



Stock projections and the harvest decision table for 2024-2026

Agenda item 7.1
IPHC-2024-IM099-12 Rev_1
(I. Stewart, & A. Hicks)

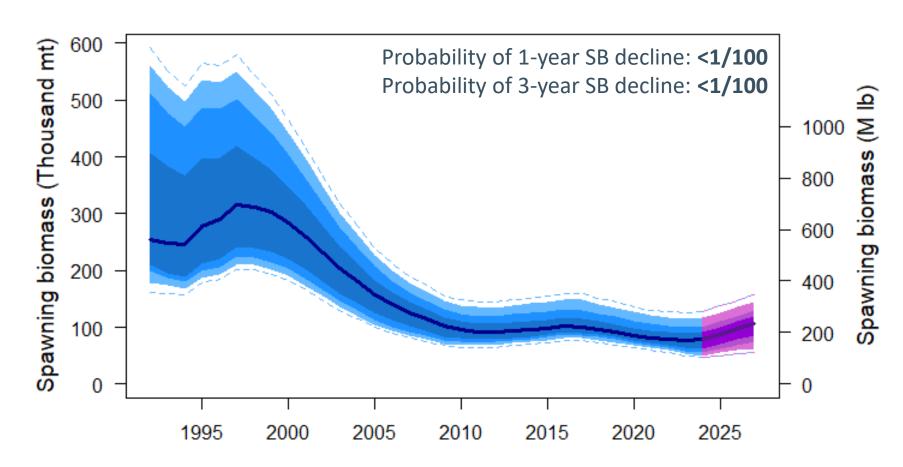


Projections and harvest decision table for 2024

- Project a constant TCEY for the next 3 years
- Calculate the probabilities of: stock decline, dropping below stock reference points, fishery decline, exceeding the reference $F_{43\%}$ fishing intensity
- Include a range of mortality levels:
 - No fishing
 - Status quo +/- 5 and 10%
 - 1-year surplus production (<=50% chance of dropping below current SB)
 - 3-year surplus production
 - F_{43%} Reference
 - $F_{40\%}$ Maximum Economic Yield (*MEY*) proxy
 - F_{35%} Maximum Sustainable Yield (*MSY*) proxy

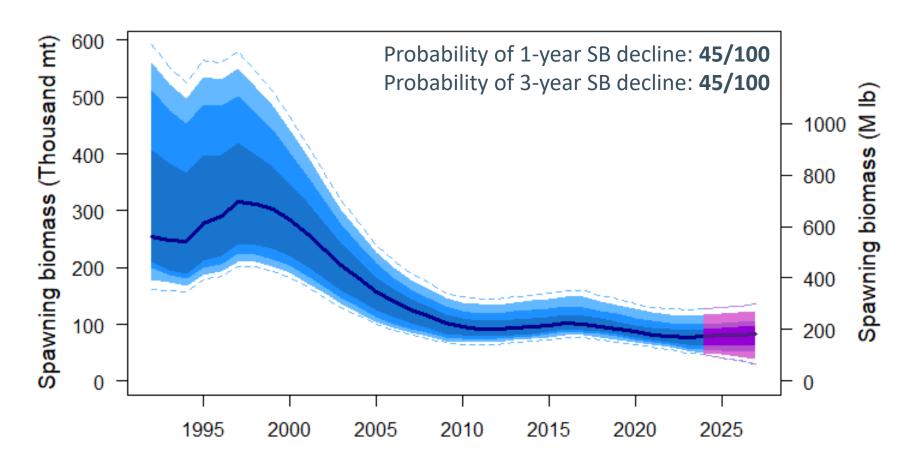


Projections: no fishing mortality



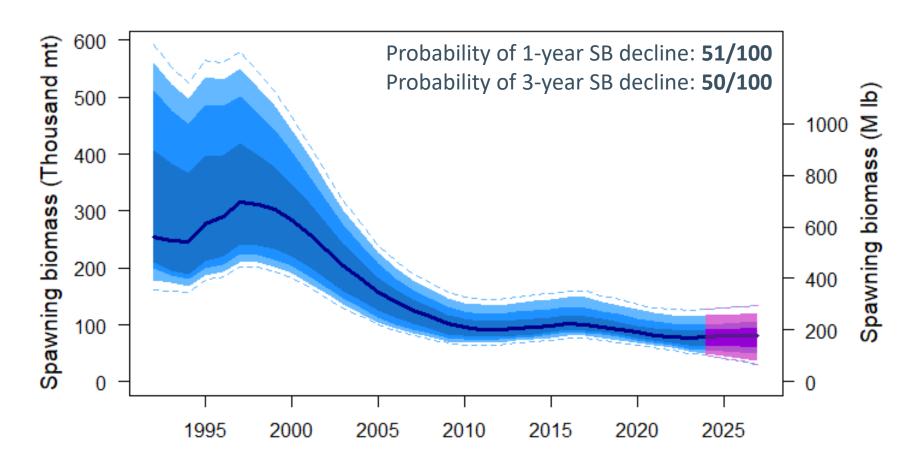


Projections: status quo (36.97 Mlb TCEY)



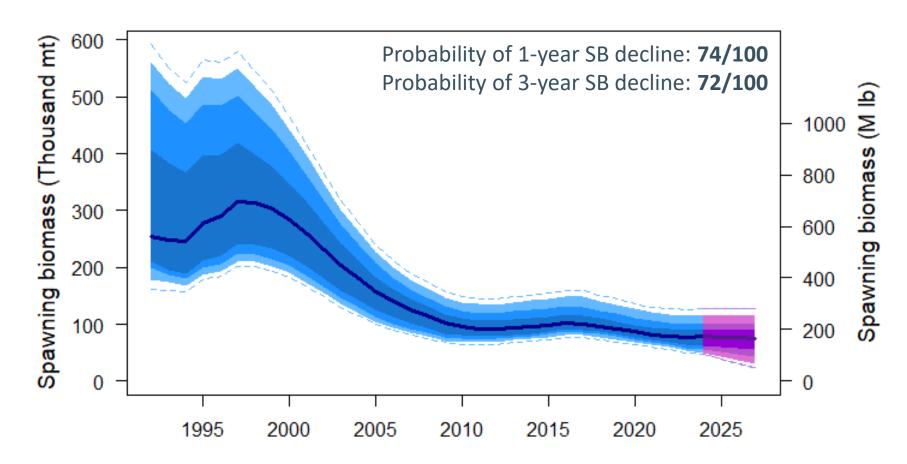


Projections: 3-year surplus (39.1 Mlb)



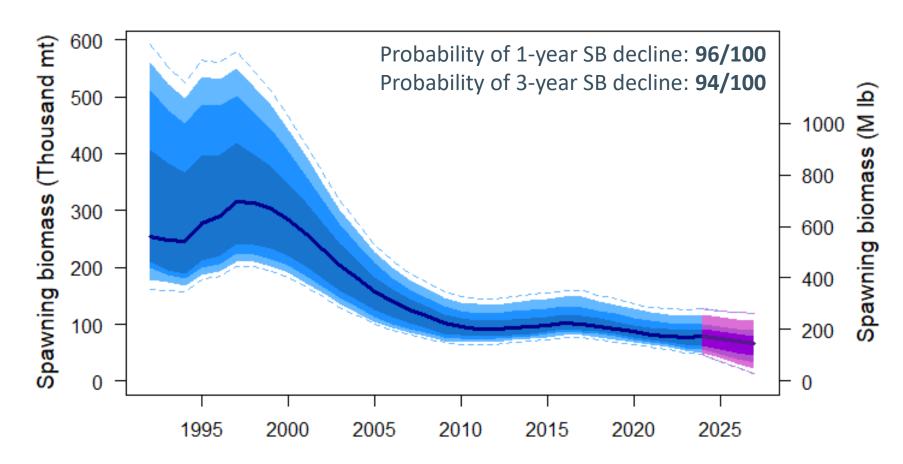


Projections: $F_{43\%}$ Reference (48.9 Mlb)





Projections: $F_{35\%}$ MSY proxy (65.7 Mlb)





Decision table

2024 Alternative

Total mortality (M Ib)

TCEY (M Ib)

2024 fishing intensity

Fishing intensity interval

0.0
0.0
F _{100%}

21.6
20.0
F _{68%}
46-79%

Status quo -10%	Status quo -5%	Status quo	Status quo +5%	3-Year Surplus	Status quo +10%		Reference F _{43%}	MEY proxy
34.9	36.7	38.6	40.4	40.7	42.3	46.6	50.5	56.1
33.3	35.1	37.0	38.8	39.1	40.7	45.0	48.9	54.5
F _{54%}	F _{52%}	F _{51%}	F _{50%}	F _{49%}	F _{48%}	F _{45%}	F _{43%}	F _{40%}
32-68%	31-67%	29-65%	28-64%	28-64%	27-63%	25-60%	23-58%	20-55%

Increasing mortality/fishing intensity →
Increasing risk →



MSY

proxy

67.3

65.7

F_{35%}

17-50%

Decision table

	Status quo -10%	Status quo -5%	Status quo	Status quo +5%	3-Year Surplus	Status quo +10%		Reference F _{43%}	MEY proxy	MSY proxy				
	Total mortality (M lb) 0.0 2					36.7	38.6	40.4	40.7	42.3	46.6	50.5	56.1	67.3
	TCEY (M Ib) 0.0 20.0					35.1	37.0	38.8	39.1	40.7	45.0	48.9	54.5	65.7
	2	2024 fishing intensity	F _{100%}	F _{68%}	F _{54%}	F _{52%}	F _{51%}	F _{50%}	F _{49%}	F _{48%}	F _{45%}	F _{43%}	F _{40%}	F _{35%}
Fishing intensity interval 46-79%					32-68%	31-67%	29-65%	28-64%	28-64%	27-63%	25-60%	23-58%	20-55%	17-50%
	in 2024	is less than 2023	<1	7	35	40	45	50	51	55	66	74	85	96
		is 5% less than 2023	<1	<1	7	9	12	15	15	18	26	33	44	69
Stock Trend	in 2025	is less than 2023	<1	8	35	40	45	50	50	54	65	74	84	95
(spawning biomass)		is 5% less than 2023	<1	2	17	20	24	28	29	32	42	51	64	85
	in 2026	is less than 2023	<1	10	36	40	45	49	50	54	64	72	82	94
		is 5% less than 2023	<1	4	23	26	30	34	35	39	49	57	69	87

Risk of three-year SB decline



Decision table

	Status quo -10%	Status quo -5%	Status quo	Status quo +5%	3-Year Surplus	Status quo +10%		Reference F _{43%}	MEY proxy	MSY proxy				
	Total mortality (M lb) 0.0 21.0						38.6	40.4	40.7	42.3	46.6	50.5	56.1	67.3
TCEY (M Ib) 0.0				20.0	33.3	35.1	37.0	38.8	39.1	40.7	45.0	48.9	54.5	65.7
	F _{68%}	F _{54%}	F _{52%}	F _{51%}	F _{50%}	F _{49%}	F _{48%}	F _{45%}	F _{43%}	F _{40%}	F _{35%}			
Fishing intensity interval 46-79%					32-68%	31-67%	29-65%	28-64%	28-64%	27-63%	25-60%	23-58%	20-55%	17-50%
	in 2024	is less than 30%	25	25	25	25	25	25	25	25	26	26	26	26
		is less than 20%	<1	<1	1	2	2	2	2	2	3	4	5	9
Stock Status	in 2025 -	is less than 30%	21	24	25	25	25	25	25	25	25	25	26	26
(Spawning biomass)		is less than 20%	<1	<1	2	2	2	3	3	3	5	7	9	16
	in 2026	is less than 30%	8	21	24	25	25	25	25	25	25	25	26	26
		is less than 20%	<1	<1	2	2	3	3	3	4	6	8	12	19

Three-year risks of dropping below $SB_{30\%}$ and $SB_{20\%}$



Full decision table

	2024 Alternative					Status quo -5%	Status quo	Status quo +5%	3-Year Surplus	Status quo +10%		Reference F 43%	MEY proxy	MSY proxy
ble	,	Total mortality (M lb)	0.0	21.6	34.9	36.7	38.6	40.4	40.7	42.3	46.6	50.5	56.1	67.3
		TCEY (M Ib)	0.0	20.0	33.3	35.1	37.0	38.8	39.1	40.7	45.0	48.9	54.5	65.7
	2	2024 fishing intensity	F _{100%}	F _{68%}	F _{54%}	F _{52%}	F _{51%}	F _{50%}	F _{49%}	F _{48%}	F _{45%}	F _{43%}	F _{40%}	F _{35%}
		46-79%	32-68%	31-67%	29-65%	28-64%	28-64%	27-63%	25-60%	23-58%	20-55%	17-50%		
	In 2024	is less than 2023	<1	7	35	40	45	50	51	55	66	74	85	96
		is 5% less than 2023	<1	<1	7	9	12	15	15	18	26	33	44	69
Stock Trend (spawning biomass)	in 2025	is less than 2023	<1	8	35	40	45	50	50	54	65	74	84	95
	IN 2023	is 5% less than 2023	<1	2	17	20	24	28	29	32	42	51	64	85
	L. 0000	is less than 2023	<1	10	36	40	45	49	50	54	64	72	82	94
	in 2026	is 5% less than 2023	<1	4	23	26	30	34	35	39	49	57	69	87
	in 2024	is less than 30%	25	25	25	25	25	25	25	25	26	26	26	26
	in 2024	is less than 20%	<1	<1	1	2	2	2	2	2	3	4	5	9
Stock Status	In 2025	is less than 30%	21	24	25	25	25	25	25	25	25	25	26	26
(Spawning biomass)	111 2020	is less than 20%	<1	<1	2	2	2	3	3	3	5	7	9	16
	In 2026	is less than 30%	8	21	24	25	25	25	25	25	25	25	26	26
		is less than 20%	<1	<1	2	2	3	3	3	4	6	8	12	19
	in 2024	is less than 2023	0	<1	25	27	28	30	31	33	41	50	63	85
	III 2024	is 10% less than 2023	0	<1	23	25	26	27	27	29	34	41	52	75
Fishery Trend	I 000F	is less than 2023	0	1	25	26	28	30	31	33	42	51	65	87
(TCEY)	in 2025	is 10% less than 2023	0	<1	22	24	26	27	27	29	35	42	55	78
	I 0000	is less than 2023	0	1	24	26	28	30	31	33	42	52	67	88
	in 2026	is 10% less than 2023	0	<1	21	23	25	27	27	29	35	43	57	81
Fishery Status (Fishing Intensity)	in 2023	is above F _{43%}	0	<1	26	27	29	31	32	34	42	50	62	82



Risks not included in the decision table

- Stock is at the lowest absolute population level in the last 30+ years (actual number or biomass of fish in the water)
 - Recent poor recruitment and low weight-at-age have resulted in low productivity relative to the long-term average
 - Low catch-rates in the FISS and directed commercial fisheries
- Biological Region 3 is currently at the lowest observed proportion of the coastwide biomass since 1993 (the full historical range is unknown)
- Ecosystem/climate uncertainty remains high
 - Unclear when/if we should expect to see long term average productivity levels



Recent adopted TCEYs

	2A	2B	2C	3A	3B	4A	4B	4CDE	Total
2013	1.11	7.78	5.02	17.07	5.87	2.43	1.93	4.28	45.48
2014	1.11	7.64	5.47	12.05	3.73	1.56	1.49	3.58	36.65
2015	1.06	7.91	6.20	13.00	3.72	1.96	1.53	4.27	39.63
2016	1.26	8.24	6.54	12.75	3.41	1.95	1.37	4.07	39.59
2017	1.47	8.32	7.04	12.96	3.98	1.80	1.34	3.84	40.74
2018	1.32	7.10	6.34	12.54	3.27	1.74	1.28	3.62	37.21
2019	1.65	6.83	6.34	13.50	2.90	1.94	1.45	4.00	38.61
2020	1.65	6.83	5.85	12.20	3.12	1.75	1.31	3.90	36.60
2021	1.65	7.00	5.80	14.00	3.12	2.05	1.40	3.98	39.00
2022	1.65	7.56	5.91	14.55	3.90	2.10	1.45	4.10	41.22
2023	1.65	6.78	5.85	12.08	3.67	1.73	1.36	3.85	36.97



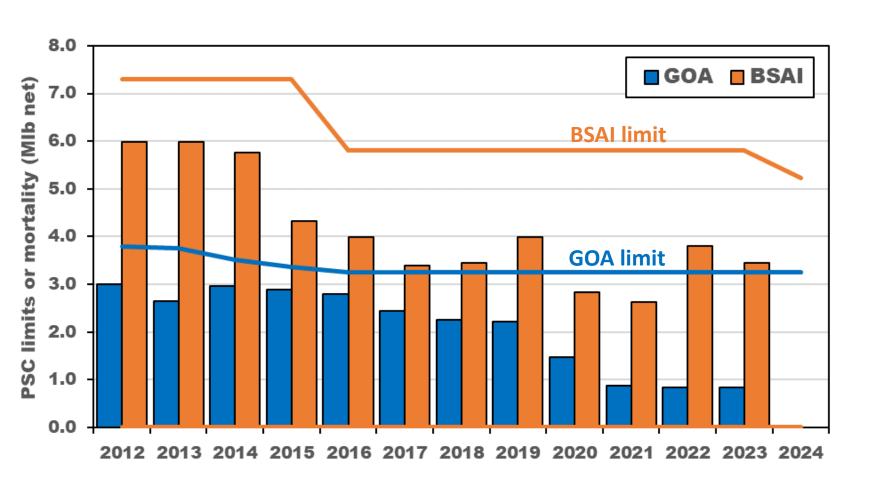
Recent adopted TCEYs

'Reference' TCEY

	2A	2B	2C	3A	3B	4A	4B	4CDE	Total	Coastwide	
2013	1.11	7.78	5.02	17.07	5.87	2.43	1.93	4.28	45.48	36.63	"Blue line"
2014	1.11	7.64	5.47	12.05	3.73	1.56	1.49	3.58	36.65	33.48	
2015	1.06	7.91	6.20	13.00	3.72	1.96	1.53	4.27	39.63	35.48	
2016	1.26	8.24	6.54	12.75	3.41	1.95	1.37	4.07	39.59	36.31	F _{46%}
2017	1.47	8.32	7.04	12.96	3.98	1.80	1.34	3.84	40.74	39.10	
2018	1.32	7.10	6.34	12.54	3.27	1.74	1.28	3.62	37.21	31.00	
2019	1.65	6.83	6.34	13.50	2.90	1.94	1.45	4.00	38.61	40.00	
2020	1.65	6.83	5.85	12.20	3.12	1.75	1.31	3.90	36.60	31.90	
2021	1.65	7.00	5.80	14.00	3.12	2.05	1.40	3.98	39.00	39.00	F _{43%}
2022	1.65	7.56	5.91	14.55	3.90	2.10	1.45	4.10	41.22	41.22	
2023	1.65	6.78	5.85	12.08	3.67	1.73	1.36	3.85	36.97	51.95	
2024										48.88	+



Non-directed discard management in Alaska



Prohibited Species Catch (*PSC*) limits (Mlb net)

BSAI:

Trawl LA=1.23, Non-Trawl=1.17, CDQ=0.52, A80= $2.89 \rightarrow 2.31$

GOA:

Trawl (2.82), H&L (0.44)



Recommendations

That the Commission:

- 1) NOTE paper IPHC-2023-IM099-12 Rev_1, which provides a summary of projections and the harvest decision table for 2024-2026.
- 2) REQUEST any additional harvest decision table alternatives for evaluation at AM100.
- 3) REQUEST any detailed mortality projections¹ for 2024 (by IPHC Regulatory Area and fishery sector) for evaluation at AM100.

¹Detailed projections will include revised non-directed discard estimates through the end of 2023, available in early January.



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