California Department of Fish and Wildlife

Klamath-Trinity Project

Klamath Basin Fishery Monitoring Overview and current status

Klamath Database Workshop

February 24, 2022

Morgan Knechtle

Siskiyou County
Office of Education

U.S. Department of the Interior
Bureau of Reclamation

The Great Seal of the Hoopa Valley Tribe

U.S. Fish & Wildlife Service
Department of the Interior

Salmon River Restoration Council

California Department of Fish & Wildlife

AmeriCorps

The Yurok Tribe

California Conservation Corps
CCC
Est. 1976

Mid Klamath Watershed Council

Oregon Fish & Wildlife

Karuk Tribe of California
Natural Resources

Forest Service
US
Department of Agriculture

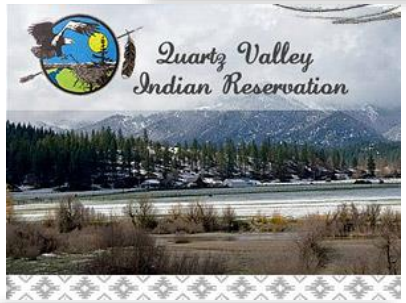
National Oceanic and Atmospheric Administration
NOAA
U.S. Department of Commerce
NOAA Fisheries

Siskiyou Resource Conservation District
RCD

Northern California Resource Center
we help people

RCD
Shasta Valley
Resource Conservation District
215 Executive Court, Suite A
Yreka, CA 96097
(530) 842-6121 ext 106
www.svrcd.org

The Klamath Tribes
Klamath · Modoc · Yahooskin



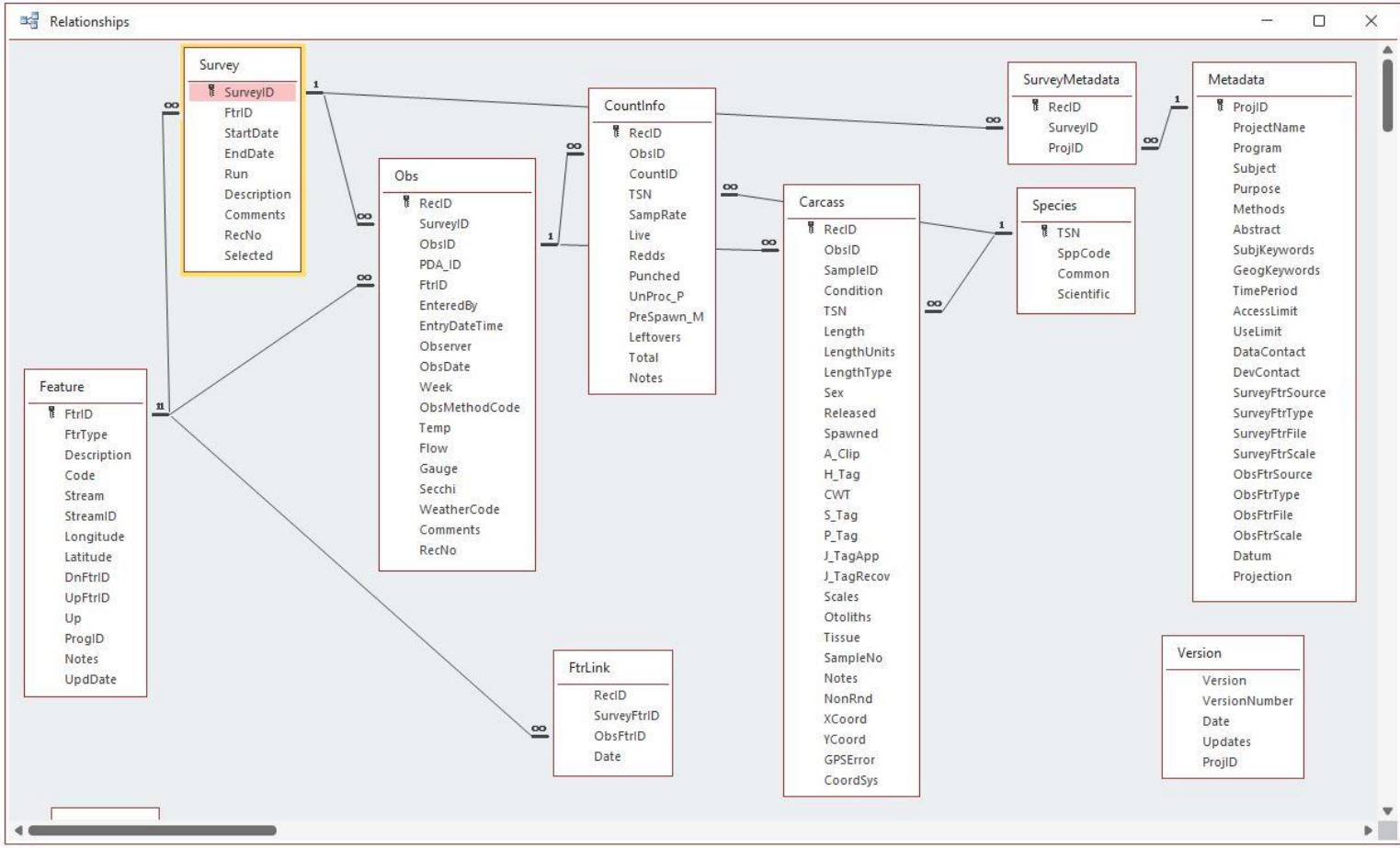
Scott River
Watershed Council

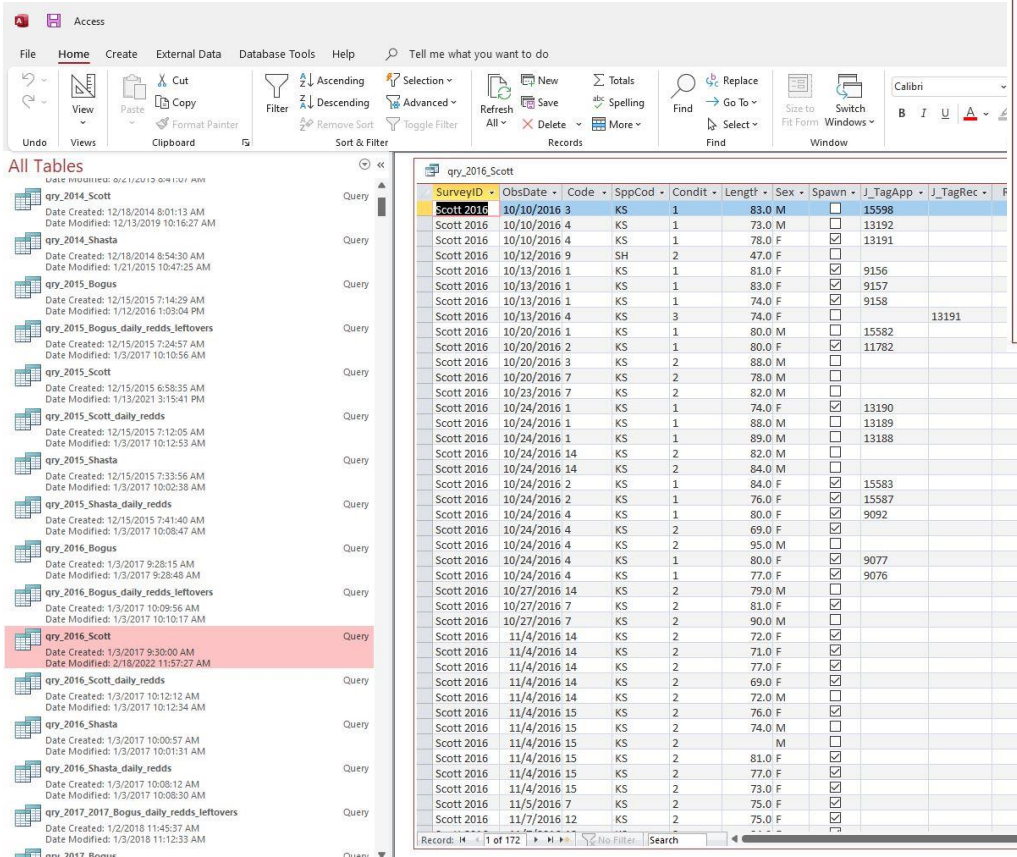
Trinity River Restoration Program
Restore • Adapt • Improve

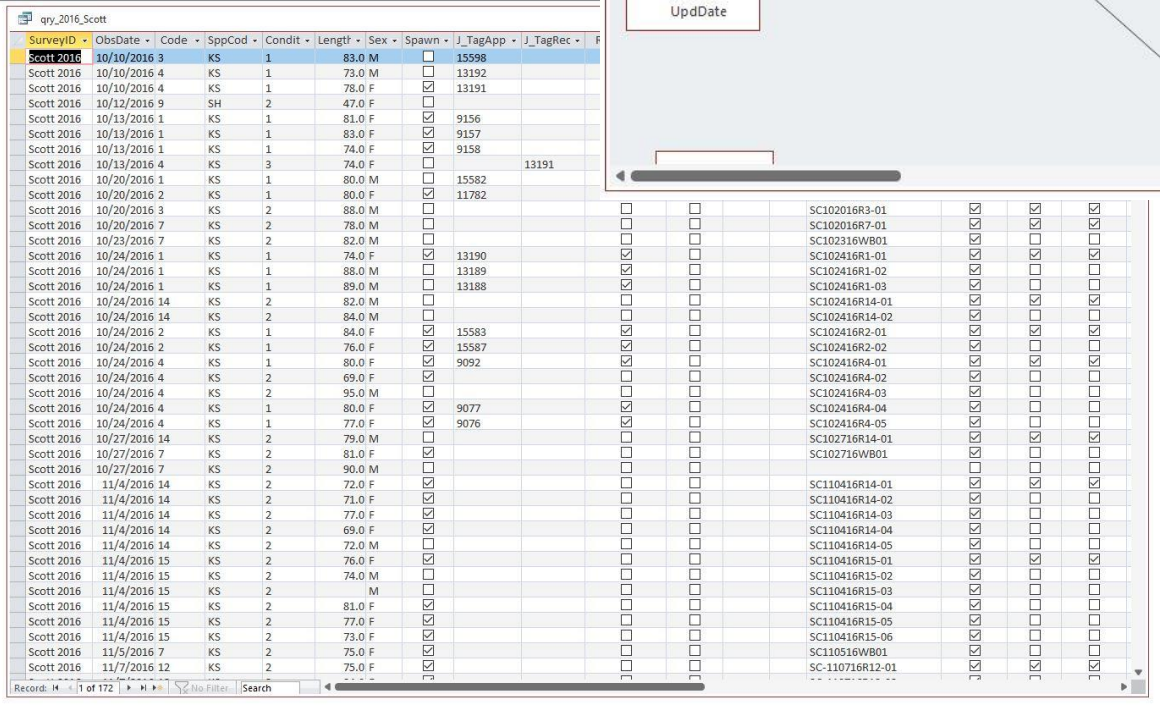
AND LANDOWNERS

Database considerations:

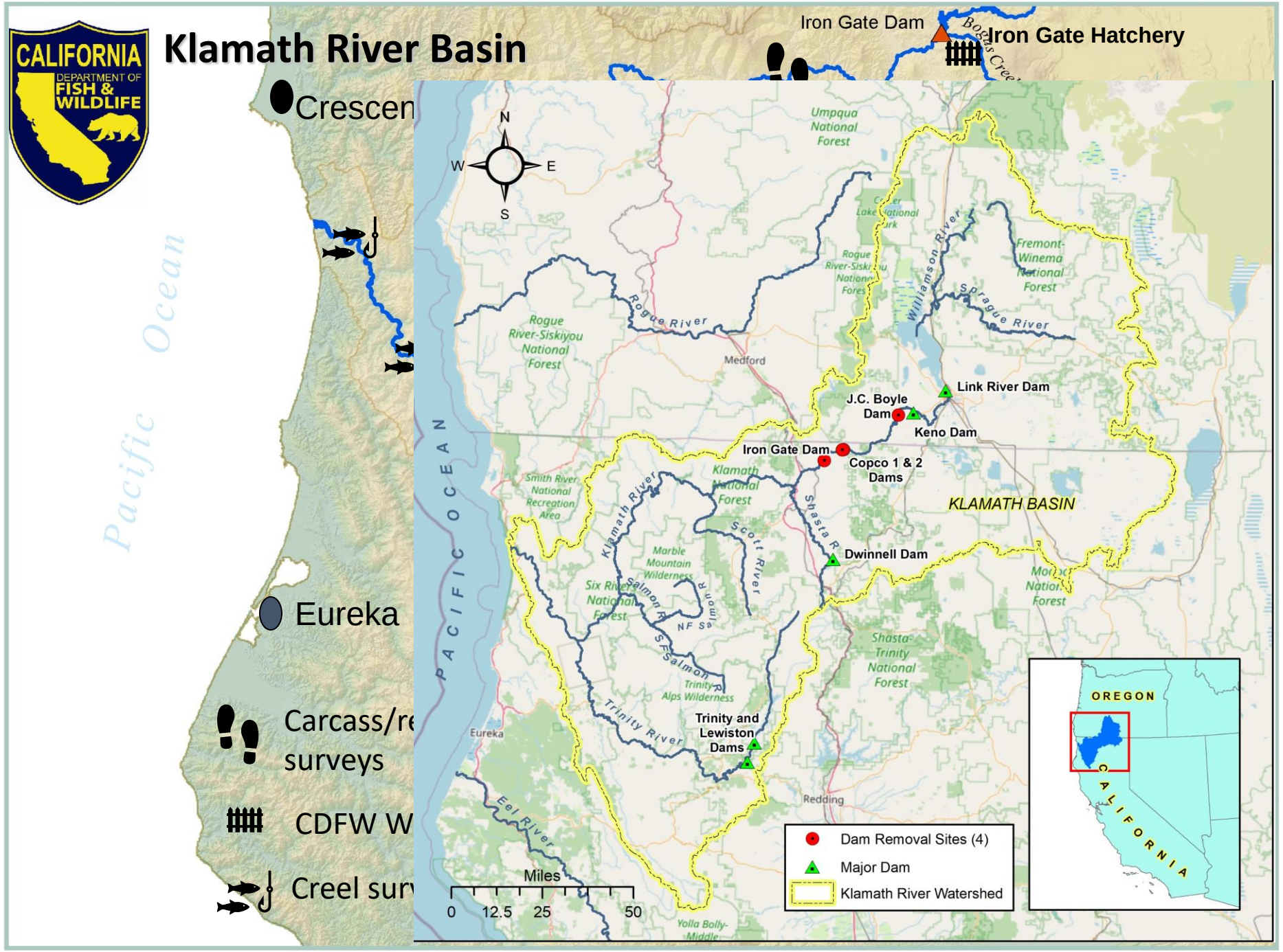
- Overview of some of the current monitoring to leverage existing work to maximize benefit of future monitoring





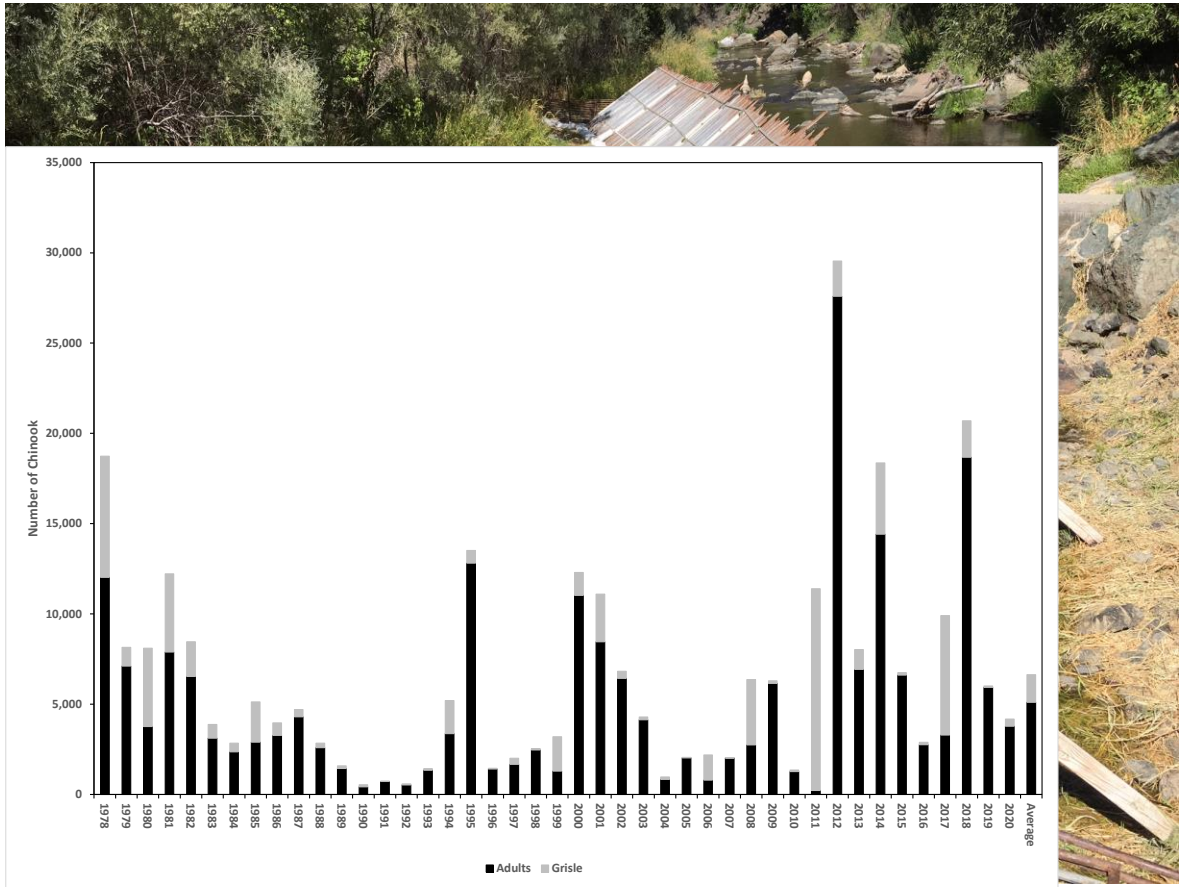


- Lots of co-managers
- Many independent projects
- Large geographic area
- Improve communication
- Information sharing


Klamath River Basin
Iron Gate Dam
Iron Gate Hatchery
Crescen
Eureka
Carcass/re
surveys
CDFW W
Creel surv
Pacific Ocean
PACIFIC OCEAN
N
W
E
S
Umpqua National Forest
Rogue River-Siskiyou National Forest
Rogue River
Medford
Williamson River
Sprague River
Fremont-Winema National Forest
Link River Dam
J.C. Boyle Dam
Keno Dam
Iron Gate Dam
Copco 1 & 2 Dams
KLAMATH BASIN
Klamath National Forest
Klamath River
Shasta R
Dwinnell Dam
Scott River
Smith River National Recreation Area
Marble Mountain Wilderness
Six Rivers National Forest
Salmon R
NF Sa
S Fk Salmon
Trinity R
Alps Wilderness
Trinity River
Trinity and Lewiston Dams
Shasta-Trinity National Forest
Eureka
Redding
Eel River
Miles
0
12.5
25
50
Yolla Bolly-Middle
Dam Removal Sites (4)
Major Dam
Klamath River Watershed
OREGON
CALIFORNIA

Video Fish Counting Stations

- Shasta River



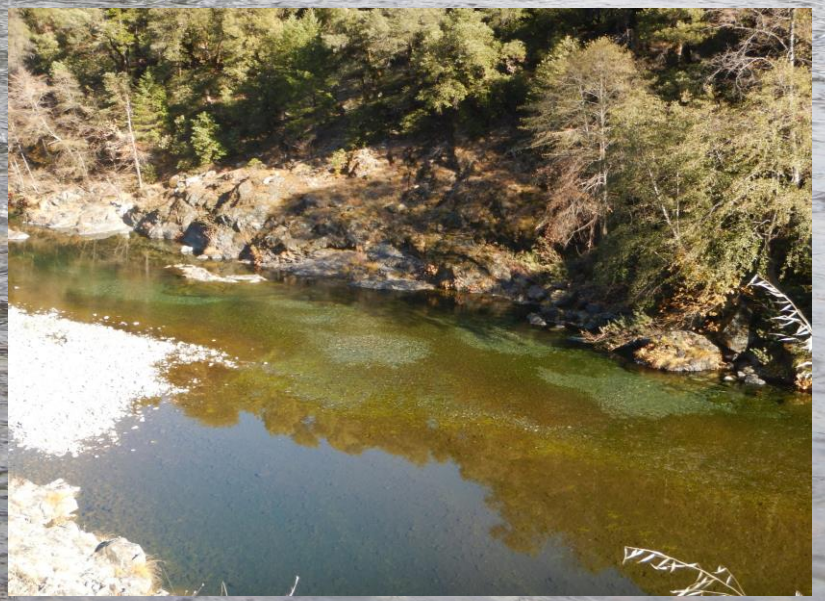
- Scott River

SONAR

Resistance Board Weirs

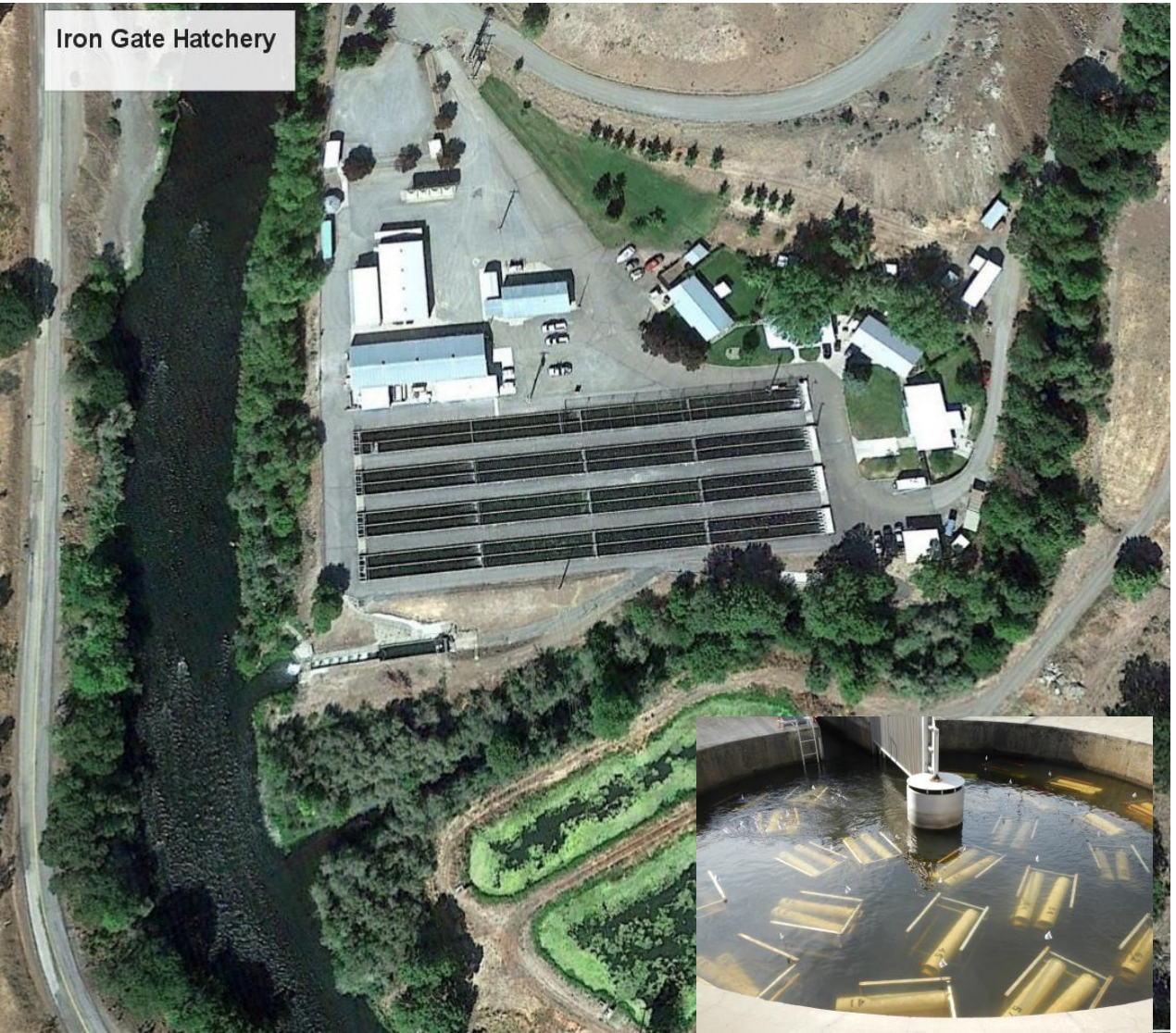
Trinity River Marking Weir-Willow Creek


NRS
NRS



Recreational and Tribal Harvest Monitoring

Mitigation Hatcheries:



Total River Return by Age and Sector

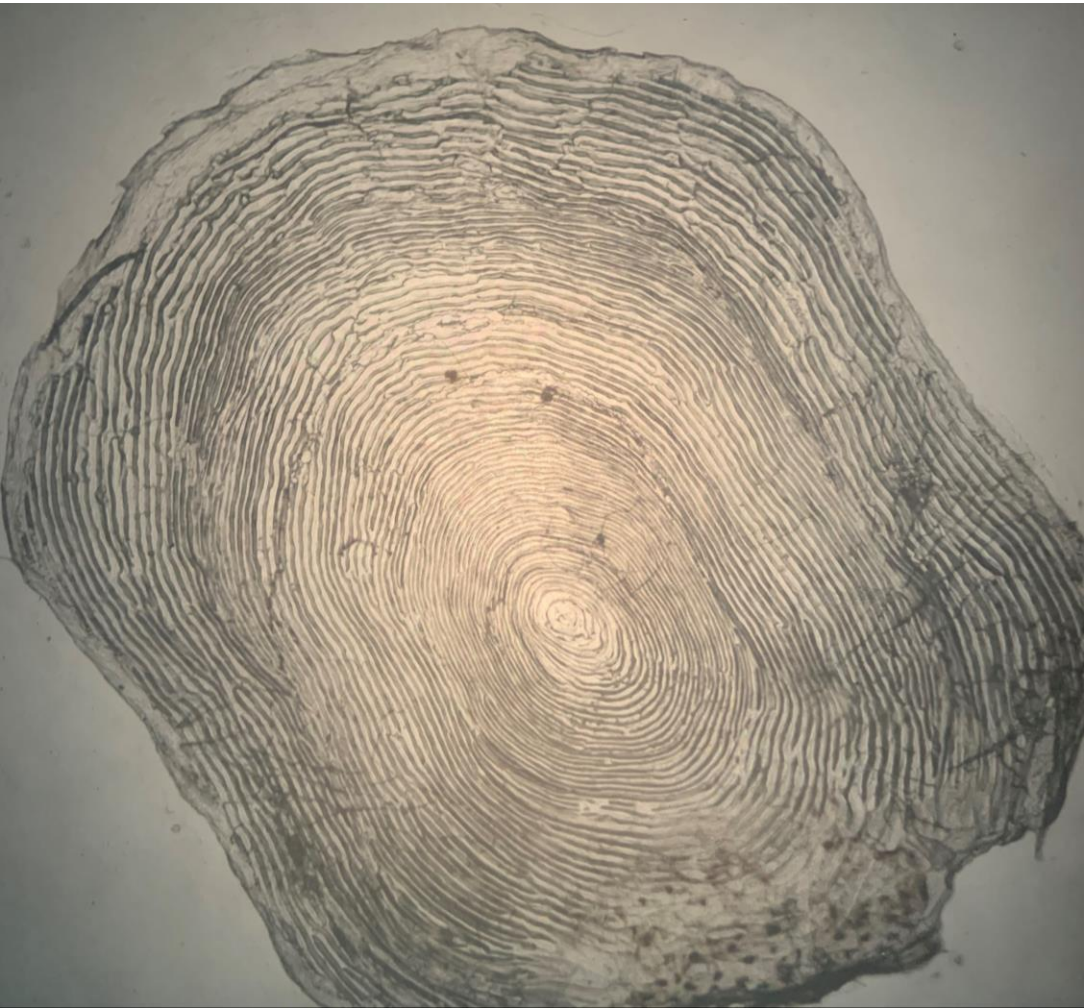
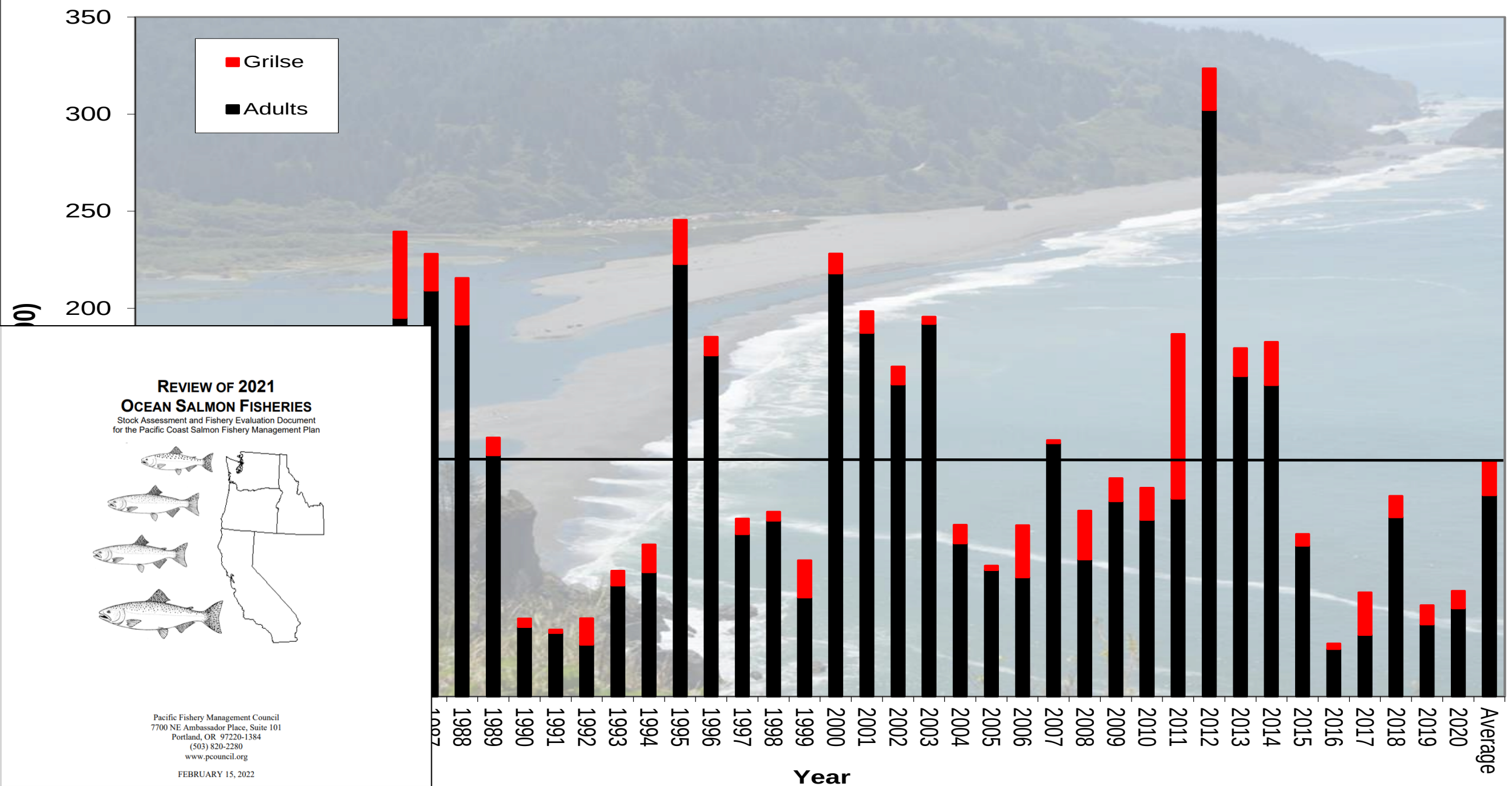


Table 5. Age composition of the 2020 Klamath Basin fall Chinook run. 2/4/2021

Escapement & Harvest	AGE 2	3	4	5	Total Adults	Total Run
Hatchery Spawners						
Iron Gate Hatchery (IGH)	413	3,198	843	1	4,042	4,455
Trinity River Hatchery (TRH)	2,815	4,070	219	0	4,289	7,104
Hatchery Spawner subtotal	**3,228**	**7,268**	**1,062**	**1**	**8,331**	**11,559**
Natural Spawners						
Salmon River Basin	122	862	110	0	972	1,094
Scott River Basin	43	564	248	0	812	855
Shasta River Basin	393	2,948	827	0	3,775	4,168
Bogus Creek Basin	88	1,908	324	0	2,232	2,320
Klamath River mainstem (IGH to Shasta R.)	55	1,087	83	0	1,170	1,225
Klamath River mainstem (Ash Cr. to Wingate Bar)	75	1,474	110	0	1,584	1,659
Klamath River mainstem (Persido Bar to Big Bar)	20	249	25	0	274	294
Klamath tributaries (above Trinity River)	34	836	38	0	874	908
Blue Creek	99	46	78	0	124	223
Klamath Basin subtotal	929	9,974	1,843	0	11,817	12,746
Trinity River Basin (above WCW)	3,792	12,182	1,559	0	13,741	17,533
Trinity River mainstem (below WCW)	93	298	38	0	336	429
Trinity tributaries (above Reservation, below WCW)	97	139	75	0	214	311
Hoopa Reservation tributaries	37	53	29	0	82	119
Trinity Basin subtotal	4,019	12,672	1,701	0	14,373	18,392
Natural Spawners subtotal	**4,948**	**22,646**	**3,544**	**0**	**26,190**	**31,138**
Total Spawner Escapement	**8,176**	**29,914**	**4,606**	**1**	**34,521**	**42,697**
Recreational Harvest						
Klamath River (below Hwy 101)	39	168	38	0	206	245
Klamath River (Hwy 101 to Weitchpec)	343	2,718	228	0	2,946	3,289
Klamath River (Weitchpec to IGH)	134	1,294	294	1	1,589	1,723
Trinity River Basin (above WCW)	0	322	0	0	322	322
Trinity River Basin (below WCW)	17	53	1	0	54	71
Subtotals	**533**	**4,555**	**561**	**1**	**5,117**	**5,650**
Tribal Harvest						
Klamath River (below Hwy 101)	85	915	809	6	1,730	1,815
Klamath River (Hwy 101 to Weitchpec)	156	1,433	1,070	0	2,503	2,659
Trinity River	87	649	330	0	979	1,066
Subtotals	**328**	**2,997**	**2,209**	**6**	**5,212**	**5,540**
Total Harvest	**861**	**7,552**	**2,770**	**7**	**10,329**	**11,190**
Totals						
Harvest and Escapement	9,037	37,466	7,376	8	44,850	53,887
Recreational Angling Dropoff Mortality 2.04%	11	93	11	0	104	115
Tribal Net Dropoff Mortality 8.7%	29	261	192	0	453	482
Total River Run	**9,077**	**37,820**	**7,579**	**8**	**45,407**	**54,484**

Klamath Basin Fall Chinook Run Size



REVIEW OF 2021
OCEAN SALMON FISHERIES

Stock Assessment and Fishery Evaluation Document
for the Pacific Coast Salmon Fishery Management Plan

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384
(503) 820-2280
www.pcouncil.org

FEBRUARY 15, 2022

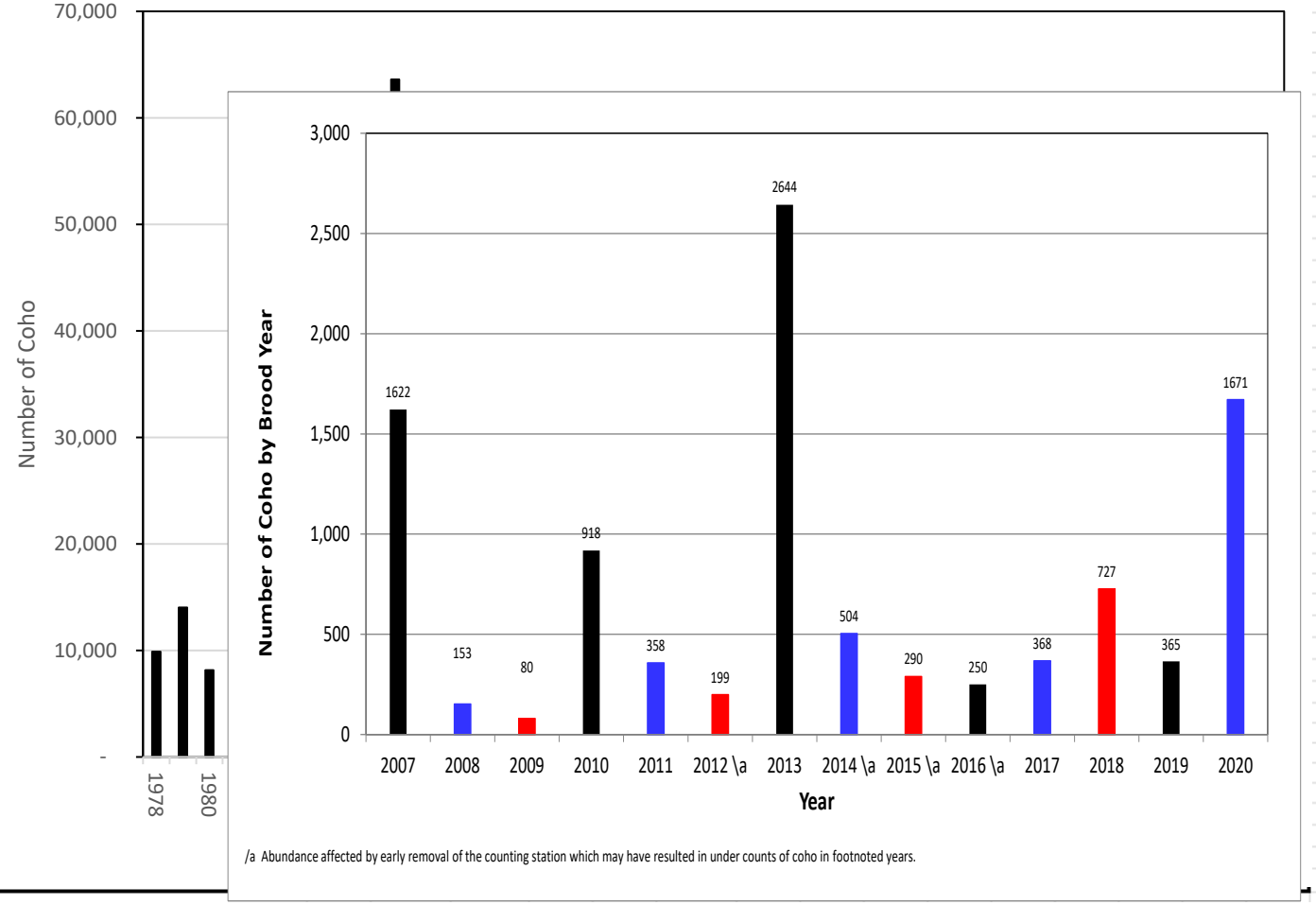
Coho Mega Table

- California Threatened
- Federal Threatened

California Department of Fish and Wildlife, Klamath Trinity Program, coho salmon megatable (preliminary)
PLEASE DO NOT DISTRIBUTE
COHO SPAWNER ESCAPEMENT

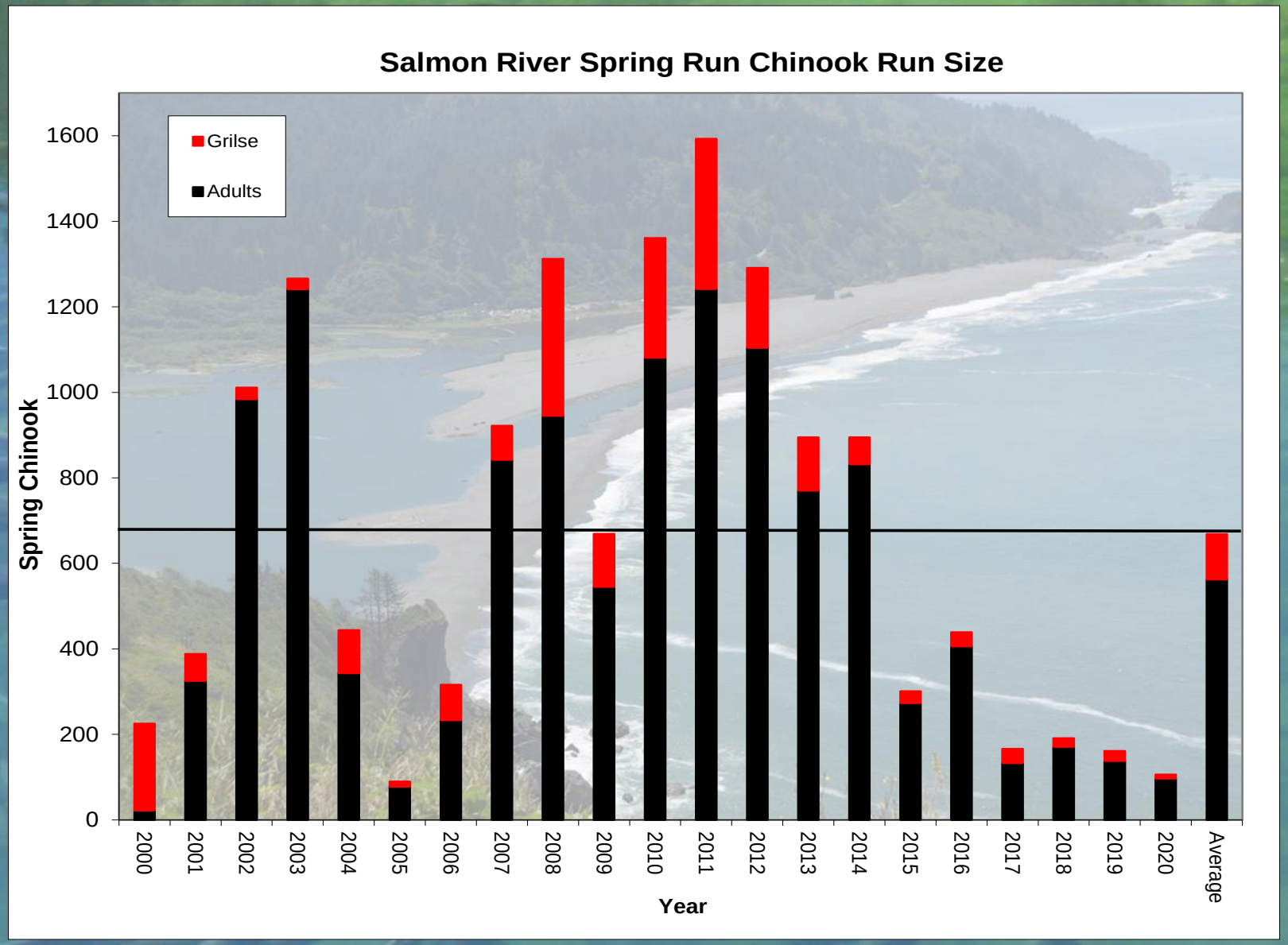
Hatchery Returns:	2013			2014			2015			2016			2017		
	Grilse	Adults	Totals	Grilse	Adults	Total	Grilse	Adults	Totals	Grilse	Adults	Totals	Grilse	Adults	Totals
Iron Gate Hatchery (IGH)_A	63	1,205	1,268	249	135	384	38	34	72	30	56	86	29	93	122
Trinity River Hatchery (TRH)_B	427	6,204	6,631	937	2,971	3,908	278	3,059	3,337	45	482	527	150	270	420
Hatchery Return Subtotals:	**490**	**7,409**	**7,899**	**1,186**	**3,106**	**4,292**	**316**	**3,093**	**3,409**	**75**	**538**	**613**	**179**	**363**	**542**
Klamath Natural Area Spawners_C	**2013**			**2014**			**2015**			**2016**			**2017**		

Coho Mega-Table



/a Abundance affected by early removal of the counting station which may have resulted in under counts of coho in footnoted years.

- **Spring Chinook** (California Threatened)



- *O.mykiss* monitoring:

2019 Summer STHD / Spring Chinook Survey Results - Klamath National Forest, Happy Camp and Oak Knoll Ranger Districts			
Stream	Reach Surveyed	Survey Miles	Survey Date
Beaver			
Clear	Slippery RA to mouth	4.2	8/21/2019
Clear	Tenmile Ck to Slippery RA	3.1	8/13/2019
Clear	Bear Pen to Tenmile Ck	4.6	8/14/2019
Clear	Wilderness Falls to Bear Pen	5.2	8/13/2019
Totals		17.1	
Dillon	Mill to mouth	2.0	8/8/2017 **
Dillon	NF Trail to Mill Creek	4.6	9/3/2019
Dillon	Vann Ck to NF Trail	3.9	9/2/2019
Dillon	MS Dillon to NF Confluence	1.8	8/20/2019
Copper	1.4 mi. of Copper Ck to MS Dillon	1.4	8/20/2019
Totals		13.7	
Elk	5 Mile Bridge to Pumping Station	3.2	7/29/2019
Elk	Twins to 5 Mile Bridge	1.8	7/29/2019
Elk	Doolittle to Twins	3.6	7/24/2017
Elk	Bear Ck to Doolittle Ck	4.4	8/1/2019
Elk	Hummingbird Ck to Bear Ck	2.8	8/1/2019
Totals		15.8	
Grider	No Name Ck to mouth	2.9	8/5/2019
Grider	Bark Shanty Ck to No Name	3.1	8/5/2019
Grider	Rancheria Ck to Bark Shanty Ck		
Totals		6.0	
Independence	Mine to mouth	0.7	8/7/2019
Indian	Buchanon Falls to Mouth	4.6	7/31/2019
Indian	SF Bridge to Buchanon Falls	4.0	7/31/2019
Indian	Westbranch Ck to SF Bridge		
Totals		8.6	
Thompson	2 Mile Trail to mouth	1.7	8/8/2019
Thompson	Upper road access to 2 Mile Trail	3.3	8/8/2019
Totals		5.0	
SF Indian	reen Gate Swimming Hole to Mouth		
Ukonom	Waterfall Barrier to Mouth	0.5	
	Grand total surveyed miles =	67	

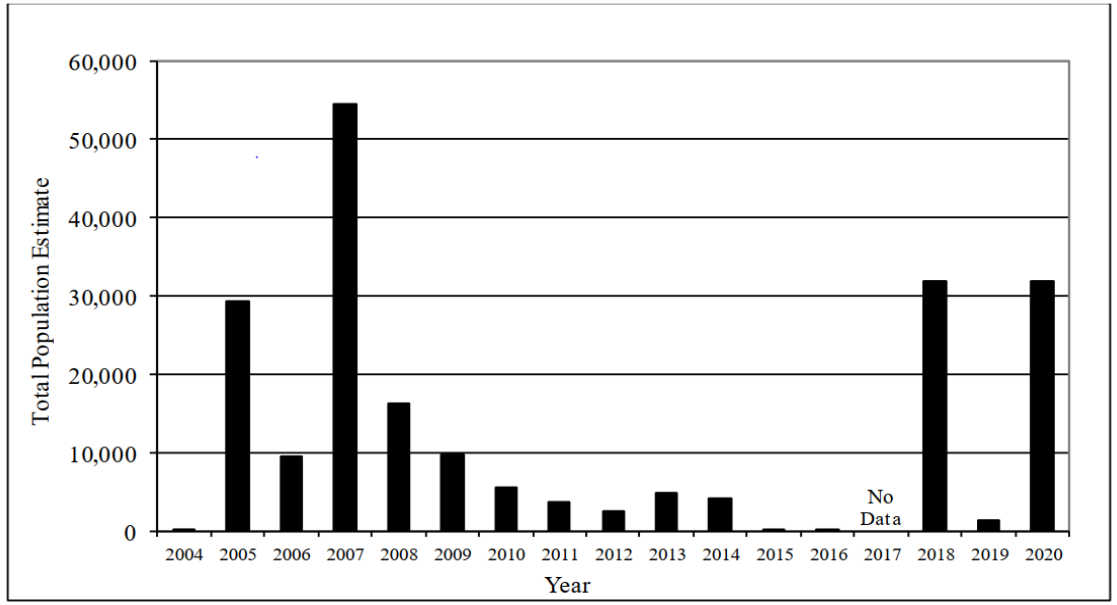


Figure 24. 2004 – 2020 2+ Steelhead population estimates, Scott River. The Scott RST was not in operation in 2017.

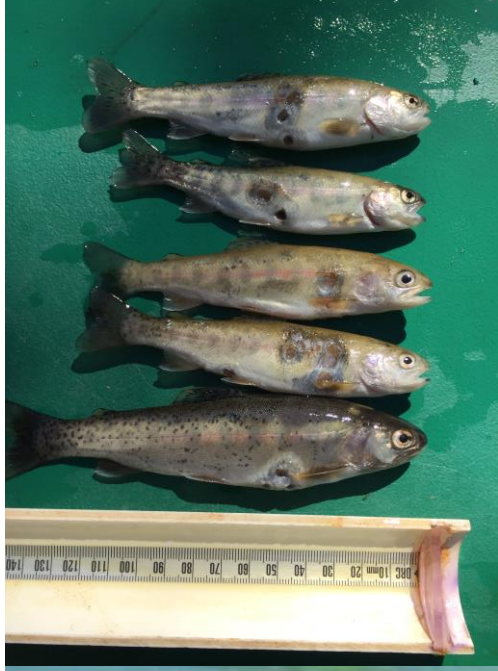
Bogus Creek

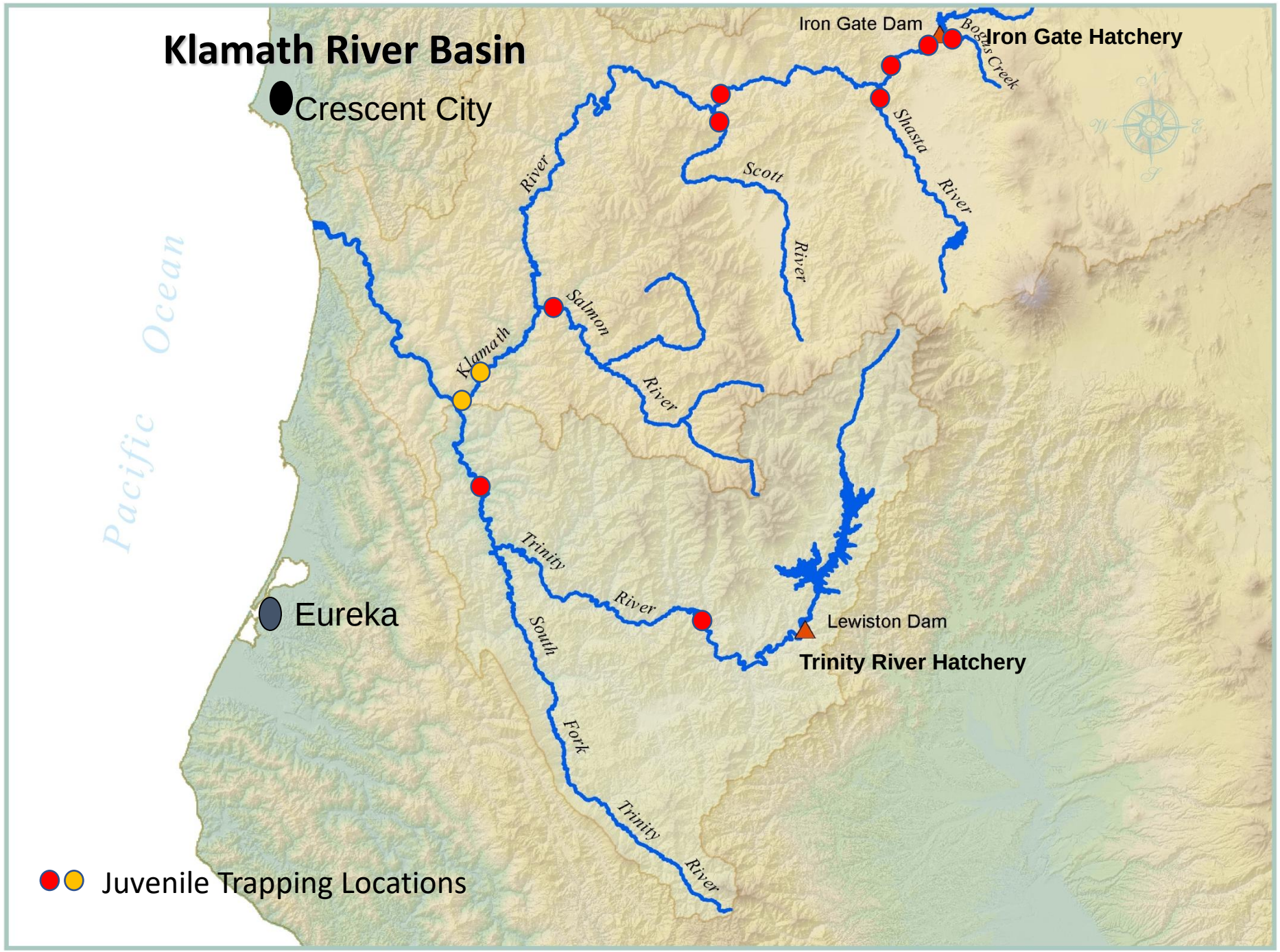
Year	Net Upstream *O.mykiss* >40.6 cm	Last date of Monitoring
2007	24	12/31
2008	48	12/22
2009	54	12/15
2010	24	12/14
2011	42	12/23
2012	59	12/7
2013 - 2014	103	5/1
2014	41	12/1
2015 - 2016	46	1/16
2016 - 2017	84	5/1
2017 - 2018	205	6/8
2018 - 2019	267	5/30
2019 - 2020	431	5/4
Average	110	

Juvenile Trapping:

Table 5. Catch Table Chinook Salmon 0+, Shasta River 2019

Julian week	Live fish trapped[1]	Mortalities	Adjusted total trapped[2]	Volume sampled, MCF	Adjusted marked & released[3]	Recaptured	% Trap efficiency[4]	Weekly population estimate[5]	Lower 95% CI	Upper 95% CI
5	28,717	115	28,832	19.66	2,496	404	16.19%	207,389	191,451	223,327
6	30,617	214	30,831	20.69	2,500	496	19.84%	181,005	168,710	193,301
7	7,637	200	7,837	8.84	999	131	13.11%	138,533	129,053	148,012
8	30,932	178	31,110	20.24	1,882	143	7.60%	474,608	410,827	538,388
9	14,399	389	14,788	4.66	500	0**	17.30%	299,179*	---	---
10	192,373	788	193,161	25.63	2,496	413	16.55%	1,359,203	1,256,716	1,461,691
11	211,489	743	212,232	14.64	2,497	245	9.81%	2,514,288	2,258,950	2,769,626
12	93,530	508	94,038	16.89	2,493	312	12.52%	874,183	796,550	951,816
13	93,704	725	94,429	18.19	2,493	332	13.32%	825,096	754,369	895,823
14	48,275	883	49,158	17.90	1,890	303	16.03%	428,095	396,560	459,631
15	24,332	1,431	25,763	14.53	1,995	193	9.67%	371,093	335,610	406,576
16	36,377	967	37,344	20.66	1,794	340	18.95%	229,339	210,502	248,175
17	45,655	991	46,646	21.99	1,386	208	15.01%	361,153	322,481	399,825
18	29,436	572	30,008	16.31	1,484	223	15.03%	232,093	208,050	256,136
19	17,120	103	17,223	17.99	898	304	33.85%	59,226	54,562	63,891
20	8,216	13	8,229	12.01	500	282	56.40%	16,996	15,859	18,133
21	6,150	45	6,195	15.95	400	236	59.00%	14,675	13,807	15,542
22	6,416	53	6,469	19.95	498	88	17.67%	42,315	35,476	49,154
23	4,592	49	4,641	14.73	300	140	46.67%	13,870	12,664	15,076
24	4,210	73	4,283	12.90	482	155	32.16%	15,471	13,733	17,209
25	596	6	602	14.54	415	218	52.53%	1,334	1,213	1,456
26	267	4	271	13.14	202	129	63.86%	592	540	645
Totals	**935,040**	**9,050**	**944,090**	**362.05**	**30,600**	**5,295**	**17.30%**	**8,659,737**	–	–




Klamath River Basin
Crescent City
Eureka
Pacific Ocean
Iron Gate Dam
Iron Gate Hatchery
Bogus Creek
Shasta River
Scott River
Salmon River
Klamath River
Trinity River
South Fork Trinity River
Lewiston Dam
Trinity River Hatchery
Juvenile Trapping Locations

Coho Life History Projects:

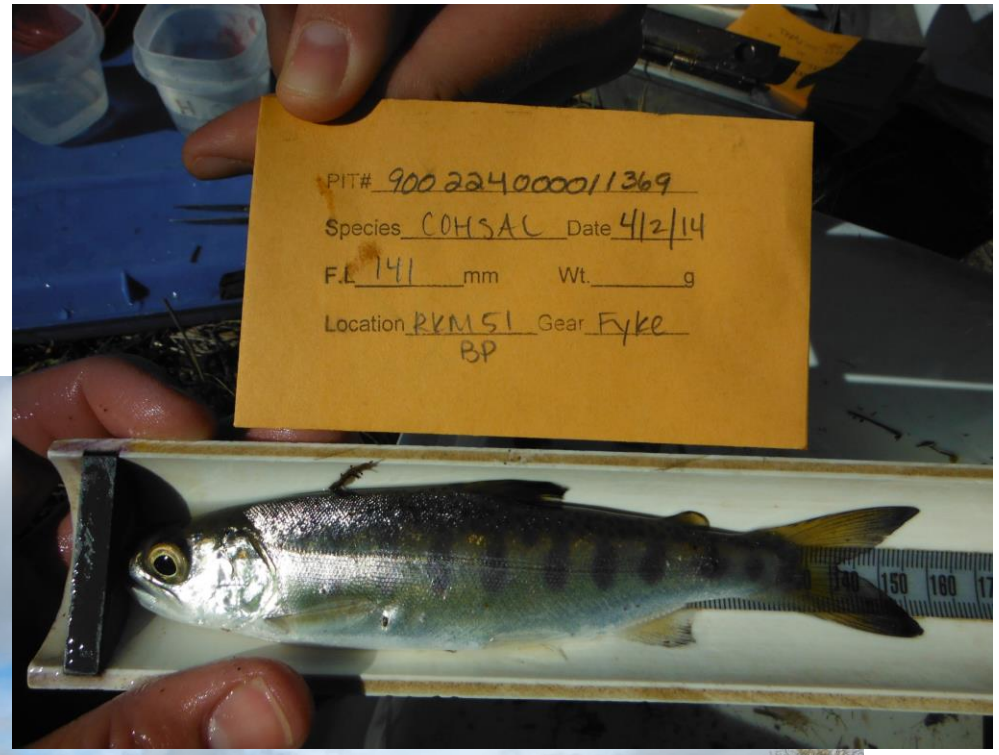
-Non-natal Rearing

-PIT tagging studies

-Antenna network increasing

-Collaborative Projects

-Klamath Database



What would we like to know?

- Stray rates of source populations
- Stray rates of hatchery populations
- Contribution of non-natal rearing life history
- Meta population dynamics
- Migration patterns of hatchery and natural juvenile populations
- Increased tag detection probability
- Drought effects
- Disease effects

Future Opportunities for collaboration:

- Increasing landscape with Dam Removal
- Additional Partners
- Spring Run Response
- Coho Response
- Restoration Response ($162M)

Questions?

Federal Perspective on Klamath Basin Salmonid Recovery and Monitoring

Tommy Williams

Southwest Fisheries Science Center Fisheries Ecology Division – Santa Cruz, California

Klamath Fisheries Collaborative Spring 2022 Meeting

U.S. Department of Commerce | ***National Oceanic and Atmospheric Administration*** | ***National Marine Fisheries Service***

~~Federal~~ NMFS Perspective on Klamath Basin Salmonid ~~Recovery and~~ Monitoring To Inform Conservation and Management

Tommy Williams

Southwest Fisheries Science Center Fisheries Ecology Division – Santa Cruz, California

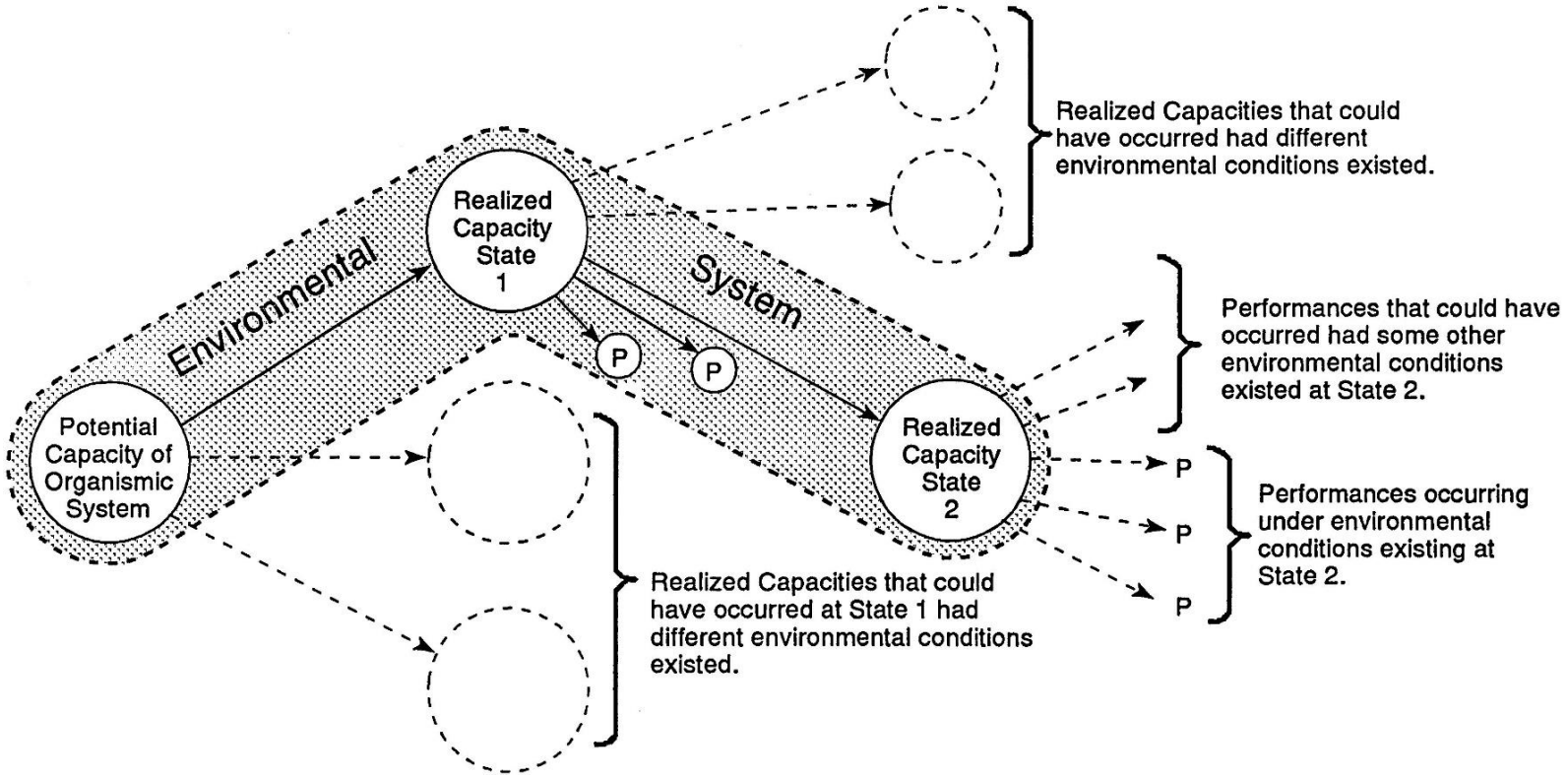
Klamath Fisheries Collaborative Spring 2022 Meeting

U.S. Department of Commerce | National Oceanic and Atmospheric Administration | National Marine Fisheries Service

Motivation for presentation:

- **Briefly describe an approach to consider how salmonids persist in a dynamic environment**
- **Constraints on salmon populations**
- **Tracking movement across the landscape**

Klamath River Renewal Corporation



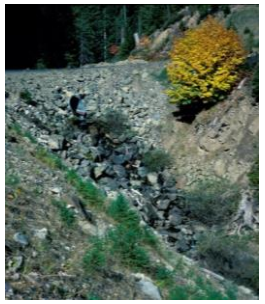
From Ebersole et al. 1997. Envir. Mgt. 21:1-14.

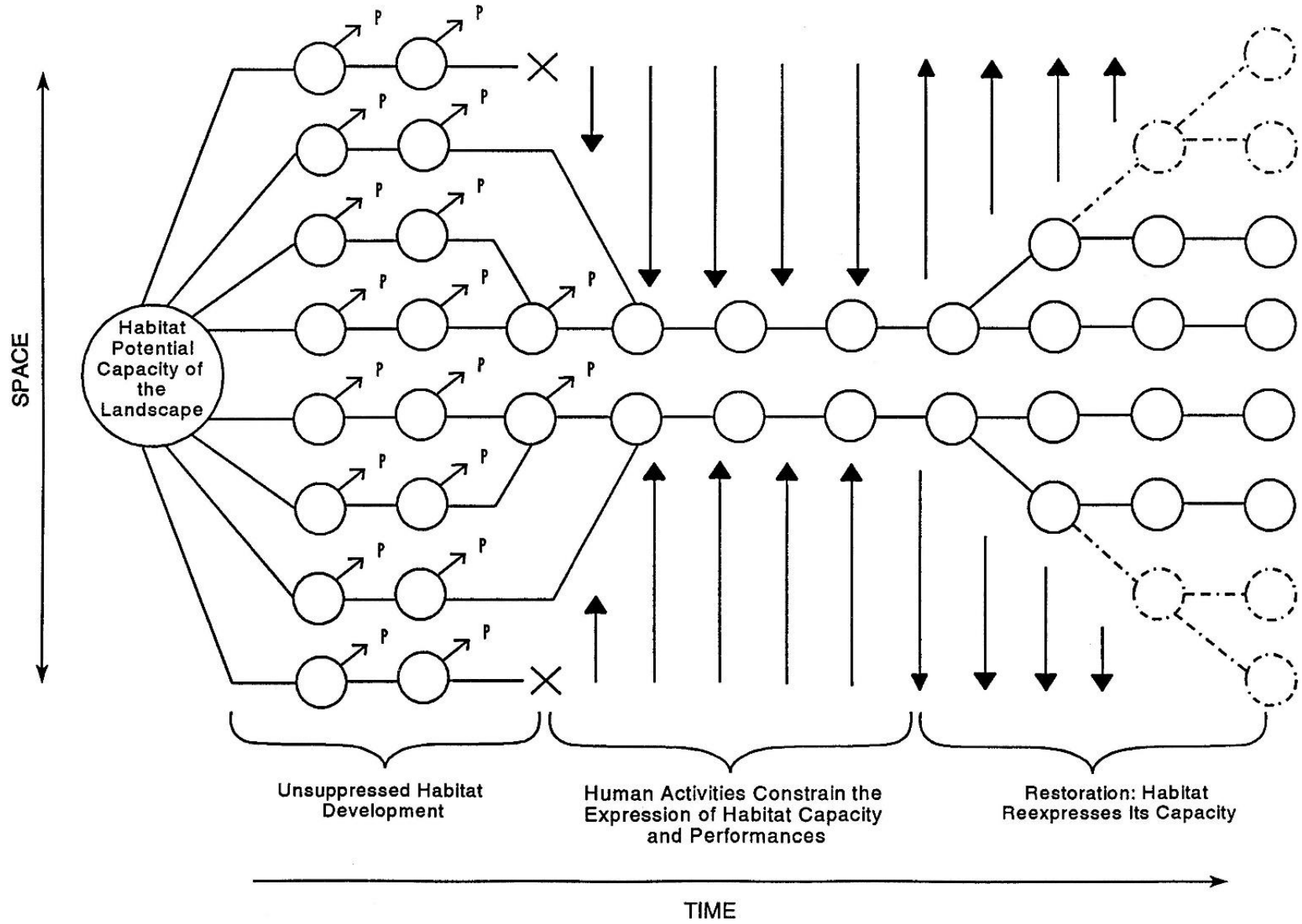
Natural disturbance events that influence salmonid populations throughout their range include:

- **fires**
- **landslides**
- **glaciers**
- **earthquakes**
- **volcanic eruptions**
- **floods**

Anthropogenic constraints that can influence the ability of salmonid populations to track changes in environmental conditions include:

- urbanization
- land management activities
- fire (magnitude, frequency, intensity)
- water diversion and withdrawal
- flooding (magnitude, frequency)




SPACE
Habitat Potential Capacity of the Landscape
P
Unsuppressed Habitat Development
Human Activities Constrain the Expression of Habitat Capacity and Performances
Restoration: Habitat Reexpresses Its Capacity
TIME

To be viable (i.e., persist) – fish need to be able to track changes in environment

- **Individuals (within and between life stages)**
- **Populations**
- **Groups of populations**
- **Species**

Tracking a dynamic and changing environment

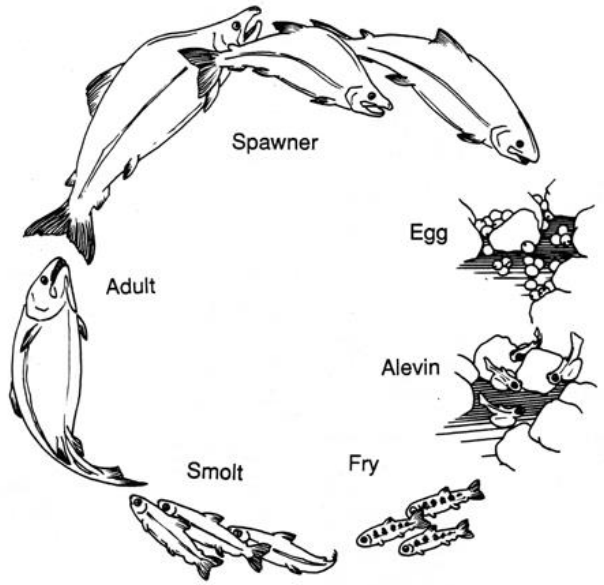
- **animals (and plants, etc.) do it – salmon do it**
- **individuals, populations, groups of populations**
- **movement across the landscape / connectivity**

- **Straying by adults**
- **Relatively high fecundity**
- **Juvenile dispersal**
- **Distribution of run-timing**
- **Distribution of age at ocean entry**
- **Overlapping generations *(Chinook and steelhead, coho to some degree)***
- **Life-history types / ecotypes**

Salmonid Life Cycle

Freshwater

Marine



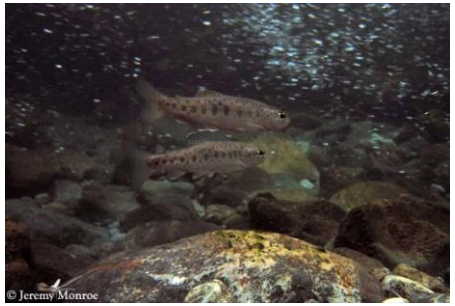
Estuarine

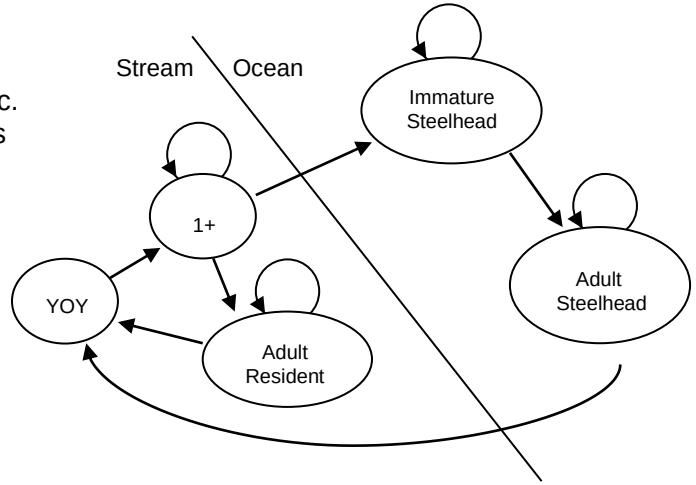
Study design - population dynamics

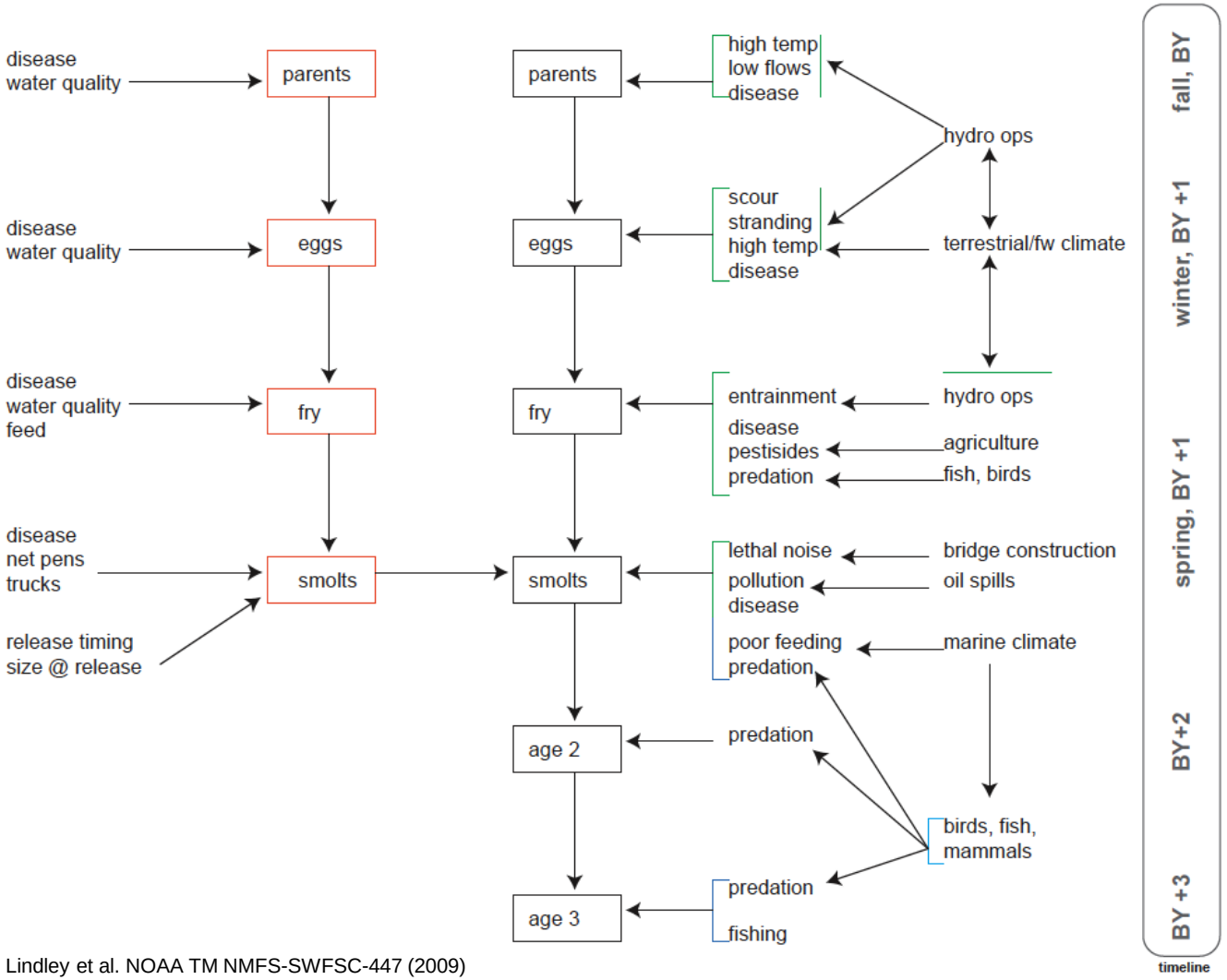
Population modeling:

- Analyze tagging data with capture-recapture models
  - abundance, survival, and transition rates among size/age classes
  - non-anadromous vs. anadromous pathways
  - residence times in stream/ocean

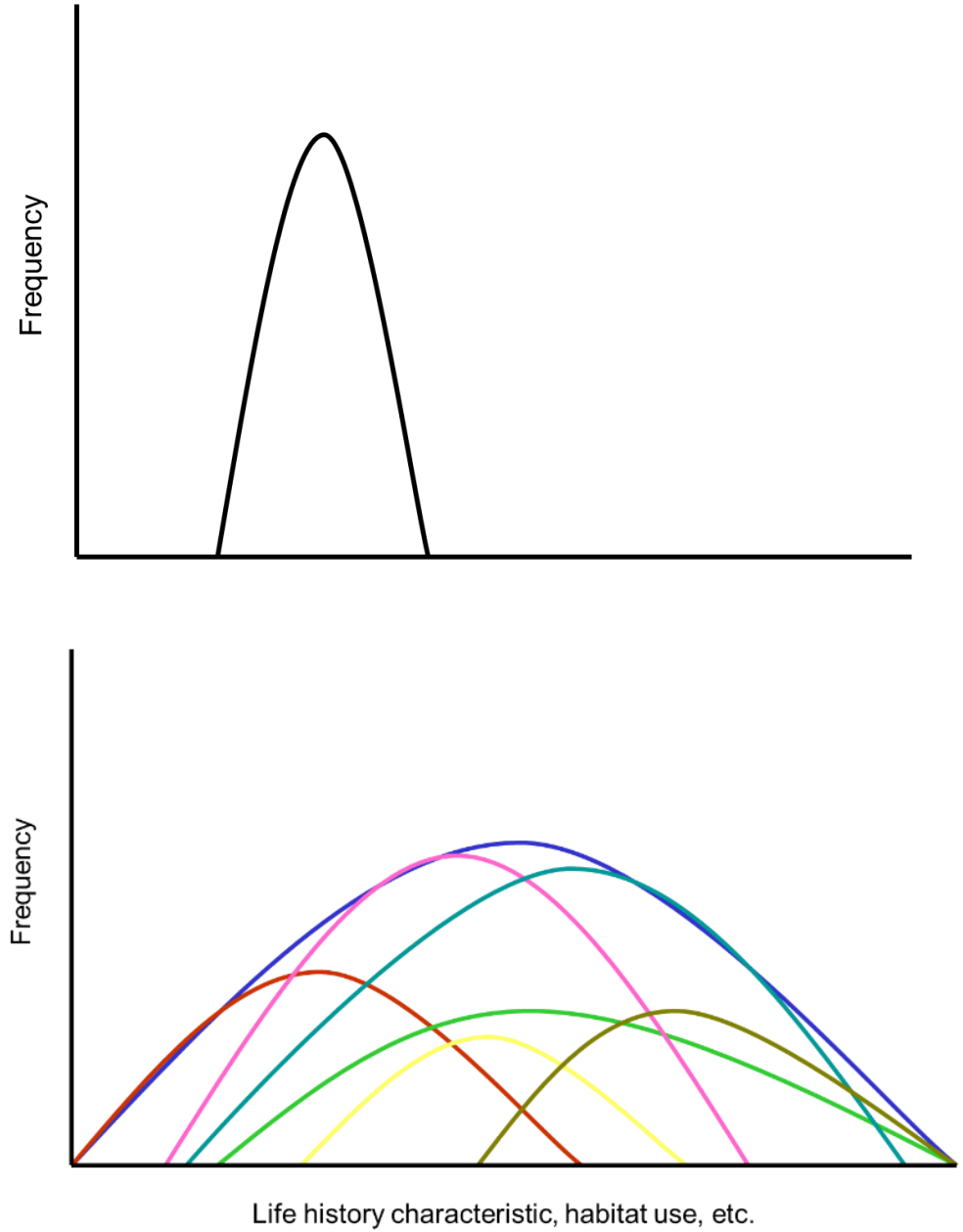
- Life-cycle based population model
  - population growth rate
  - simulate population dynamics
    - longer time frames
    - effects of changes to specific life stages, metapopulations, etc.
    - resilience and critical life stages

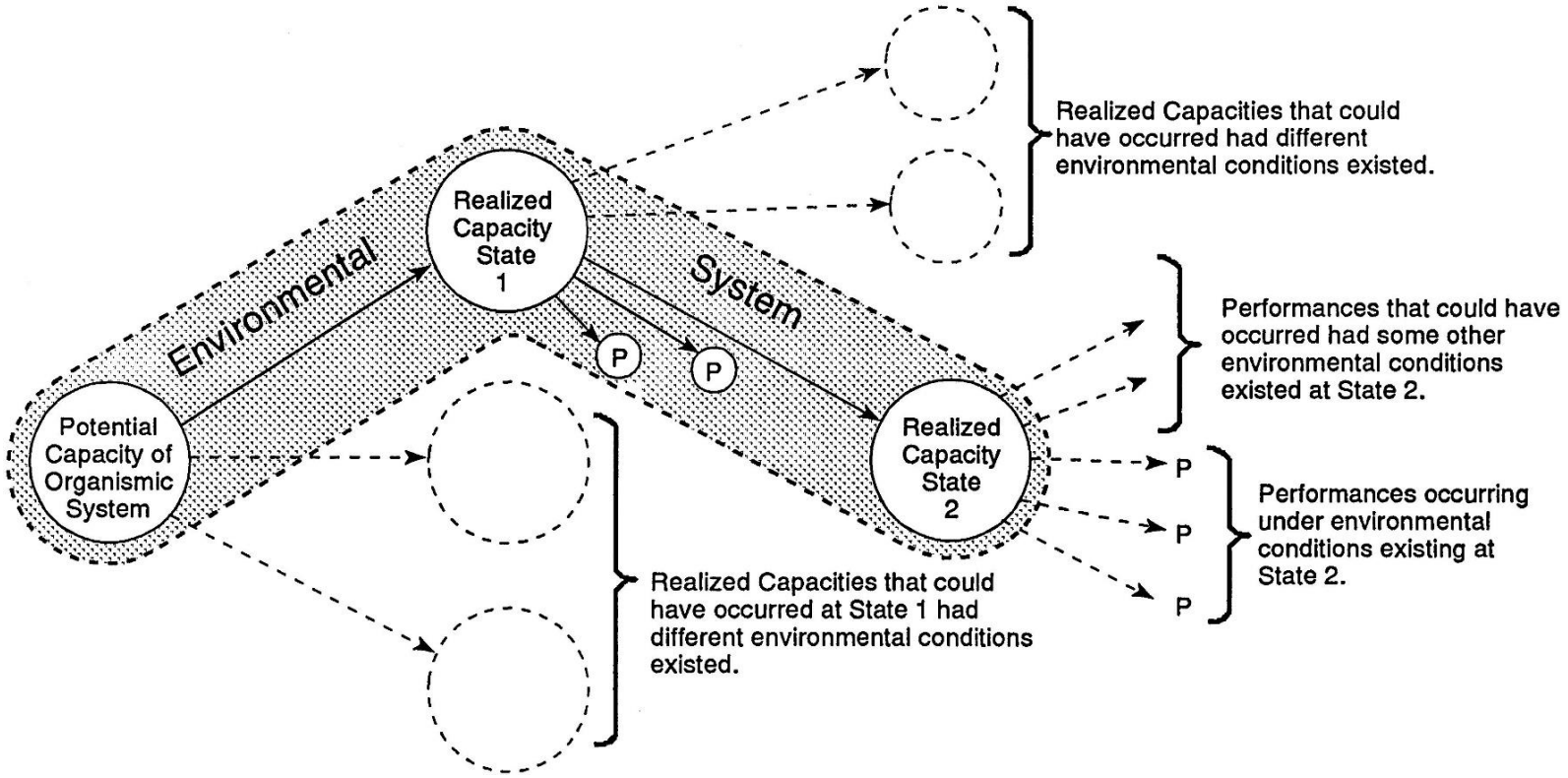




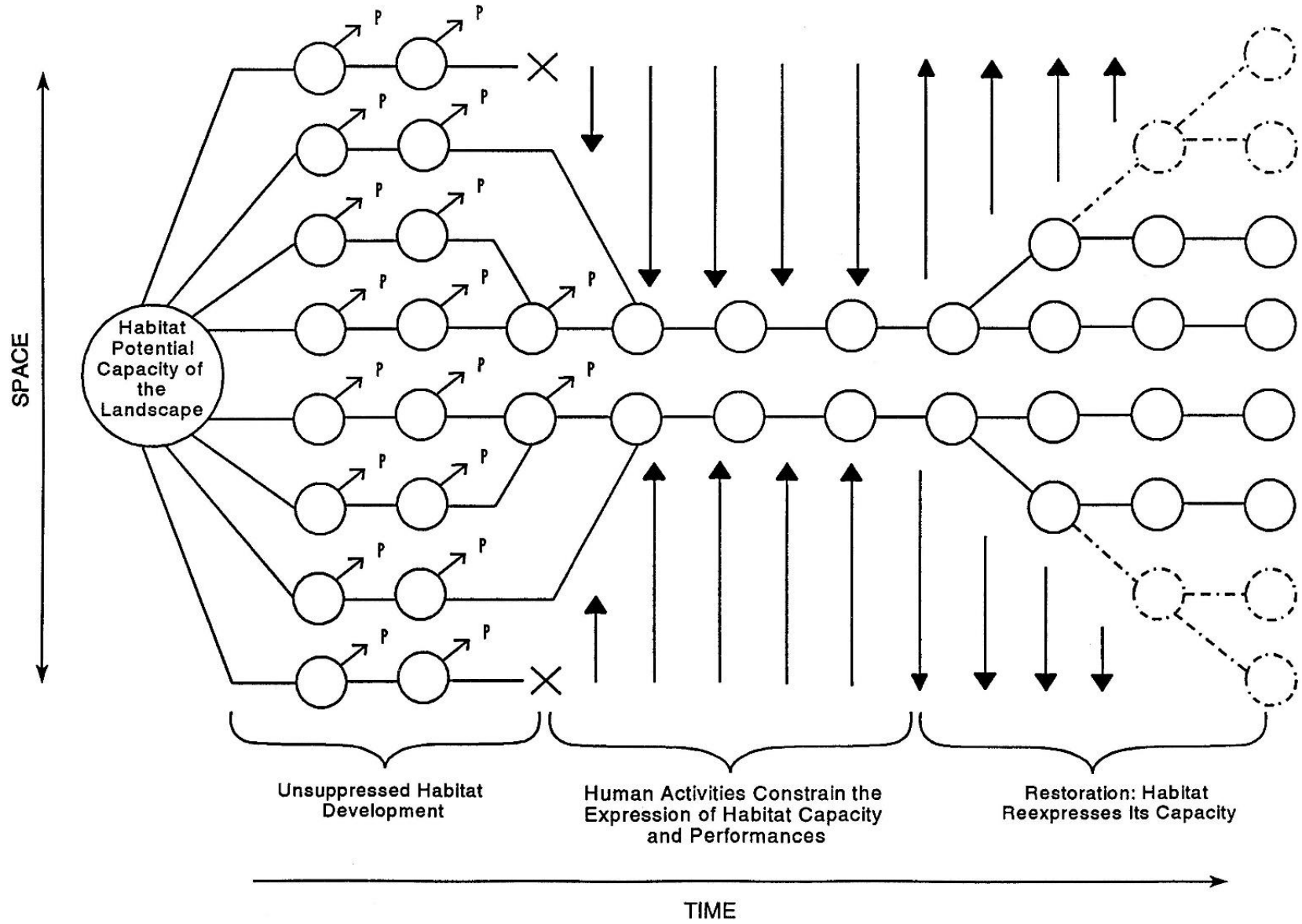


Lindley et al. NOAA TM NMFS-SWFSC-447 (2009)


Frequency
Frequency
Life history characteristic, habitat use, etc.

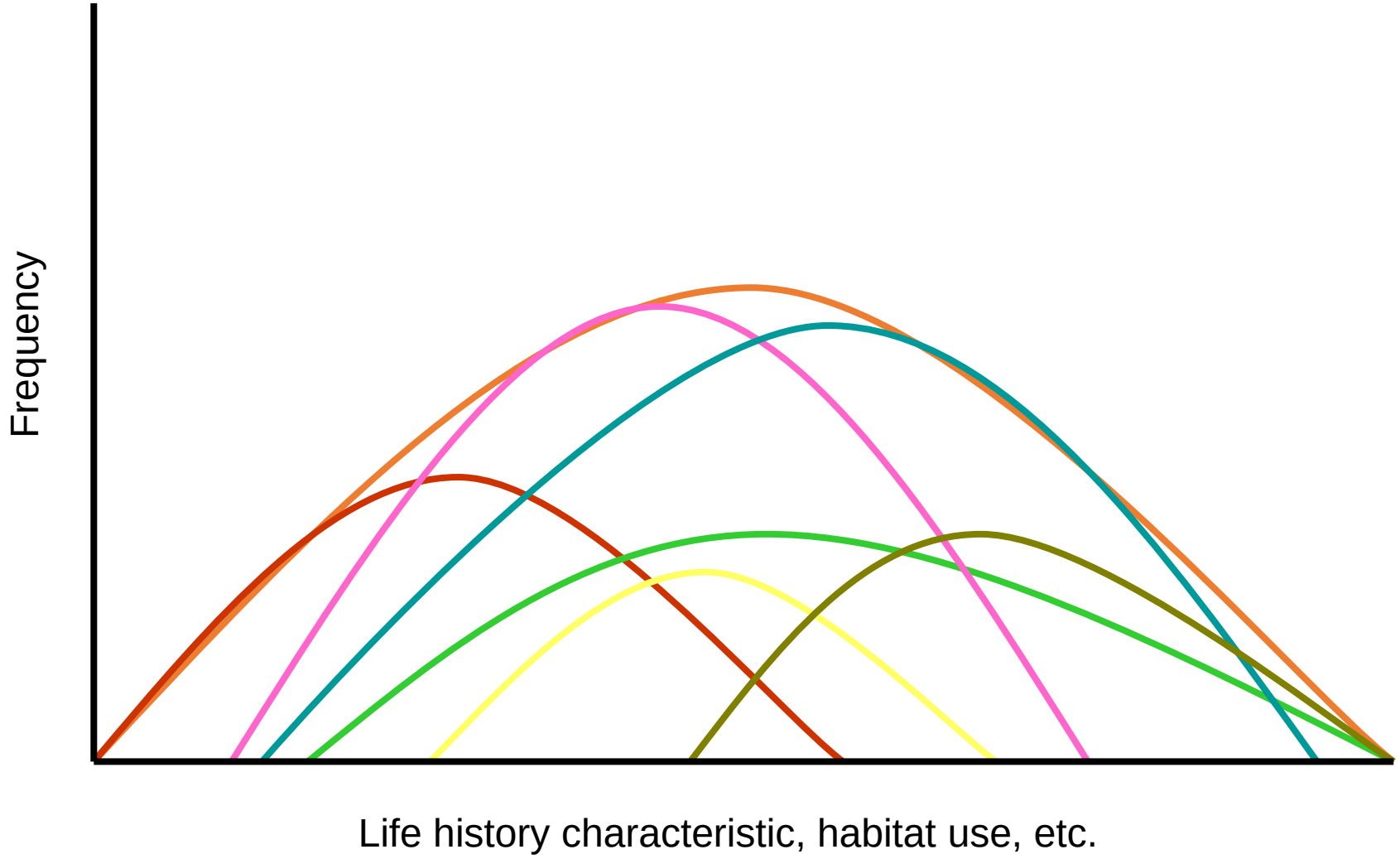


From Ebersole et al. 1997. Envir. Mgt. 21:1-14.


SPACE
Habitat Potential Capacity of the Landscape
P
Unsuppressed Habitat Development
Human Activities Constrain the Expression of Habitat Capacity and Performances
Restoration: Habitat Reexpresses Its Capacity
TIME

To be viable (i.e., persist) – fish need to be able to track changes in environment

- **Individuals (within and between life stages)**
- **Populations**
- **Groups of populations**
- **Species**


Frequency
Life history characteristic, habitat use, etc.

Used with permission: Ray Troll

Klamath River Basin PIT Tagging Database

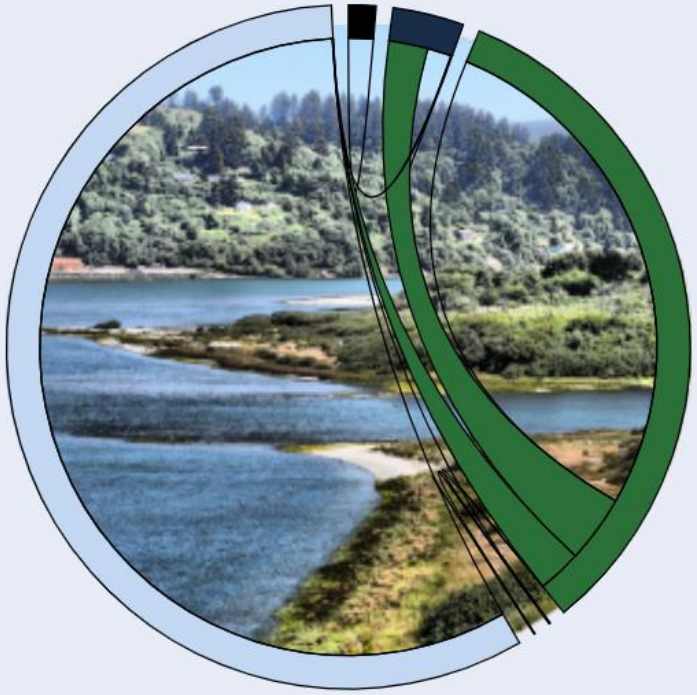
Database Development

Web Interface Tool

Collaboration

Data Pipeline

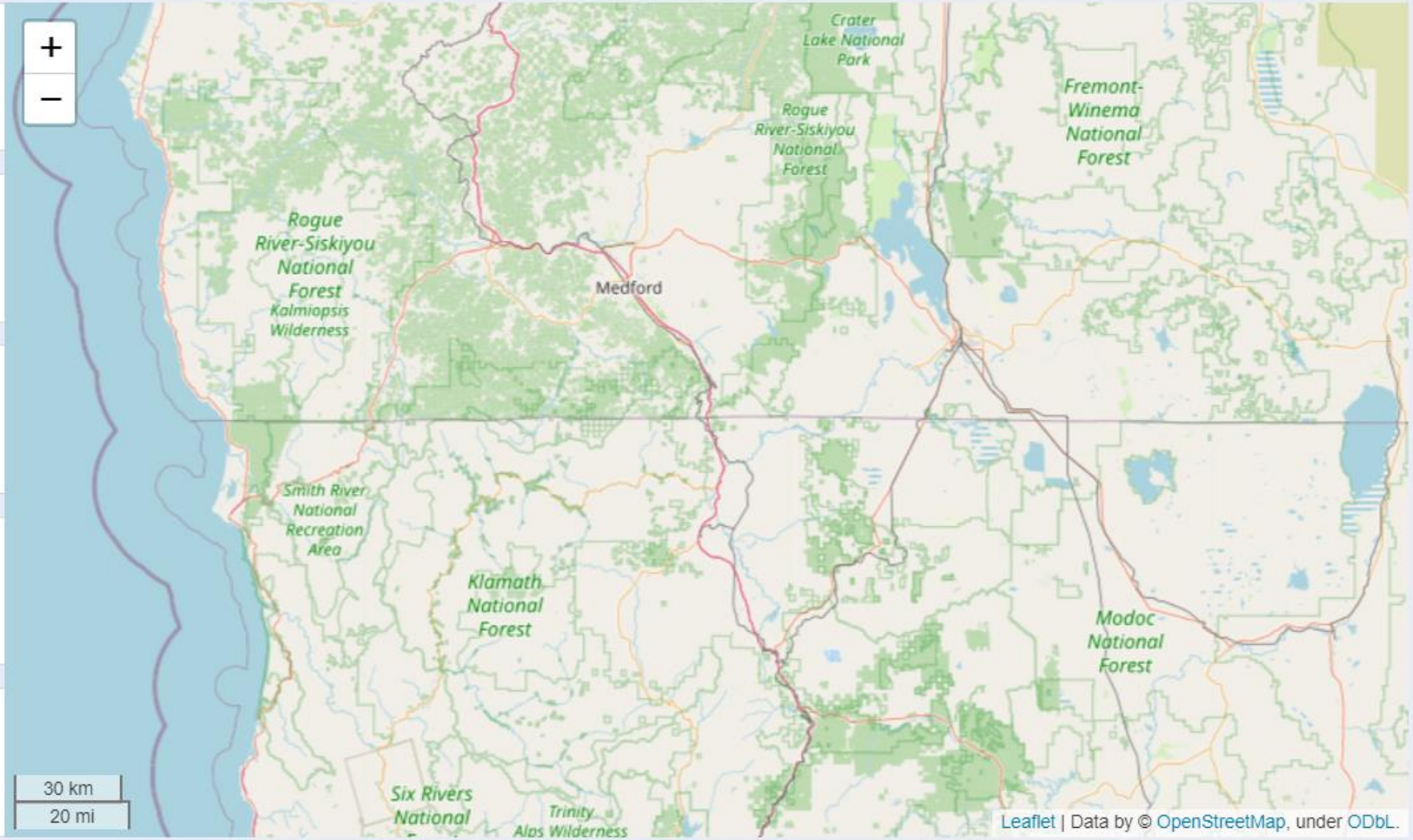
Future of the Project



A database application to facilitate the sharing and understanding of PIT tag data in the Klamath River Basin of Southern Oregon and Northern California.

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project



Klamath River Basin PIT Tagging Database

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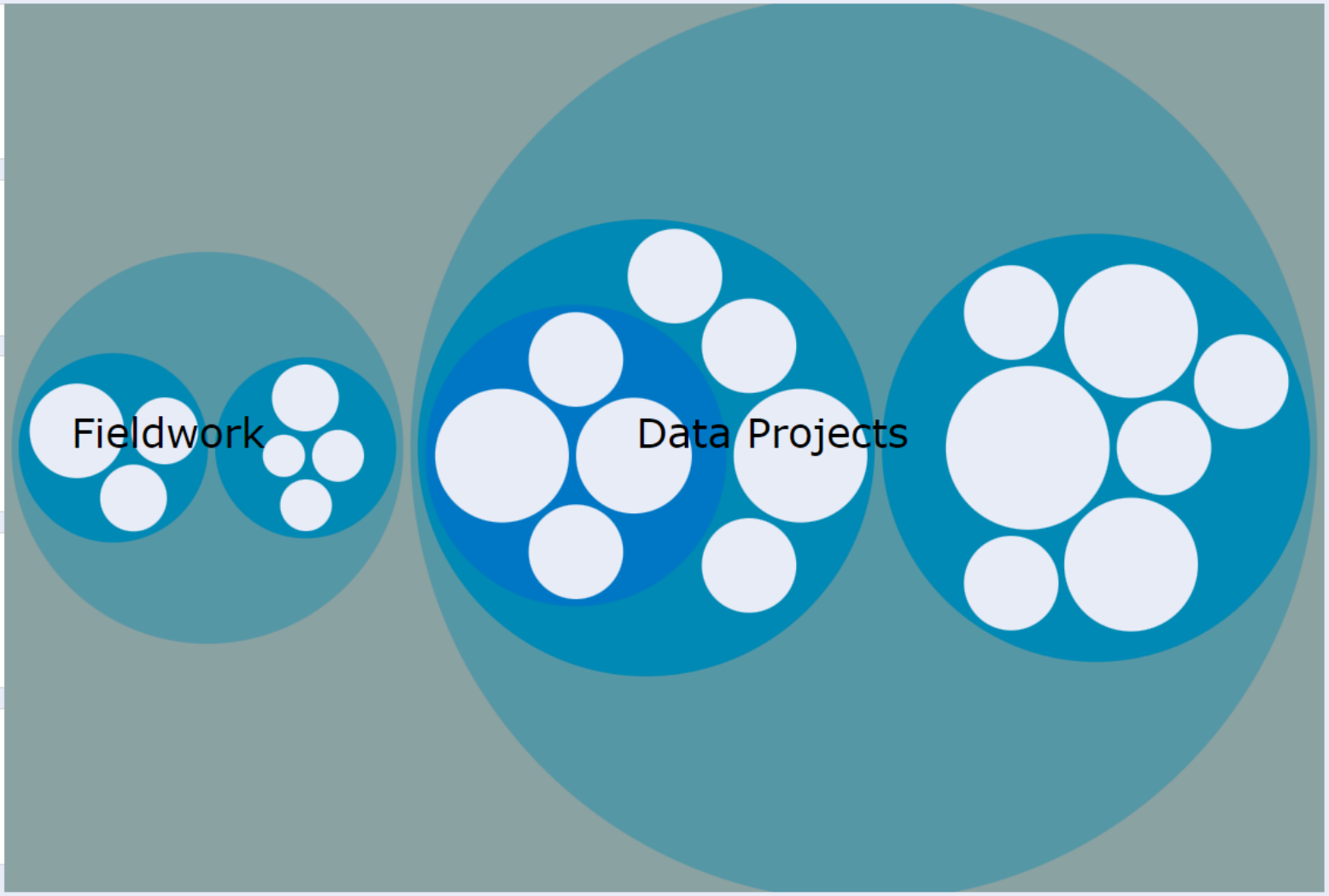
- Future of the Project



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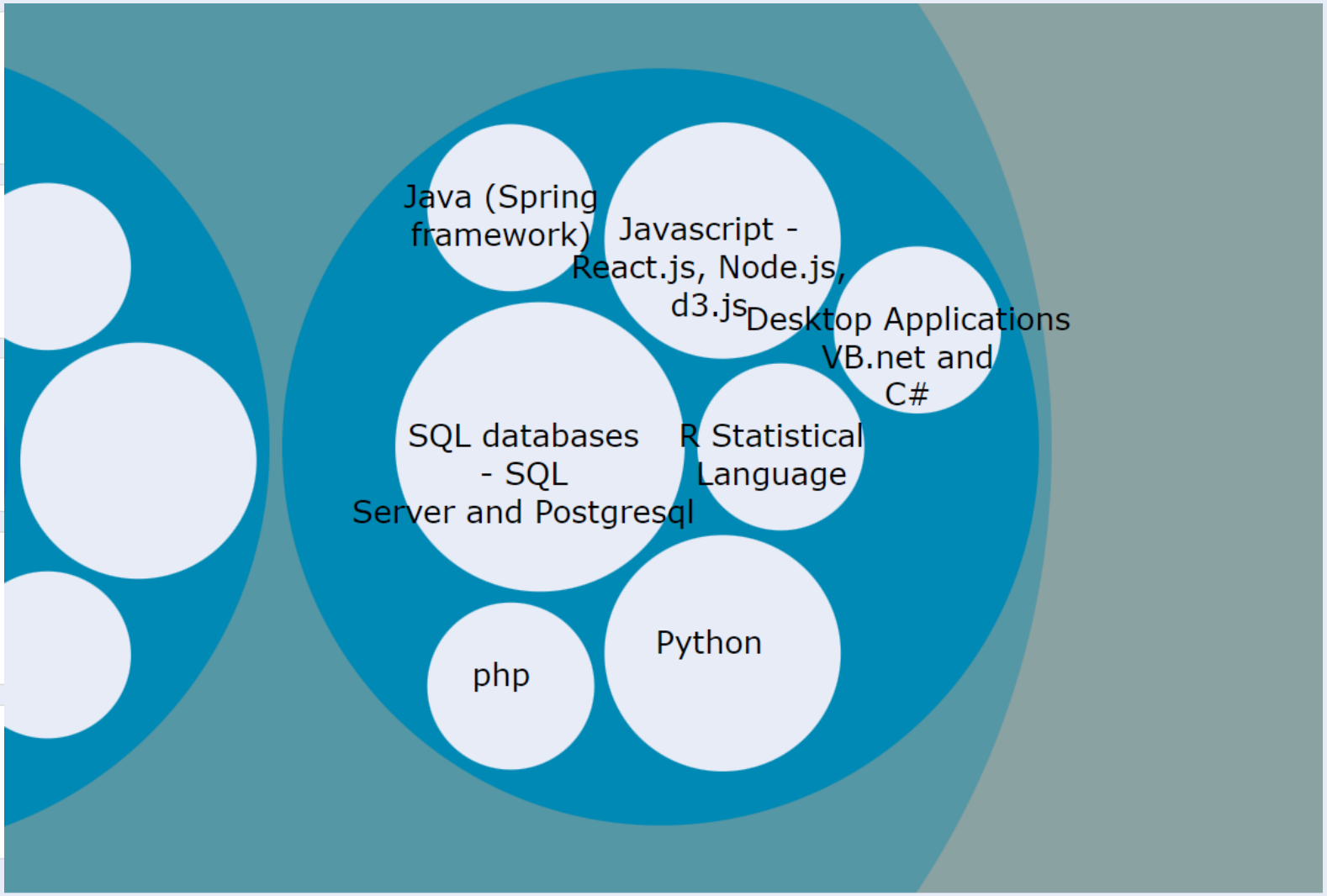


Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

- To curate and disseminate ecological data with the hope that our efforts will aid in the recovery of endangered species.
- To produce novel solutions to data related issues that ensure the quality and accessibility of our data without making things more difficult for the people collecting it.

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

Planning and development of the Klamath River Basin(KRB) PIT tagging database began in 2009.

- Not a software product
- Dataset is the most important asset
- Communication is imperitive for success

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

★ Database

★ Data Pipeline

🛠 Web Interface

👤+ Database Working Group

👤+ Data Sharing Agreement

👤+ Meetings

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

- Agency Home Page
- Administrator Home Page

Klamath River Basin PIT Tagging Database

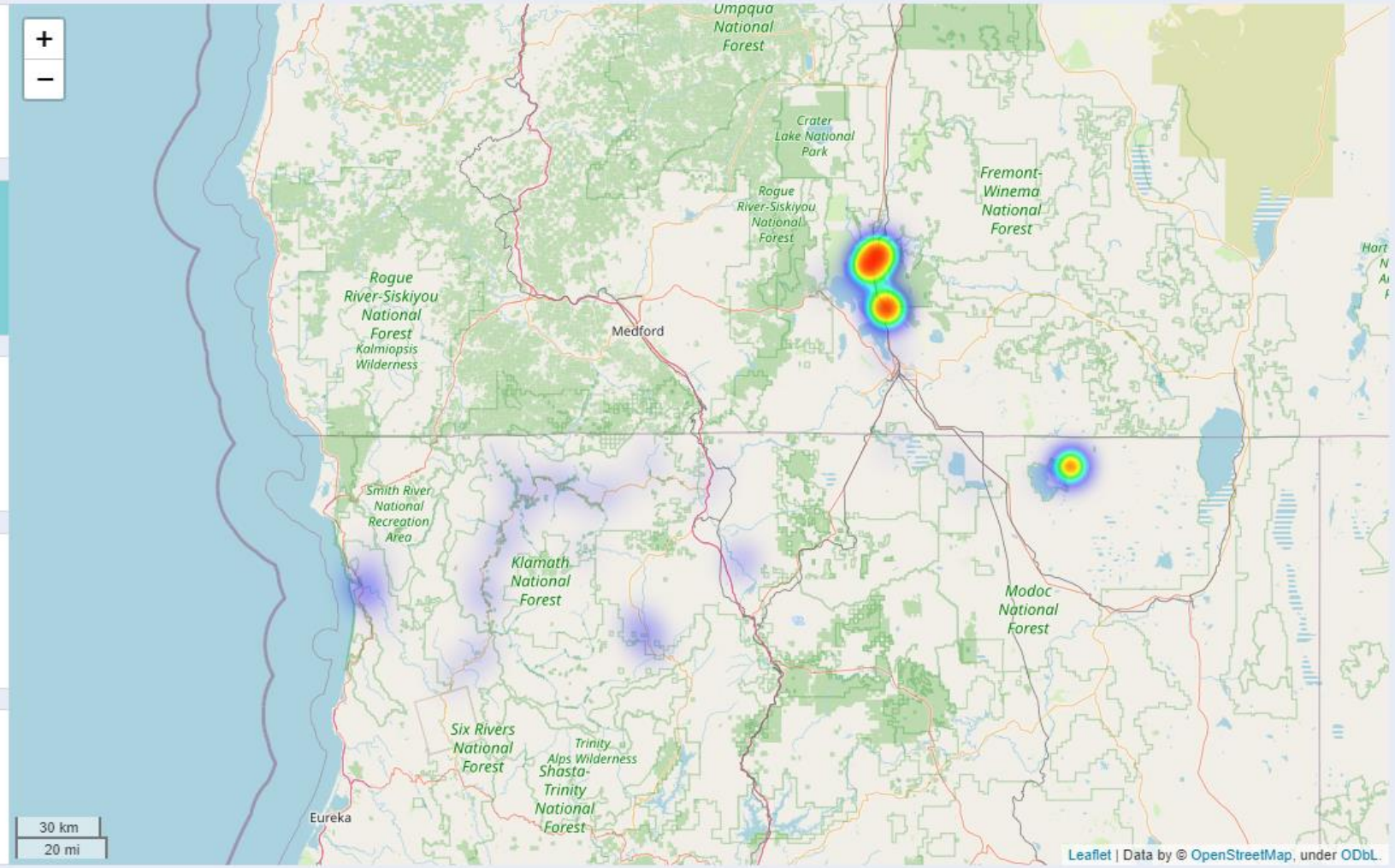
- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

Home **Summary Data** **My Fish Summaries** **Remote Time Series** **Browse My Data**

Explore Maps **Submit Data** **Tag Lookup** **Build Query** **Logout**

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project



Klamath River Basin PIT Tagging Database

Database Development

Web Interface Tool

Collaboration

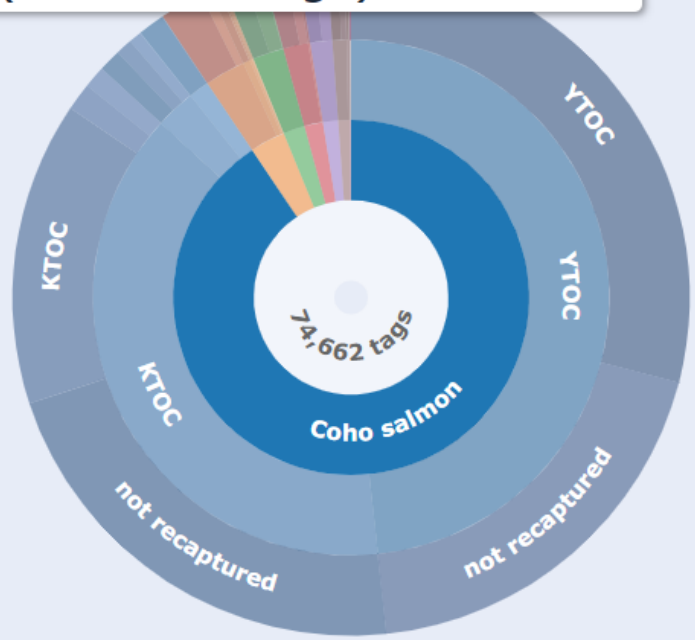
Data Pipeline

Future of the Project

species: 67,646 tags

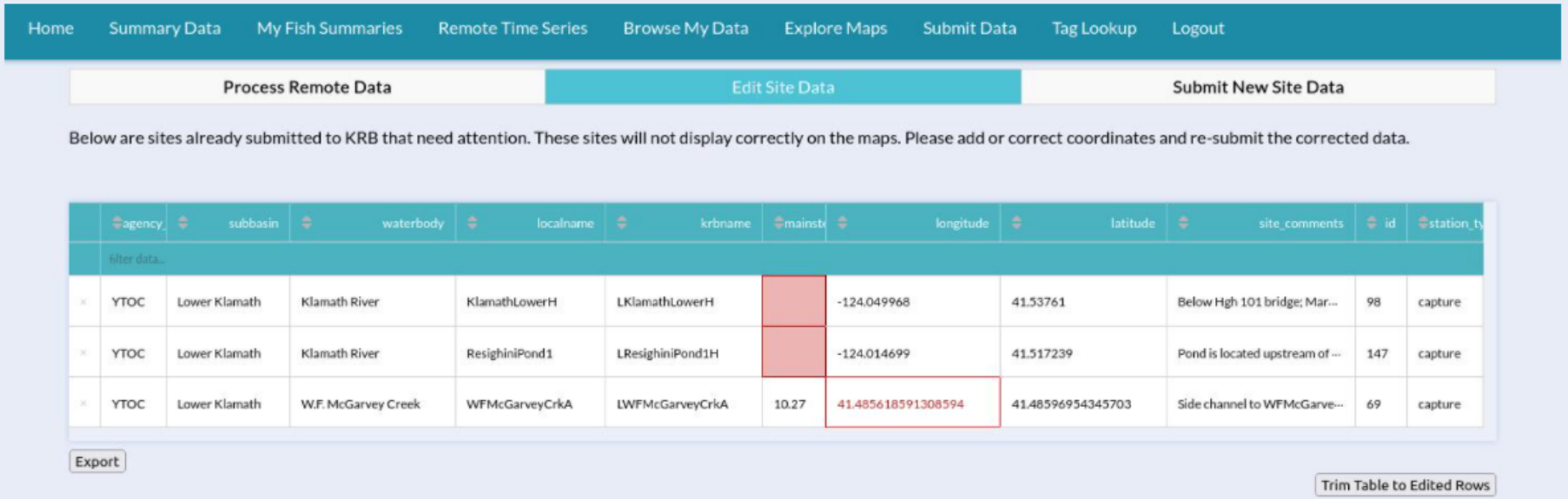
Coho salmon 90.6%

67,646 Coho salmon tags released
67,646 tags released by Coho salmon
(90.6% of tags)



Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project



Klamath River Basin PIT Tagging Database

- Database Development
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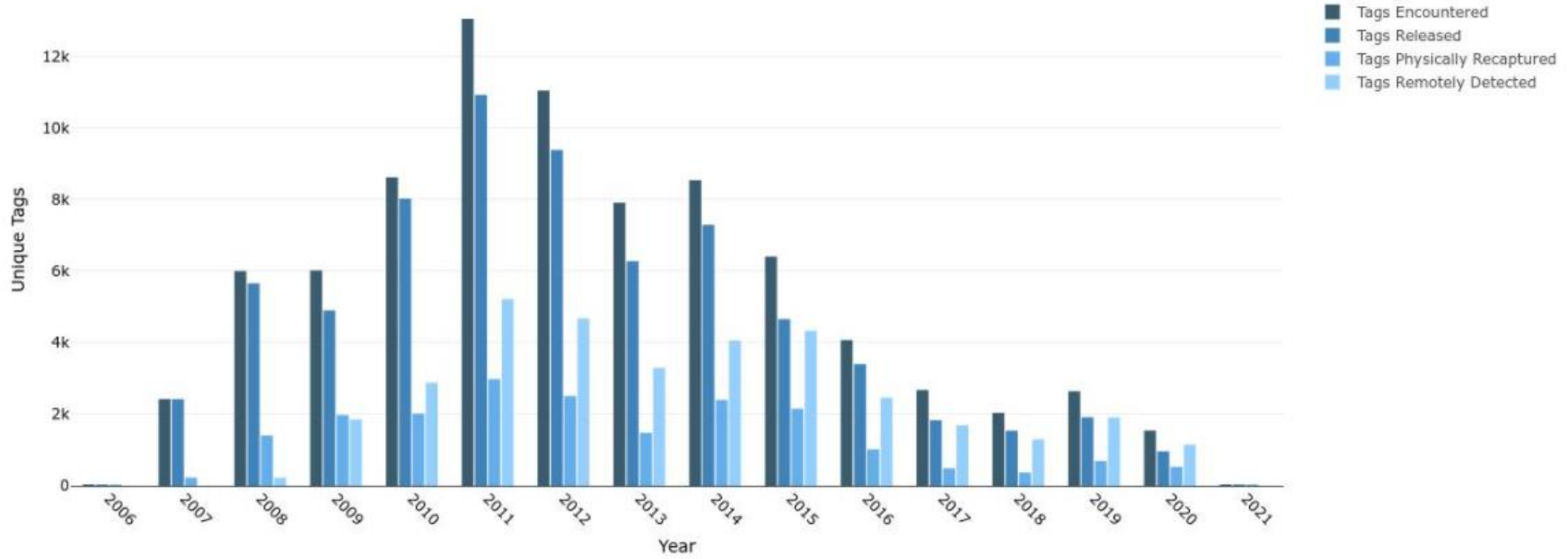
- Future of the Project



Klamath River Basin PIT Tagging Database

Database Development

Web Interface Tool

Collaboration

Data Pipeline

Future of the Project

- Data Sharing Agreement
- Klamath Basin Fisheries Collaborative Spring Meeting
- Project Roadmap
- Electronic Data Entry
- Capture Remote Site and Outage Information
- Array Site Selection

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

★Database

Access tools

Backlog
Metadata
Tagging Data
Remote Files

Administrator tools
User Interface

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

- Remote Files
- Tagging Data
- Site Information
- Remote Outage Information

Klamath River Basin PIT Tagging Database

Database Development

Web Interface Tool

Collaboration

Data Pipeline

Future of the Project

- Administrator Interface
- File Transfer Package
- Electronic Data Collection Application (tagging data)

Klamath River Basin PIT Tagging Database

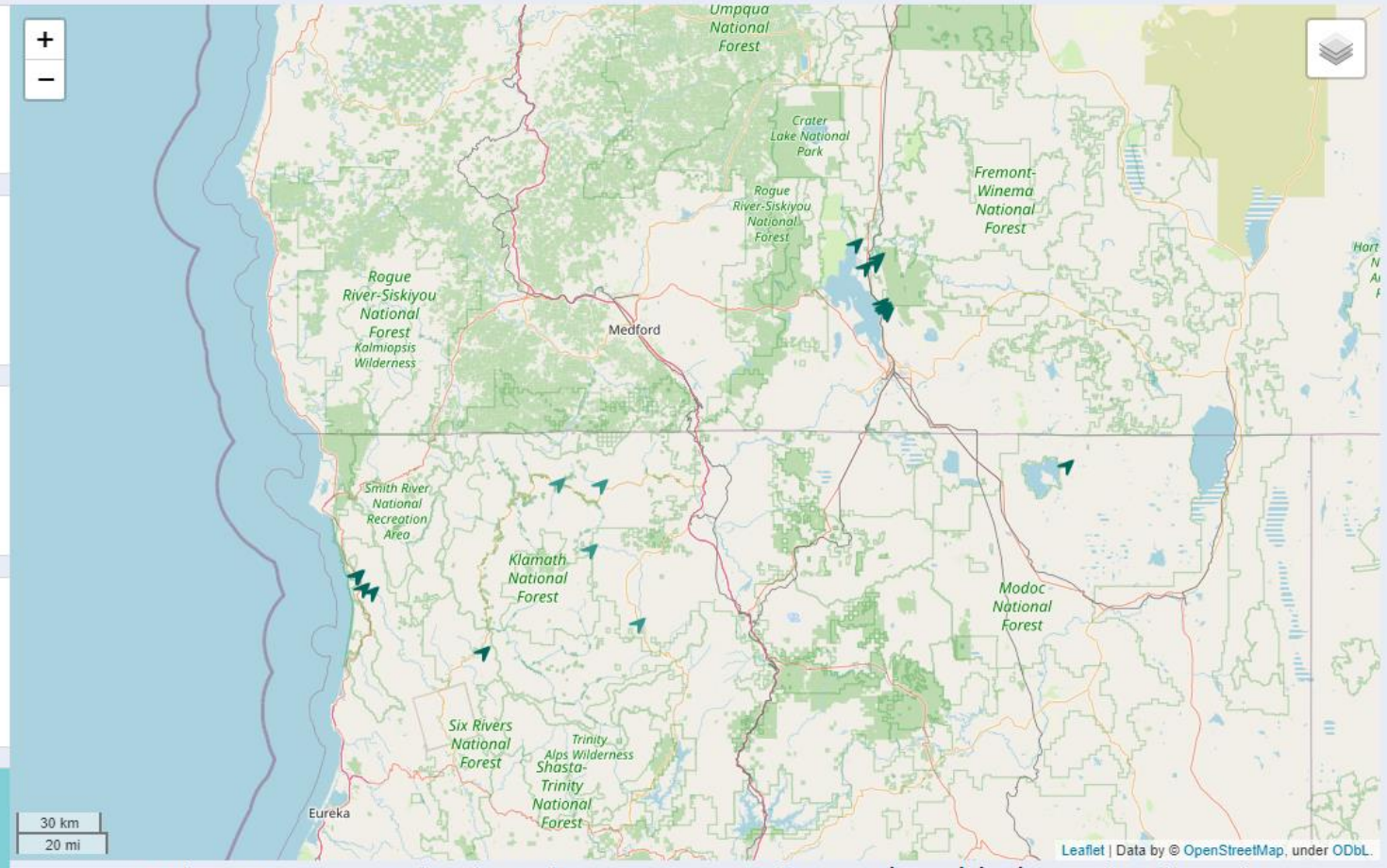
Database Development

Web Interface Tool

Collaboration

Data Pipeline

Future of the Project



Longterm monitoring sites

Potential sites

Recently added monitoring sites

Potential sites with dam removal

Klamath River Basin PIT Tagging Database

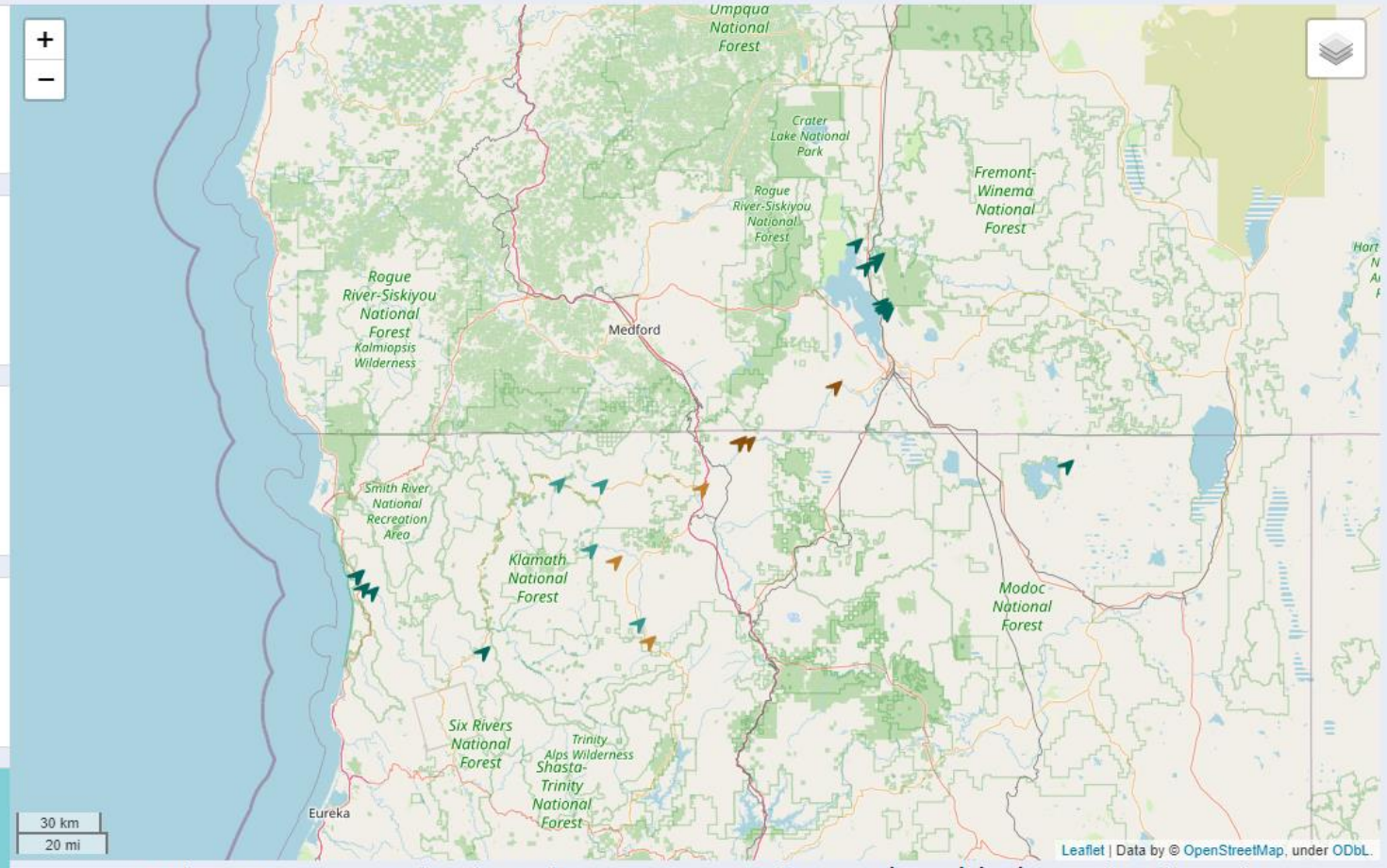
Database Development

Web Interface Tool

Collaboration

Data Pipeline

Future of the Project



Longterm monitoring sites

Potential sites

Recently added monitoring sites

Potential sites with dam removal

Using PIT tags to monitor Coho Salmon restoration effectiveness in the Scott River

Erich Yokel

Darrell Mitchell

Charnna Gilmore & Betsy Stapleton

Scott River Watershed Council

The SRWC Gratefully Acknowledges our Funders and Collaborators

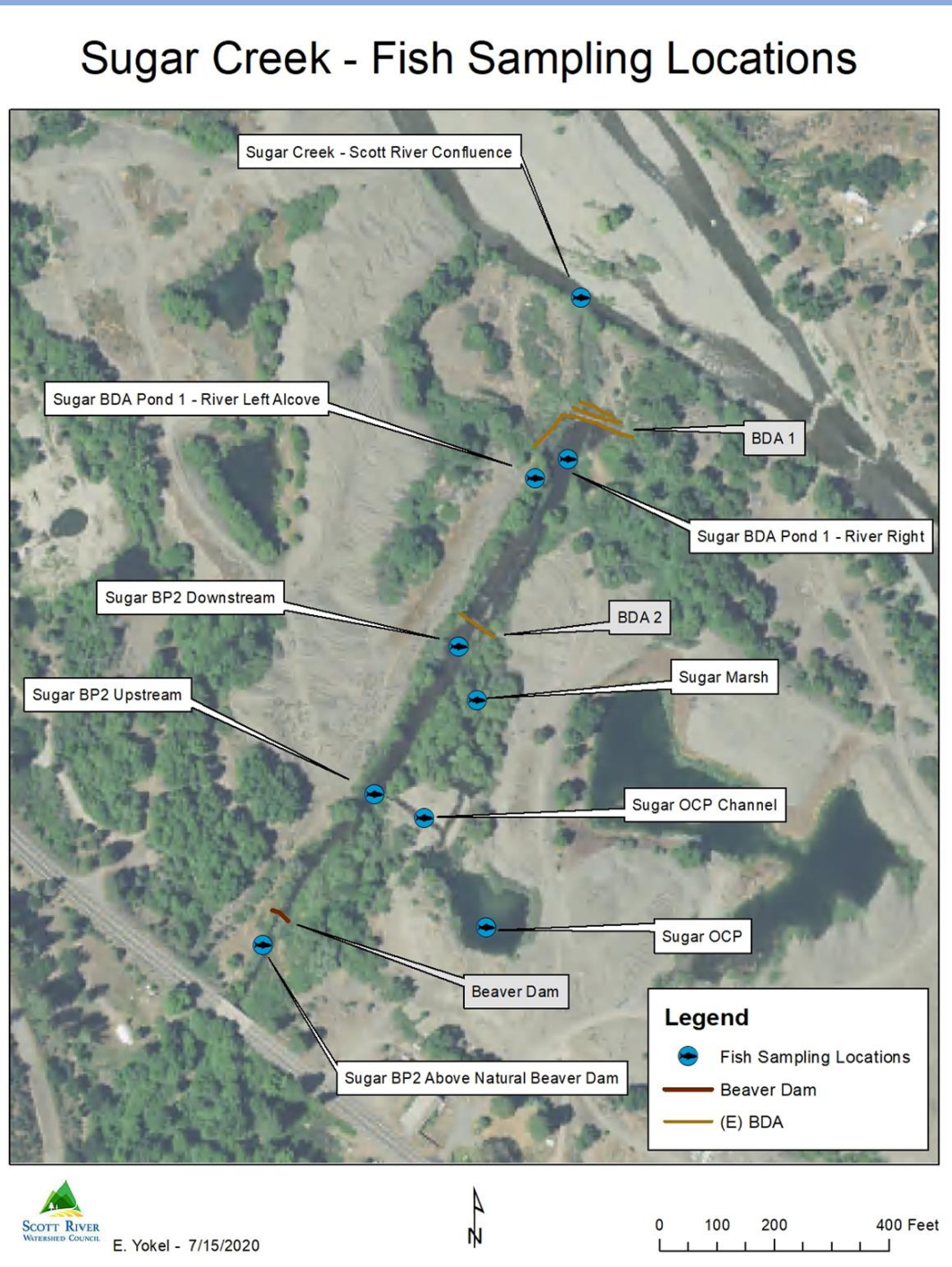
Bella Vista FOUNDATION

Scott Valley Landowners

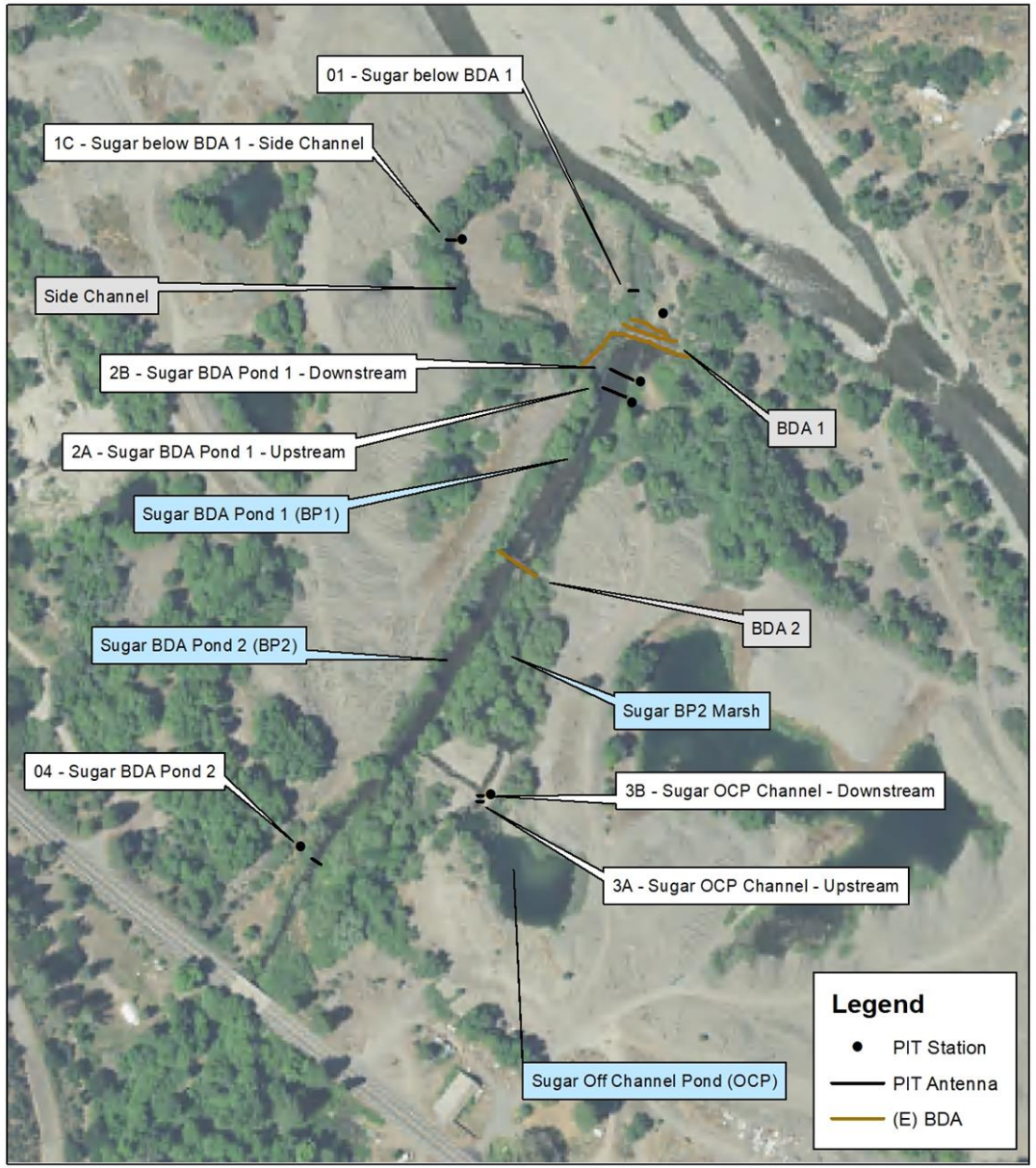
Sugar Creek BDA Complex

Sugar BDA 1.0 & 1.1
HSU Fish Passage
Experiment - 2019

Beaver Dam



Sugar Creek - PIT Array Network



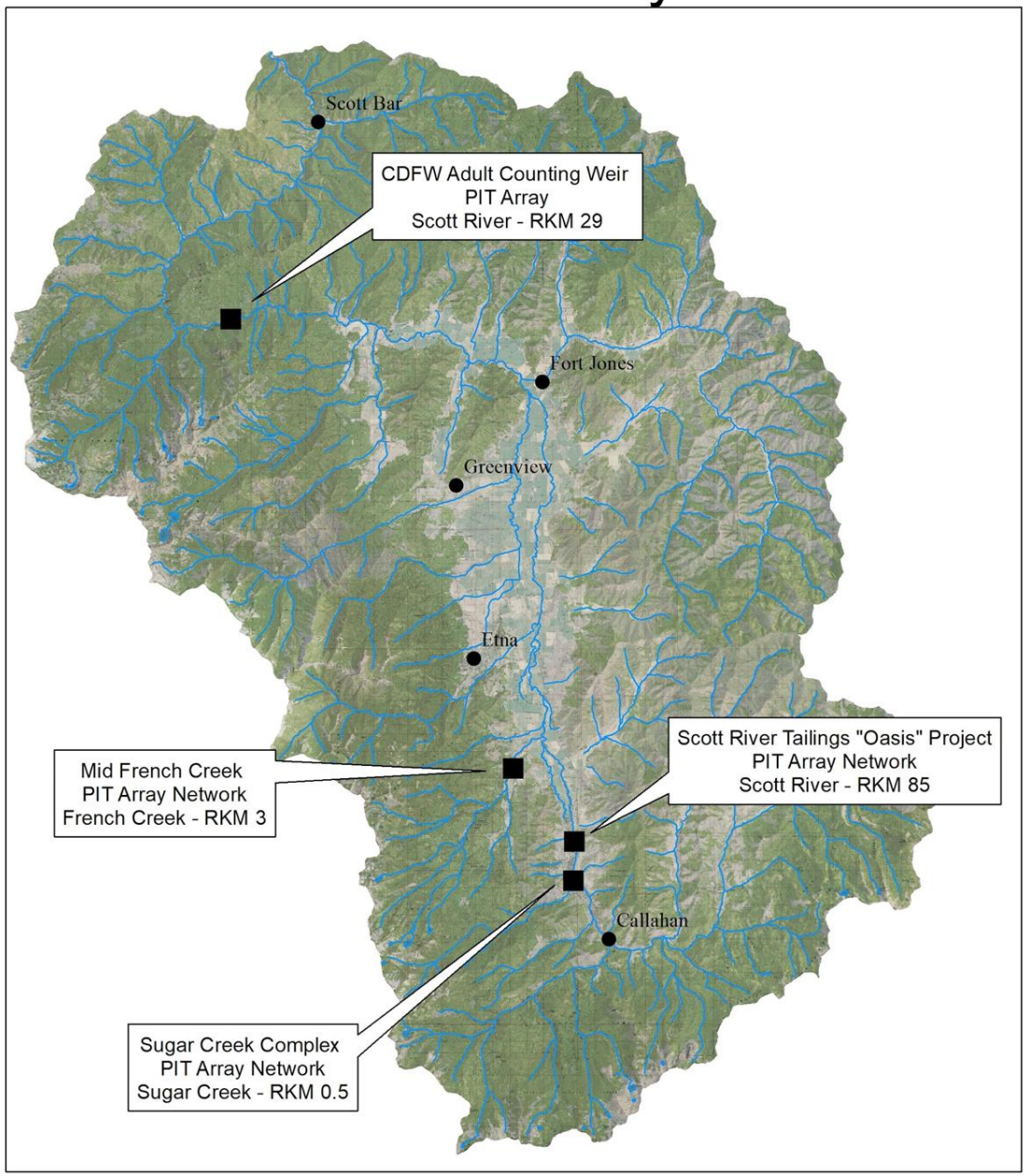
Scott River Watershed Council

E. Yokel - 5/21/2020

N

0 100 200 400 Feet

Scott River PIT Array Stations



Scott River Watershed Council

E. Yokel - 2/14/2022

N

0 2.5 5 10 Miles

CDFW Adult Escapement Video Weir - Scott River RKM 29.0

CDFW installed PIT array on Scott River adult video weir in 2019

Coalition of the Willing (COW) supports funding for PIT array on adult escapement weirs on Scott River and Shasta River

Installed arrays on Scott and Shasta weirs on 2020-21 & 2021-22

Detected 2 PIT tags on Shasta River weir – 1) Karuk tag & 2) Currently Unknown

During the adult escapement in 2021-2022, 24 PIT tagged Coho Salmon were detected in the Scott River

20 of the adults (83%) were tagged by the SRWC in the Scott River
4 were tagged by the Karuk Tribe in Mid Klamath restoration projects

Marked 2004 Coho Salmon in Sugar Creek with PIT tags in 2019 - 2020
Operated 7 PIT arrays in Sugar
100,000s of detections in one cohort

Track juvenile movement of PIT tagged fish on arrays
Detect individual fish on arrays entering and exiting Sugar OCP Outlet

Begin Date	End Date	Movement	Days
1/10/2020 12:00	1/13/2020 17:57	BDA Pond 2 to Downstream Beaver Dam	3
1/13/2020 17:57	1/14/2020 18:29	DS Beaver Dam to Sugar OCP Outlet	1
1/14/2020 18:29	3/14/2020 1:00	Between Sugar OCP and BDA Pond 2	59
3/14/2020 1:00	4/15/2020 19:43	BDA Pond 2	33
4/15/2020 19:43	4/20/2020 19:34	Sugar OCP Outlet to DS Beaver Dam	5
4/21/20 19:58	4/22/2020 20:16	DS Beaver Dam to Downstream BDA 1	1

PIT Tagged Coho Salmon - 989001032565987
Utilization of Sugar Off Channel Pond

		Duration in OCP	
Date Enter OCP	Date Exit OCP	Days	Hours
1/14/2020 22:14	1/15/2020 18:20	0.8	20
1/16/2020 3:00	1/16/2020 17:59	0.6	15
1/17/2020 2:16	1/17/2020 17:30	0.6	15
1/18/2020 2:30	1/18/2020 17:35	0.6	15
1/19/2020 2:50	1/19/2020 17:39	0.6	15
1/23/2020 6:36	1/23/2020 18:35	0.5	12
1/25/2020 4:22	1/25/2020 16:44	0.5	12
1/28/2020 7:08	1/28/2020 17:38	0.4	10
2/6/2020 6:35	2/11/2020 18:14	5.5	132
2/12/2020 18:31	2/13/2020 17:59	1.0	23
3/5/2020 4:13	3/5/2020 18:16	0.6	14
3/5/2020 18:45	3/6/2020 18:36	1.0	24
3/10/2020 3:13	3/10/2020 18:56	0.7	16
3/10/2020 21:20	3/11/2020 5:47	0.4	8
3/11/2020 19:22	3/12/2020 3:56	0.4	9
3/12/2020 4:21	3/12/2020 18:55	0.6	15
3/12/2020 19:22	3/14/2020 0:59	1.2	30

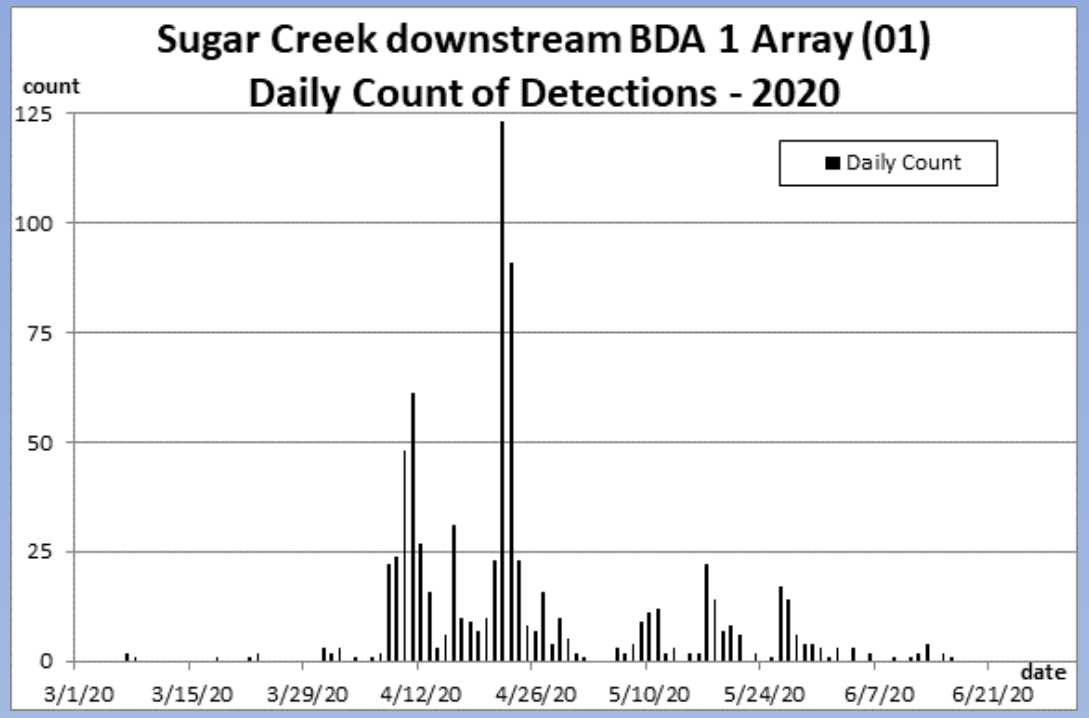
PIT Tagged adult returns – Scott and Shasta CDFW Weirs

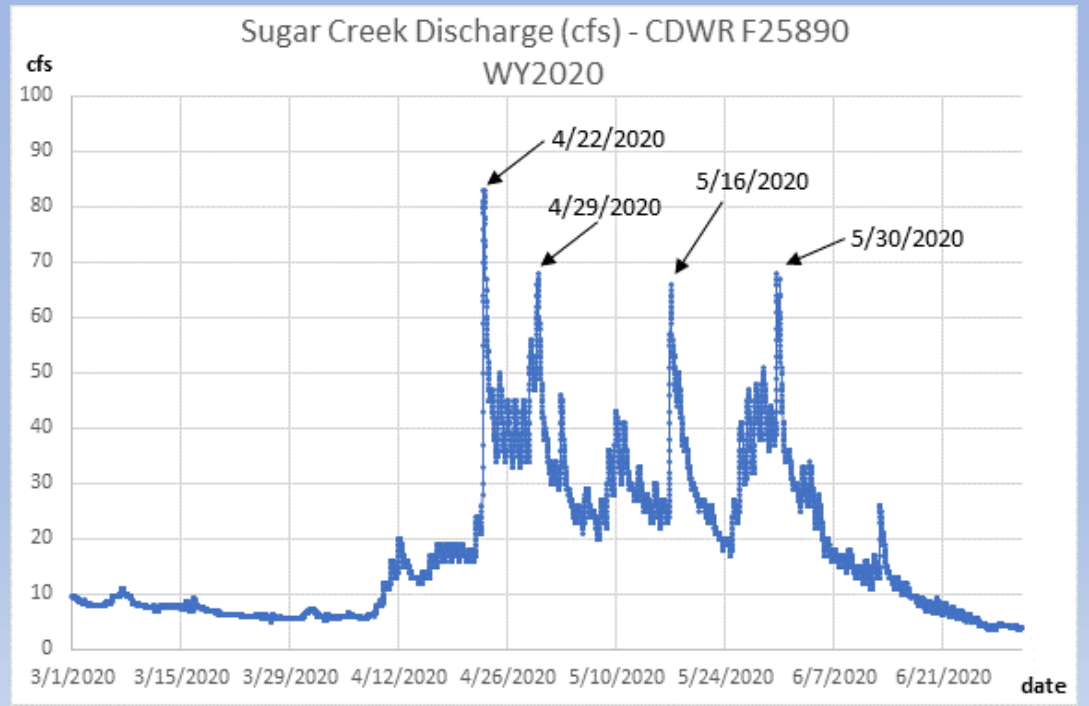
PIT_No	Tagged Date	First Array Detection	Sample	Tag Location
989001027743125	7/31/2019	Scott Weir	Sugar - BDA1 - Above	Sugar
989001027743076	7/31/2019	Sugar 1	Sugar - BDA1 - Above	Sugar
989001027743359	7/31/2019	Sugar 1	Sugar - BDA1 - Above	Sugar
989001007222252	8/15/2019	Scott Weir	China Creek - Karuk	Mid Klamath
989001030719028	8/22/2019	French 10	French Control Pool 1 - DS Log Jam	French
989001030719030	8/22/2019	Scott Weir	French Creek - ELJs - DS ELJ 3	French
989001030719206	8/22/2019	Scott Weir	French Control Pool 3	French
989001030719244	8/22/2019	Scott Weir	French Control Pool 2	French
989001030719358	8/26/2019	Oasis Mainstem	Sugar Creek BP2	Sugar
989001030719595	8/27/2019	Sugar 1	Sugar Creek Control - Above Beaver Dam	Sugar
989001028156906	9/24/2019	Sugar 1	French Creek - ELJs - US ELJ1	French
989001028156762	9/27/2019	Sugar 1	Sugar - BP2 above Nat. Beaver Dam	Sugar
989001028156787	9/27/2019	Scott Weir	Sugar - BP2 above Nat. Beaver Dam	Sugar
989001031380909	10/29/2019	Scott Weir	French Control Pool 4	French
989001031380674	10/31/2019	Sugar 1	Sugar BDA1 RR	Sugar
989001031380948	10/31/2019	Scott Weir	Sugar BDA1 RR	Sugar
989001031380824	10/31/2019	Scott Weir	Sugar BDA1 RR	Sugar
989001031380578	11/5/2019	Sugar 1	Sugar - BP2 - Pool at OCP Outlet	Sugar
989001032566025	1/7/2020	French 10	Sugar - BP2 - Pool at OCP Outlet	Sugar
989001032566027	1/8/2020	Scott Weir	Sugar Creek - BP1 RR	Sugar
989001032565987	1/8/2020	Scott Weir	Sugar Marsh DS	Sugar
989001028156354	2/5/2020	Scott Weir	Sandy Bar Pond - Karuk	Mid Klamath
989001028156444	2/25/2020	Scott Weir - 94	May Pond - Karuk	Mid Klamath
989001028155263		Scott Weir - 94		Mid Klamath??
989001001356795		Shasta Weir		Unknown
989001028156713	10/29/2019	Shasta Weir	Little Horse Creek - Karuk	Mid Klamath

Juvenile detections of adult returns

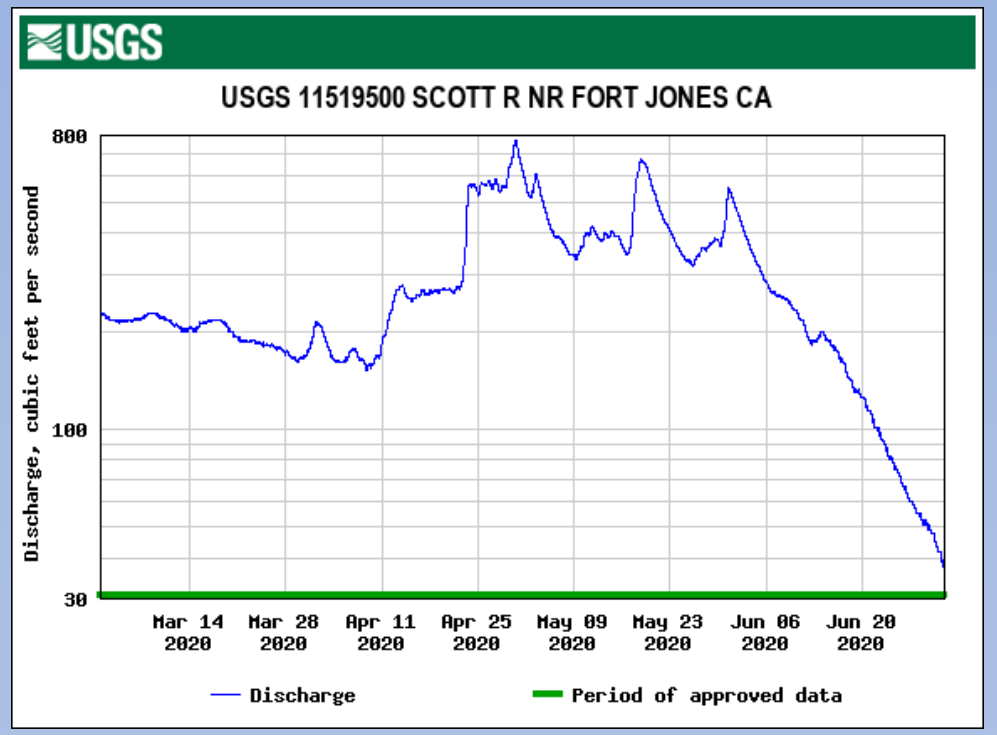
PIT No	Number of Detections	Array Location
989001032565987	3	Sugar BDA 2 - Downstream Beaver Dam
989001032565987	85	Sugar OCP Inlet - Downstream
989001032565987	90	Sugar OCP Inlet - Upstream
989001032565987	0	Sugar BDA Pond 1 - Upstream
989001032565987	0	Sugar BDA Pond 1 - Downstream
989001032565987	1	Sugar Creek - Downstream BDA 1

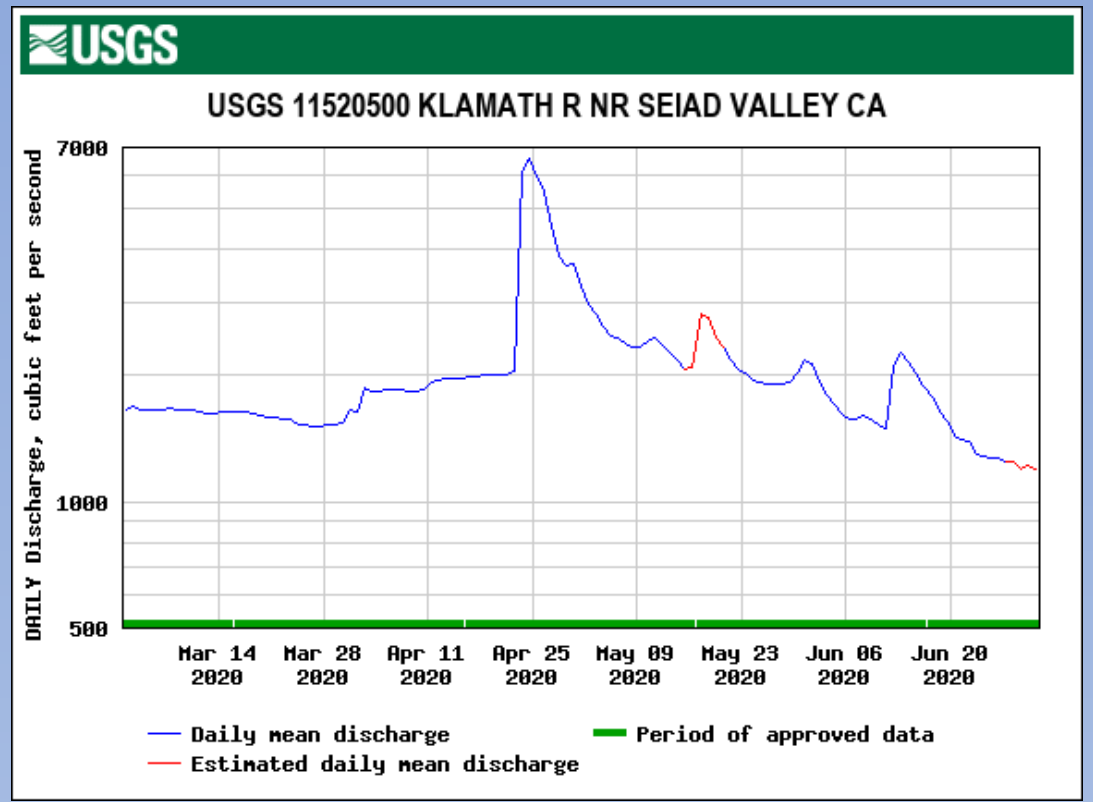
Last Detection - Sugar	Discharge (cfs) - Sugar
4/9/2020 20:29	8
4/10/2020 18:42	11
4/11/2020 18:04	13
4/21/2020 18:08	17
4/21/2020 23:02	23
4/22/2020 20:16	80
4/22/2020 20:52	79
4/22/2020 22:45	82
4/23/2020 19:34	45
4/29/2020 23:17	60
5/11/2020 2:00	38
5/18/2020 0:10	50
5/18/2020 2:09	47
5/31/2020 2:08	53





Timing of juvenile out migration and Water Quality Conditions in Scott River and Klamath

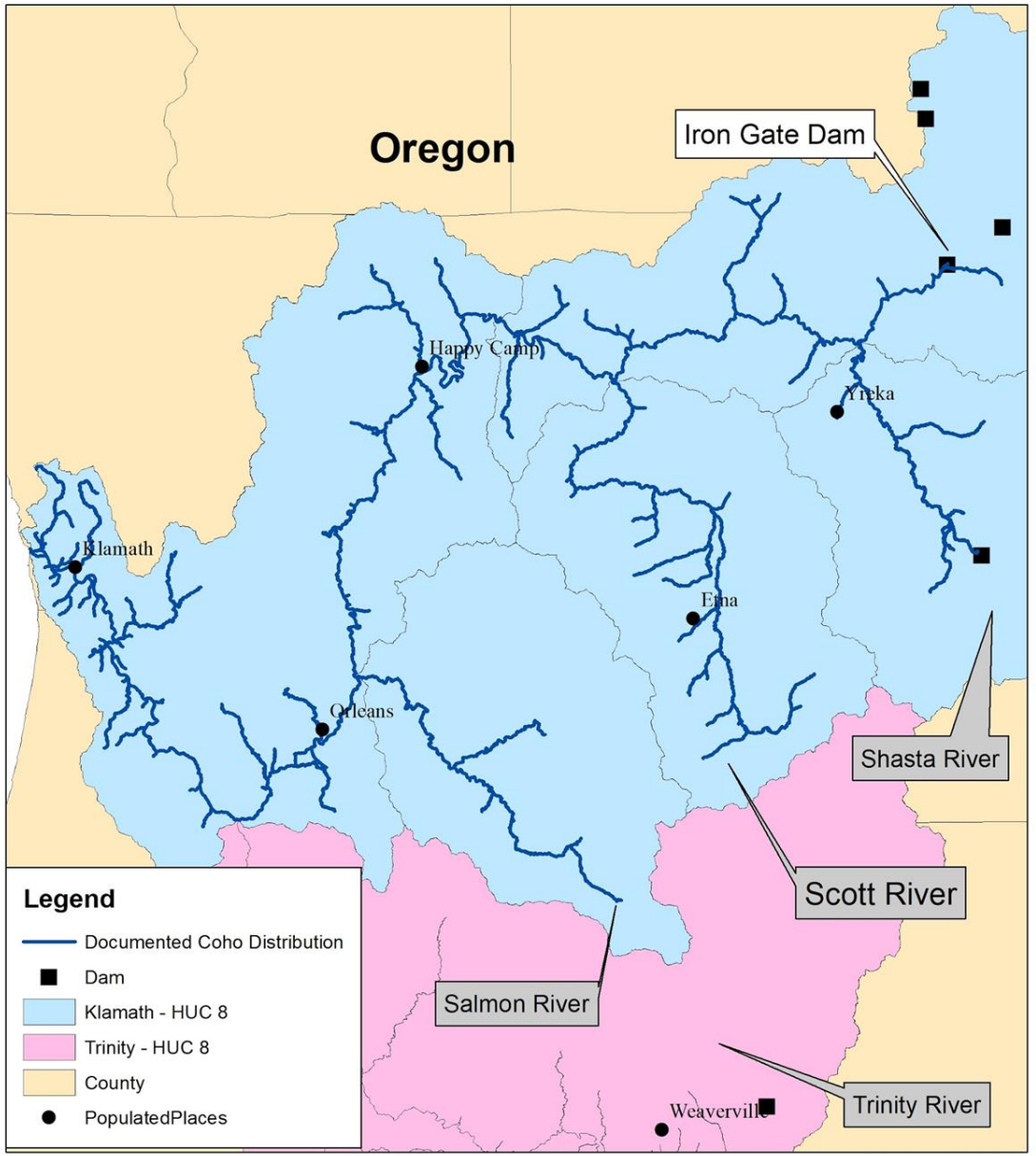




Challenging condition during smolt outmigration: poor water quality & high incidence of disease

How long does it take out-migrating Coho smolts from Scott River to Reach Klamath Estuary?

Value of Mid-Klamath refugia: non–natal juvenile rearing



Thank you

Questions?

erich@scottriver.org

PTAGIS

PIT Tag Information System

Columbia Basin

PTAGIS Example: Lessons Learned from a Basin Wide Collaborative

John Tenney and Nicole Tancreto, PSMFC

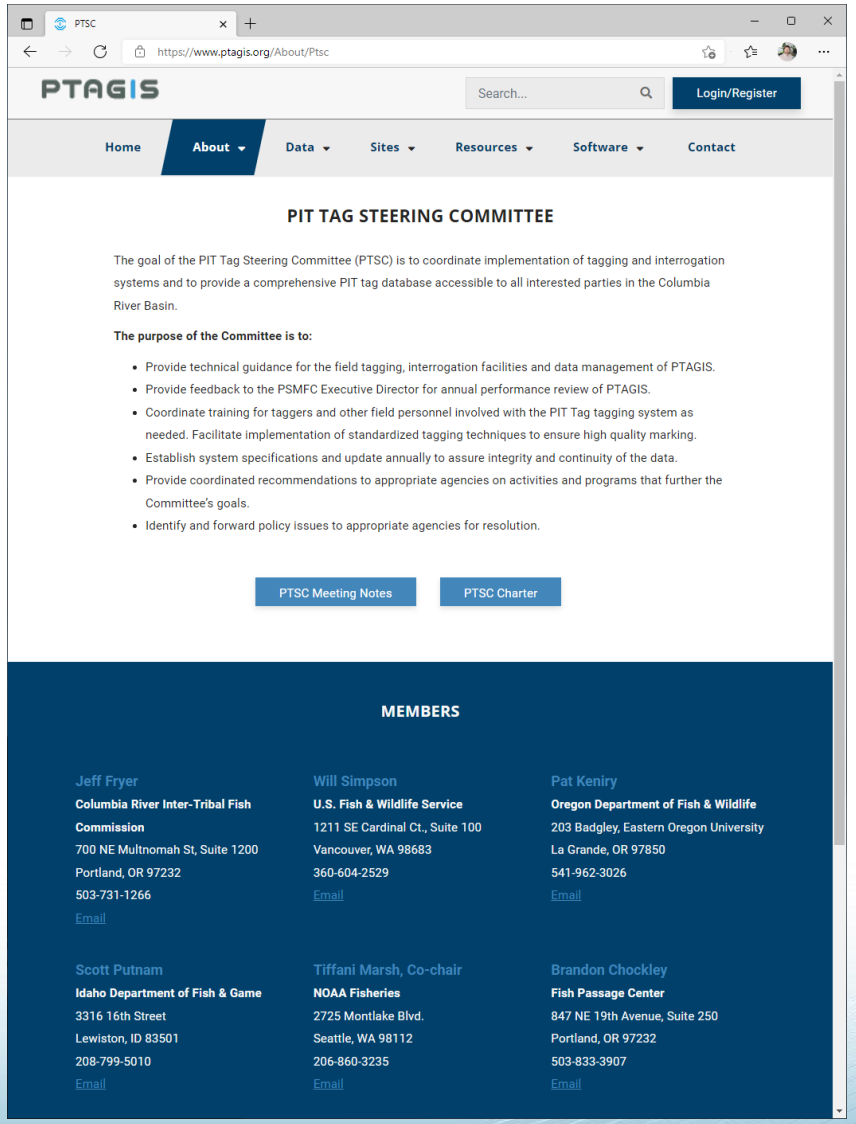
A presentation for the
Klamath Basin PIT Tag Database Collaborative February 2022 Meeting

PTAGIS Program Overview

- **Fisheries Data Project of the PSMFC started in 1991**
- **Regional database of PIT tag data in Columbia River basin**
- **Funded by BPA via *Columbia Basin Fish & Wildlife Program***
- **Data contributed from regional agencies, available to anyone**
- **PTAGIS doesn't perform analysis (RM&E) of the data**
- **PTAGIS O&M large scale interrogation sites**
- **PTAGIS provides technical coordination:**
  - Meetings, newsletters, training, documentation, workshops

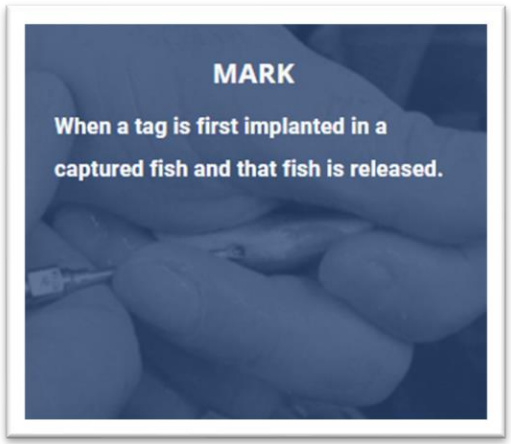
Governance

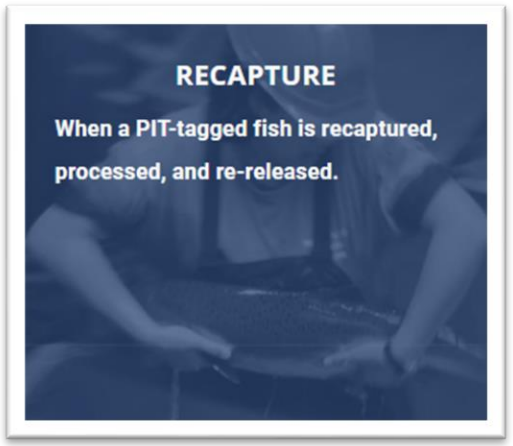
- **PIT Tag Steering Committee**
  - Members from each state agency, NOAA, Tribes, FPC
  - Data standardization and policy
  - Regional coordination and technical guidance
  - Separation of concerns: biology/policy vs technology

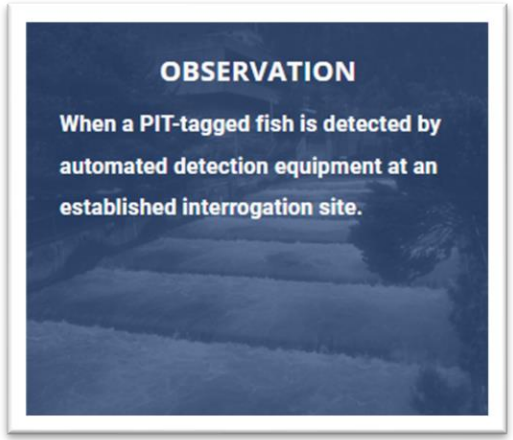


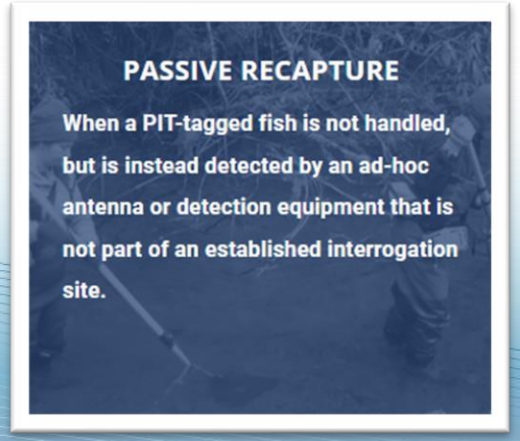
PTAGIS Data Overview

Organized around 5 event types linked by unique PIT tag :



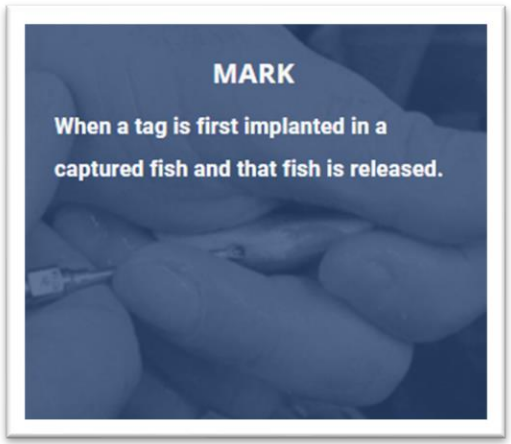


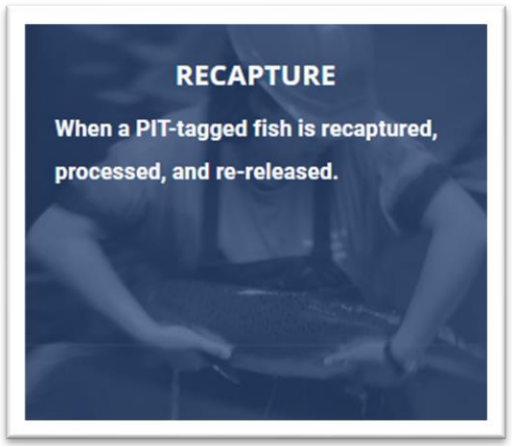


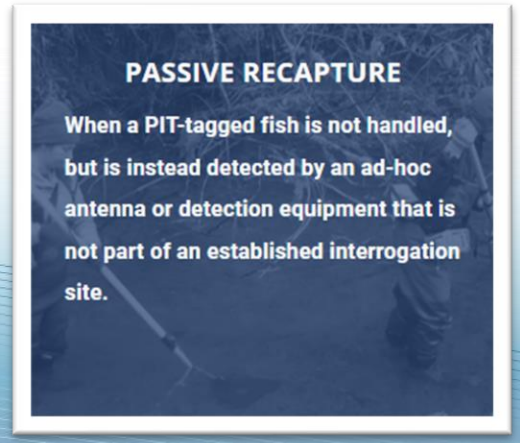


PTAGIS Data Overview

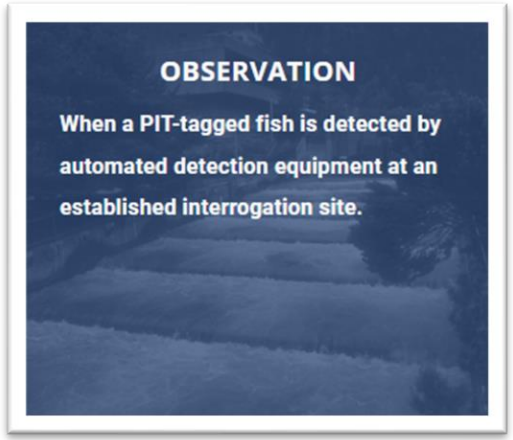
MRR (Mark Recapture Recovery)







Interrogation



MRR Event Data

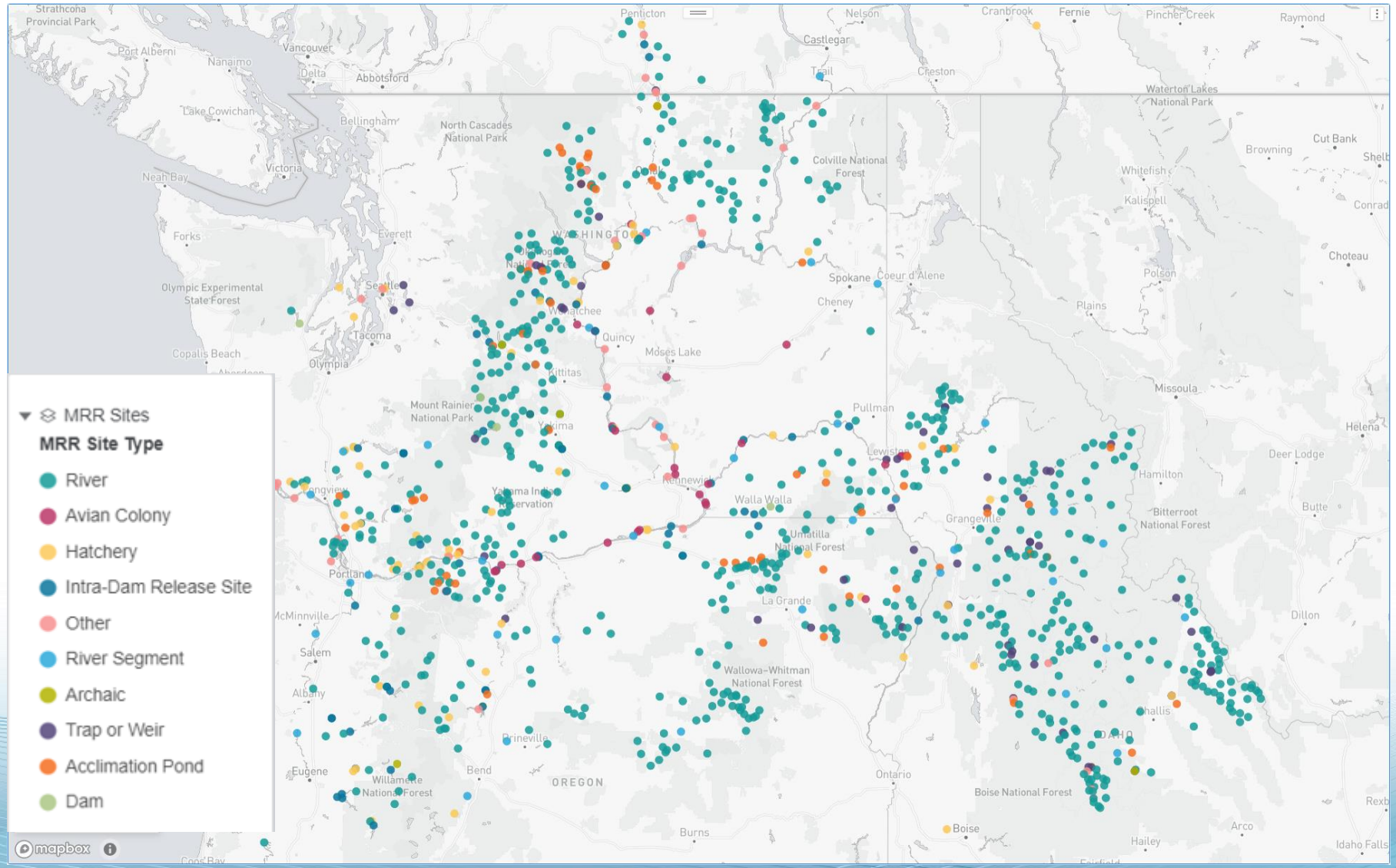
- MRR events captured while fish in hand
- Includes biological and conditional information
- Also *When*, *Where* and *Who* collected the data
- Collected and submitted in common file format and specs

Contributing MRR Data to PTAGIS

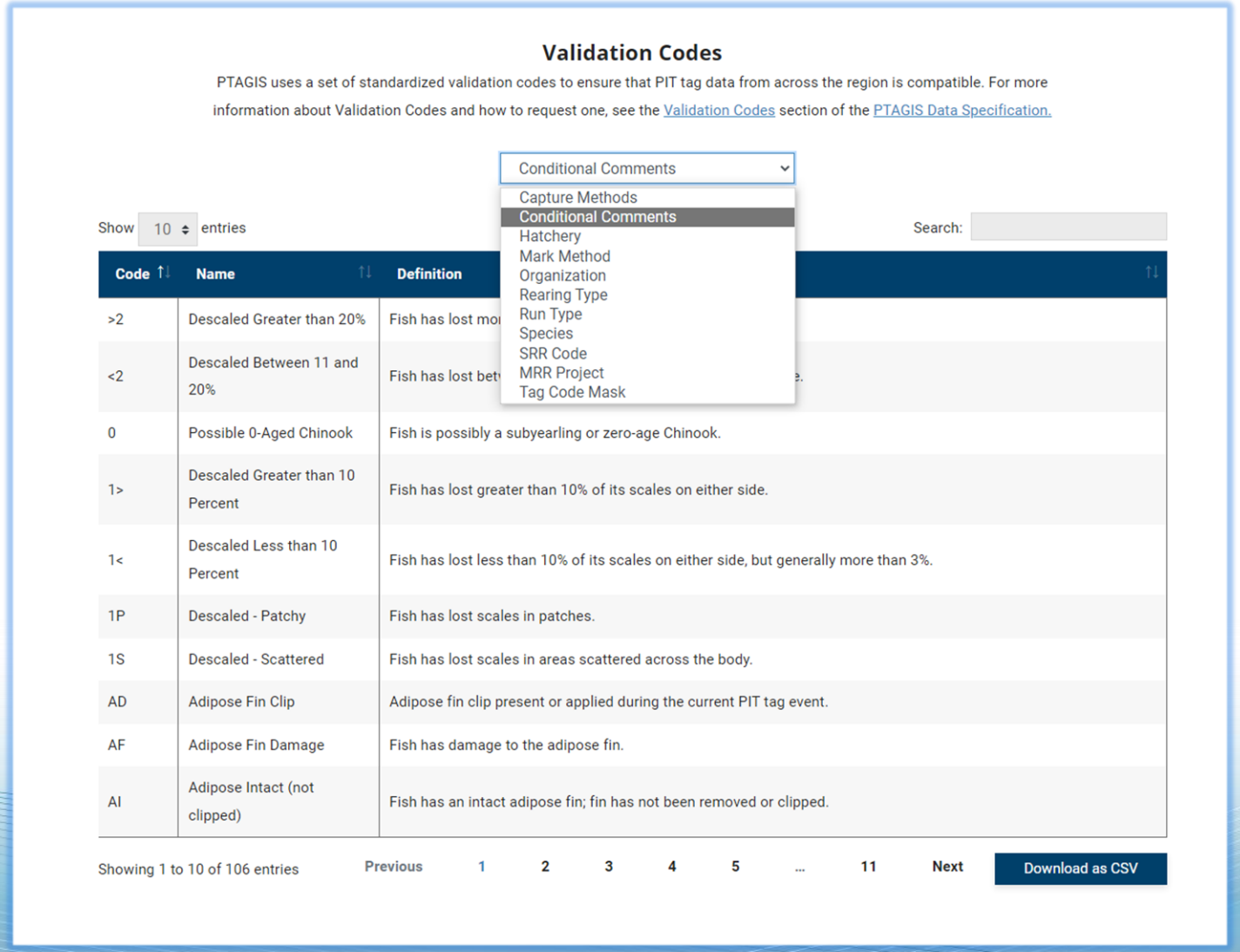
- **MRR Project: identifies individuals ultimately responsible for data**
- **Receive validation alerts from PTAGIS, designate subordinates**
- **Point of contact for questions or request usage of associated data**
- **Contact at project level, not individual (longevity)**
- **Example:**

Project Code:	ILR
Name:	IDFG Lemhi River Basin Projects
Project Status:	Active
Start Year:	2012
End Year:	Present
Contact Info:	phone, email, address

MRR Sites Registered with PTAGIS



MRR Validation Codes



Validation Codes

PTAGIS uses a set of standardized validation codes to ensure that PIT tag data from across the region is compatible. For more information about Validation Codes and how to request one, see the Validation Codes section of the PTAGIS Data Specification.

Conditional Comments

- Capture Methods
- Conditional Comments
- Hatchery
- Mark Method
- Organization
- Rearing Type
- Run Type
- Species
- SRR Code
- MRR Project
- Tag Code Mask

Show 10 entries

Search:

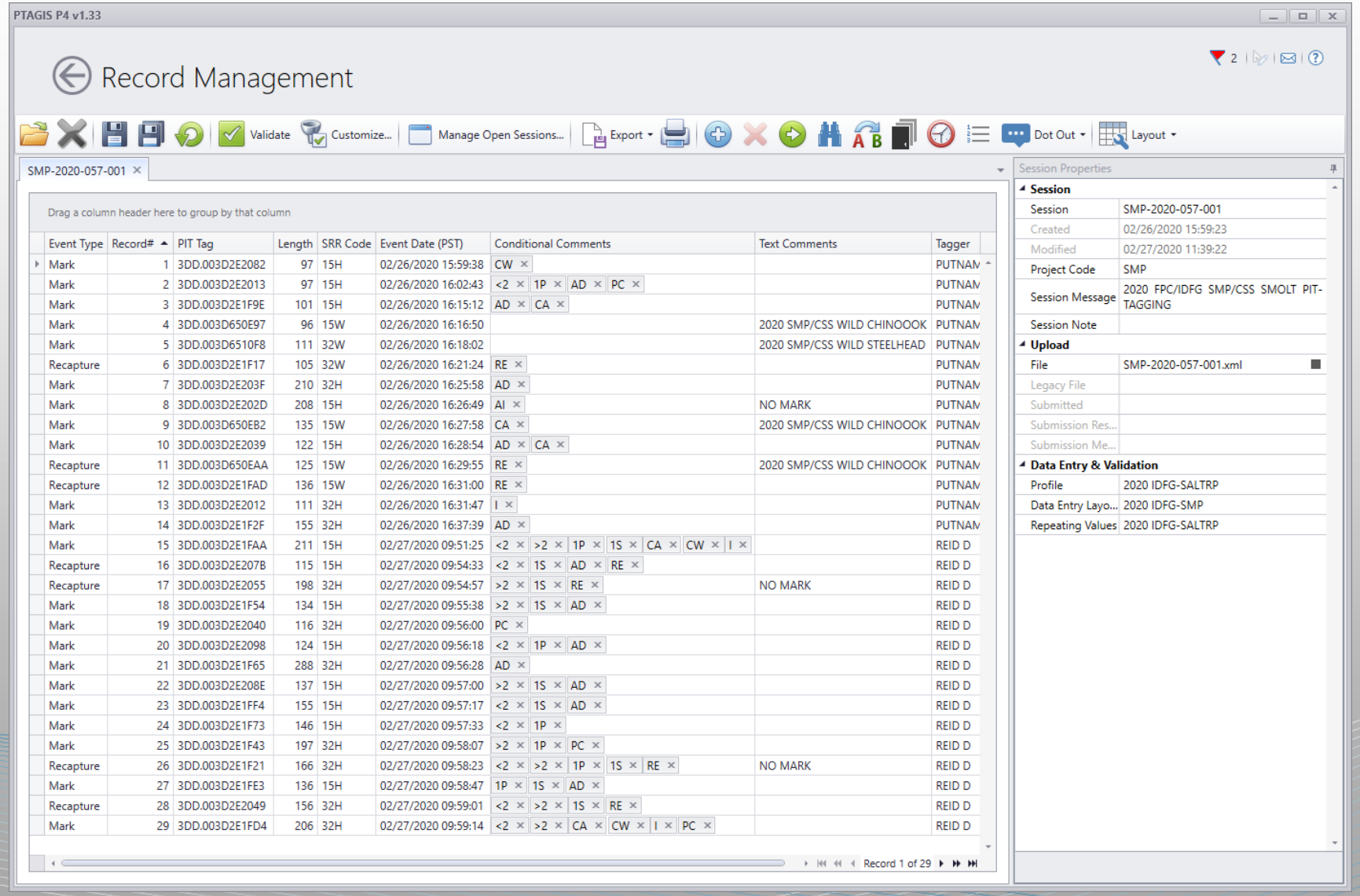
Code	Name	Definition
>2	Descaled Greater than 20%	Fish has lost mo
<2	Descaled Between 11 and 20%	Fish has lost bet
0	Possible 0-Aged Chinook	Fish is possibly a subyearling or zero-age Chinook.
1>	Descaled Greater than 10 Percent	Fish has lost greater than 10% of its scales on either side.
1<	Descaled Less than 10 Percent	Fish has lost less than 10% of its scales on either side, but generally more than 3%.
1P	Descaled - Patchy	Fish has lost scales in patches.
1S	Descaled - Scattered	Fish has lost scales in areas scattered across the body.
AD	Adipose Fin Clip	Adipose fin clip present or applied during the current PIT tag event.
AF	Adipose Fin Damage	Fish has damage to the adipose fin.
AI	Adipose Intact (not clipped)	Fish has an intact adipose fin; fin has not been removed or clipped.

Showing 1 to 10 of 106 entries

Previous 1 2 3 4 5 ... 11 Next

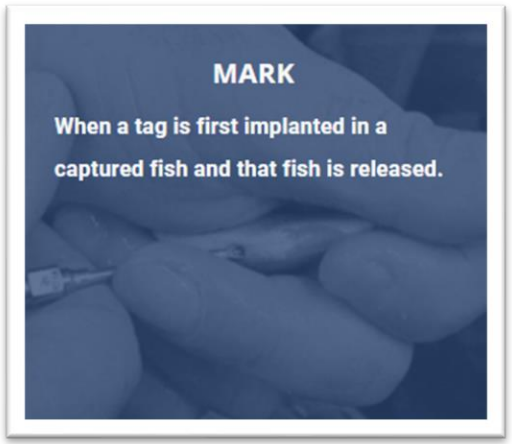
Download as CSV

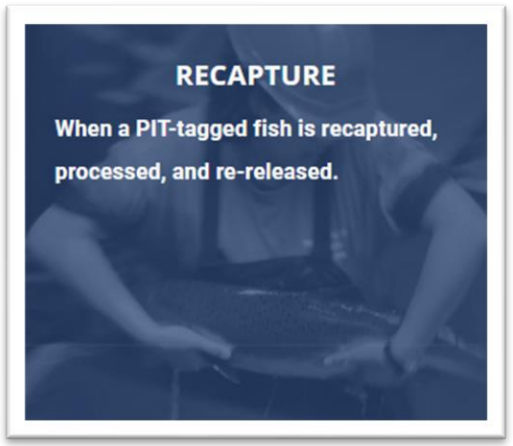
P4 Tagging Software: MRR Data Entry and Quality Assurance

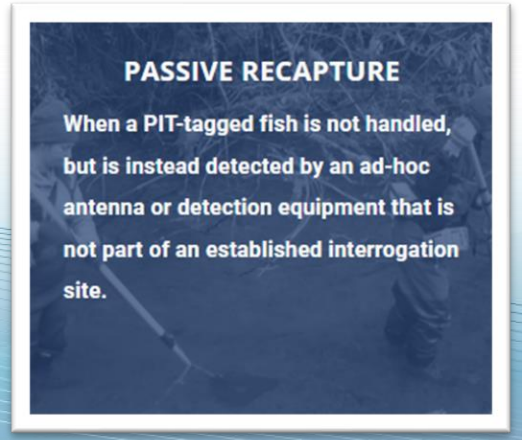


PTAGIS Data Overview

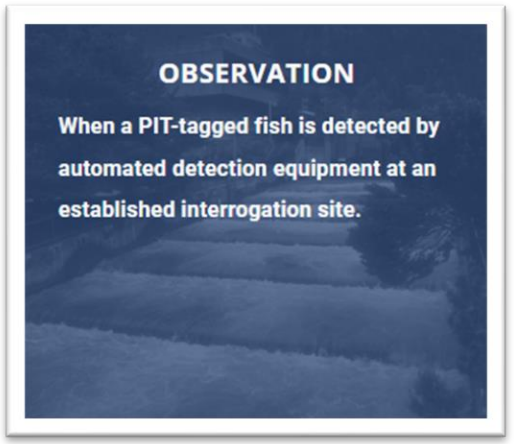
MRR (Mark Recapture Recovery)







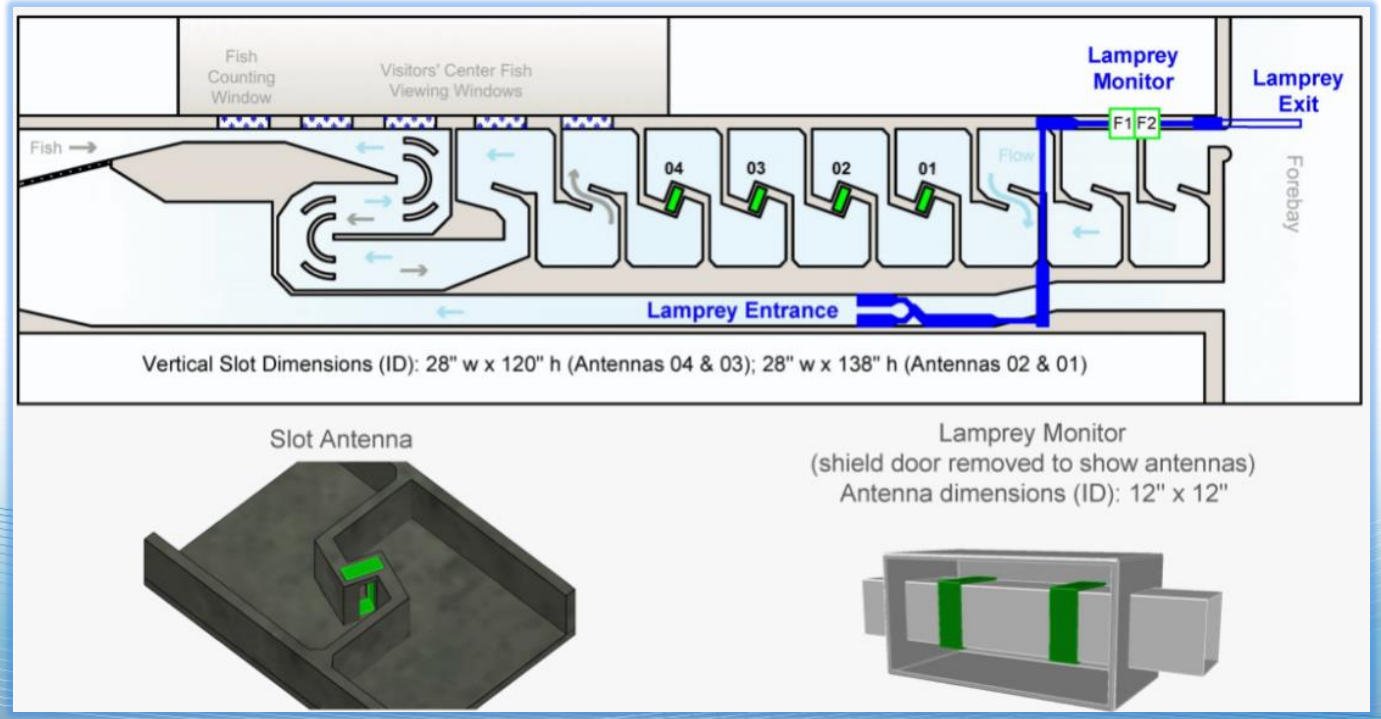
Interrogation



Interrogation Data

Observation Event: record of PIT-tagged fish passing thru interrogation site

- Includes: unique tag + antenna id + timestamp (PST) + site code
- Site code ties observation events to site metadata: coordinates, antenna arrangement, operational status, event logs



Interrogation Site Metadata

BBA -
Status:

Site Typ

General
Start Da

The Big
Potlatch
replaced
2021.

Curren
Last File
Date La
Date La
Date La
Last Ob
Last Ob
Detectio

Configuration

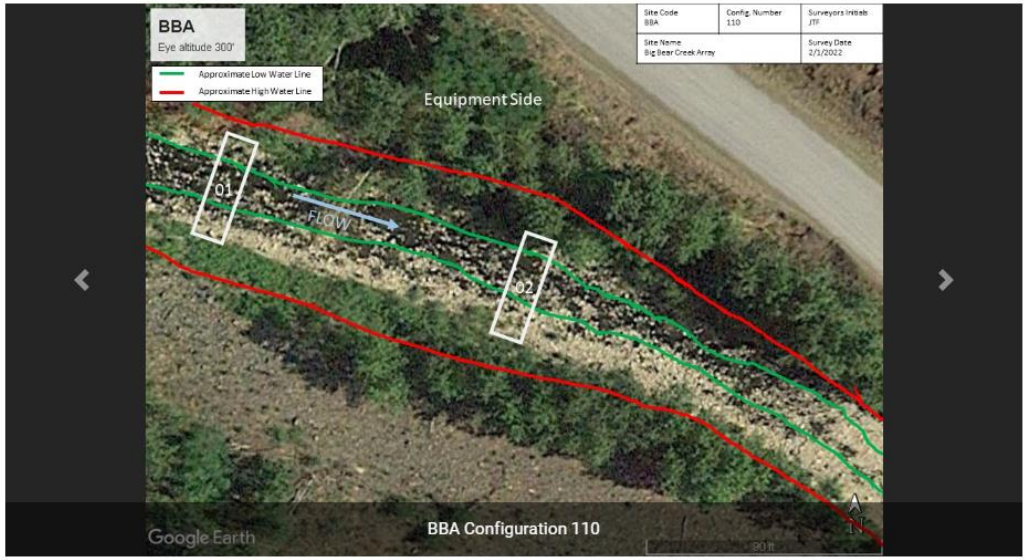
Configuration metadata includes details about the equipment used at the site to detect and record PIT tags. A new configuration sequence record is created when equipment is added or removed from the site and the period of time it was active. A configuration sequence without an End Date is currently active.

Select Configuration Number: 110

Start Date: 2/1/2021 **End Date:** ----

Antenna Group	Transceiver ID	Antenna ID
Upstream Antenna	01	01
Downstream Antenna	02	02

Site Configuration Diagrams:



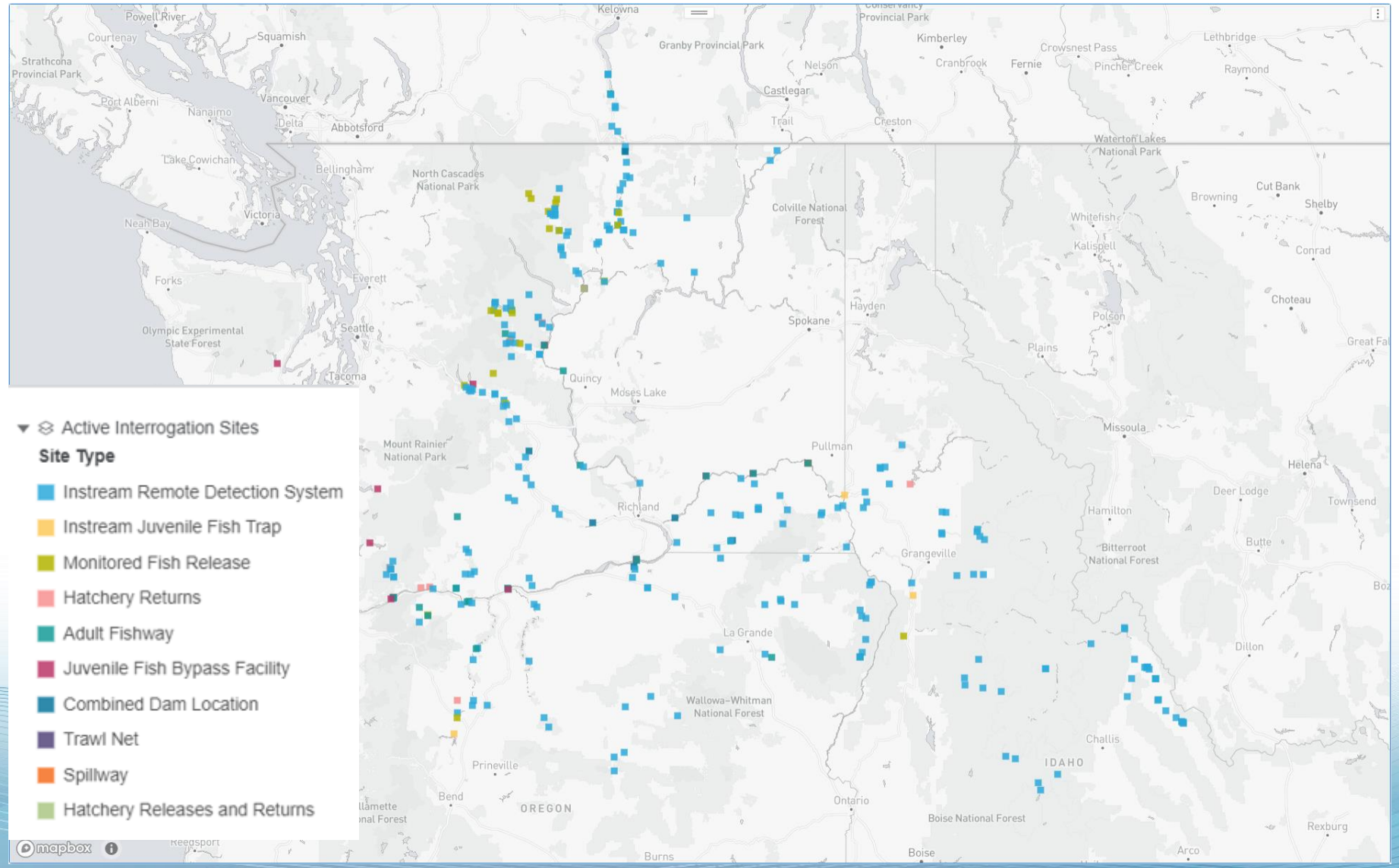
SCROLL TO:

Contacts
Location
Operational History
Configuration
Equipment History
Photos
Event Log Summary
Archived Event Logs

Interrogation Site Stewardship

- Point of contact about data, site operations and maintenance
- Responsible for updating site metadata
- Register new sites with PTAGIS with PTSC approval
- Interrogations sites and contacts can retire

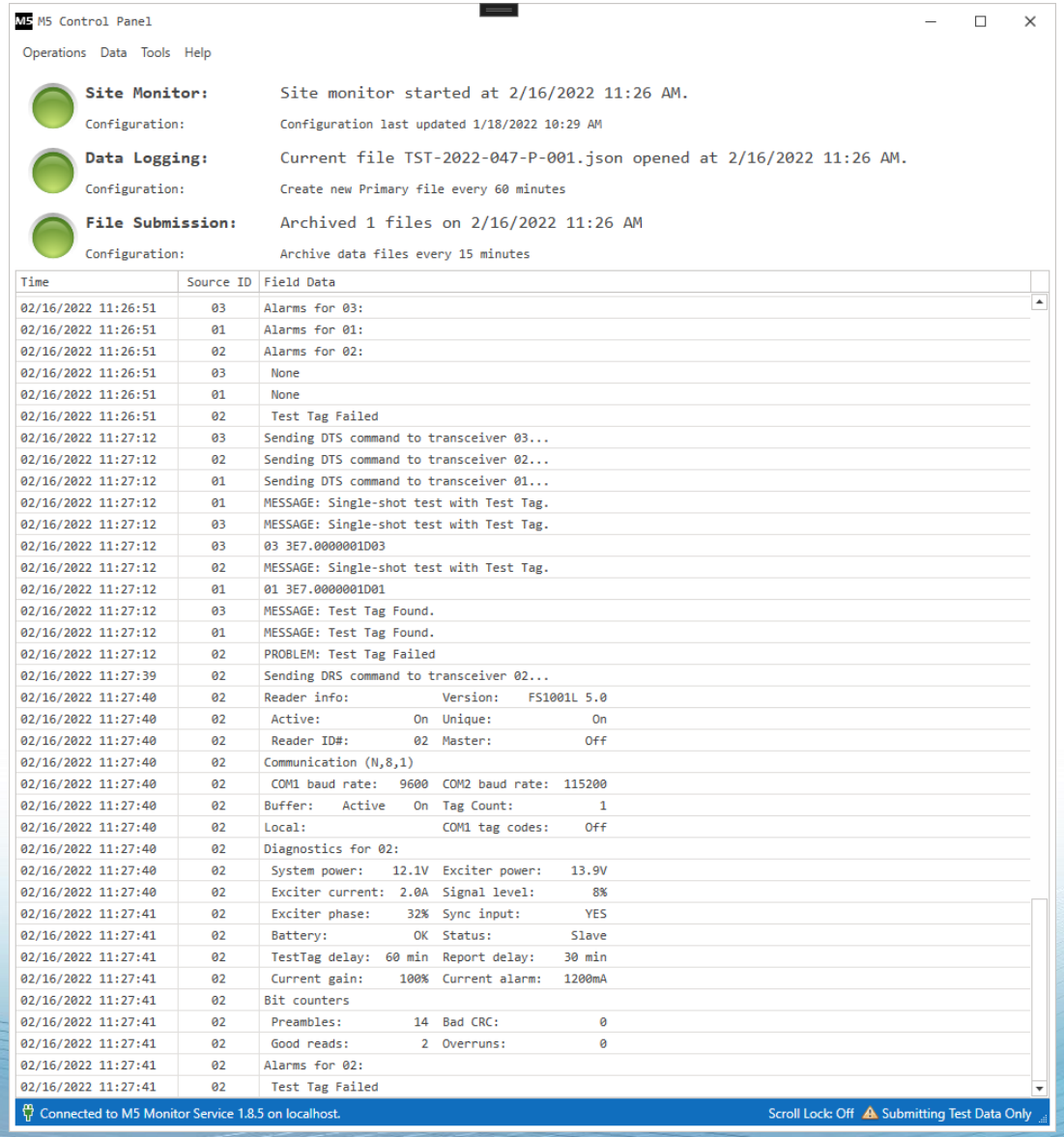
Interrogation Sites Registered with PTAGIS



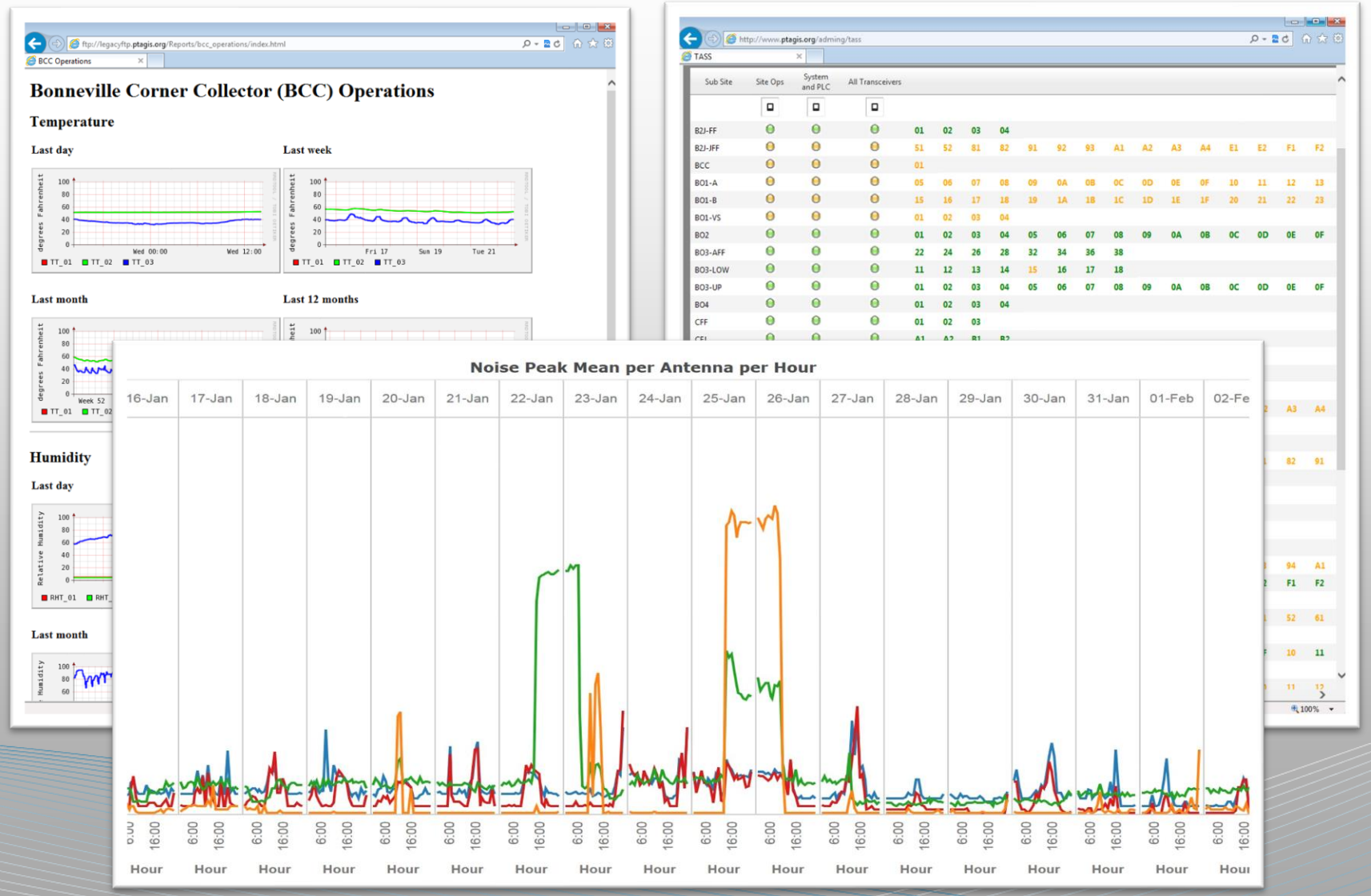
Interrogation Software: M5

Captures and submits:

- Observations
- Transceiver Diagnostics

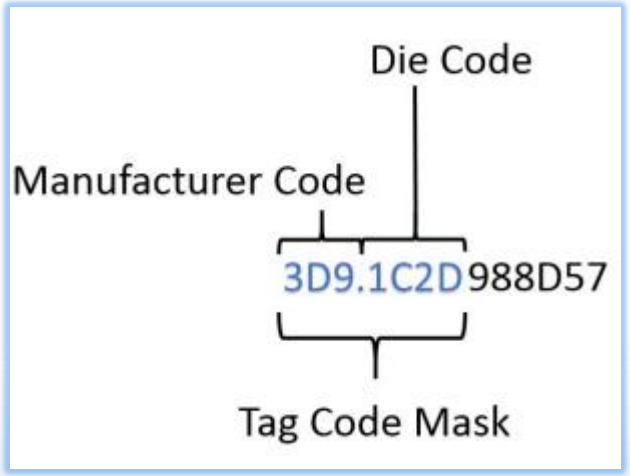


O&M Remote Monitoring



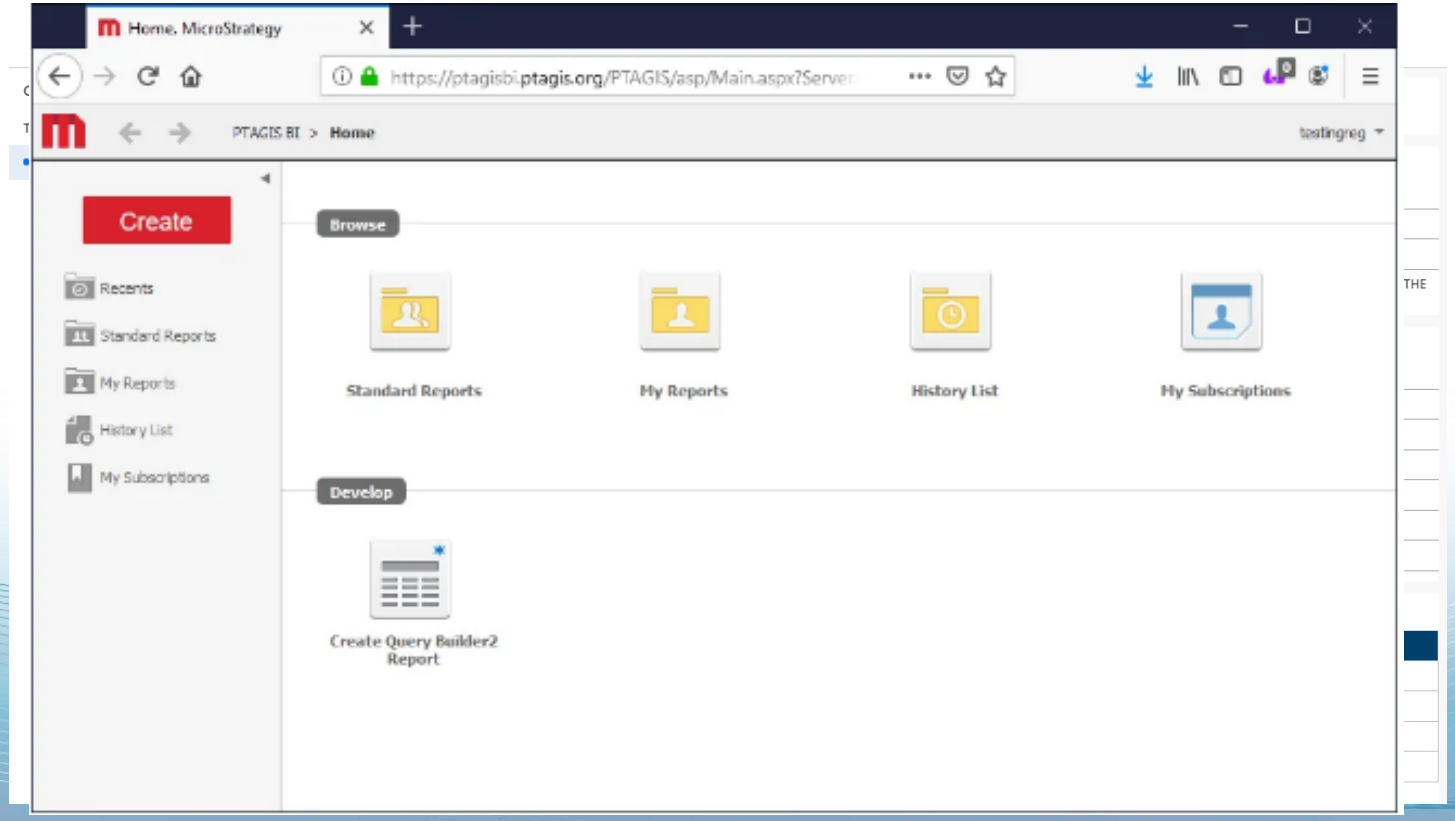
Data Submission and Validation

- **Data contained in structured files (JSON, XML)**
- **Support for Corrections and Deletions of files**
- **Submitted via Web API (HTTPS)**
  - Requires authorization (API Key, JWT)
  - Discontinue FTP and Email submissions
- **Validation and Alerting:**
  - File format and conventions
  - Duplicate files/records
  - Validation codes
  - Interrogation site configuration
  - Tag mask validation
- **Confirmation when MRR data loaded**
- **Alert when interrogation site fails to submit data**



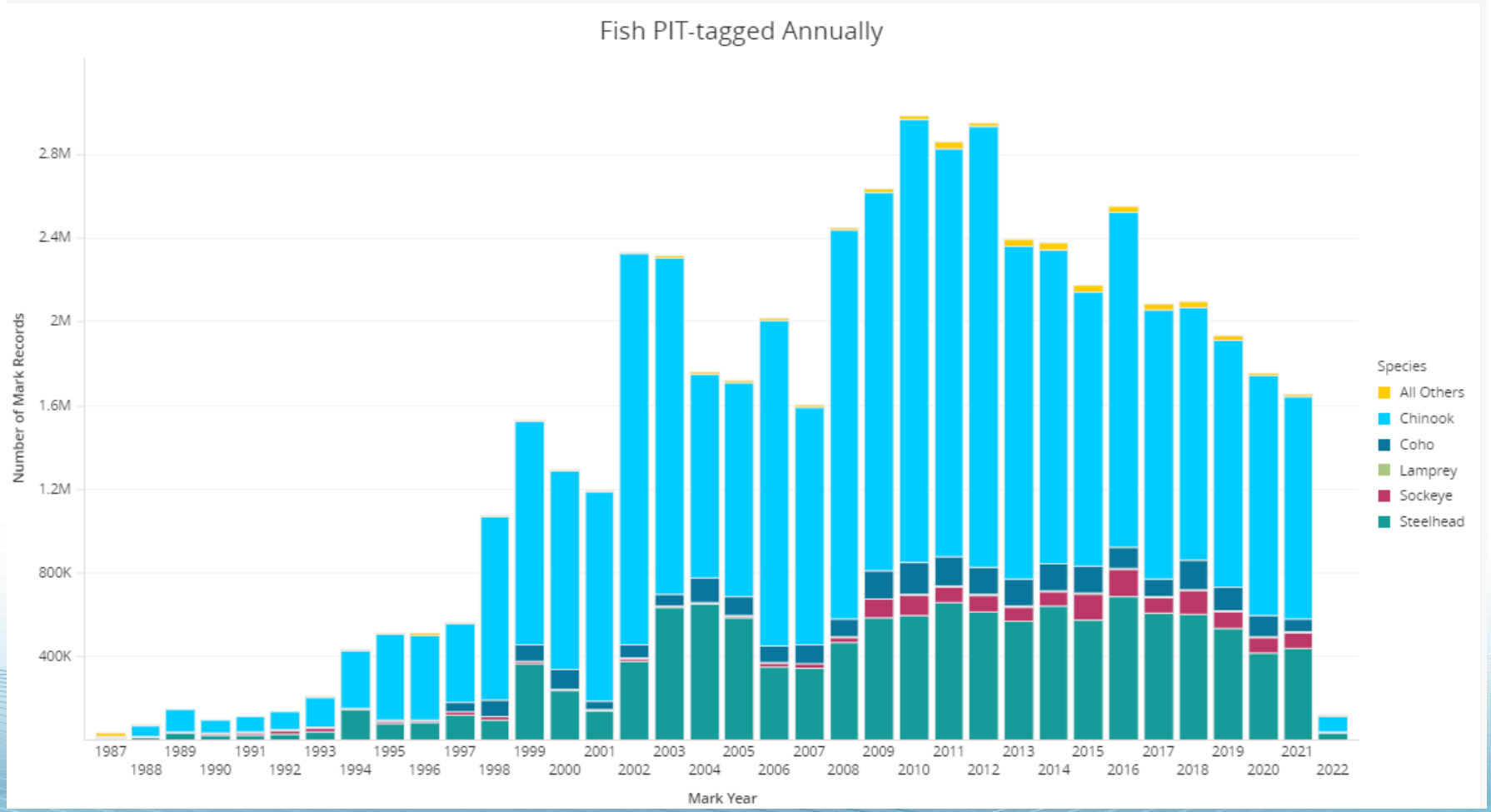
Querying Data out of Database

- **Website www.ptagis.org:**
  - Quick reports (no login)
  - Advanced Reporting (requires login)



Plan for Growth!

52,698,019 fish PIT-tagged by 51 different organizations since 1987



USGS
science for a changing world

Electronic Data Collection, Options and Experiences

Alta Harris

Electronic Data Collection Benefits

- Error checking in the field
- Reduces tag transcription errors
- Reduces data entry time
- Machine readable files

Uniform Solution

- Database community support
- Improve data pipeline

- May not meet individual needs
- Already have a working solution
- Costly to implement

Requirements

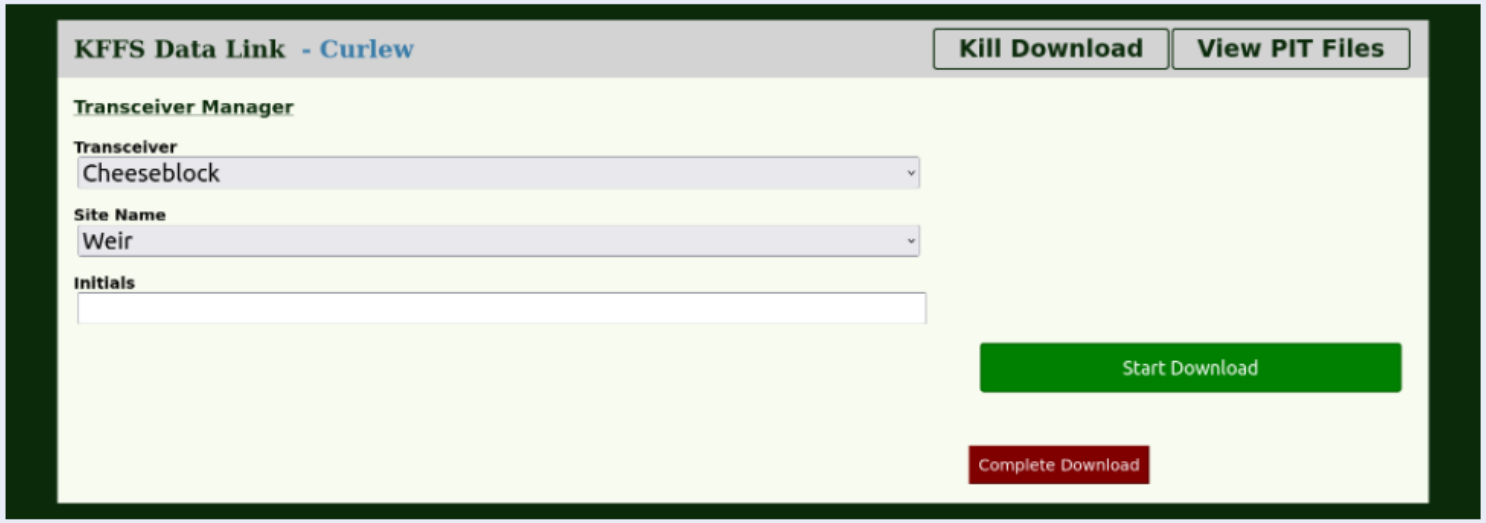
- Flexibility for different project requirements
- Adherence to PIT tagging database standards
- Not difficult to maintain
- Tech support available
- Connects to PIT reader
- Forms are easy to navigate
- Customizable
- Changes are logged
- Backups available without an internet connection
- Persistant

USGS Custom Solution

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

USGS Application



Klamath River Basin PIT Tagging Database

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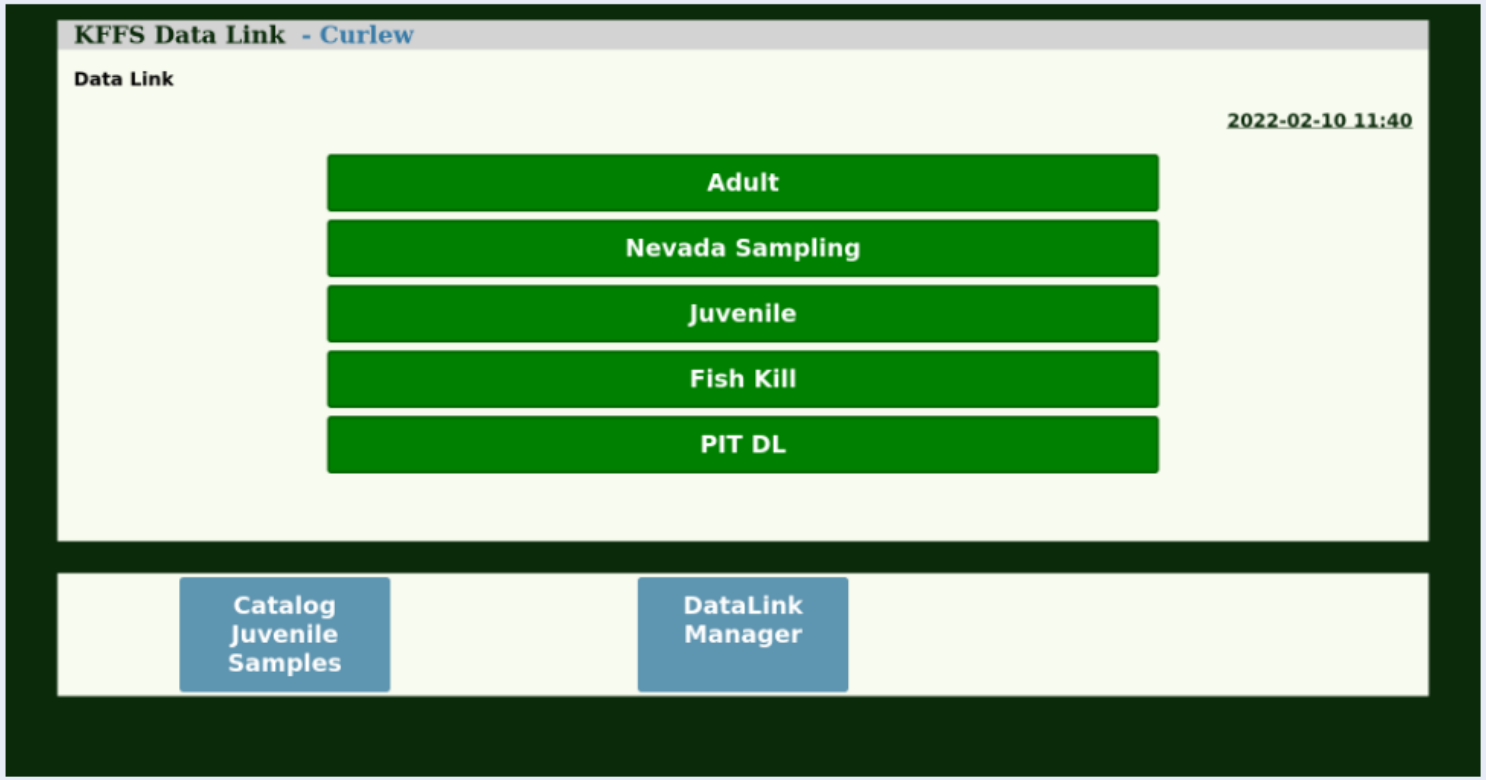
USGS Application



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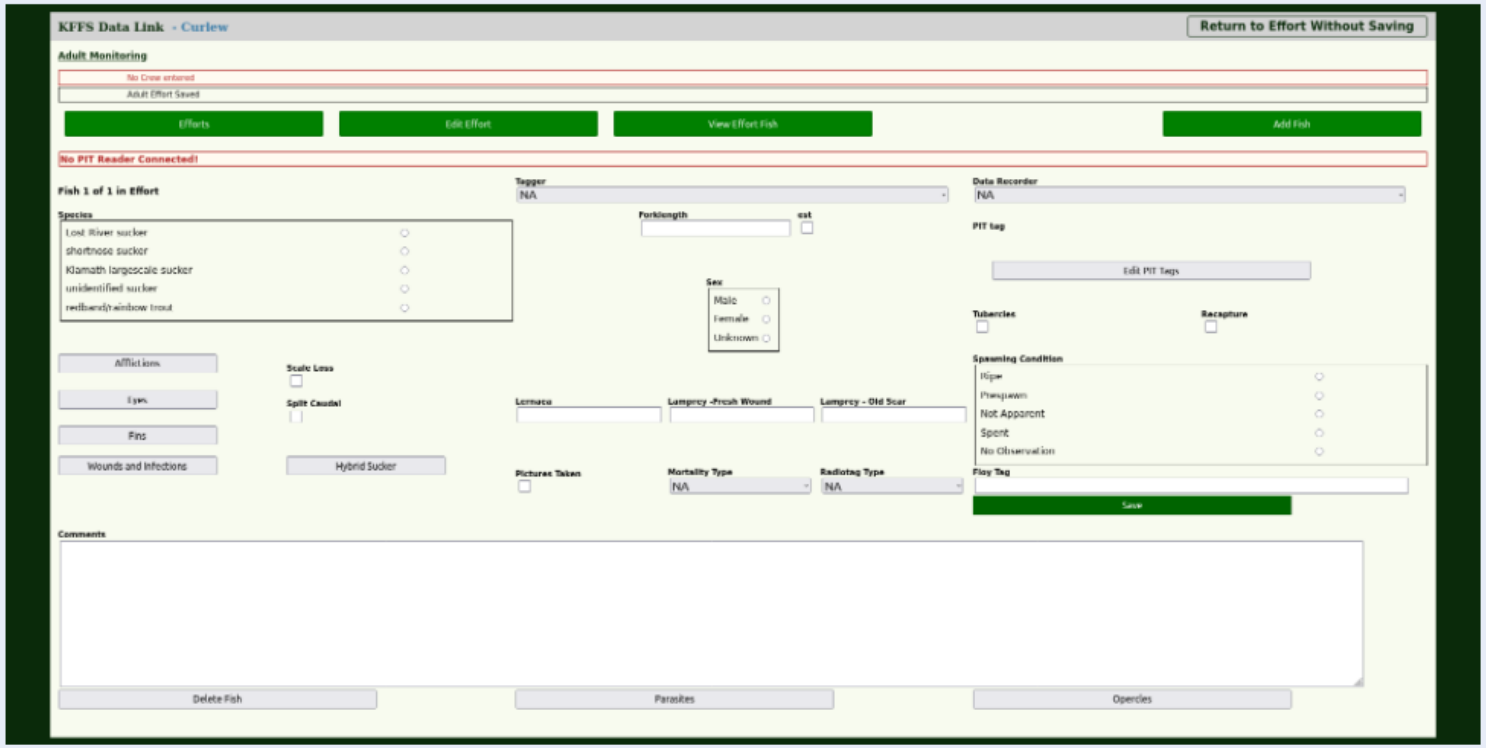


USGS Solution

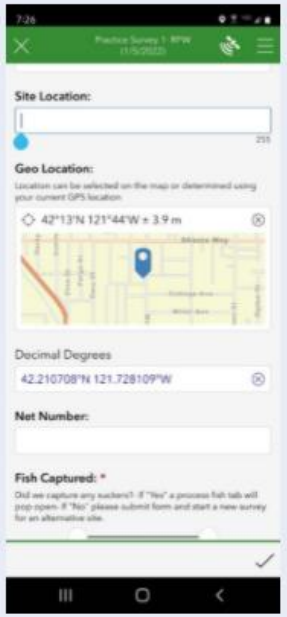
- Customizable
- Changes are recorded
- Backups to external system
- SQLITE database
- Can reference exiting information

- Prototype
- Nontypical file system
- File transfers

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

ESRI Survey 123



Klamath River Basin PIT Tagging Database

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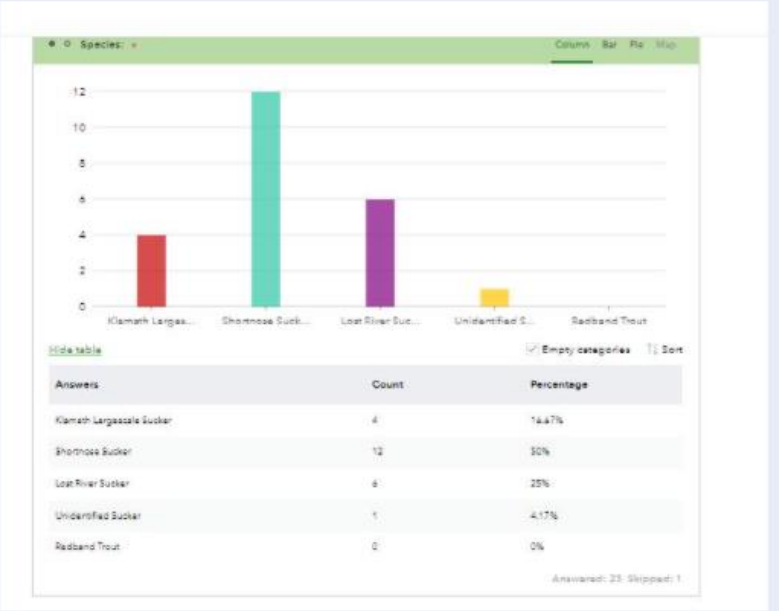
ESRI Survey 123



Klamath River Basin PIT Tagging Database

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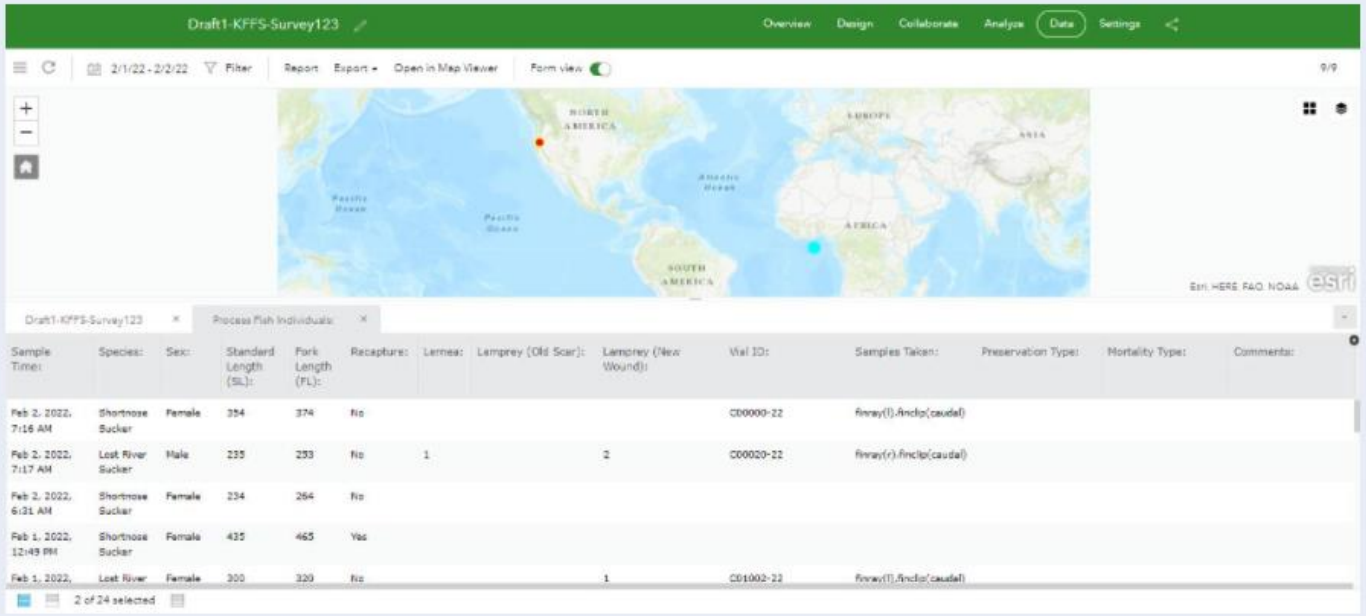
ESRI Survey 123



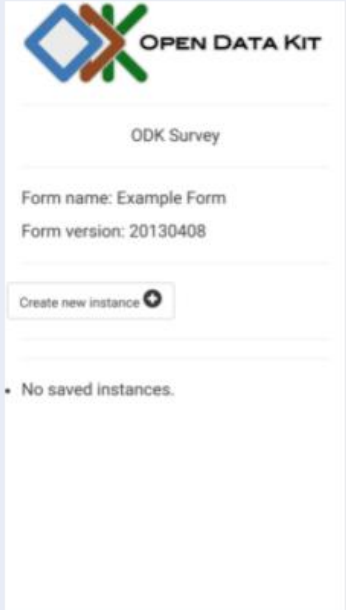
ESRI Survey 123

- Individual Databases
- Cloud Storage
- Customizable Forms
- Georeferencing
- Accessible
- ESRI support
- ESRI License
- PIT reader connection

Klamath River Basin PIT Tagging Database

- Database Development
- Web Interface Tool
- Collaboration
- Data Pipeline
- Future of the Project

Open Data Kit



Options

- Do not adopt a uniform solution
- Find a custom solution based on USGS model
- ESRI Survey 123
- ODK forms with our own server
- Custom application
- Find another product