PTAGIS Data Analysis: Transforming Raw Data into Research Insights

PNAMP Fish Monitoring Work Group (FMWG)

The PNAMP Fish Monitoring Work Group supports collaboration and coordination among fish monitoring practitioners for effective monitoring and assessment methods and efficient data sharing. It also assists the Coordinated Assessments Partnership and StreamNet Program by facilitating discussions among data providers and reporting/decision makers related to fish monitoring data sharing and reporting needs.

pacific northwest aquatic monitoring partnership

CAP

StreamNet
Fish Data for the Northwest

PIT Tag Array Data and Related Analyses Task

Document and recommend improvements to data management and analytical methods for PIT tag array data

- Identify and discuss tools to improve data management
- Discuss metadata storage options (e.g., methods for estimating site efficiencies and abundances in GITHub)
- Develop recommendations for large-scale application of PIT-tag array detection data and operations for reporting and modeling (e.g., run reconstruction, productivity, life-cycle, IMW)

Image: NOAA Fisheries

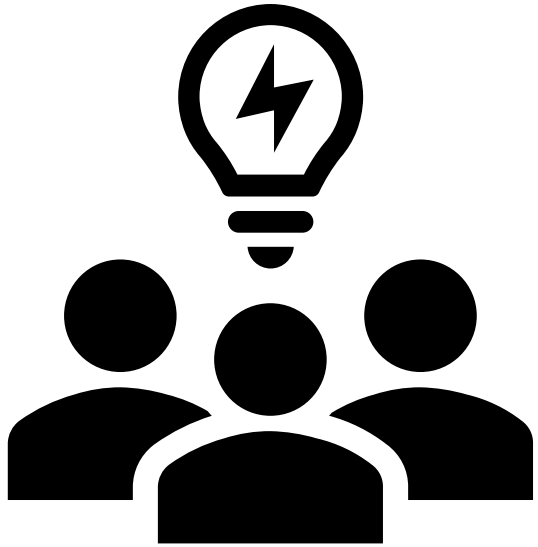
What does this mean for you?

We are developing the task around the needs of the fisheries community.

Your input would help us identify issues and create a workflow to address the highest priorities.

Potential options:

- Workshops for hands-on training
- Webinars on analysis tools
- Resources for information-sharing



PIT Tag Array Data and Related Analyses Issues

Where do we start?

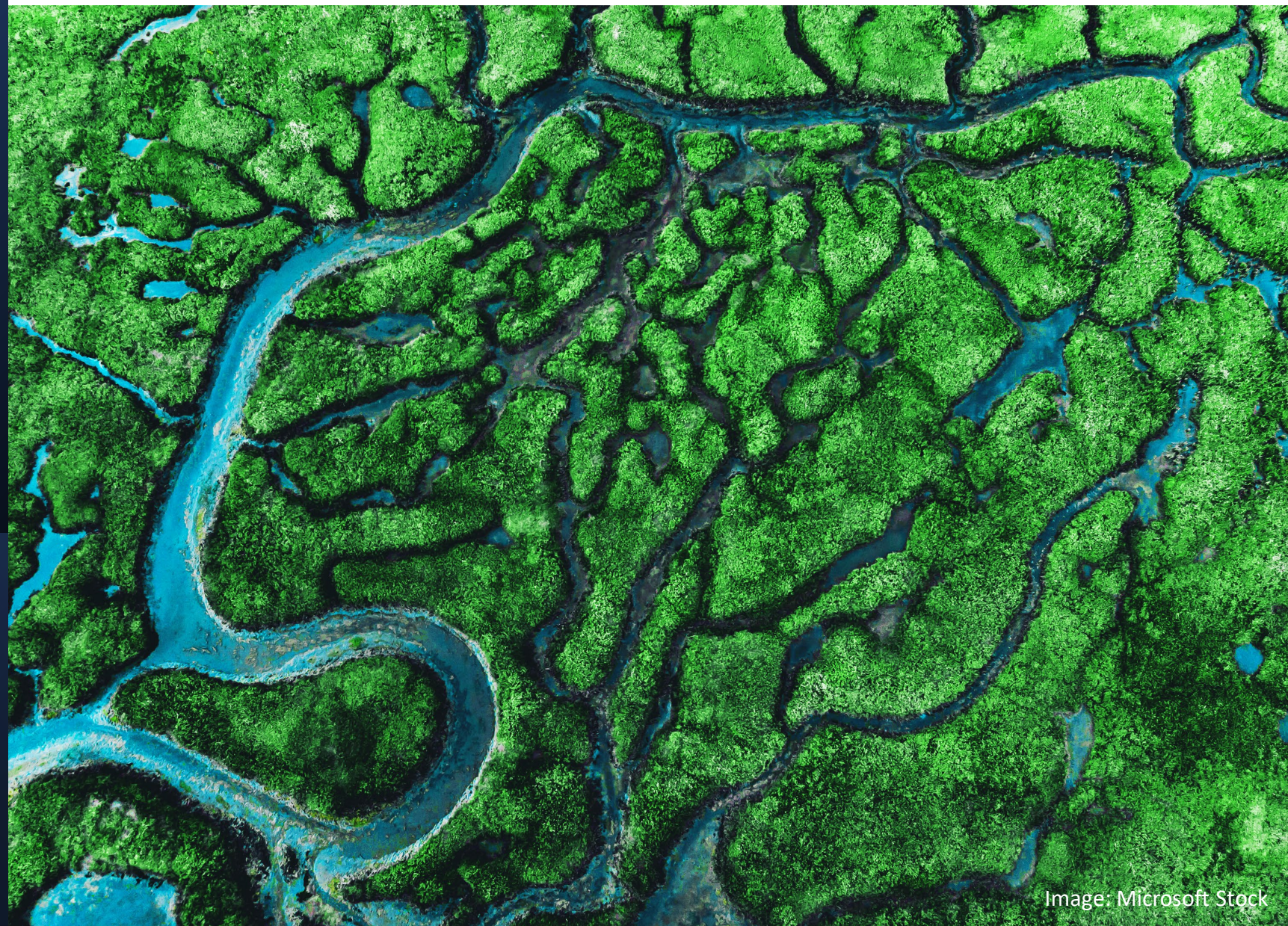


Image: Microsoft Stock

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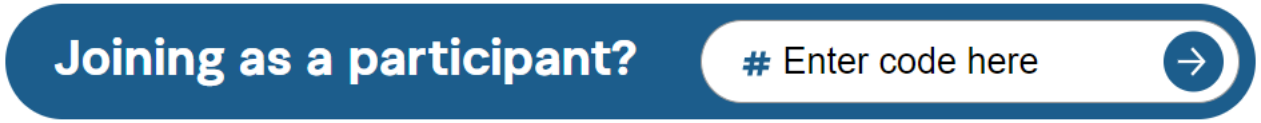
Scan QR Code or go to Slido.com and enter code #PIT

- Scan QR Code, by opening your phone and focusing on QR code until link pops up, click link
- Or try going to Slido.com and entering code PIT



*We will try to display live results
If we cannot, you can see results on your device during polling

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What is your organization or entity?

ⓘ Start presenting to display the poll results on this slide.

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What is your role with PIT tag array infrastructure and data?

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If you are involved with PIT tag arrays and the data, what metrics are crucial to your program?

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If answered other, please define.

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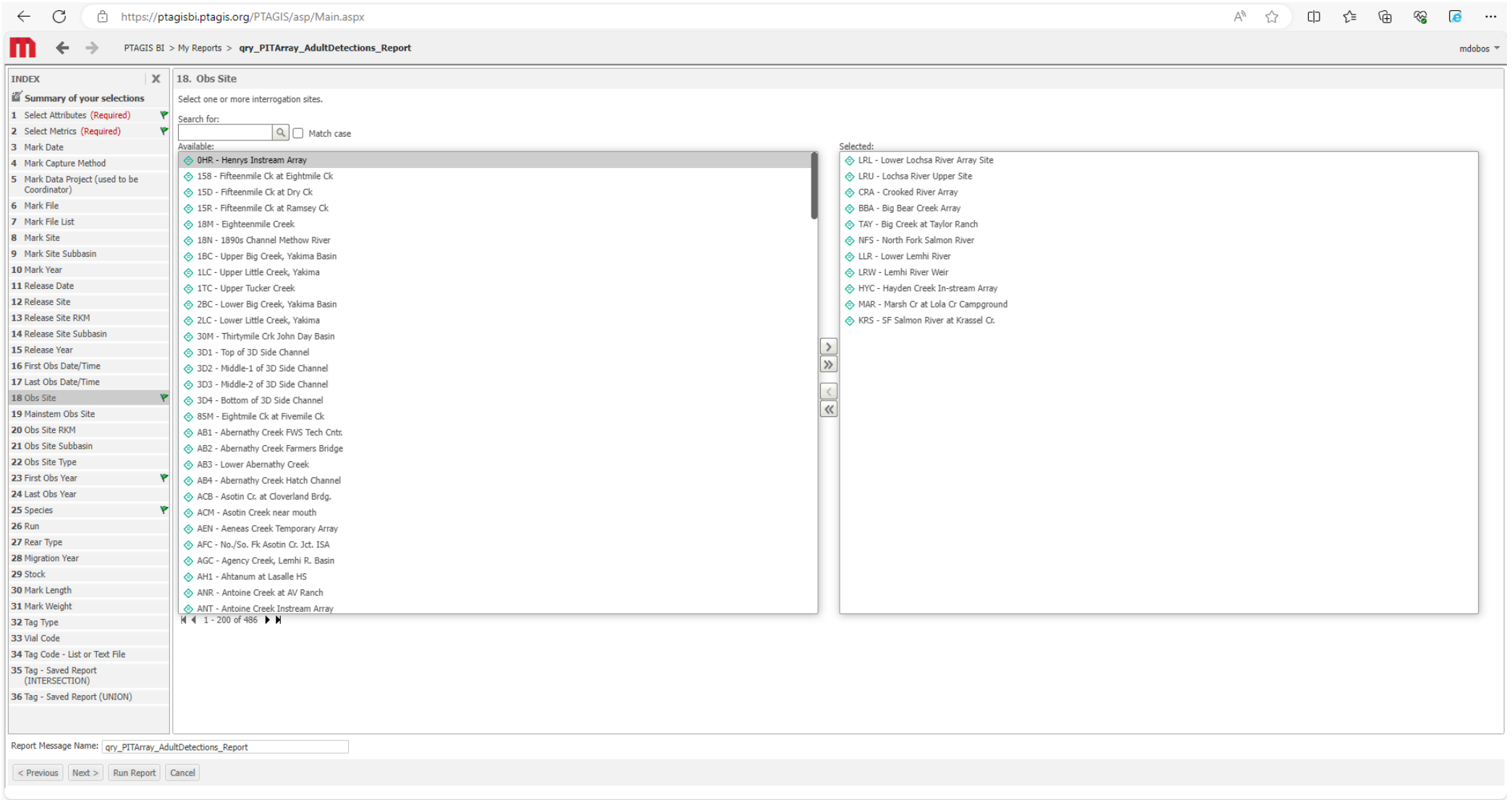
Uses For PIT Tag Array Data

- **Abundance/escapement (adults and juveniles)**
- **Migration timing**
- **Survival**
- Age structure
- Genetic composition (sex, stock)
- Hatchery ratios
- Straying

Primary Data Repository - PTAGIS



Other Available Resources

https://www.cbr.washington.edu/dart/query/pitadult_graph_text

Suggested Sites | Home_IDFG Wire | WA/BC/ID AFS Mee... | 22-24 Clearwater Fi... | PotlatchDelticPrope... | IDFG Outlook | NOAA AMIP | Idaho Pacific Coast... | NeoGovSignIn | Other favorites

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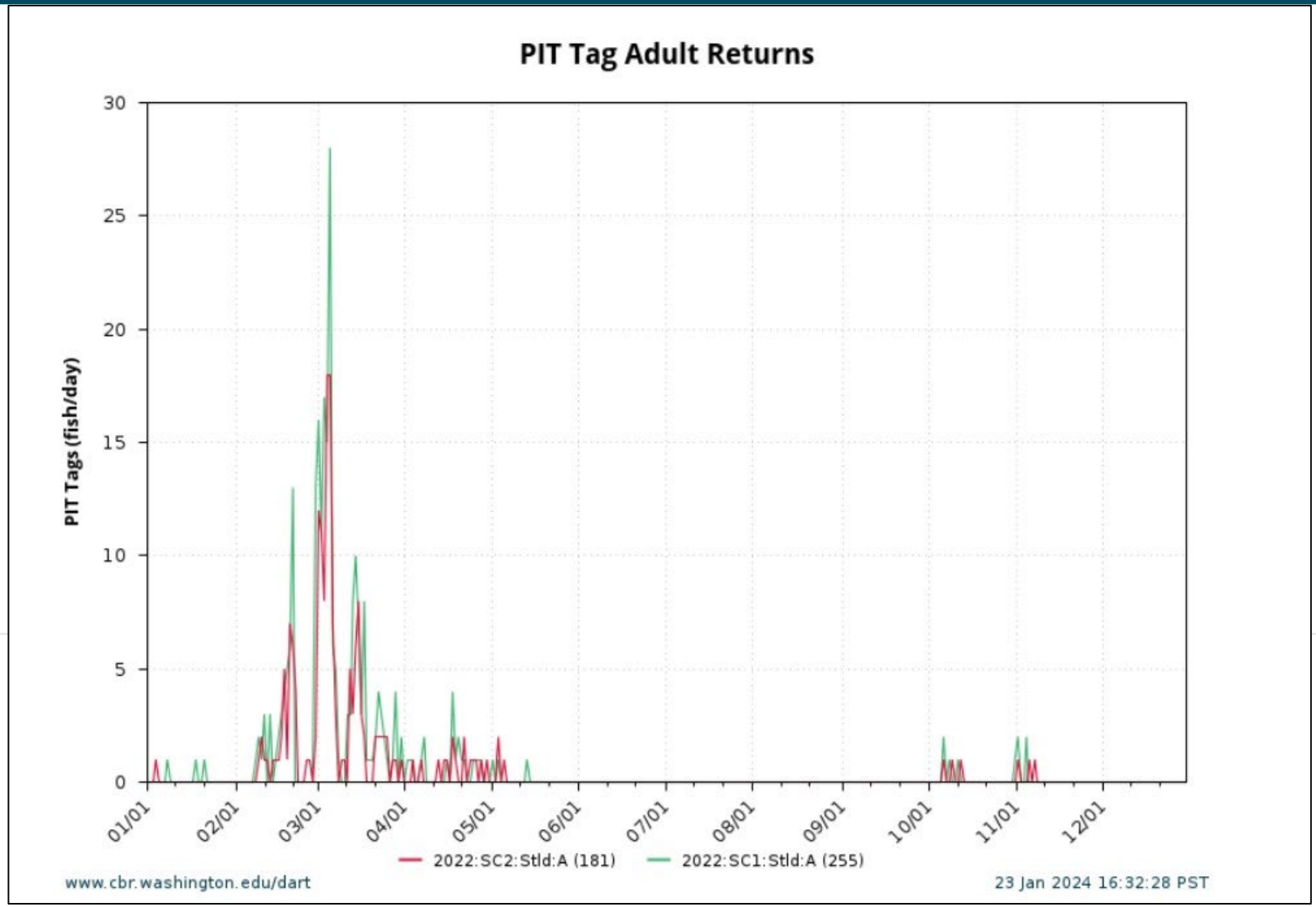


What Does it All Mean???

- Adult detections
- Upstream spawners versus kelts
- Which to include?
- Correctly identify spawn year

	A	B	C	G	H	
1	Tag Code	Mark File Name	Site Name	First Time Valu	Last Time Value	First
3	3DD.003D82B166	JSW-2021-270-001.xml	LRL - Lower Lochsa River Array Site	10/18/2021 18:36	10/18/2021 18:36	Instr
4	3DD.003D82B3F2	JSW-2021-282-001.xml	LRL - Lower Lochsa River Array Site	10/29/2021 18:55	3/24/2022 3:31	Instr
6	3DD.003D82BAFA	JSW-2021-261-001.xml	LRL - Lower Lochsa River Array Site	11/15/2021 3:31	11/15/2021 3:31	Instr
8	3DD.003D82B719	JSW-2021-250-001.xml	LRL - Lower Lochsa River Array Site	2/9/2022 21:57	2/9/2022 21:57	Instr
11	3DD.003D82B867	JSW-2021-297-001.xml	LRU - Lochsa River Upper Site	3/12/2022 19:00	3/13/2022 20:41	Instr
14	3DD.003D82B528	JSW-2021-259-001.xml	LRU - Lochsa River Upper Site	3/13/2022 21:30	3/13/2022 21:30	Instr
17	3DD.003D82B95D	JSW-2021-264-001.xml	LRL - Lower Lochsa River Array Site	3/14/2022 22:38	3/14/2022 22:38	Instr
18	3DD.003D82B5D2	JSW-2021-291-001.xml	LRL - Lower Lochsa River Array Site	3/14/2022 22:40	3/14/2022 22:40	Instr
21	3DD.003D82B18E	JSW-2021-270-001.xml	LRL - Lower Lochsa River Array Site	3/15/2022 14:33	3/15/2022 14:33	Instr
24	3DD.003D82B877	JSW-2021-297-001.xml	LRL - Lower Lochsa River Array Site	3/15/2022 18:23	3/15/2022 18:23	Instr
26	3DD.003D82BA98	JSW-2021-255-001.xml	LRL - Lower Lochsa River Array Site	3/15/2022 18:55	3/15/2022 18:55	Instr
28	3DD.003D82B20B	JSW-2021-286-001.xml	LRL - Lower Lochsa River Array Site	3/15/2022 20:11	3/15/2022 20:11	Instr
29	3DD.003D82AF87	JSW-2021-266-001.xml	LRL - Lower Lochsa River Array Site	3/15/2022 20:19	3/15/2022 20:19	Instr
35	3DD.003D82B893	JSW-2021-300-001.xml	LRL - Lower Lochsa River Array Site	3/16/2022 12:04	3/16/2022 13:10	Instr
36	3DD.003D82B19B	JSW-2021-269-001.xml	LRL - Lower Lochsa River Array Site	3/16/2022 14:48	3/16/2022 18:53	Instr
37	3DD.003D82B3F1	JSW-2021-284-001.xml	LRL - Lower Lochsa River Array Site	3/16/2022 15:47	3/16/2022 15:47	Instr
38	3DD.003D82B51E	JSW-2021-260-001.xml	LRU - Lochsa River Upper Site	3/16/2022 17:37	3/16/2022 17:37	Instr
39	3DD.003D82B57B	JSW-2021-274-001.xml	LRL - Lower Lochsa River Array Site	3/16/2022 18:12	3/16/2022 18:12	Instr
40	3DD.003D82B7B5	JSW-2021-313-001.xml	LRL - Lower Lochsa River Array Site	3/16/2022 19:15	3/16/2022 19:15	Instr
47	3DD.003D82B54D	JSW-2021-274-001.xml	LRL - Lower Lochsa River Array Site	3/16/2022 23:04	3/16/2022 23:04	Instr
48	3DD.003D82BAC3	JSW-2021-262-001.xml	LRL - Lower Lochsa River Array Site	3/17/2022 3:13	3/17/2022 3:13	Instr
49	3DD.003D82B97D	JSW-2021-263-001.xml	LRL - Lower Lochsa River Array Site	3/17/2022 4:45	3/17/2022 4:45	Instr
50	3DD.003D82B968	JSW-2021-263-001.xml	LRL - Lower Lochsa River Array Site	3/17/2022 4:45	3/17/2022 4:45	Instr
55	3DD.003D82B89F	JSW-2021-299-001.xml	LRL - Lower Lochsa River Array Site	3/17/2022 14:29	3/17/2022 14:29	Instr
57	3DD.003D82B1E5	JSW-2021-286-001.xml	LRL - Lower Lochsa River Array Site	3/17/2022 16:30	3/17/2022 16:30	Instr
58	3DD.003D82B56F	JSW-2021-274-001.xml	LRL - Lower Lochsa River Array Site	3/17/2022 17:35	3/17/2022 17:35	Instr
61	3DD.003D82B364	JSW-2021-272-001.xml	LRL - Lower Lochsa River Array Site	3/17/2022 19:09	3/17/2022 19:09	Instr
67	3DD.003D82B104	JSW-2021-301-001.xml	LRL - Lower Lochsa River Array Site	3/18/2022 12:28	3/18/2022 12:28	Instr
69	3DD.003D82B869	JSW-2021-296-001.xml	LRU - Lochsa River Upper Site	3/18/2022 16:08	3/18/2022 16:08	Instr
70	3DD.003D82AFA7	JSW-2021-268-001.xml	LRL - Lower Lochsa River Array Site	3/18/2022 20:37	3/18/2022 20:37	Instr
71	3DD.003D82B81E	JSW-2021-276-001.xml	LRL - Lower Lochsa River Array Site	3/18/2022 23:03	3/18/2022 23:03	Instr
74	3DD.003D82B80F	JSW-2021-277-001.xml	LRL - Lower Lochsa River Array Site	3/19/2022 22:36	3/19/2022 22:36	Instr
76	3DD.003D82AFE7	JSW-2021-278-001.xml	LRL - Lower Lochsa River Array Site	3/20/2022 9:30	3/20/2022 9:30	Instr
77	3DD.003D82B95B	JSW-2021-264-001.xml	LRL - Lower Lochsa River Array Site	3/20/2022 12:57	3/20/2022 12:57	Instr
79	3DD.003D82B389	JSW-2021-273-001.xml	LRL - Lower Lochsa River Array Site	3/20/2022 13:28	3/20/2022 13:28	Instr
80	3DD.003D82B7C6	JSW-2021-316-001.xml	LRU - Lochsa River Upper Site	3/20/2022 16:16	3/20/2022 16:16	Instr

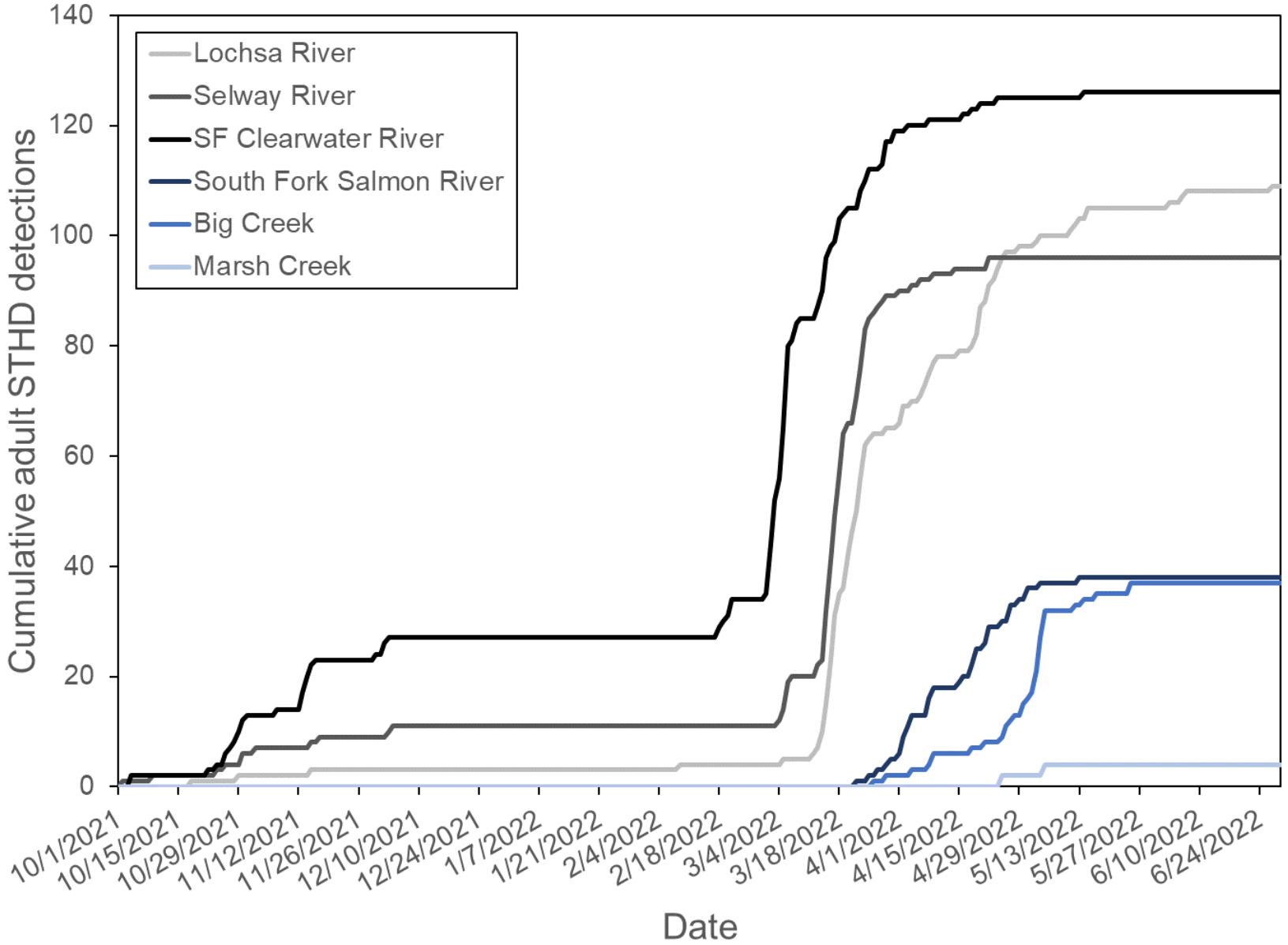
Estimating the Parameters of Interest

Table 3. South Fork Clearwater River array summary for adult steelhead detections

Location tagged	Life stage tagged	Lower array	Upper array	Both arrays	Total unique	Count <780 mm	Count ≥780 mm
Wild-origin							
Lower Granite	Adult	119	86	82	123	60	63
Lower Granite Passage & Survival Study	Juvenile	3	0	0	3	---	---
Crooked River	Juvenile	0	0	0	0	---	---
Newsome Creek	Juvenile	0	0	0	0	---	---
SF Clearwater Mainstem	Juvenile	0	0	0	0	---	---
Snake River Reconditioned Kelt	Adult	0	0	0	0	---	---
Clearwater Floy/PIT tagged	Adult	0	0	0	0	---	---
Lyle Falls, Klickitat	Adult	0	0	0	0	---	---
Hatchery-origin							
Lower Granite (AD-intact)	Adult	116	93	85	124	52	72
Lower Granite Passage & Survival Study	Juvenile	5	0	0	5	---	---
Dworshak Hatchery	Juvenile	8	1	0	9	---	---
Clearwater Hatchery	Juvenile	42	34	31	44	---	---
Priest Rapids	Adult	2	1	1	2		
Columbia River CPN Survival Study	Adult	1	1	1	1	0	1
Unknown-origin							
Bonneville (assumed wild)	Adult	33	18	18	33	17	14
Lower Granite Passage & Survival Study	Juvenile	0	0	0	0	---	---
Total		**329**	**234**	**218**	**344**	**129**	**150**

Adjusted array efficiency	
Lower Array Efficiency	0.488
Upper Array Efficiency	0.408
Combined	**0.697**

Variation Among Populations



Other Challenges

- What do PIT tags represent?
- Sample size limitations (PIT tags and detections)
- Inconsistencies with data storage
- How to store other associated data
  - Temperature
  - Flow
  - Detectability
  - Site or antenna outage
  - Site metadata
- Managing and making available the final products
- Different approaches to analyzing data

South Fork Clearwater Adult Steelhead

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Crooked River	Juvenile	0	0	0	0
Newsome Creek	Juvenile	0	0	0	0
SF Clearwater Mainstem	Juvenile	0	0	0	0
Snake River Reconditioned Kelt	Adult	0	0	0	0
Clearwater Floy/PIT tagged	Adult	0	0	0	0
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Hatchery-origin					
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Lower Granite Passage & Survival Study	Juvenile	0	0	0	0
Total		**329**	**234**	**218**	**344**

Lower Granite Dam

Additional Information

- Handled at Lower Granite Dam
  - 222 hatchery adults
  - 44 wild adults
  - 71 unclipped hatchery adults
    - 64% of unclipped adults detected on SF and handled at LGR
- 81 additional adults not handled

Origin	Female	Male	Female %
Hatchery	122	82	60%
Wild	24	20	54%

Stock	Count
L. Clearwater	7
L. Snake	1
SF Clearwater	27
U. Clearwater	7
U. Salmon	2

Discussion and Identification of Needs

Image: Microsoft Stock

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What are your challenges with PIT tag array data?

ⓘ Start presenting to display the poll results on this slide.

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What are your issues with management PIT tag array data?

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Do you use your own "in-house" tools for managing your data?

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If not, what tools do you use?

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What options would be helpful for PIT tag array data assistance? (e.g., workshops, webinars, “one-stop shop” for models, something else)

ⓘ Start presenting to display the poll results on this slide.

PNAMP Fish Monitoring Work Group Contacts

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