C5 GOA Tanner crab protection measures

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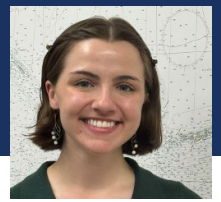


Presentation outline

- Background, alternatives, and history of action (Sec. 1 and 2)
- Methods for custom closure apportionment (Sec. 3.1.1)
- Alternative 2
  - Description of Fisheries (Sec. 3.1 and 3.4)
  - Economic and Social Impacts (RIR, Sec. 4)
    - Impacts to groundfish pot & trawl fisheries (4.3.1)
    - Potential impacts to non-regulated entities (4.3.2)
  - Environmental Assessment (EA, Sec. 5)
    - Tanner crab life history, management, spatial & temporal distribution, SDMs, sources of mortality, PSC, displacement (Sec. 5.3)
    - Groundfish, Chinook and halibut PSC (Sec. 5.2, 5.4, and 5.5)
    - Habitat (Sec. 5.6)
- Management considerations (Sec. 6)
- Alternative 3 (Sec. 7)
- MSA and FMP considerations (Sec. 8)
- Next steps - points of focus for SSC

Background, Purpose and Need (1.1)

- Crab is a prohibited species in GOA groundfish fisheries, and there is no PSC limit
- Time and area closures were developed to minimize impacts of groundfish fisheries on GOA red king crab and Tanner crab
- Most existing crab protection closures around Kodiak Island are from the 1980s
- New information is available and new State harvest strategies
- Importance of crab and groundfish fisheries to Kodiak
- Tanner crab populations persist in known locations

Therefore, the Council is considering management actions that **conserve and protect Tanner crab while minimizing negative impacts on Central GOA groundfish fisheries, including:**

  - **Establishing a new groundfish fishing area closure on east side of Kodiak Island** in areas known to have high densities and abundance of Tanner crab
  - **Considering a process to evaluate the effectiveness of the existing GOA crab protection areas** around Kodiak Island, and determine whether modifications are needed

Overview of Alternatives (Sec. 2)

Alternative 1: Status quo

Alternative 2: Closure area

Objectives: Minimize groundfish fishery interactions off east side of Kodiak Island

1. where high densities of Tanner crab are known to occur
2. during life stages Tanner crab are vulnerable to fishery interactions

Council intends to establish criteria & a timeline to review closure area effectiveness

Alternative 3: Evaluate Existing Closure Areas

Options for modification or removal will be considered after evaluation

Alternative 1, status quo

Existing crab protection closures (Table 2-1)

- **Type I:** year-round
- **Type II:** Feb 15 - June 15
- **Type III:** open unless otherwise closed
- **Marmot Bay Tanner Crab Protection Area** (year-round)

Other groundfish closures (see Sections 2.1.1 and 2.2.1)

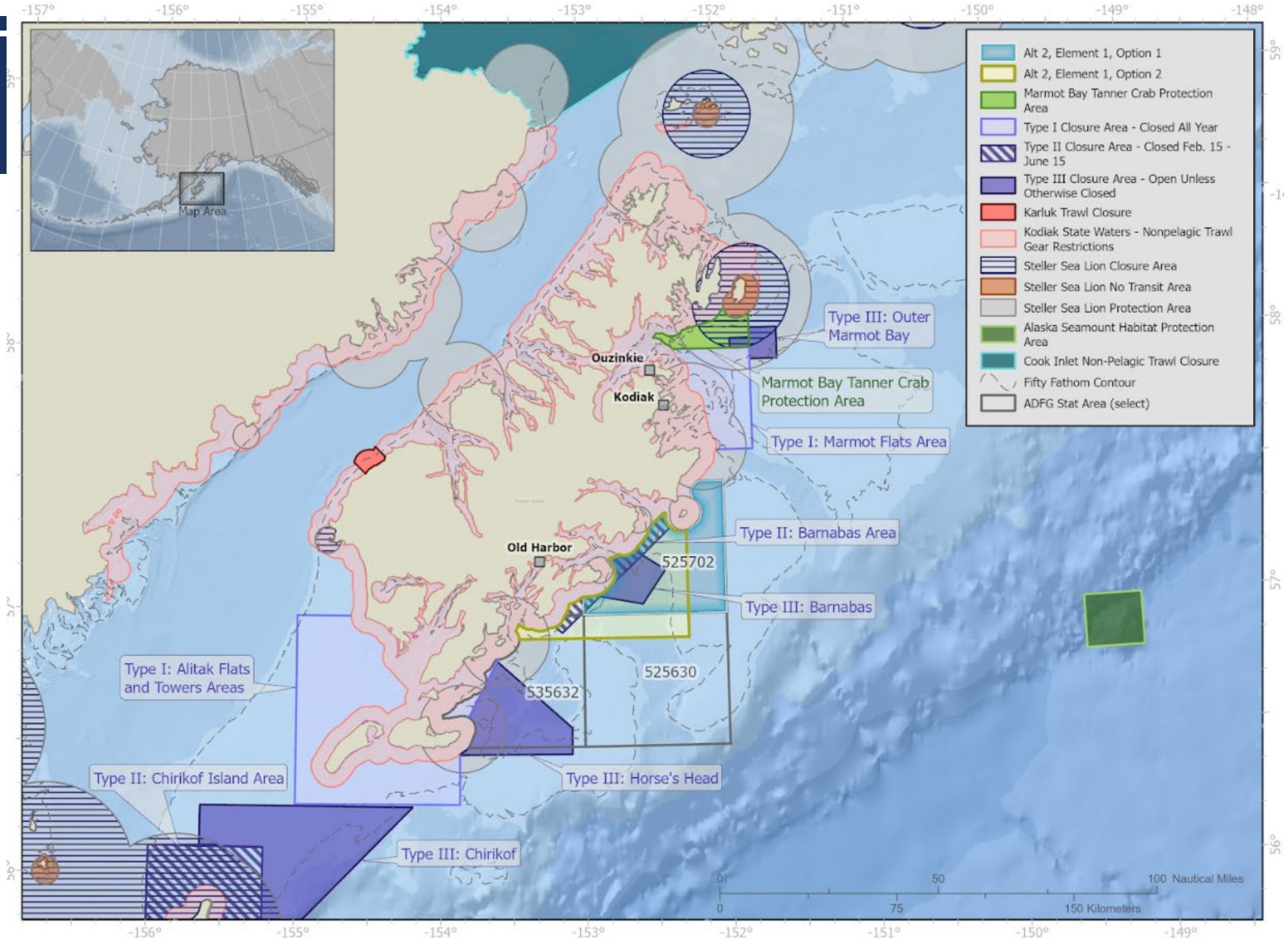


Figure 2-1, pg. 30

Alternative 2: Closure Area, Elements 1-3

Element 1: Closure Area

- Option 1: ADF&G Statistical Area 525702
- Option 2: Custom Area (overlaps portion of 525702, 525630, 535632, & 525704)

Element 2: Closure Duration

- Option 1: Year-round
- Option 2: Seasonal
  - 2a: February 15 to June 15
  - 2b: April 1 to June 15

Element 3: Gear Type

- Option 1: Groundfish pot & trawl (nonpelagic and pelagic) gear
- Option 2: Nonpelagic trawl gear

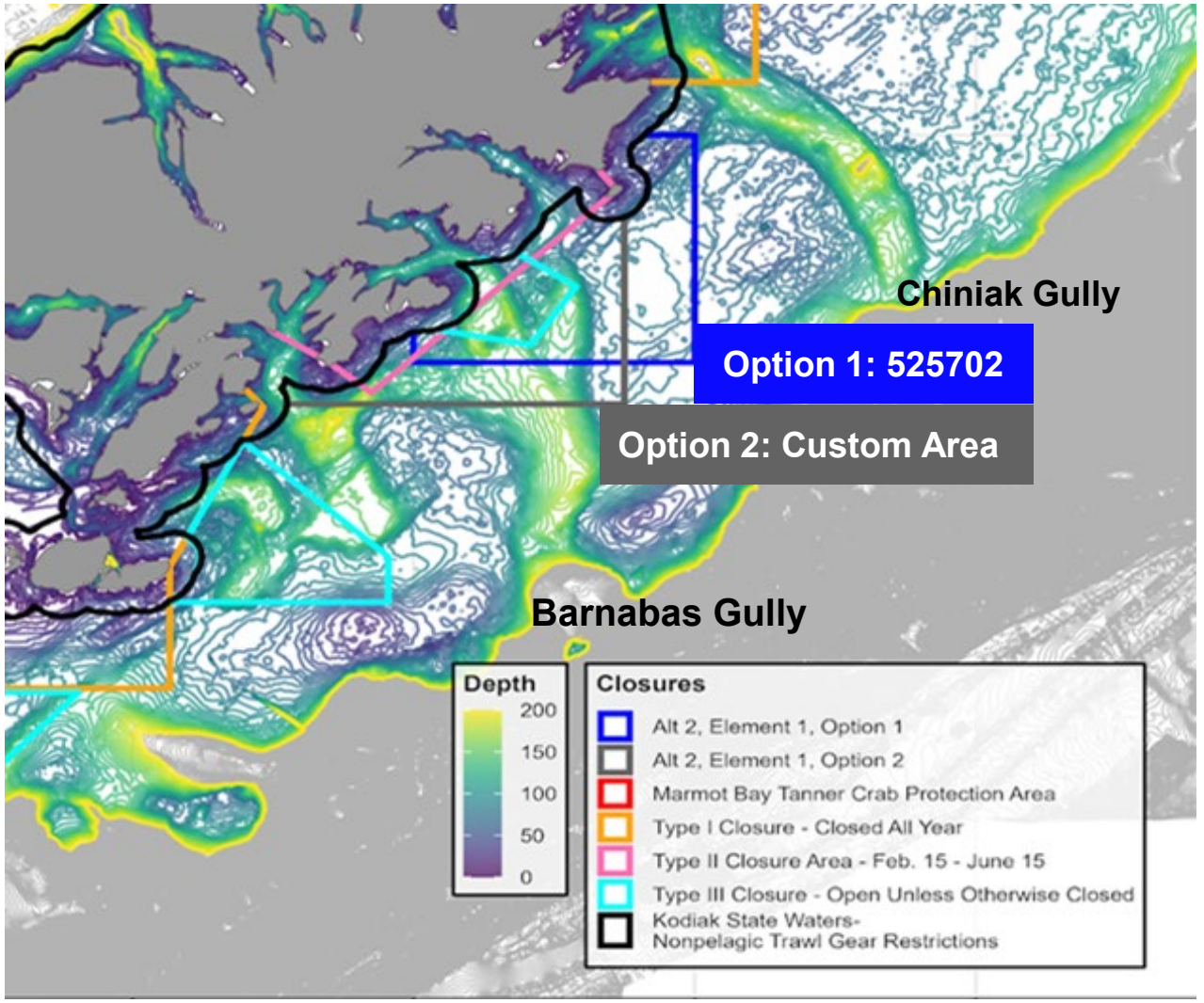


Figure 5-19, pg. 183

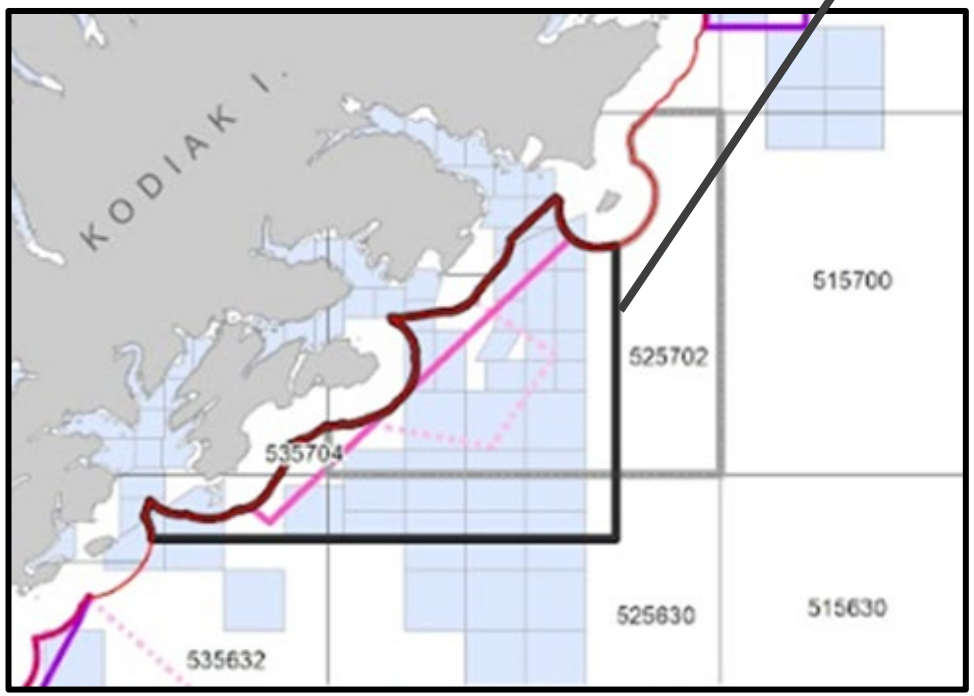
Method for Custom Closure Catch, Value, and PSC Apportionment (3.1.1)

- Data reported by ADF&G statistical area or other regulatory boundary
  - Actuals not available for custom closure - overlaps 4 stat areas
- Catch-In-Areas 2.0 database - potential for higher spatial resolution, but not yet available

- Custom closure catch, value, & PSC estimates based on observer vessel track data: higher spatial resolution than stat areas
  - human observer data, no Trawl EM incorporated at this time

    1) *Vessel tracks determined to be inside/outside/partially within custom closure*
    2) *Catch within custom closure boundary summed across all years, and divided by total observed catch in each overlapping statistical area, to estimate % of observed catch occurring within boundaries*
    3) *Percentages applied to all catch (observed + unobserved), by gear type & statistical area*

Element 1, Option 2: Custom Closure Area

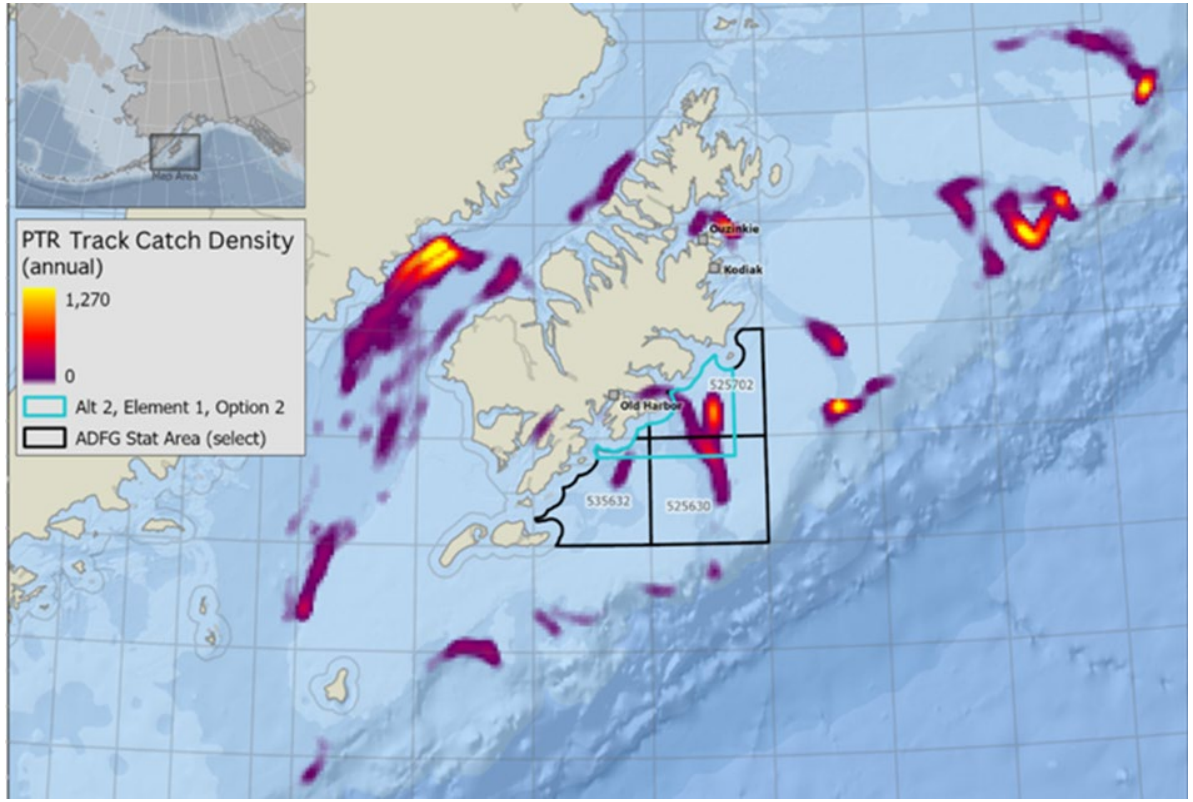


Modified from Figure 1-2, pg. 22

*See Table 3-2, pg. 40 for percentages by gear type
*See Table 2-2, pg. 33 for stat areas and % overlap
*Note: the approximation method used in Alt. 3 (Sec. 7) is different

Method for Track Catch Density Maps (3.1.3.3 and 3.1.4.3)

- Observer vessel track data aggregated across 2012-2025 to offset variable observer coverage rates
- Vessel tracks weighted by catch weight
- NPT and PTR by closure duration option (3 panels each) - no map for groundfish pot fishing due to low observer coverage
- Maps provide inferences for spatial fishing patterns and relative density by gear but not by fishery



Modified from Figure 3-1, pg. 51

Description of Fisheries

3.1: Affected Groundfish Fisheries

3.2: Kodiak Tanner Crab Fisheries

3.3: Products & Markets

3.4: Participation by Community

3.5: Kodiak Processing Sector

Groundfish Pot Fishery Activity in Proposed Area Closures, by Closure Duration (3.1.2)

	% of CGOA groundfish pot fishing activity occurring within proposed area closures (2012-2025)			
	% of Catch, by closure duration	% of Ex-Vessel Value, by closure duration	% of Wholesale Value, by closure duration	% of Vessels active in 525702 within closure duration
Year-round, Option 1	~3%	~2%	~2%	5% of CVs (4 vessels)
Seasonal, Option 2a: 2/15 to 6/15	<1%	<1%	<1%	<1% of CVs (0-1 vessels)
Seasonal, Option 2b: 4/1 to 6/15	<1%	<1%	<1%	<1% of CVs (0-1 vessels)

Data from Tables 3-3 & 3-4, pg. 42 & 43. Percentages shown are averages of 525702 & Custom Closure Area

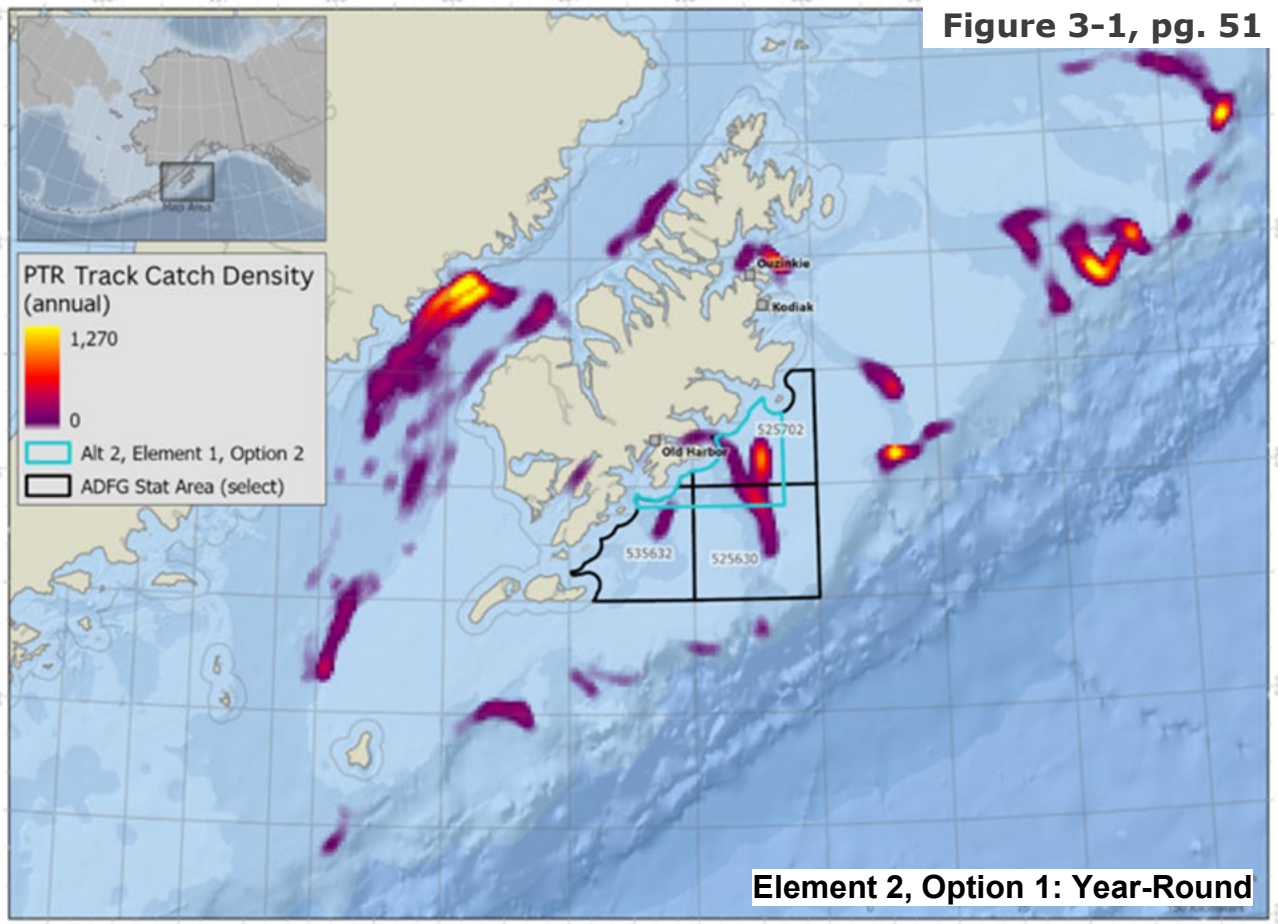
- Pacific cod comprises majority of groundfish pot activity in areas considered for closure (<10 mt of sablefish annually, on average)
- Areas of low proportional importance to groundfish pot fisheries
  - Importance diminished over time; higher prior to Pacific cod stock collapse in 2018
- Nearly no seasonal activity; Pcod pot season has very little overlap with seasonal time closure option windows

Pelagic Trawl Fishery Activity, by Closure Duration (3.1.3)

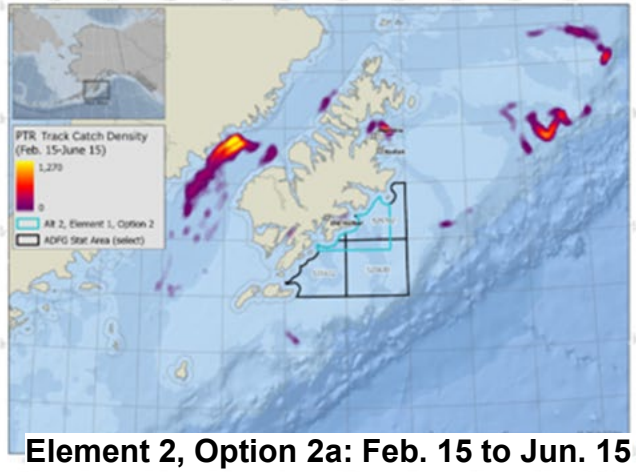
% of CGOA PTR fishing activity occurring within proposed area closures (2012-2025)				
	% of Catch, by closure duration	% of Ex-Vessel Value, by closure duration	% of Wholesale Value, by closure duration	% of Vessels active in 525702 within closure duration
Year-round, Option 1	~10%	~10%	~10%	53% (26 vessels)
Seasonal, Option 2a: 2/15 to 6/15	<1%	<1%	<1%	4% (1-2 vessels)
Seasonal, Option 2b: 4/1 to 6/15	<1%	<1%	<1%	2% (0-1 vessels)

Data from Tables 3-7 & 3-8, pg. 47 & 48. Percentages shown are averages of 525702 & Custom Closure Area

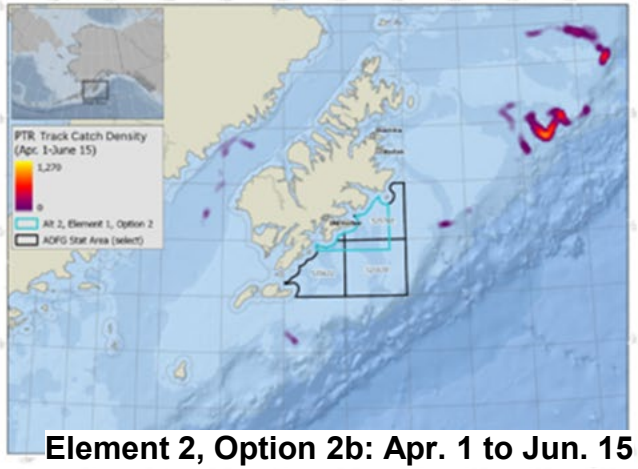
Figure 3-1, pg. 51



Element 2, Option 1: Year-Round



Element 2, Option 2a: Feb. 15 to Jun. 15



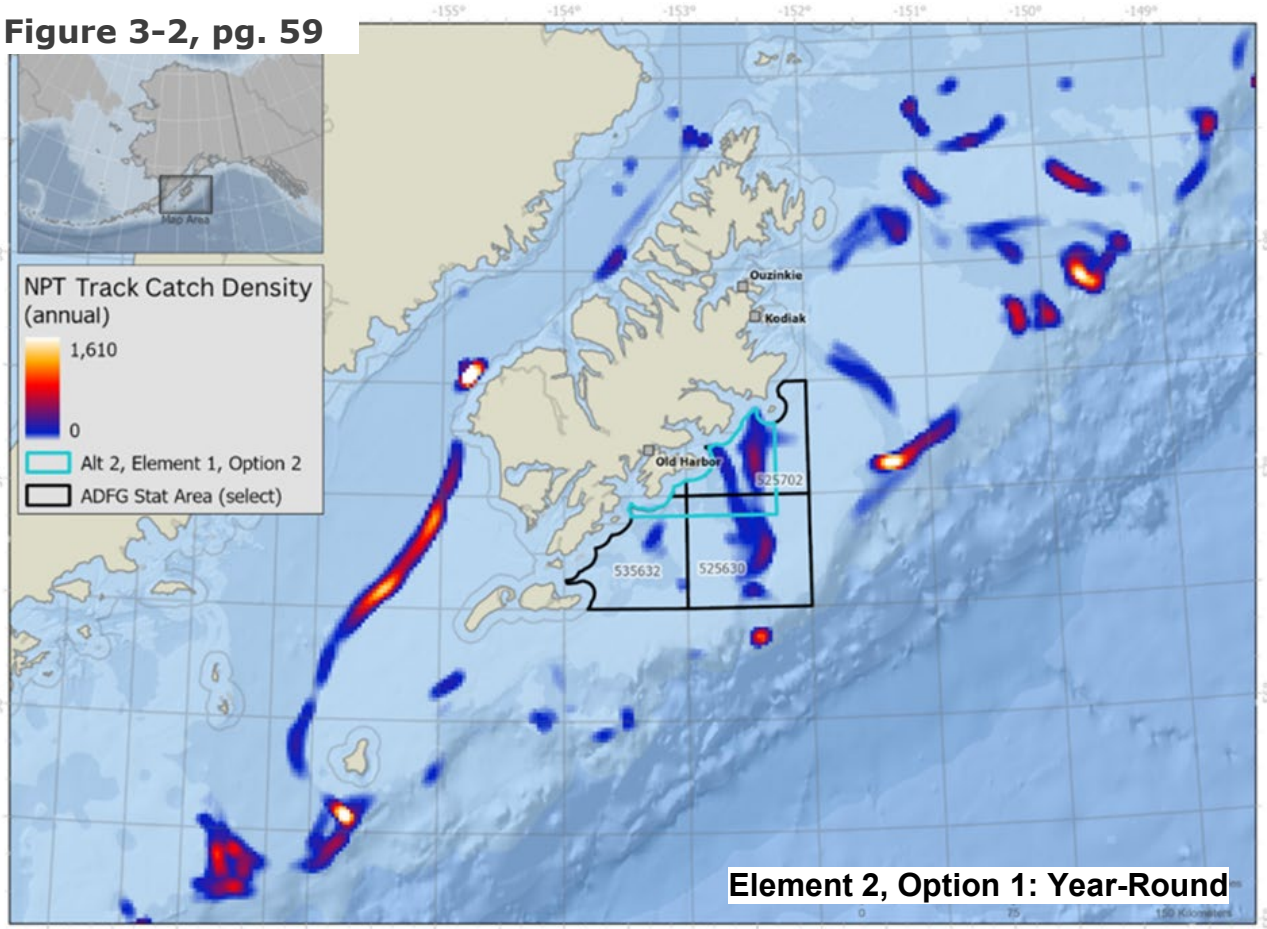
Element 2, Option 2b: Apr. 1 to Jun. 15

Nonpelagic Trawl Fishery Activity, by Closure Duration (3.1.4)

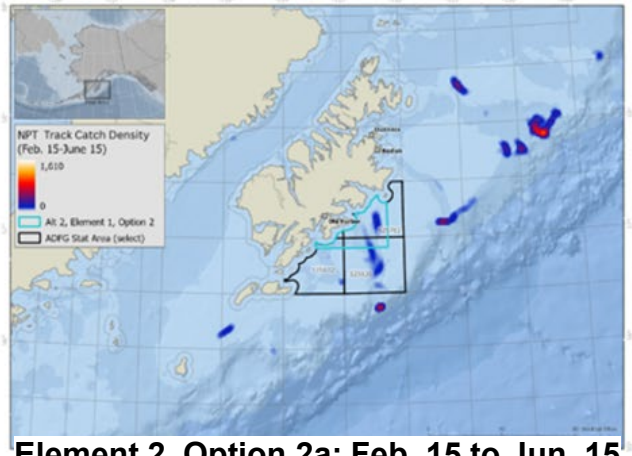
% of CGOA NPT fishing activity occurring within proposed area closures (2012-2025)				
	% of Catch by closure duration	% of Ex-Vessel Value by closure duration	% of Wholesale Value by closure duration	% of Vessels active in 525702 within closure duration
Year-round, Option 1	~11%	~10%	~9%	51% of CVs, (21 vessels) 20% of CPs (1-2 vessels)
Seasonal, Option 2a: 2/15 to 6/15	~10%	~9%	~8%	41% of CVs (15 vessels) 24% of CPs (1 vessel)
Seasonal, Option 2b: 4/1 to 6/15	~9%	~7%	~7%	36% of CVs (11 vessels) 22% of CPs (0-1 vessel)

Data from Tables 3-11 & 3-12, pg. 54 & 55. Percentages shown are averages of 525702 & Custom Closure Area

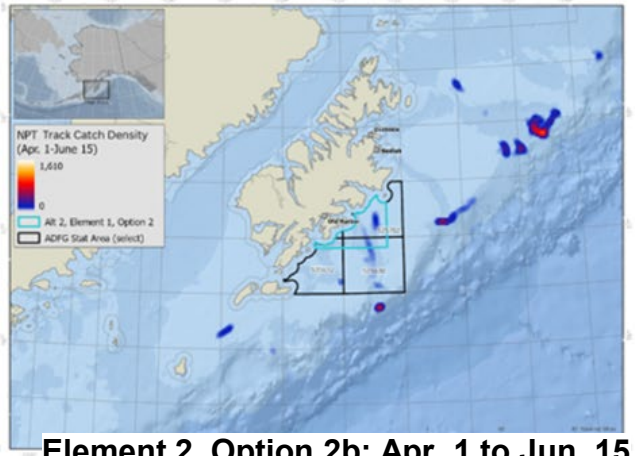
Figure 3-2, pg. 59



Element 2, Option 1: Year-Round



Element 2, Option 2a: Feb. 15 to Jun. 15



Element 2, Option 2b: Apr. 1 to Jun. 15

Participation/Engagement by Community (3.4)

Community	Harvesting Engagement					Processing Engagement	
	Groundfish pot vessel owners	PTR vessel owners	NPT vessel owners	Kodiak commercial Tanner crab vessel owners	Sport & Subsistence Tanner crab harvesters	Groundfish pot & trawl catch from 525702	Kodiak Commercial Tanner Crab
Kodiak	X	X	X	X	X	X	X
Other Kodiak Island Communities				X	X		
Homer	X			X			
Newport		X	X				
Seattle MSA		X	X				

Table 3-23, pg. 69

Economic and Social Impacts

4.1: Methods

4.2: Baseline Conditions under Alternative 1

4.3: Expected Effects of Alternative 2

4.4: Affected Small Entities

4.5: Net Benefits to the Nation

Methodology and Key Assumptions (4.1)

Degree & nature of impacts on groundfish fleets are proportional to:

1. **Extent of Reliance on Areas for Target Fishing**
    - Magnitude of displaced efforts estimated using current/historical fishing patterns
    - Assumed impacts are largely proportional to reliance
2. **Degree of Catch Redistribution**
    - Impacted vessels seek to replace catch within target fishery, OR seek to replace revenues through other target fishing efforts
    - Kodiak fleet primarily comprised of multigear/multispecies boats, which may have more operational flexibility to replace displaced catch/revenues in other fisheries
        - i.e., vessels w/ a CGOA trawl LLP endorsement often use both NPT & PTR (Table 4-1)
    - Catch may be redistributed spatially, or in some cases temporally if seasonal closure is chosen
3. **Costs of adjusting fishing behavior**
    - Operating costs may increase if vessels do not find comparable alternative fishing patterns
    - Decreased operational efficiency can occur via changes to catch composition, increased competition, increased travel/fuel costs, etc.

Groundfish Pot Impacts (Section 4.3.1.1)

Extent of Reliance on Areas

- Harvests in the areas been low in the last decade; higher volumes of catch may be displaced if TACs increase in the future
- Seasonal closure windows largely outside Pacific cod pot seasons
- Low revenue dependence; most vessels derive <10% of annual income from pot harvests from the areas

Degree of Catch Redistribution

- Highly likely that displaced Pacific cod pot catch volumes would be recoverable
  - Fishing activity largely occurred outside of closure areas in the last decade; many comparable areas

Pelagic Trawl Impacts (Section 4.3.1.2)

Extent of Reliance on Areas

- Annual closure option would displace PTR activity occurring in the fall; areas are important for B season pollock harvests
  - Very little displacement under seasonal closure options
- Half of CGOA PTR CVs operate in the area annually
  - Vessels are highly diversified; most earn <10% of annual revenues from 525702 PTR harvests

Degree of Catch Redistribution

- Vessels will attempt to redistribute effort to adjacent areas, or alternative fishing locations
  - Constrained by factors such as existing closures, and spatial catch specifications
- Catch/revenue redistribution likely, albeit with potential increased costs

Nonpelagic Trawl Impacts (Section 4.3.1.3)

Extent of Reliance on Areas

- NPT fishing activity occurs in the area year-round; displacement would occur under any closure duration
  - Seasonal closure windows overlap ‘gap season’ flatfish efforts
- Half of CGOA NPT CVs operate in the area annually
  - Vessels are highly diversified; most earn <10% of annual revenues from 525702 NPT harvests

Degree of Catch Redistribution

- Displaced volumes from most target fisheries likely to be redistributed, albeit with potential increased operational costs
  - Shallow-water flatfish appear most concentrated in 525702; vessels may pivot to other targets if costs to replace shallow-water flatfish harvests are too high
- Temporal displacement possible under seasonal closure

Potential Impacts to Non-Regulated Entities (Section 4.3.2)

Community-Level Impacts (Kodiak)

- Action unlikely to impact community spending patterns in a discernable way
- Diverse economy, including in other fisheries

Processors

- Impacts likely to be minimal
- Temporal displacement may shift timing of processing operations; i.e. during "gap season"

Kodiak Tanner Crab Users

- Localized benefits may accrue; may improve opportunities for subsistence, sport, or commercial users
- Magnitude & likelihood unknown

Environmental Assessment

5.1: Methods

5.2: Groundfish

5.3: Tanner crab

5.4: Chinook PSC

5.5: Halibut PSC

5.6: Habitat

Tanner crab life history (5.3)

- Bay and gully systems: may provide refuge from tidal forces, sites where soft sediment settles
- Migration: ontogenetic shift from inshore bays to connected offshore gullies; not thought to migrate outside regulatory areas (mark recapture tagging, 2004-2010)
- Cyclical recruitment: larger amounts of crab move through the system every few years (3-5 or 6 years; Figure 5-12 and Figure 5-13, pg. 145)
- Maturity ~ 5-7 years, hence cyclical recruitment period timing between peaks

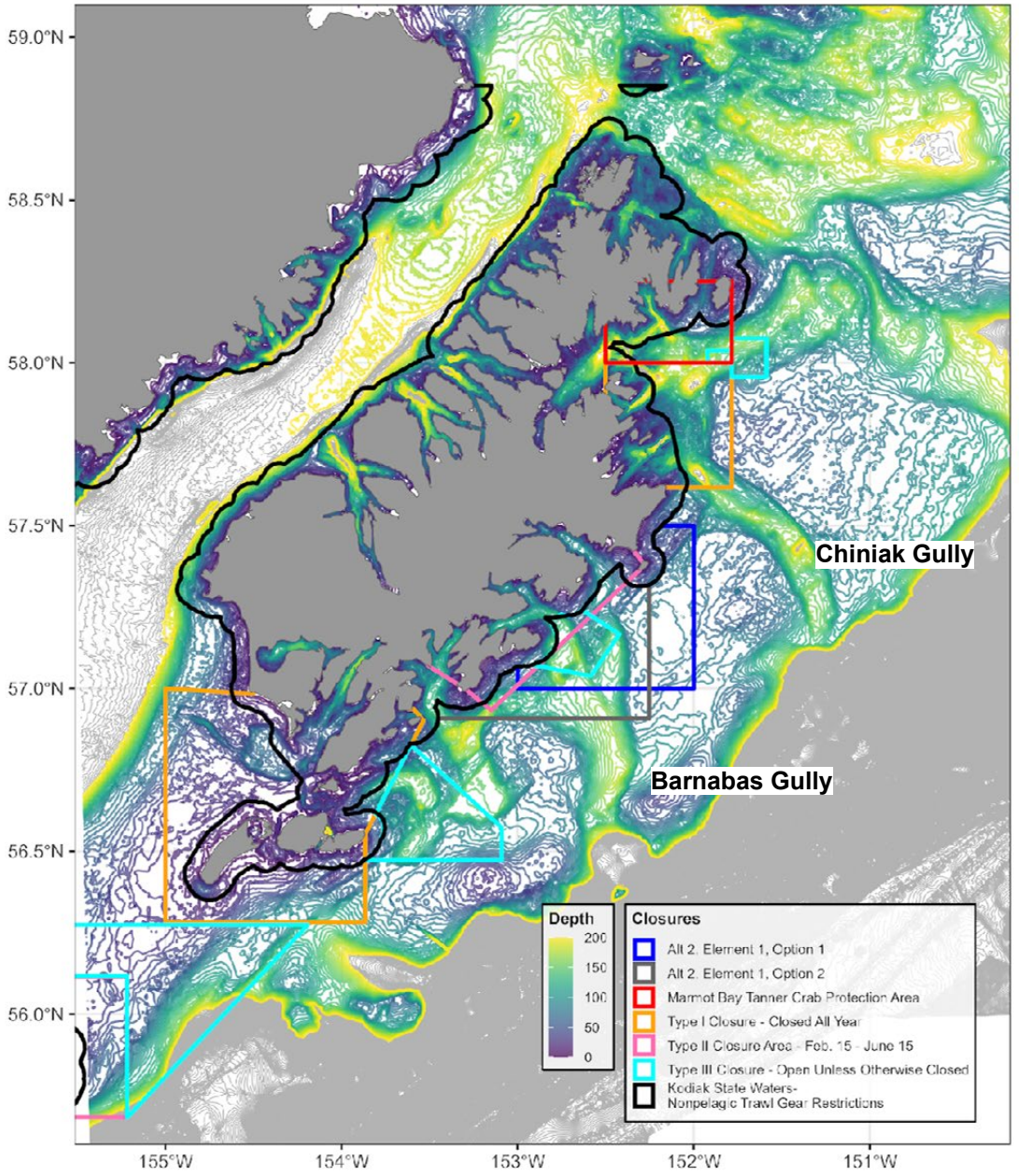


Figure 5-18, pg. 182: Bathymetric map of Kodiak Island, 5 m contours.

Tanner crab molting & mating (5.3.1.4)

Event	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Primiparous female molt to maturity/mating	■	■	■	■	■	■	■					■
Primiparous peak of new egg clutch extrusion				■	■							
Multiparous females mate in deepwater aggregations				■	■	■						
Multiparous females mounding, larvae release				■	■							
Primiparous and multiparous egg clutch incubation	■	■	■	■	■	■	■	■	■	■	■	■
Egg clutch hatching				■	■	■						
Mass molting events - smaller, mixed sex; larger, males		■	■	■	■							
Male and female soft shell encounters - ADF&G survey						■	■	■				
Male molt - Western GOA					■							
Male molt - Southeast Alaska			■	■								
Benthic juveniles annual molt			■	■								

*Tanner crab shell hardening duration unknown

Closure Duration Option 2a

Closure Duration Option 2b

Table 5-22 (p. 137)

Tanner crab - annual abundance trends & harvest strategy

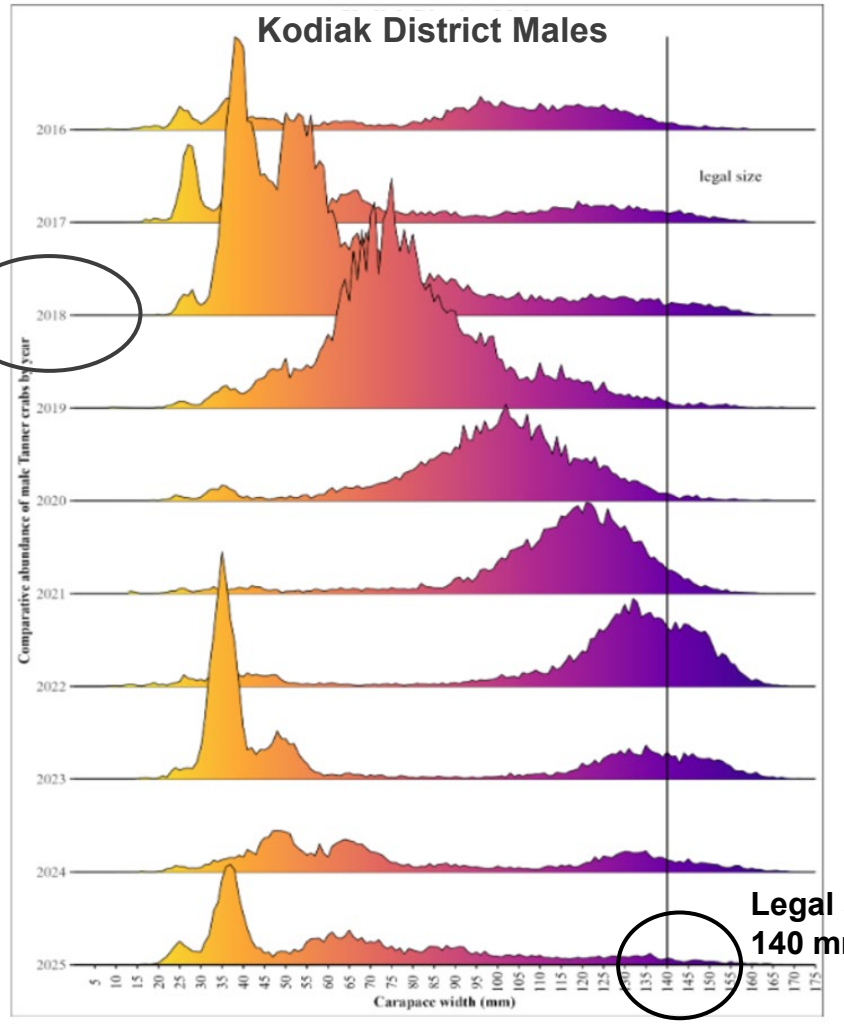
2025 Abundance (Sec. 5.3.5, pg. 157)

- Kodiak District: 85.2 million crab
  - Eastside Section
    - 30% of population
    - highest # mature males for last 5 yrs
  - Southeast Section
    - 34% of population
    - highest # of mature females
- Element 1, Option 1 (525702): 3.2 million crab
- Element 1, Option 2 (custom closure): 10.7 million crab

Harvest Strategy (Sec. 5.3.1.2, pg. 130)

- Three different harvest strategies since survey start (1988)
- In newest strategy (2022), notable advancements, including female dimmer, and elimination of the use of a molting mature males calculation

2018: largest recruitment since 1988

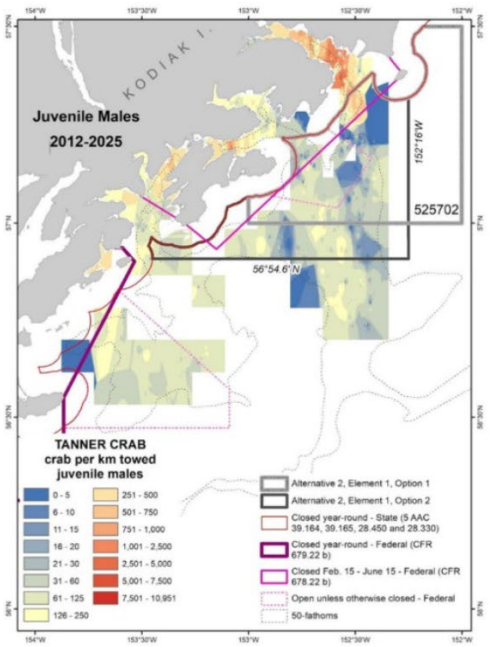


Legal size: 140 mm (5.5 in)

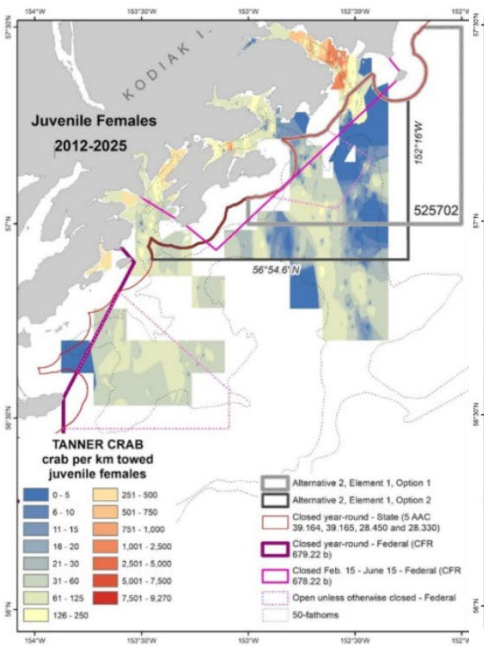
Figure 5-14, pg. 146: Male Tanner crab abundance by size, Kodiak District, 2016-2025.

ADF&G Trawl Survey - Tanner crab density

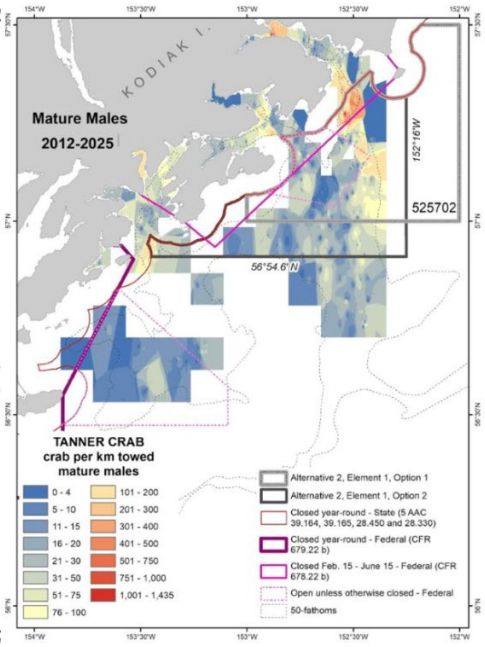
Juvenile males



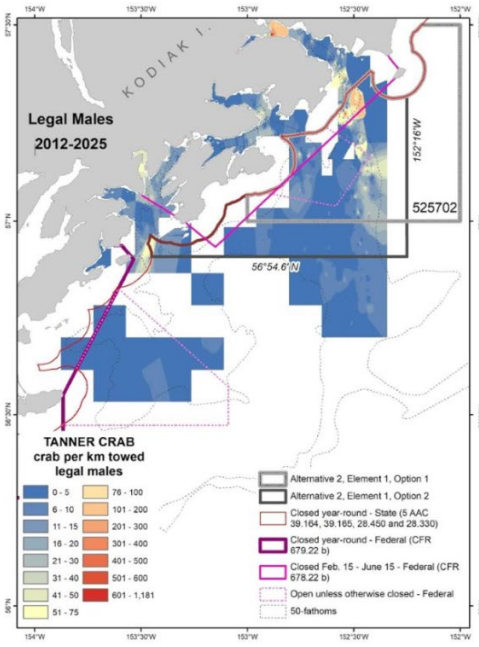
Juvenile females



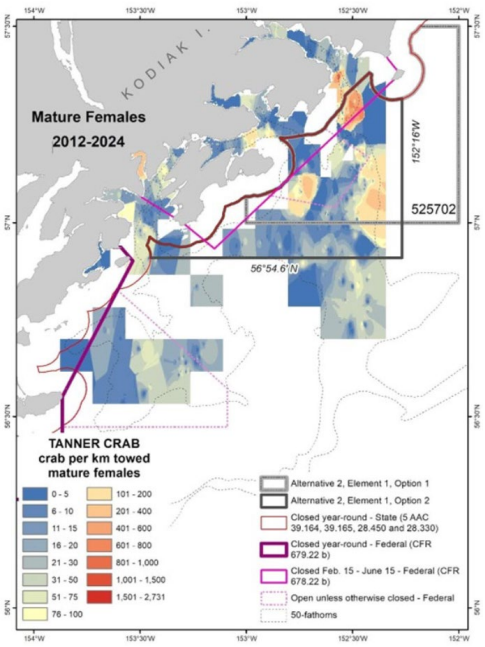
Mature males



Legal males



Mature females



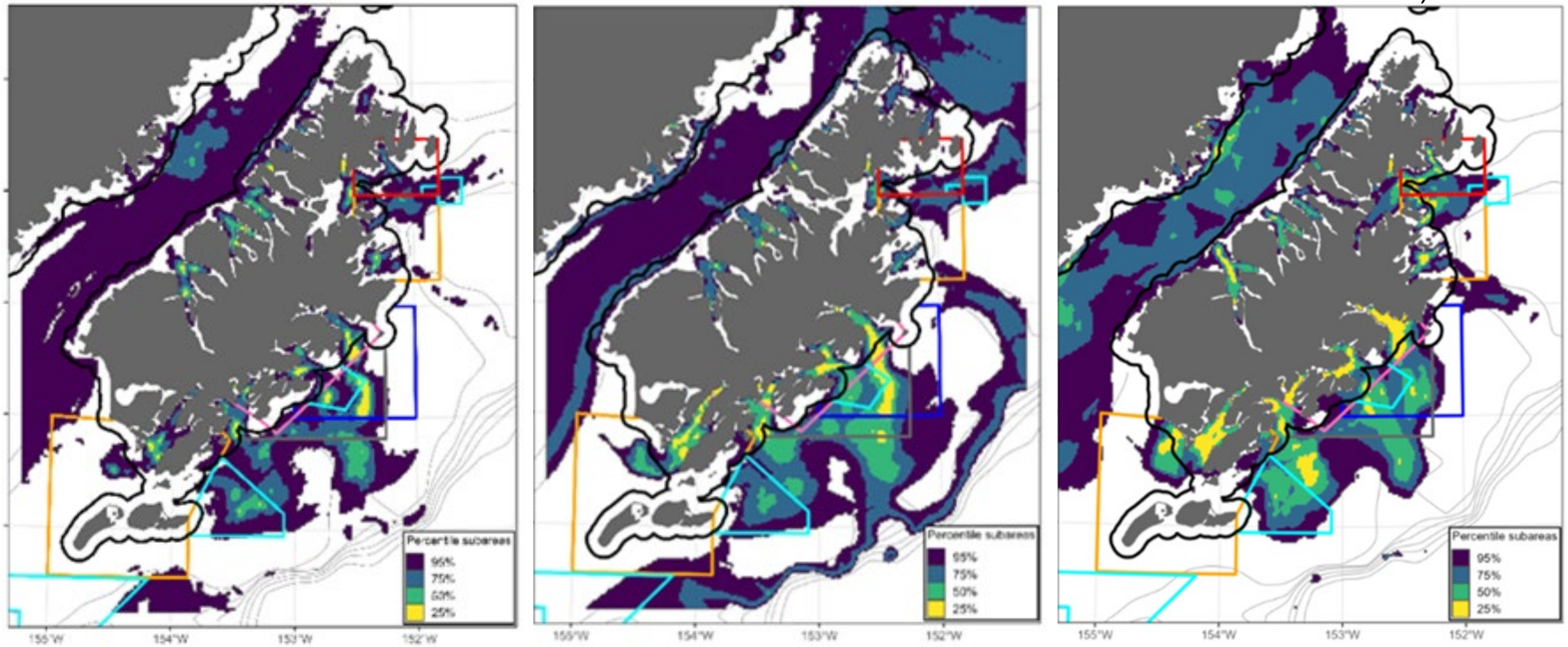
Appendix 1 Time period average density by sex and maturity
Section 5.3.1.3 ADF&G survey details

Tanner crab species distribution models (2012-2025)

Mature Females (ADF&G)

Mature Males (ADF&G)

All Tanner crab (juv + mature; ADF&G + NMFS)



Figures 5-15 through 5-17, pg. 149-151: Blue boundary = 525702 (Option 1); grey boundary = custom closure (Option 2).

Potential sources of mortality (5.3.1.5 & 5.3.6)

Sources of mortality

- Bycatch handling & discard mortality from groundfish and crab fisheries, varies by gear, likely higher for soft-shell crab
- Predation - e.g., potential inverse relationship with Pacific cod abundance
- Bitter Crab Disease - unclear pop. impacts
- Environmental factors (e.g., temperature, spring bloom timing)
- Other (e.g., cannibalism, density-dependent impacts)

Unobserved mortality from groundfish fishing gear

- UFMWG Report (2023)
  - cannot quantify magnitude of unobserved mortality impacts
  - priority future research categories included: gear specific bottom contact estimates, crab spatial distribution, movement, life stage dependent vulnerabilities, encounter rate, and mortality rate
- Bering Sea bottom trawl w/ raised sweeps (Rose et al, 2012; Hammond et al 2013)
  - RKC more vulnerable; snow and Tanner mortality similar across gear components (~4-15%)
- Norway, smaller demersal trawl w/ mods (Brinkhof et al 2026)
  - center section of gear low damage to snow crab, mortality from other gear components not examined
- Limited to no unobserved mort. research for pelagic trawl gear

Tanner crab PSC (5.3.4)

By counts (# of crab)

- NPT highest
- On average, custom area (Option 2) higher PSC, but varies by year compared to 525702 (Option 1)
- Groundfish pot PSC higher before 2018
- Closure durations: NPT reduced; pot and PTR minimal to none
- Adjacent stat areas 525630 and 535632 also have PSC

By rates (crab/ton of groundfish)

- Proposed closures very similar
- Closure durations: NPT rates generally increase across stat areas
- 525630 lower rate than proposed closures; 535632 much higher rate

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2012-2025
Non-pelagic Trawl	1.30	3.09	0.67	1.12	1.41	1.82	4.15	4.13	11.93	0.36	0.19	0.40	0.70	0.38	2.34
525630	5.10	5.42	1.35	0.40	2.03	1.89	6.46	4.30	34.69	0.48	1.32	3.04	2.49	0.58	4.90
525702	1.95	10.68	2.63	5.39	2.92	4.97	9.32	10.81	22.14	2.13	1.44	0.95	1.87	1.38	6.44
535632	0.38	7.22	2.35	1.66	3.65	17.37	13.09	4.46	46.86	1.68	0.16	*	4.40		12.73
535704				*			*	*							7.85
Custom*	2.42	9.55	2.41	4.90	2.83	4.48	8.98	9.99	23.66	2.02	1.43	1.34	1.95	1.31	6.29
Other CG	0.71	1.26	0.28	0.42	0.98	1.16	2.69	2.52	6.44	0.12	0.11	0.21	0.27	0.22	1.23
Pot	4.82	19.78	1.63	2.65	1.78	0.20	2.98	2.61	0.01	1.09	0.35	0.66	0.41	0.14	3.26
525630	4.07	3.27	0.13	1.74	3.18	*			0.00	0.00	*	*	*	0.00	2.88
525702	5.58	4.04	0.29	3.25	6.03	0.25				*	*	*	*	0.00	3.30
535632	4.72	2.17	*	1.78	0.55	*				*				0.00	2.64
535704	*	*	*		*	*				*					6.51
Custom*	5.88	3.83	0.27	3.14	5.56	0.24	#DIV/0!	#DIV/0!	0.00	2.16	0.00	0.00	1.37	0.00	3.44
Other CG	4.78	23.05	1.76	2.65	1.62	0.20	2.98	2.61	0.01	1.07	0.35	0.67	0.38	0.14	3.27
Pelagic Trawl	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03	0.01	0.01	0.04	0.00	0.01
525630	0.50	0.00	0.00	0.01	0.00	0.00	0.03	0.00	0.09	0.00	0.40	*	0.00	0.00	0.01
525702	0.02	0.21	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.13	0.01	0.15	0.24	0.00	0.03
535632		*	0.00	0.00	0.00	*	0.08	0.00	0.01	0.00	0.01	0.00	*	0.00	0.00
535704				*	0.00						*				0.00
Custom*	0.03	0.16	0.00	0.00	0.00	0.00	0.01	0.01	0.03	0.11	0.02	0.13	0.24	0.00	0.02
Other CG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.01	0.01	0.00	0.00
Total	1.24	3.26	0.42	0.62	0.64	0.58	1.31	1.62	5.57	0.24	0.10	0.19	0.41	0.19	1.15

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

Table 5-28, pg. 155: Tanner crab PSC rates (crab/ton groundfish), year-round closure duration (Element 2, Option 1)

Distribution of Tanner crab abundance and groundfish fishing

Mature male Tanner crab SDM

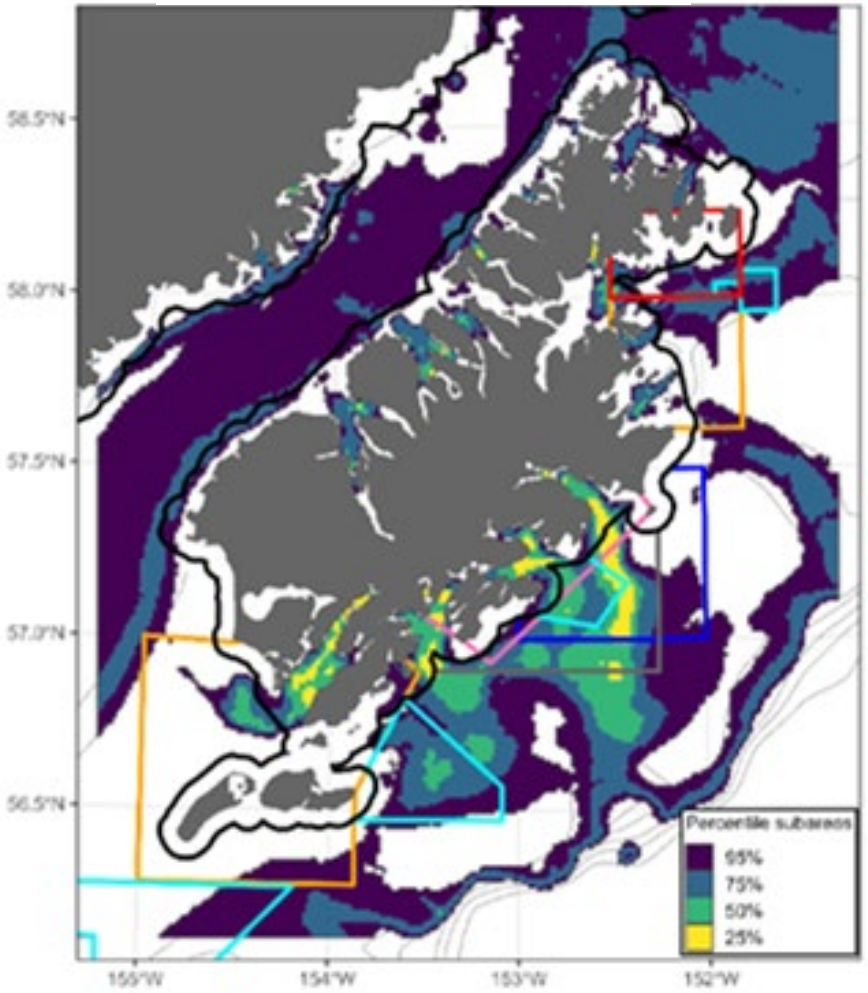


Figure 5-16, pg. 150

Nonpelagic trawl track density

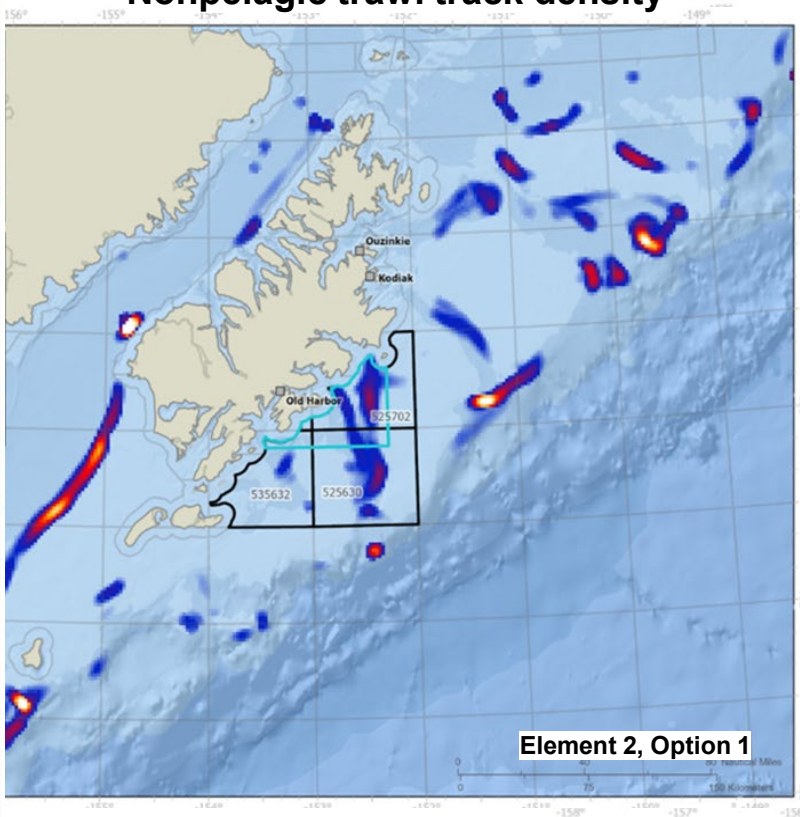


Figure 3-2, pg. 59

Pelagic trawl track density

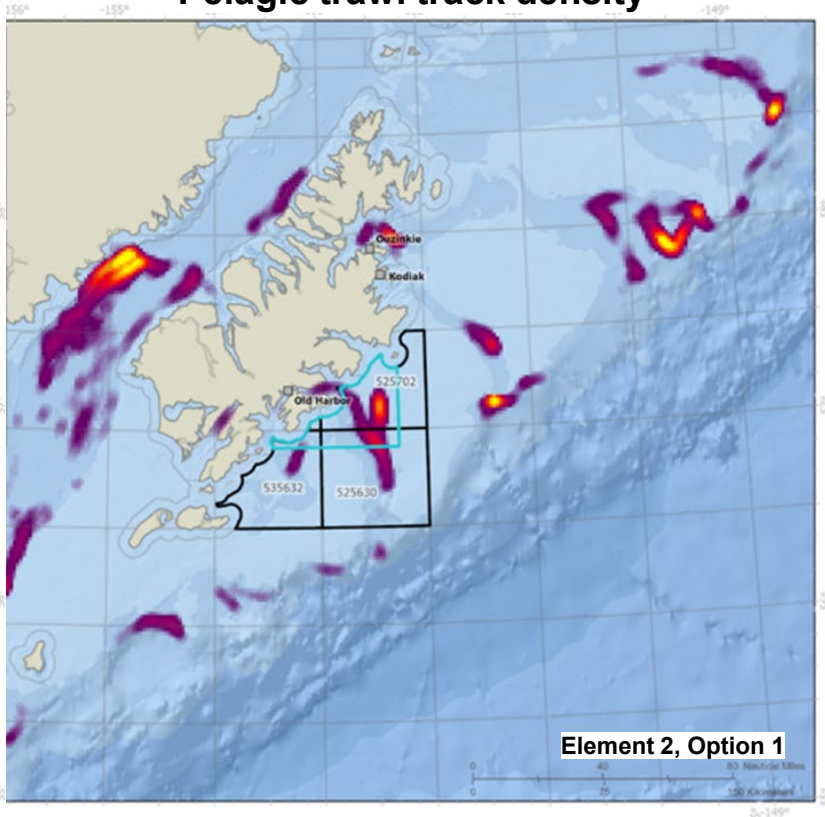


Figure 3-1, pg. 51

Effects on Tanner crab from Alt. 2 (5.3.5)

Element 1: Area		Element 2: Duration			Element 3: Gear	
Option 1: Stat Area 525702	**Option 2: Custom Area**	**Option 1: Year-Round**	**Option 2a: Feb 15 – June 15**	**Option 2b: April 1 – June 15**	**Option 1: NPT, PTR, and POT**	**Option 2: NPT**
Reduces benefits relative to custom closure, but still provides conservation benefit. Displacement may offset benefits.	Greatest conservation benefit; highest amount of Tanner crab population, highest amount of fishing. Displacement may offset benefits.	Aligns with soft-shell and egg clutch timing. Would displace the most fishing, and would provide the greatest conservation benefit.	Aligns with majority of crab soft-shell window. Would displace NPT activity; reduces benefits relative to year-round closure. Temporal displacement may offset benefits.	Aligns with peak molting/mating activity. Would displace NPT activity; reduces benefits relative to year-round closure or longer time closure window option. Temporal displacement may offset benefits.	Greatest conservation benefit; would reduce interactions and displace the most fishing activity.	Reduced conservation benefit relative to Option 1; would still provide conservation benefits.

Alt. 2 Effects: Groundfish, Chinook & Halibut PSC

Groundfish (Sec. 5.2.2)

- **Pollock:** varies from negligible to moderate, mainly from potential redistribution of fishing
- **Pacific cod:** minor impacts mainly from potential redistribution and potential reductions in efficiency but diversity of gear types, locations, and flexibility from reallocation
- **Rockfish:** minor impacts, relatively small removals
- **Flatfish:** minor impacts at stock level, but potentially moderate localized impacts, particularly for shallow water flatfish due to higher concentrations

Chinook PSC (Sec. 5.4.2)

- Limited amount in either proposed closure area compared to CGOA
- Mainly from pollock PTR fishery
- Low rates for either proposed closure area and adjacent stat areas (same seasonally)
- Minimal impact compared to status quo

Halibut PSC (Sec. 5.5.2)

- Highest in NPT fishing
- Similar between proposed closure areas
- Seasonally, PSC rate increases, but similar between proposed closure options
- Similar PSC rates in adjacent stat areas if displacement occurred
- Impacts not expected to be significant

Alt. 2 - Effects on Habitat (Sec. 5.6.4)

- Historical fishing activity (2012 - Aug 2022)
- Fishing Effects model: Fishing Module
- Proposed closure areas very similar
- Similar spatial fishing activity patterns to the track density maps
- Implementation of either closure area expected to decrease bottom contact area within closure boundaries, but displaced fishing activity may result in bottom contact elsewhere
- Ongoing research may result in changes to PTR bottom contact adjustments

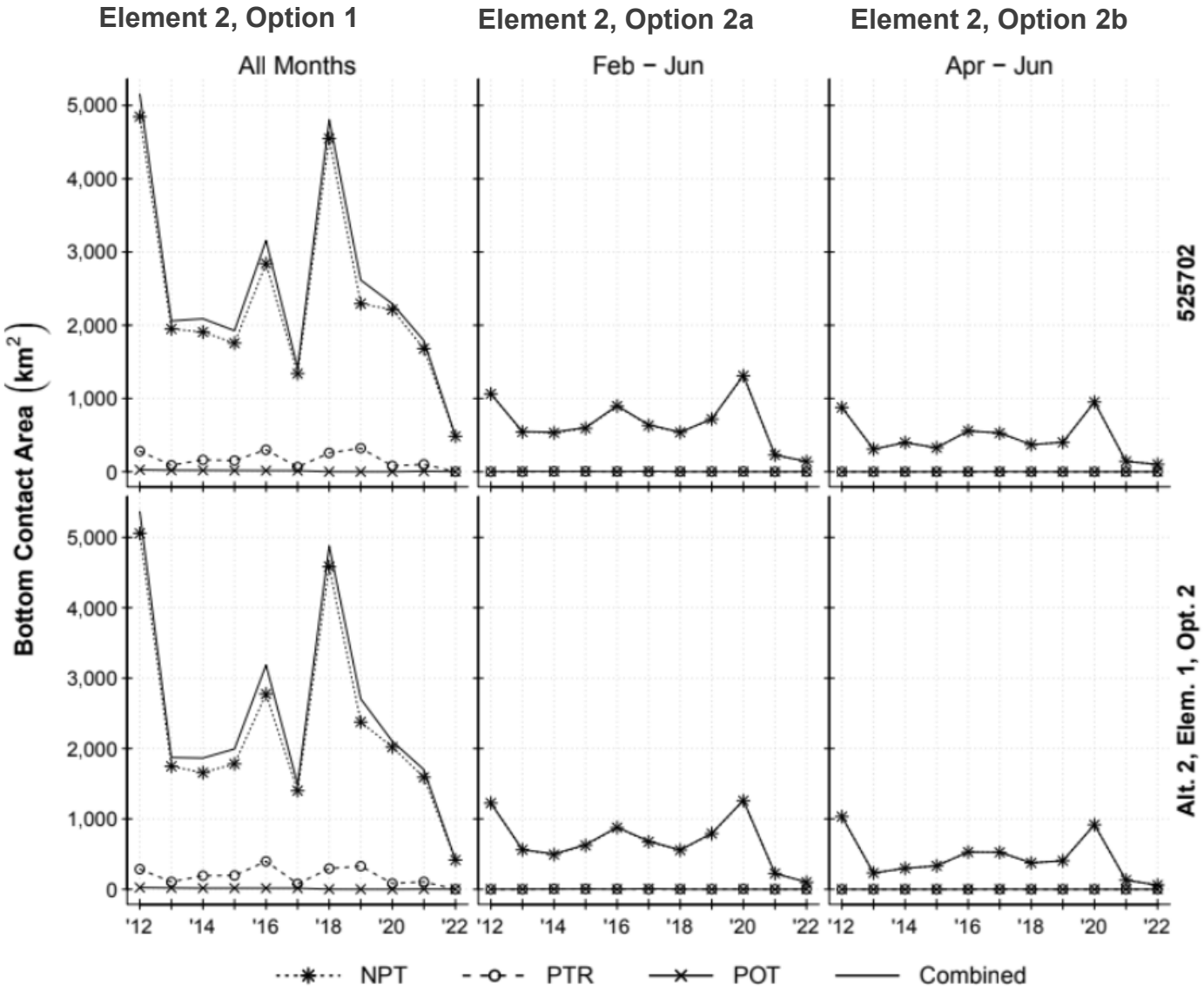


Figure 5-20, pg. 186. Summed bottom contact area by year, gear type, proposed closure area, and closure duration option. Fishing Effects Model, CIA legacy database, 2012- Aug 2022

Alternative 3: Evaluate Existing Closure Areas

Section 7

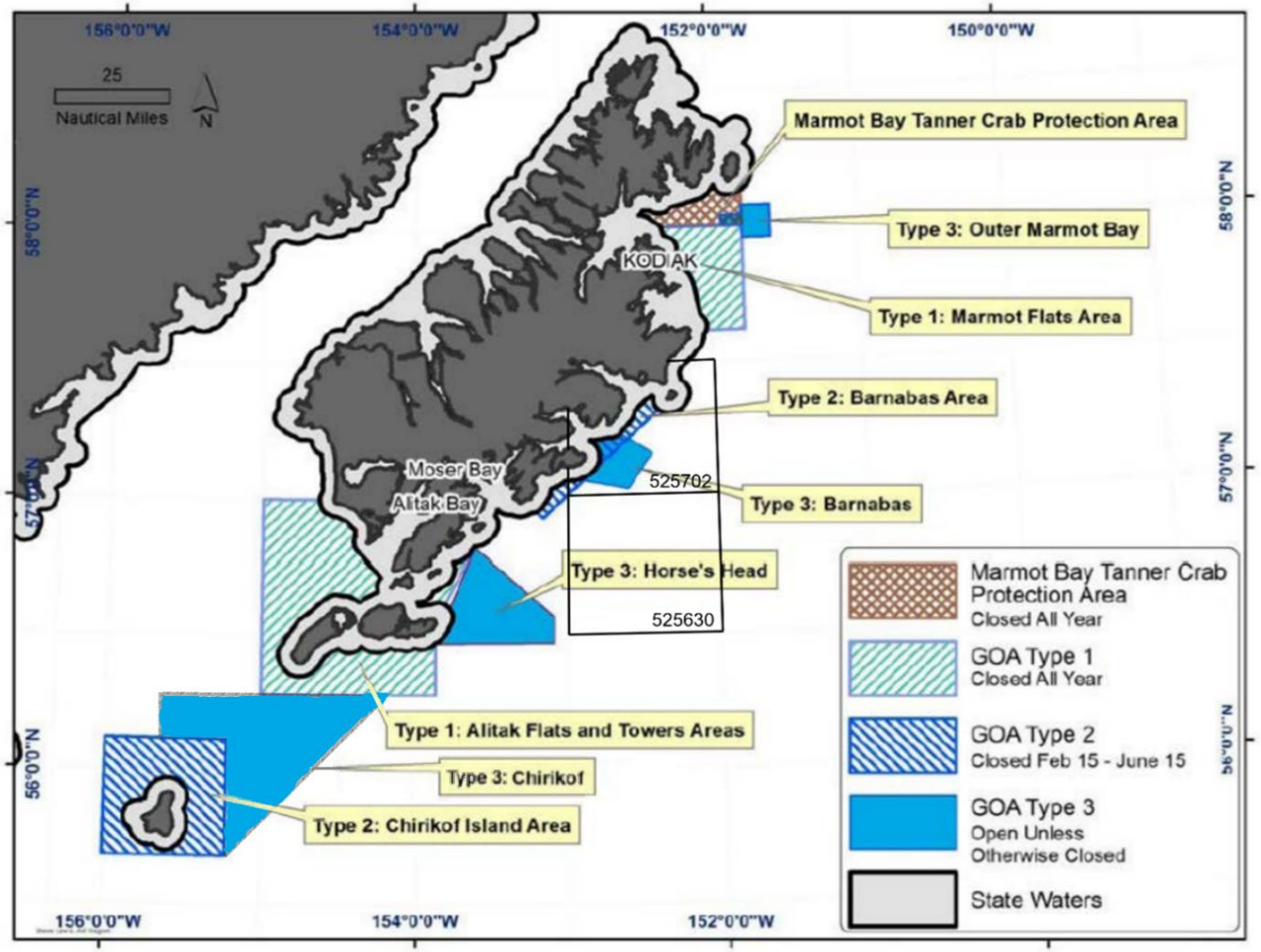
Alternative 3: Approach and Overview

Alternative 3: Evaluate <u>existing GOA crab closure areas</u>, & consider options for modification or removal

- Type I-III Areas, implemented for RKC protection/conservation
- Marmot Bay Tanner Crab Protection Area

Discussion-paper style analysis; broad overview of objectives, rationale/history, recent crab abundance & PSC estimates, and considerations

Development of evaluation options under Alt. 3 may inform development of criteria and timelines to review effectiveness of Alt. 2



Modified from Figure 5, § 679.22(b)(1) and (b)(3). See also Appendix B, GOA Groundfish FMP.

Objectives of GOA Type I-III Closure Areas for RKC (Sec. 7.1 & 7.2)

Type I-III Closures (est. 1986-1989)

- Established to promote rebuilding of severely depressed RKC stocks by reducing bycatch mortality
- Additional protections were established throughout implementation process, as outlined in table
- Type III areas have never been triggered; threshold based on RKC abundance from 1960's/1970's, and has never been updated

Elements Considered, & Rationale Behind Selection	
CLOSURE AREA	**Type I & II:** Based on female RKC distribution (from 1960s) **Type III:** Areas adjacent to existing Type I/II, thought to be rearing areas & migratory pathways
CLOSURE DURATION	**Type I:** Closed year-round; to provide maximum protections **Type II:** Closed 2/15 to 6.15; to protect RKC during period of highest vulnerability (soft-shell phase) **Type III:** Open unless abundance-based threshold met; to further facilitate rebuilding efforts while otherwise maintaining groundfish fishing opportunities
PROHIBITED GEAR	**Type I/II:** Closed to NPT gear; only flatfish fishery had occurred in the areas at the time

Objectives of Marmot Bay Tanner Crab Protection Area (Sec. 7.1 & 7.2)

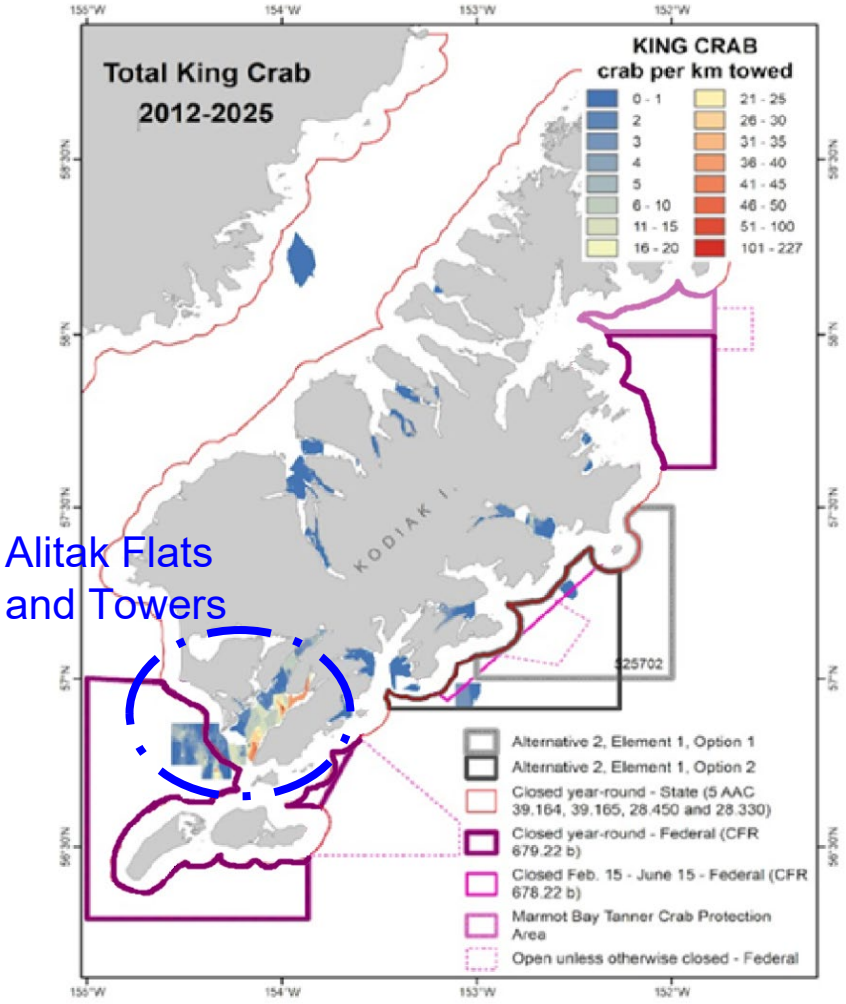
Marmot Bay Tanner Crab Protection Area (est. 2014)

- Established to protect Tanner crab by reducing Tanner crab bycatch in GOA groundfish fisheries, and reduce gear contact from NPT
- Trailing amendment requiring NPT gear modifications (elevated sweeps)
- Originally included observer coverage requirements in other areas w/ high Tanner PSC
  - Not included in final rule

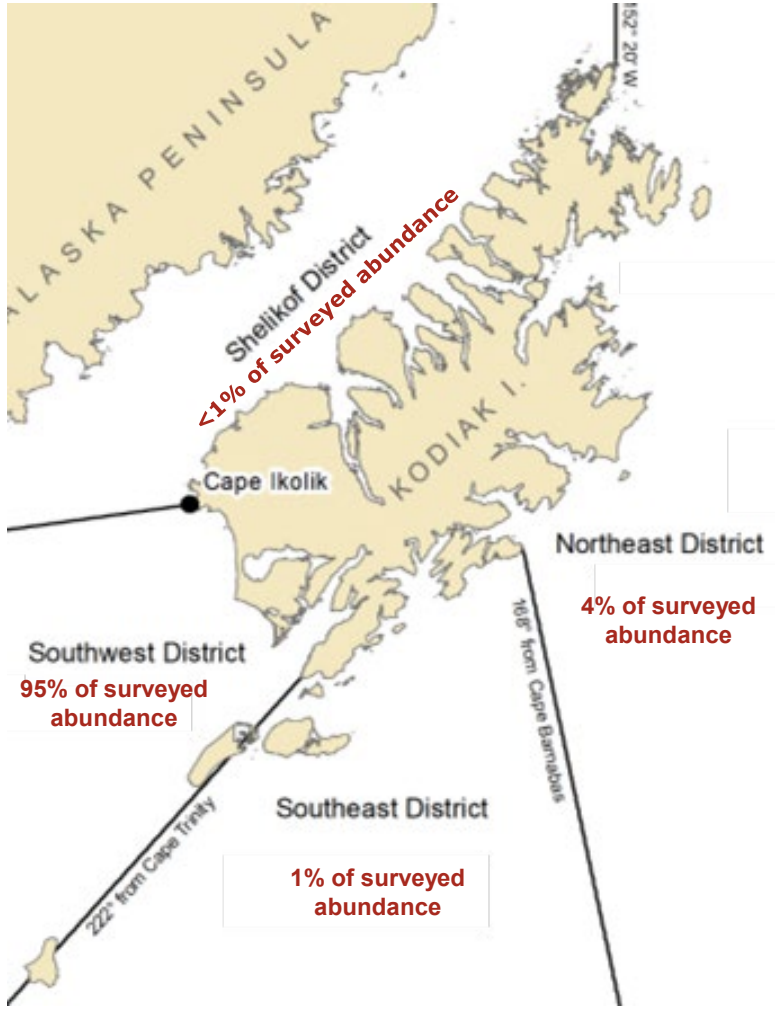
Elements Considered, & Rationale Behind Selection	
CLOSURE AREA	Considered areas of high Tanner abundance: Marmot Bay, Chiniak Gully, 525702, 525630 Selected Marmot Bay; highest observed PSC mortality rate, and lower levels of groundfish impacts
CLOSURE DURATION	Considered annual & seasonal (1/1 to 7/31) Year-round closure offered higher protections, aligned duration with adjacent Marmot Flats Type I area
PROHIBITED GEAR	Considered groundfish pot & trawl NPT contributed majority of Tanner PSC in CGOA. Pot gear also contributed PSC intermittently, but occurred predominantly in other areas in the CGOA

RKC abundance & PSC estimates in existing closures (Sec. 7.4)

ADF&G Abundance Est., 2012-2025 (Fig. 7-2, pg. 206)



Abundance by King Crab Management District, 2012-2025 (Fig. 3-3, pg. 64)



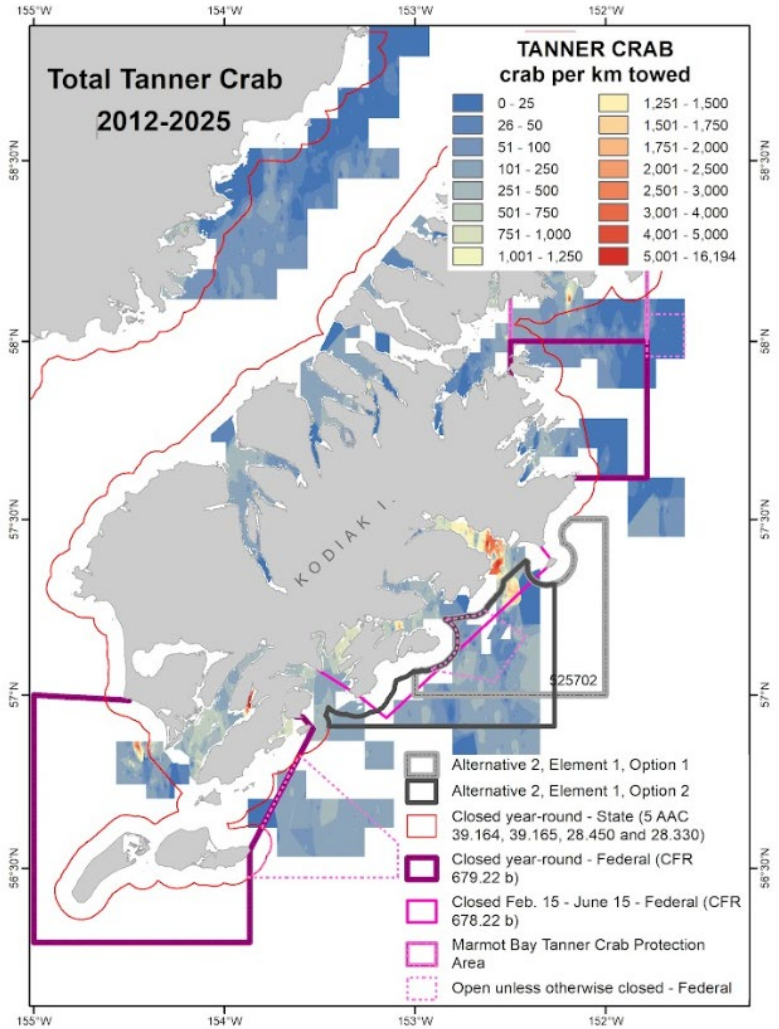
RKC Abundance & PSC Summary, by Closure Area

		Red King Crab	
		% of Surveyed Abundance (2012-2025)	**PSC*** (2012-2025)
Marmot Bay Tanner Crab Protection Area		None	None
Type I	Alitak Flats & Towers	18%	<1 crab/year
	Marmot Flats	None	None
Type II	Chirikof Island Area	NA; survey not conducted in Chirikof	None
	Barnabas Area	<1%	None

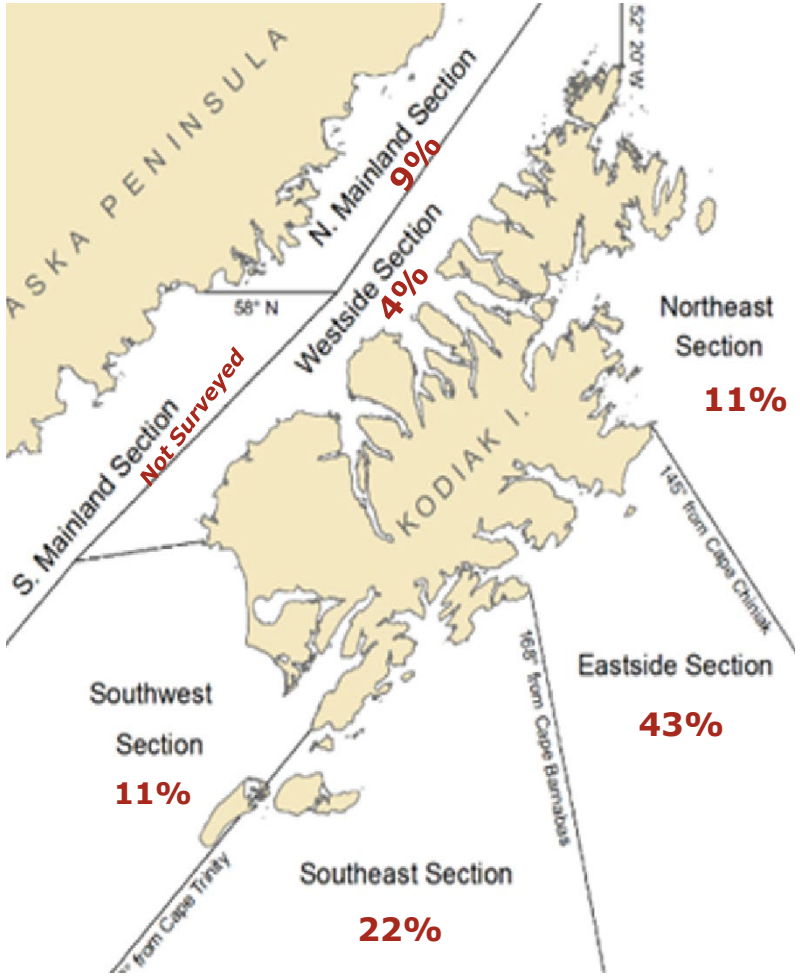
Data from Tables 7-2, 7-3, & 7-4, pg. 204-205
*PSC method sums overlapping stat areas and is therefore a conservative estimate, which may overstate PSC counts

Tanner abundance & PSC estimates in existing closures (Sec. 7.4)

ADF&G Abundance Est., 2012-2025 (Fig. 5-10, pg. 143)



Abundance by Tanner Crab Management Section, 2012-2025 (Fig. 3-3, pg. 64)

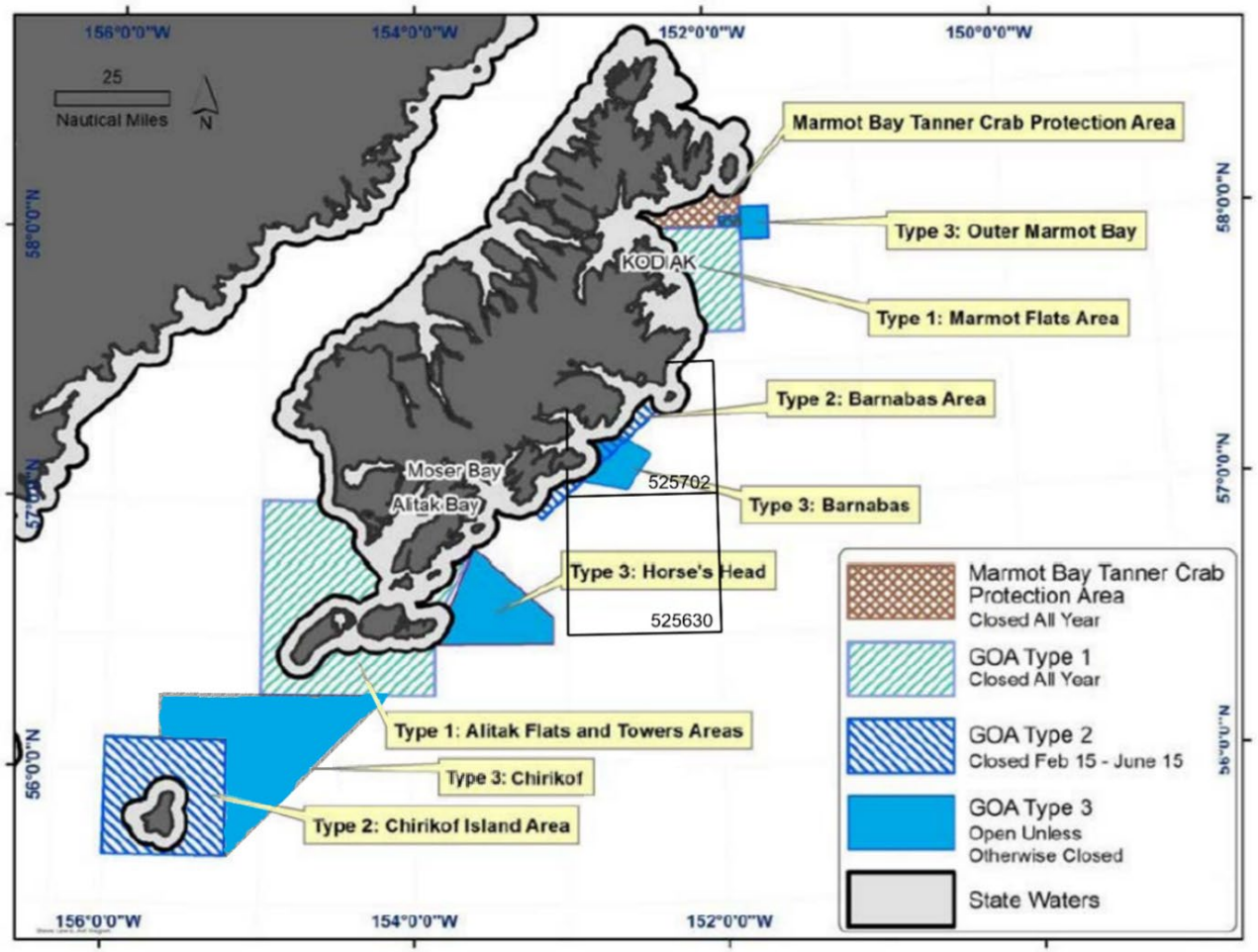


Tanner Crab Abundance & PSC Summary, by Closure Area

		Tanner Crab	
		% of Surveyed Abundance (2012-2025)	**PSC*** (2012-2025)
Marmot Bay Tanner Crab Protection Area		1%	Historically high, declines over time
Type I	Alitak Flats & Towers	4%	104.4 crab/year
	Marmot Flats	2%	Historically high, declines over time
Type II	Chirikof Island Area	NA; survey not conducted in Chirikof	43 crab/year
	Barnabas Area	6%	17,700 crab/year

Data from Tables 7-5 and 7-6, pg. 207-208
*PSC method overlapping stat areas and is therefore a conservative estimate, which may overstate PSC counts

Considerations for existing closures (Sec. 7.3)



Modified from Figure 5 in § 679.22(b)(1) and (b)(3). See also Appendix B, GOA Groundfish FMP

Marmot Bay Tanner Crab Protection Area		Low abundance relative to other Kodiak crab protection areas
Type I	Alitak Flats & Towers	Last remaining portion of king crab stock
	Marmot Flats	May provide incidental Tanner protections; overlaps a portion of Chiniak Gully
Type II	All Areas	Seasonal closure duration based on data from 1970s/80s, could be revised
	Chirikof Island Area	Not surveyed; abundance difficult to quantify
	Barnabas Area	Overlaps Alt 2 proposed closure areas
Type III	All Areas	Have never been triggered; benefits have not yet been afforded Outdated threshold & trigger
All Closure Areas		Potential for incidental protection from overlapping closures (e.g., SSL)

Next Steps

Next steps - points of focus for SSC

- Determine if analysis of Alternative 2 is adequate to allow the Council to understand the impacts of the alternatives given what information is currently available, and if so, whether to release for final action
- Provide advice for setting clear, measurable objectives when initiating new closure areas
- Methods for measuring the effectiveness of these objectives in the future
- Specific objectives that may be appropriate for protecting Tanner crab
- Types of information that should be updated/included in future iterations, e.g., sex/maturity status to focus on for protection
- Evaluation of existing closure frameworks under Alt. 3 may inform development of criteria and timelines to review effectiveness of Alt. 2