

Indigenous Sentinels Network

Community-Driven Fisheries Monitoring and
Digitizing Surveys for YRDFA's In-Season Community
Surveyor Program



Yukon River Preseason Meeting
May 2-3, 2024
Anchorage, Alaska
Hotel Captain Cook



Hannah-Marie Garcia,
Bruce Robson,
Amanda Pope
May 2024



**Hannah-Marie
Garcia**
ISN Program Director



Amanda Pope
ISN Interior and
Northwest Boral
Regional Coordinator



**Maya Reda-
Williams**
ISN Social
Scientist and
Southeast Regional
Coordinator



Bruce Robson
ISN Technical Director



**Ecosystem Conservation
Office (ECO)**
ISN Sentinels and Staff
Collaborators

CORE ISN TEAM



Presentation Outline

1. Background on the Indigenous Sentinels Network
2. Overview of Collaboration Project - Digitizing Surveys for YRDFA's In-Season Community Surveyor Program
3. Examples of Outcomes from Other Marine and Fisheries Monitoring Programs:
 - a. Co-Management on St. Paul
 - b. Fish Map App
 - c. Skipper Science
4. Looking Ahead at YRDFA's 2024 In-Season Community Surveyor Program



Terms we use in our work with Indigenous Sentinels Network (ISN)

Community-Driven Monitoring: Community-driven monitoring is a form of local observation and information gathering driven by local information needs and community values. It aims to increase accountability by involving the community in the collection and analysis of data relevant to their well-being and interests.

Indigenous-Led Stewardship: Indigenous-led stewardship refers to “conservation” efforts led by Indigenous communities. It involves relationships built on generosity, collaboration, and reciprocity, centering on the sustainable management of natural resources and traditional lands.

Guardians Networks: Canadian origin. Guardians Networks are initiatives that empower First Nations for autonomous management of their traditional land and water. These networks, like the First Nations Guardians Network, provide support and autonomy for Indigenous communities in environmental stewardship.

Sentinel Programs: Sentinel Programs are designed for environmental monitoring networks. They play a crucial role in improving research, filling data gaps, and supporting climate change adaptation by providing real-time data, early warnings, and a comprehensive understanding of ecological changes.

Background on the Indigenous Sentinels Network

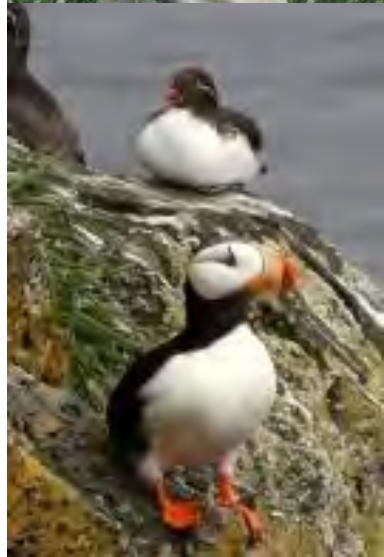
Empowering Indigenous-led and
Community-driven
environmental monitoring.





Mission Statement:

Our mission is to support the collection of Indigenous, local, and traditional knowledge (ILTK) and scientific information to empower holistic, ecosystem- and community-centered natural resource management and decision-making at multiple levels.



Background on the Indigenous Sentinels Network:

- ISN was established by the Aleut Community of St. Paul Island's (ACSPI) Tribal Government 20+ years ago
- The Network's platform supports the **collection of Indigenous, local, and traditional knowledge (ILTK) and scientific information** to empower holistic, ecosystem- and community-centered natural resource management and decision-making at multiple levels.
- ISN was established by and for Indigenous peoples
- ISN aims to address the urgent need to increase seasonal breadth and spatial resolution of monitoring efforts to track environmental changes across the Arctic and other ecosystems.



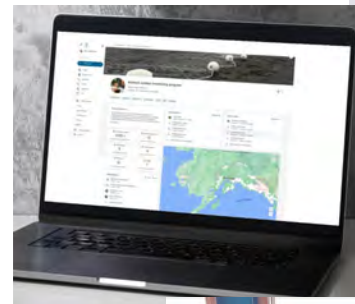
ISN Empowers Community-Driven and Indigenous-Led Environmental Monitoring

Software: *to design and implement community-driven environmental monitoring programs*

- Online privacy-protected database
- Mobile applications for offline data collection
- External technical support as needed (protocols, ID's, etc.); Data reliability (quality control); Data ownership

Programmatic Support and Consulting: *to ensure sustainable solutions*

- Grant Writing and Collaboration
- Partnership Development
- Science Communication and Storytelling Support
- Training, Education, and Outreach



Use Case Examples

WHAT TYPES OF DATA COLLECTION ARE POSSIBLE?

- **Species distribution, abundance, behaviour & condition**
- **Subsistence harvest & biosampling**
- **Entanglements; strandings**
- **Anomalous sightings, Early arrivals, late departures**
- **Audio, video and text recording of ILTK**
- **Water temperature, salinity and quality**
- **Coastal erosion and shoreline change (Stakes for Stakeholders)**
- **Environmental threats (e.g. Oil spills & contamination)**
- **Sea ice extent & condition**
- **Storm surges/ Weather**
- **Fisheries observations**





HARBOR SEAL HARVEST NOTES

Sample Name: CRIC_H5_012

Date collected: 12-29-22
Harvest time: 12:41
GPS: 60 37 41 146 11 63
Duration of Chase: 1hr
Number of shots fired: 1
Beaufort Sea Level: 1 2 3 4 5 6

Sex: Male (Female)
Pregnant? (Yes) / No
Lactating? Yes / No

Age (Adult) Juvenile
Length (cm): 151
Curved length (cm): 146
Axillary girth (cm): 106
Time of sampling: 1:30
Time put in freezer: 5:30

General Notes: wave high + 1ft
Seal

Sample Name: CRIC_H5_011

Date collected: 12-29-22
Harvest time: 12:41
GPS: 60 37 41 146 11 63
Duration of Chase: 1hr
Number of shots fired: 2
Beaufort Sea Level: 1 2 3 4 5 6

Sex: Male (Female)
Pregnant? (Yes) / No
Lactating? Yes / No

Age (Adult) Juvenile
Length (cm): 140
Curved length (cm): 141
Axillary girth (cm): 97
Time of sampling: 1:30
Time put in freezer: 5:20

General Notes: wave high + 1ft
Seal



Observations

ALL IN REVIEW COMPLETED ARCHIVED

1 000 items · Last saved 10:00



Community name · Filter name · Observer · Date entry

<input type="checkbox"/>	Observation Code	Observer	Status	Program Name	Community Name	Observation Date	...
<input type="checkbox"/>	THSD-1	Rubel Higgins	In Review	Aleak's salmon monitoring program	Green Gait community	14 Mar 2023	...
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community	14 Mar 2023	...
<input type="checkbox"/>	THSD-1	Linda Lake	In Review	Aleak's salmon monitoring program	Green Gait community	14 Mar 2023	...
<input type="checkbox"/>	THSD-1	Linda Lake	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Will Moon	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Linda Lake	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community		
<input type="checkbox"/>	THSD-1	Aaron Landerolf	In Review	Aleak's salmon monitoring program	Green Gait community		



ISN Platform Modules Available to All Network Collaborators

Parts or independent pieces of ISN's software that can be used to construct a community's monitoring program.

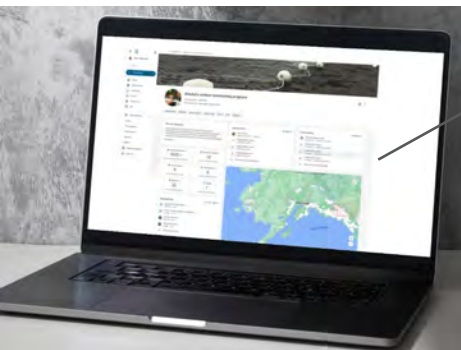
Dynamic Forms 	 Reports
Protocols / Training Support 	 Programs
Communities 	 a \$ t t 4 > Å >
Geospatial 	 Data access policy
Quality assurance 	 Polls & surveys

**Note: Not an exhaustive list, and this is a summary for this presentation. For full list, please email isn@aleut.com*



Program Profile

Purpose: For each program, there will be a profile from which users can gather insight on the activity in this program, the related users, the organizing organizations and the related forms. As such, the programs module provides functionality to structure the growing amount of forms, users and observations into manageable work items.

A screenshot of a web application interface for a program profile. The page is titled "Alaska's salmon monitoring program" and features a navigation sidebar on the left, a header with a search bar and "Create new" button, and a main content area with various data cards and a map.

Alaska's salmon monitoring program
Program budget: \$50 000
Timeframe: 14 Mar 2023 - 14 Dec 2025

Observations | Members | Organizations | Communities | Forms | DAP | Protocols

Mission statement
Mission statement or description, Managers, biologists and oceanographers need information to understand the marine habitat and distribution of salmon and other fish. Meanwhile, Southeast Alaska's approximately 1,500 salmon trollers are on the water through...
[See more](#)

Total Observations: 1020 (20% more than previous 30 days)
Species Observed: 12 (About the same as usual)

Communities: 9 (About the same as usual)
Organizations: 6 (About the same as usual)

Members: 10 (About the same as usual)
Forms: 7 (About the same as usual)

Attached files
Species list description (345 KB - word)
How to measure water parameters (4.3 MB - word)
instruction-help (806 MB - video)
instruction-help (1.2 MB - png)
[Show more 3 files](#)

Organizations (Manage all)
Green Gaia (Joined 27 Aug 2023 - leading)
Organization name (Joined 27 Aug 2023)
Organization name (Joined 27 Aug 2023)
Organization name (Joined 27 Aug 2023)
[Show more 2 organizations](#)

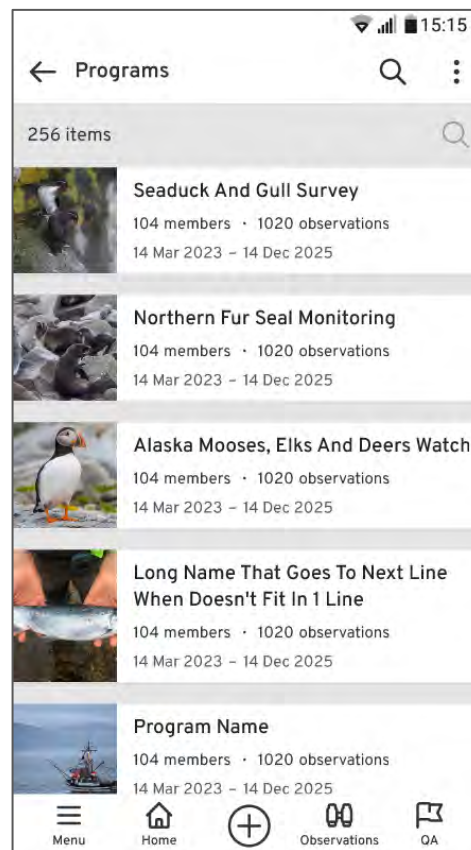
Communities (Manage all)
Sea Gaia community (8 members - Joined 27 Aug 2023)
Community name (8 members - Joined 27 Aug 2023)
Community name (8 members - Joined 27 Aug 2023)
Community name (8 members - Joined 27 Aug 2023)
[Show more 5 communities](#)

Map: A map of Alaska with Fairbanks and Anchorage marked. A red dashed circle highlights a region in the southeast, and a blue dashed circle highlights a region in the north. The Gulf of Alaska is labeled.

Navigation Sidebar
Home
Observations
Programs
Forms
Reporting
QA
Admin settings
Users
Organizations
Communities
Species
Objects
Help and support
Sign out



Programs



Overview of Collaboration Project - Digitizing Surveys for YRDFA's In- Season Community Surveyor Program

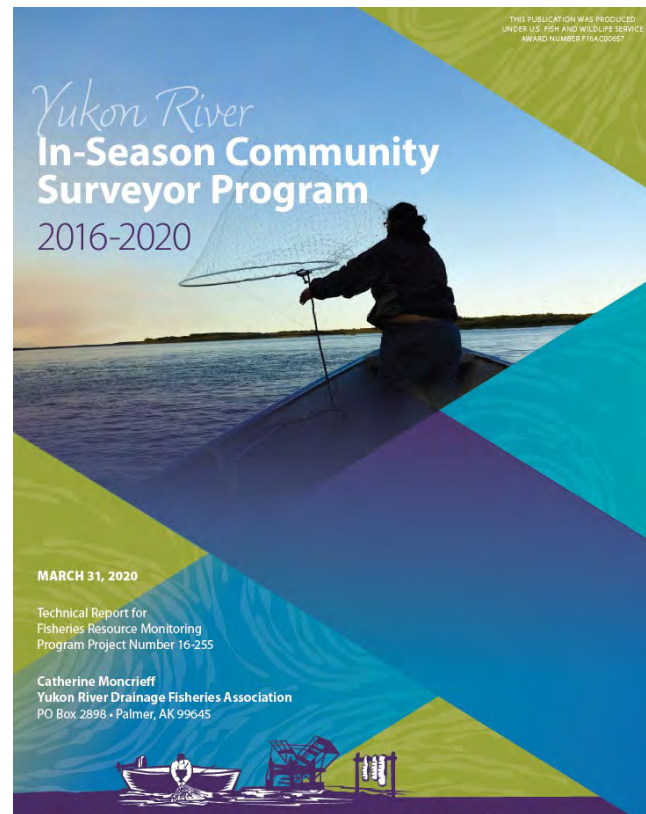


YRDFA and ISN Project Background

Collaboration: Aimed at enhancing environmental fisheries data collection in the Yukon River region, aiming to revolutionize how communities collect, own, and share data

Introduction of Innovative Tool: The collaboration introduces ISN's software to facilitate real-time collaboration between community members and YRDFA staff

Building off of Existing Fisheries Survey Program: YRDFA's fisheries survey program, initiated in 2004, will leverage ISN's tools to enhance efficiency and impact, incorporating audio, photo, and file upload capabilities. Plus expanding access to community members in addition to full-time surveyors.





Timeline and Milestones

February 2023: Initial Ideas Shared

March - April 2023: Scoping of Project Needs

August 2023 - January 2024: Research Methods, Design Requirements, and Data Protocols

February 2024: Finalizing Design Requirements

March 2024: In-Person “*Testing*”/Training and Feedback

April 2024: Secured Funding

May - July 2024: Final App Development, Onboarding/Training, Outreach, and Data Collection





Pilot Project in Multilevel Methodologies

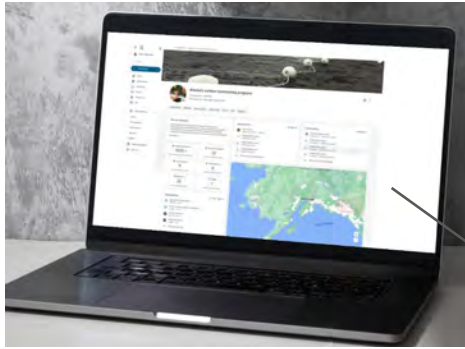
**App Based
Data Collection**

**Indigenous-led
Research and
Elevating Local
Expertise**

**Community
Driven**

**Quantitative and
Qualitative
Research**





Draft Final Designs of YRDFA's Database and Data Collection Tools



Yukon River In-season Community Surveyor Program 2024

Timeframe: 08 Mar 2024 - 30 Sep 2024
Code: YRDFA

Observations Members Organizations Communities Forms Protocols Files Data Access Policy Management Polls & Surveys Contact Info

Mission Statement
Salmon are a critical resource for subsistence and commercial users in the Yukon River region and fisheries managers must have a means to gather input, assess harvests, and share information with Yukon River fishermen and fisheries stakeholders throughout the fishing season. The Yukon River
[See More](#)

Total Observations 84	Species Observed 0
Communities 8	Organizations 1

1 Organizations [Manage All](#)

- Yukon River Drainage Fisheries Association
Joined 14 Feb 2024 [Leading](#)

8 Communities [Manage All](#)

- Alakanuk
11 members • Joined 14 Feb 2024
- Arvik
2 members • Joined 17 Mar 2024
- Russian Mission
2 members • Joined 17 Mar 2024
- Ruby
2 members • Joined 17 Mar 2024
- Mountain Village
2 members • Joined 17 Mar 2024



Draft Final Designs of YRDFA's Database and Data Collection Tools

WEEKLY SURVEY FORM Yukon River Drainage Fisheries Association Yukon River In-Season Subsistence Salmon Survey 2022

DATE	VILLAGE						
Household Name	Did you fish this week? (If no, enter code below)	How many days did you fish this week? (fishing schedule?)	Compared to LAST WEEK, how was fishing for this week? Why? (weather, run strength, fishing schedule?)	How many fish and what type did you harvest this past week? Did you keep or release king? How many?	What gear type did you use this week? What species were you targeting?	What is done with fishing are you?	What general comments do you have about management this week?
	Chum worse same better			What size gillnets?	net net net	1/4 done done done 1/2 done done done all done done done	
	Kings worse same better		1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100		net net net	1/4 done done done 1/2 done done done all done done done	
Comments:							
	Chum worse same better			What size gillnets?	net net net	1/4 done done done 1/2 done done done all done done done	
	Kings worse same better		1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100		net net net	1/4 done done done 1/2 done done done all done done done	
Comments:							
	Chum worse same better			What size gillnets?	net net net	1/4 done done done 1/2 done done done all done done done	
	Kings worse same better		1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100		net net net	1/4 done done done 1/2 done done done all done done done	
Comments:							
	Chum worse same better			What size gillnets?	net net net	1/4 done done done 1/2 done done done all done done done	
	Kings worse same better		1/2/3/4/5/6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/21/22/23/24/25/26/27/28/29/30/31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50/51/52/53/54/55/56/57/58/59/60/61/62/63/64/65/66/67/68/69/70/71/72/73/74/75/76/77/78/79/80/81/82/83/84/85/86/87/88/89/90/91/92/93/94/95/96/97/98/99/100		net net net	1/4 done done done 1/2 done done done all done done done	
Comments:							

Did Not Fish Codes: (1) Bad Weather/ poor fishing conditions. (2) Low # of fish. (3) Closure. (4) Personal Reasons. (5) Mechanical/ Gear Issues. (6) Have not begun fishing. (7) Out of town. (8) Other.





Protocols



← Protocols ⋮

Alaska's salmon monitoring program

Last viewed ▾ 🔍

Protocol	Form Name
Protocol name 27 Aug 2023	Form name ⋮
Protocol name long name 27 Aug 2023	Form name with premade sections ⋮
Protocol name 27 Aug 2023	Form name ⋮
Protocol name 27 Aug 2023	Form name ⋮
Protocol name 27 Aug 2023	Form name ⋮
Protocol name 27 Aug 2023	Form name ⋮
Protocol name 27 Aug 2023	Form name ⋮

15:15

Fishermen collect samples year-round at set stations near the fishing grounds and along frequently used transit routes to provide a robust time series of environmental conditions.

Show less ^

8 Attached files 📄

- Species list description.pdf
345 KB · uploaded 24 Aug 2023 ⋮
- How to measure water paramete...
4,3 MB · uploaded 24 Aug 2023 ⋮
- How to measure wind parameter...
4,3 MB · uploaded 24 Aug 2023 ⋮
- How to measure fish parameters...
806 MB · uploaded 24 Aug 2023 ⋮
- How to measure fish parameters...
1,2 MB · uploaded 24 Aug 2023 ⋮
- Attached file name.doc
345 KB · uploaded 24 Aug 2023 ⋮
- Attached file name.doc
345 KB · uploaded 24 Aug 2023 ⋮
- Attached file name.doc
345 KB · uploaded 24 Aug 2023 ⋮



Looking Ahead to Summer 2024

- App release to YRDFA surveyors soon
- May - July data collection and teleconferences
- Community outreach events
- Training and feedback on application design
- 2025 Season shift (or sooner) to citizen science in addition to trained surveyors

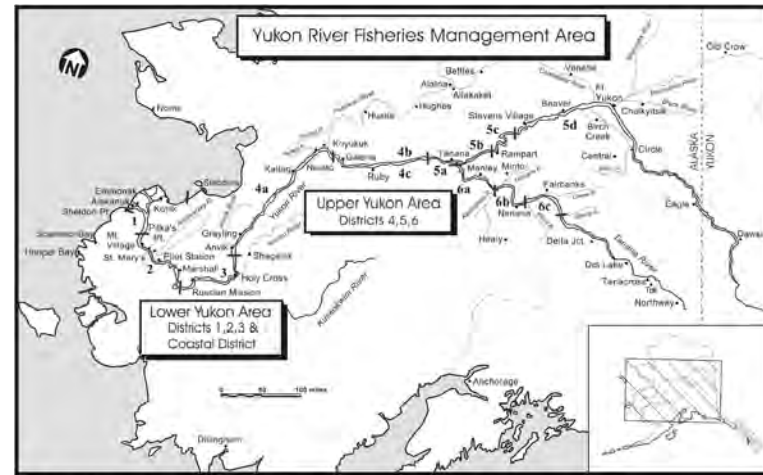


Figure 1. Alaska Department of Fish and Game fishing district map. Source: Alaska Department of Fish and Game.



Surveyor	Village / Location
Max Ayagar	Alakanuk
Alberta Walker	Anvik
Basil Larsen	Russian Mission
Karalisa Tremblay	Fort Yukon
Rachael Kangas	Ruby
Ruby Becker	Eagle

Examples of Outcomes from Other Marine and Fisheries Monitoring ISN Programs



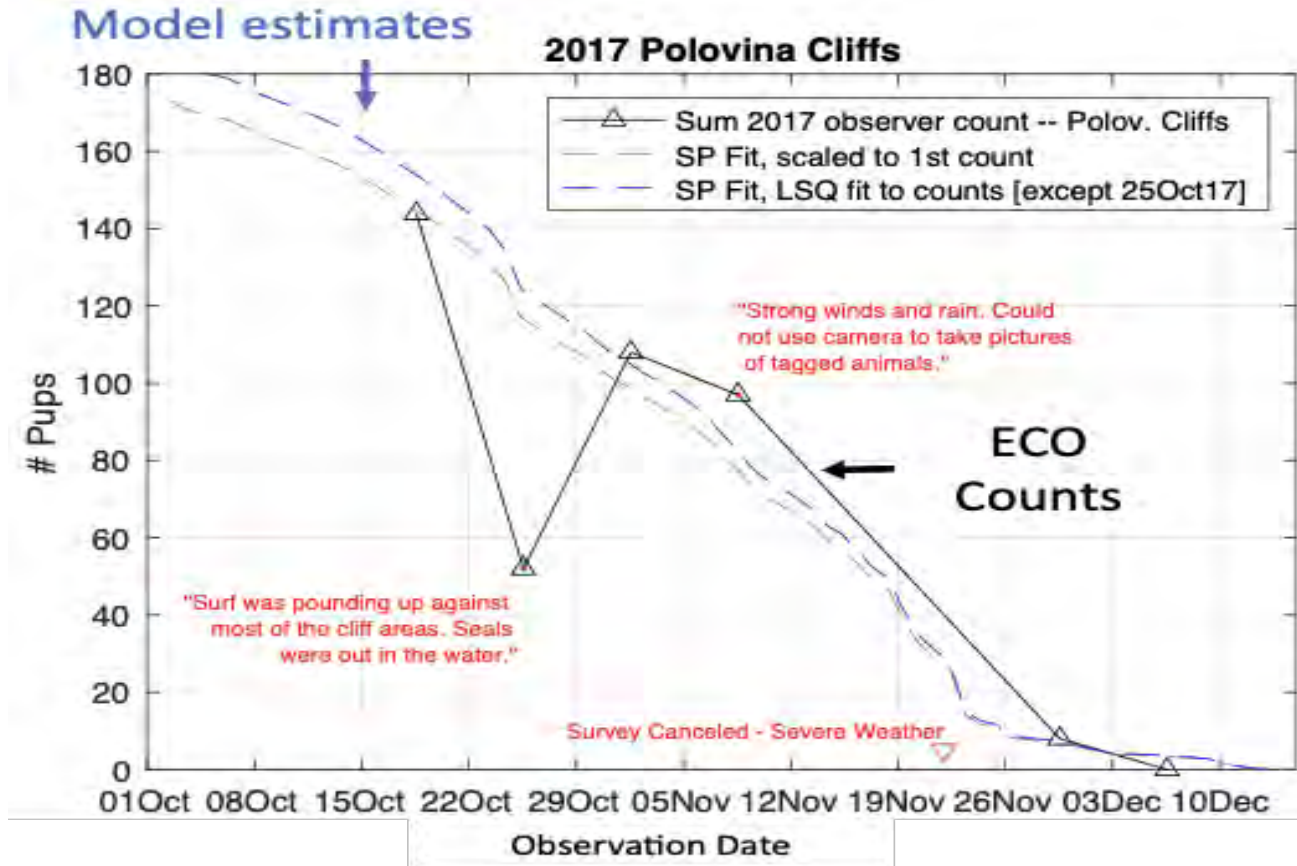
St. Paul Island's Co-Management Marine Mammal Monitoring Programs

- Marine Mammal Subsistence Harvest Monitoring
- Marine Mammal Stranding and Entanglement Surveys
- NFS Rookery Patrols
- NFS & SSL Bio-sampling
- NFS Adult Male Arrival Counts
- NFS Adult Female & Pup Departure Counts
- NFS Winter Haulout Surveys
- NFS Harem/Female Counts
- NFS Pup Tag Resight Surveys
- General Marine Mammal Sighting Observations
- NFS Adult and Pup Habitat Use Surveys
- SSL Remote Camera Monitoring (past)
- Killer Whale Depredation



NFS = northern fur seal
SSL = Steller sea lion

Timing of Departure of fur seals



Alaska Fish Habitat Mapping App

"Fish Map App"

Nyssa Russell – *Northern Latitudes Partnerships*
Heather Bauscher – *Sitka Conservation Society*
Eric Castro – *USDA Forest Service*



Project Partnerships:

Alaska Department of Fish and Game
Northern Latitudes Partnerships
Aleut Community of St. Paul Island
Indigenous Sentinels Network

Funding by U.S. Fish and Wildlife Service

Anadromous Waters Catalog & Atlas (AWC)



- ADF&G tasked by State of Alaska to compile & manage waterbodies utilized by anadromous species
- ADF&G estimates ~20,000+ streams, rivers, or lakes are in the catalog (*specified segments of stream, species, and life stage*)
- Despite decades of effort by ADF&G and others, **this is only a fraction** of the waters used by anadromous species
- Until these habitats are inventoried, they will lack specific habitat protections* under Alaska law (Title 16).



Ä < Ä 7 0 d Ü407 1 ç



- ADF&G staff provide vast majority of nominations in a given year (additions, edits, etc.)
- Other groups (e.g. Trout Unlimited & Kenai Watershed Forum) dedicate efforts to providing some every year
- *Very few come from the public!*



Current Nomination methods ([PDF form](#) & online [web portal](#)) **require field documentation AND separate submission.**

- Possibility of transcription error and/or missing required data
- Requires more time and effort



Fish Map App

- Streamlines the data gathering process - *document in ONE place!*
- Prompts user for *all* required information
- Allows for data collection offline (out of cell service range)
- Uploads to protected/secure online database with editing capabilities
- Northern Latitudes Partnership team reviews for completeness and submits all nominations to ADF&G

Learn more at AlaskaFishMapping.org



Nomination Steps

Fish Map App x

GPS Reading

Get GPS data

We use decimal degrees as coordinate units.
If you want to input coordinate in other formats please use the following format converter.

Format converter

mapbox

Latitude

63.809287210347605

Longitude

-157.05458587721864

Fish Map App x

Details*

Species *

Pink/Humpy Salmon

Oncorhynchus gorbuscha

Date/Time

Mar 23, 2023 at 2:26 PM

Presence/Absence

present

ID Confidence

Sure

Sex

Co

Fish Map App x

Images

Add picture

Select from gallery

- Download app and create account
- Log an Observation (no need for cell connection!)
- Fill out required information in the field add photos, GPS coordinates, species/life stage info
 - *option to add fields for data collection (eg. culvert/barrier documentation)
- Upload Observation(s) to online database when back in cell service (you can edit later in the database if needed)
- Our team will notify you if any additions/changes are needed - can directly connect you to ADF&G staff
- **Complete nominations receive \$100 stipend!!**

° Ü₄¹ đ⁷ ¢ 80 ¢ Æ Æ 9 4⁷ đÜü8

2022 Pilot Season focus: Piloted with Tribal Conservation Districts (Prince of Whales TCD) Significant in-person outreach in Southeast Alaska (led to 13 nominations) (Yakutat Tlingit Tribe; US Forest Service (Petersburg and Wrangell Ranger Districts))

2023 Season outcomes: 19 nominations were submitted, resulting in 39 edits or updates to the AWC.

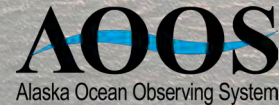
Updates included;

- 7 new waterbodies being added 2 existing waterbodies which were extended.
- 9 waterbodies had new anadromous species added to them
- 1 waterbody had new life-phase information added to an existing species.



Skipper Science Partnership

Powered by ISN Technology

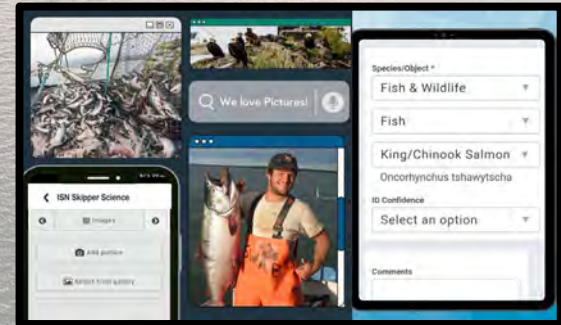


The Skipper Science Partnership

MISSION: To center communities in fisheries management by connecting fishermen and scientists in order to support resilient fisheries and build trust.

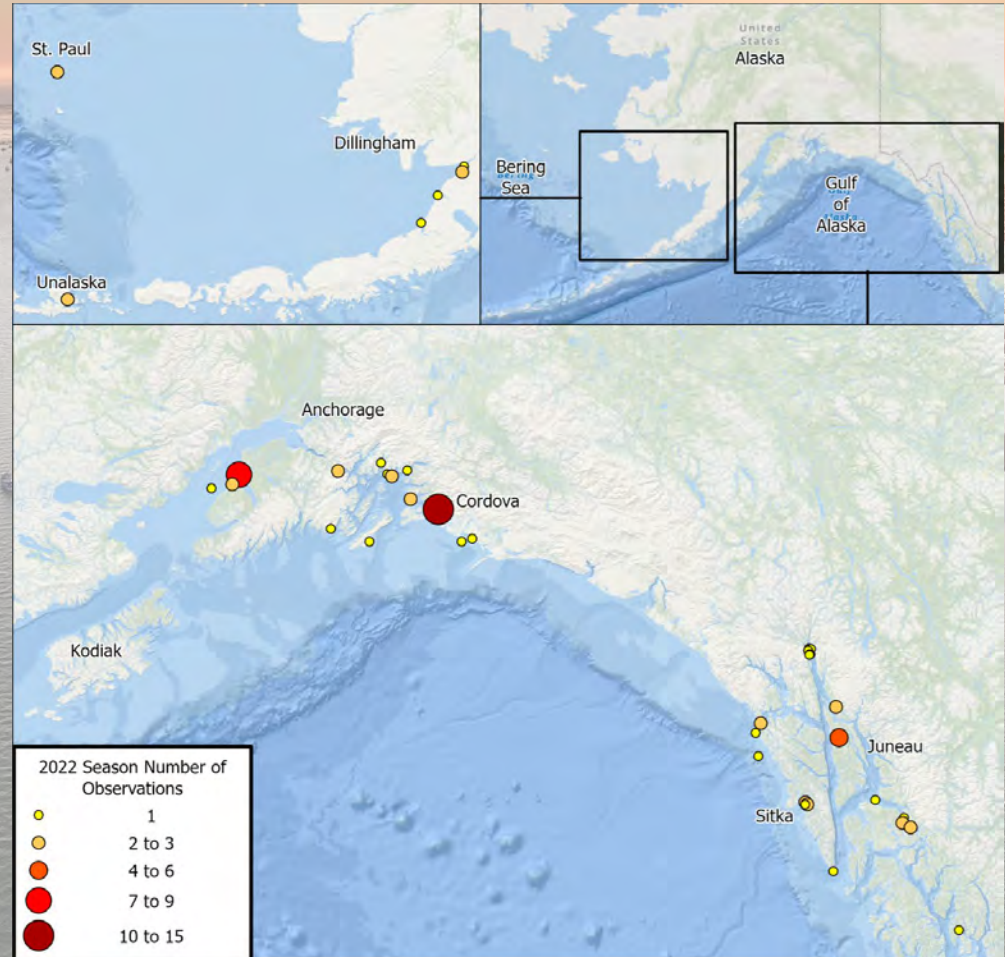
Originated out of St. Paul Island in the Bering Sea after conversations with fishing communities in Unalaska.

- Started in 2021, as an expansion of the Indigenous Sentinels Network (ISN)
- General Observation program as method for local knowledge holders to systematically record and share environmental and biological data
- A partnership that brings fishermen & coastal user voices to the table with decision makers



Highlights from the 2023 season:

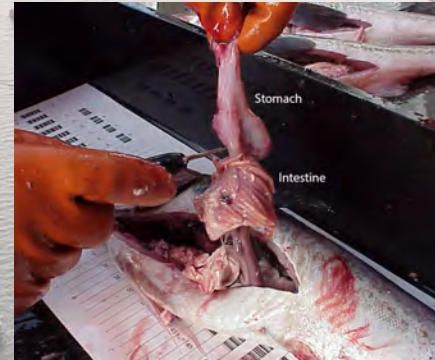
- Over 300 fishermen participating since 2021
- 4 targeted research programs run with industry, scientist, government agencies, and fishermen
- 173 general observation data entries completed
- 13 outreach events and presentations across Alaska and Washington



Example Project

AFSC Black Cod Stomach Content Collection Program:

- 2 year pilot
- Participation from 6 vessels in Southeast in Fall 2023
- Total of 68 samples collected for analysis (i.e., image of stomach contents, GPS, length and sex of fish, and general comments)
- Compensation of \$1000 up to 10 observations/samples
- Review and adjustment of methods expected in July 2024




Skipper Science Fish Stomach Content Imaging Protocol
Updated: Oct. 17th 2022

Start here
Log into ISN Skipper Science app, and click "New Observations"
In a sampling session use the arrows on the menu bar to navigate to the following pages in the app and fill them out:
• GPS Location
• General Information
• Observation Details
• Images
• Database Actions (Save)


Select a fish to sample. This should be fairly random process - you decide how to implement it (grab every 10th fish, reach into a bin and grab one, etc). Track the number of empty stomachs between stomachs with prey and record the number discarded in the Comments box in the "General Information" page of the app.

When you find a stomach with contents record the relevant information on the Observation Details page of the app.
• Species/Object - Fish & Wildlife - Fish - Gobiesfish
• Presence/Absence - present
• ID Confidence - Sure
• Sex - Male or Female
• Age Class - Adult (or another category if relevant)
• Exact Count - 1

Measure the fork length of the fish to be sampled and its location if possible and record in the Comments box on the Observation Details page of the app.



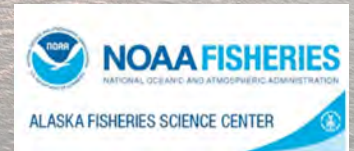
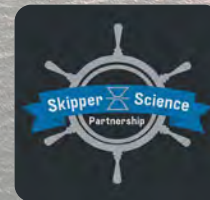
Remove the stomach cutting as close to the gill arches as possible and between the stomach and intestine. Cut open the stomach and place the contents on the bucket lid for imaging, use the underside of lid. If there is obvious bait in the stomach, remove it. Then place the ruler above the contents on the bucket and snap a picture using the "Add picture button" in the Images page of the app.



IMPORTANT - When you are finished recording the information for a sample be sure to hit the blue Save button on the Database Actions page of the app to save your observation.
After you save the observation, it should be listed on the Landing Page of the SS app. The observation will be saved on your mobile device until you have a signal or wifi and upload it to the Skipper Science database.
See the back/next page for examples photos.

Need help? Call Hannah-Marie Garcia at (843)991-9427
or email info@skipper-science.org

INDIGENOUS PARTNERSHIP
BENTHIC NETWORK





Ecosystem Status Reports (ESRs)



<https://www.fisheries.noaa.gov/alaska/ecosystems/ecosystem-status-reports-gulf-alaska-bering-sea-and-aleutian-islands>

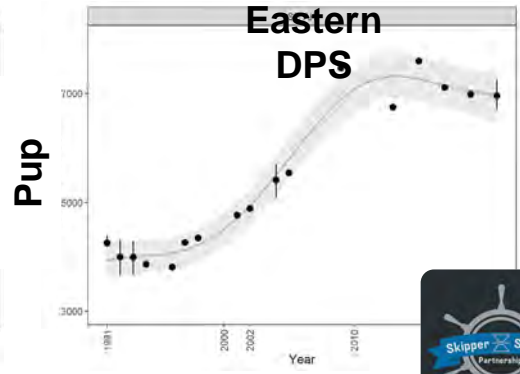
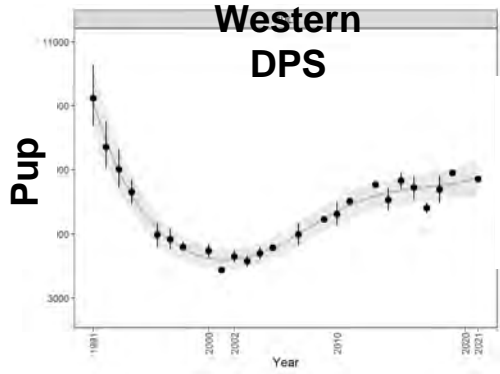
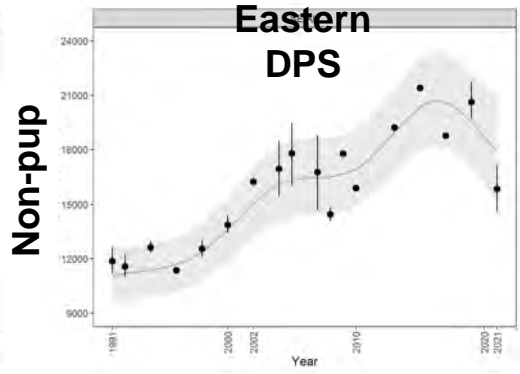
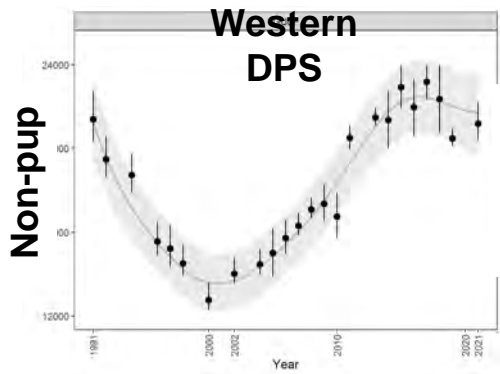


- Annual summary of marine ecosystem status
- Paired with annual groundfish stock assessment cycle
- Presented to North Pacific Fisheries Management Council

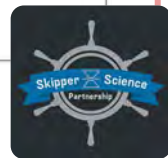


Steller Sea Lions (2021): *declining/plateauing*

K. Sweeney, Skipper Science Partnership



- WGOA/EGOA: increasing since 2000 then decline/plateau since 2017
- Prey availability (P. cod, walleye pollock)? EGOA adult movement
- 2022 (Skipper Science) - More and increasing numbers of Steller sea lions than expected; “More fish with ‘seal/ sea lion’ bites on salmon” - observations reported from WGOA, SEAK



Looking Ahead at YRDFA's 2024 In-Season Community Surveyor Program





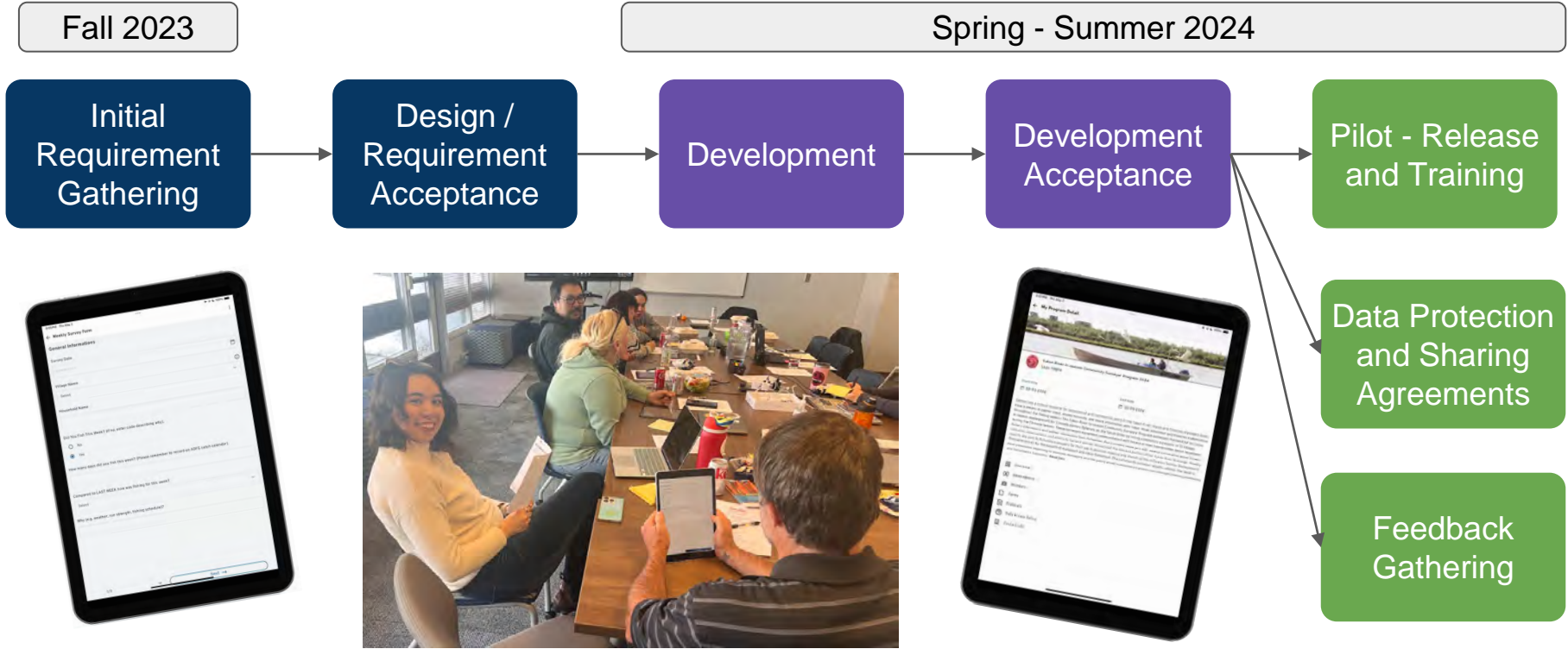
Working together to support Indigenous-led Stewardship and Empower Communities for Environmental Monitoring

Overall, ISN and YRDFA are focused on digitizing surveys this first season:

- Supporting community surveyors and communities as local experts in data collection
- Finding innovative solutions for climate research, adaptation, and collaborative stewardship



Process for Building YR DFA's In-Season Community Surveyor Program Tools



Looking Ahead

Projects and collaborations like the one between YRDFA, ISN, and communities are needed to address:

- Access to important traditional and subsistence foods in Alaska that is threatened by rapid environmental change impacting all lands, waters, plants, and animals.

YRDFA and ISN are working together to find creative and innovative ways to support sustainable stewardship of resources and redesign the current in-season surveyor program.

YRDFA-ISN Data Collection Tools will be available in the coming weeks:

In-Season Fisheries Survey ISN App

YRDFA Staff/Surveyors will start data collection at the end of May 2024 - end of July 2024

**Stay tuned for more information and
announcements on on app availability and training opportunities!**

<https://www.facebook.com/YRDFAak>





Thank you to all of ISN's partners & funders - a snapshot

GORDON AND BETTY
MOORE
FOUNDATION



U.S. National
Science
Foundation



NFWF



United States Department of Agriculture
Natural Resources Conservation Service

AOOS
Alaska Ocean Observing System



the David & Lucile
Packard
FOUNDATION



Qāasakung

Hannah-Marie Garcia

ISN Program Director

Aleut Community of St. Paul

Island Tribal Government

hgarcia@aleut.com

sentinelsnetwork.org



SCAN ME



Extra Slides // Appendix of More Information

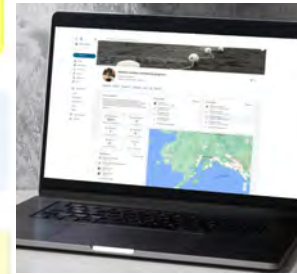
Understanding the ISN System:

Online Database and Mobile Data Collection

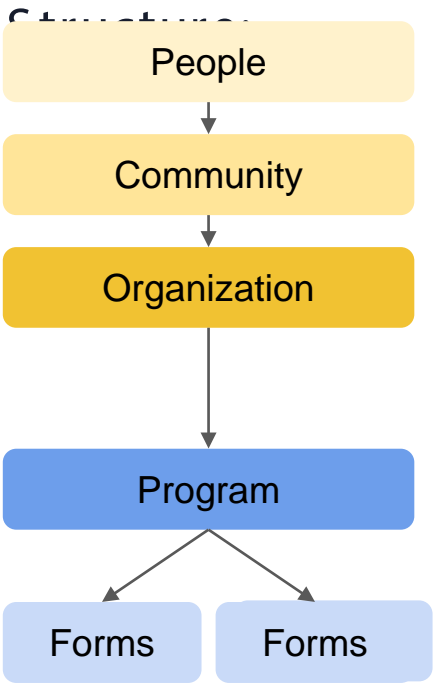
Application

DEFINITIONS

People	An individual human.	Example: HM
Community	Group of people that are connected by a commonality - either region, shared heritage, shared interest, etc	Example: Fisherman, Alaskans, St Paul Community, etc
Organization	An organized group of people with a purpose, usually representing/governing a community.	Example: TGSPI
Program	A data collection effort managed by an organization with clear target observations and protocols.	Example: NFS
Form(s)	A list of questions to collect observations under a program.	Example: NFS form



Basic ISN



Observer

Community admin

Organization Admin

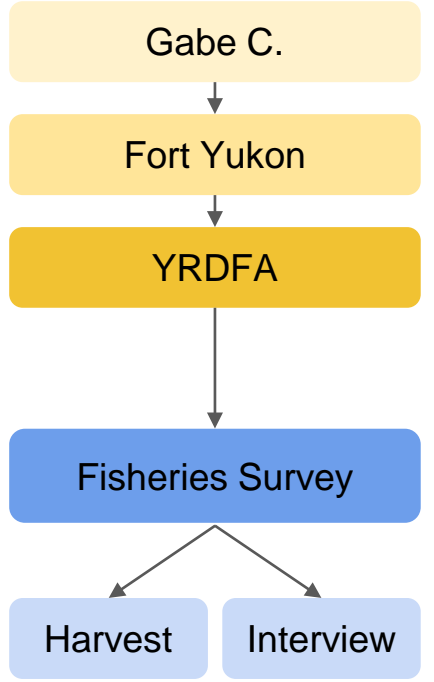
Program Admin

External Reviewer

Internal Reviewer

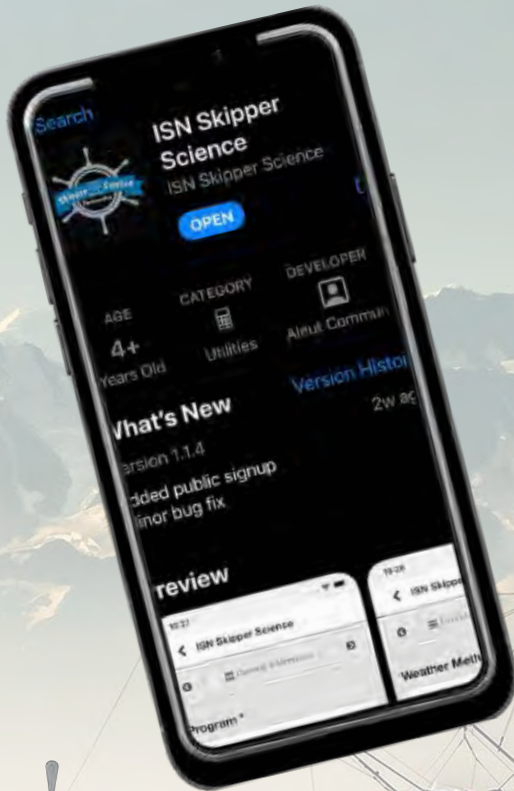
Data End Viewer

YR DFA



Examples of Outcomes from Other Marine and Fisheries Monitoring ISN Programs





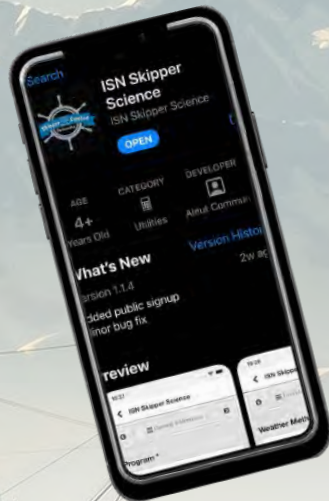
App Based Data Collection

Data form fields created by AFDF/Skipper Science team

1. Created prototype based on existing AMMOP forms and other existing data on seabird bycatch in salmon gillnet fishery.
2. Shared prototype with Alaska Fish & Wildlife seabird scientists to assess priority data fields and score priority questions.
3. The team internally adopted the input to create fields that are relevant and streamlined for user experience.



www.skipperscience.org
info@skipperscience.org



DOWNLOAD THE APP



SCAN HERE



AOOS
Alaska Ocean Observing System

Skipper Science data collection form

- District
- Net deployment date/time
- Target salmon species
- Observed seabirds at deployment
 - Numbers present
 - ID confidence
- Net retrieval date/time
- Water depth at retrieval

9:40 LTE 85

ISN Skipper Science X

Net Deployment Information

District

✓ Select an option

1 (SE)

11 (SE)

15 (SE)

6 (SE)

8 (SE)

Bering River (PWS)

Coghill (PWS)

Copper River (PWS)

Eshamy (PWS)

Montague (PWS)

Northern (PWS)

Unakwik (PWS)

9:40 LTE 85

ISN Skipper Science X

Net Deployment Information

District

Select an option

Net Deployment Date/Time

Jun 12, 2023 at 9:40 AM

Target Species

Select an option

King/Chinook Salmon

Chum/dog Salmon

Coho/Silver Salmon

Pink/Humpy Salmon

9:41 LTE 85

ISN Skipper Science X

Seabird Species Observed

Seabirds observed at deployment?

Select an option

✓ Select an option

absent/not observed

present

Double-Crested Cormorant

Marbled Murrelet

Common Loon

Common Murre

Kittlitzs Murrelet

Pacific Loon

Pelagic Cormorant

Red-Throated Loon

Thick-Billed Murre



- GPS of net retrieval
 - Seabird bycatch
 - Species
 - Number present
 - Condition
 - Alive or dead
 - Optional: text/audio comments
 - Optional: Picture/photo upload

9:31 LTE 94

Select a format

Deg. and decimal min.
90° 12' 34.567"

Deg. min. sec.
90° 12' 34.567"

Latitude

N

Longitude

W

9:43 LTE 95

ISN Skipper Science

Seabird Interactions

Seabird Bycatch (Check Box If Seabirds Were Present In The Net)

Seabird Bycatch species

Murrelet Unidentified

Number Present

2

Seabird Condition

Select an option

Alive

Dead

9:43 LTE 95

ISN Skipper Science

Seabird Interactions

Seabird Bycatch (Check Box If Seabirds Were Present In The Net)

Seabird Bycatch species

Select an option

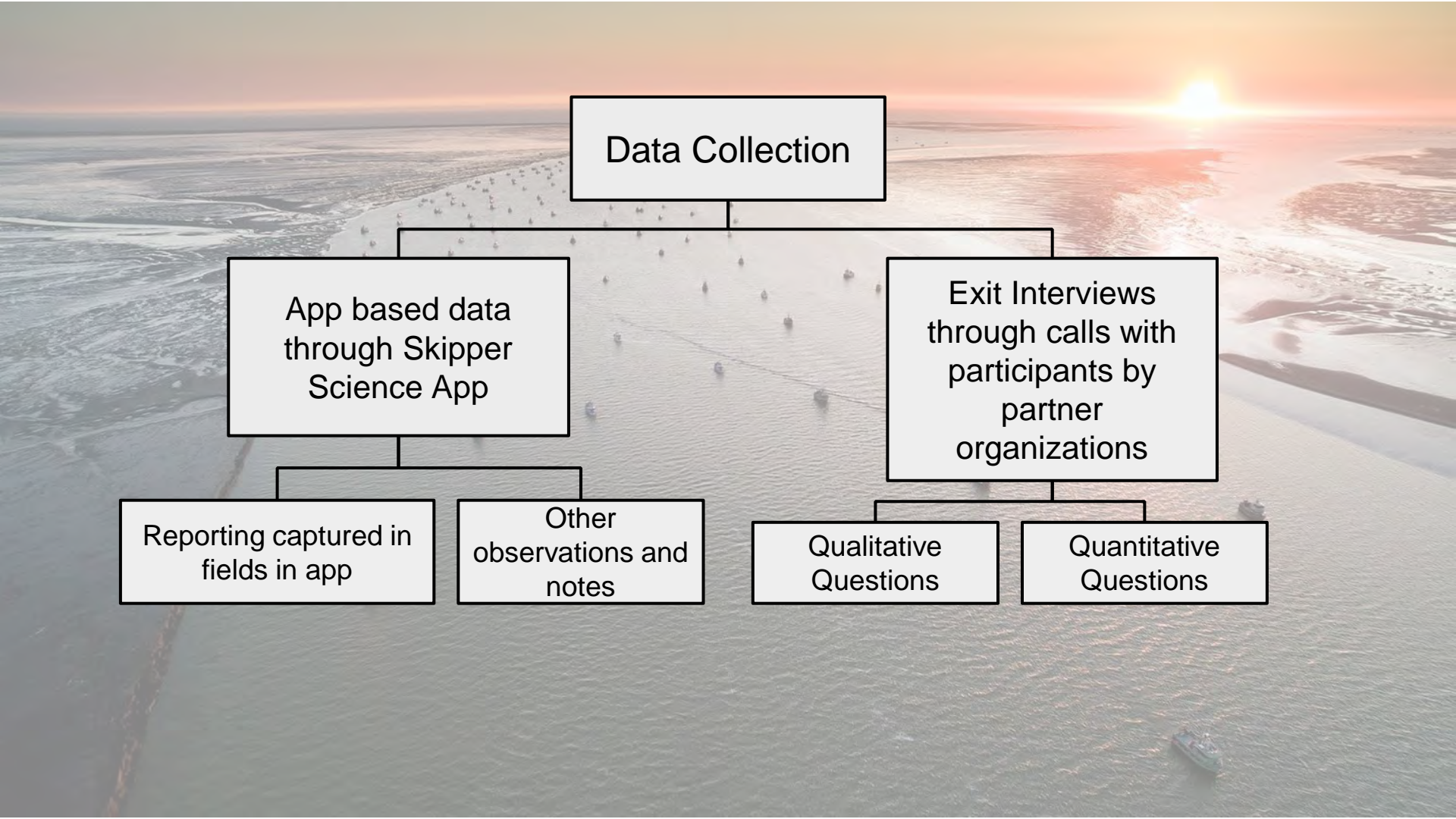
Number Present

0

Seabird Condition

Select an option





Data Collection

App based data through Skipper Science App

Exit Interviews through calls with participants by partner organizations

Reporting captured in fields in app

Other observations and notes

Qualitative Questions

Quantitative Questions

Bycatch Data summary

<u>Participant</u>	<u>Number of observed hauls over 3 months</u>	<u>Number of bycatch events reported</u>
1	110	1
2	85	0
3	64	2
4	26	0
5	40	1
6	94	0
7	96	0
8	47	0
9	66	0
Grand Total	563	4





Freezing Spray Forecasting Project

Goal: Improve Freezing Spray Guidance
for marine safety

Address:

- Inaccuracies in forecasting
- Inaccuracies in modeling and communication
- Data gaps



Images from Observation SSC-47272

			observations logged from January 18 - January 25 2024						
SSC-47272	19-24mph (BFT 5); N	6ft-10ft (BFT 5)	20	39	Moderate	SE	6.5	Voice note transcript: Any spray that hits the boat freezes. The weather is coming down so we're not taking much spray anymore, but any that hits the boat does freeze. It's cold enough now where any of the windows that don't have the window heaters are freezing. From water line all the way to the top of the house is taking spray and freezing.	Fair





Target App Users

- **ANYONE!**
- Technicians/Field crews working in remote areas
- Researchers/Biologists
- Youth & Students

