Recommended Updates for Tanner Crab Harvest Strategies in the Kodiak, Chignik, South Peninsula, and Eastern Aleutian Districts

Proposals 268 and 272

Report to the Alaska Board of Fisheries

March 26–April 2, 2022

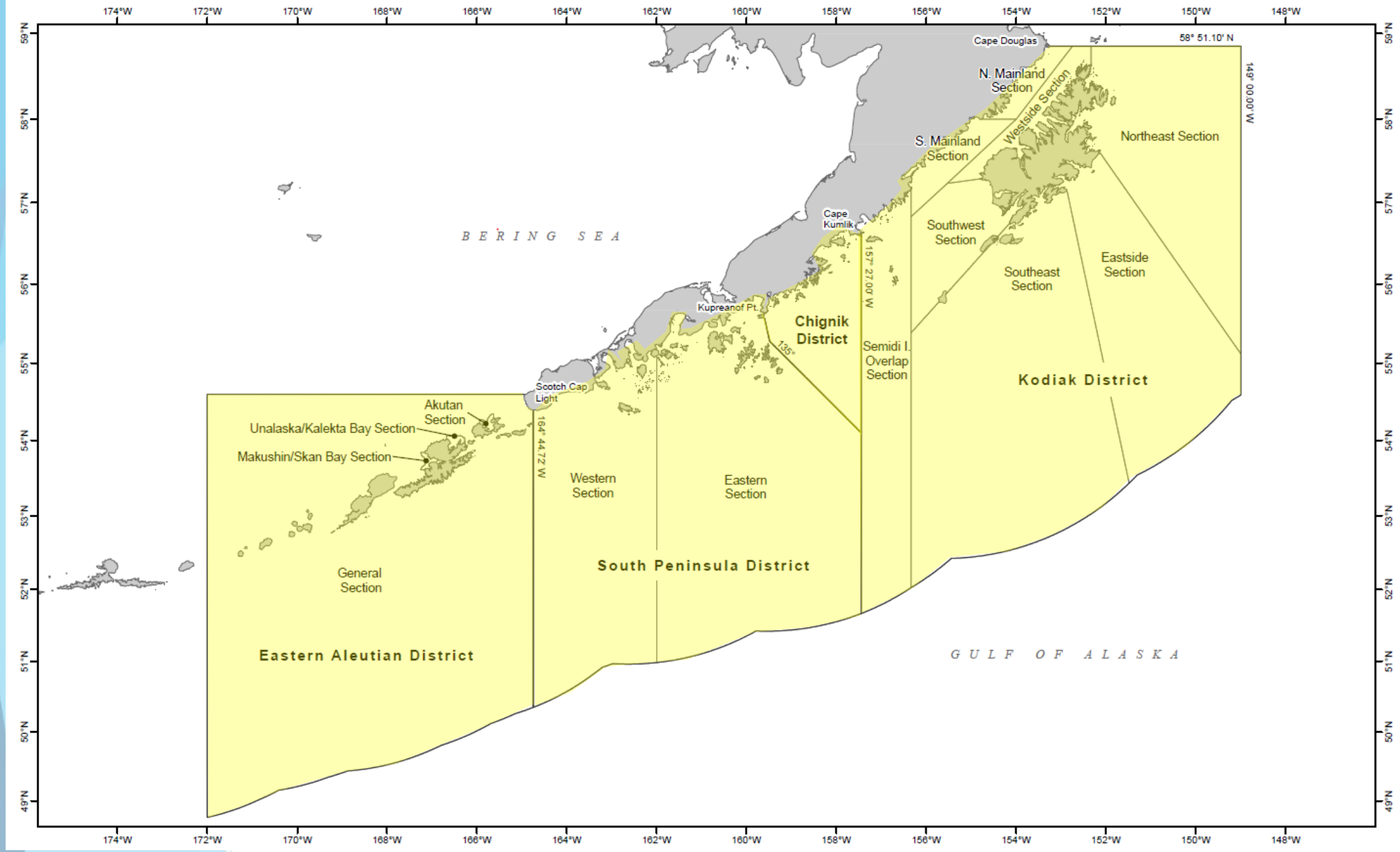
Anchorage, Alaska

Alaska Department of Fish and Game

Division of Commercial Fisheries

Outline

- Area overview
- **<u>Proposal 268 – Kodiak, Chignik, and South Peninsula Districts</u>**
  - Highlights
  - Survey
  - Fishery
  - Results of recommended updates
  - Details of recommended updates
- **<u>Proposal 272 – Eastern Aleutian District</u>**
  - Fishery
  - Results and details of recommended updates


Cape Douglas
58° 51.10' N
N. Mainland Section
Westside Section
S. Mainland Section
Northeast Section
149° 00.00' W
Cape Kumlik
Southwest Section
Eastside Section
Southeast Section
157° 27.00' W
Kupreanof Pt.
Chignik District
135°
Semidi I. Overlap Section
Kodiak District
Scotch Cap Light
Akutan Section
Unalaska/Kalekta Bay Section
Makushin/Skan Bay Section
164° 44.72' W
Western Section
Eastern Section
General Section
South Peninsula District
Eastern Aleutian District
BERING SEA
GULF OF ALASKA
174°W
172°W
170°W
168°W
166°W
164°W
162°W
160°W
158°W
156°W
154°W
152°W
150°W
148°W
59°N
58°N
57°N
56°N
55°N
54°N
53°N
52°N
51°N
50°N
49°N

Proposal 268

Kodiak, Chignik, and South Peninsula Districts

What is a harvest strategy?

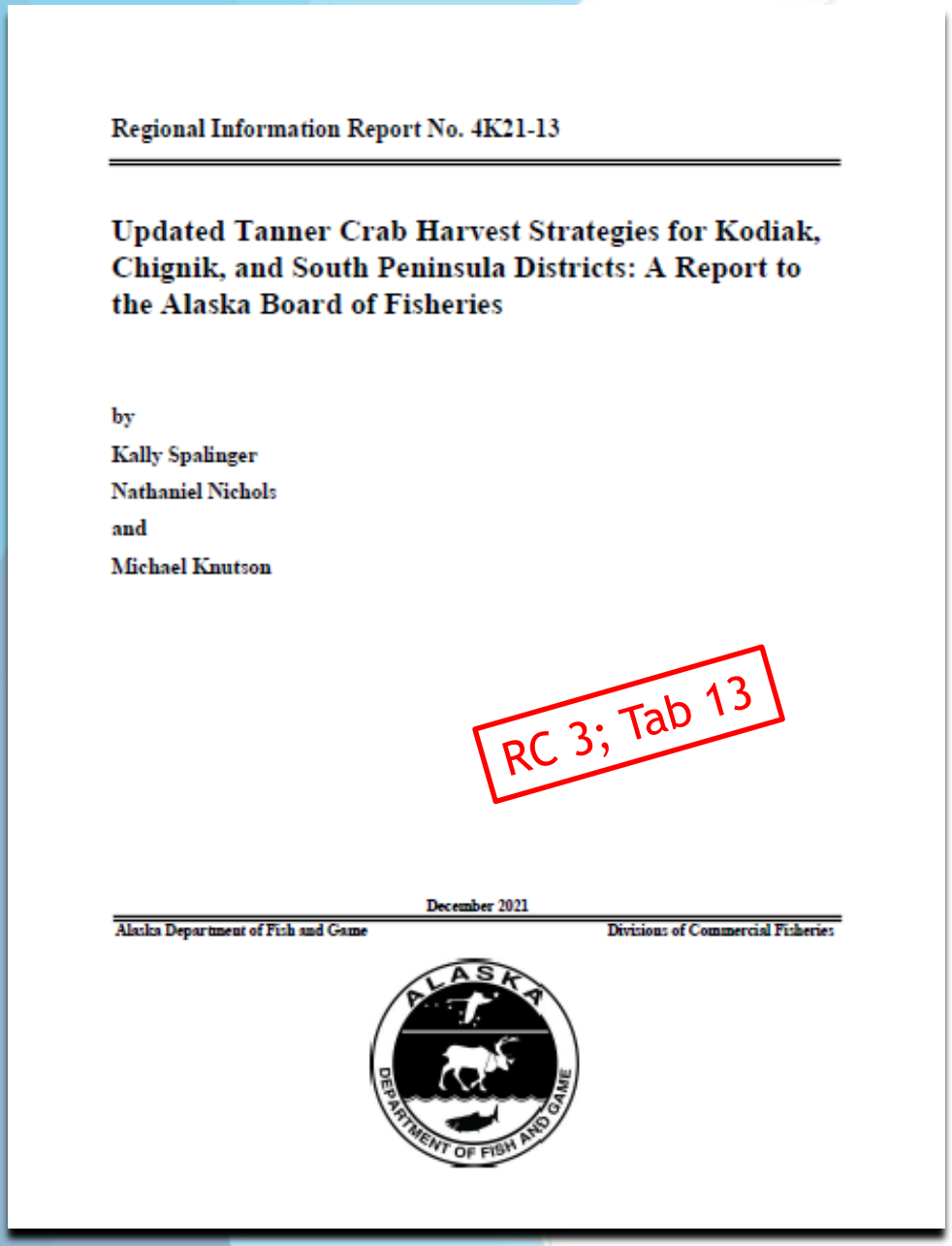
Survey

Biological components

Harvest Control Rule (math)

Management components

Fishery



Regional Information Report No. 4K21-13

Updated Tanner Crab Harvest Strategies for Kodiak, Chignik, and South Peninsula Districts: A Report to the Alaska Board of Fisheries

by
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Nathaniel Nichols
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Michael Knutson

RC 3; Tab 13

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Alaska Department of Fish and Game — Divisions of Commercial Fisheries

ALASKA DEPARTMENT OF FISH AND GAME

Highlights

- These recommended updates seek to improve upon harvest strategies that are currently performing well.

Better science

- Incorporates females (This is new!)
  - Builds on extensive analysis recently used to update the Bering Sea Tanner crab harvest strategy
- Last updated in 1999 (23 years of additional survey data available)

Simpler

- Updated harvest strategy is easier to communicate

Higher yield

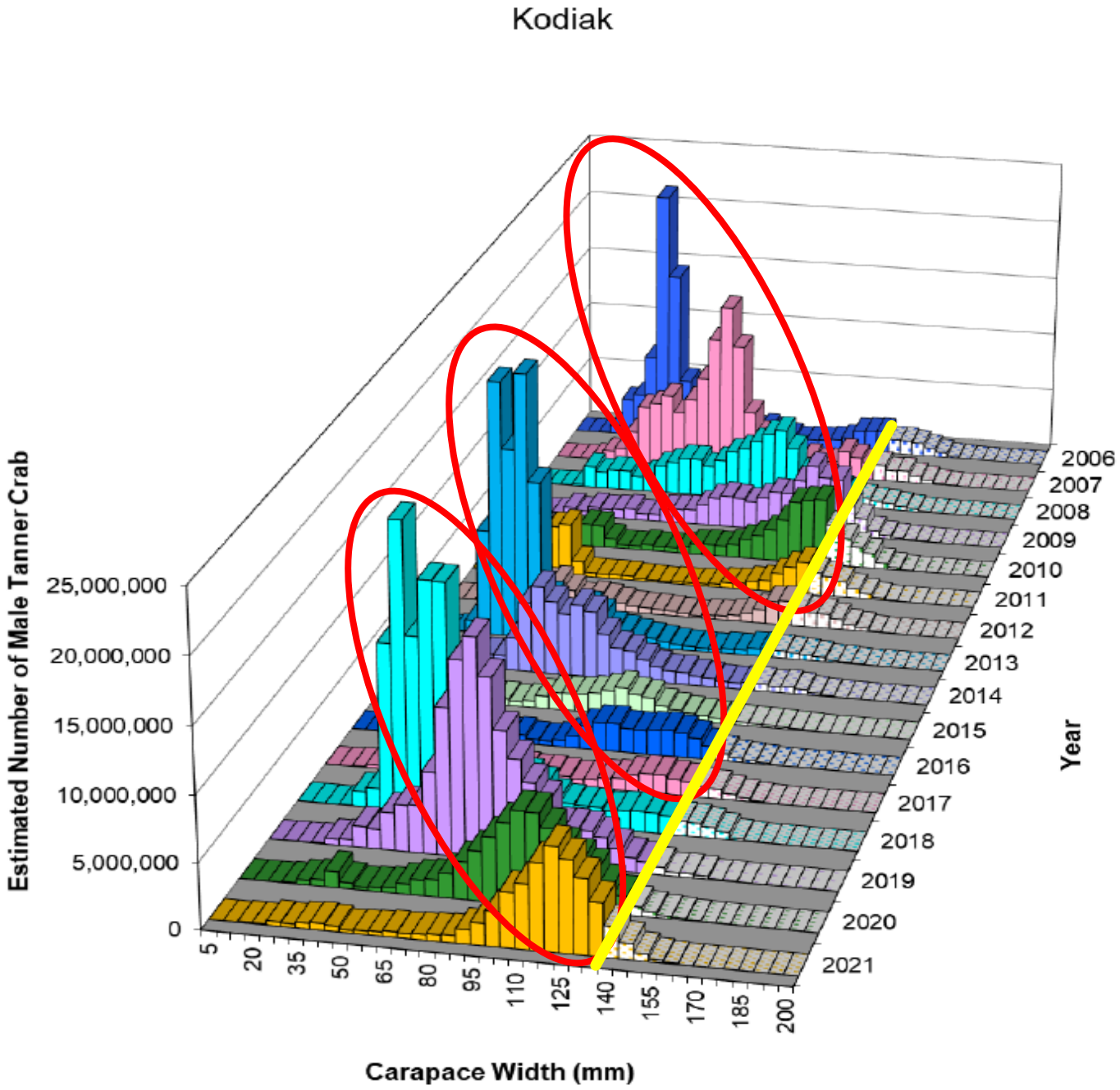
- Increases estimated annual harvest in all districts

Survey

1988–present, consistent:

- **Vessel** (R/V *Resolution;* 95 x 36 ft stern trawler)
- **Net configuration** (400-Eastern otter trawl)
- **Survey grid** (375 stations)
- **Survey timing** (Jun–Sep; 75 days at sea)

R/V Resolution large-mesh trawl survey station grid


Kodiak
Estimated Number of Male Tanner Crab
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
5
20
35
50
65
80
95
110
125
140
155
170
185
200
Carapace Width (mm)
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Year

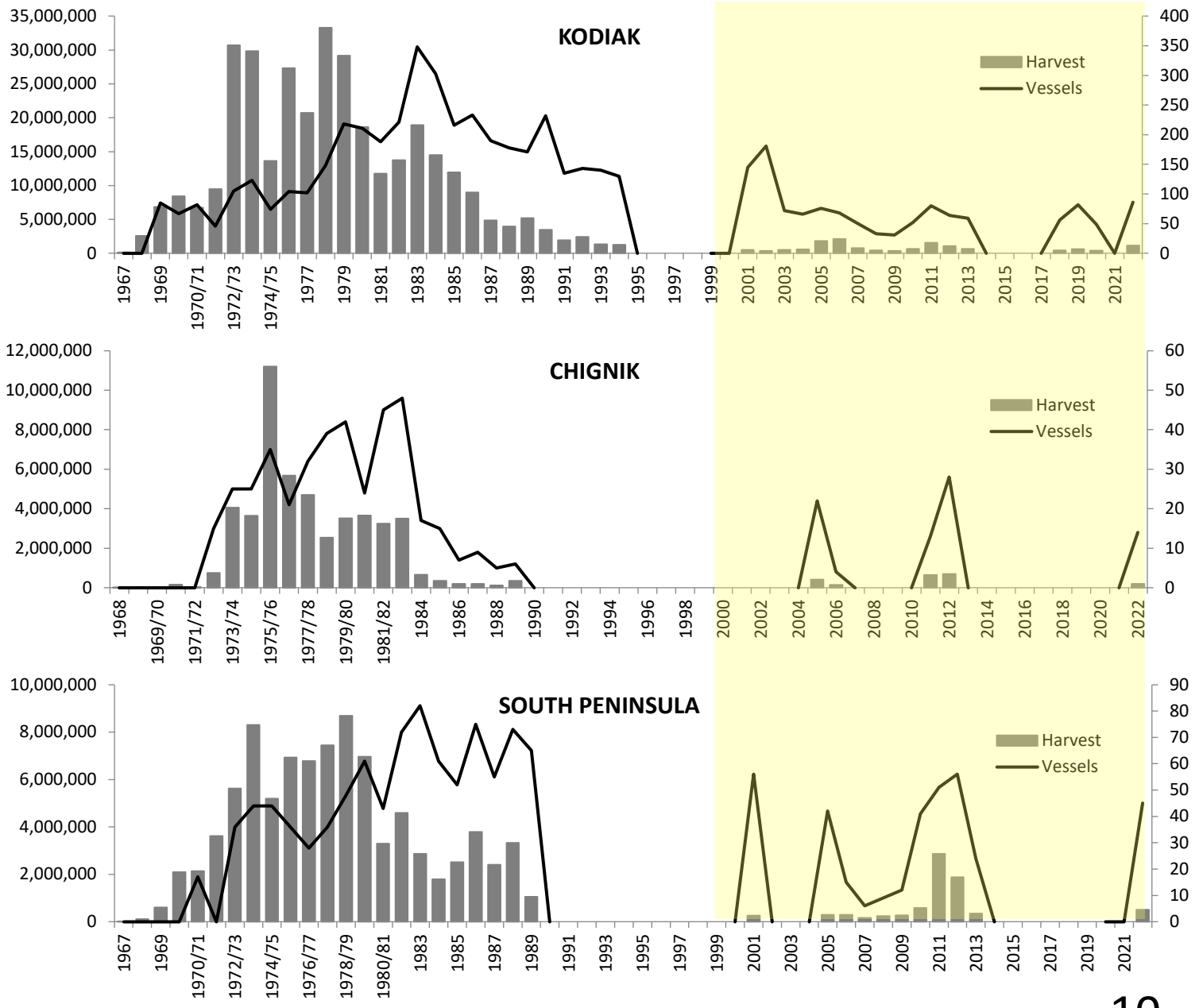
Fishery development

- Fisheries developed in the late 1960s
- Harvest peaked in 1970s and declined through the 1980s
- Fisheries closed in 1990s
- Current harvest strategies adopted by the board in 1999
- Lower harvest levels 2000s–present

Fishery Overview

- Kodiak (Limited Entry; 179 permits)
  - 17 seasons, 74 vessels, ~800k pounds
- Chignik (Open Access)
  - 5 seasons, 16 vessels, ~400k pounds
- South Peninsula (Open Access)
  - 11 seasons, 32 vessels, ~700k pounds

Kodiak, Chignik, and South Peninsula Districts Tanner crab harvest and effort, by year, 1967–2021



Results

Differences in outcomes of the current harvest strategies compared the updated harvest strategies (Proposal 268) for Tanner crab in the Kodiak, Chignik, and South Peninsula Districts, 2001–2021.

	Kodiak	Chignik	South Peninsula
Frequency of fishery openings	No change	Increase	Decrease
Average annual harvest	No change	Increase	Increase
Total harvest	No change	No change	Increase

Survey

Biological Thresholds	**Compare survey results to long-term average (Minimum stock size threshold)**
Harvest Control Rule	**Input survey results (mature male and female abundance) Output max GHL (legal males)**
Management Thresholds	**Compare computed max GHL to regulatory min GHL (Minimum fishery size threshold)**

Fishery

Biological Thresholds

Harvest Control Rule

Management Thresholds

Recommended updates to <u>biological</u> components

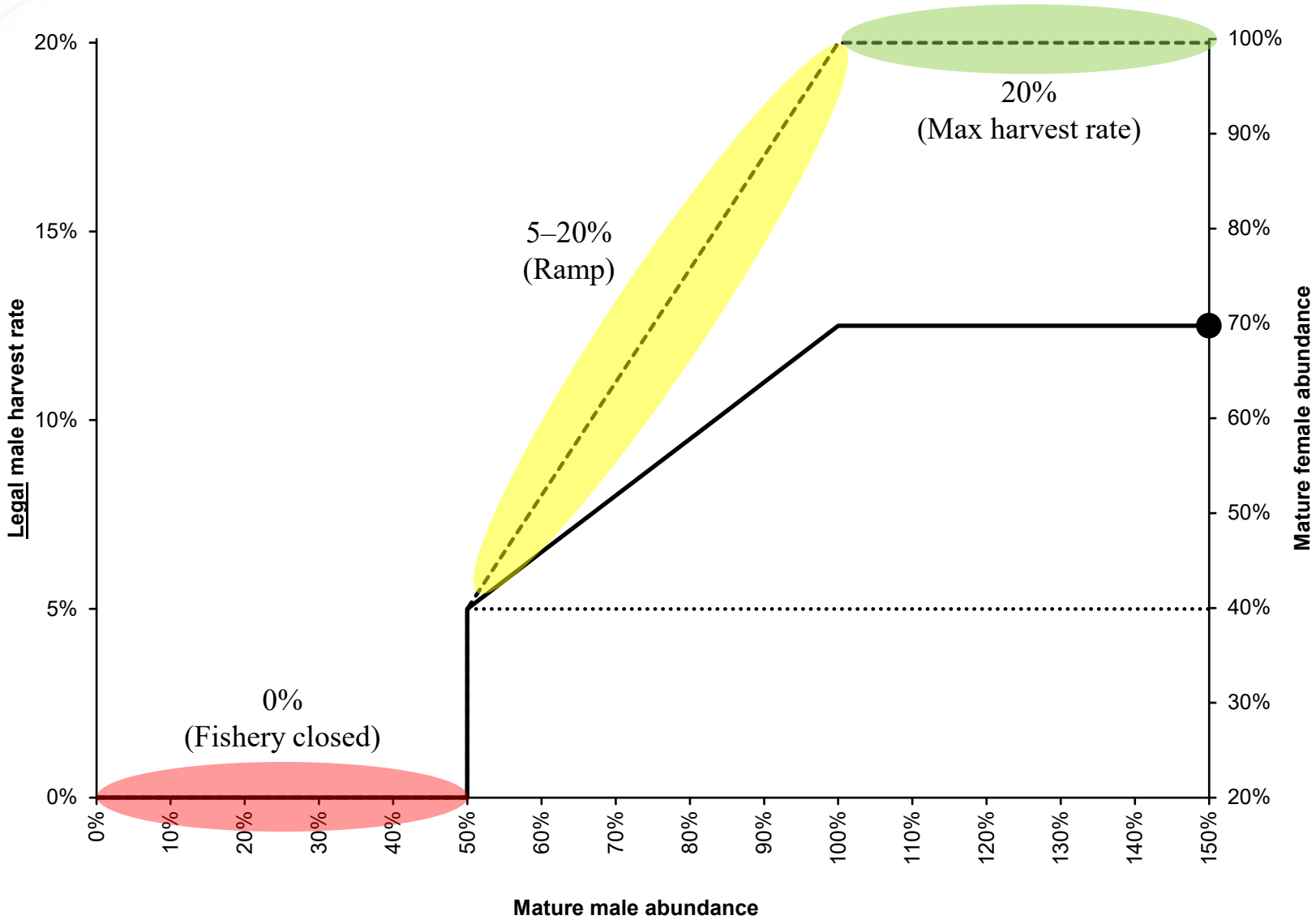
- Update survey timeseries
  - Currently using 1977–1999 timeseries
  - Updated to 1988–2021 (adds 23 years of data)
  - Recompute biological thresholds
- Bring maximum harvest rates inline with management practices
- Replace coarse “on-off” harvest control rule with ramped harvest control rule
- Include “female dimmer” (New!)

Ramped Harvest Control Rule (HCR) with Female Dimmer

Biological Thresholds

Harvest Control Rule

Management Thresholds

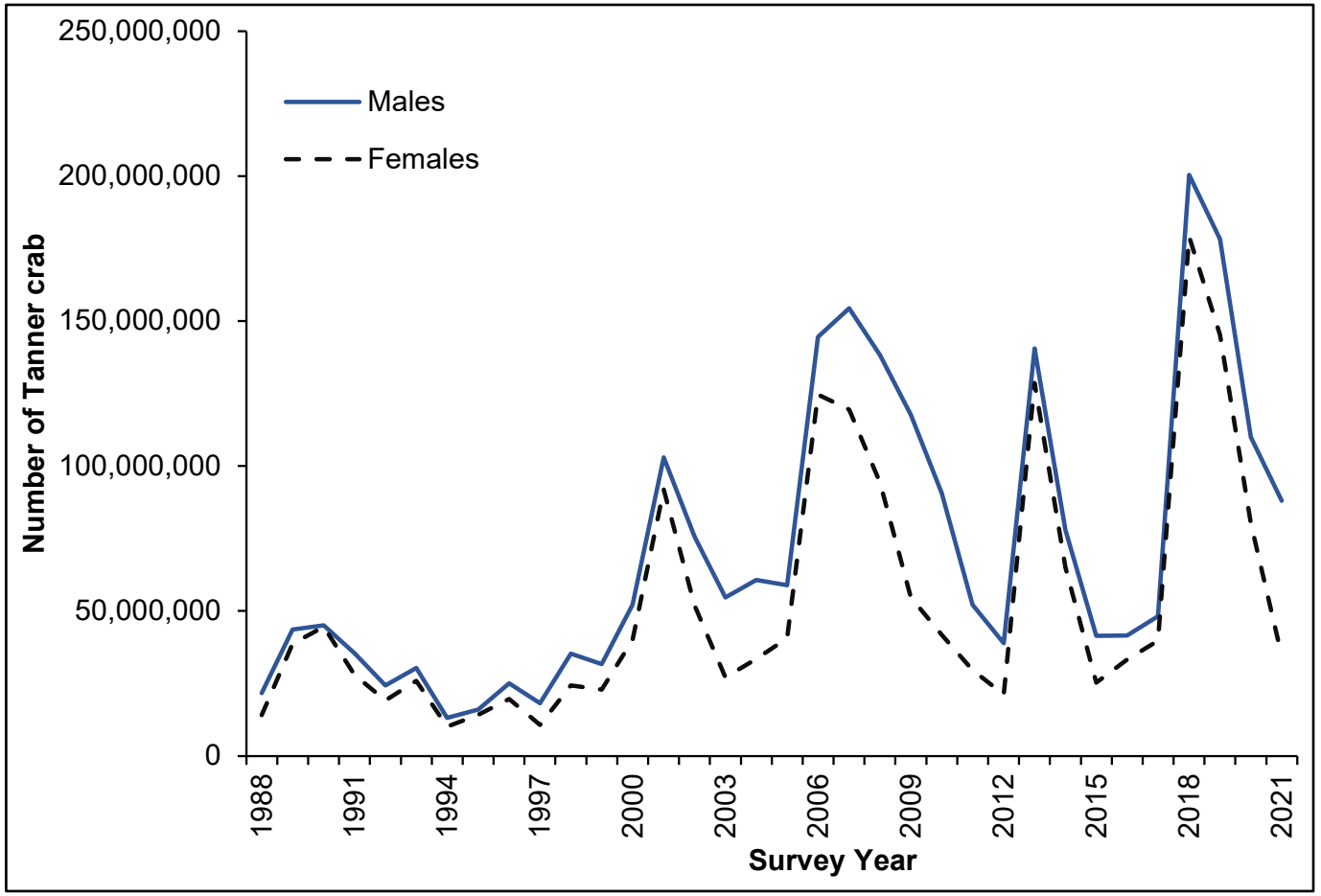


Why use a female dimmer?

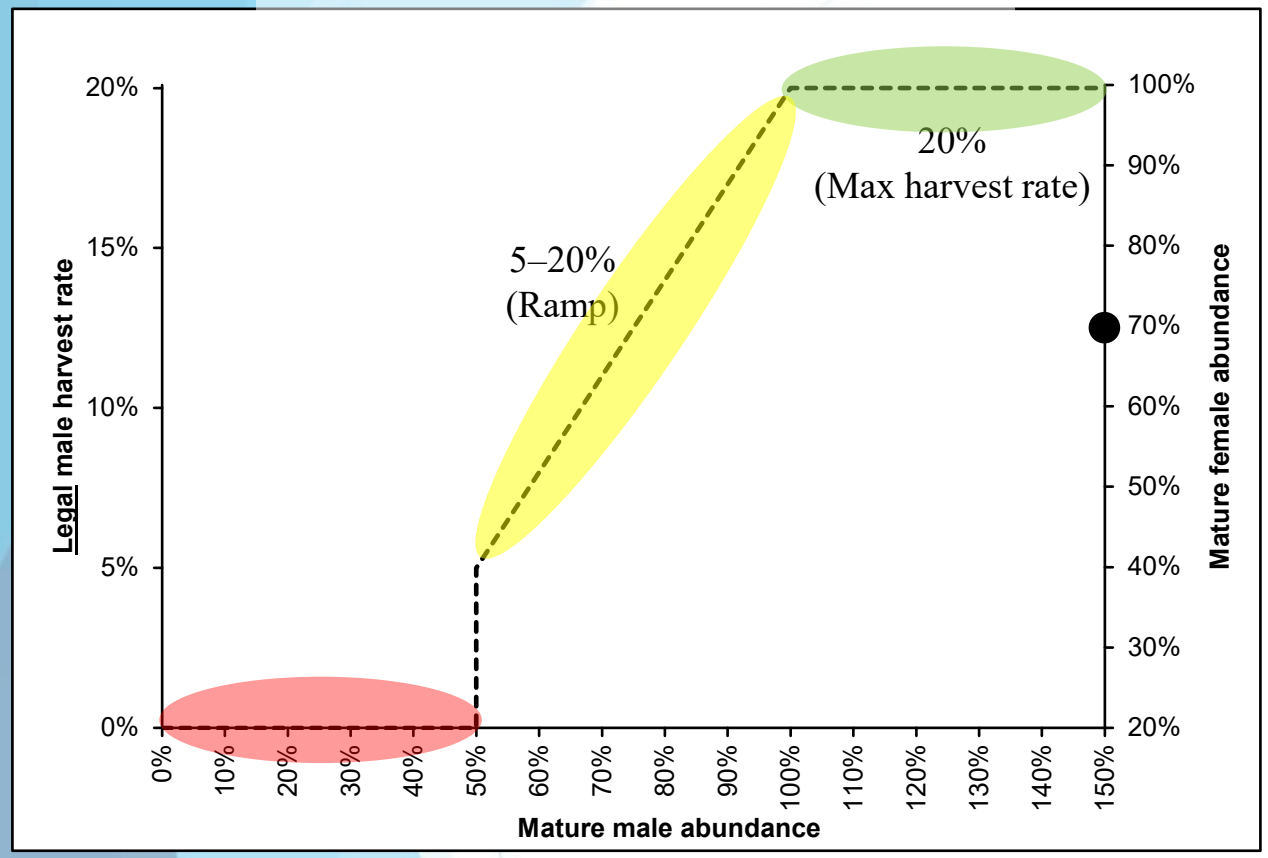
- Mature female abundance is directly related to the reproductive capacity of the stock. (“Females are important.”)

What does the female dimmer do?

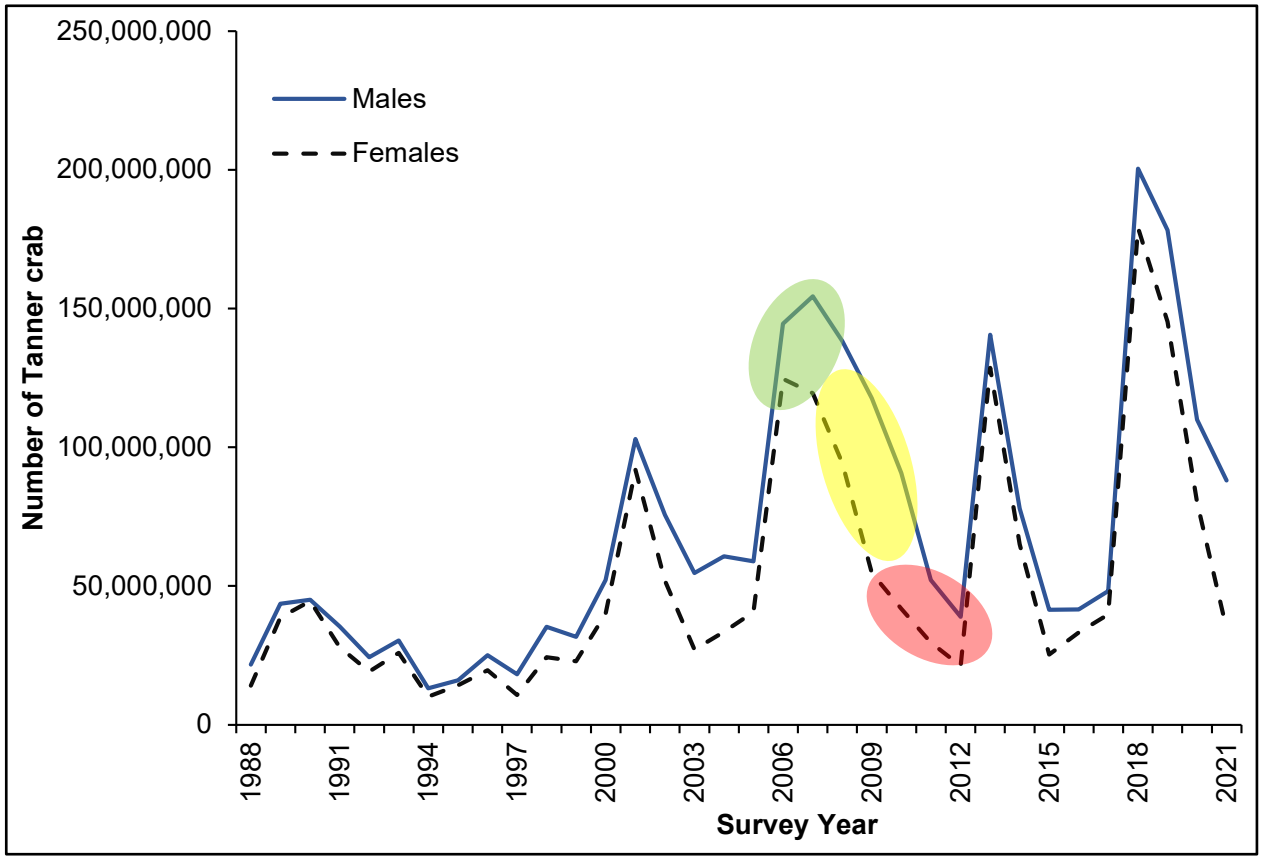
- Maximizes harvest when crab are most valuable to industry (clean shell, high abundance)
- Reduces harvest rate when population is in decline
  - Females act as predictor of male population declines
  - Preserves males to mate with females from the next cohort



Harvest Control Rule (HCR)



Tanner crab abundance (1988–2021)



Biological Thresholds

Harvest Control Rule

Management Thresholds

Recommended updates to management components

Kodiak District only

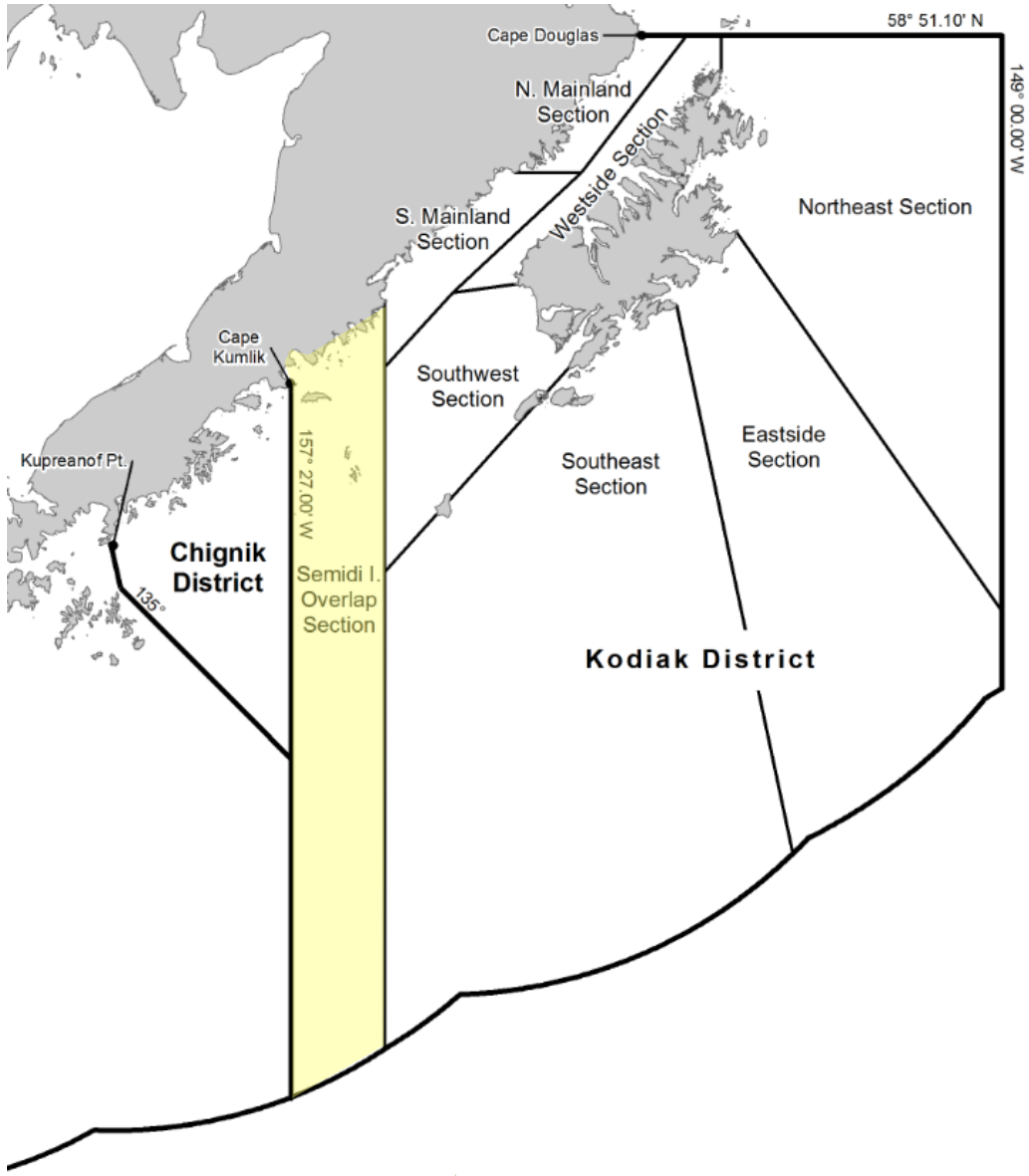
- Reduced minimum district GHL from 400k to 100k pounds
- Allow fishery to occur with only 1 section open

Semidi Island Overlap Section

- Exploratory section (no survey, no GHL)
  - 3-S management (size, sex, season)
- Both Kodiak and Chignik permit holders can participate (“Overlap”)
- Opens when adjacent areas open (either Southwest Section of Kodiak District or Chignik District)
- Established in 1999 (access issues were addressed, management objectives were not)

Recommended updates to <u>management</u> components

- Shorten season (change closure date from Mar 31 to Feb 15)



Comparison of Kodiak, Chignik, and South Peninsula Tanner crab harvesty strategy components
Current strategy vs. reccomended updated strategy (Proposal 268)

		Kodiak		Chignik		South Peninsula	
		Current	Proposed	Current	Proposed	Current	Proposed
Biology	Survey index time series	1973–1998 (26 yrs)	1988–2021 (34 yrs)	1974–1998 (25 yrs)	1988–2021 (34 yrs)	1974–2004 (31 yrs)	1988–2021 (34 yrs)
	Min mature male threshold	50%	50% or 100%[1]	50%	50% or 100%[1]	50%	50% or 100%[1]
	Max legal male harvest rate	30%	20%	30%	20%	30%	20%
	Female component	No	Yes	No	Yes	No	Yes
	GHL "doubling requirement"	Yes	No	Yes	No	Yes	No
	Mature size	>114 mm (~4.5 in)	No change	>114 mm (~4.5 in)	No change	>114 mm (~4.5 in)	No change
	Legal size	5.5 in	No change	5.5 in	No change	5.5 in	No change
	Escape Mechanisms	5 in rings or 7.25 in mesh	No change	5 in rings or 7.25 in mesh	No change	5 in rings or 7.25 in mesh	No change
Management	Season dates	Jan 15–Mar 31	No change[2]	Jan 15–Mar 31	No change	Jan 15–Mar 31	No change
	Weather delay	Gale warning Jan 14	No change	Gale warning Jan 14	No change	Gale warning Jan 14	No change
	Final registration	26 hours prior	No change	24 hours prior	No change	24 hours prior	No change
	Pot limit	20–60	No change	30–50	No change	20–50	No change
	Vessel size limit	120 ft	No change	58 ft	No change	58 ft	No change
	Permit type	Limted entry	No change	Open access	No change	Open access	No change
	Exclusivity	Superexclusive	No change	Superexclusive	No change	Nonexclusive	No change
	Fishing hours	8:00 a.m. to 5:59 p.m.	No change[3]	8:00 a.m. to 5:59 p.m.	No change	8:00 a.m. to 5:59 p.m.	No change
	Minimum number of sections	2	1	NA	No change	1	No change
	Minium section GHL	100,000 pounds	No change	NA	No change	200,000 pounds	No change
	Minimum district GHL	400,000 pounds	100,000 pounds	200,000 pounds	No change	200,000 pounds	No change

[1] 50% in sections with increasing abundace and 100% in sections with stable or decreasing abundance (currently only affects Northeast, Westside, and North Mainland Sections of Kodiak District)

[2] Jan 15–Feb 15 in Semidi Island Overlap Section

[3] No restriction in Semidi Island Overlap Section

Grey cells indicate change

Partial grey cells indicate change for Semidi Island Overlap Section only

Proposal 272

Eastern Aleutian District

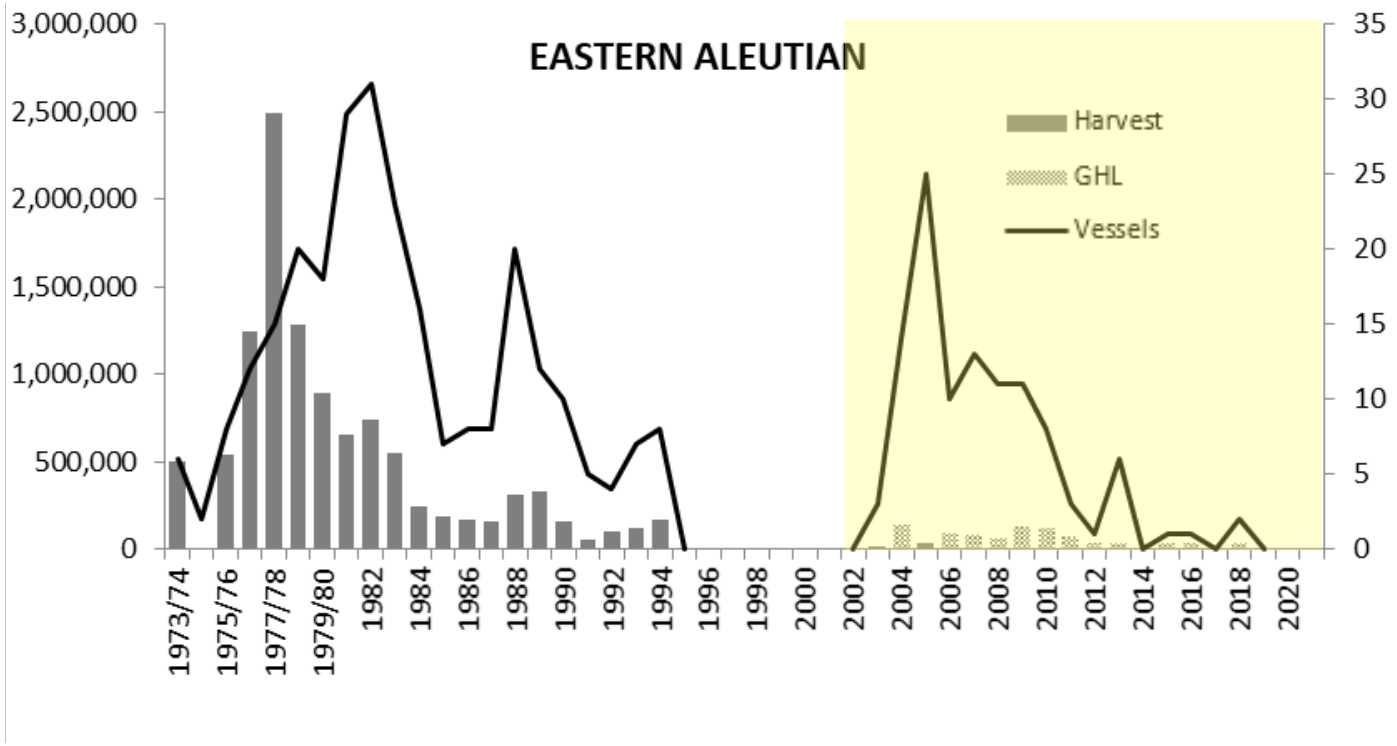
Fishery development

- Harvest peaked in late 1970s and declined through the 1980s and early 1990s
- Fishery closed 1995–2002
- Current management approach adopted in 2003
- Lower harvest levels 2003–present

Fishery overview

- Eastern Aleutian District (Open access)
  - 14 seasons, 8 vessels, 65k pounds

Eastern Aleutian District Tanner crab harvest and effort, by year, 1973–2021



Recommended updates

Biological components

- *Not* including females, not enough survey data to support this
- Update survey timeseries (Last updated in 2008; 14 additional years 2008–2021)
- Bring maximum harvest rates in line with management practices
- Update definition male maturity

Management components

- Reduce minimum section GHLs from 35k to 15k pounds
- Add authority to make area closures to protect subsistence opportunity
- Add authority to open small (<30k-pound), monitoring fisheries in the absence of a survey
- Add commissioner permit authority for the General Section

Results

- Increase frequency of fishery openings
- Increase average annual harvest

Thank you