	-	-	3.21	170	1.01	3.47	895	1.29
2001	4.3	345	1.42	-	-	-	3.26	605	1.17	3.27	221	1.11
2002	-	-	-	-	-	-	3.14	501	1.20	3.42	469	1.25
2003	-	-	-	-	-	-	3.02	444	1.21	3.45	190	1.25
2004	3.81	728	1.40	-	-	-	2.94	211	1.27	3.25	446	1.15
2005	4.13	377	1.58	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-
2008	3.68	552	1.49	4.02	100	1.36	3.21	389	1.24	3.73	180	1.33
2009	3.99	549	1.51	3.35	183	1.34	3.57	559	1.25	3.53	171	1.32
2010	4.24	260	1.62	3.92	172	1.73	3.51	485	1.22	3.38	557	1.12
2011	4.35	481	1.61	3.43	129	1.18	3.22	563	1.24	3.51	249	1.30
2012	4.38	967	1.61	3.24	94	1.26	3.4	866	1.13	3.68	312	1.25
2013	4.06	555	1.55	-	-	-	3.19	566	1.13	3.53	559	1.29
2014	3.69	561	1.14	3.71	123	1.12	3.37	554	1.17	-	-	-
2015	3.96	581	1.38	3.95	312	1.39	3.47	455	1.18	-	-	-
2016	3.93	589	1.46	3.76	575	1.34	3.52	559	1.21	3.32	155	1.22
2017	3.87	572	1.35	3.71	410	1.35	3.57	560	1.14	4.59	31	1.31
2018	3.95	560	1.56	3.54	378	1.28	3.63	739	1.20	4.97	11	0.90
2019	4.08	182	1.67	3.37	40	1.20	3.47	383	1.93	3.49	553	1.25
2020	4.17	55	1.22	-	-	-	3.71	10	1.23	-	-	-

Table 14.2. Catch (t) of demersal shelf rockfish (DSR) from research, directed commercial, incidental commercial, recreational, and subsistence fisheries in the Southeast Outside Subdistrict (SEO), 1992–2020, allowable biological catch (ABC), overfishing level (OFL) and total allowable catch (TAC) for commercial and recreational sectors combined after estimated subsistence harvest is decremented. Commercial catch includes discards at sea and at the dock and catch retained for personal use.

Year	Research	Directed	Incidental ^{d,f}	Recreational ^b	Subsistence ^c	Total ^d	ABC ^e	OFL	TAC
1992	-	351	119	-	-	478	550	-	550
1993	13	341	188	-	-	534	800	-	800
1994	4	383	219	-	-	604	960	-	960
1995	13	168	103	-	-	271	580	-	580
1996	11	350	85	-	-	436	945	-	945
1997	16	280	100	-	-	380	945	-	945
1998	2	241	120	-	-	361	560	-	560
1999	2	242	126	-	-	367	560	-	560
2000	8	187	107	-	-	295	340	-	340
2001	7	178	146	-	-	324	330	-	330
2002	2	136	149	-	-	285	350	480	350
2003	6	105	169	-	-	275	390	540	390
2004	2	173	155	-	-	329	450	560	450
2005	4	42	195	-	-	237	410	650	410
2006	2	0	203	75	-	280	410	650	410
2007	3	0	196	60	-	259	410	650	410
2008	1	42	152	68	-	263	382	611	382
2009	2	76	139	37	-	254	362	580	362
2010	7	30	131	52	8	228	295	472	287
2011	5	22	87	36	6	156	300	479	294
2012	4	105	76	46	7	238	293	467	286
2013	4	130	83	34	7	258	303	487	296
2014	5	33	63	40	7	148	274	438	267
2015	4	33	70	48	8	163	225	361	217
2016	4	34	79	48	7	172	231	364	224
2017	5	32	92	45	7	181	227	357	220
2018	6	51	79	40	7	183	250	394	243
2019	10	45	76	47	7	185	261	411	254
2020 ^a	6	0	87	7	7	107	238	375	231

^aLandings from ADF&G Southeast Region fish ticket database and NMFS weekly catch reports through October 5, 2020. The directed commercial DSR fishery was closed in all management areas in 2020.

^bRecreational harvest (retained harvest plus estimated discard) from 2006 to 2008 include EYKT and IBS. These data are not available prior to 2006. Harvest of DSR was prohibited in the recreational fishery in 2020 for Southeast Alaska; however, this number reflects release mortality estimates.

^cProjected subsistence catch for the fishery year, (i.e., 2010 is for the 2010 fishery). These data were not available or deducted from the ABC prior to 2009. The subsistence data has not been updated since 2015 due to lack of funding.

^dData are from reported landings. Full retention of DSR went into effect in 2005; unreported DSR discards not reported in this table.

^eNo ABC prior to 1988, 1988–1993 ABC for CSEO, NSEO, and SSEO only (not EYKT).

^fAssignment of ADF&G groundfish management areas for DSR bycatch landed in the commercial salmon troll fishery began in 2015.

Table 14.3. A comparison of the lower 90% confidence interval of the demersal shelf rockfish (DSR) biomass estimate to the biomass point estimate and associated overfishing level (OFL), recommended allowable biological catch (ABC), and total allowable catch (TAC) from 2018 to 2021.

Species	Year	Biomass Lower 90% CI	Biomass Point Estimate	OFL Lower 90% CI	OFL Point Estimate	ABC Lower 90% CI	ABC Point Estimate	TAC¹ Lower 90% CI	TAC¹ Point Estimate
DSR	2018	11,508	15,531	394	523	250	331	243	324
	2019	12,032	16,543	411	555	261	351	254	344
	2020	10,903	15,085	375	509	238	322	231	315
	2021	11,852	16,693	405	560	257	354	250	347

¹TAC is for the commercial and recreational fisheries and is calculated after the subsistence estimated harvest is deducted from the ABC.

Table 14.4. Submersible (1994–1995, 1997, 1999, 2003, 2005, 2007, 2009) and remotely operated vehicle (ROV) (2012–2013, 2015–2019) yelloweye rockfish density estimates with 95% confidence intervals (CI) and coefficient of variation (CV) by year and management area. The number of transects, yelloweye rockfish (YE), and meters surveyed included in each model are shown, along with the encounter rate of yelloweye rockfish. Values in bold were used for this stock assessment.

Area	Year	Number transects	Number YE ^b	Meters surveyed	Encounter rate (YE/m)	Density (YE/km ²)	Lower CI (YE/km ²)	Upper CI (YE/km ²)	CV
EYKT ^a	1995	17	330	22,896	0.014	2,711	1,776	4,141	0.20
	1997	20	350	19,240	0.018	2,576	1,459	4,549	0.28
	1999	20	236	25,198	0.009	1,584	1,092	2,298	0.18
	2003	20	335	17,878	0.019	3,825	2,702	5,415	0.17
	2009	37	215	29,890	0.007	1,930	1,389	2,682	0.17
	2015	33	251	22,896	0.008	1,755	1,065	2,891	0.25
	2017	35	134	33,960	0.004	1,072	703	1,635	0.21
	2019	33	288	33,653	0.009	1,562	951	2,566	0.25
CSEO	1994 ^c	-	-	-	-	1,683	-	-	0.10
	1995	24	235	39,368	0.006	2,929	-	-	0.19
	1997	32	260	29,273	0.009	1,631	1,224	2,173	0.14
	2003	101	726	91,285	0.008	1,853	1,516	2,264	0.10
	2007	60	301	55,640	0.005	1,050	830	1,327	0.12
	2012	46	118	38,590	0.003	752	586	966	0.13
	2016	32	160	30,726	0.005	1,101	833	1,454	0.14
	2018	35	193	33,700	0.006	898	672	1,199	0.14
NSEO	1994 ^c	13	62	17,622	0.004	765	383	1,527	0.33
	2016	36	125	34,435	0.004	701	476	1,033	0.20
	2018	30	95	29,792	0.003	553	388	788	0.16
SSEO	1994 ^c	13	99	18,991	0.005	1,173	-	-	0.29
	1999	41	360	41,333	0.009	2,376	1,615	3,494	0.20
	2005	32	276	28,931	0.010	2,357	1,634	3,401	0.18
	2013	31	118	30,439	0.004	986	641	1,517	0.22
	2018	32	345	31,073	0.011	1,624	988	2,667	0.25

^a Estimates for EYKT management area include only the Fairweather Grounds, which are composed of a West Bank and an East Bank. In 1997, only 2 of 20 transects and in 1999, no transects were performed on the East Bank that were used in the model. In other years, transects performed on both the East and West Bank were used in the model.

^b Subadult and adult yelloweye rockfish were included in the analyses to estimate density. A few small subadult yelloweye rockfish (based on visual assessments) were excluded from the 2012 and 2015 models based on size; length data were only available for the ROV surveys (not submersible surveys). Data were truncated at large distances for some models; therefore, the number of yelloweye rockfish included in the model does not necessarily equal the total number of yelloweye rockfish observed on the transects.

^c Only a side-facing camera was used in 1994 and earlier years to video fish. The forward-facing camera was added after 1994, which ensures that fish are observed on the transect line.

Table 14.5. Commercial landings (t) of demersal shelf rockfish (DSR) by species in Southeast Outside (SEO) Subdistrict from 2011–2020. Discards (at sea and at dock) and personal use included.

Species	2011	2012	2013	2014	2015^a	2016	2017	2018	2019	2020^b
Canary	0.34	2.87	2.88	0.26	0.66	1.13	0.72	3.04	1.25	0.52
China	0.02	0.02	0.05	0.02	0.02	0.11	0.05	0.06	0.07	0.14
Copper	0.01	0.04	0.03	0.01	0.01	0.15	0.11	0.08	0.05	0.08
Quillback	1.68	3.79	3.72	1.83	2.47	3.07	2.70	3.24	5.53	2.69
Rosethorn	-	0.02	0.04	-	0.02	0.17	0.28	0.16	0.07	0.01
Tiger	0.11	0.41	0.31	0.26	0.23	0.32	0.21	0.22	0.13	0.09
Yelloweye	106.16	173.31	205.74	94.05	99.96	108.65	115.47	130.20	137.38	89.66
Total (t)	108.32	180.46	212.77	96.43	103.37	113.60	119.54	137.00	144.48	93.19
Percent Yelloweye	98.01	96.04	96.70	97.53	96.70	95.64	96.60	95.04	95.09	96.21

^aAssignment of ADF&G groundfish management areas for DSR bycatch landed in the commercial salmon troll fishery began in 2015.

^bRepresents preliminary commercial harvest data through October 5, 2020. The directed commercial DSR fishery was closed in 2020.

Table 14.6. Other FMP groundfish species landed (t) in demersal shelf rockfish (DSR) directed commercial fisheries in the Southeast Outside (SEO) Subdistrict from 2011–2020. Discards (at sea and at dock) and personal use included.

Species	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020^a
Black rockfish	0.08	0.31	0.85	0.02	0.01	0.06	-	0.57	0.21	-
Bocaccio rockfish	<0.01	0.03	0.12	0.01	-	<0.01	-	0.03	0.01	-
Pacific cod	1.00	2.33	5.10	0.23	0.12	0.01	0.24	1.40	0.94	-
Redbanded rockfish	0.06	1.10	1.71	0.01	-	0.14	0.01	0.46	0.27	-
Dark rockfish	-	-	-	-	-	-	-	-	-	-
Dusky rockfish	0.32	3.84	5.35	2.12	3.23	2.38	2.27	1.94	0.49	-
Rougheye rockfish	<0.01	-	-	-	-	<0.01	-	-	<0.01	-
Shortraker rockfish	-	-	-	-	-	-	-	-	-	-
Silvergray rockfish	0.30	0.66	1.92	0.24	0.07	0.40	0.33	0.35	0.48	-
Skate, general	-	0.18	-	-	-	-	-	-	-	-
Spiny dogfish shark	-	0.17	-	-	-	-	-	-	-	-
Yellowtail rockfish	0.04	0.09	0.10	<0.01	<0.01	-	-	0.04	0.03	-
Total (t)	1.80	8.71	15.15	2.63	3.43	2.99	2.85	4.79	2.43	-

^aAll DSR management areas were closed to the directed commercial DSR fishery in Southeast Alaska in 2020.

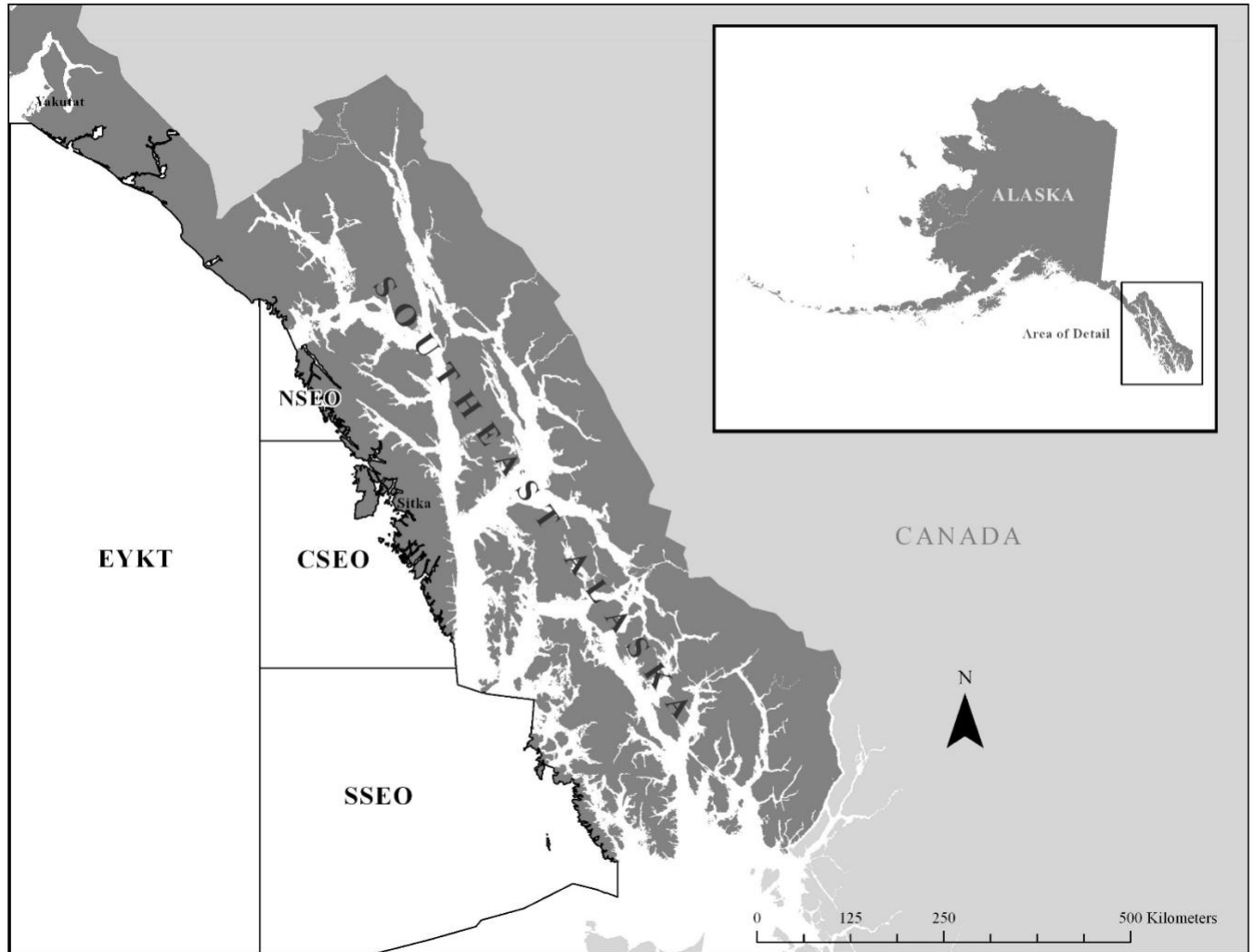


Figure 14.1. Demersal shelf rockfish (DSR) management area boundaries in the Southeast Outside (SEO) Subdistrict: East Yakutat (EYKT), Northern Southeast Outside (NSEO), Central Southeast Outside (CSEO), and Southern Southeast Outside (SSEO) Sections.

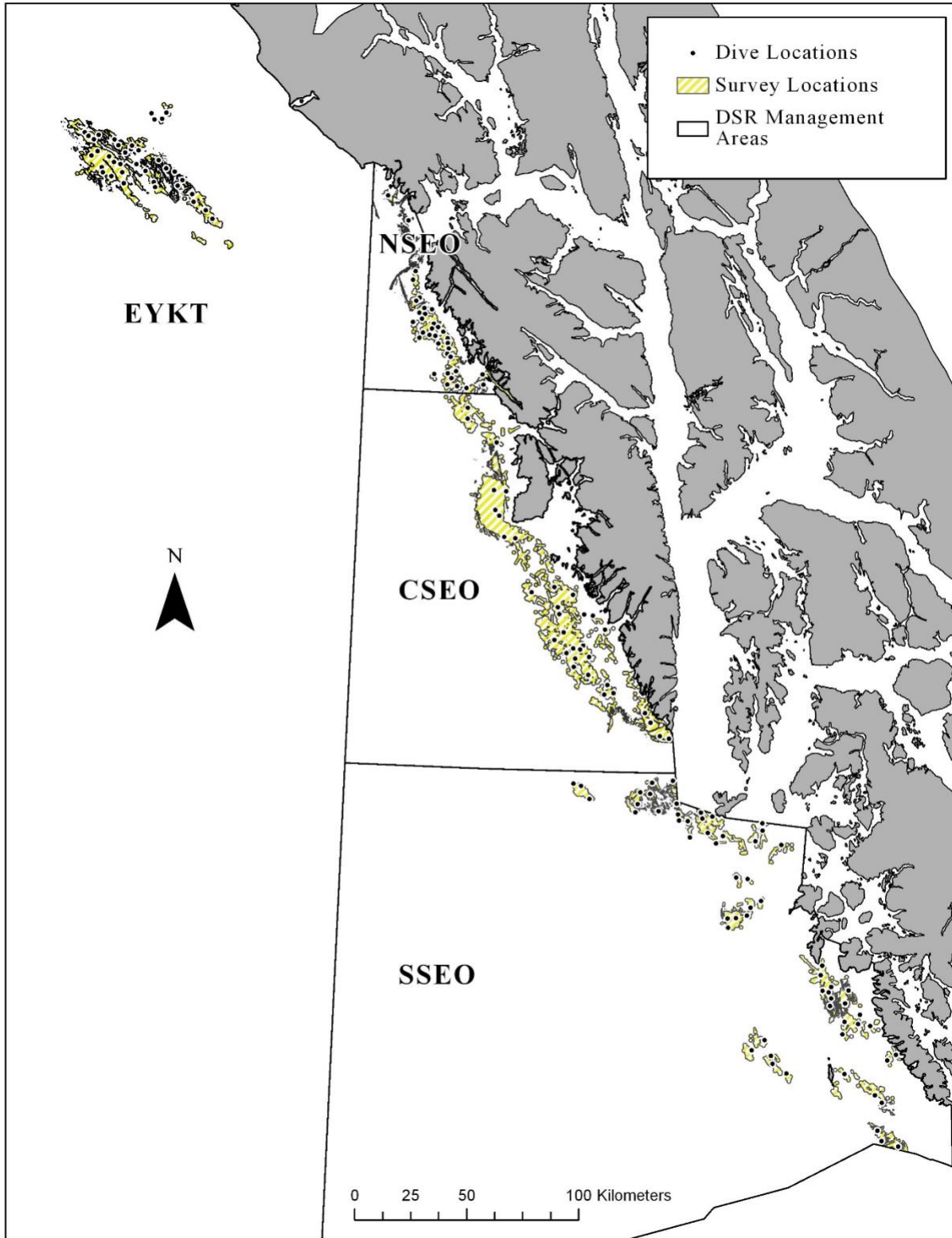


Figure 14.2. Remotely operated vehicle (ROV) transects conducted in Northern Southeast Outside (NSEO) and Central Southeast Outside (CSEO) in 2018, and East Yakutat (EYKT) in 2019. Southern Southeast Outside (SSEO) was surveyed in August 2020.

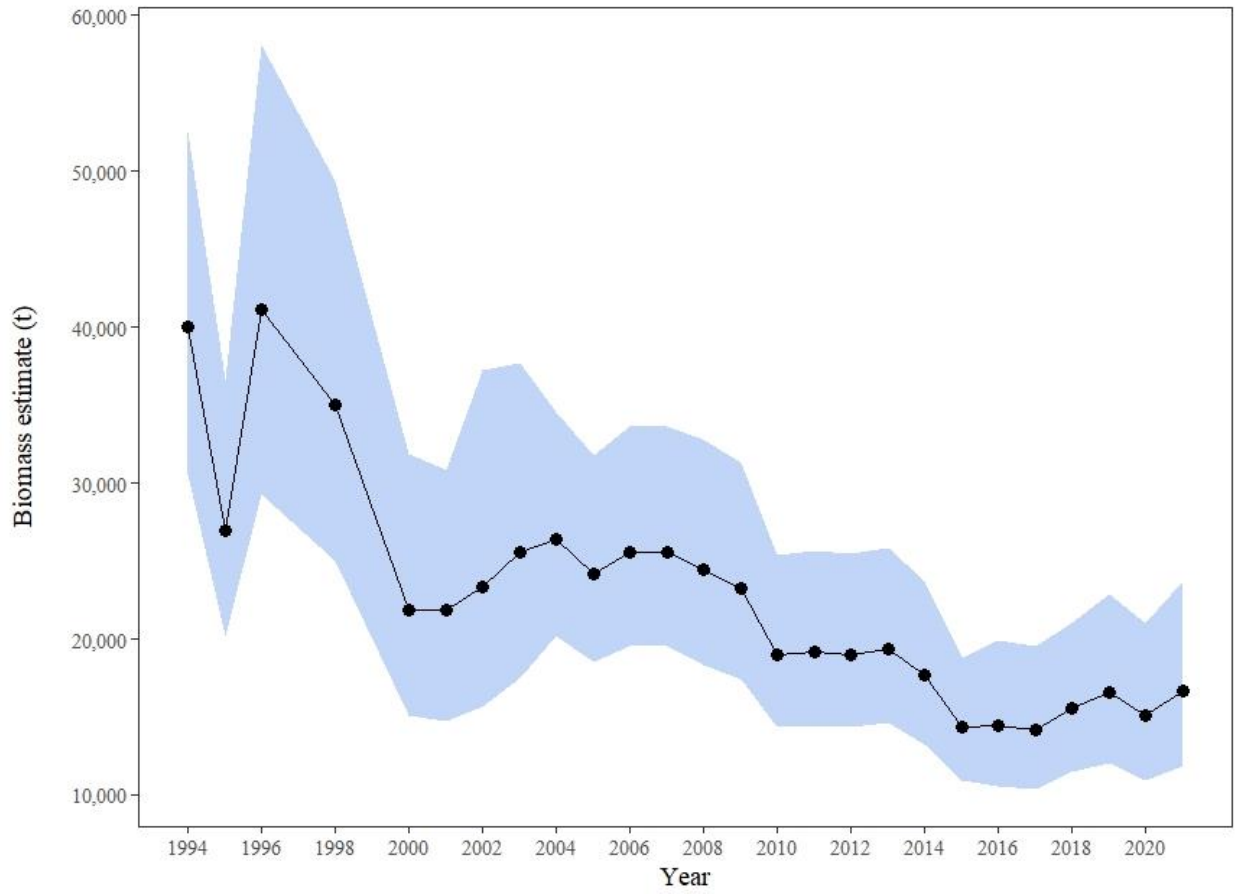


Figure 14.3. Yelloweye rockfish biomass estimate (t) (solid line) and 90% lower and upper confidence intervals (blue) for the Southeast Outside (SEO) Subdistrict, 1994–2021.

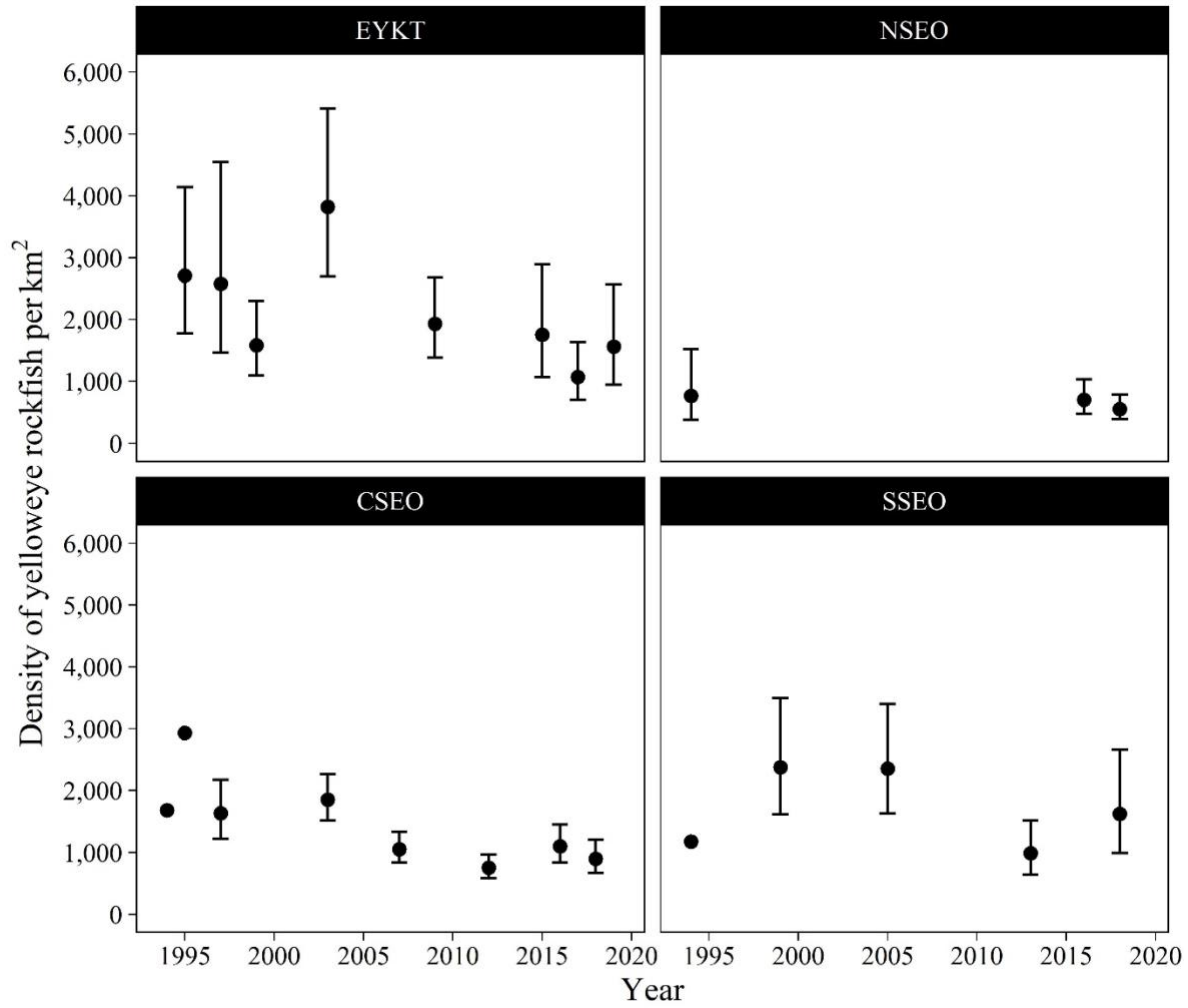


Figure 14.4. Density of yelloweye rockfish predicted by DISTANCE (circles) +/- two standard deviations in each management area (East Yakutat (EYKT), Northern Southeast Outside (NSEO), Central Southeast Outside (CSEO), and Southern Southeast Outside (SSEO) Sections), 1994–2019.

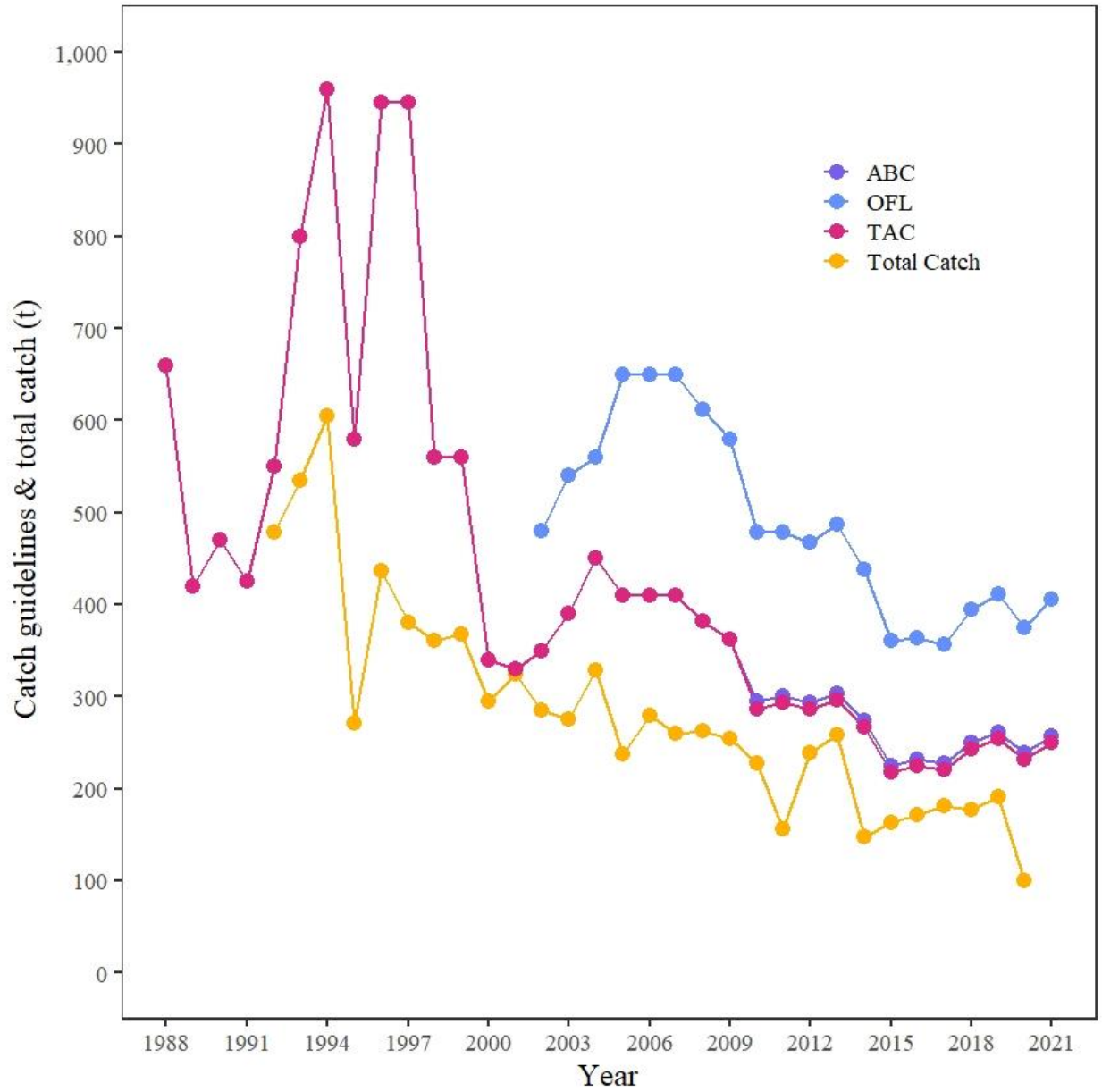


Figure 14.5. Demersal shelf rockfish (DSR) catch guidelines (overfishing level (OFL), allowable biological catch (ABC), and total allowable catch (TAC)) and total catch for the Southeast Outside (SEO) Subdistrict, 1988–2021. The directed DSR commercial and recreational fisheries were closed in all management areas in 2020; however, 2020 catch includes the estimated release mortality for the recreational fishery.

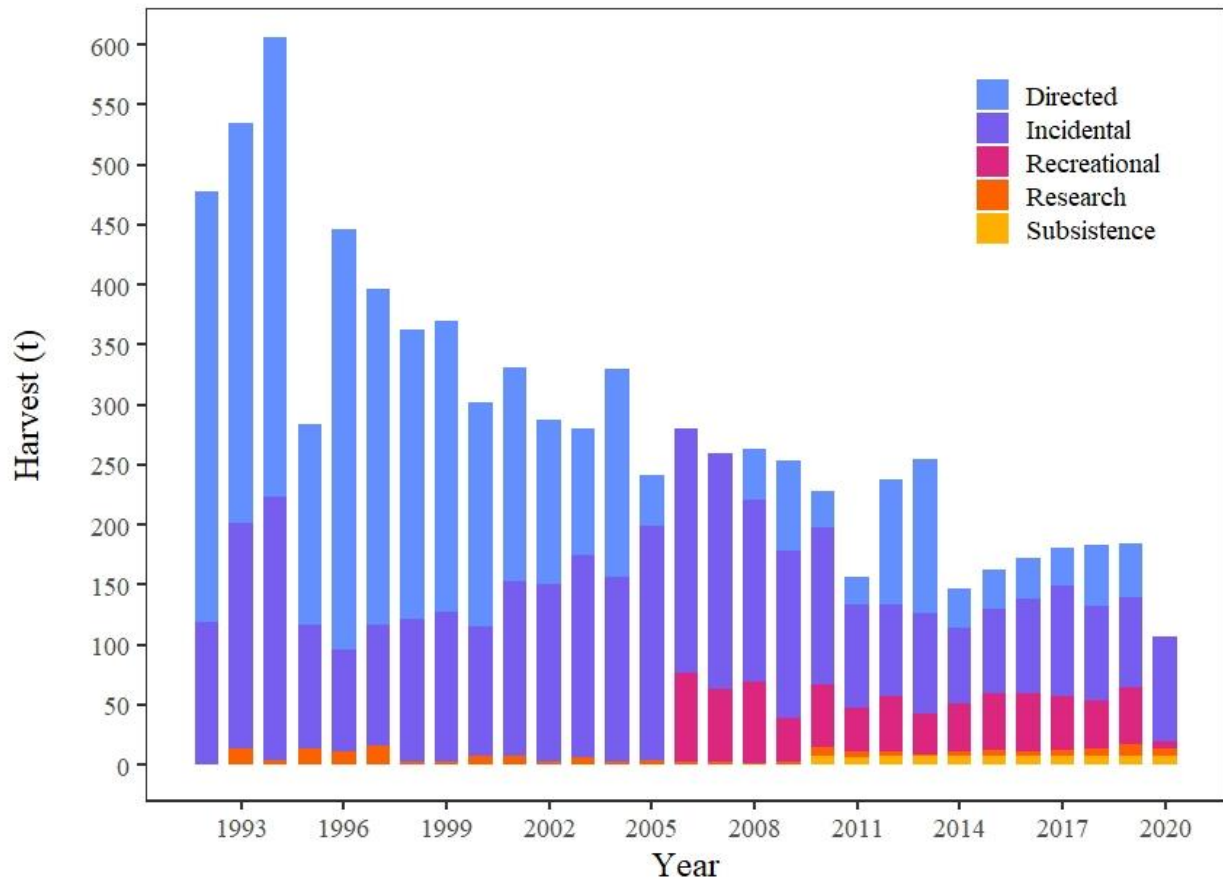


Figure 14.6. Demersal shelf rockfish (DSR) catch (t) by fishery type: commercial (directed and incidental), recreational, research (International Pacific Halibut Commission (IPHC) longline survey), and subsistence, 1992–2020. The directed DSR commercial and recreational fisheries were closed in all management areas in 2020; however, 2020 harvest includes the estimated release mortality for the recreational fishery. Data for the recreational fishery was updated through October 12, 2020.

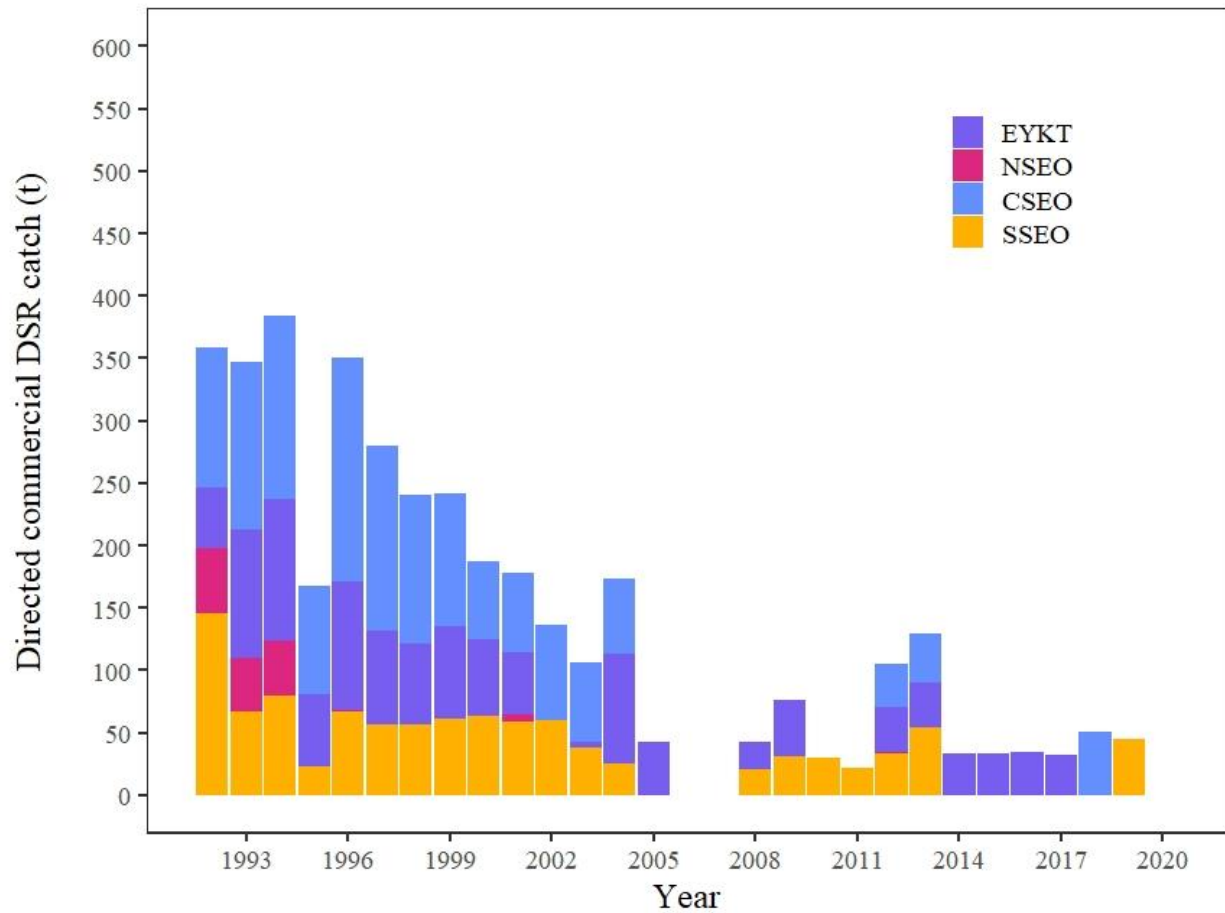


Figure 14.7. Directed commercial fishery catch (t) of demersal shelf rockfish (DSR) in the Southeast Outside (SEO) Subdistrict groundfish management areas: East Yakutat (EYKT), Northern Southeast Outside (NSEO), Central Southeast Outside (CSEO), and Southern Southeast Outside (SSEO) Sections, 1992–2020. The directed DSR commercial fishery was closed in all management areas in 2020.

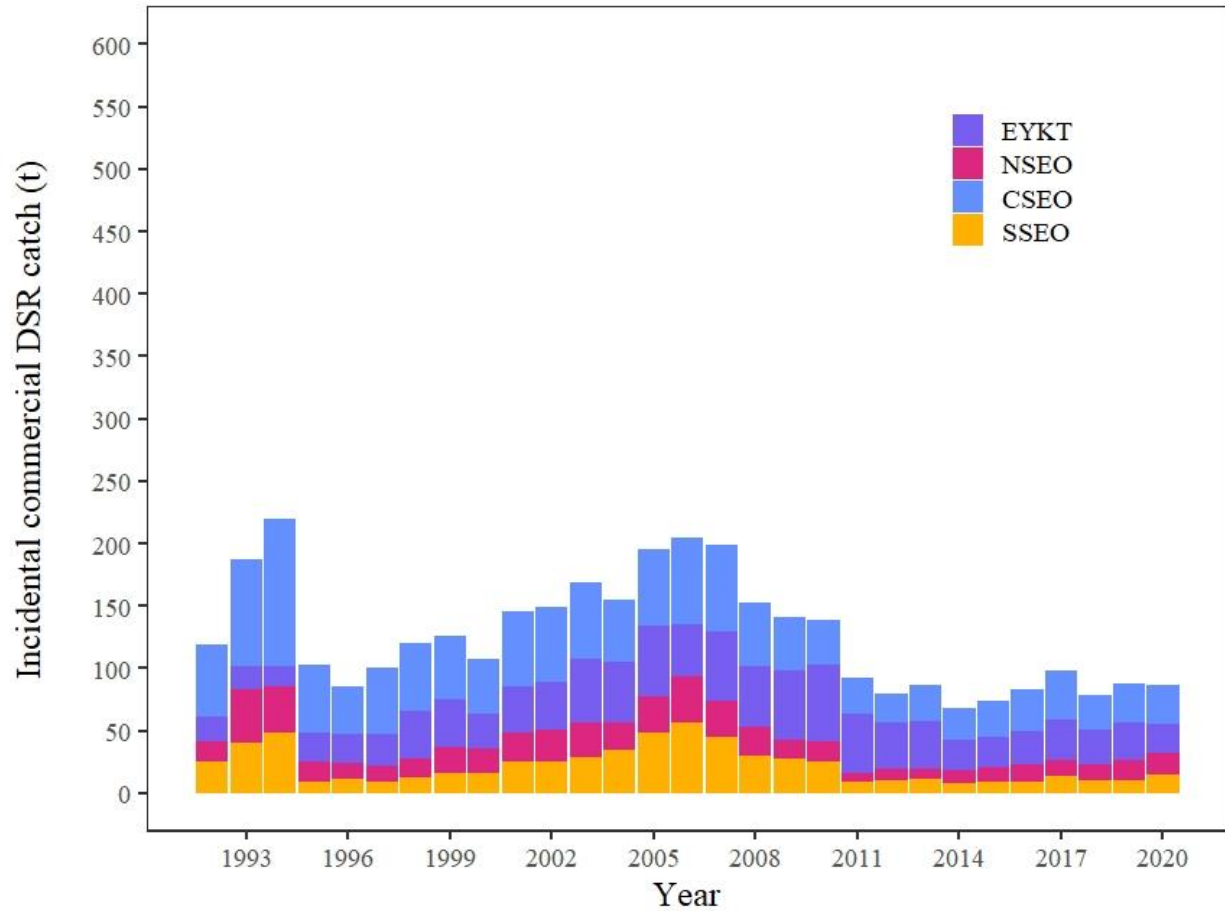


Figure 14.8. Incidental commercial fishery catch (t) of DSR in the halibut, sablefish, lingcod, Pacific cod, and salmon fisheries for Southeast Outside (SEO) Subdistrict groundfish management areas: East Yakutat (EYKT), Northern Southeast Outside (NSEO), Central Southeast Outside (CSEO), and Southern Southeast Outside (SSEO) Sections, 1992–2020. The 2020 data has been updated through October 5, 2020.