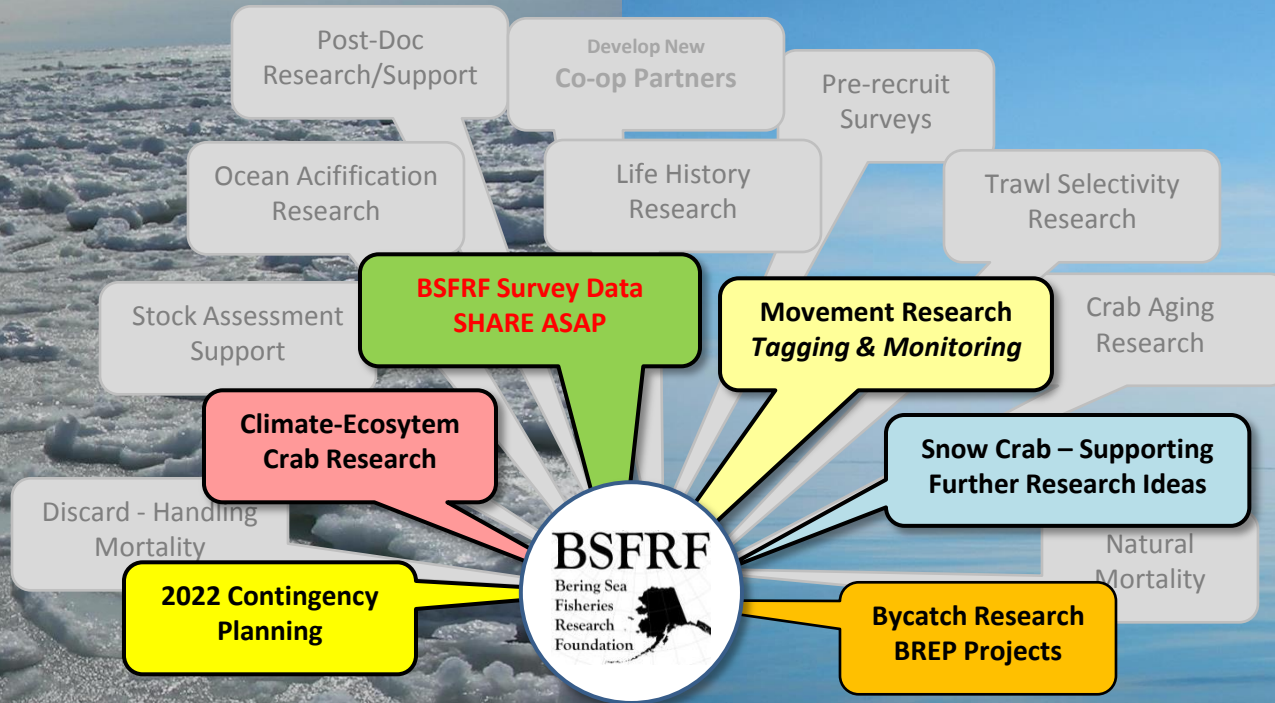


BSFRF Research Update

Scott Goodman – CPT September 2022



Harvesters - Processors ↔ Cooperative Research Partners



BSFRF Mission / Goal

Our mission is to work in a productive manner with fellow stakeholders, federal and state agency partners, independent researchers, and the public in ongoing collaborative scientific research.

The goal of our work is to assist in determining and developing the best scientific approach for gathering information for management of the Bering Sea fisheries. Our belief is that better research will result in better management, insuring that these fisheries will be protected and preserved while at the same time producing sustainable yields.

Who We Are – Active 13 Member Board

Sinclair Wilt

Westward Seafoods

Shannon Carroll

Trident Seafoods

Lenny Herzog

FVs Saga/Tempo Sea

Louie Lowenberg

FVs Arctic Lady

Doug Wells

CP Baranof

Edward Poulsen

FVs Patricia Lee/Aleut. #1

Gary Painter

FV Trailblazer

Garry Loncon

Royal Aleutians Seafoods

Charlie Hensel

Bristol Bay Econ. Dev. Corp.

Mark Casto

FV Pinnacle

Frank Kelty

City of Unalaska

Owen Kvinge

FV Arctic Sea

Heather McCarty

Central Bering Sea Fish. Assoc.

Who We Are – Science Advisors

Advisor	Affiliation
Scott Goodman	NRC/BSFRF (Exec. Director)
Madison Shipley	NRC / UW / BSFRF
Dr. Gary Stauffer	BSFRF (NMFS ret)
Dr. Gordon Kruse	BSFRF (UAF ret)

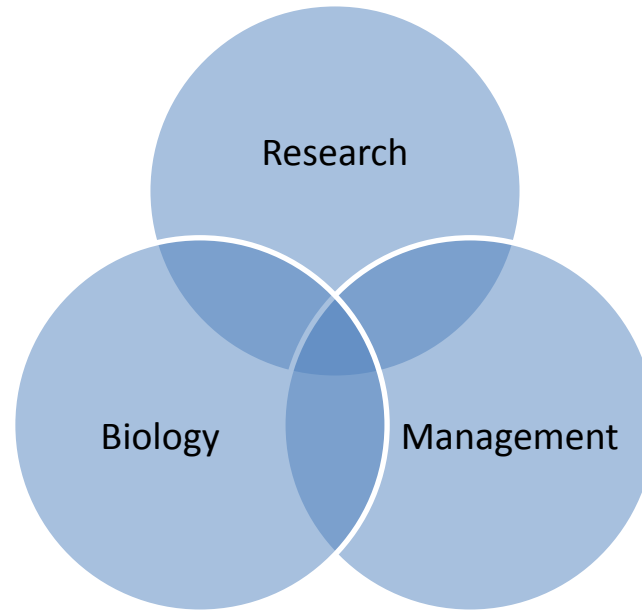
Regular coordination w/ several other formal/informal science advisors:
NMFS/ADFG/UAF/UW/others

➤ For this update

- Comments on BSFRF as industry funded collaborative crab research group
- Priority of our existing data
- Shaking the bushes for research funds
- Boiled down research priorities
- Tagging/movement priority – update
- Capacity Building – crab researchers
- Bycatch focused research
- **Crab Science Symposium – this Friday**
- *Videos from inside pots*

BSFRF Comments : what we are trying to accomplish

Annual
Research
\$1 m/yr



Research
Reserves
\$1 m/yr

- Staying focused on research
- Staying in touch with CPT and SSC activity
 - Following Council and BOF activity
 - Not advocating for outcomes
 - Raising profile of crab issues now
- Collaborating toward more flexibility

- BSFRF Nephrops trawl survey data

- Priority of our existing data
 - Buck, updated bairdi data
 - Cody, updated opilio data
 - Leah/Mike/others – SDMs opilio, BBRKC
 - Jim/Cody – opilio data
 - Other requests...

- Scott's working/catching up !

➤ BSFRF Nephrops trawl survey data

General Summary of BSFRF Survey Data – Focus Species & Coverage, 2005-2019

Source: Goodman 05.04.20

Year	# BSFRF	#NMFS	Focus	Total	Side by Side	Index	Coverage per Species/Area		
	Vessels	Stations	Species	Tows	Tows	Tows	RKC	OPI	BRD
2005	1	10	RKC	135	0	135 *	MED	LOW	LOW
2006	0	0	NA	0	0	0	NA	NA	NA
2007	1	70	RKC	245	0	245	HIGH	LOW	LOW
2008	1	70	RKC	242	0	245	HIGH	LOW	LOW
2009	1	27	OPI	108	24 *	108	LOW	MED	LOW
2010	1	92	OPI	92	92	0	LOW	HIGH	MED
2011	1	21	RKC	93	0	93	MED	LOW	LOW
2012	1	20	RKC	93	0	93	MED	LOW	LOW
2013	2	65	RKC	195	65	130	HIGH	LOW	LOW
2014	2	65	RKC	195	65	130	HIGH	LOW	Lo-MED
2015	2	65	RKC	195	65	130	HIGH	LOW	Lo-MED
2016	2	65	RKC	195	65	130	HIGH	LOW	Lo-MED
2017	2	97	BRD/RKC	258	97	161	MED	MED	Hi-MED
2018	2	95	BRD/RKC	248	94	154	MED	LOW	Hi-MED
2019	1	30	BRD	118	0	118	LOW	LOW	Hi-MED

➤ Seeking research funds

PROJECT – Description

CRAB MOVEMENT RESEARCH – smart tags (satellite/acoustic) and smart monitoring (drone) technology along with other traditional means to tag release and recover BBRKC and snow crab, are needed. Efforts to date have been limited by funds and sample size. A primary project would be to increase the number of sampled tags scaled 1x, 3x, 5x, or 10x to get more tagged crab out and to better cover the crab distribution in areas of particular interest. **Focus species: BBRKC, snow crab**

CRAB SURVEY RESEARCH – currently the BSFRF is determining a plan to conduct trawl survey, pot survey, and other survey efforts that would fill critical information gaps in the winter and spring periods when and where fishery or summer survey information does not exist. NMFS summer surveys provide a rich, long time series, but don't cover winter grounds, nor provide insight on mating/molting activity in time and space, which is needed now to consider necessary protections for crab. Surveys would also enable us to set tag results into the context of population densities. **Focus species: BBRKC, snow crab**

HABITAT & RECRUITMENT RESEARCH – understanding of specific areas of crab habitat is lacking context with recent ecosystem and climate changes, and current fishing activities. Proposed tagging and survey research could be further specified to focus on precise areas (BBRKC: Amak Island, Black Hills, nearshore AK Peninsula, and snow crab: Pribilof Islands areas, canyon areas) that may reflect important breeding, nursery, and/or juvenile areas that may require designation. This research will help to fill huge gaps in knowledge about important recruitment areas. **Focus species: BBRKC, snow crab, Tanner crab, other king crab stocks**

BYCATCH RESEARCH – research has been completed to roughly estimate handling and discard mortality for crabs that are captured and released in both target and non-target fisheries. Given poor stock status, a research focus on bycatch and fishing impacts would provide more precision to these important estimates of mortality for sustainable fishery management. **Focus species: BBRKC, snow crab, Tanner crab, other king crab stocks**

CRAB PREDATION – longstanding research on cod stomachs provides a limited understanding for how much crab are eaten by groundfish (cod). Major gaps in time and space requires a focus on molting periods, when crab are most vulnerable, and nearshore areas occupied by young crab that have not been studied. This information is particularly critical now given changing ocean conditions that are affecting the overlap of groundfish predators with crab. **Focus species: snow crab, Tanner crab, BBRKC, other king crab stocks**

➤ Tagging/movement – priority update



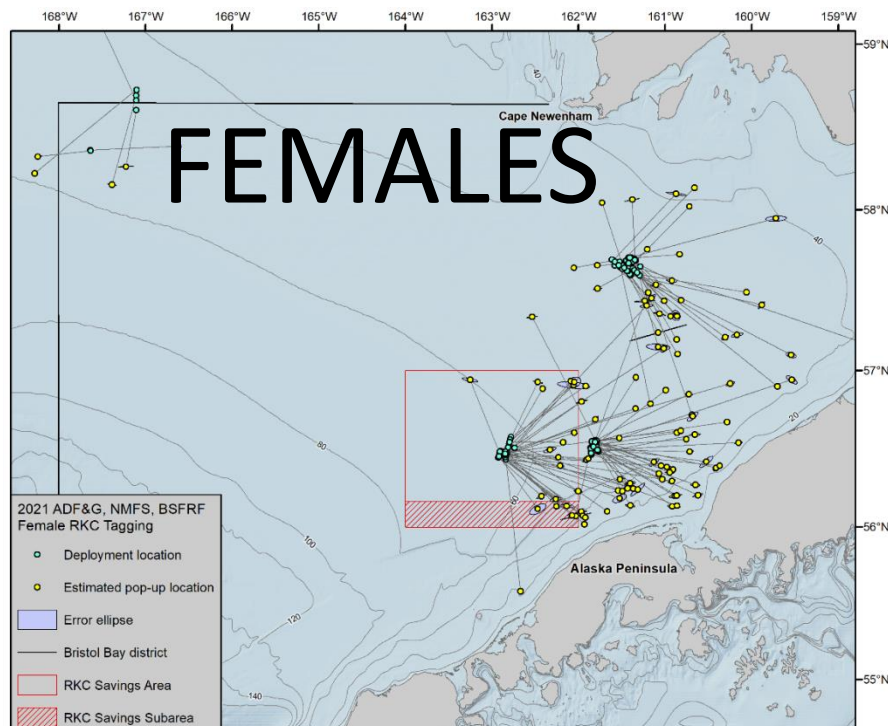
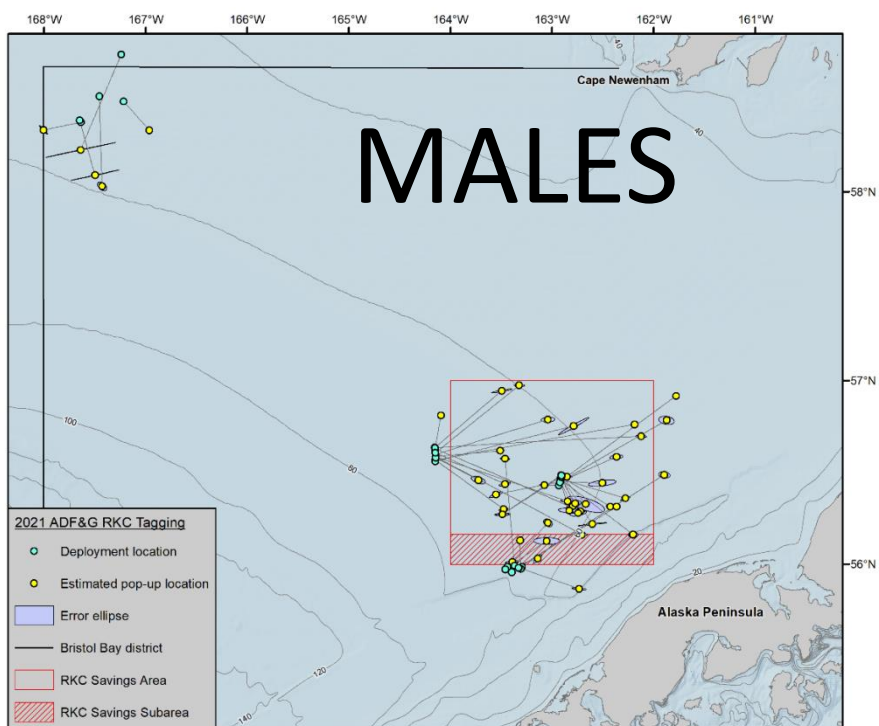
Movement/Tagging update

Work is continuing/building on:
part of a **multi-year \$2 million+** effort

2017-2019 acoustic/drone work

2020-2022 satellite tags

RKC focus so far, extending to opilio next



➤ Tagging/movement – priority update



WHAT'S NEXT:

- JUL-AUG 2022 – BSFRF purchase of 40 tags (~\$90k)
- AUG 2022 – sharing/coordination w/ other sectors
- AUG-SEP 2022 – coordinate tags out on test fishing
- OCT-NOV 2022 – deployment of tags on 40 RKC (males)
- JAN-MAY 2023 – scheduled pop-ups

- SEP 2022 onward – coordinating larger scale next steps

➤ Surveys – New Research to Fill Gaps

- Winter Surveys – options to address new data; pot surveys, trawls surveys, paired with other life history work, etc. – **considering how to do this**
- More crab specific survey approaches overall
- Collaborations with other sectors: other fixed gear, A80, pollock CVs, pollock CPs

“Currently the BSFRF is determining a plan to conduct trawl survey, pot survey, and other survey efforts that would fill critical information gaps in the winter and spring periods when and where fishery or summer survey information does not exist. NMFS summer surveys provide a rich, long time series, but don’t cover winter grounds, nor provide insight on mating/molting activity in time and space, which is needed now to consider necessary protections for crab. Surveys would also enable us to set tag results into the context of population densities.”

BSFRF *capacity building*



- ***Madison Heller-Shipley***



- ***SEP '22 @ UW Punt Lab for PhD supported by BSFRF/NRC***
- ***“Eat or be eaten: an exploration of *Chionoecetes* fishing mortality, natural mortality, and speciation”***
- ***Prelim topics: bairdi MSE-lite, Ch. spp. F ref. points, predation, cannibalism, and hybridization)***
- ***MHS is an integral part of BSFRF cooperative crab research***

➤ **Bycatch focused research**

- ***Reviewing/helping characterize UFM research***

➤ ***Unobserved Fishing Mortality (UFM)***

“unobserved mortality due to a direct encounter with fishing vessels and gear”

***Notable and important difference from observable data
(which inform measured bycatch mortality)***

- ***BSFRF: trying to help with understanding of scale and magnitude of issue with available info***

➤ **Bycatch focused research**

- ***Reviewing/helping characterize UFM research***

➤ ***Unobserved Fishing Mortality (UFM)***

- ***Factors of scale to consider: time, space, overlap, bottom contact, density estimates, mortality estimates, others***
- ***How to do this, looking first at “foot print” then at densities to apply for estimating scale/magnitude***
- ***We know this will be an estimate – but is a starting point to inform next steps.***
- ***Goodman: “did not cause current status, but could be part of what is constraining recovery - needs to be considered”***

➤ Bycatch focused research-UFM

- ***Scaling factors – footprint of PTR pollock fishery***
- ***We are working on quantities, maps, available data from the Council discussion paper, survey density estimates, and looking to include other important information***
- ***Next steps, coordinate with others/CPT as appropriate***
- ***BSFRF: trying to help with understanding of scale and magnitude of issue with available info***
- ***Goodman: “did not cause current status, but could be part of what is constraining recovery - needs to be considered”***

Crab Science Symposium – this FRI 9/16, 9am-1pm



CRABS ON THIN ICE

*Join us for the
**ABSC/BSFRF Crab
Science Symposium***

WHEN

Friday, September 16, 2022
9:00 am – 1:00 pm Seattle Time



Crab Science Symposium – this FRI 9/16, 9am-1pm

WHERE

**Leif Erikson Hall
2245 NW 57th St.
Seattle, WA 98107**

ZOOM INFORMATION

**Meeting ID: 816 4952 0202
Passcode: 770033**

BSFRF and ABSC would like to welcome all industry folks, researchers, and managers that are interested and available to participate with us at a hybrid (in person/virtual) Crab Science Symposium this year.

We have several crab scientists lined up for shorter presentations and some time for Q/A followed by a round table discussion.

Presentations will be made available after the symposium.



ALASKA
Bering Sea Crabbers

alaskaberingscraabbers.org
bsfrf.org



Crab Science Symposium – this FRI 9/16, 9am-1pm

AGENDA

8:30-9:00 Arrivals, Coffee, and Zoom set-up

9:00-9:15 Introduction – Jamie Goen/Scott Goodman

- Intros for industry efforts to get through low stock periods, research that is underway, and what we can do further to help

9:20-9:45 Dr. Mike Litzow/Dr. Leah Zacher (NMFS/Kodiak)

- 2022 NMFS summer survey results with a focus on the three primary stocks and then some of the current tagging research that we are in the midst of (BBRKC sat tags)

9:45-10:15 Ms. Erin Fedewa (NMFS/Kodiak), Dr. Cody Szuwalski (NMFS/Seattle), Ms. Katie Palof (ADFG/Juneau)

- Ecosystem status indicators, Bering Sea snow crab assessment status, Bristol Bay red king crab status

10:15-10:35 Dr. Ben Daly and Mr. Mark Stichert (ADFG/Kodiak)

- Management options – Challenges with threshold management in a postcollapse period

10:35-11:30 Open Discussion

- Q/A with stakeholders, questions to presenters, etc.

11:35-12:00 Light Lunch

- Pizza/Salad/Beer-drinks

12:00-1:00 Round Table Discussion

- Science and stakeholder round table for further open discussion, feedback, and brainstorming to help prioritize research and management

➤ **Bycatch focused research-BREP**

CRAB POT VIDEOS

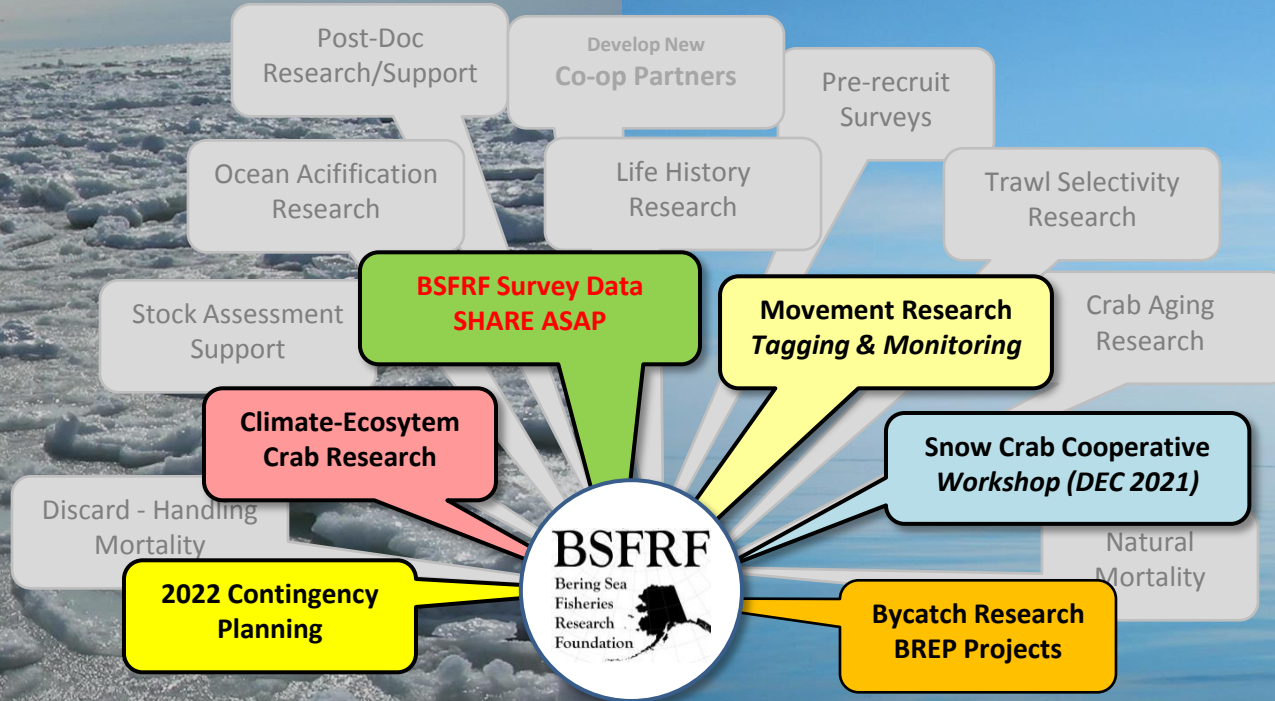
➤ ***Part of BREP pot cod project***

Thanks to

- ***Dr. Noelle Yochum (NOAA Seattle – cameras)***
 - ***FV Kevleen K, C. Studeman***
 - ***FV Pacific Sounder, O. Lone***
 - ***FV Arctic Lady, C. Lowenberg***

BSFRF Research Update

Scott Goodman – CPT MAY 2022



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Cooperative Research Partners

