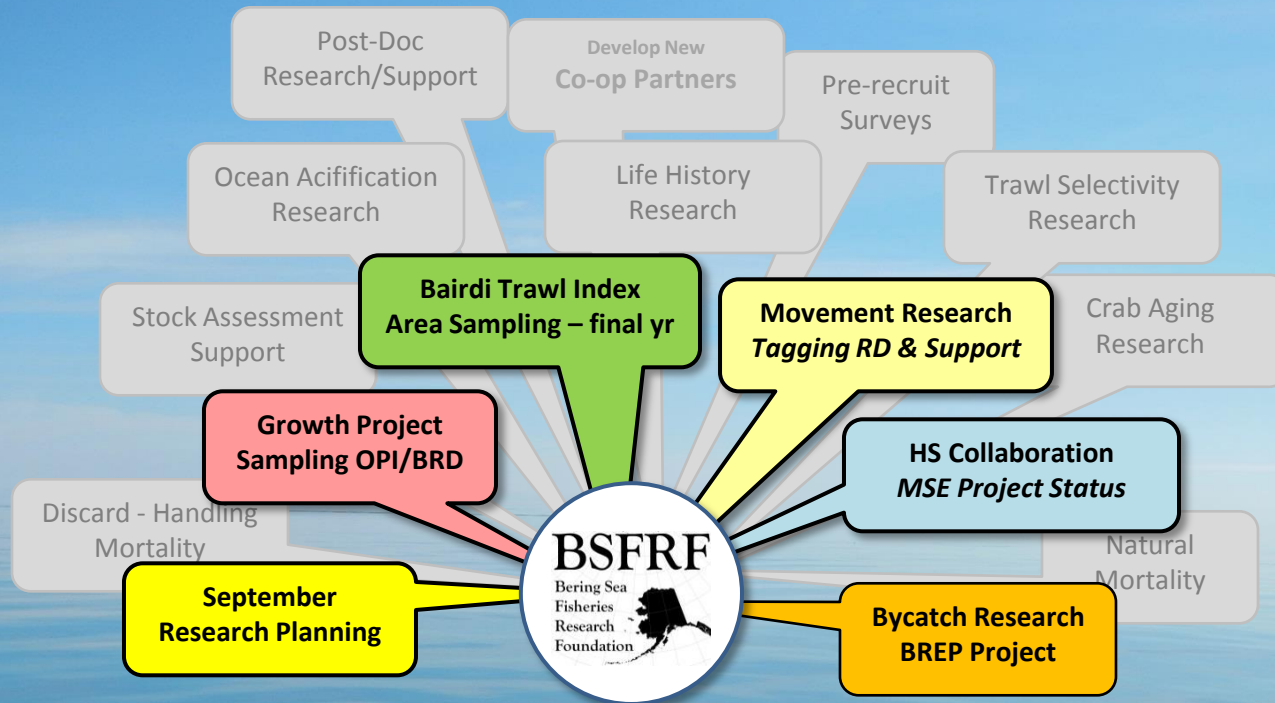


# BSFRF Research Update - 2019

Scott Goodman | Executive Director  
CPT September | 09.17.19



# BSFRF Research



Who We Are...



# BSFRF Research Update - 2019

- Growth studies / sampling update
- Movement research / tag RD and project support
- Spatial research / trawl index area sampling
- Bycatch Research – BREP project focus
- Management support / bairdi MSE project update
- Research Coordination – Planning & PR
- FRIDAY ABSC / BSFRF Crab Science Symposium

# Growth Studies – Sampling Update

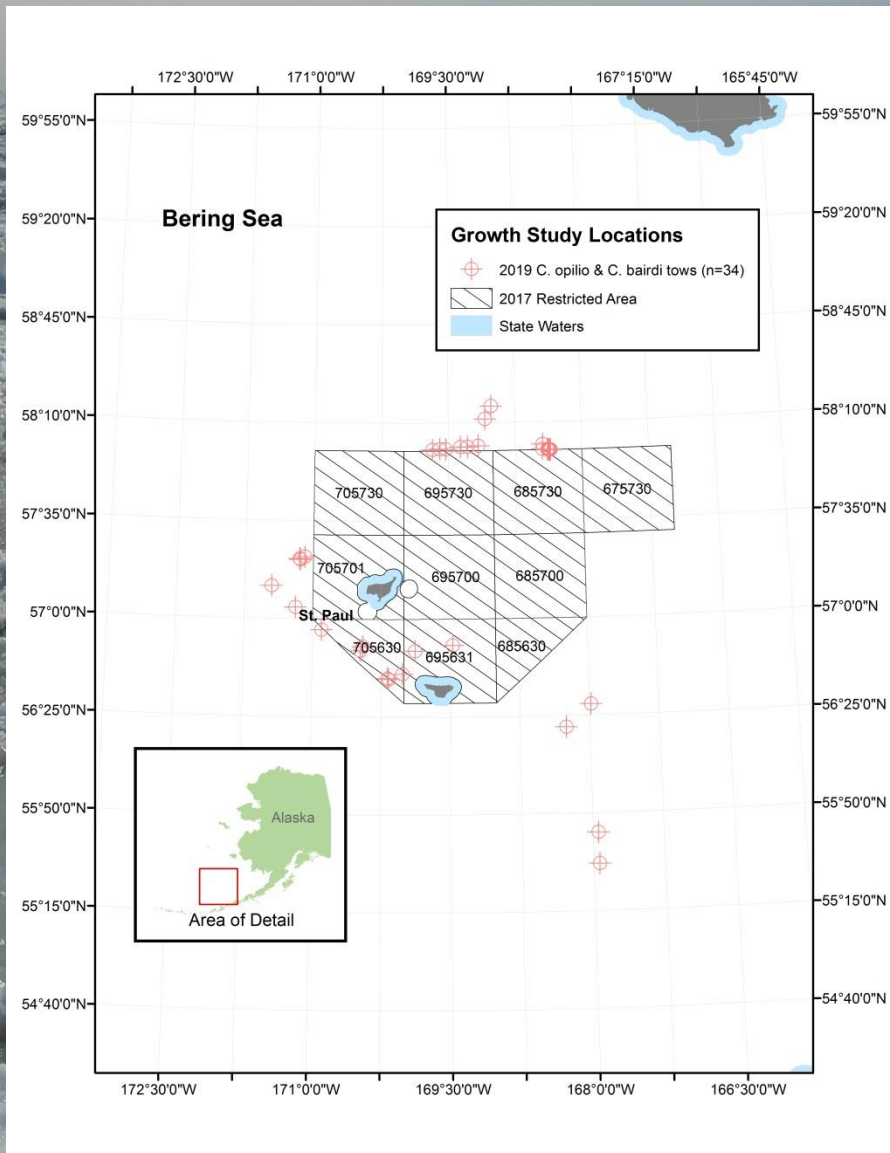
## Bering Sea Sampling History

- 2011 Opilio Focus
- 2012 Opilio Focus
- 2013 Opi/Bairdi Focus
- 2015 Opilio Focus
- 2017 Opi/Bairdi Focus
- 2019 Opi/Bairdi Focus
- 2020 Opi Focus – Earlier?

## April 2019 Sampling

- *F/V Half Moon Bay*
- Nephrops trawl <4 m/tow
- 6 days total, 4/7-4/12
- 464 study crab retained
- Brd 113/132, Opi 100/119
- Special boat ride to KOD
- <50 at sea mortalities
- 4/17 @ KOD – crab condos
- Fill gaps / increase samples
- About 35 so far...

# Growth Studies – Sampling Update



Highlight ability to combine objectives  
“Adding Projects”

- 1) OPI growth data
- 2) BRD growth data
- 3) OPI condition samples
- 4) OPI black eye samples
- 5) OPI <10 mm OA samples
- 6) Pollock juv. tissue samples

**FOR 2020, Coordinate w/  
Cody & Buck, NMFS/ADFG  
Kodiak, Sample Options?**

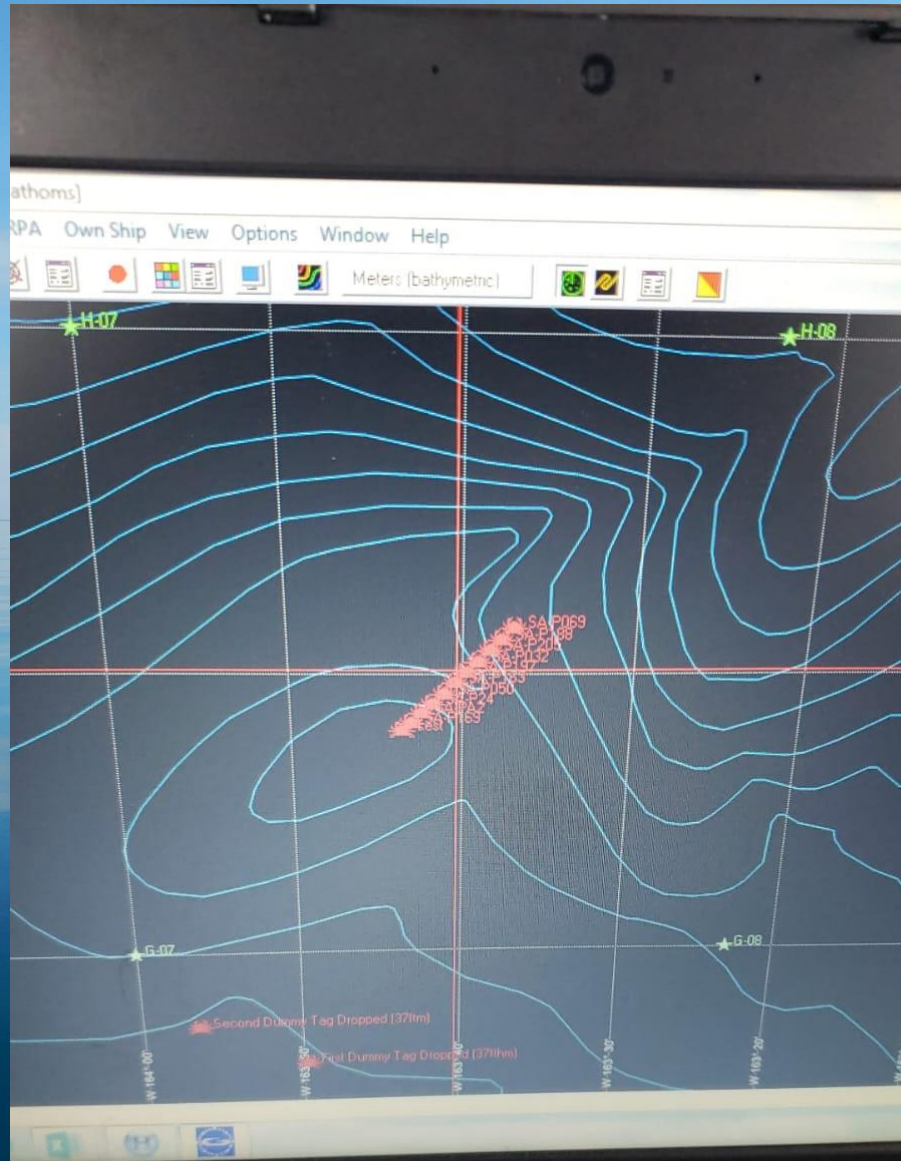
# Growth Studies – Sampling Update



# Movement Research – Tagging Crabs

- Traditional Approach – Current Tech/Focused Project
  - Balancing effort on tags released and recovered
  - Overcoming challenges of low recovery
  - Leveraging existing resources and tech
- New Approach – Tags R&D, Acoustics /Focused Project
  - Focusing on acoustic tech for maximizing “recovery”
  - Getting more than 1 sample “ping” per recovery
  - Leveraging existing resources and tech
  - Multi-year remote sensing methods

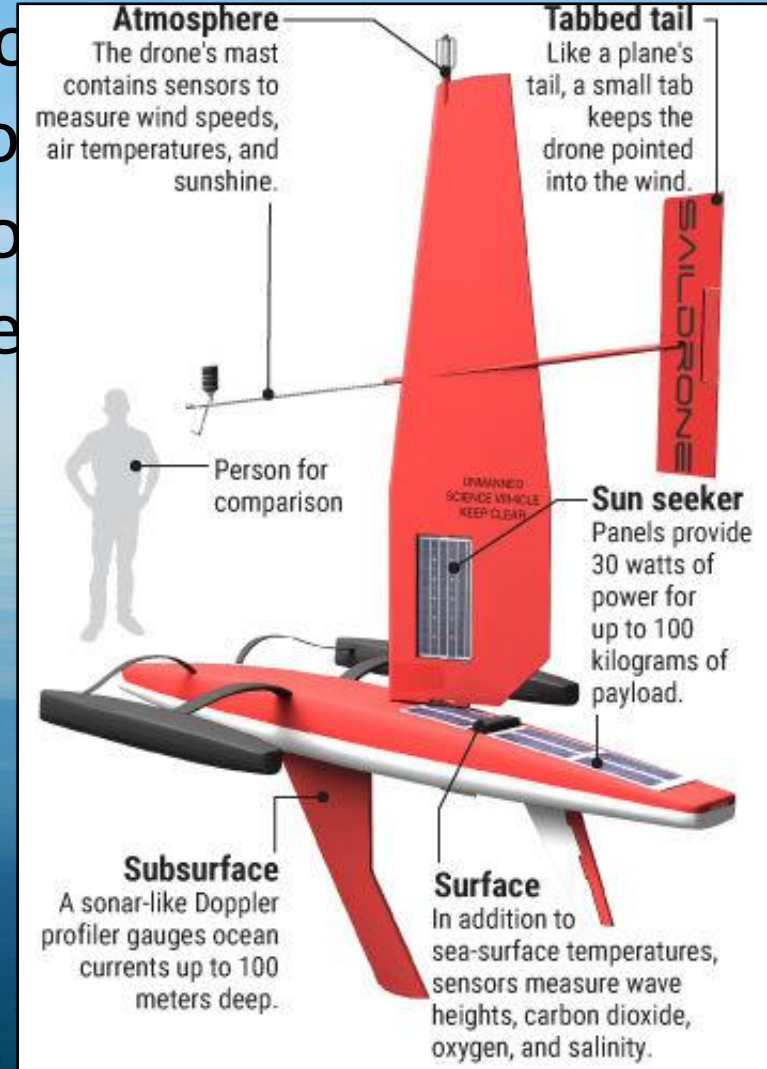
# Movement Research – Tagging Crabs



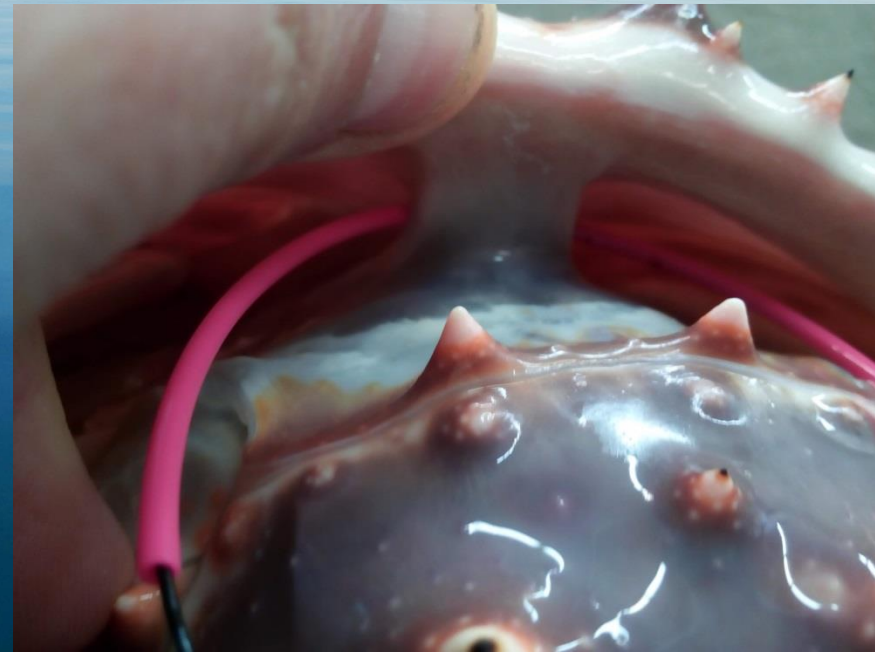
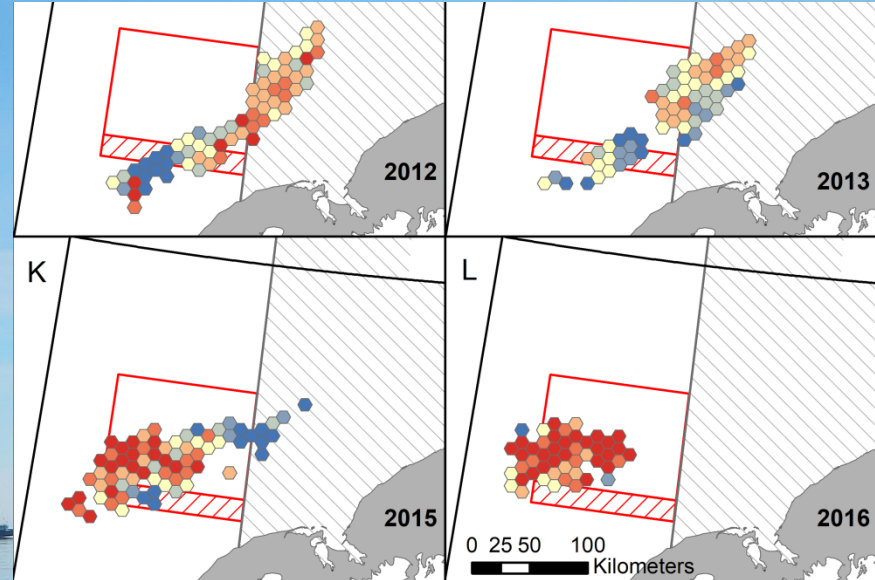


# Movement Research – Tagging Crabs

- New Approach – Tags R&D, Acc
- Focusing on acoustic tech for
- Overcoming challenges of lo
- Leveraging existing resource



# Movement Research – Tagging Crabs



# Movement Research – Tagging Crabs

- New Approach – Tags R&D, Acoustics /Focused Project
  - Focusing on acoustic tech for maximizing “recovery”
  - Shifting to new paradigm on resources and tech

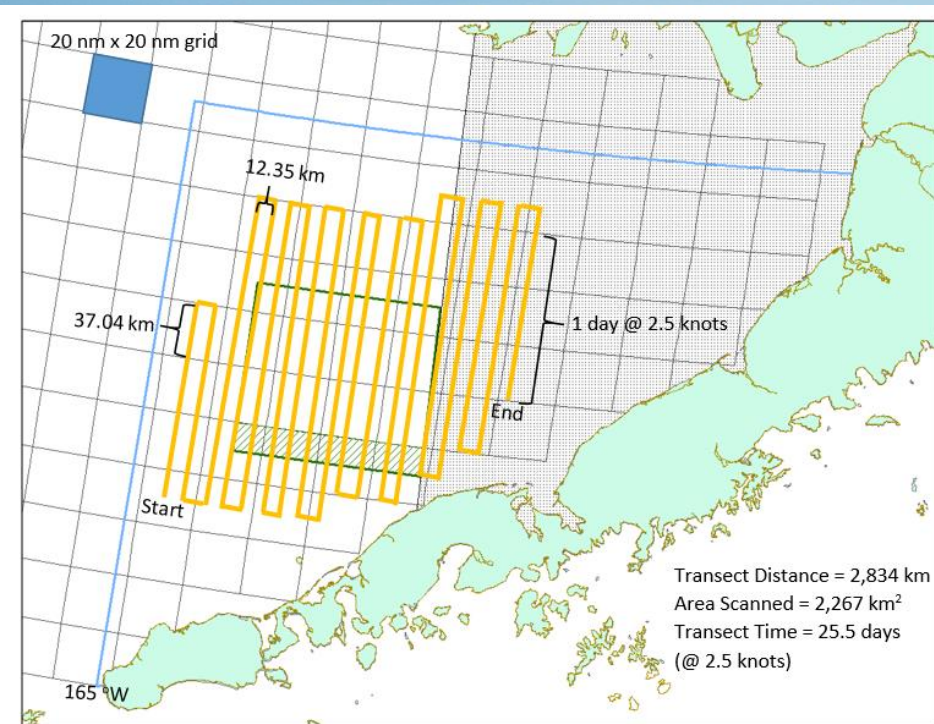
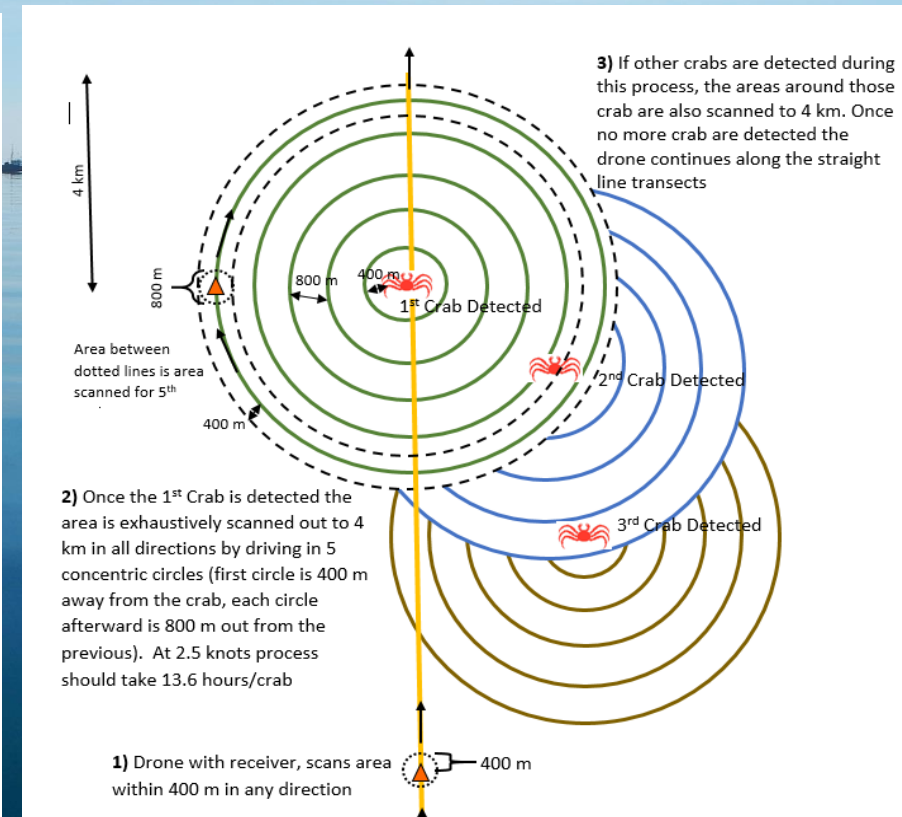


Figure 1: Sampling design for October, 2019. Yellow drone tracks shown for sampling period. Transect distance and transect time do not include time circling crabs (see Fig. 3).



# Movement Research – Tagging Crabs

- New Approach – Tags R&D, Acoustics /Focused Project
  - Locating RKC for tag and release
  - Coordinate with NMFS survey – and Fall fishery?
  - High survey catch was “8” LGM, fishery was < 5m lbs
  - Deploy drones (2x) Oct 1-15, 2019
  - Monitor progress, pings, ocean, weather, etc.
  - Redeploy drones Mar-Apr 2020 to relocate crabs
  - Hope to monitor same group of 150 crabs right before fishery occurs and then in winter
  - Progress to more tags released in following years if acoustic reception concept for crab tracking is +
  - Shift to movement other Bering Sea crab stocks

# Tag Deployment

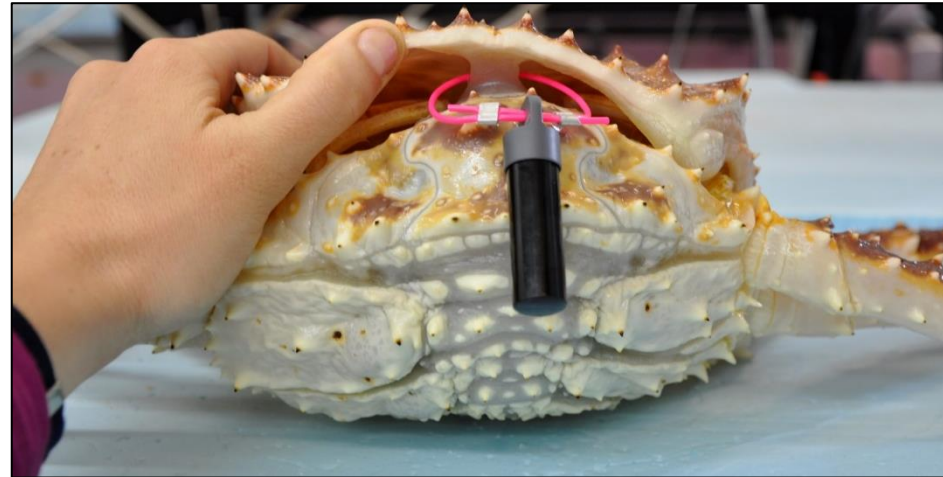
June 2019 – Set pots in higher density red king crab areas indicated by NMFS survey



# Tag Deployment



Collaborative Tagging Effort with NOAA, ADF&G, and Industry Scientists

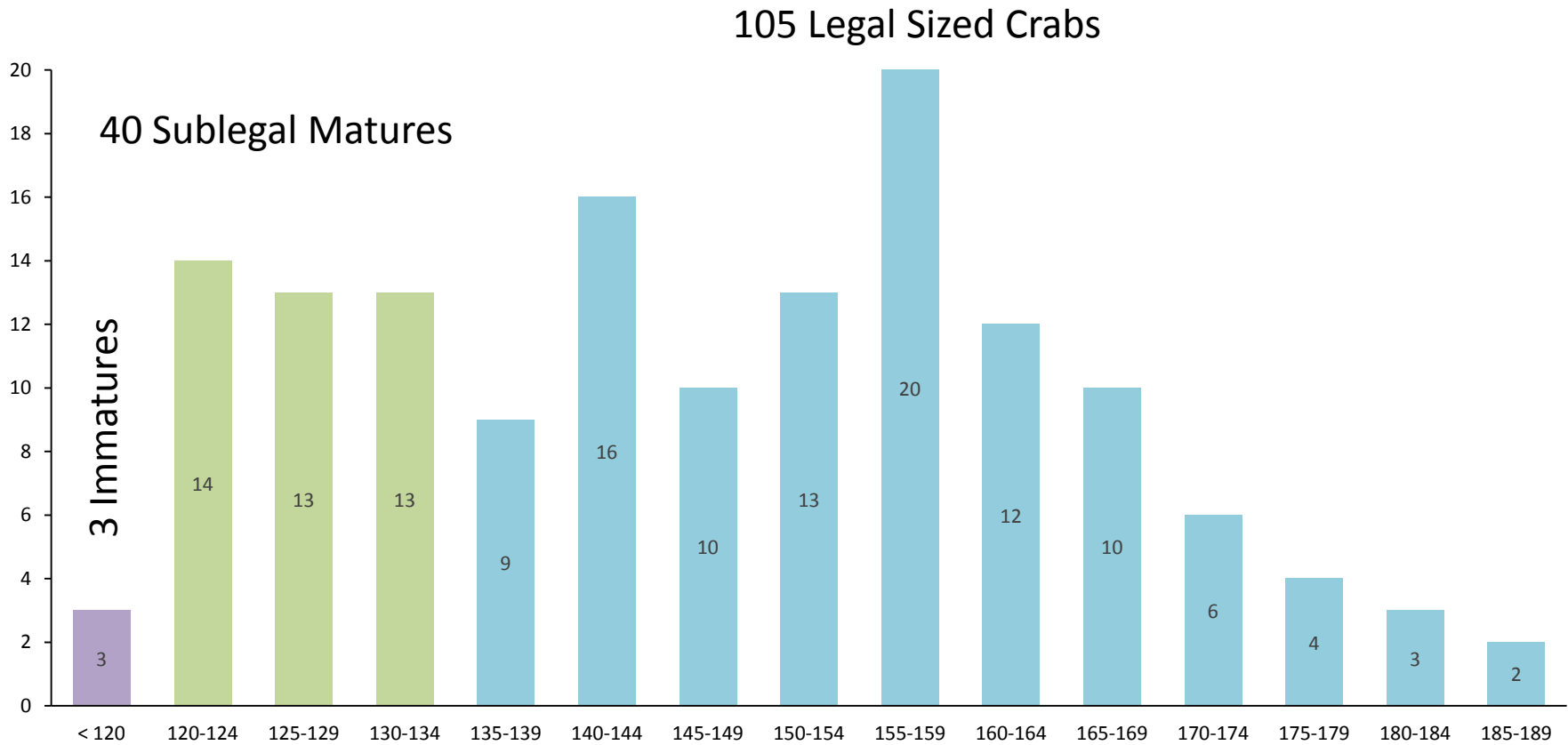


# Tag Deployment



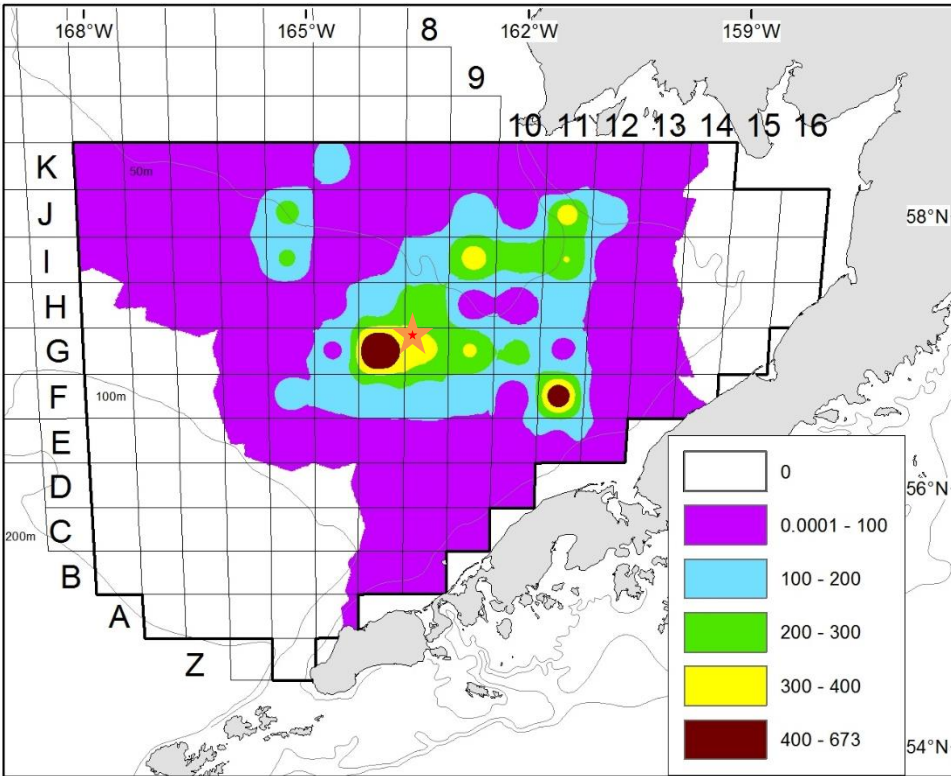
- Tagged 148 crabs
- Deployed 2 fixed tags

# Size Distribution

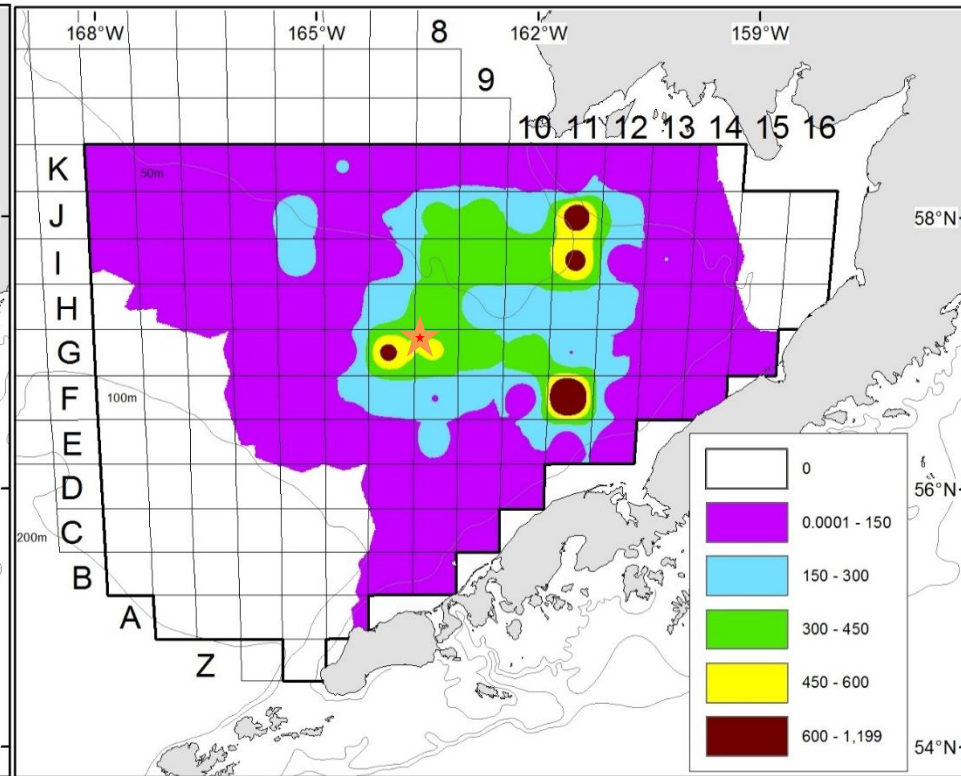




# Tagging Location



2019 Bristol Bay Red King Crab **Legal Males** ( $\geq 135$  mm CL)



2019 Bristol Bay Red King Crab **Mature Males** ( $\geq 120$  mm CL)

# Next Step – Re-finding the crab



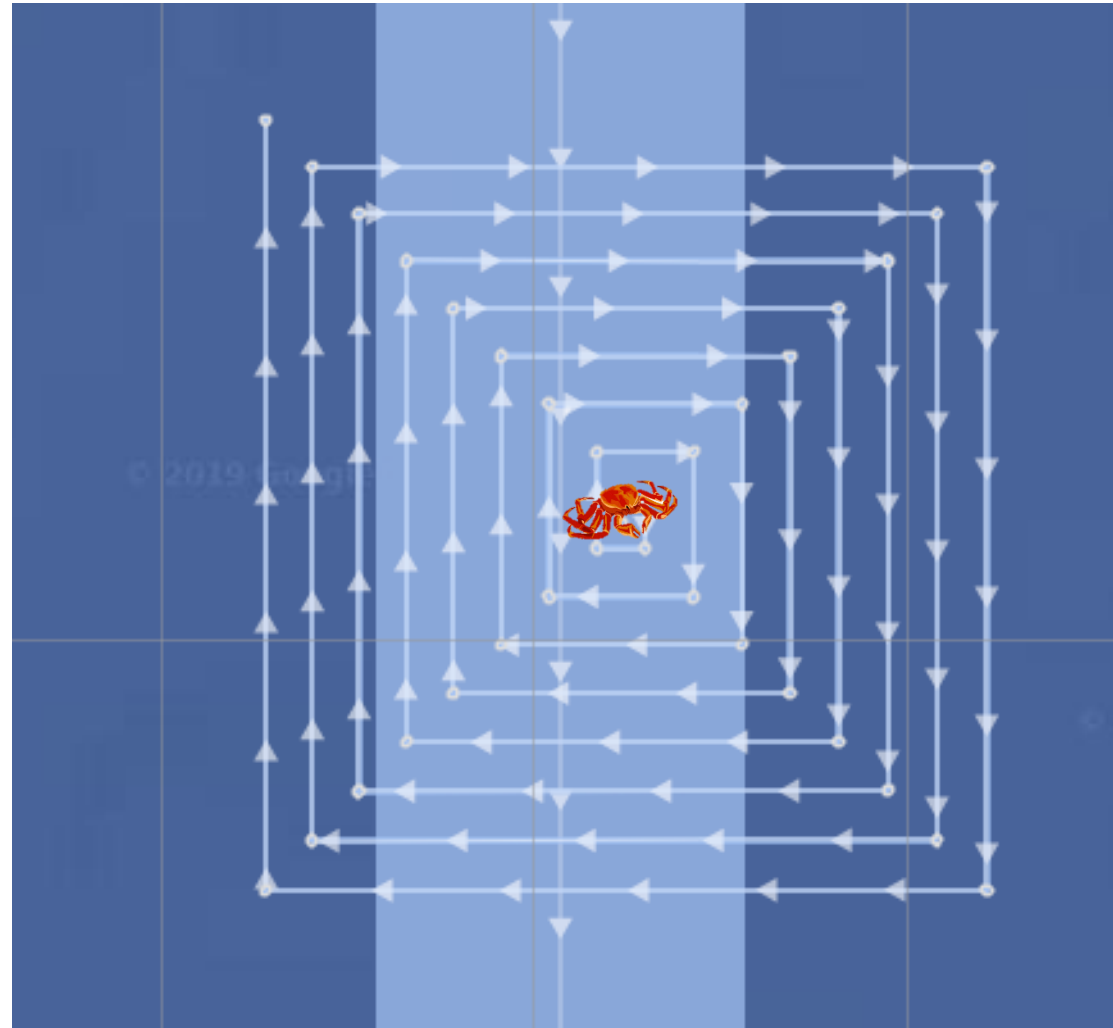
- Saildrone's Autonomous Surface Vehicle
- Contracted by industry for two 30 day deployments to re-find tagged crab
- Equipped with acoustic receiver
- Deployments in October, 2019 and March/April 2020

## Saildrones onsite Dutch Harbor 9/24

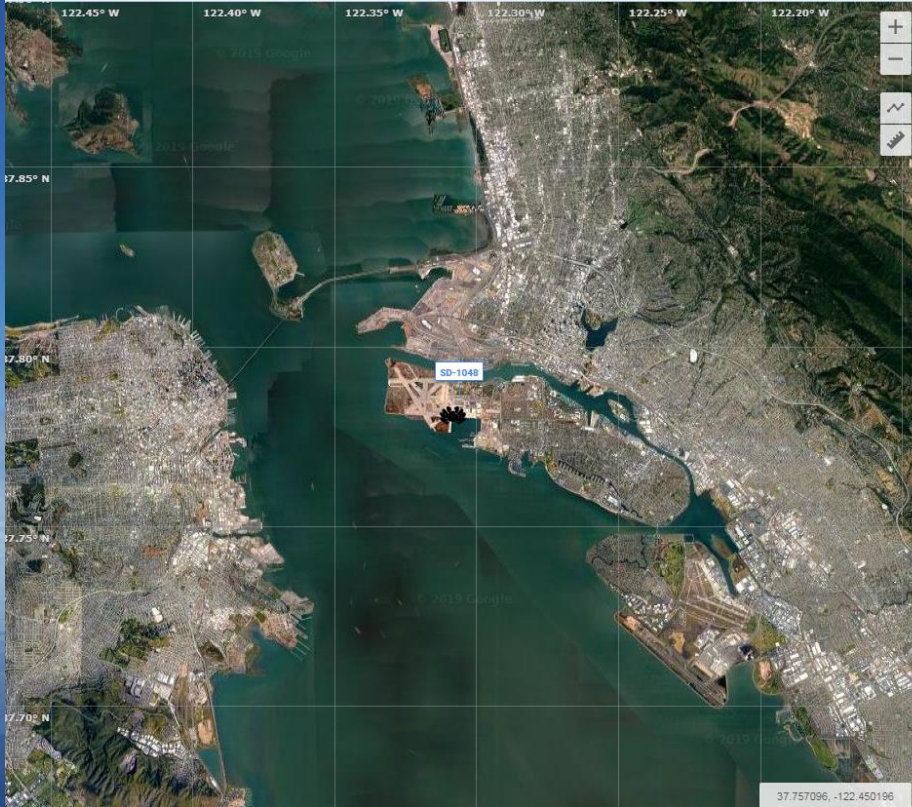
# Next Step – Re-finding the crab



- Search Grid
- Intensive sampling around detected crab



Mission Portal has a new look and some exciting new features! [Learn More...](#)



37.757096, -122.450196

This mission is scheduled to start 10/01/19

Mission Log Discussions Files

« Back

Mission Requests  
3 people are subscribed

✓ Subscribed

Search this discussion

Page 1 of 1

out 4 km in all directions from where the signal is first detected, with the concentric squares 400 meters apart (a total of 6 squares). For this I am assuming a detection distance of 400 m, once range test are done we may adjust these distances. If another crab is detected while doing this intensive searching the same procedure will occur from where that detection was made (after the sampling for the first crab is done); however, we'll need to adjust the sampling so that we don't waste time recovering the same ground.

sample search when detect...

Reply

Leah Z. posted on 07/09 - 20:31:38 UTC

I also added two Points of Interest. These are the locations of our two fixed tags (the smaller V13 tag and larger V16 tag) that we want to use for conducting range tests (under the same oceanographic conditions the rest of the crab tags are experiencing). The range tests will be conducted when we get to those locations following the basic track. However, I'd like them to be done "back to back" (e.g., do the V13 range test since that's what we'll hit first and then immediately do the V-16 test, not wait until we get there on the next transect). I wasn't sure the best way to add a track for the range tests. If possible, for each of these tags I'd like to do a total of 9 "passes" over them. For the V16 the starting/ending point for each pass would be 3 km on either side of the tag and for the V13 it would be 2 km (these are huge overestimates for range, they may be adjusted). For these 9 "passes" could we do them at 3 different speeds (3 passes at each of 3 speeds)? Obviously what exactly these speeds are depends on weather conditions (maybe something like 0.75, 2, & 3 knots).

Reply

Leah Z. posted on 07/09 - 21:02:06 UTC

Edited 08/05 - 21:30:28 UTC

I added the crab release locations as points of interest. We'll want to slightly veer off our transect to cover these locations (if crabs are here that will suggest that they died during the tagging process).

Show 1 Reply

Leah Z. posted on 09/09 - 20:31:56 UTC

This is the proposed track for the second drone (offset grid in opposite direction). I set the radius at 1000m here and I'd like radius for the 1st drone to also be changed to 1000m (it's at 3000m and since I've already submitted that route, I don't seem to be able to change it myself). Thanks!

octtrackpts2.csv.gpx

Reply

Type your comment here...

Post Comment

Attach Files

# Monitoring Project Status

# Spatial Research / index area sampling

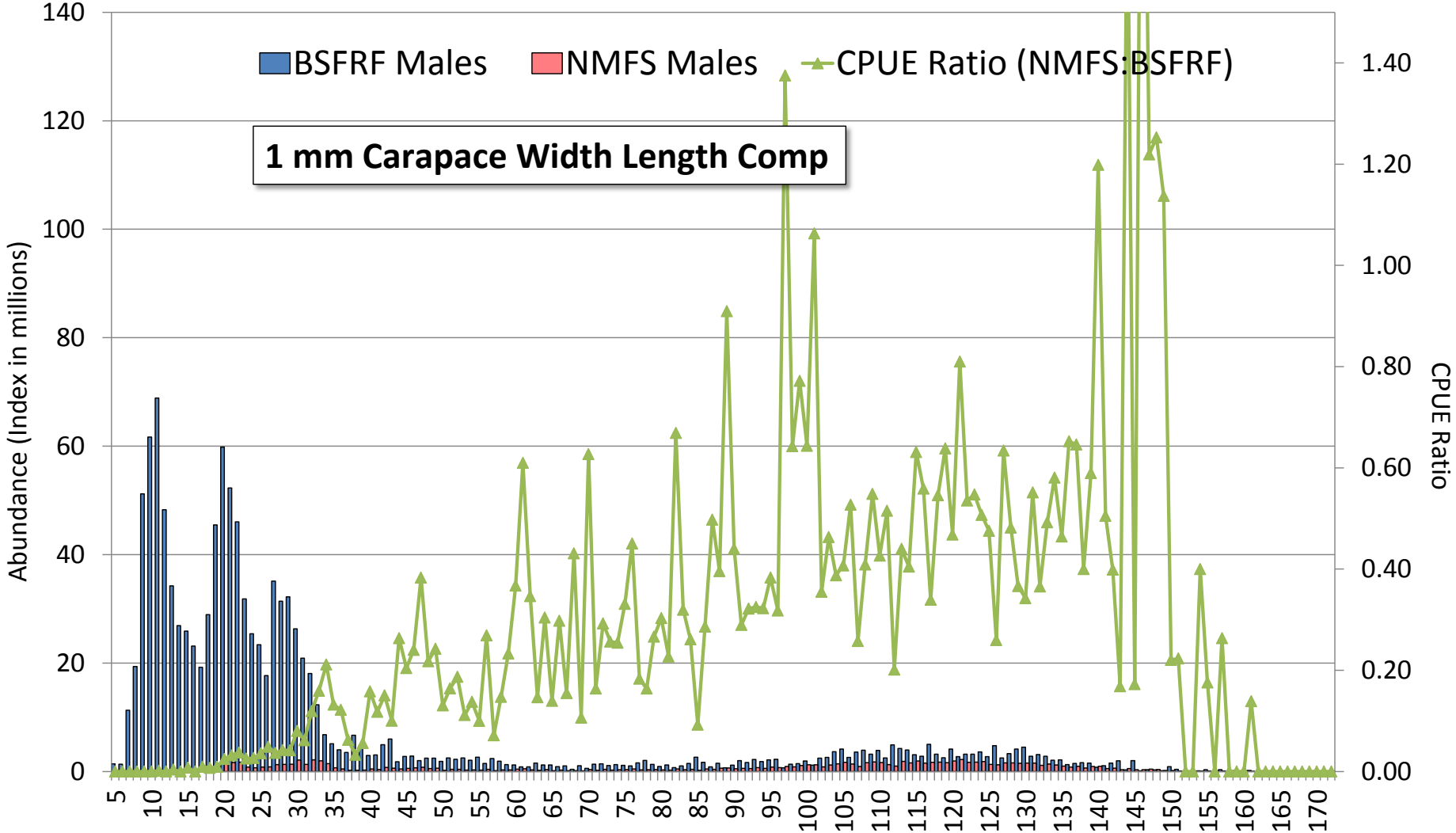
- Focused on index area sampling in high abundance juvenile area for bairdi, some overlap with opilio
- Objective: capture third year snapshot of high abundance as selectivity/growth/mortality data
- One survey vessel chartered v. two from prior years
- Jun 5 – Jun 27 sampling period, earlier by 7-10 days
- Index sampling occurs “off center” in 4 quartiles of NMFS standard stations, semi randomly
- Sampling follows prior methods w/ Nephrops trawl
- Data to be included with prior years’ index area sampling – provided to and considered by the bairdi assessment model, ultimately

# Spatial Research / index area sampling

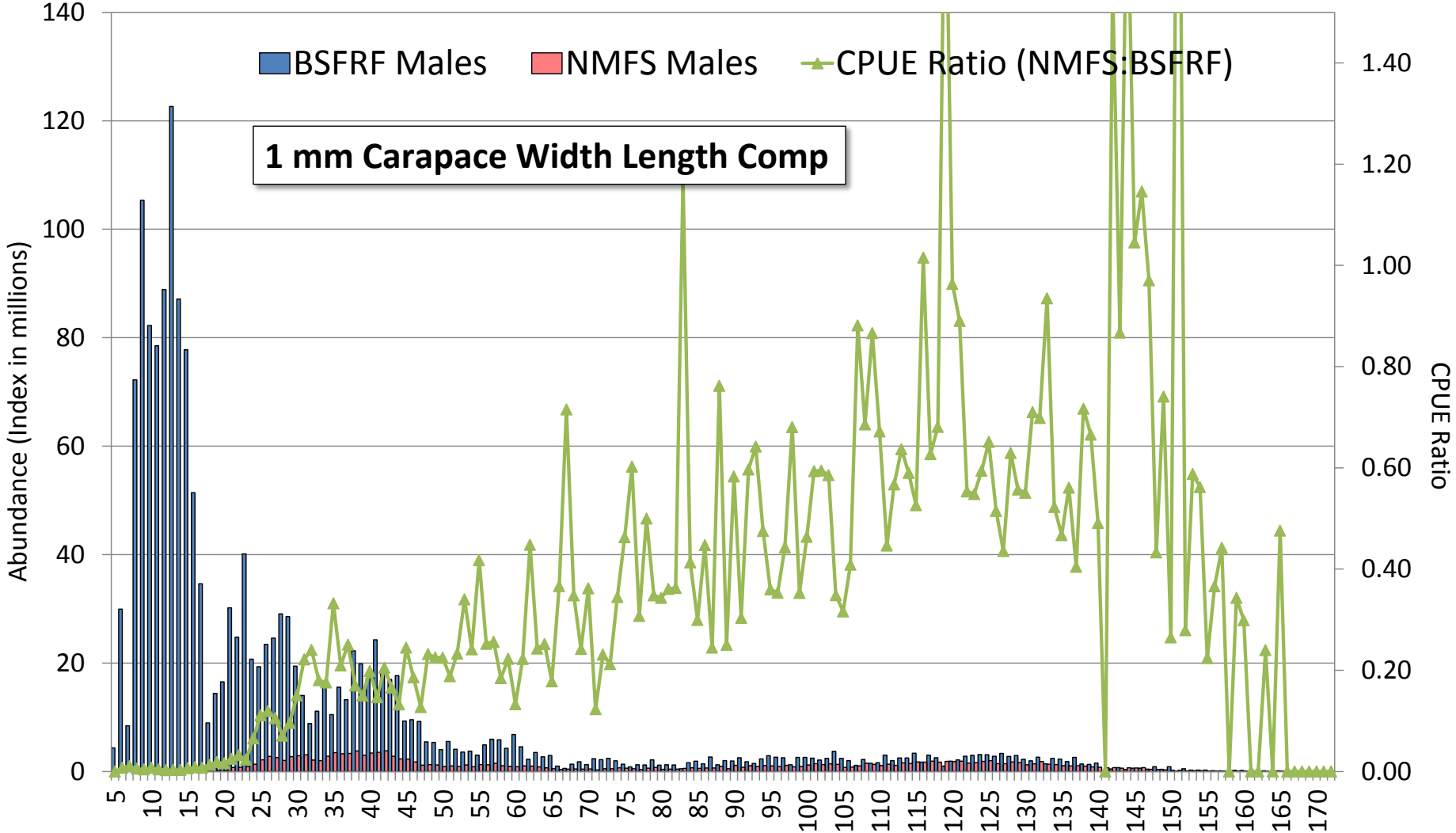
- Quick review on side by side v. index survey sampling



# Bairdi Trawl Selectivity 2017 – Expanded Side by Side

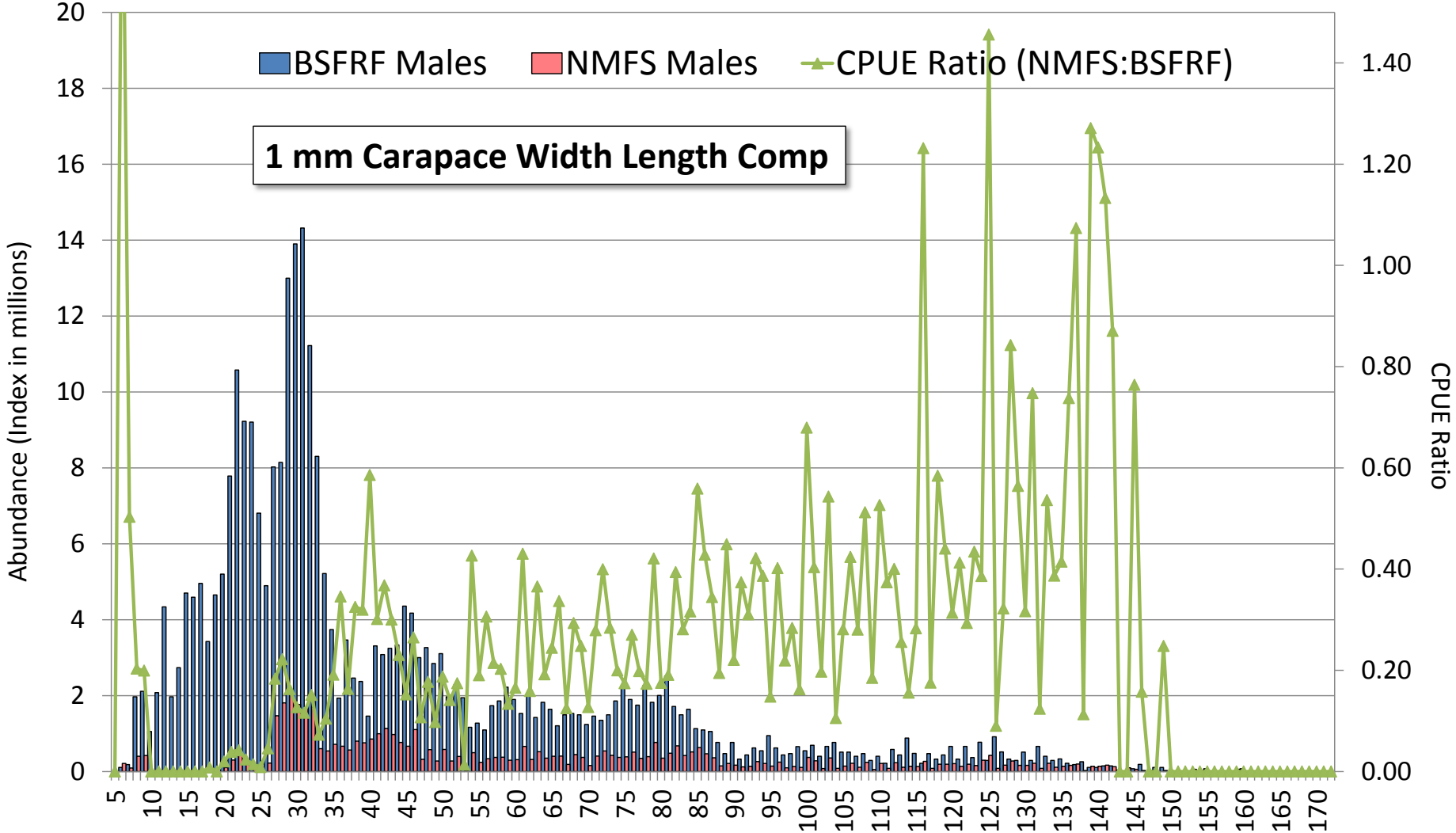


# Bairdi Trawl Selectivity 2018 – Expanded Side by Side

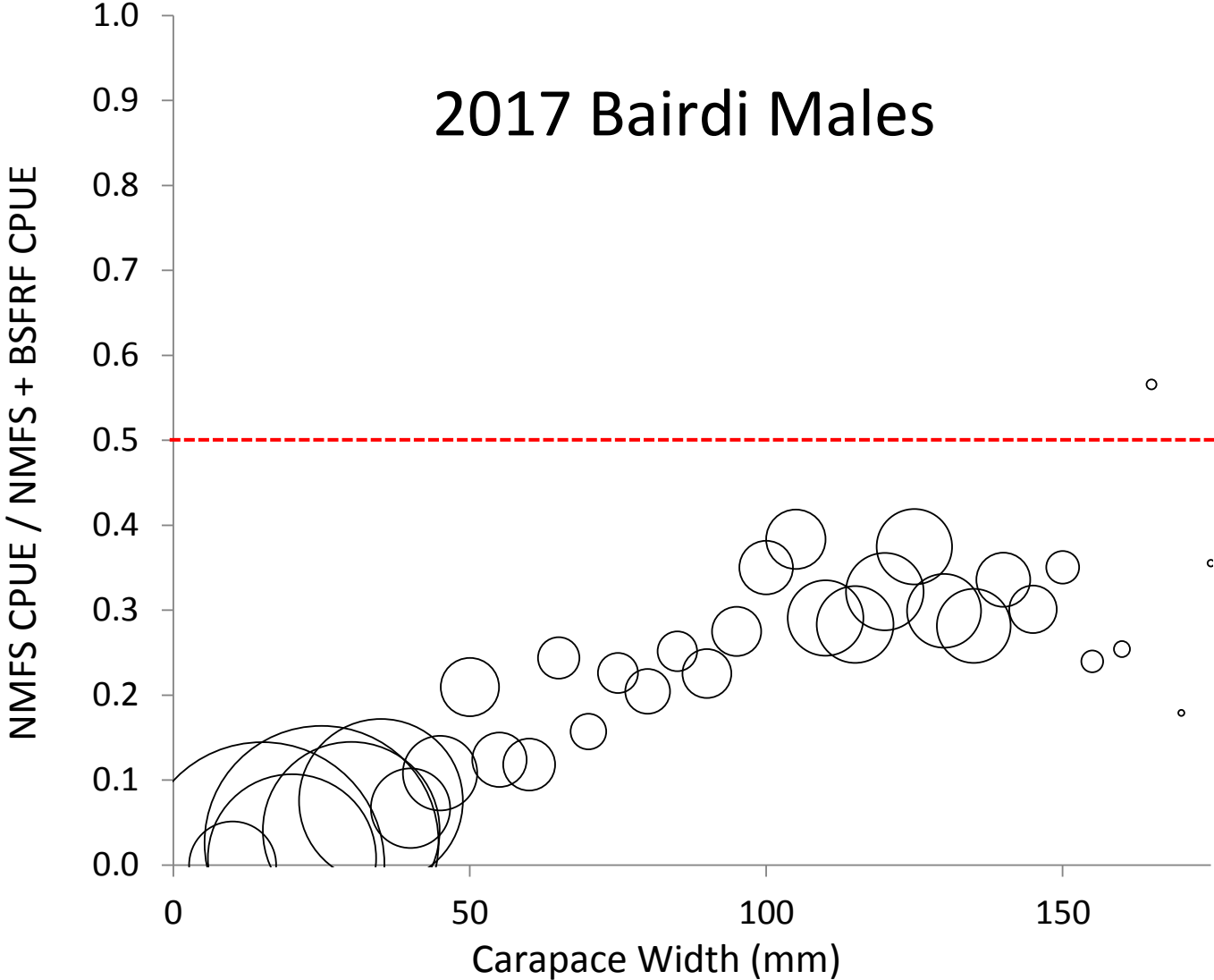




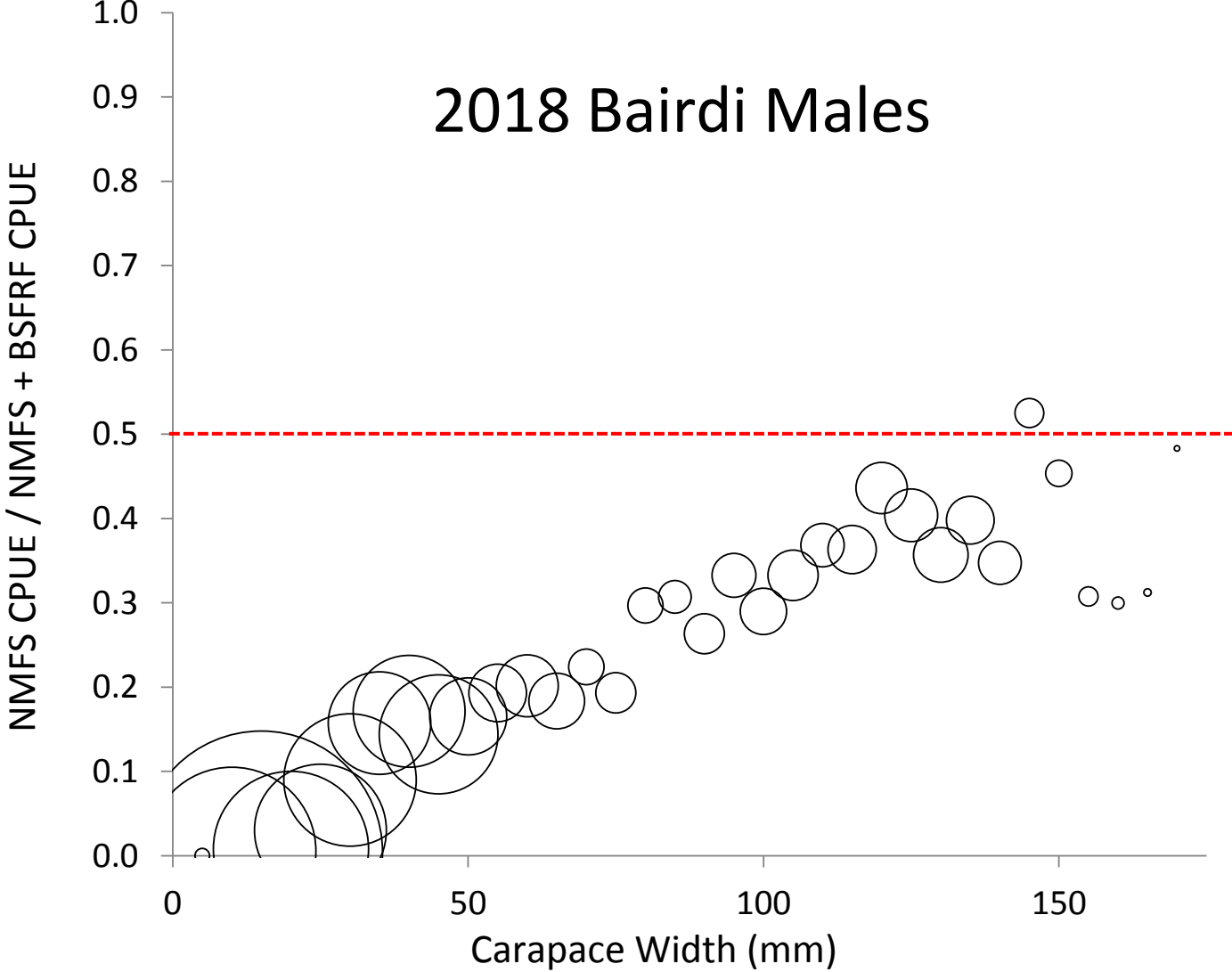
# Bairdi Trawl Selectivity 2019 – Expanded Side by Side



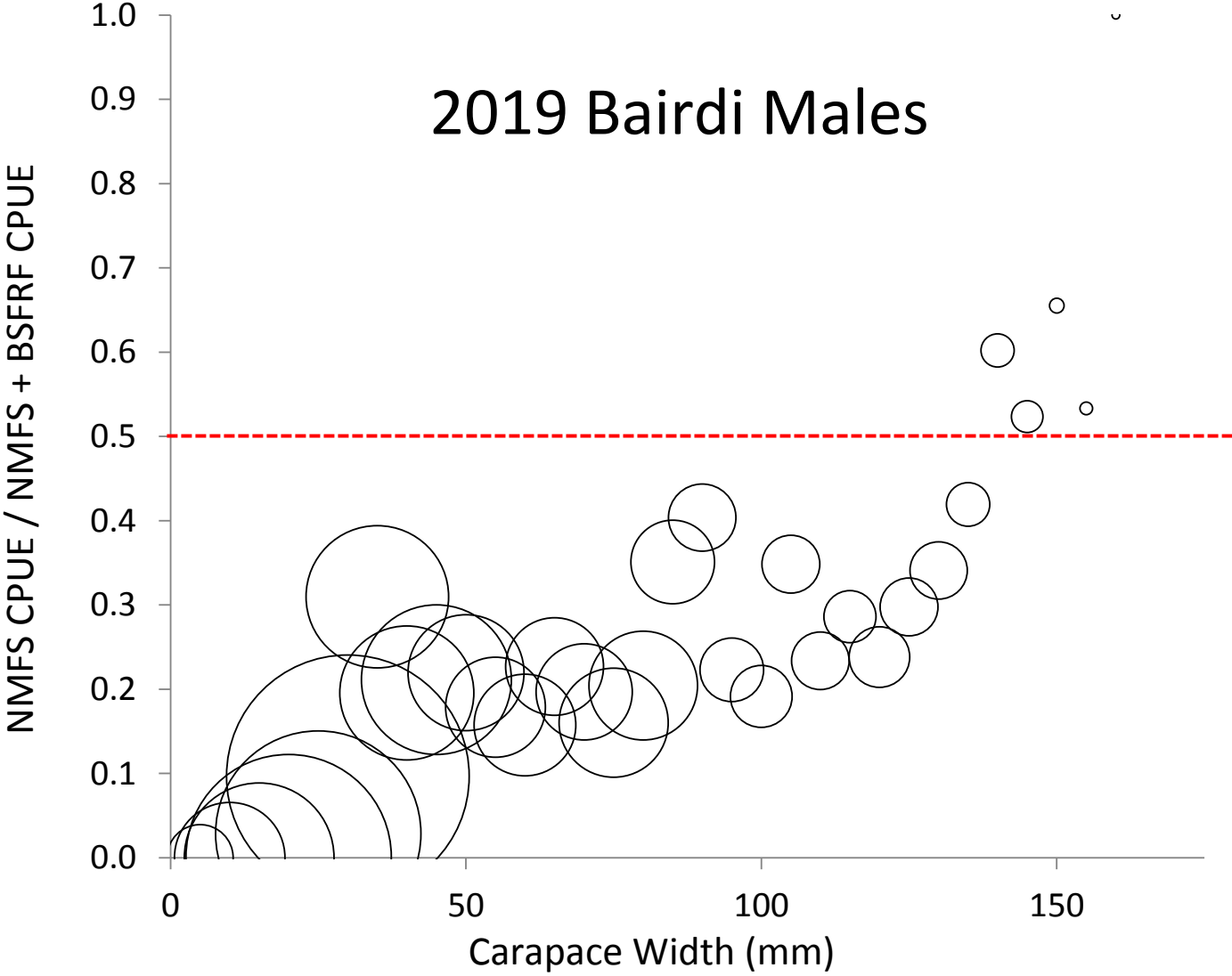
# Bairdi Trawl Selectivity 2017 – Expanded Side by Side



# Bairdi Trawl Selectivity 2018 – Expanded Side by Side

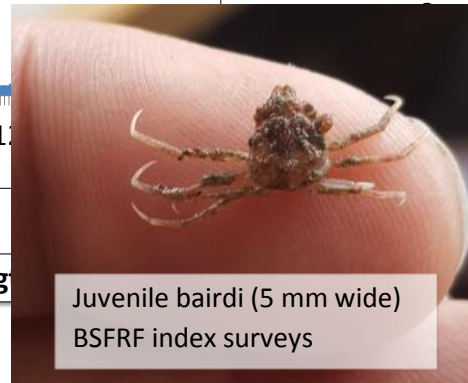
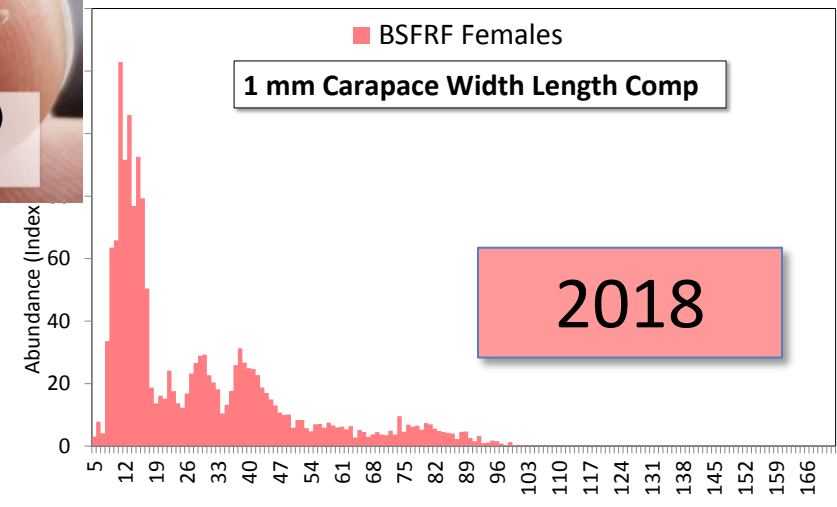
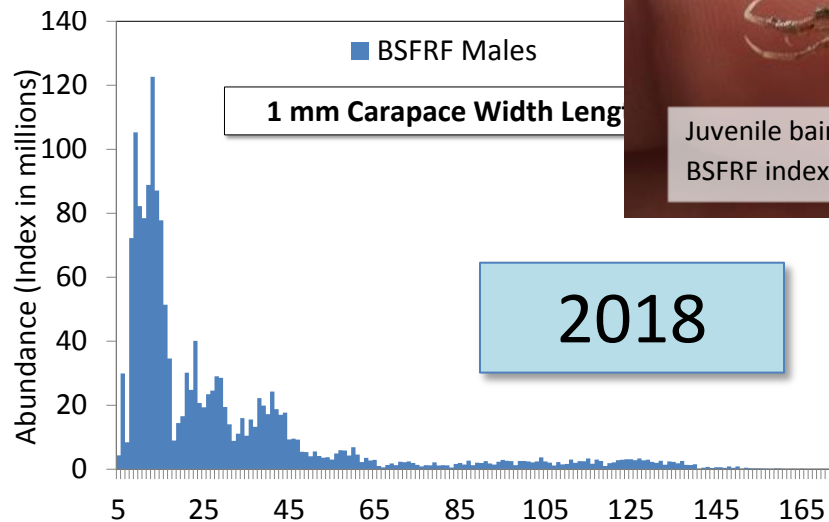
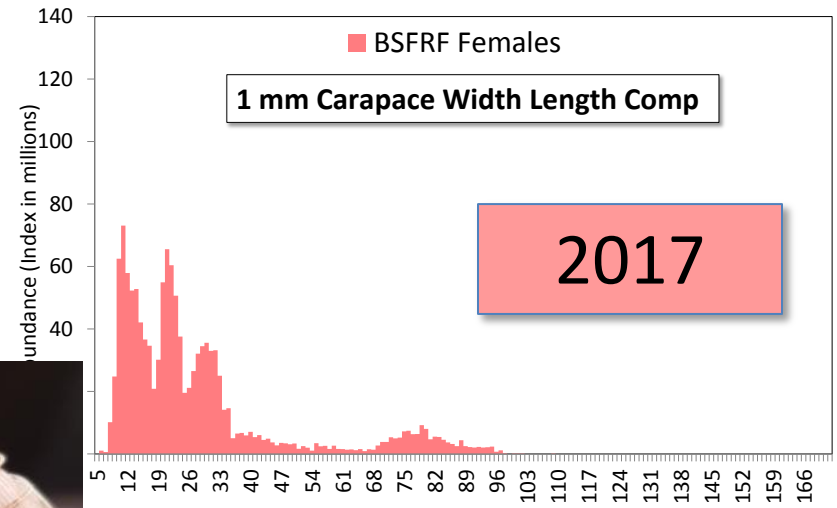
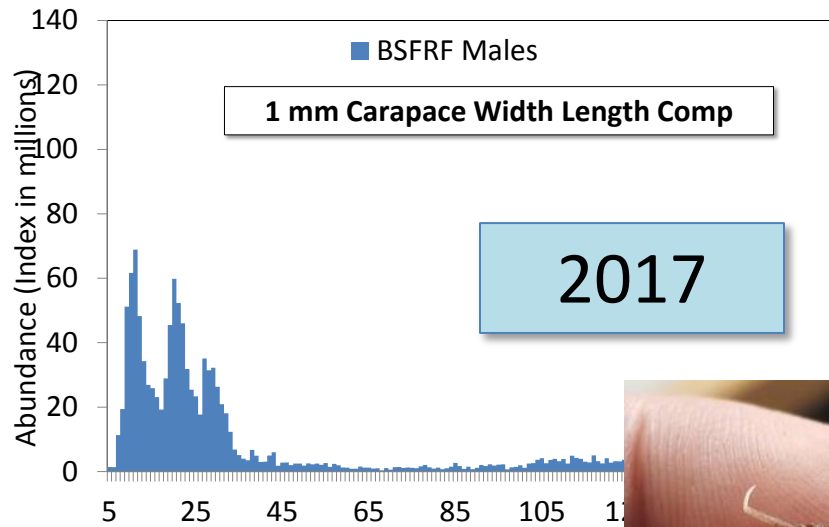


# Bairdi Trawl Selectivity 2019 – Expanded Side by Side

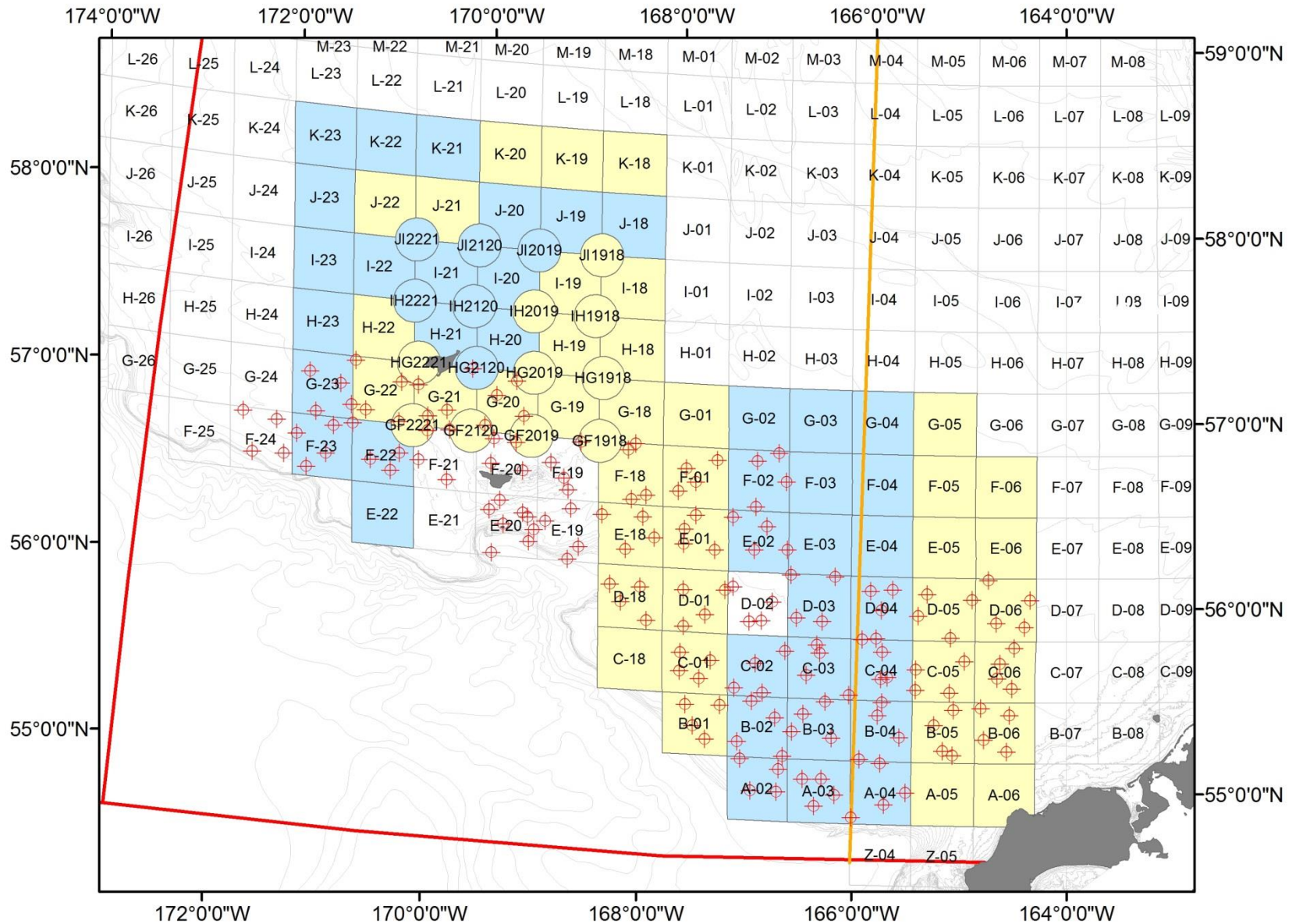


# Bairdi Trawl Selectivity 2017/18

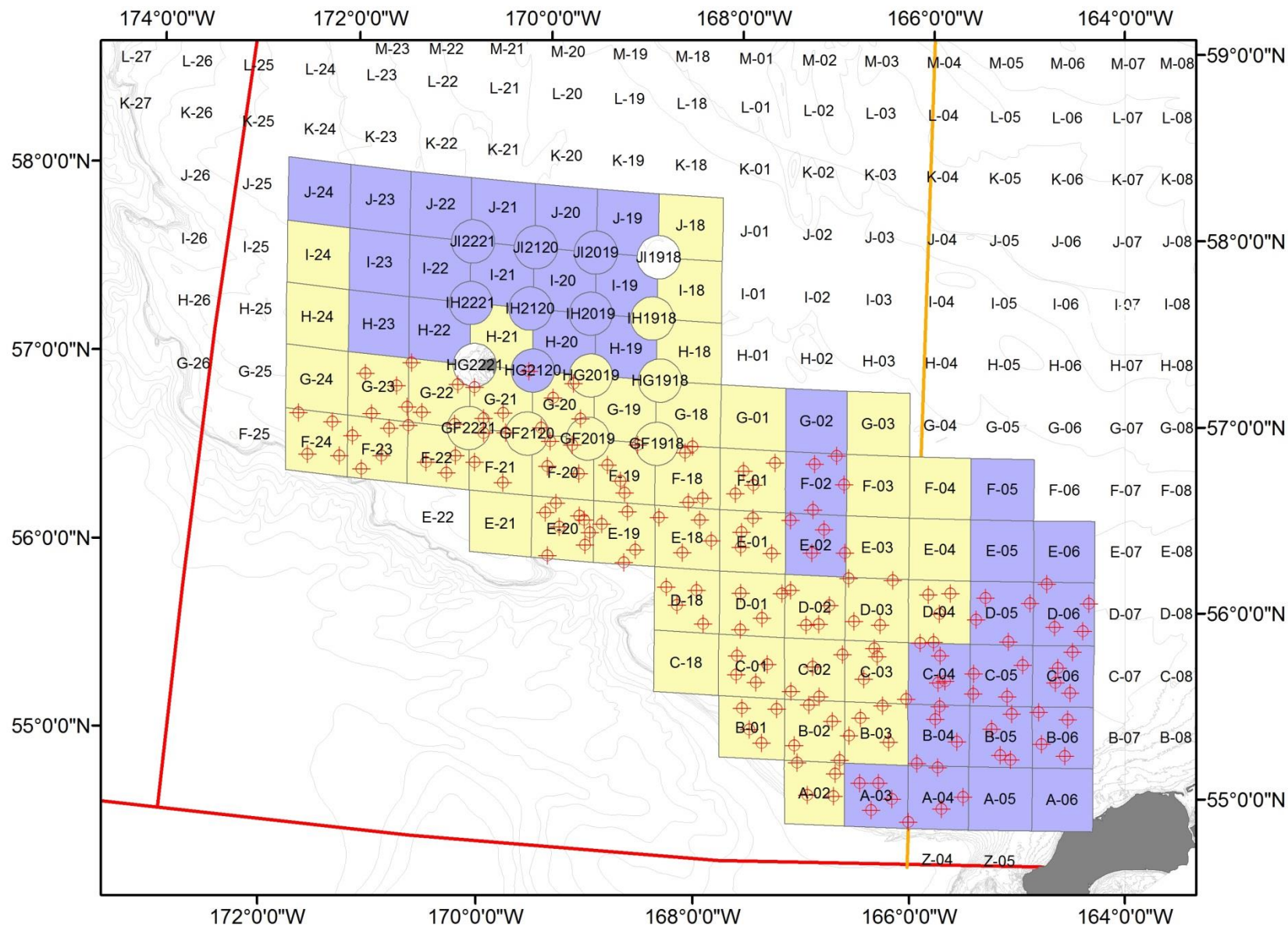
## Two Surveys – Selectivity & Index Areas



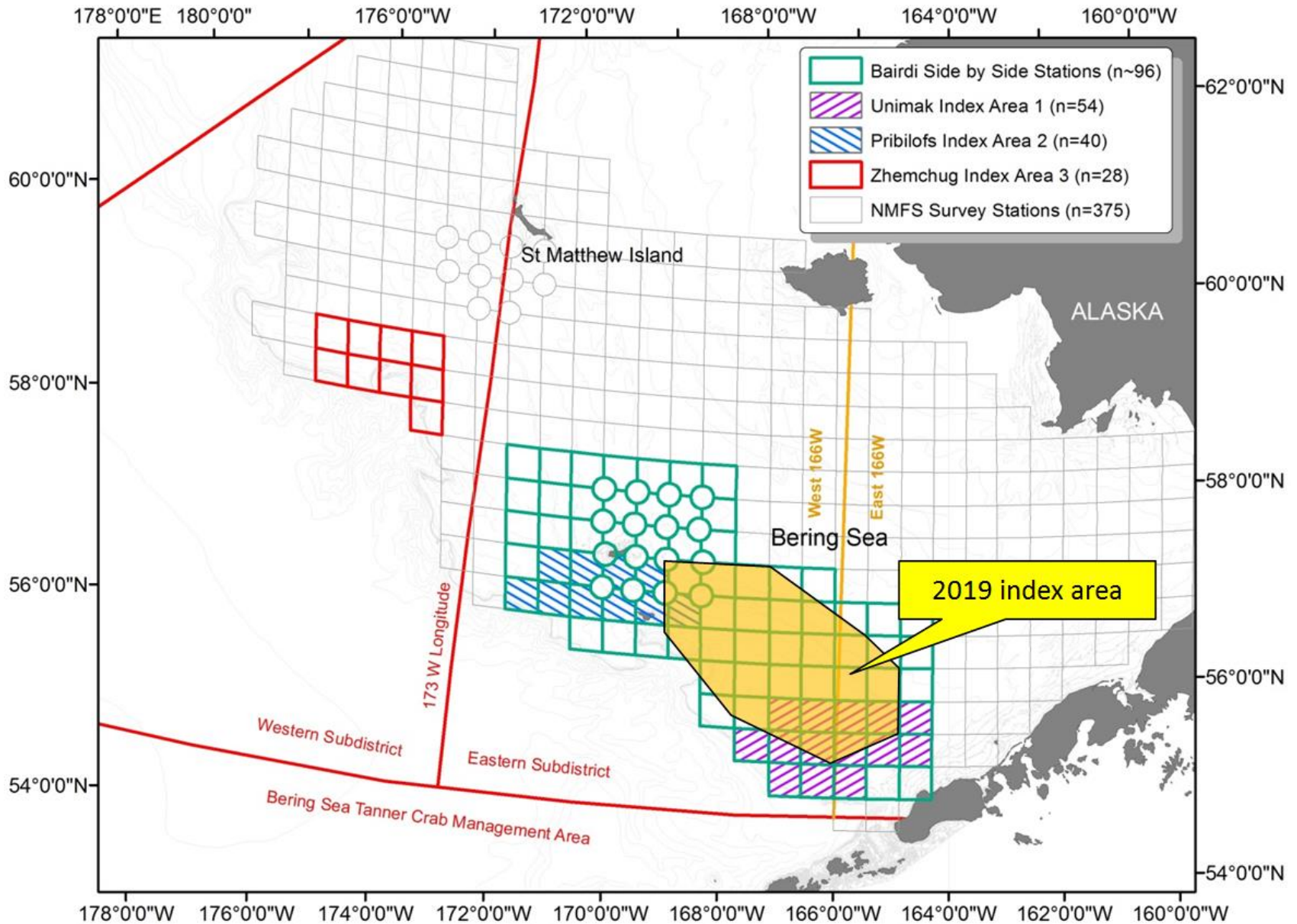
# Bairdi Survey Stations – Actual 2017



# Bairdi Survey Stations – Actual 2018



# Bairdi Survey Stations – Actual 2019





# BSFRF Outlook & Focus

- Seeking input on other research options
- Broadening scope of projects
- Coordinating w/ CPT and public this week
- Board of Directors meets monthly, plans annually
- Flexible to new opportunities...



## Testing Pot Gear Modifications to Reduce Crab Bycatch in Cod and Halibut Fisheries

With Bering Sea crab stocks at historic lows, bycatch of crab is a growing concern. The North Pacific Fishery Management Council and NOAA Fisheries plan to allow Pacific halibut fishermen in the Bering Sea and Aleutian Islands, who traditionally fish with longline gear, the use of pot gear as an option to help them avoid whale depredation. Additionally, the pot cod fishery in the Bering Sea is exploring ways to reduce crab bycatch in their fishery.

The Alaska Bering Sea Crabbers (ABSC), Bering Sea Fisheries Research Foundation (BSFRF), and Natural Resources Consultants (NRC), with the support of several partners (listed below), were granted an award from the NOAA Fisheries Bycatch Reduction Engineering Program (BREP) to conduct lab and field experiments to develop and test the effectiveness of crab bycatch reduction in a variety of pot gear modifications. **This project will test pot gear modifications by working with fishermen from the halibut, cod, and crab fisheries, as well as gear manufacturers, to utilize their knowledge and experience when coming up with the design and then applying a scientific protocol to rigorously test its effectiveness.**

To start this project, an industry gear committee meeting will be held (details below) where project partners and industry representatives will discuss gear modifications and determine which will be tested during lab experiments. Some initial ideas for pot gear modifications have been developed by industry representatives and are available on the backside of this flyer as a starting point for discussion.

*Industry Gear Committee Meeting*

*September 16, 2019 6:00pm*

*Ivar's Salmon House*

*401 NE Northlake Way, Seattle, WA 98105*

## For more information contact:

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[absc\\_jamie@gmail.com](mailto:absc_jamie@gmail.com)

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Foundation  
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[sgoodman@nrccorp.com](mailto:sgoodman@nrccorp.com)

Kyle Antonelis, Fisheries Analyst  
Natural Resources Consultants  
206-285-3480 |  
[kantonelis@nrccorp.com](mailto:kantonelis@nrccorp.com)



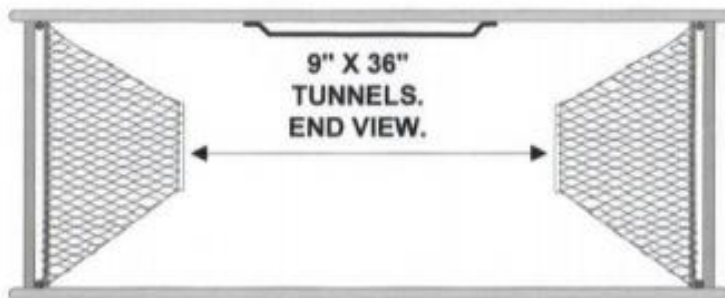
**NOAA**  
**FISHERIES**



**Bering Sea  
Pot Cod  
Cooperative**



## Some initial ideas for pot gear modifications to reduce crab bycatch



**COMMERCIAL POT WITH  
TUNNELS RIGGED VERTICAL  
FOR P-COD**

**DUAL TENSIONING BUNGY TO  
EXCLUDE CRAB**



# Tanner Crab MSE Update

Madison Shipley  
Master's Research  
January CPT 2019

# Schedule

Update Operating Model and Run Simulations

Framework Place Holder for Board of Fish

White Paper Full Draft

Winter 2019

Spring 2019

Apr. 2019

Sep. 2019

Sep. 2019

Mar. 2020

Analysis and Preliminary Results and Write Up

Presentation of Results to ADFG and CPT

Selected HCR Presented to Board of Fish

# Info Cards, Sharing, Crab Symposium FRIDAY September 20, Ballard



**ALASKA**  
Bering Sea Crabbers

(Revised 09.11.19)

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## Fall Crab Science Symposium

“Crabs v. Mother Nature” What Can We Do?

Date: Friday, September 20, 2019 [2:00 – 7:00 pm]

Location: Leif Erickson Hall, Ballard 2245 NW 57<sup>th</sup> St. Seattle

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Scott Goodman | Executive Director  
CPT Seattle | 09.17.19

