



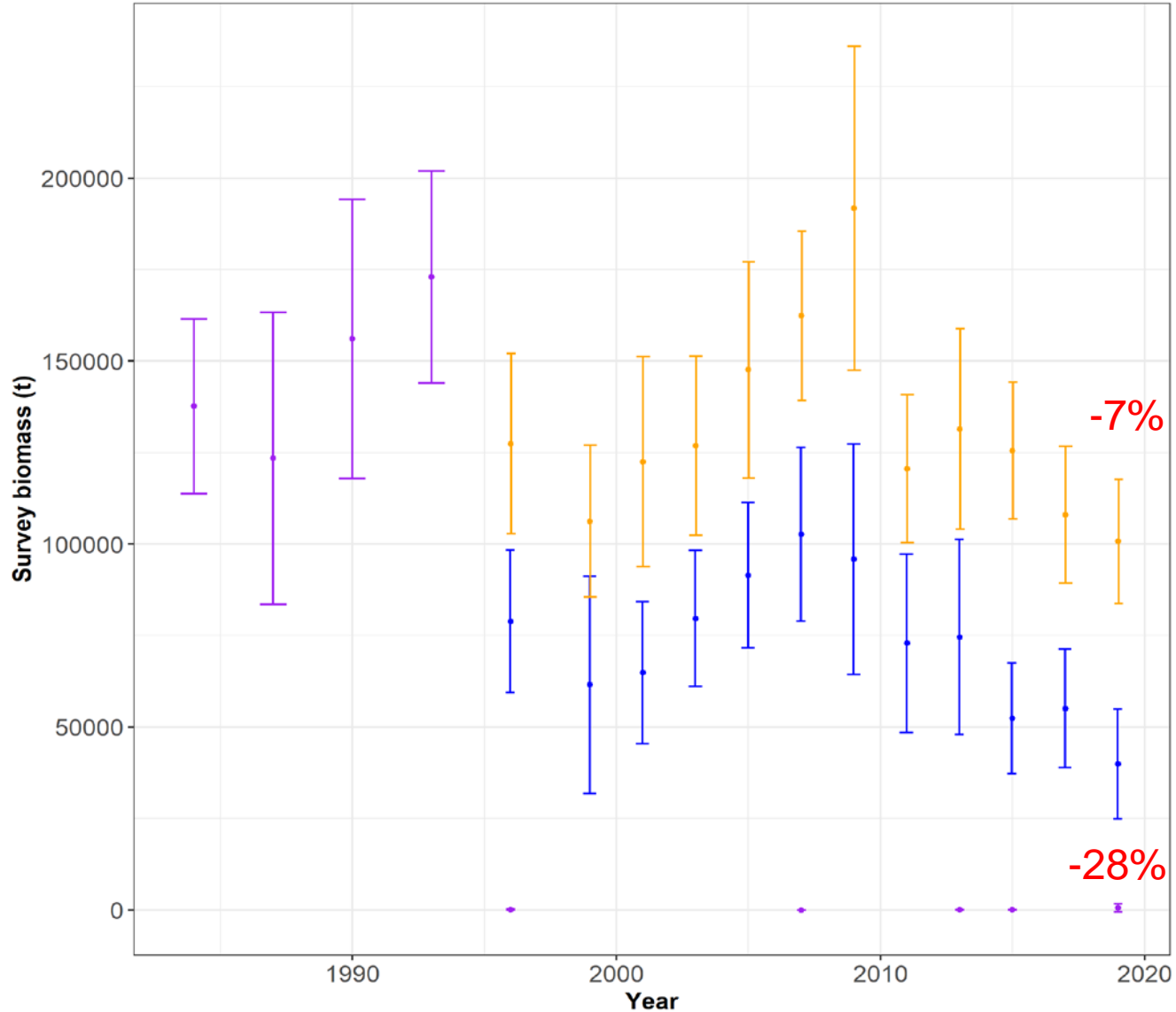
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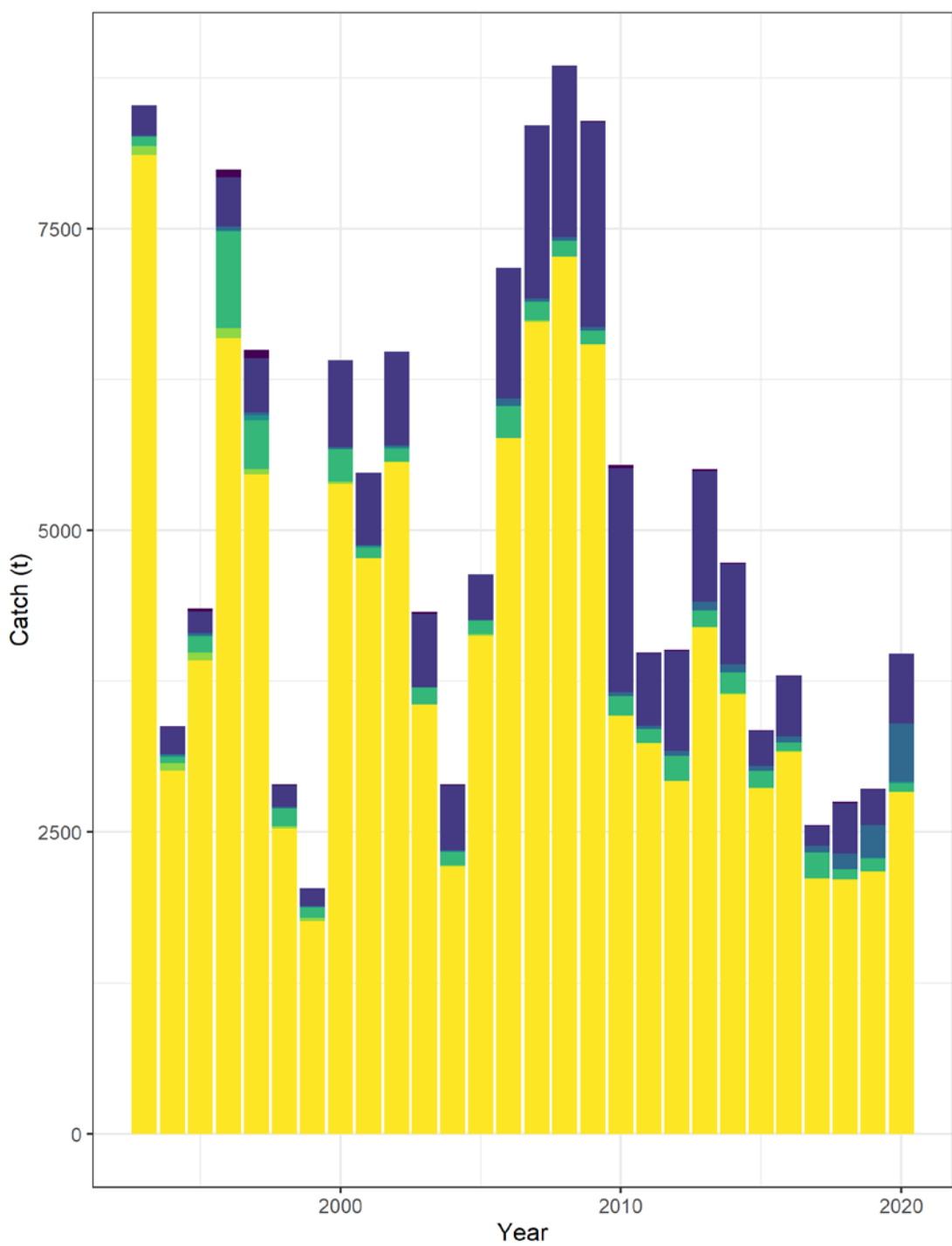
Assessment of northern and southern rock sole stocks in the Gulf of Alaska

Meaghan Bryan and Wayne Palsson

Survey biomass estimates

Common.Name — northern rock sole — rock sole unid. — southern rock sole





Projections

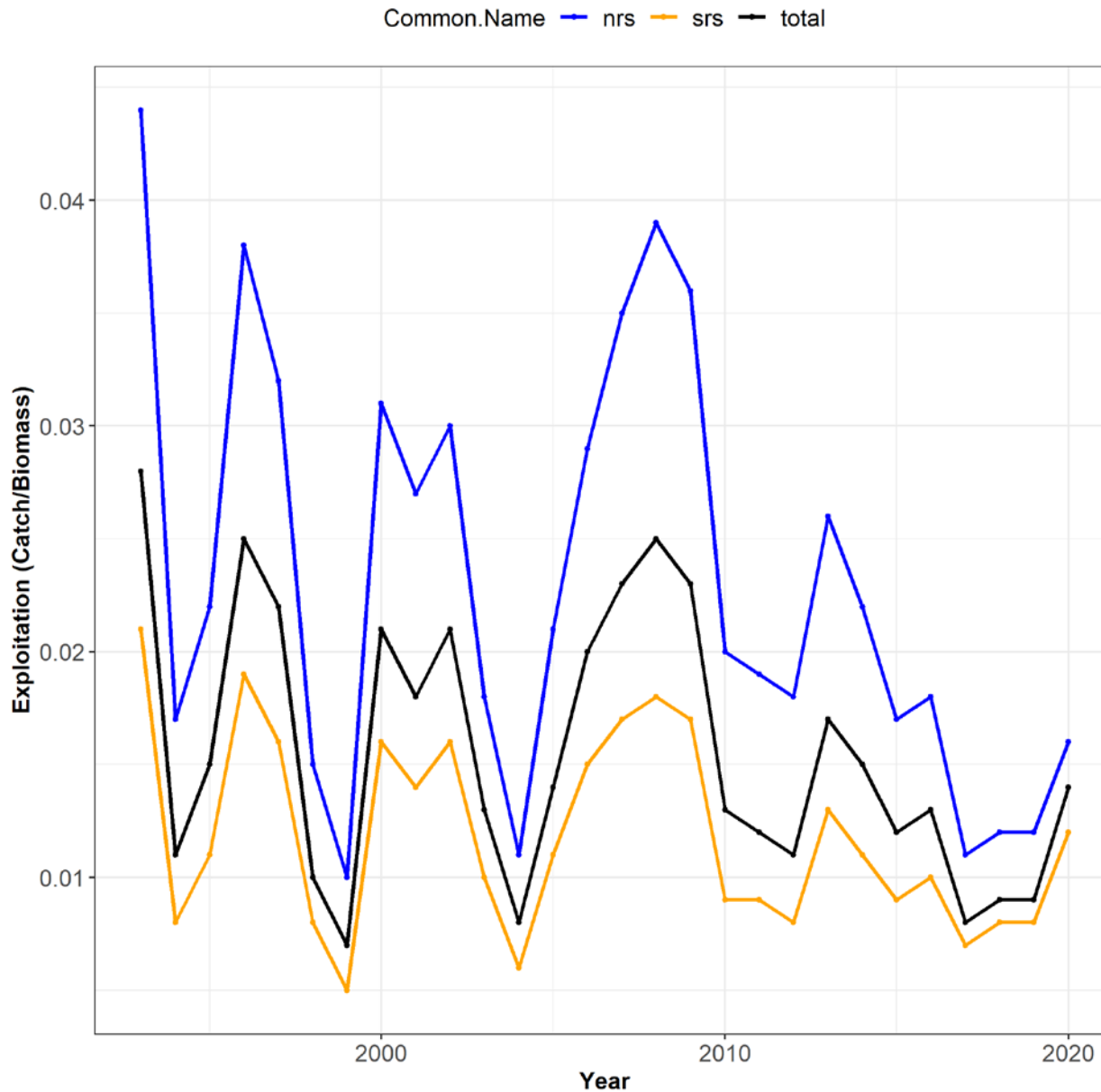
- Tier 3 projection model
- Updated 2019 catch estimates (half of total)
 - Previous estimate: 880 t
 - Final from AKRO Catch Accounting System: 1,086 t
- 2020 catch estimate
 - Expanded the October 30th total catch (2,831 t) by 1.082
 - Estimate used in projection model: 1,531 t (half of total)
 - Estimate used in 2019 projections: 880t
- 2021 catch estimate
 - 1,531 t



Quantity	As estimated or <i>recommended last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2020	2021	2021	2022
<i>M</i> (natural mortality rate; female, male)	0.2, 0.253*	0.2, 0.253*	0.2, 0.253*	0.2, 0.253*
Tier	3a	3a	3a	3a
Projected total (age 0+) biomass (t)	94,619	95,275	94,612	94,614
Projected Female spawning biomass (t)	47,701	46,643	47,694	46,330
$B_{100\%}$	51,387	51,387	51,387	51,387
$B_{40\%}$	20,555	20,555	20,555	20,555
$B_{35\%}$	17,985	17,985	17,985	17,985
F_{OFL}	0.462	0.462	0.462	0.462
$maxF_{ABC}$	0.382	0.382	0.382	0.382
F_{ABC}	0.382	0.382	0.382	0.382
OFL (t)	20,962	21,246	21,080	21,191
maxABC (t)	17,655	17,897	17,756	17,851
ABC (t)	17,655	17,897	17,756	17,851
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2018	2019	2019	2020
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2020	2021	2021	2022
M (natural mortality rate; female, male)	0.2, 0.262*	0.2, 0.262*	0.2, 0.262*	0.2, 0.262*
Tier				
Projected total (age 0+) biomass (t)	142,193	145,405	144,833	148,917
Projected Female spawning biomass (t)	71,643	71,340	72,973	73,930
$B_{100\%}$	93,518	93,518	93,518	93,518
$B_{40\%}$	37,407	37,407	37,407	37,407
$B_{35\%}$	32,731	32,731	32,731	32,731
F_{OFL}	0.326	0.326	0.326	0.326
$maxF_{ABC}$	0.271	0.271	0.271	0.271
F_{ABC}	0.271	0.271	0.271	0.271
OFL (t)	26,491	27,326	27,204	27,943
maxABC (t)	22,390	23,094	22,990	23,614
ABC (t)	22,390	23,094	22,990	23,614
	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
Status	2018	2019	2019	2020
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Catch-biomass ratios





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Assessment of the shallow-water flatfish stock complex in the Gulf of Alaska

						<i>As specified last year for:</i>				<i>As recommended this year for:</i>			
						2020		2021		2021		2022	
				2020	2021								
Species	Tier	FABC	FOFL	Biomass ¹	Biomass ¹	ABC	OFL	ABC	OFL	ABC	OFL	ABC	OFL
Northern rock sole	3a	0.382	0.462	94,619	94,612	17,655	20,962	17,897	21,246	17,756	21,080	17,851	21,191
Southern rock sole	3a	0.271	0.326	142,193	144,833	22,390	26,491	23,094	27,326	22,990	27,204	23,614	27,943
Yellowfin sole	5	0.15	0.2	31,259	31,259	4,689	6,252	4,689	6,252	4,689	6,252	4,689	6,252
Butter sole	5	0.15	0.2	14,304	14,304	2,146	2,861	2,146	2,861	2,146	2,861	2,146	2,861
Starry flounder	5	0.15	0.2	30,605	30,605	4,591	6,121	4,591	6,121	4,591	6,121	4,591	6,121
English sole	5	0.15	0.2	16,943	16,943	2,541	3,389	2,541	3,389	2,541	3,389	2,541	3,389
Sand sole	5	0.15	0.2	2,673	2,673	401	535	401	535	401	535	401	535
Alaska plaice	5	0.15	0.2	6,997	6,997	1,050	1,399	1,050	1,399	1,050	1,399	1,050	1,399
Total						55,463	68,010	56,409	69,129	56,164	68,841	56,883	69,691

Quantity	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2020	2021	2021	2022
M (natural mortality rate) ¹	0.2	0.2	0.2	0.2
Tier	3a and 5	3a and 5	3a and 5	3a and 5
Biomass (t)	339,593	343,461	342,226	346,312
F_{OFL}	*	*	*	*
$maxF_{ABC}$	*	*	*	*
F_{ABC}	*	*	*	*
OFL (t)	68,010	69,129	68,841	69,691
maxABC (t)	55,463	56,409	56,164	56,883
ABC (t)	55,463	56,409	56,164	56,883
Status	As determined <i>last year for:</i>		As determined <i>this year for:</i>	
	2018	2019	2019	2020
Overfishing	No	NA	No	NA

Area apportionment

	Central	Southeast	Western	W. Yakutat	Total
Area Apportionment	50%	2%	43%	5%	100%
2021 Area ABC (t)	28,082	1,123	24,151	2,808	56,164
2022 Area ABC (t)	28,442	1,138	24,460	2,844	56,883

Summary

Stock/Assemblage	Area	2020				2021		2022	
		OFL	ABC	TAC	Catch ¹	OFL	ABC	OFL	ABC
Shallow-water flatfish	W	--	23,849	13,250	74	--	24,151	--	24,460
	C	--	27,732	27,732	2,791	--	28,082	--	28,442
	WYAK	--	2,773	2,773	<1	--	2,808	--	2,844
	SEO	--	1,109	1,109	1.47	--	1,123	--	1,138
	Total		68,010	55,463			68,841	56,164	69,691

