

Klamath Basin Fisheries Collaborative 2023 Annual Meeting

June 13-15, 2023

Yreka, California



"If you want to go fast, go alone; If you want to go far, go together"

PRESIDENT JOE BIDEN
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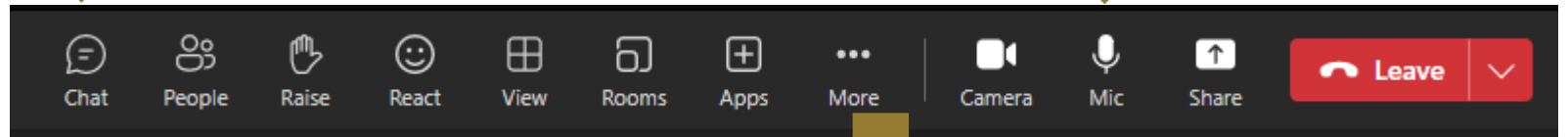
Use the meeting chat if you need assistance.

Chats can be seen by all participants.

Please mute yourself when not speaking.

Use *6 to mute phone audio.

Use the microphone icon on the control bar to mute computer audio.



Virtual participants:

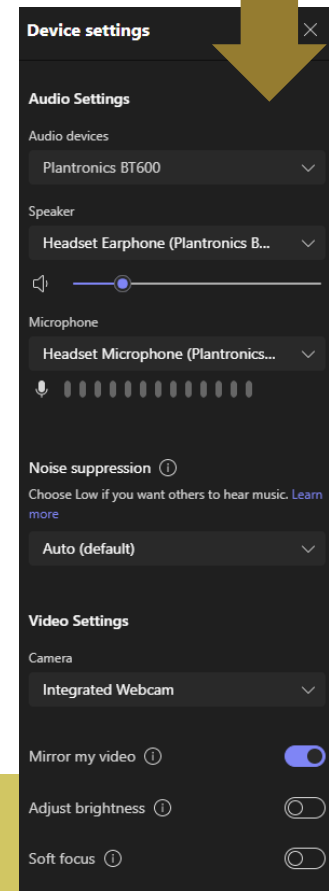
Please leave web cameras on to facilitate discussion

Please use the chat to introduce yourself (name and affiliation)

In-person participants:

Please sign in on sheet

Please state your name/affiliation when speaking



If you are having problems with audio/video, check your device settings.



Welcome – Day 1

- Overview of the day
- Brief history of the collaborative
- Logistics
- Map and Interest Boards
- Leadership team lunch meeting
- Post meeting survey



Tribal Invocation



KARUK TRIBE

The Benefits of Working Collaboratively: Highlights from the 2022 IYS Pan-Pacific Winter High Seas Expedition

Laurie Weitkamp

Research Fisheries Biologist

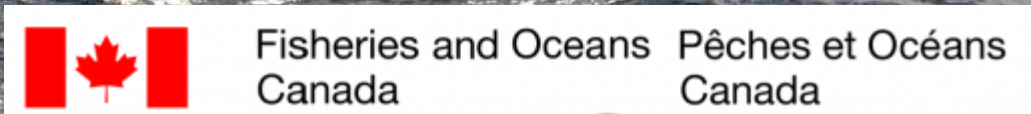
NOAA Fisheries/Northwest Fisheries Science Center



The benefits of working collaboratively: Highlights from the 2022 IYS Pan-Pacific Winter High Seas Expedition

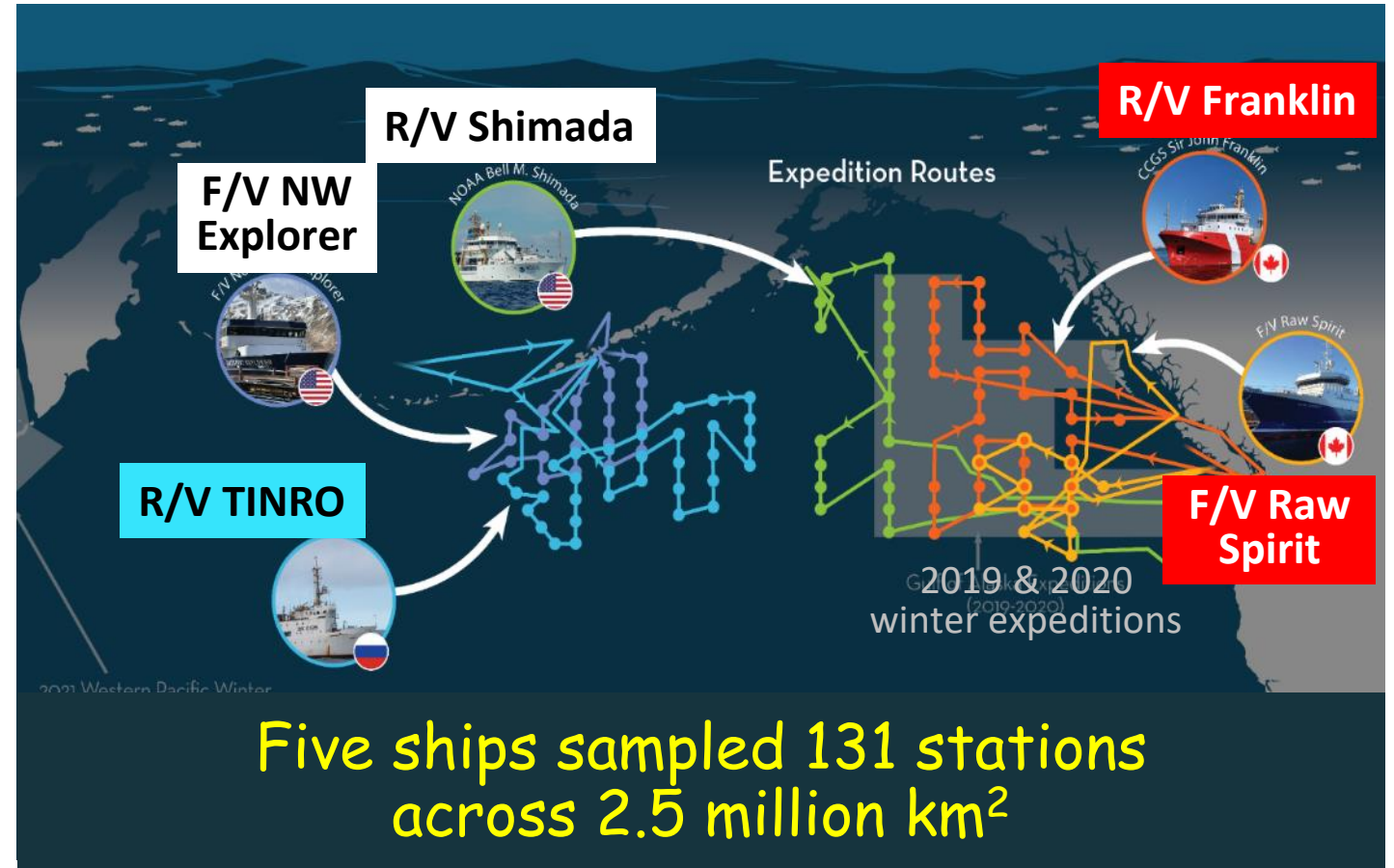


Laurie Weitkamp and Ed Farley: U.S. NOAA Fisheries
Evgeny Pakhomov: University of British Columbia
Jackie King and Cam Freshwater: Fisheries & Oceans Canada
Aleksy Somov: Russian Res Inst Fisheries & Oceanography-Pacific
Mark Saunders, Caroline Graham, Aidan Schubert: IYS/NPAFC
Vladimir Radchenko: North Pacific Anadromous Fish Commission
Dick Beamish: Independent
Brian Riddell: Pacific Salmon Foundation



What was the 2022 International Year of the Salmon (IYS) Pan Pacific Winter Expedition?

A well-publicized international multi-ship survey of high seas Pacific salmon habitats across the North Pacific Ocean conducted in late winter 2022.



<https://yearofthesalmon.org/high-seas-expeditions/>

Today's talk

- Why the survey?
- Methods
- Initial results
- Lessons learned

None of this would have been possible without full collaboration by all partners!



*Loading trawls on NOAA Ship Shimada,
Newport, Oregon, January 18, 2022*

Why study salmon on the high seas in winter?



Why study salmon on the high seas in winter?

- Least understood part of the salmon life cycle
- Use to improve management (forecasts, IUU fishing)
- Critical need to understand dynamics of high seas ecosystems as oceans change

History of winter high seas surveys starting in 1960s

North Pacific Anadromous Fish Commission
 Bulletin No. 6: 113-138, 2016

Pacific Salmon

What is the same? What is different?

Winter Ocean

Katherine W. Myers¹, James R. Irvine², Elizabeth A. Logerwell³, Shigehiko Urawa⁴,
 Svetlana V. Naydenko⁵, Alexander V. Zavolokin^{5,6}, and Nancy D. Davis⁷

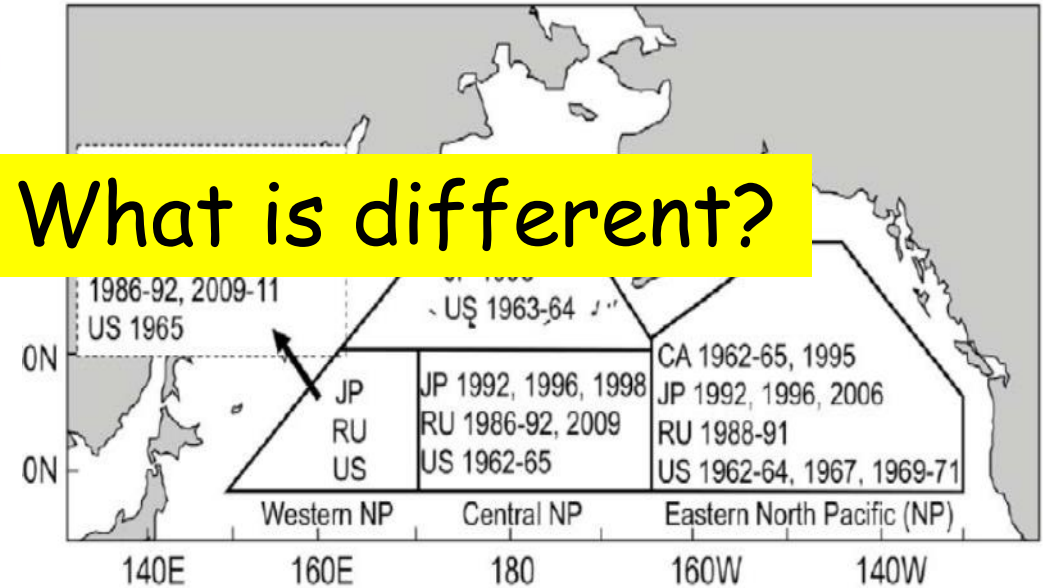


Fig. 3. The regional locations of high seas salmon winter research by Canada (CA), Japan (JP), Russia (RU), and the United States (US) in the Bering Sea and North Pacific Ocean, 1958-2015.

Common methods across all ships

Physical oceanography



CTD casts to 300-2000m
Multi-depth samples for O₂,
nutrients, Chl a, flow cytometry,
POM, HPLC,
environmental DNA

Biological oceanography



Standardized vertical bongo
nets (all ships), also Tucker
trawls (Shimada, Franklin),
Juday net (TINRO)

Fishing



Surface trawls (most ships) or
Japanese-style research gill net
and longlines (*F/V Raw Spirit*)

Common methods across all ships

Physical
oceanography

Biological
oceanography

Fishing

Spent **100s** of hours discussing and agreeing to **common protocols** across all ships to generate **seamless datasets**.



CTD c
Multi-d
nutrients, *and new systems,*

POM, HPLC,
environmental DNA

Juday net (TINRO)

) or
net
and longines (*1/4 row spirit*)

Measurements & samples collected from trawls catches

Basic biology

- Length, weight
- Scales (age, growth)*
- Otoliths (age, hatchery thermal marks)*
- CWTs (origins, age)*
- External marks (possible predation attacks)
- Gonads (maturation)*

Food web linkages/bioenergetics

- Stomach contents (food habits)
- Muscle, liver, gonads (bioenergetics, fatty acids, stable isotopes, thiamine)

*Salmon only

“Newish” technologies*

Fin clips (Genetic Stock Identification)

Gill tissue (pathogens, up/down regulation of genes)

Blood (Insulin-like Growth Factor hormone)

Stomachs (microplastics; also from myctophids & squid)



Spoiler alert! Northwest salmon use the high seas!

The 2022 Pan Pacific survey and winter surveys to Gulf of Alaska (2019, 2020) have caught:

- **Coho**: Washington, Oregon, Columbia River
- **Sockeye**: Columbia River
- **Chum**: Washington
- **Chinook**: Columbia River
- **Steelhead**: Columbia River (analysis not complete)

NW salmon are minor players compared to salmon from other areas, but still out there!



Processing the catch on the Shimada



Data sharing

All participants agreed to **F**indable, **A**ccessible, **I**nteroperable, and **R**eusable (FAIR) data standards (Wilkinson et al. 2016)

- Certain time limits before data becomes public
- Dedicated data managers (Hakai Institute), Github space, provided templates

Slow to assemble initial datasets (e.g., station locations, dates, in-water activities and trawl catches)

- Due to country- or agency-specific internal reviews, required permissions
- 4 months to release data that were ±complete when ships docked in March.

Dataset assembly is only as fast as the slowest partner!

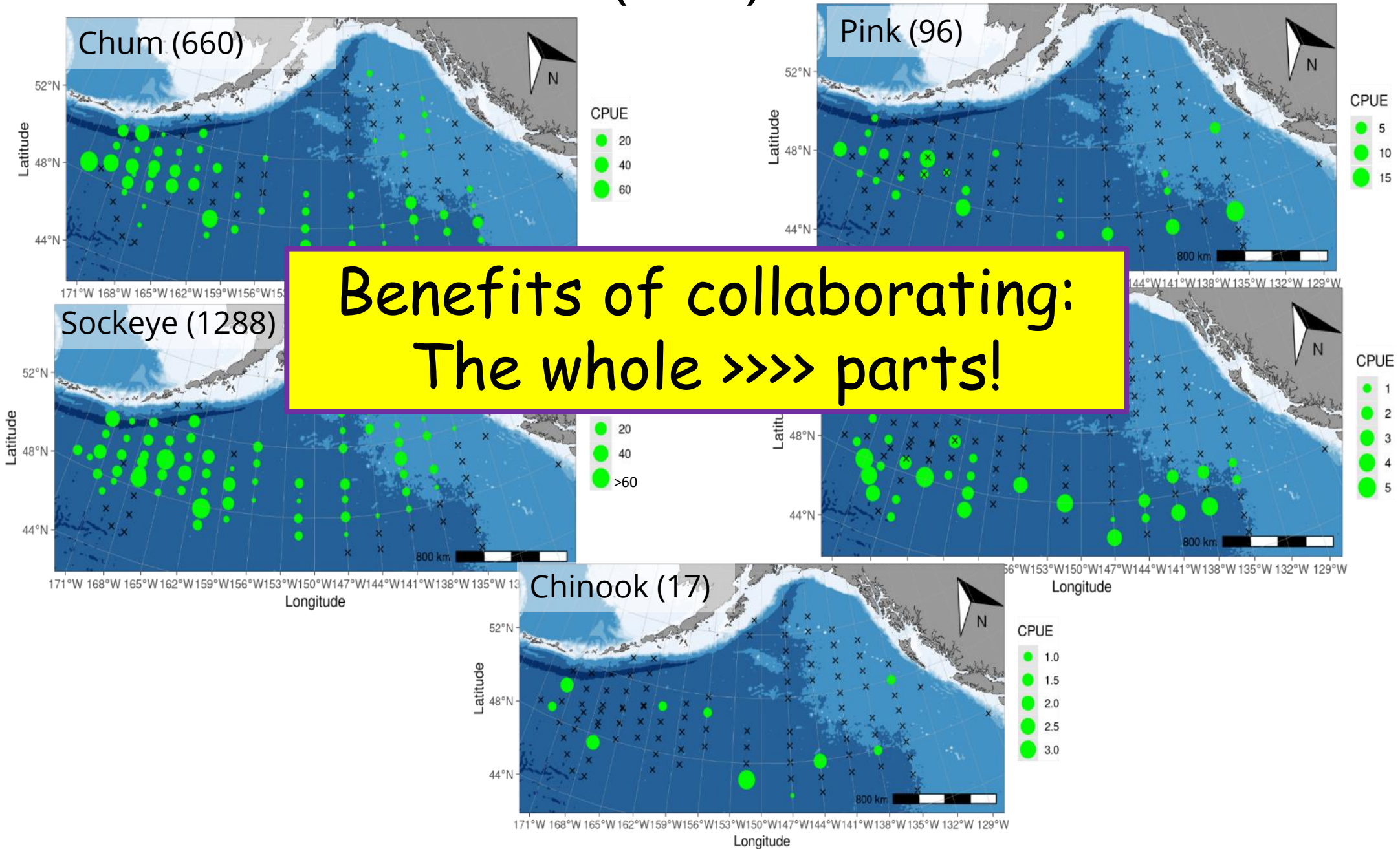
Quality assurance/quality control

Lots of QA/QC once data are shared (example: trawl catch data)

- Common units (mm vs cm, g vs kg)
- Scientific names
 - “sp.” versus “spp.”
 - Russian vs US/Canadian taxonomy
- Level of taxonomic group for taxa not identified to species
 - class, subclass, superorder, etc.



Salmon counts/hour (total)



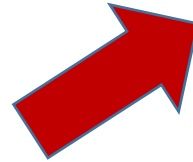
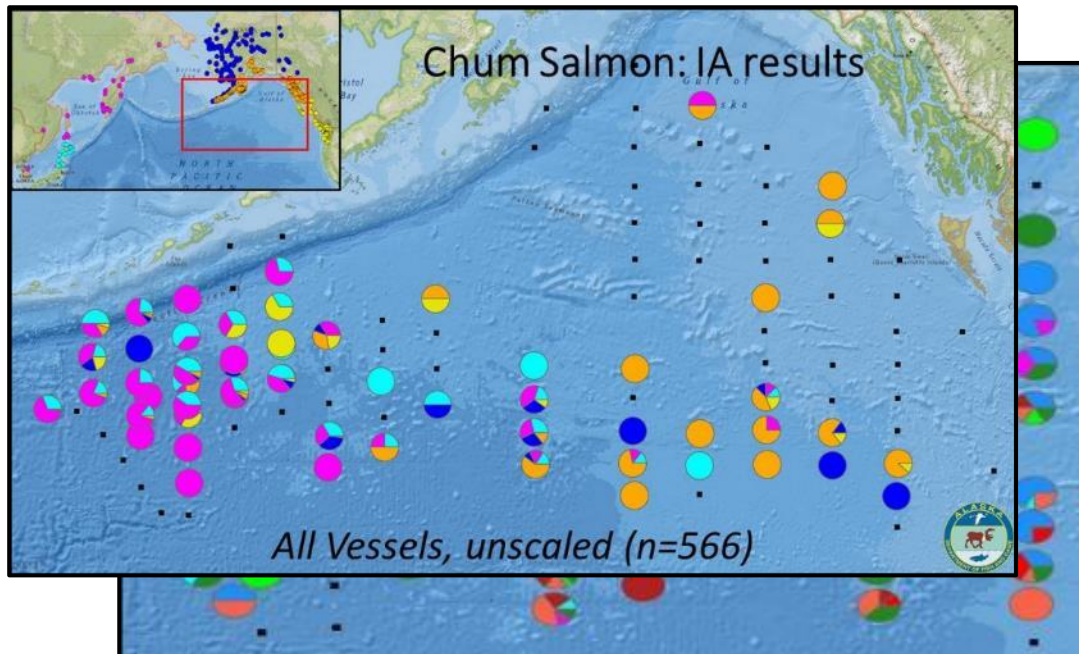
Some datasets merge better than others: genetic stock identification (GSI) not so much

Four labs ran duplicate salmon genetic samples

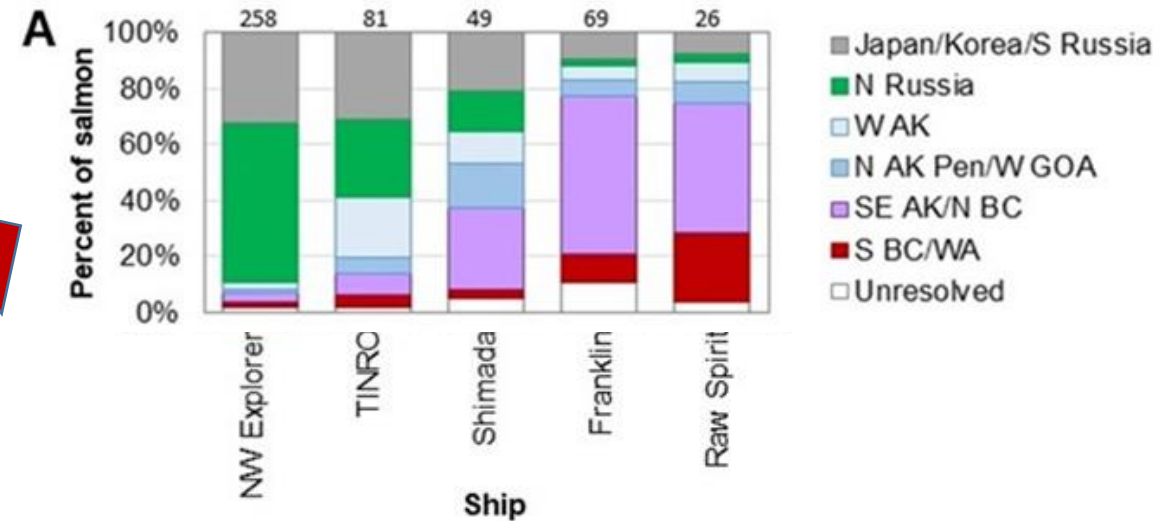
- ADFG, CDFO, NWFSC, AFSC

Different loci, different baselines = challenge to reconcile results

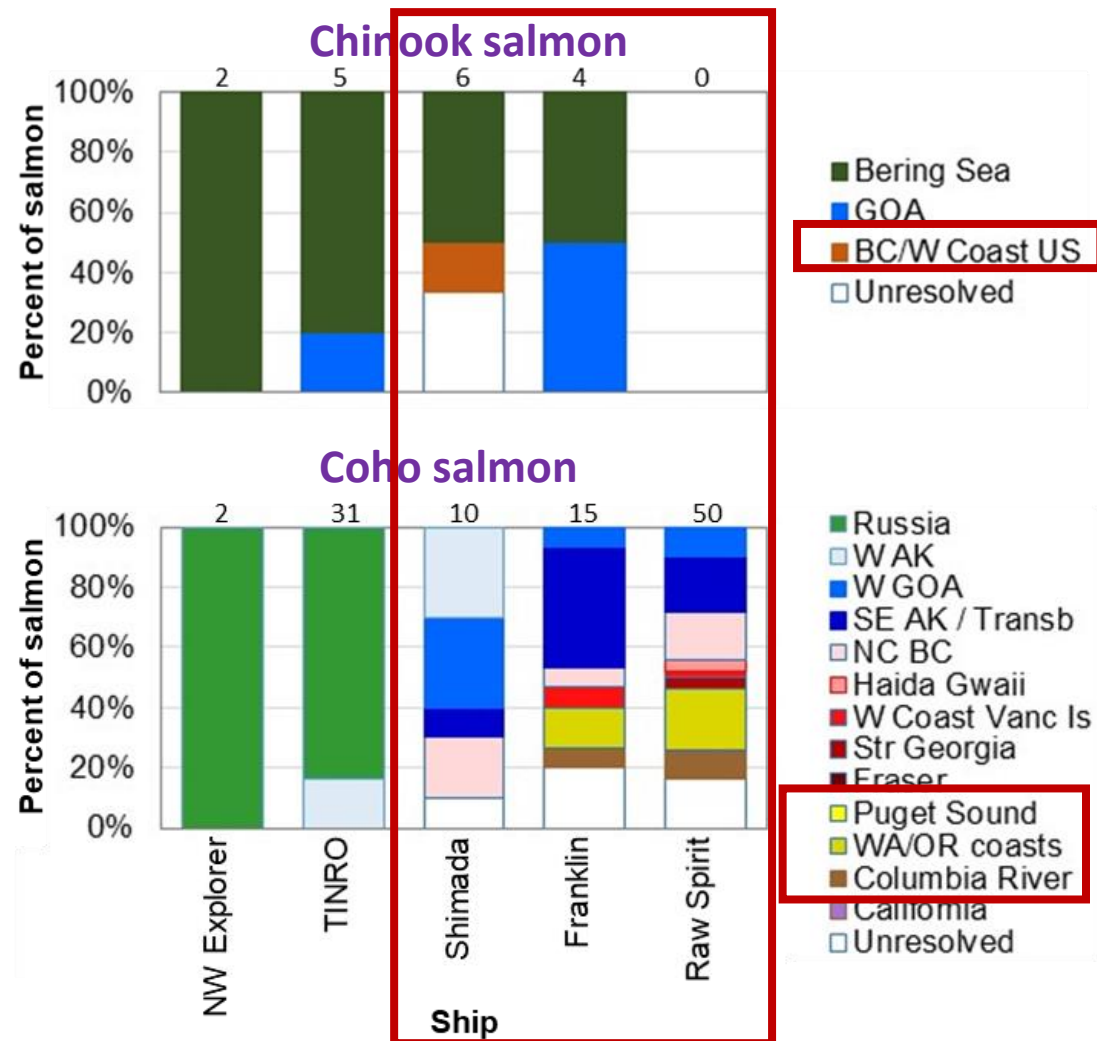
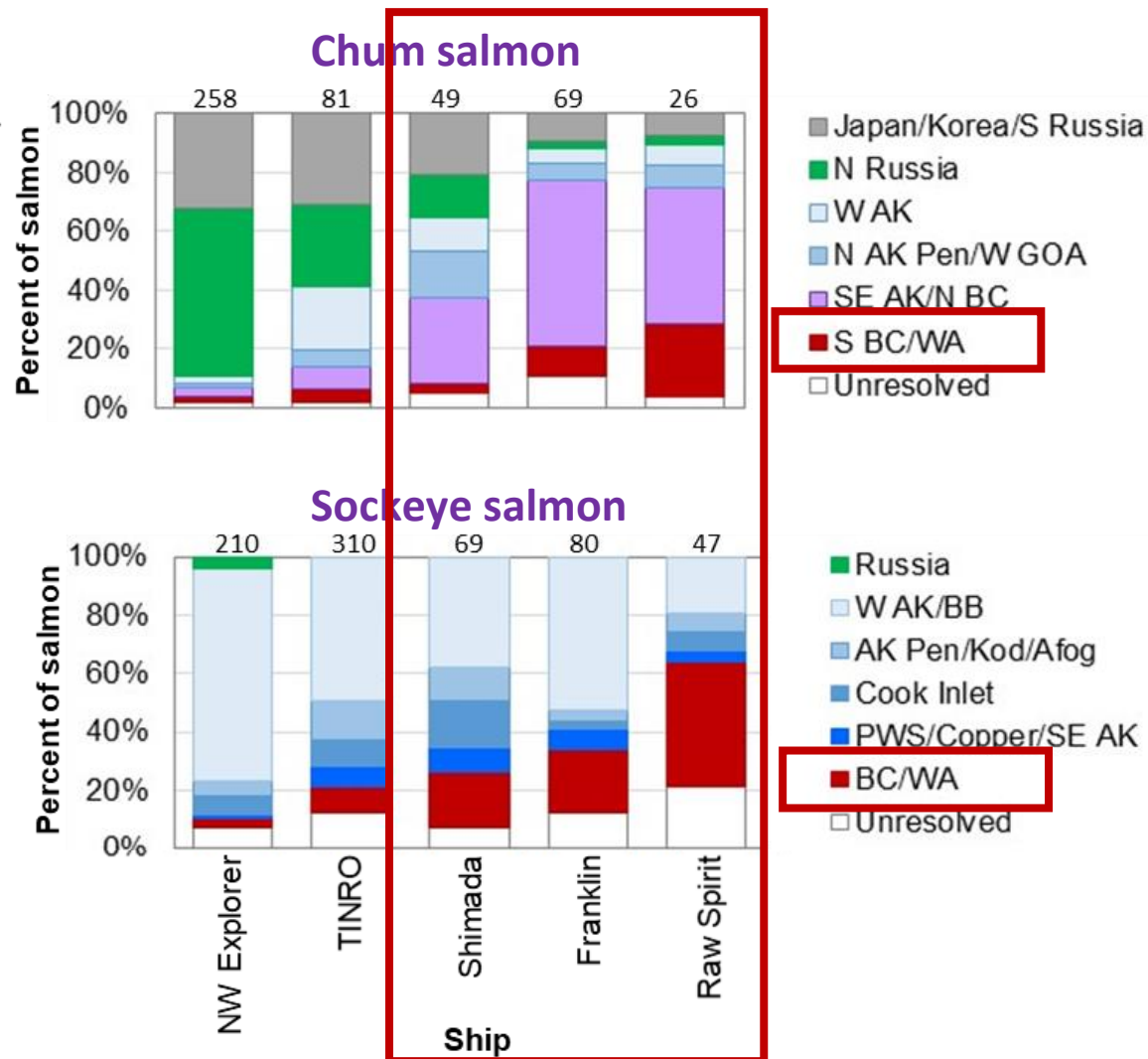
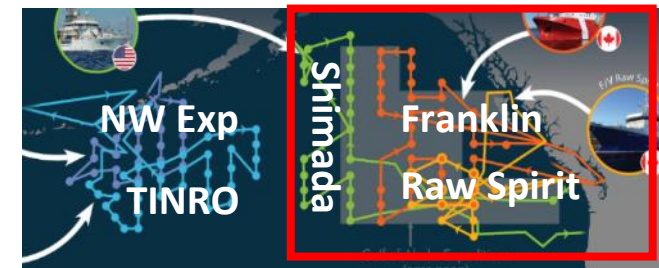
Individual lab assignments



Combined results



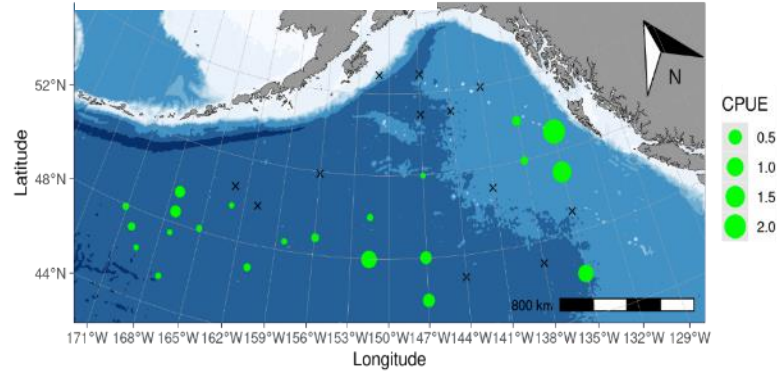
Origins of salmon (from genetics)



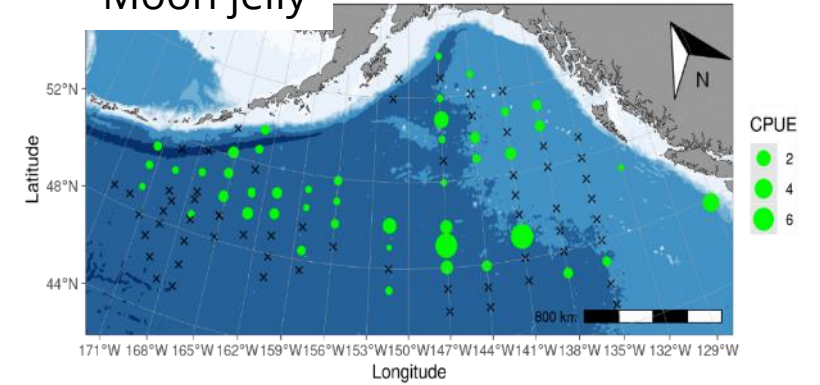
Other frequently caught species: squid, myctophids and jellyfish (kg/hour)

Prey, competitors

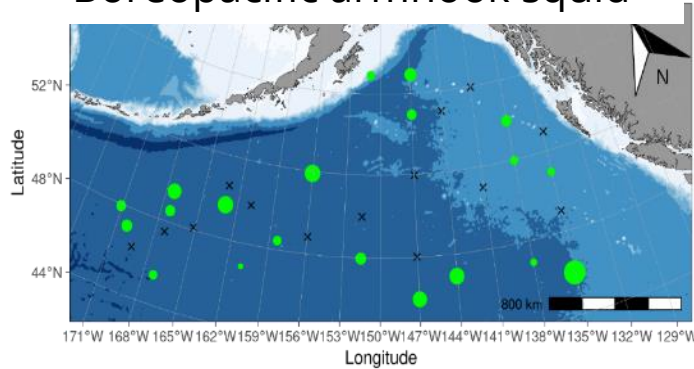
Blue lanternfish



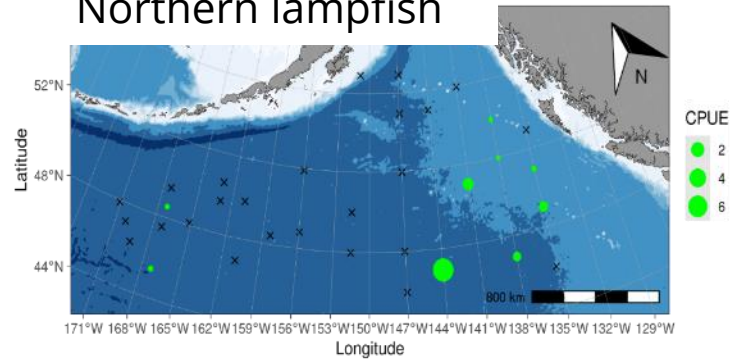
Moon jelly



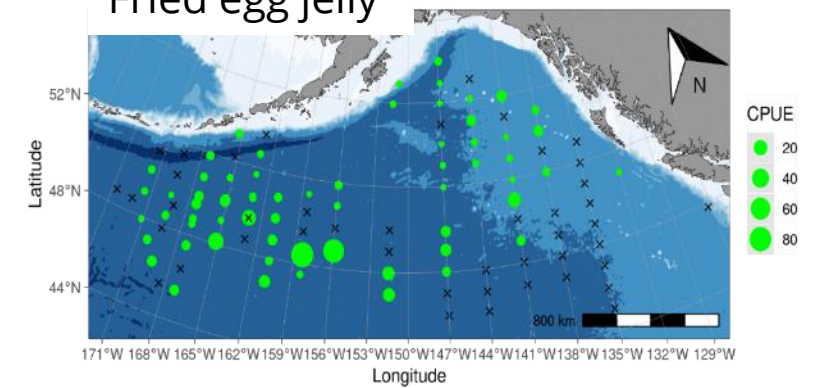
Boreopacific armhook squid



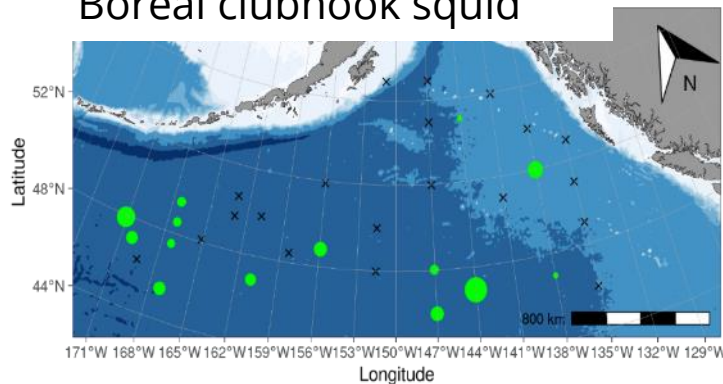
Northern lampfish



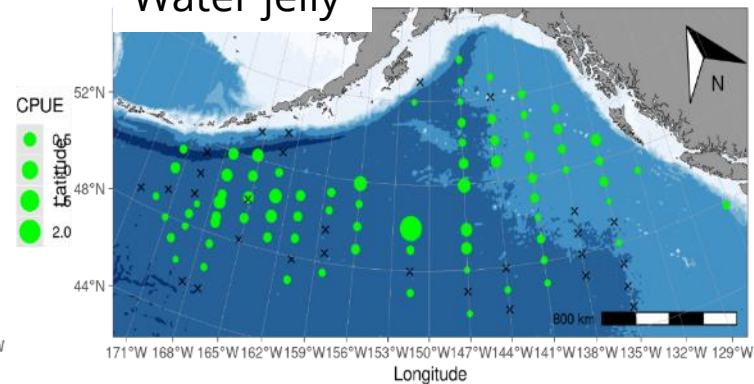
Fried egg jelly



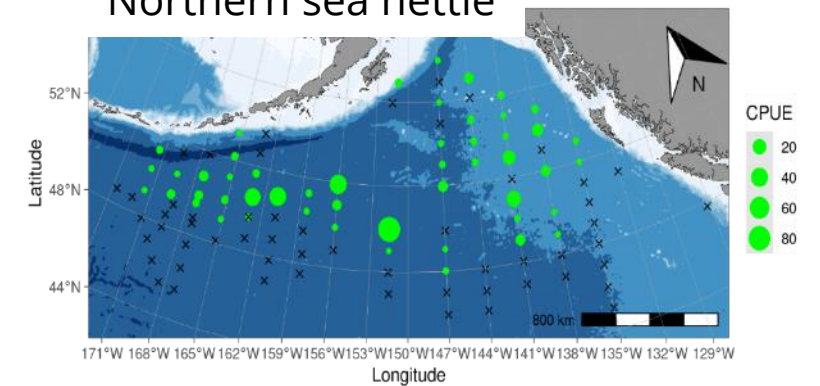
Boreal clubhook squid



Water jelly



Northern sea nettle



Is predation the ultimate cause of mortality?

(Bugaev and Shevlyakov 2007, Naydenko and Temnykh 2016)



Few potential predators caught by nets or eDNA or observed



If predation isn't the source of mortality, what is?



Looking forward

- Many samples to run, data to analyze
- Synthesize many data sets (multiple layers)
- Why stop high seas expeditions now?
 - Dick Beamish organizing a First Nations/Tribal-staffed cruise April 2024
 - Basin Event to Coastal Impacts (Beci.info), joint NPAFC/PICES “ocean intelligence system” of monitoring, research, analytical approaches for high seas and coastal systems.



Lessons from the IYS expedition

- Spend time spent to resolve minutia of protocols BEFORE field work starts!
 - Minor protocol differences may make datasets incompatible
- Cooperation and trust among parties are essential
 - Builds from **personal** relationships
- Not all datasets fit together seamlessly (e.g., GSI)
- Data sharing and collaboration takes time. Chill!!!
- The whole is superior to the parts



Questions?

Approaching Kodiak at the end of Leg 1
on the NOAA Ship *Shimada*, Feb 16, 2022

Governance: Working Together to Reach Interim Consensus on Structure for the KBFC



Draft Charter (1)

History of process to date

- Started 11/2022 with Seatone Consulting
- 14 Collaborator Interviews (individual and group)
- Two large group meetings and two smaller meetings
- After first group meeting, a desire from group for more defined structure
- Four draft versions to date
- Clarification of Leadership Group Members

Charter

Klamath Basin Fisheries Collaborative
Purpose, Commitments and Organizational Structure

Working Draft 4 – April, 2023



Draft Charter (2)

- Overview of today's process
 - Living Document
 - Will Evolve
 - Need structure to function
 - Don't let perfection be the enemy of the good-Consensus Definition
 - We have agreement through section 5
- Use "Parking Lot" for questions/issues that can be addressed in the future. Note takers are ready!
- Discuss issues/ideas on Sections 6,7, 8, 9, 10 to inform next iteration of this living document
- Input from collaborative

Charter

Klamath Basin Fisheries Collaborative
Purpose, Commitments and Organizational Structure

Working Draft 4 – April, 2023

[View document](#)



Draft Charter (3)

- Section 6
 - Decision Making: Types of decision, consensus, back up voting.
- Section 7
 - Membership: Agreeing to the rules of the road
- Section 8
 - Annual Review: Living document.
- Section 9
 - Technical Workgroups: Right groups, other needs
- Section 10
 - Ability and Flexibility to change

Charter

Klamath Basin Fisheries Collaborative
Purpose, Commitments and Organizational Structure

Working Draft 4 – April, 2023

[View document](#)



Draft Charter (4): Collaborative Input

- Change Name to “Operating principles”?
 - Why
 - Show of hands
- Recommend Acceptance of Document by Leadership Team?
 - Show of hands

Charter

Klamath Basin Fisheries Collaborative
Purpose, Commitments and Organizational Structure

Working Draft 4 – April, 2023

[View document](#)



Break

Back in 15 minutes



Draft KBFC Data Sharing Agreement

- What is a Data Sharing Agreement (DSA)
- DSA compliance
- Draft KBFC DSA - process and sections
- Discuss issues and ideas to inform next iteration
- Support of current draft



Klamath Basin Fisheries Collaborative Network

"Coming together is a beginning, staying together is progress, and working together is success."

Home Meetings **Data Sharing Agreement**

Data Sharing Agreement

Need

The centralized Klamath basin PIT tag database maintained by USGS is a repository of PIT tag data applied to salmonids in the Klamath River basin outside of the Trinity River subbasin. Data in the database cover years beginning in 2006 to the present time. The data originate from monitoring and research activities being carried out by various entities in the basin, including Indian tribes, state agencies, federal agencies, university departments and graduate students, and independent watershed councils. All of these entities desire to access the database to obtain information in support of their research and watershed management activities, including those related to fish and fisheries management and habitat restoration.

A need exists for a common understanding among the various entities regarding accessing the data, its use, and permissions and authorities in its use and dissemination.

Purpose

The purpose of this statement is to provide a common, agreed-upon understanding on data sharing among the parties related to data stored in the USGS PIT tag database. The parties desire to share data among the cooperators to the centralized database with the goals of improving the health and performance of the various Klamath basin fish populations, promoting scientific inquiry and understanding about the fish populations, and encouraging collaboration among the parties in these activities.

This statement is intended to help facilitate such cooperation, while recognizing that such cooperation needs to remain consistent with the separate policies and management procedures of each of the cooperating parties. An example of such policies is seen in the unique



Data Sharing Agreement - What is it?

Ensures proper handling and protection of data while allowing data to advance our knowledge

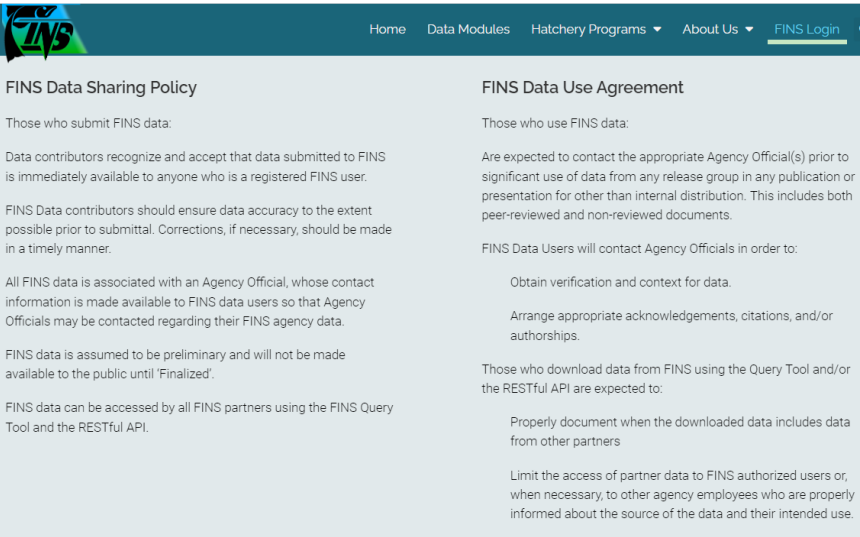
- What data to be shared
- Who participates in sharing (submit/access)
- How accessed and used (permissions, attribution)
- Restrictions or limitations on data use
- Responsibilities for data sharing
 - Adhering to data exchange standards
 - Data provider's ability to add, edit, delete their records
 - Quality of data shared (timeliness, completeness, and accuracy)
 - Process to opt-in and opt-out



Data Sharing Agreement Compliance

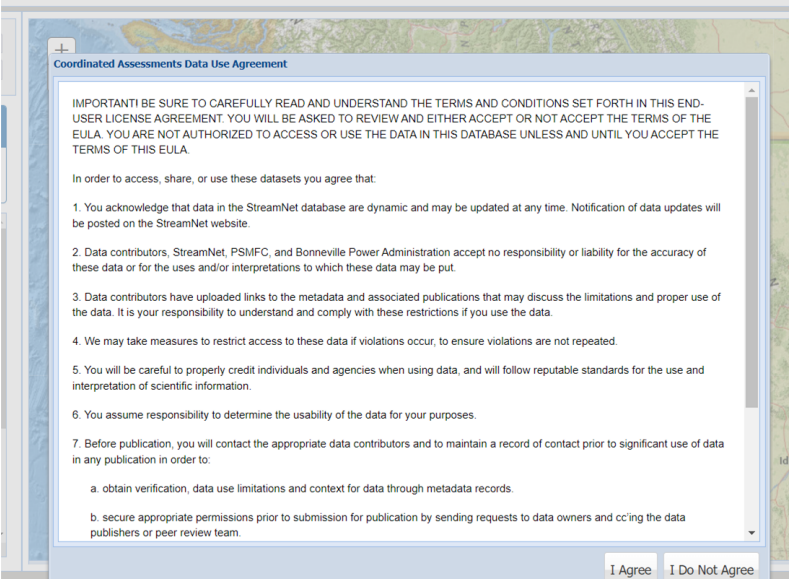
Participants accept data sharing agreement when sharing and using data

Agreement on website



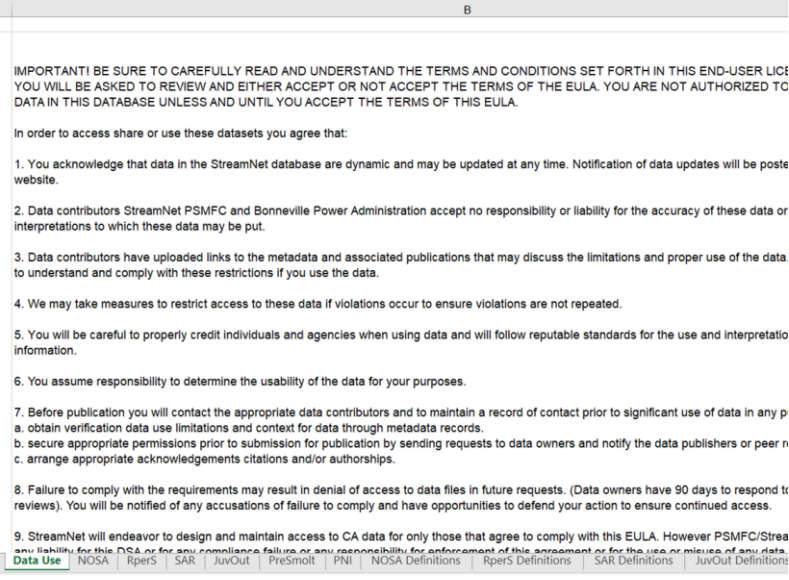
The screenshot shows the FINS website with a navigation bar containing 'Home', 'Data Modules', 'Hatchery Programs', 'About Us', and 'FINS Login'. Below the navigation bar, there are two columns of text. The left column is titled 'FINS Data Sharing Policy' and contains several paragraphs of text. The right column is titled 'FINS Data Use Agreement' and contains several paragraphs of text, including a list of expectations for users.

User clicks box to access data query



The screenshot shows a user interface with a map in the background. A modal window titled 'Coordinated Assessments Data Use Agreement' is open, displaying the same text as the 'FINS Data Use Agreement' section in the previous screenshot. At the bottom of the modal, there are two buttons: 'I Agree' and 'I Do Not Agree'.

Agreement included in Data File



The screenshot shows a data file interface with a table containing one row with the letter 'B'. Below the table, there is a section titled 'IMPORTANT! BE SURE TO CAREFULLY READ AND UNDERSTAND THE TERMS AND CONDITIONS SET FORTH IN THIS END-USER LICENSE AGREEMENT. YOU WILL BE ASKED TO REVIEW AND EITHER ACCEPT OR NOT ACCEPT THE TERMS OF THE EULA. YOU ARE NOT AUTHORIZED TO ACCESS OR USE THE DATA IN THIS DATABASE UNLESS AND UNTIL YOU ACCEPT THE TERMS OF THIS EULA.' This is followed by a list of nine numbered items detailing the terms of the agreement.

Adhered to by power of courtesy, professionalism, understanding, and acceptance by scientific and management community



Data Sharing Agreement Compliance

Built-in mechanics to facilitate adherence:

Data Submitters

Agreed to Data Exchange Standards

- Ensures correct data are shared

Authenticated Access for Data Sharing

- Approved submitters can upload data

Create-Read-Update-Delete permission

- Maintains ownership of submitted records

Data Users

Permission Restrictions

- Which records can be read by who

Communication with Data Provider

- Who to contact and how for each record

Proper Attribution

- Example or actual recommended data citation are provided to the user

And others ...



Draft KBFC Data Sharing Agreement

- Summary of process to-date
- Overview of current sections
 - Need
 - Purpose
 - Importance of Professional Courtesies
 - Openly Viewable and Need to Request-View Data

Initial draft version will be refined as we develop the data system and agree to what is shared and how accessed/used

Data Sharing Agreement

Need

The centralized Klamath basin PIT tag database maintained by USGS is a repository of PIT tag data applied to salmonids in the Klamath River basin outside of the Trinity River subbasin. Data in the database cover years beginning in 2006 to the present time. The data originate from monitoring and research activities being carried out by various entities in the basin, including Indian tribes, state agencies, federal agencies, university departments and graduate students, and independent watershed councils. All of these entities desire to access the database to obtain information in support of their research and watershed management activities, including those related to fish and fisheries management and habitat restoration.

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This statement is intended to help facilitate such cooperation, while recognizing that such cooperation needs to remain consistent with the separate policies and management procedures of each of the cooperating parties. An example of such policies is seen in the unique government to government relationships that the tribes have with both the federal government and state governments, as reflected in the current policy of the U.S. Fish and Wildlife Service toward Indian tribes

(https://pame.is/mema/MEMAdatabase/38o_FWSPolicy-revised-2016.pdf).

Importance of Professional Courtesies

Recognition of a potential desire by the data originator to publish: if an outside party is interested in using data from the PIT tag database to conduct an analysis leading to the publication of a report or journal manuscript, the originator will be invited to participate as a full collaborator and co-author on project development and write-up to the extent they desire. The data originator may decline to provide the requested data to the requesting party if they can document any inappropriate intended uses or interpretations of the data by the requestor, or provide any notes, emails, files, etc. demonstrating realized or intended applications by the originator that are similar to those proposed by the requestor.

Openly Viewable and Need to Request-View Data

Open Viewing:

View document

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Lunch

Leadership team lunch meeting

All back by 1pm



Bull Trout and Redband Trout PIT Telemetry in Upper Klamath Headwaters and the Benefits of Collaboration

Dave Hering

Supervisory Aquatic Ecologist,

Crater Lake National Park, National Park Service



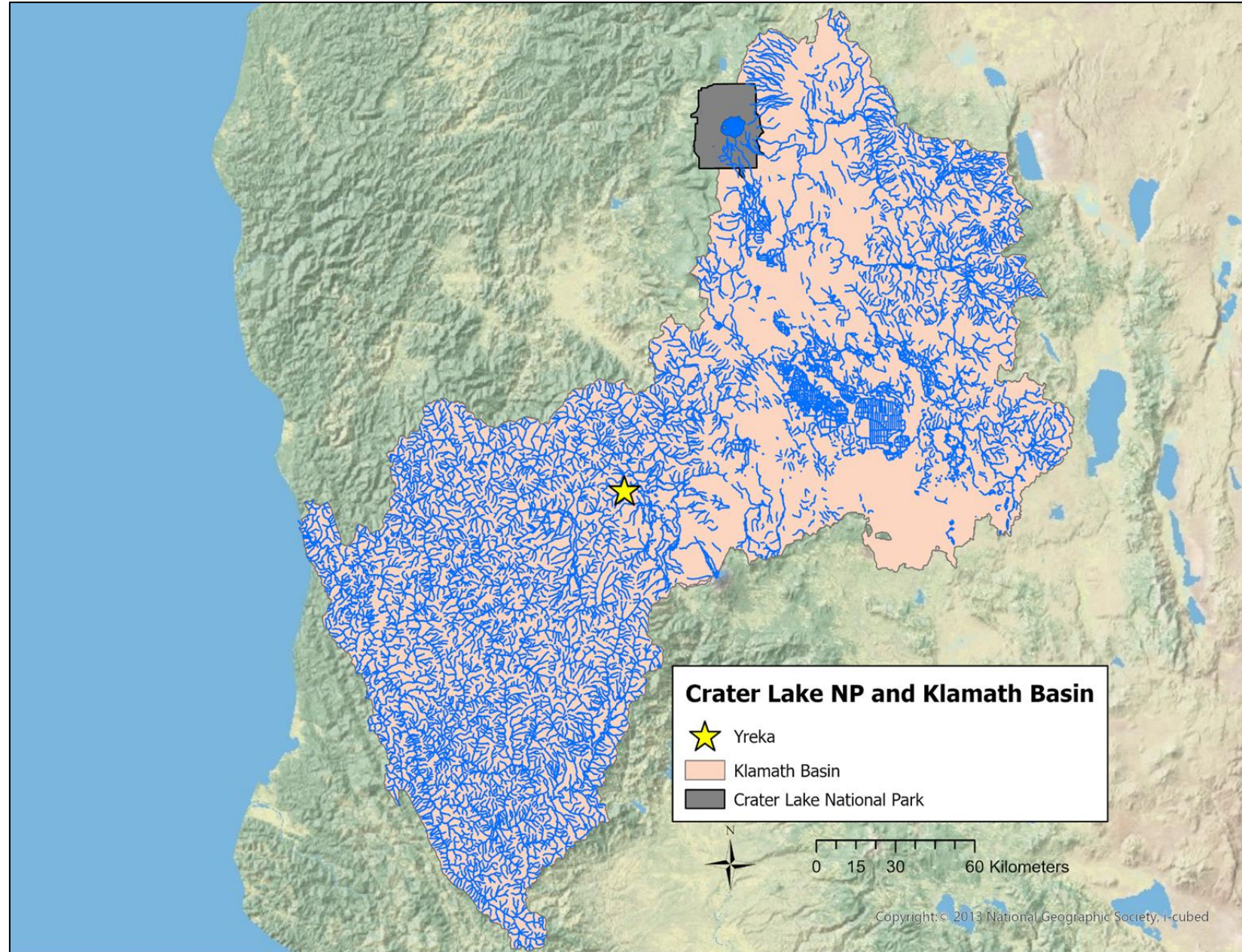
Bull Trout and Redband Trout PIT Telemetry in Upper Klamath Headwaters and the Benefits of Collaboration

Dave Hering, Crater Lake National Park, Crater Lake, Oregon



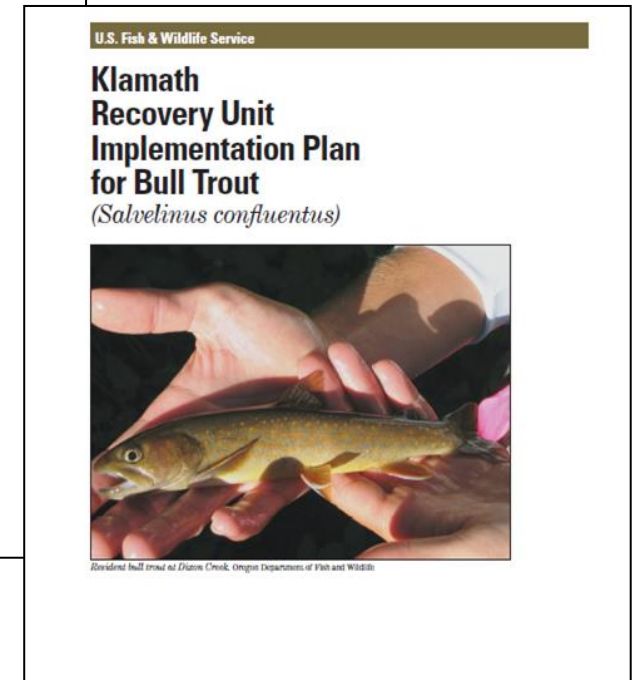
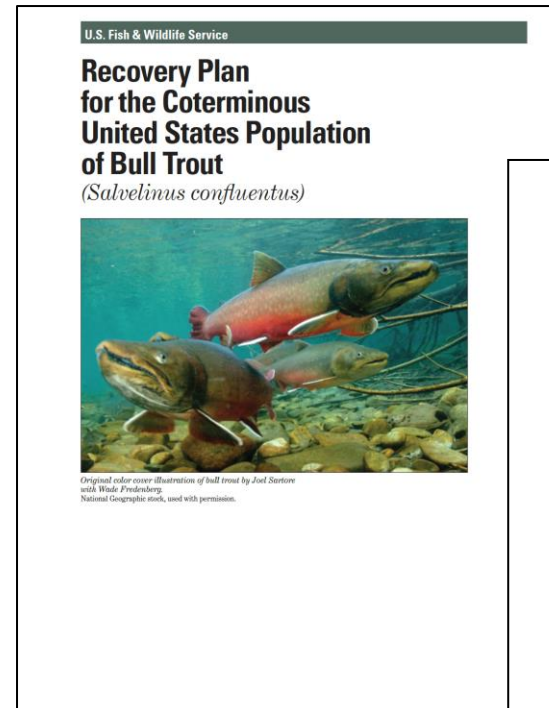
Is Crater Lake National Park in the Klamath Basin?

- Crater Lake National Park protects 741 km² (183,224 acres) of the southern Oregon Cascades.
- We are the nation's fifth national park, established in 1902.
- The NPS mission is to “*preserve unimpaired the natural and cultural resources ...for the enjoyment, education, and inspiration of this and future generations.*”
- Yes! The southern and eastern slopes of the park drain into the upper Klamath Basin.



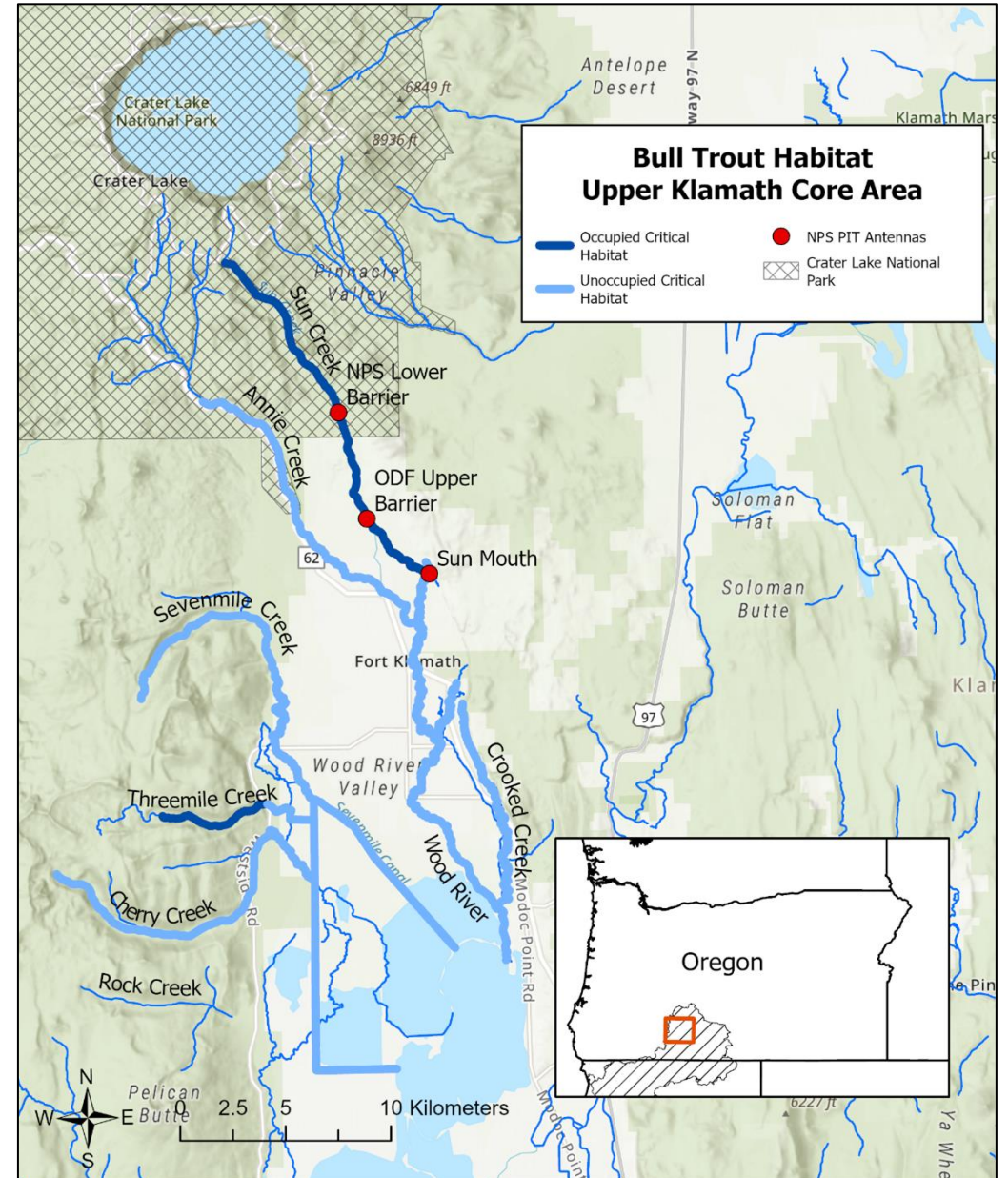
Crater Lake National Park Fisheries Program

- The Crater Lake National Park Fisheries Program has been working since the 1990s to conserve and recover Bull Trout (*Salvelinus confluentus*) in tributaries of the Wood River.
- Sun Creek contains the most robust population of Bull Trout in the Upper Klamath Lake Core Area.
- Annie Creek was also occupied historically by Bull Trout and will be the site of future reintroduction.
- Bull Trout Recovery Plan (USFWS 2015) calls for re-establishing Bull Trout in historically occupied habitats and promoting recovery of *migratory* life histories.



Sun Creek and Cross Boundary Connectivity

- NPS work began solely in the National Park but has expanded as Bull Trout distribution has grown downstream onto neighboring land management units.
- In 2017, we worked with multiple partners to restore natural connection of Sun Creek with Wood River, which had been diverted for irrigation.
- With increased connectivity, we expect to see increased fish movement into the surrounding stream network.
- We presently maintain three stationary stream-width PIT antennas in Sun Creek



Sun Creek and Cross Boundary Connectivity



PIT Tagging of Trout at Crater Lake

- We began using PIT tags about 15 years ago to individually mark Bull Trout and investigate in-stream movement, growth, and survival.
- In 2018, we started marking Redband Trout to evaluate efficacy of lower Sun Creek restoration project.
- All Bull Trout tagged with half-duplex (HDX) tags. Redband Trout with full duplex (FDX) tags because we anticipated they would move to Upper Klamath Lake.

PIT tags deployed in trout at NPS-CRLA, 2008-present.

Year	Bull Trout	Redband Trout
2008	27	--
2009	200	--
2010	50	--
2011	?	--
2012	32	--
2013	5	--
2014	176	--
2015	59	--
2016	33	--
2017	22	--
2018	6	27
2019	183	13
2020	10	96
2021	~135	83
2022	146	114
TOTAL	~1084	333

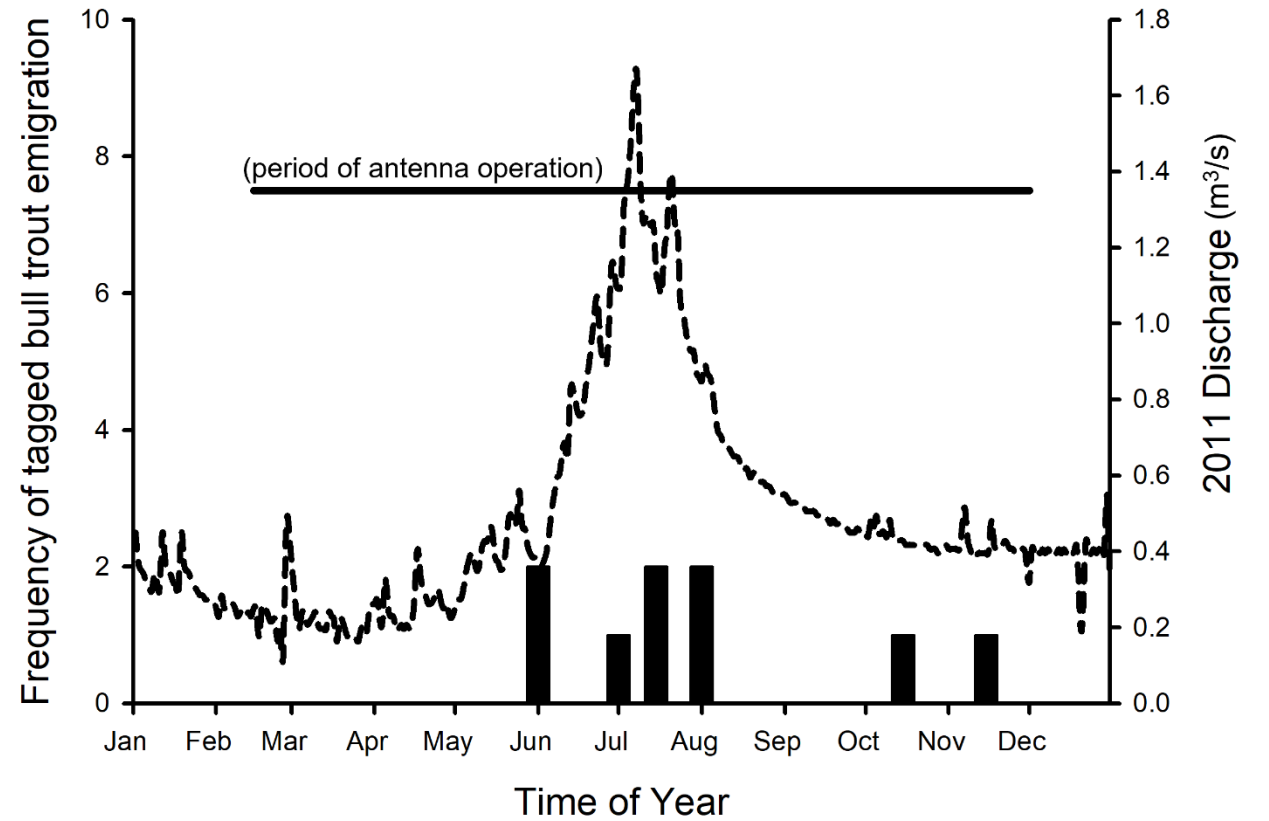


Stationary PIT Antennas

NPS Lower Barrier



ODF Upper Barrier



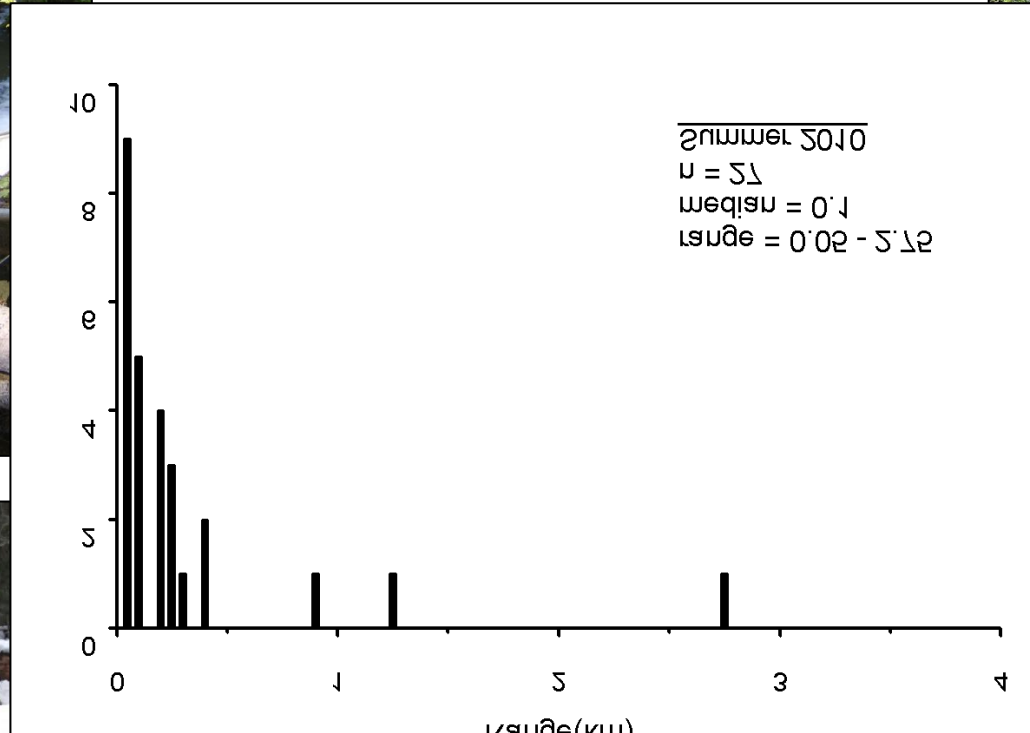
Frequency and date of downstream emigration detected by PIT antenna (black bars). Period of PIT antenna operation (solid line) and typical Sun Creek hydrograph (dashed line).

Stationary PIT Antennas

Sun Mouth



Mobile PIT Antennas



Summertime home range of 27 bull trout detected three or more time during 2010.

Other PIT-tag Projects

Jenny Creek Sucker Project (2013-2014)

- Collaboration with Medford BLM
- Tagged 844 dwarf Klamath smallscale suckers (*Catostomus rimiculus*) in Jenny Creek (Klamath River tributary) upstream of impassable falls.
- Mark-recapture measurements of fish growth.
- Stationary antennas deployed for short time in suspected spawning streams

Oregon Spotted Frog Project

- Collaboration with USGS
- ESA-listed frog species PIT tagged in agriculturally-modified habitats in Wood River Valley
- Stationary antennas installed to monitor movement over fine scale (<1 km)
- Monthly surveys with mobile PIT tag antennas



Example of Trout Migration From Sun Creek

An individual Redband Trout tagged in Sun Creek and later detected by remote PIT antenna in Upper Klamath Lake.

Date	PIT Tag	Species	Length (mm)	Weight (g)	Gear	Location	Agency
10/1/2020	003BF33222	Redband Trout	95	9.7	Electrofisher	Lower Sun Creek	ODFW
4/19/2021	003BF33222	Redband Trout	--	--	Remote Antenna	Sun Mouth Antenna 1	NPS
4/19/2021	003BF33222	Redband Trout	--	--	Remote Antenna	Sun Mouth Antenna 2	NPS
7/13/2021	003BF33222	Redband Trout	--	--	Remote Antenna	Pelican Bay Submersible 03	USGS



Benefits and Challenges of a Data Sharing Collaborative

Benefits

- Standardized data management format; gaining from expertise of sister agencies.
- Robust database will allow analyses we have not yet been able to complete.
- Collaboration with other agencies and a broader network of detection sites will help identify of migratory behavioral patterns between headwater streams and downstream rearing habitats – an indicator of recovery for Bull Trout.
- May lead to discovery of new information relevant to managing native fish species, e.g., avian predation.

Potential Challenges

- Incompatible technologies, HDX vs FDX tags.
- Inadequate staffing at NPS to manage and update data.



Thank You!



Contact:

Dave Hering, Aquatic Ecologist, Crater Lake National Park

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Next up: Demos, Field Trip, and Evening Dinner

Field Trip

- Group 1 will visit arrays first
- Group 2 will visit hatchery first

- Each site visit will last 45 minutes plus travel to next site

- Car pool!
 - Van
 - Suburban
 - Additional private vehicles as needed

Evening Dinner

- Jefferson Roadhouse
1281 S Main St, Yreka
- 6:00 PM
- Bring cash to pay for your meal

Demos

- *Next slide*



Demonstration of an electronic data entry platform for juvenile salmonid trapping in the Klamath Basin

Tyler “Ty” Wallin
Fish Biologist, USFWS

Using Survey 123 data entry forms to streamline data collection and exchange with the KBFC database

Rachael Paul-Wilson
Biological Science Technician, USGS
and
Erin Benham
Data Management Specialist, Pacific States Marine Fisheries Commission

Depart for Field Trip after Demonstrations



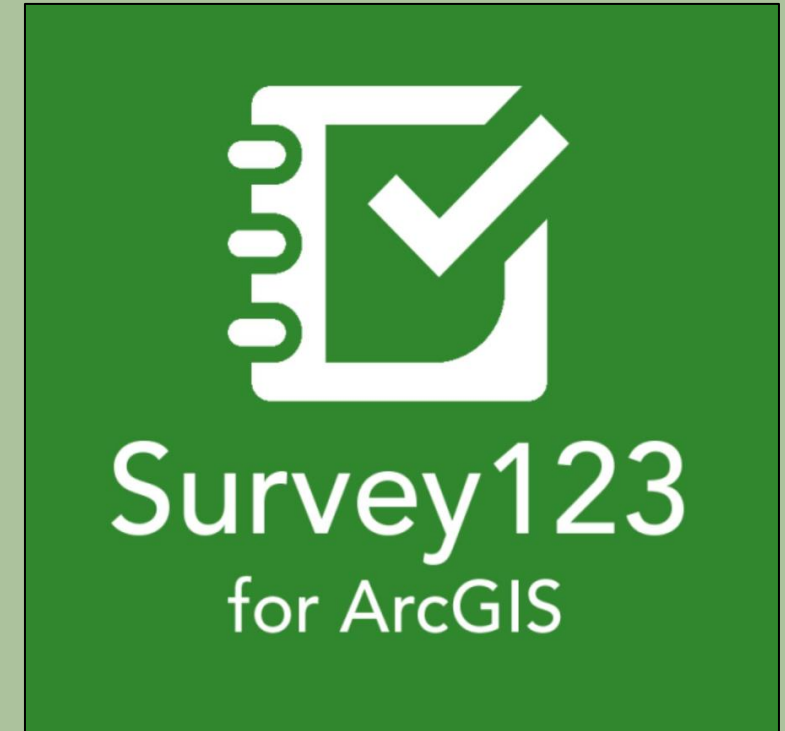
Using Survey 123 data entry forms to streamline data collection and exchange with the KBFC database

RACHAEL PAUL-WILSON AND ERIN BENHAM

U.S. GEOLOGICAL SURVEY | PACIFIC STATES MARINE FISHERIES COMMISSION

What is Survey123?

- Create, share, and analyze digital surveys and forms for data collection
- Customizable for data collection needs
 - Tagging Data
 - Equipment Installations/Removals
 - Monitoring Equipment Checks
 - Habitat Surveys

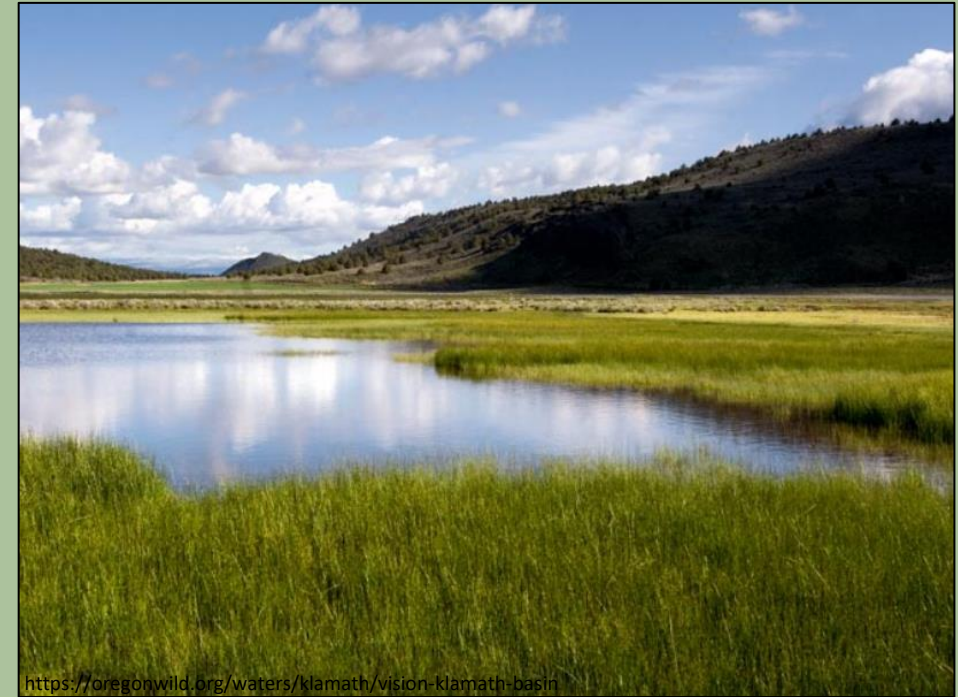


Disadvantages

- Requires an ESRI license
- Limited amount of data can be stored in the ESRI cloud
- Additional software required for PIT tag auto-integration
- Survey run time is dependent on the quantity of data input

Benefits

- Capture data anytime and anywhere
 - Capture live photos and videos
 - Connected and disconnected environments
- Streamline data collection process and minimize human error
- Collaboration options
 - Multiple users can use a survey and view data
- Functions on laptops, desktops, and smart devices



Capabilities

- Captures many types of data: Photos, GPS locations, QR codes, etc.
- Data automatically uploaded and stored online
- Update surveys in real-time
- Exportation of data into a CSV/Excel format



<https://ca.ignougaal.com/species/83/most-river-sucker>

Easy excel format to create surveys

type	name	label	hint
begin group	ProcessFish	<center>Process Fish: \${SiteLocation}</center>	
select_one Crew or_other	Tagger	Tagger:	
select_one Crew or_other	DateRecorder	Data Recorder:	
integer	LivewellTemp	Livewell Temperature:	
end group			
begin repeat	Fish_Indiv	<center>Process Fish Individuals: \${SiteLocation}</center>	
begin group	FishIndivGroup	Fish Individual	
dateTime	Fish_Indiv_DatTim	Sample Time:	
select_one Species	Species	Species:	
select_one Sex	Sex	Sex:	
integer	StandardLength	Standard Length (SL):	
integer	ForkLength	Fork Length (FL):	
text	PIT	 PIT Tag Code 	
select_one yes_no	Recapture	Recapture:	
integer	Lernea	Lernea:	
integer	LampreyOld	Lamprey (Old Scar):	
integer	LampreyNew	Lamprey (New Wound):	
select_one Mortality	MortalityType	Mortality Type:	
image	SuckerPicture	Image:	If you are unsure about your species ID please take a picture
text	Comments	Comments:	
end group			



USGS Sucker Survey

Process Fish Individuals:

Fish Individual

Species: *

Klamath Largescale Sucker
 Shortnose Sucker
 Lost River Sucker
 Unidentified Sucker
 Redband Trout

Sex: *

Male
 Female
 Unidentified

Standard Length (SL): *

Fork Length (FL): *

PIT Tag Code

Recapture: *

Yes
 No

Lernea:

Mortality Type:

Image:

If you are unsure about your species ID please take a picture

Comments:

Inventory Samples:

Vial ID:

Fin Ray (R)
 Fin Ray (L)
 Fin Clip (Caudal)



Data can be viewed and edited on ESRI Survey123

MUX-MC-ASR_SiteChecks_KFFS_2023

Overview Design Collaborate Analyze **Data** Settings

1/19/23 - 5/23/23 Filter Report Export Open in Map Viewer Form view 337/337

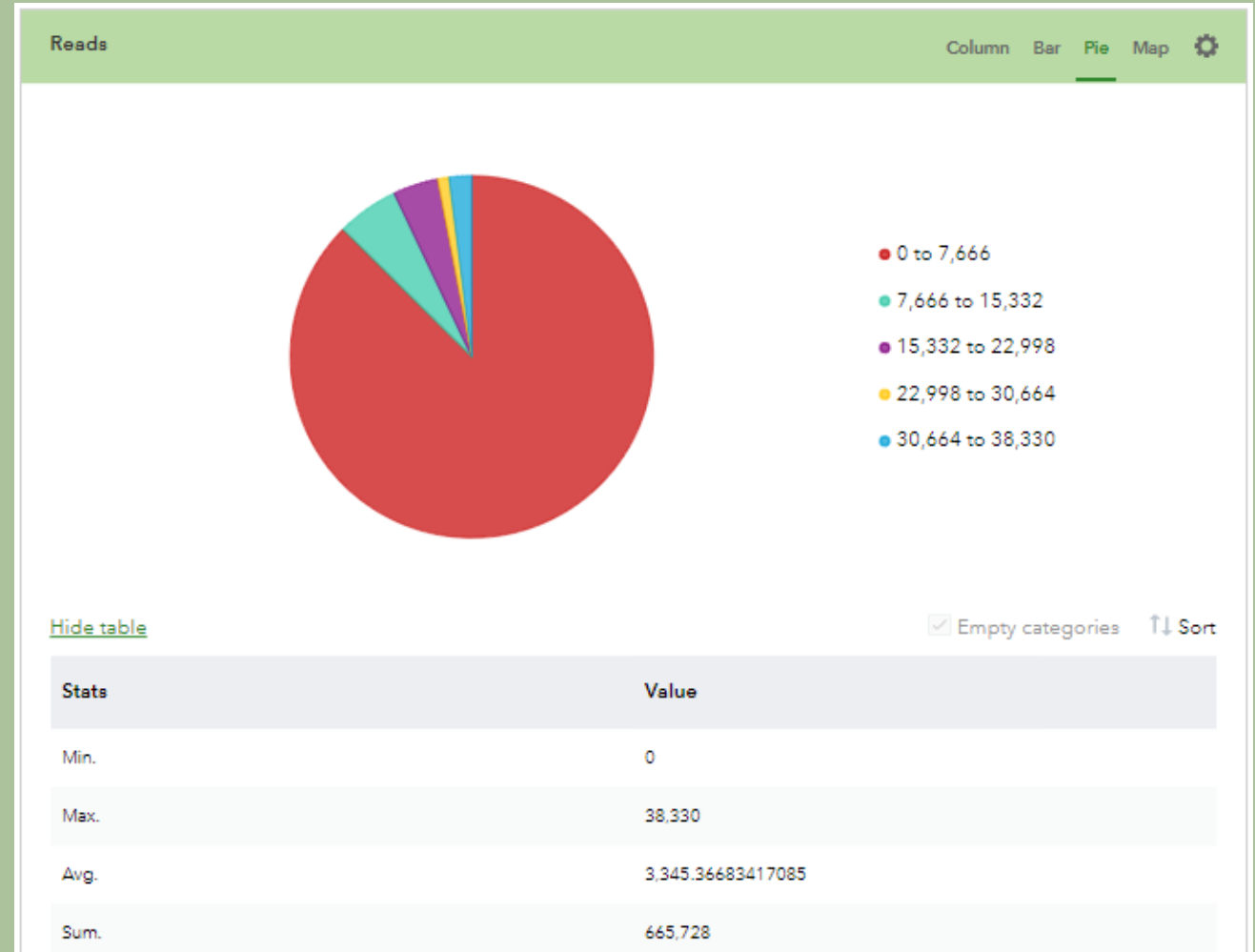
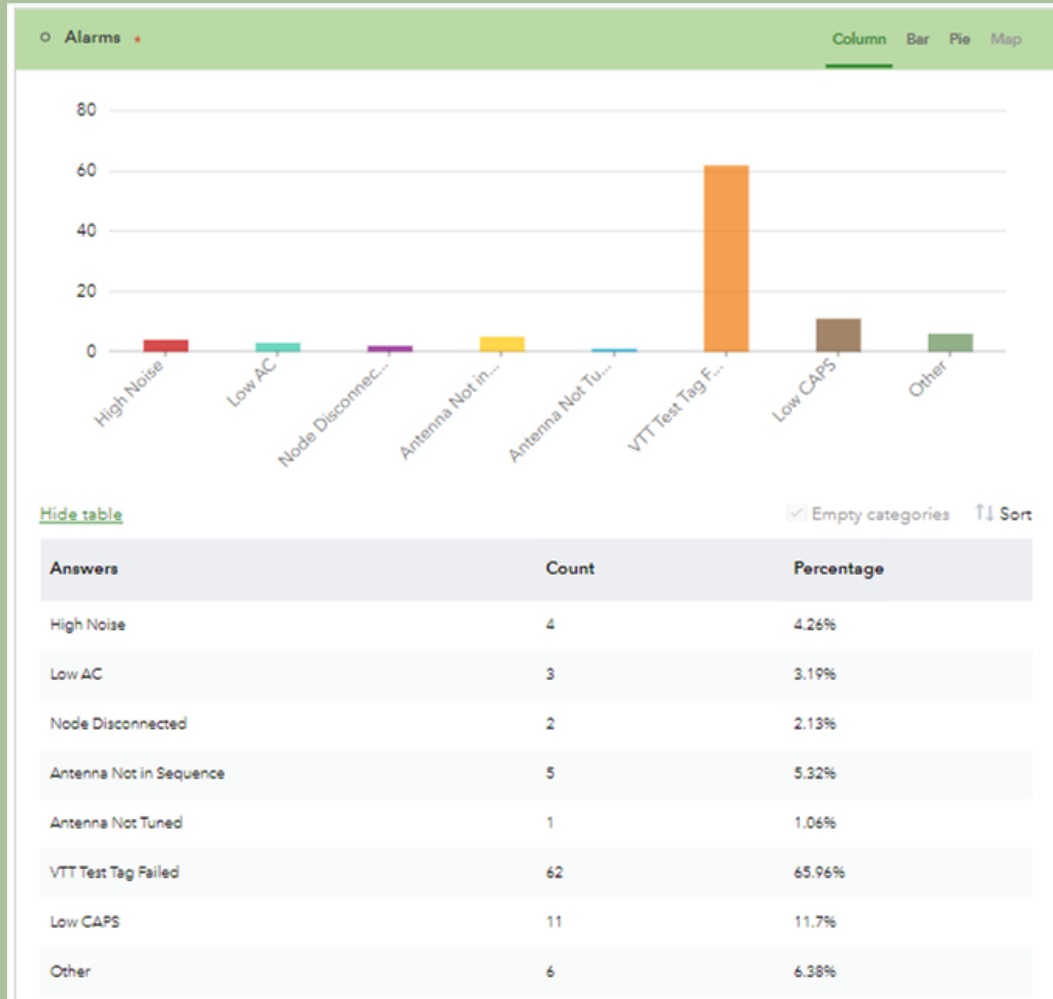
MUX-MC-ASR_SiteChecks... x Alarms x

Site	Date	Crew Initials	Specify other.	CrewSurvey	Alarms	Were Batteries Checked?	Battery Checked With?	Batteries Swapped?	Battery Bank Voltage	Batteries Swapped?	New Battery Bank Voltage	Right Battery Bank	Left Batte
Sucker Spring (Cheeseblock)	May 15, 2023, 9:04 AM	JacobL		jlaurain_USGS	No	Yes	Sun on Panels		28	No			
Silver Building Spring (Cheeseblock)	May 15, 2023, 8:53 AM	JacobL		jlaurain_USGS	No	Yes	No Sun on Panels		25.4	No			
Cinder Spring (Cheeseblock)	May 15, 2023, 8:22 AM	JacobL		jlaurain_USGS	No	Yes	No Sun on Panels		25.9	No			
LinkRiverLadder	May 12, 2023, 10:53 AM	NickP		npretto_USGS	No	Yes	NoSolar				24.7	26.4	

USGS Site Checks Survey Results for monitoring equipment.



Data can be visualized and analyzed on ESRI Survey123



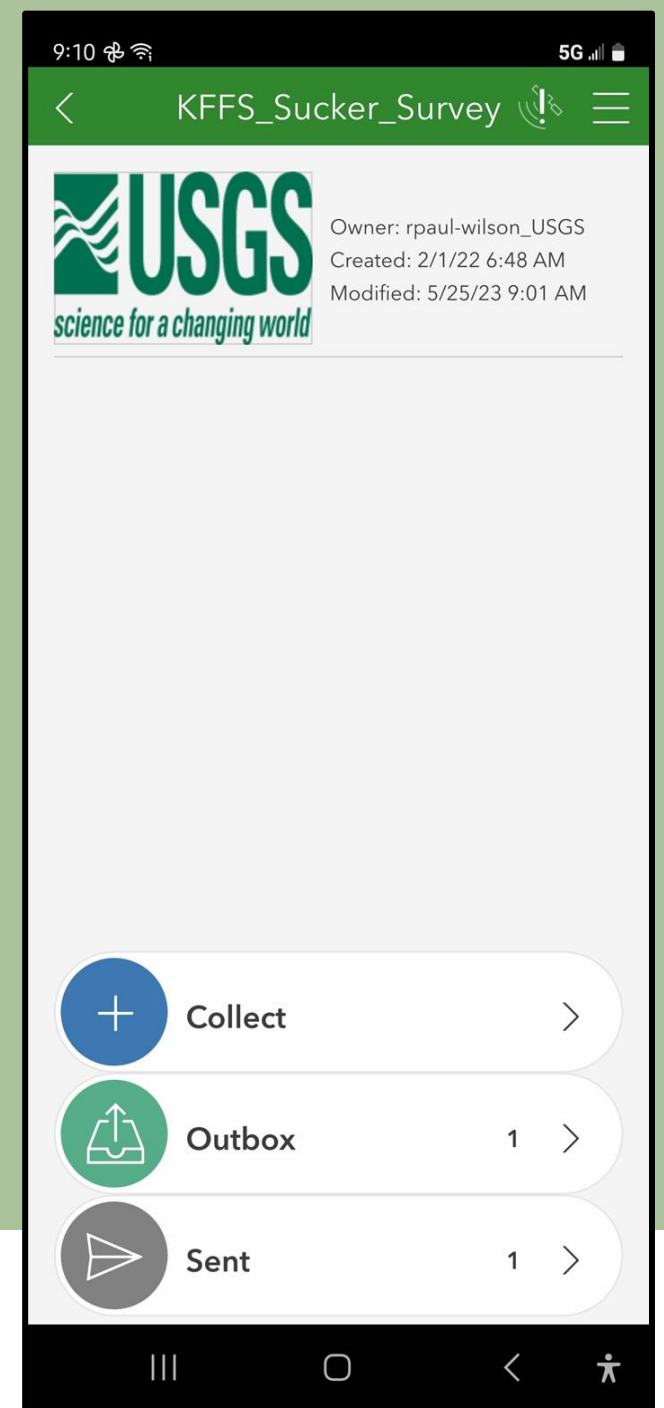
Survey Form

Sucker Survey that fits general data standards and agency goals

- Site Data- preset options based on project type
- Geolocation possibilities
- Tagging data
- Tissue sample collection

<https://arcg.is/19vDST0>

[ArcGIS Survey123](#)



Questions?