D2 GOA Tanner crab protections discussion paper

Diana Stram
Council
April 2025

Action by Council

- Review the discussion paper
- Action as necessary

Council Motion
D2 GOA Tanner crab protections
February 12, 2024

The Council requests an expanded discussion paper to inform potential closures to protect Gulf Tanner crab. The paper should also include the following:

- Staff should work with ADF&G to identify the areas of highest Tanner crab abundance inside the Barnabas gully in statistical areas 525702 and 525630 for consideration of a smaller closure area.
- Consider modifications to existing closures off the east side of Kodiak Island to consider comprehensive impacts of closures on groundfish fleet.
- Tanner crab distribution in the Kodiak District and to the extent practicable, the proportion of annual surveyed abundance of Kodiak District Tanner crab from 2012 to 2023 in statistical areas 525702 and 525630.
- Updated tables for trawl (PTR, NPT) and Pacific cod pot (POT) pot gear groundfish harvests and Tanner crab PSC from 2012 to 2023. Separate tables for catcher vessels and catcher processors as possible given confidentiality rules.
- Value of the NPT, PTR, POT groundfish and directed Tanner crab fisheries in statistical areas 525702 and 525630 and the Central Gulf of Alaska.
- NPT, PTR, POT groundfish and directed Tanner crab fishery landings by month and the resulting impacts of fishery timing on processing capacity in Kodiak.

Outline

1. Existing closures for crab around Kodiak and proportion of surveyed Red King crab and Tanner crab by sex and maturity present in each area
2. Current surveyed abundance and concentrations in the east side of Kodiak (2012-2024)
3. Groundfish Tanner crab PSC, groundfish harvests, timing and value
4. Directed Tanner crab harvests, timing and value
5. Processing considerations
6. Closure considerations

Existing closures to protect crab

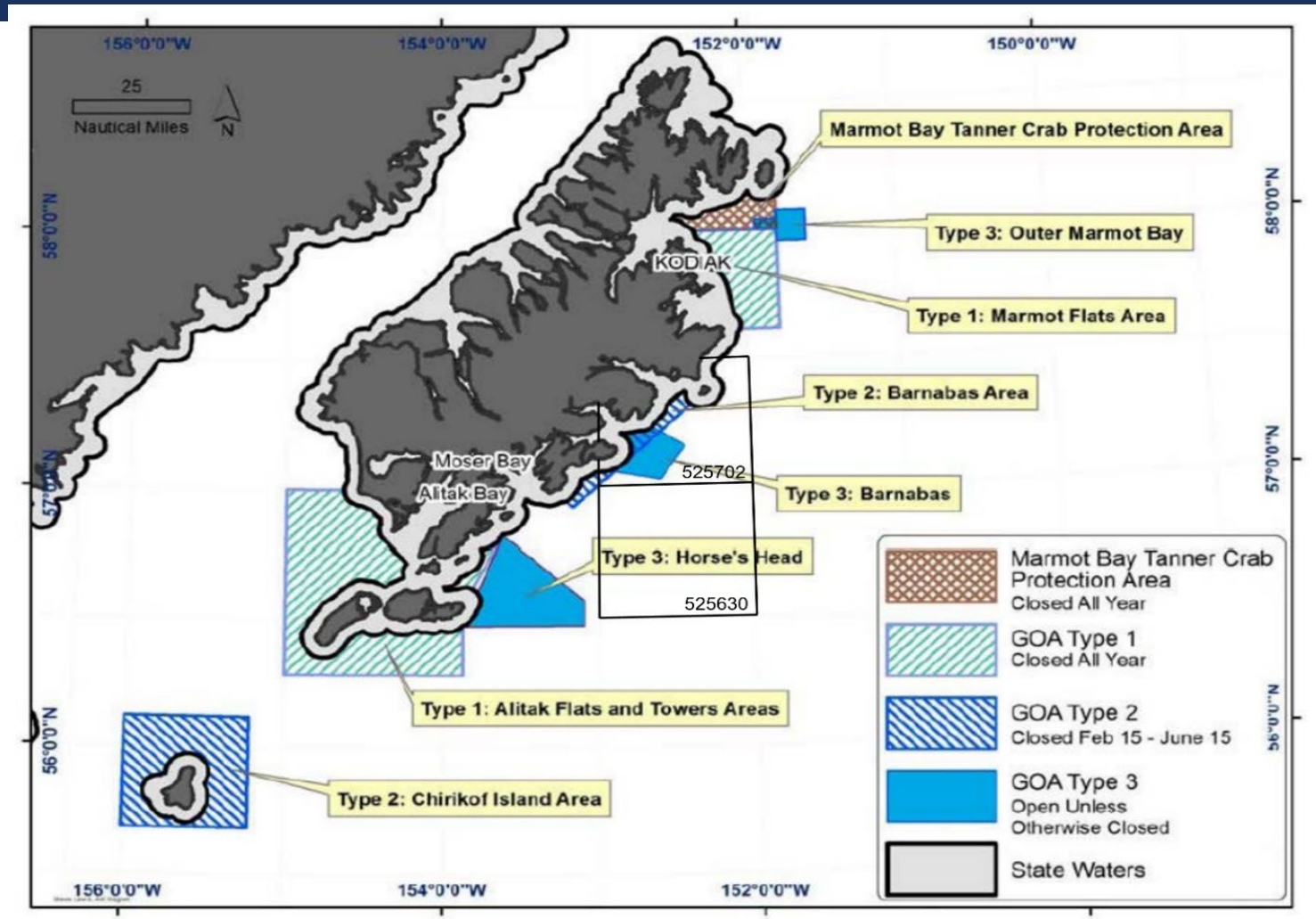
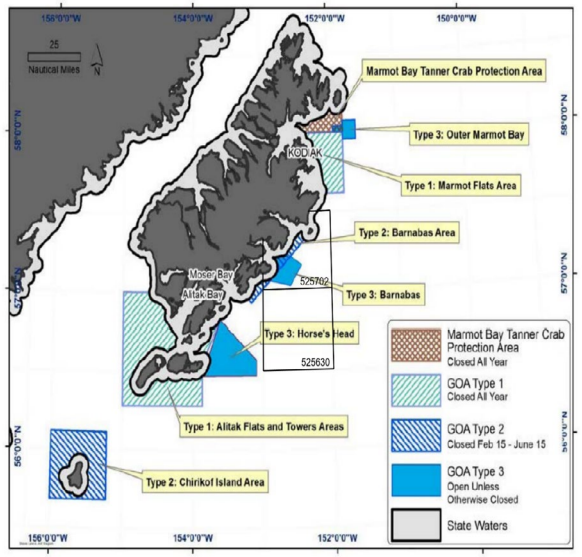


Fig 1 page 2



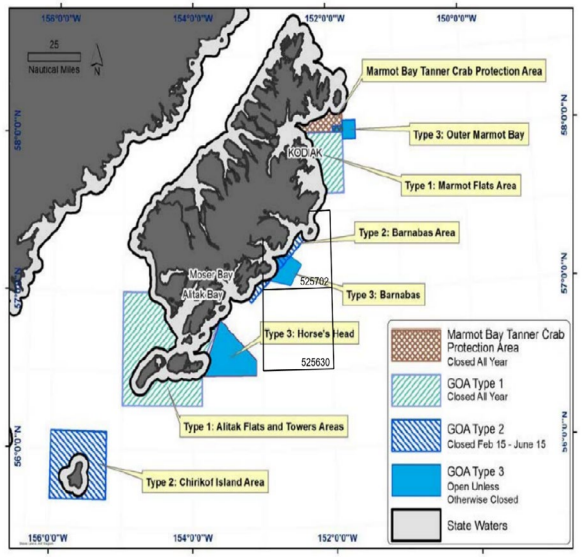
Area Type, Prohibition, and Name [year established]	Definition	Conservation Value
Tanner Crab Trawl Closure Area *Prohibition:* All fishing with trawl gear, except for pollock fishing with pelagic trawl gear Marmot Bay Tanner Crab Protection Area (112 nm^2) [est. 1989]	Tanner crab area of high abundance with a high incidence of bycatch in the groundfish trawl fisheries. Allows for a protected area for Tanner crab by closing to year-round trawling, except for pollock fishing with pelagic trawl gear.	Established protection for vulnerable Tanner crab and their habitat. Closure area reduced the incidental catch of Tanner crab in GOA groundfish fisheries. Reduction of negative impacts of non-pelagic trawl gear on Tanner crab and Tanner crab habitat.
Type I *Prohibition:* Nonpelagic trawl gear Alitak Flats and Towers (879 nm^2) Marmot Flats Area (280 nm^2) [est. 1987]	Areas known to historically have high king crab concentrations. To promote rebuilding of the crab stocks, are closed all year to all trawling, except with pelagic gear.	Established protection for vulnerable crab and their habitats. Closures provide for conservation of habitat biodiversity and ecosystems and minimize bycatch of red king crab.
Type II *Prohibition:* Nonpelagic trawl gear from February 15 – June 15 Chirikof Island Area (528 nm^2) Barnabas Area (82 nm^2) [est. 1987]	Areas known to historically have king crab concentrations, but lower than in Type I areas.	Established seasonal protection for adult female crab during vulnerable molting period and associated habitats.
Type III *Prohibition:* May be closed to trawling by NOAA Regional Administrator, otherwise open Outer Marmot Bay Barnabas Horse's Head Chirikof [est 1987]	Areas adjacent to Type I and II that have been identified as important juvenile king crab rearing or migratory areas. These become operational following determination that a recruitment event has occurred.	Can provide additional protections of up to 1,288 nm^2 area across the four regions. To date, these closures have not been triggered from a lack of recruitment.

Sources: GOA Groundfish FMP and the North Pacific Conservation and Spatial Management Areas in Alaska's Exclusive Economic Zone: Area Summaries.

Table 1 page 3

Tanner crab abundance estimates by area (Table 2 page 4)

	All Tanner crab		Legal males		Mature males		Juvenile males		Mature females		Juvenile females	
	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total	Number	% of total
525702 (federal)	14,865,331	13%	1,005,496	28%	3,783,525	28%	4,114,331	8%	4,756,566	31%	2,210,912	6%
525630 (federal)	13,725,775	12%	456,720	13%	2,486,953	19%	5,200,115	11%	2,433,982	16%	3,604,732	10%
Marmot Bay Tanner Crab Protection Area -*Federal waters*	1,046,199	1%	5,298	0.2%	42,762	0.3%	468,982	1%	83,622	1%	450,834	1%
Type I closures												
Marmot Flats -*Federal waters*	1,996,957	2%	14,362	0.4%	80,639	0.6%	847,725	2%	251,729	2%	816,866	2%
Alitak Flats/Towers -*Federal waters*	4,706,258	4%	122,764	3%	366,373	3%	2,133,897	4%	234,742	2%	1,971,245	6%
Type II closure												
Barnabas Area -*Federal waters*	6,626,030	6%	430,757	12%	1,570,355	12%	2,091,373	4%	1,958,318	13%	1,005,985	3%
All other areas	68,735,139	62%	1,494,662	42%	5,028,136	38%	33,850,953	69%	5,401,944	36%	24,446,214	71%
Kodiak District 2012–2024 Average	111,701,688		3,530,058		13,358,742		48,707,375		15,120,905		34,506,789	



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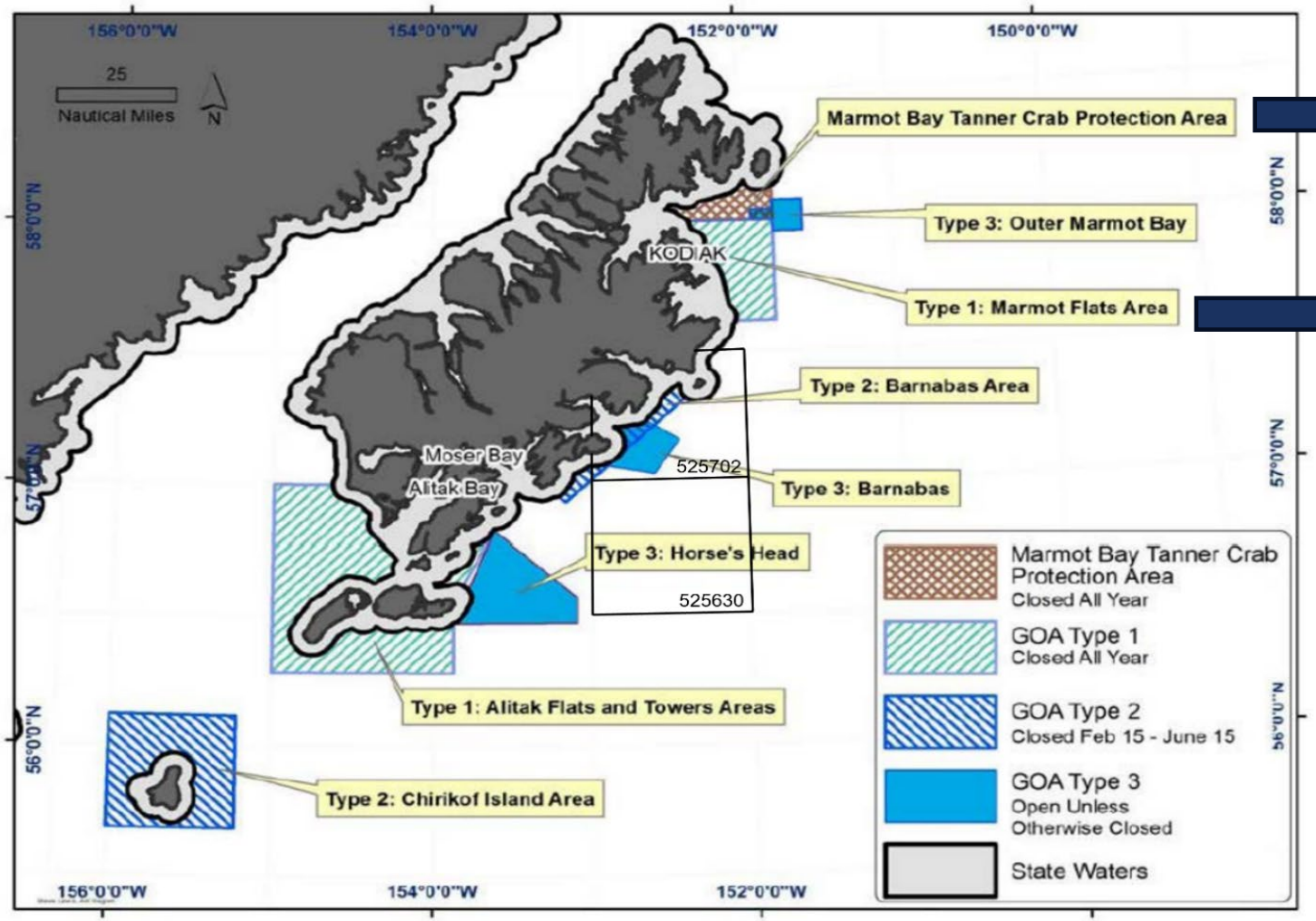
Marmot Bay and Type 1 Closures (Alitak Flats and Towers, Marmot Flats):

Closed to NPT gear
Year-round closures

Closures and relative crab abundance within (Tables 2 and 3)

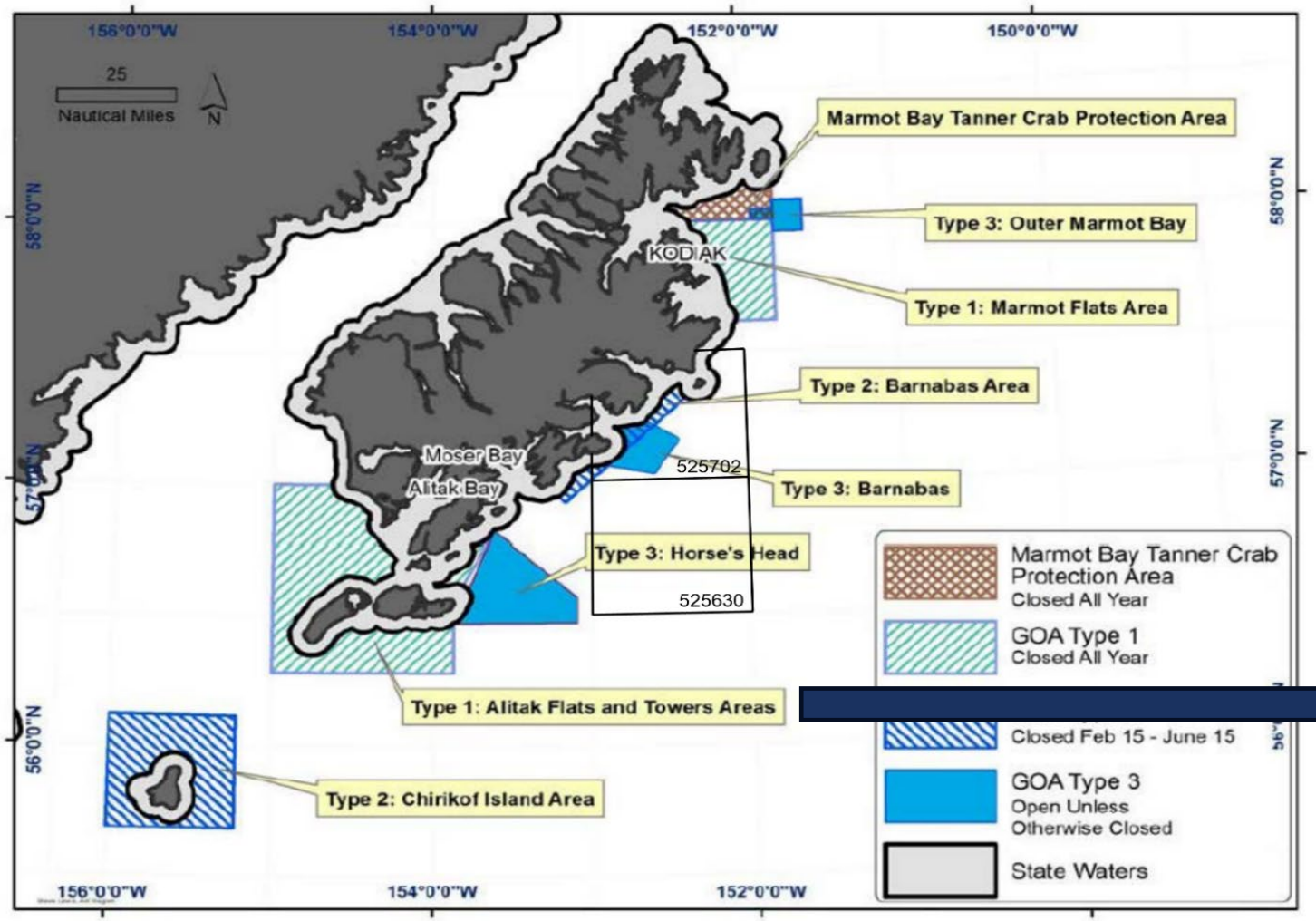


Marmot Bay:
1% overall Tanner abundance;
0 Red king crab

Marmot flats:
2% overall Tanner abundance;
0 Red king crab

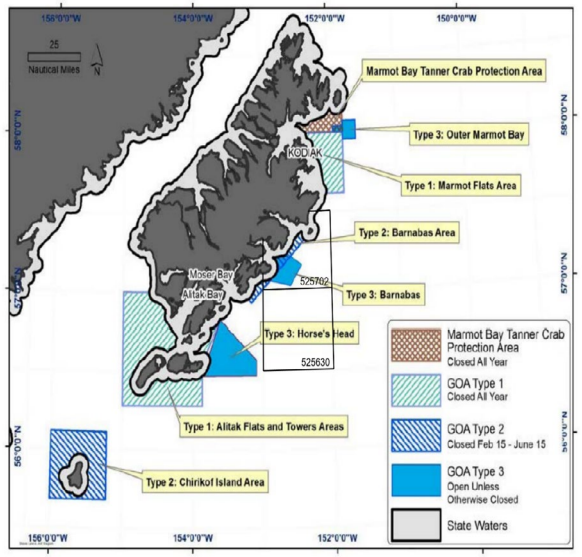
Fig 1 page 2

Closures and relative crab abundance within (Tables 2 and 3)



Alitak Flats/Towers
4% overall Tanner abundance
18% RKC (fed waters)

Fig 1 page 2



Type II Closures: Barnabus Area, Chirikof Island Area

Closed to NPT February 15-June 15

Protection to adult female crab during molting and mating

Tanner grow and molt until terminal molt at maturity
Generally age 4-5 females, age 5-6 males

Tanner crab more vulnerable to mortality during molting and mating ~February through mid-May

		crab.
Type II *Prohibition:* Nonpelagic trawl gear from February 15 – June 15 Chirikof Island Area (528 nm^2) Barnabas Area (82 nm^2) [est. 1987]	Areas known to historically have king crab concentrations, but lower than in Type I areas.	Established seasonal protection for adult female crab during vulnerable molting period and associated habitats.
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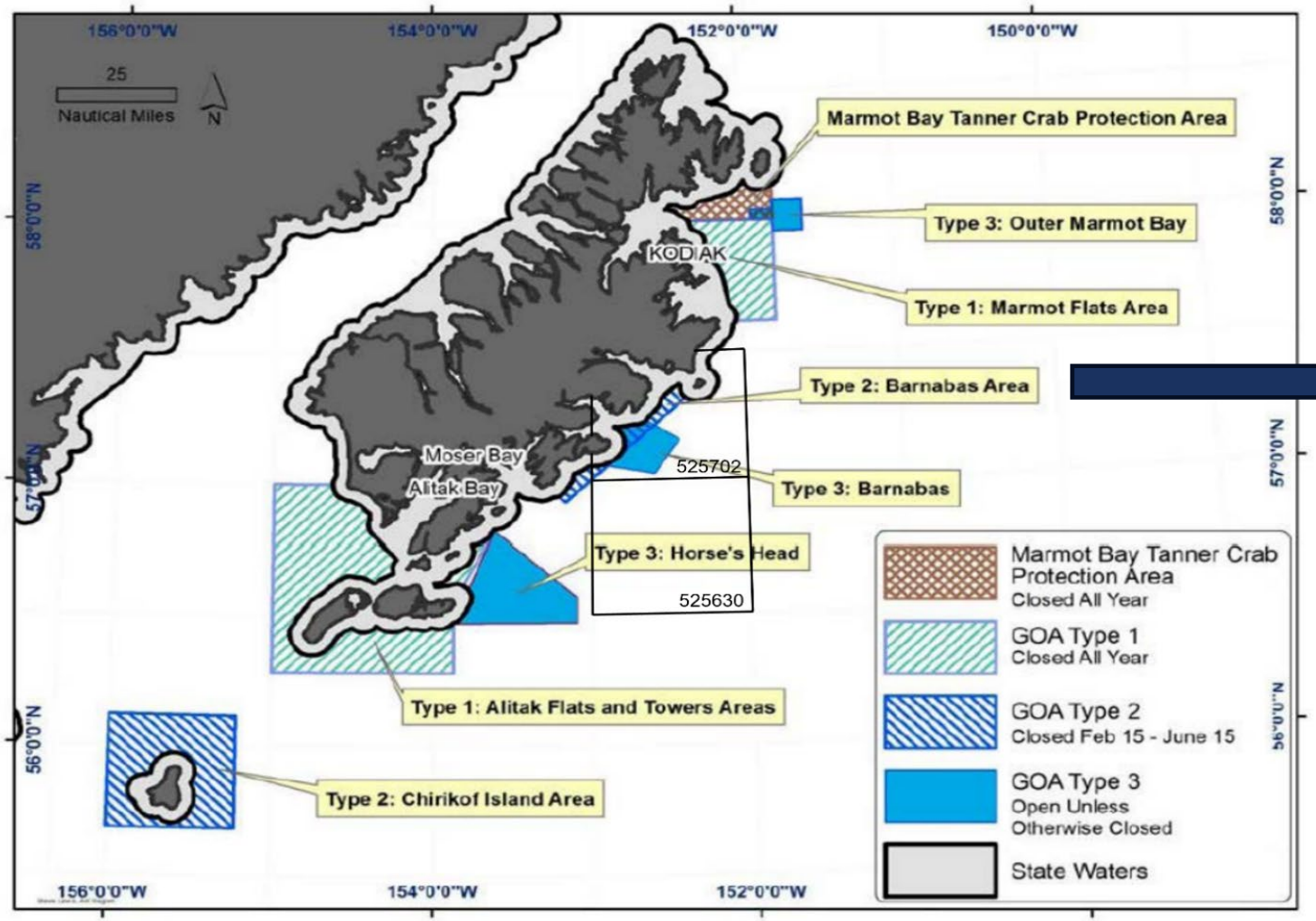
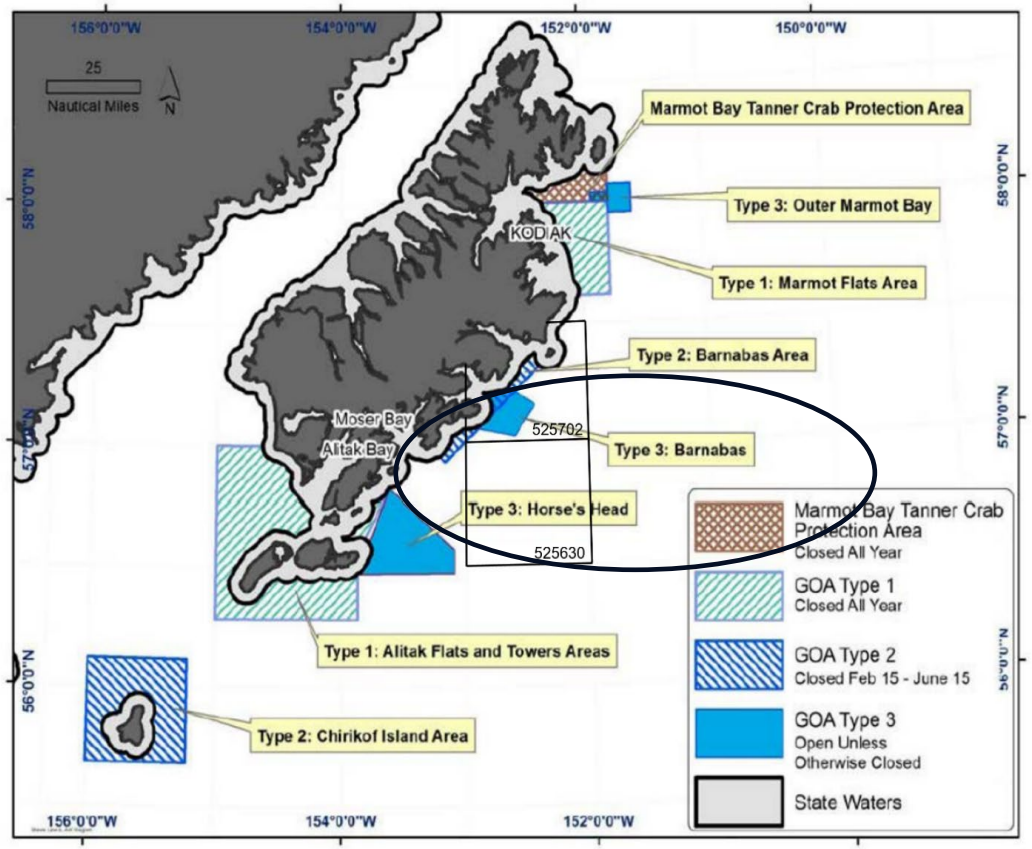
Closures and relative crab abundance within (Tables 2 and 3)



Barnabus:
6% overall Tanner abundance;
0.05% Red king crab

Fig 1 page 2

Type 3 closures



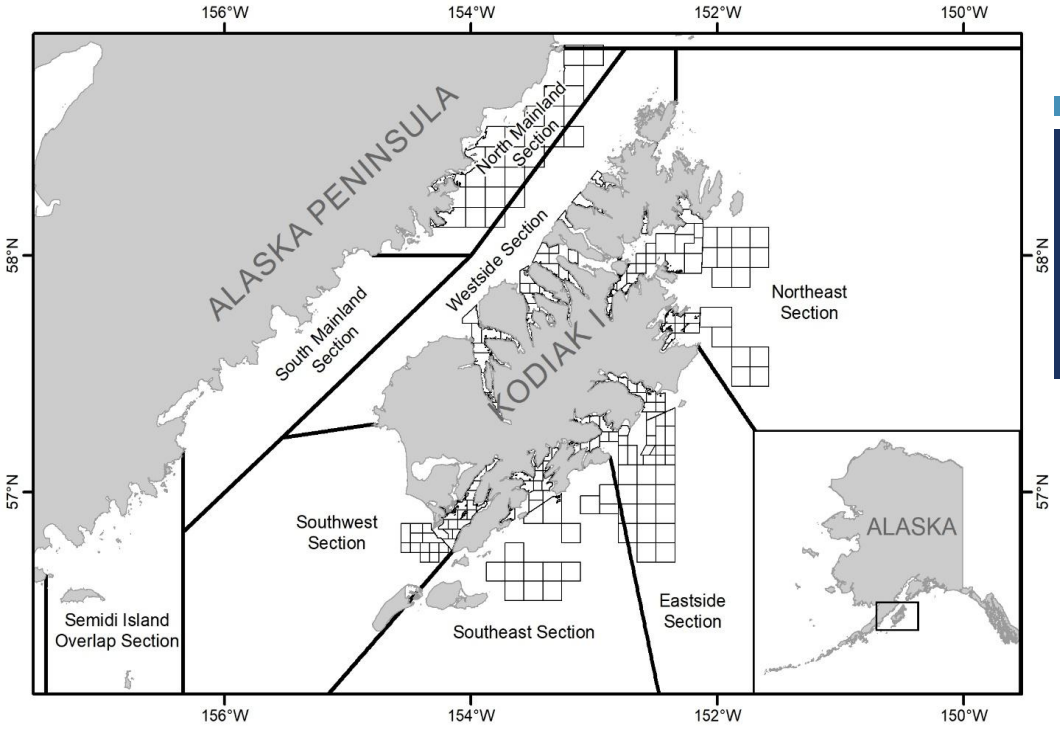
Type 3 closures:
Adjacent to Type I and II areas.

ID as important red king crab rearing or migratory areas

Operational following determination of a recruitment event

- >>># of female king crab (> # threshold to open district to commercial fishing)
- No recruitment events observed
- Type III have never closed

Fig 1 page 2



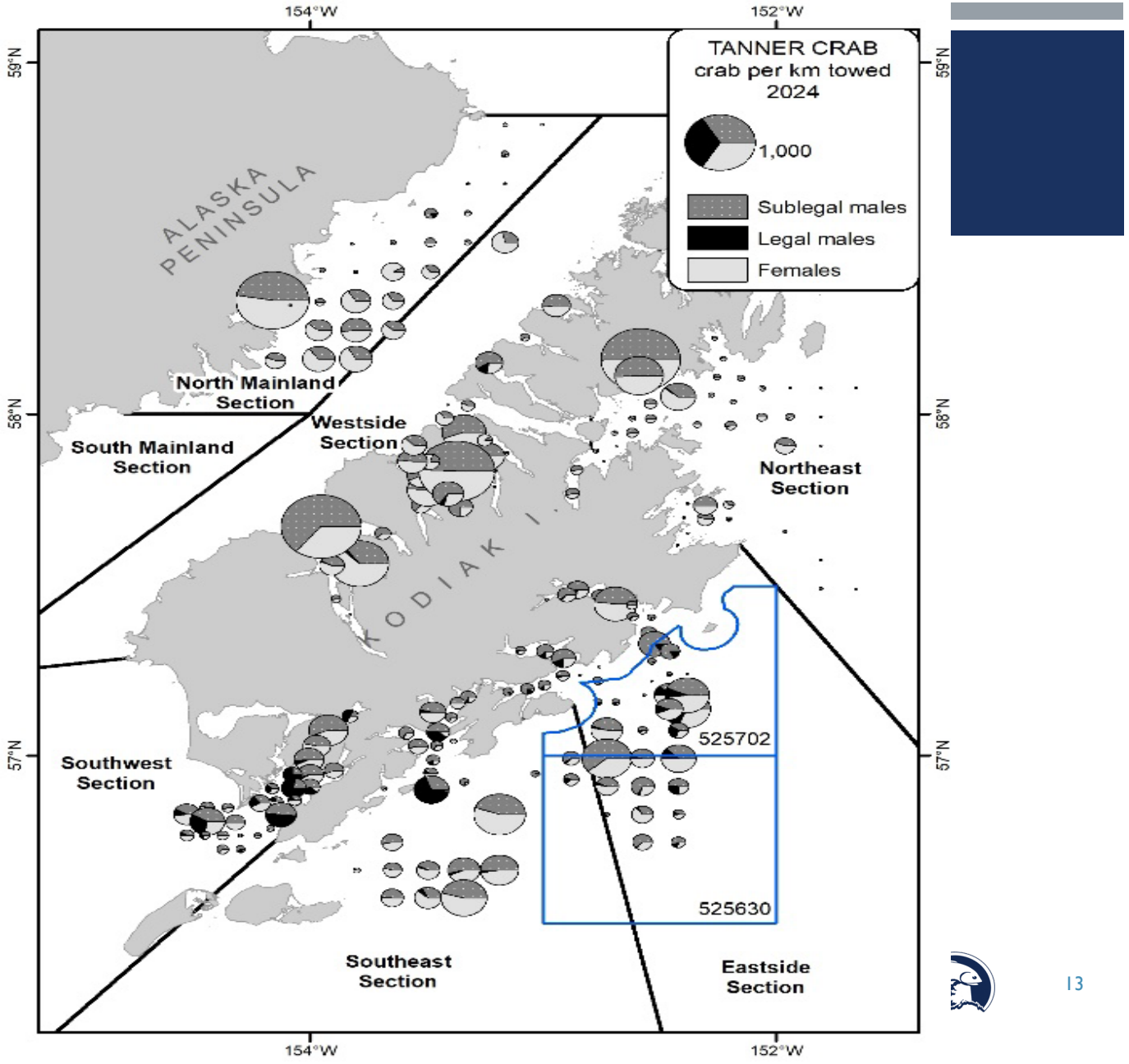


Figure 2 and 3: survey stations for ADF&G survey and 2024 Tanner crab (pages 7 and 8)

Figure 4: Tanner crab abundance from the ADF&G trawl survey 2012-2024

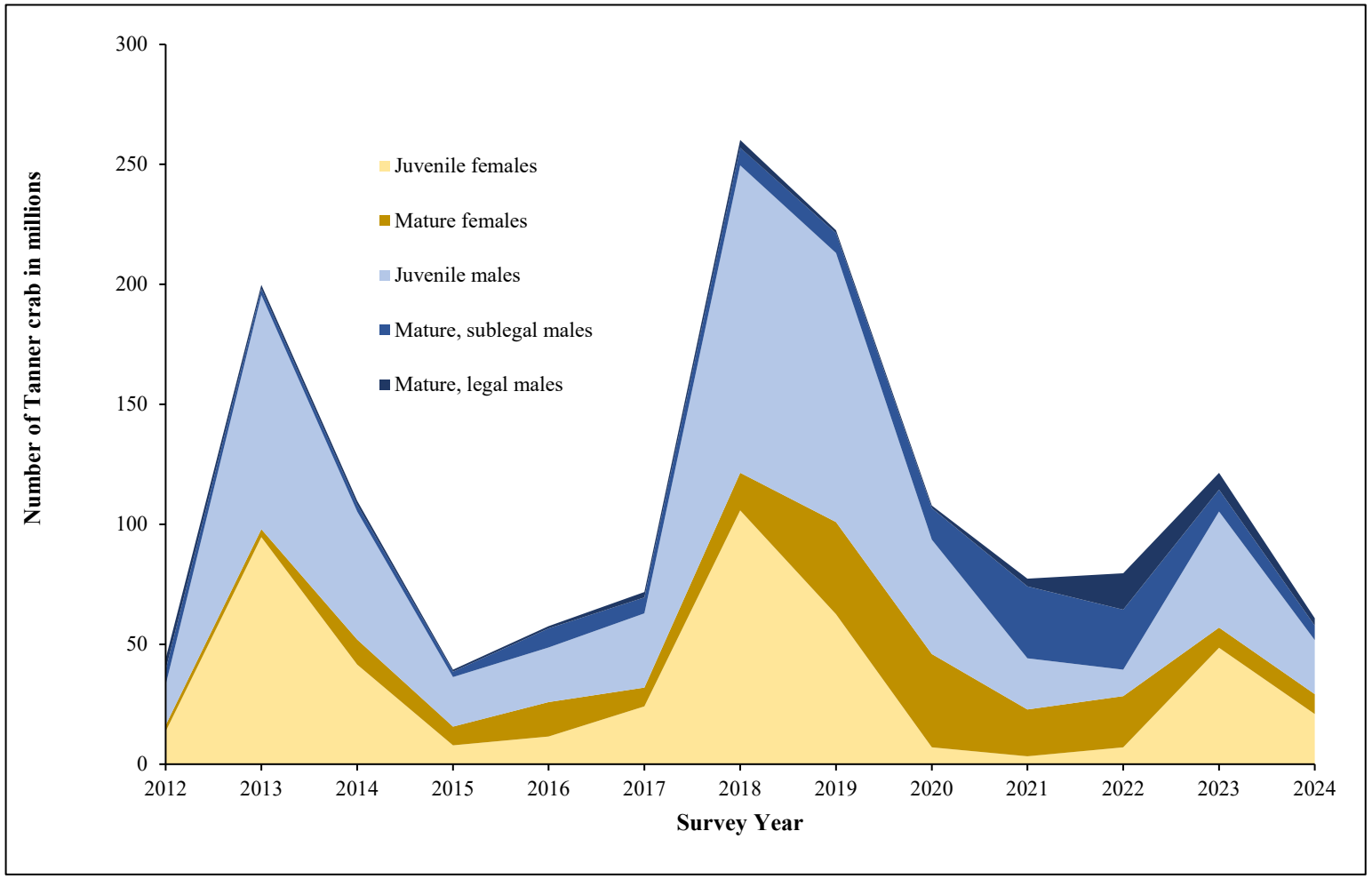
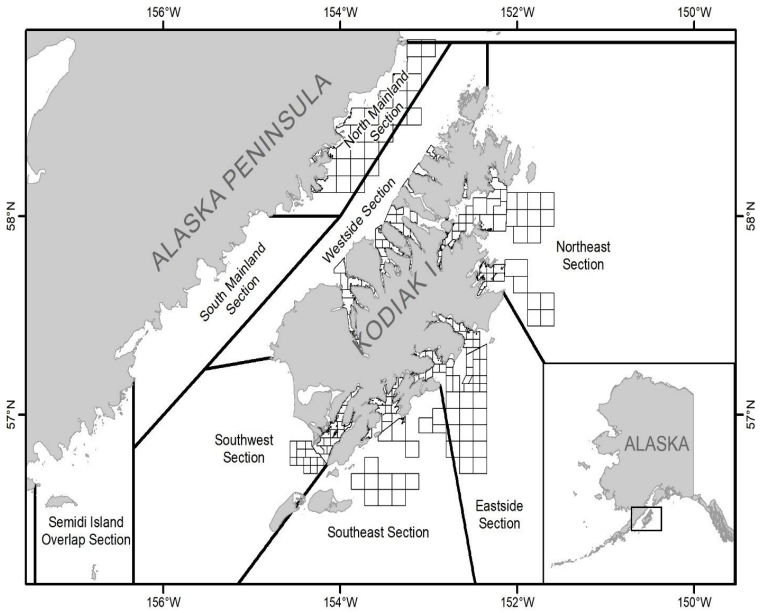
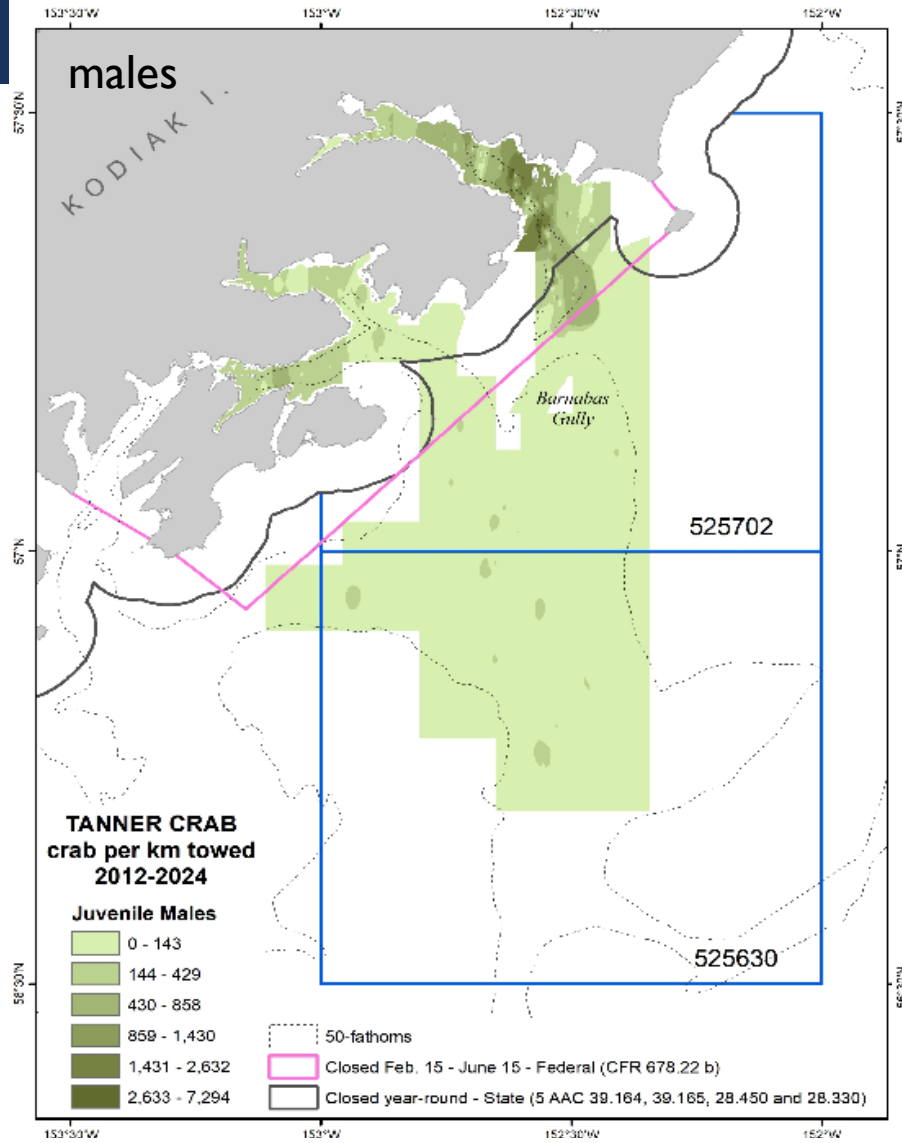


Figure 4 Page 8

Figure 5: Tanner crab juvenile crab 2012-2024



Younger crab can move to deeper offshore gullies as they grow and mature



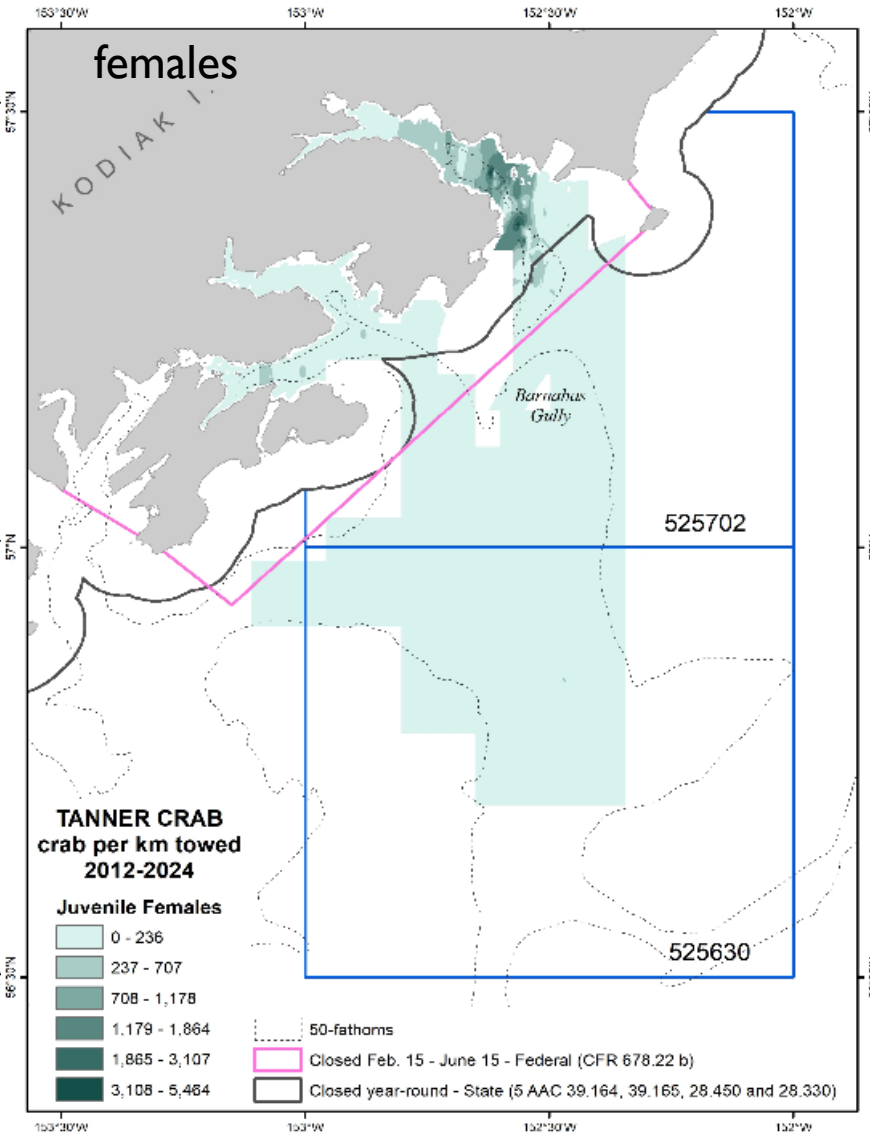
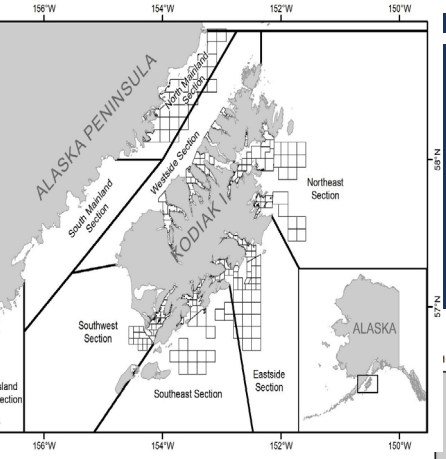
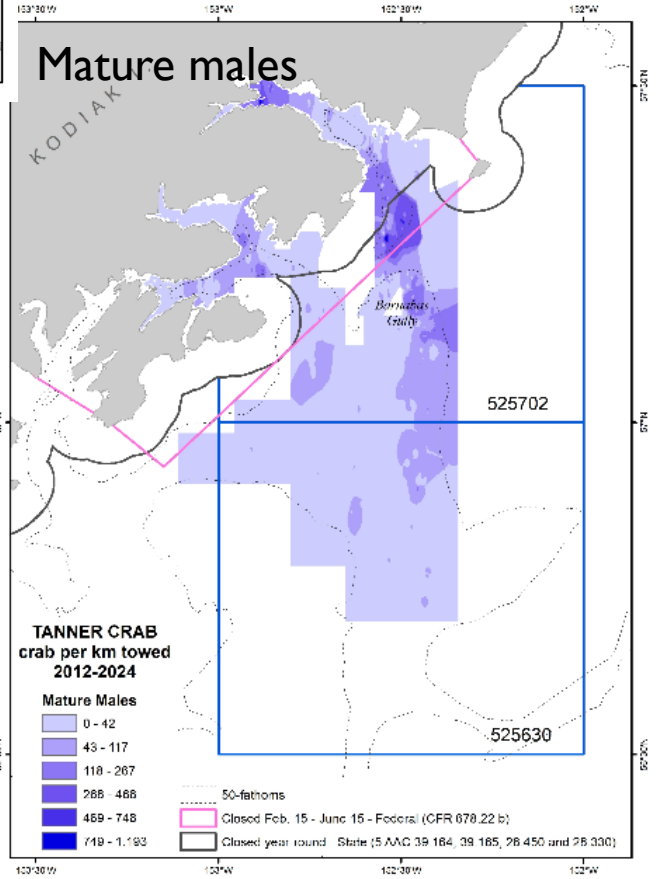
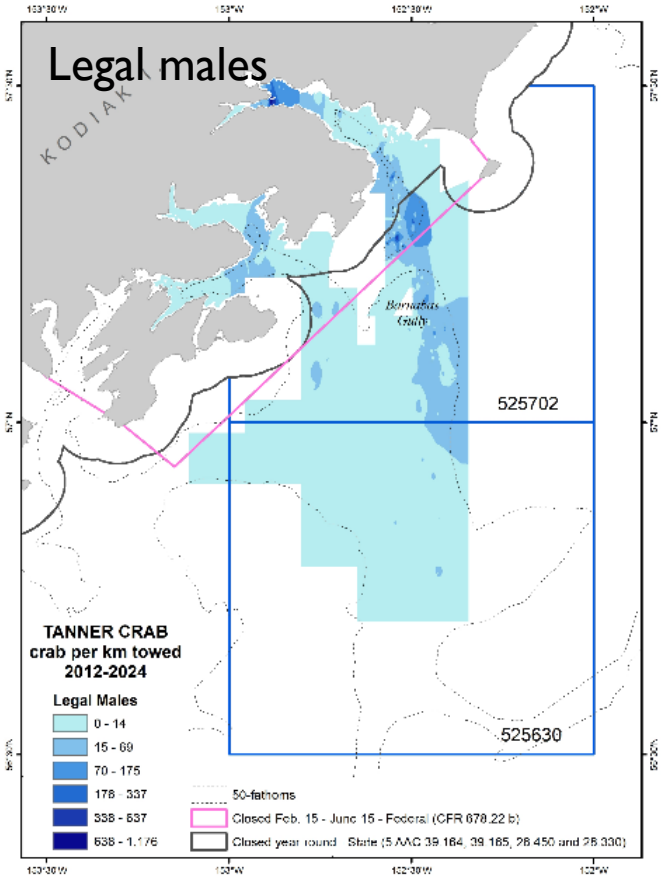


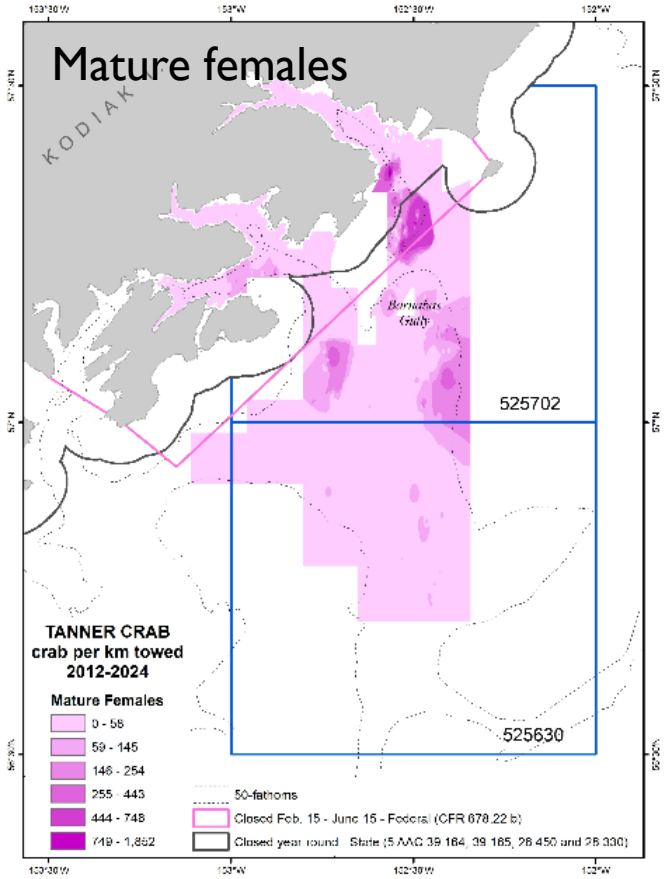
Figure 5 top panels Page 9

Figure 5: Tanner crab mature (male and female) and legal (male) crab 2012-2024









Crab in deep offshore gullies (e.g. Barnabus) tend to remain in gullies over time

Figure 5 bottom panels Page 9

Table 5: Tanner crab PSC from 525630 and 525702 by gear type (2012-2024)

Table 5 GOA Tanner Crab PSC in numbers of crab from 525630 and 525702 by gear type. Note NPT = non-pelagic trawl, CP = catcher processor, CV= catcher vessel, POT = pot gear and PTR = pelagic trawl gear. Source: ADFG/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

Gear	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
NPT	49,855	154,197	40,380	52,396	40,010	38,705	86,556	133,743	280,205	8,850	3,317	4,377	15,686
CP	7,306	130,631	34,047	28,873	10,511	20,266	11,174	53,737	31,554	6,557	2,398	0*	386*
CV	42,550	23,566	6,333	23,522	29,498	18,439	75,382	80,006	248,652	2,293	919	4,377	15,300
POT	14,364	8,545	383	5,156	5,182	120			0	65	0	0	371
PTR	310	1,350	0	62	0	0	248	55	74	260	106	267	992

*1 Catcher Processor accounted for 99% of PSC from 2012-2022

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Appendix 5 page 15 Table 19

Table 18: Sum of trips, observed trips, trips with EM, and the proportion of trips observed (with either an observer on board or through EM) as compared to the total trips in statistical areas 525630 and 525702, by sector, from 2019 – 2023.

	2019	2020	2021	2022	2023	Average 2019 - 2023
Trawl CV (NPT & PTR)						
Total trips	291	197	126	102	92	162
Total observed trips	86	39	32	29	30	43
Total trips with EM	0	0	0	0	0	0
Total trips with TEM	0	0	12	27	2	8
Proportion observed	0.30	0.20	0.35	0.55	0.35	0.35

Table 6. Ex-Vessel Value from Groundfish by Gear and Area of Landing, 2012-2023 (in Millions of nominal dollars)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average Annual	Percent of Total
525630 - Total	5.2	7.8	8.5	6.2	7.0	5.2	3.6	2.6	1.6	1.9	1.2	1.0	4.3	2.8%
Hook and Line	.2	1.4	1.2	.6	.6	.8	.1	.5	.2	.9	.7	.5	.6	0.4%
Non-Pelagic Trawl	3.1	3.5	3.6	1.9	2.1	2.3	1.7	2.0	1.2	.8	.4	.4	1.9	1.2%
Pot	1.7	1.1	.6	.4	.4	.1	.0	.0	.0	.0	.0	.1	.4	0.2%
Pelagic Trawl	.2	1.7	3.0	3.4	3.9	2.0	1.8	.2	.2	.2	.1	.1	1.4	0.9%
525702 - Total	10.7	7.8	11.4	11.2	10.4	5.2	5.7	6.4	3.4	2.7	3.3	2.2	6.7	4.4%
Hook and Line	1.0	.9	1.3	.8	.3	.5	.2	.3	.2	.5	.6	.6	.6	0.4%
Non-Pelagic Trawl	4.0	3.0	4.3	4.2	4.1	2.0	2.0	3.2	2.3	1.1	.9	.4	2.6	1.7%
Pot	1.4	.7	.9	1.3	.5	.4	.0	.0		.1	.1	.3	.5	0.3%
Pelagic Trawl	4.2	3.2	4.8	5.0	5.6	2.2	3.5	2.9	1.0	1.0	1.7	.9	3.0	1.9%
Other GOA - Total	155.1	178.7	187.1	175.7	151.0	163.0	133.6	107.0	84.4	115.2	159.6	103.2	142.8	92.8%
Hook and Line	63.3	105.6	96.1	94.4	90.7	91.9	67.5	48.2	31.9	48.3	56.8	36.5	69.3	45.0%
Jig	4.5	.4	1.7	2.1	1.8	.1	.0	.4	.4	.7	.8	1.2	1.2	0.8%
Non-Pelagic Trawl	33.9	30.6	35.9	27.1	25.8	28.1	21.5	16.8	12.5	8.9	16.5	10.8	22.4	14.5%
Pot	21.2	10.3	17.8	19.3	17.2	16.5	8.7	10.7	13.2	33.4	44.7	23.4	19.7	12.8%
Pelagic Trawl	32.1	31.8	35.6	32.9	15.6	26.3	35.8	31.0	26.3	23.8	40.6	31.3	30.3	19.7%
Grand Total	171.1	194.3	206.9	193.1	168.5	173.4	142.9	116.0	89.4	119.8	164.1	106.4	153.8	100.0%

Source: ADFG/CFEC_Fish Tickets, data compiled by AKFIN in Comprehensive_FT

Table 6:
Ex-vessel value from Groundfish by gear and area of landing 2012-2023

Table 7: Overall directed fishery Tanner crab landings, # vessels and sum of the landings from stat areas 525630 and 525702 (2012-2024). Note there was no commercial fishery between 2014-2017 and 2021.

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Year	Vessels	Lbs	Value ($)
2012	61	1,072,211	3,166,158
2013	59	658,196	1,740,029
2018	56	431,993	1,931,375
2019	82	620,729	2,685,374
2020	49	400,994	1,673,710
2022	86	1,250,702	10,227,794
2023	131	5,843,504	18,991,284
2024	134	3,135,122	10,659,415
Total	**212**	**13,413,451**	**51,075,138**

Stat areas	Vessels	Lbs	Value ($)
525702	86	2,735,229	9,718,259
525630	23	333,076	1,321,559
Total	**91**	**3,068,305**	**11,039,819**

Source: ADFG/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

Table 8: Directed Tanner crab fishery landings from 525702 and all other areas combined (2012-2024)

Table 8 Overall directed fishery Tanner crab landings for stat area 525702 and all other areas combined (2012-2024). The recent three-year average (2022-2024) is also shown for comparative purposes. Note there was no commercial fishery between 2014-2017 and 2021.

Stat areas	2012	2013	2018	2019	2020	2022	2023	2024	Average (2022-2024)
525702	161,362	169,678	49,694	179,993	71,441	105,738	1,214,904	782,419	701,020
Remaining	910,849	488,518	382,299	440,736	329,553	1,144,964	4,628,600	2,352,703	1,144,964
Total	**1,072,211**	**658,196**	**431,993**	**620,729**	**400,994**	**1,250,702**	**5,843,504**	**3,135,122**	**1,845,984**

Source: ADFG/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

Stat Area 525702 = ~38% of 3-yr landings

Table 9: Average legal male Tanner crab abundance by area compared with average Tanner landings by area (2022-2024)

	Survey Legal males		Tanner crab landings by Area	
	Number	% of total	average landings	% of total
525702 (federal)	3,116,650	37%	701,020	38%
all other stat areas			1,144,964	62%
Total			1,845,984	100%
Marmot Bay Tanner Crab Protection Area				
-Federal waters	9,102	0.1%		
Type I closures				
Marmot Flats				
-Federal waters	15,949	0.2%		
Alitak Flats/Towers				
-Federal waters	262,579	3%		
Type II closure				
Barnabas Area				
-Federal waters	1,498,641	18%		
All other areas	2,443,559	29%		

Table 10 (tons groundfish processed) and Table 11 (ex-vessel value) in Kodiak

Table 10 Average Tons of Groundfish Processed in Kodiak by Gear and Month, 2012-2024

Month	Non-Pelagic Trawl	Pot	Pelagic Trawl	Total
January	959	2,312	4,995	8,265
February	2,357	2,018	21,610	25,985
March	3,327	1,697	30,793	35,817
April	4,883	471	3,792	9,146
May	5,058	268	3,078	8,404
June	2,504	48	1,277	3,830
July	670	34	215	920
August	613	78	2,509	3,200
September	3,659	804	16,376	20,839
October	3,573	683	17,602	21,859
November	1,115	506	595	2,216
December	56	327	3	386
Total	28,775	9,247	102,846	140,868

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_C

Table 11 Average Ex-Vessel value processed in Kodiak

Month	Non-Pelagic Trawl	Pot	Pelagic Trawl	Total
January	607,581	2,267,912	1,740,836	4,616,329
February	1,223,317	1,943,665	7,248,243	10,415,224
March	2,105,020	1,822,149	9,698,259	13,625,428
April	1,982,516	922,900	1,099,291	4,004,706
May	3,255,703	849,366	1,162,731	5,267,800
June	1,566,328	188,913	490,963	2,246,204
July	583,898	202,801	101,040	887,739
August	390,945	304,732	929,626	1,625,303
September	2,134,198	1,073,097	5,407,267	8,614,561
October	1,739,151	1,152,011	6,147,613	9,038,776
November	781,560	945,949	245,700	1,973,209
December	29,902	352,279	1,624	383,805
Total	16,400,119	12,025,773	34,273,194	62,699,086

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_BLEND_CA

Fig 6:
Total revenue by month and species processed in Kodiak 2018-2023

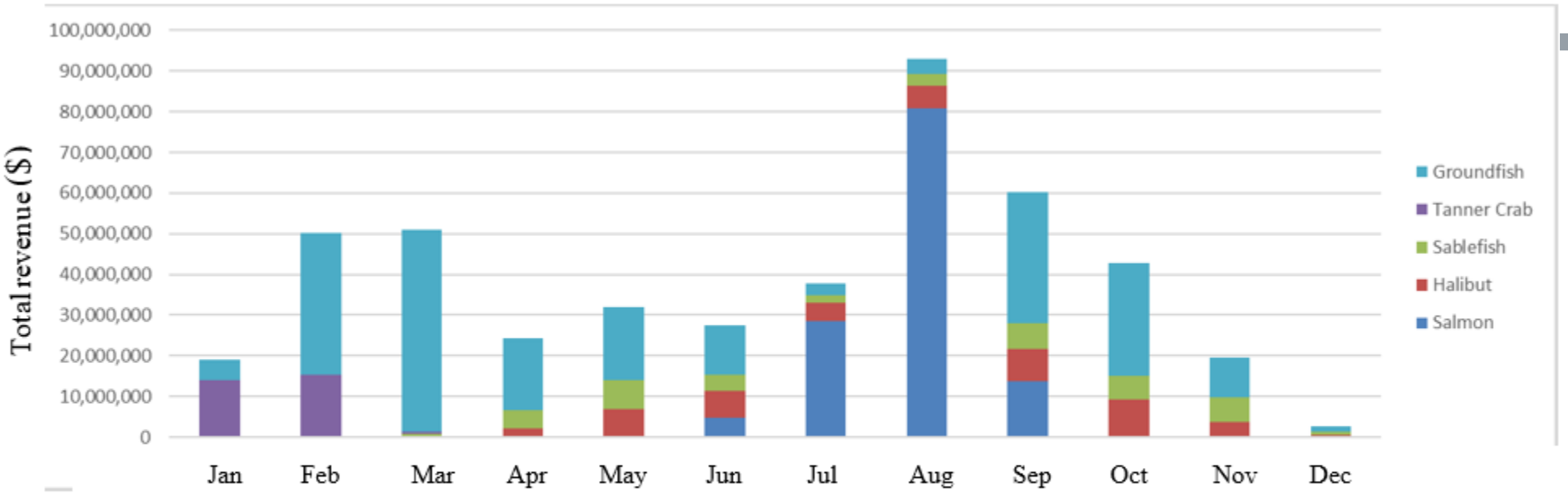


Figure 6 Total revenue ($) by month and species processed 2018-2023 in Kodiak. Source: ADFG/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

Table 12 General timing of processing by fishery and months occurring in processors in Kodiak.

January-March	April-May	June-August	September-November
Tanner Crab, Pollock, Pacific cod, flatfish	Rockfish, flatfish, halibut, sablefish	Salmon, halibut, sablefish, rockfish*, flatfish*	Pollock, Pacific cod, flatfish, rockfish**

*end of August only
**closes November 15, some activity into early November

Figure 7: **Processor employment by 2 month stanzas (with the exception of January to March) for groundfish fisheries in Kodiak**

Ave # employees

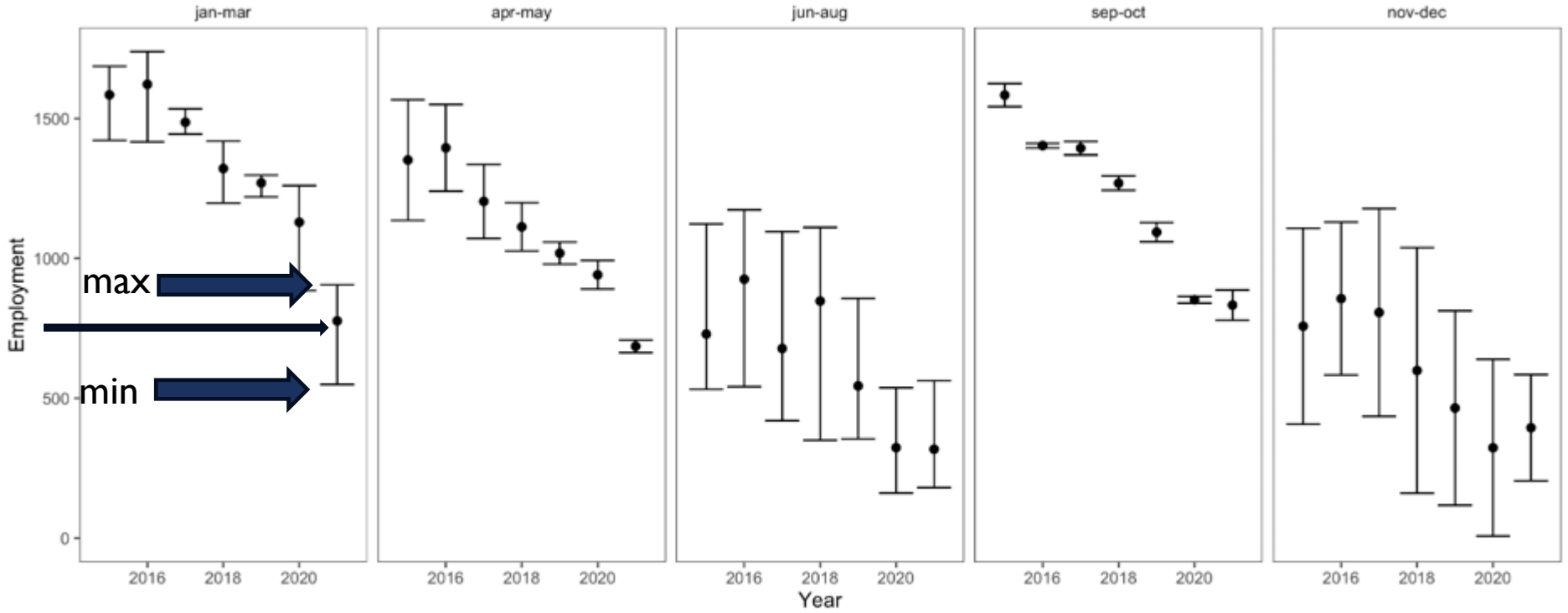


Figure 7 Processor employment by 2 month stanzas (with the exception of January to March) for groundfish fisheries in Kodiak where the dots and blue line indicate the average number of employees while the error bars show the minimum and maximum number over those time frames (2015-2021). Source Economic Data Reports, data compiled by AKFIN

Table 13: **Harvests of Tanner crab by month (2012-2024)**

No commercial fishery between 2014-2017 and 2021

Month	Number of Vessels	Harvest in Lbs	Value ($)
January			
2012	61	1,023,742	3,026,886
2013	59	509,380	1,357,818
2018	55	422,807	1,892,202
2019	82	620,729	2,685,374
2020	49	188,708	790,300
2022	86	1,155,550	9,499,820
2023	12	138,899	461,775
2024	134	3,113,469	10,585,795
February			
2012	4	48,469	139,272
2013	*	*	*
2018	*	*	*
2020	24	179,277	745,705
2022	5	66,723	514,059
2023	131	5,704,605	18,529,509
2024	6	21,653	73,620
March			
2013	*	*	*
2018	*	*	*
2020	6	33,009	137,704
2022	4	28,429	213,915

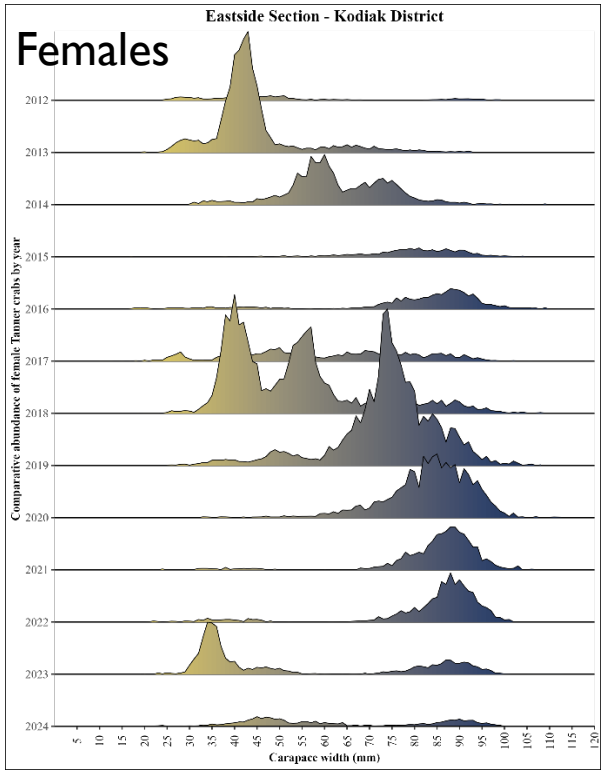
Closure Considerations: Area based

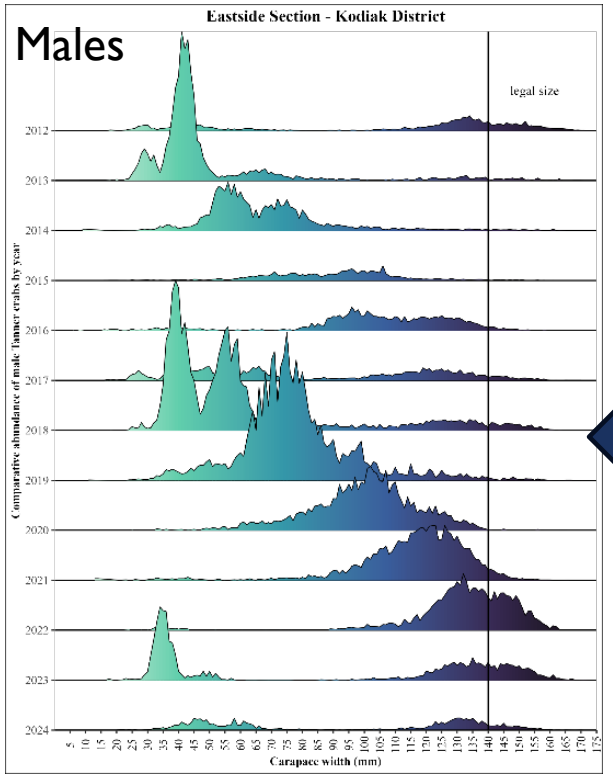
- Data indicates area 525702 is likely more important to Tanner crab than area 525630.
- Habitat-type approach could be used to identify specific areas smaller than a full stat area.
  - identifying areas where depth and slope (ie greater than 50 fathoms and less than 25% slope) are consistent with high Tanner abundance such as in Barnabas Gully to eliminate areas that may not be that important to Tanner crab (see 50 fathom contours on Figure 5 panels).
  - Survey tow location data can also be summarized in areas of high abundance as a proxy for 'productive crab habitat'.
- Potentially characterize areas that are most productive to groundfish fishing compared to Tanner survey abundance
  - Some criteria for survey abundance as compared to groundfish fishing would need to be developed to identify candidate areas for this approach.

Closure Considerations: Time based

- Close full or partial stat areas during Tanner mate/molt cycle: full time period (February-June) or when the directed Tanner season is closed (April-June).

Figure 8: East side Kodiak size composition 2012-2024





- Tanner crab recruitment highly cyclical and decision making focus on large-bodied animals mature males
- most important to the crab industry and predominantly bigger crab show up as bycatch in groundfish gear.
- Cyclical nature of the stock
  - mature crab abundance is low, juvenile abundance tends to be at its maximum

Closure Considerations: Modify existing areas

- Modifications to the existing closures:
  - Barnabus Type II seasonal closure that overlaps stat area 525702 could be modified.
    - Most of the closure covers state-waters, which are already closed to NPT gear, the Federal portion is open after June 15 and ADF&G surveys in June show high crab abundance inside portions of the area
    - Survey does not cover the entire closure area so it is difficult to determine impacts on Tanner crab that are not in the survey area.
  - Changing Barnabus to a Type I closure may provide additional conservation benefits for Tanner crab but survey data shows there are areas of high abundance in other portions of statistical area 525702, such as Barnabas Gully.

Next steps?

- Expanded discussion paper
- Move to analysis:
  - Establish Purpose and Need and alternatives for analysis
- No further action

Thank you!