

LEWIS RIVER AQUATIC COORDINATION COMMITTEE

Facilitator: ERIK LESKO
503-412-8401

Location: MERWIN HYDRO CONTROL CENTER
105 MERWIN VILLAGE COURT
ARIEL, WA 98603

Date: JANUARY 9, 2020

Time: 9:30 AM – 1:00PM

Agenda Items

- 9:30 a.m. Welcome
- Review Agenda and ACC 11/14/19 Meeting Notes
 - Comment & Accept Agenda and 11/14/19 Meeting Notes
- 9:40 a.m. Public Comment Opportunity
- 9:45 a.m. Swift FSC Collection Efficiency Evaluation Report Discussion;
Consultant Presentation
- 10:45 a.m. **Break**
- 11:00 a.m. Merwin Dam ATE Memorandum Review (delayed to Feb. or
March)
- 11:15 a.m. Salmon Port Review - Peggy Miller and Steve West
- 11:45 a.m. Lunch**
- 12:15 p.m. Study/Work Product Updates
- 2019 ACC Funds Year-end Accounting
 - In Lieu/ADR Update
 - Flows/Reservoir Conditions Update
 - ATS update; Extension of time
 - Fish Passage update
 - Hatchery Broodstock/adult return update
- 12:45 p.m. ➤ Next Meeting's Agenda
➤ Public Comment Opportunity
- Note: all meeting notes and the meeting schedule can be located at:
<https://www.pacificorp.com/energy/hydro/lewis-river/acc-tcc.html>
- 1:00 p.m. **Meeting adjourn**

Additional information:

Join by phone

[\(503\) 813-6614](tel:(503)813-6614) (US)

English (United States)

[\(503\) 813-5252](tel:(503)813-5252) [Portland, OR] (US)

English (United States)

[\(855\) 499-5252](tel:(855)499-5252) [Toll-Free] (US)

English (United States)

Conference ID: 5803472

FINAL Meeting Notes
Lewis River License Implementation
Aquatic Coordination Committee (ACC) Meeting
January 9, 2020
Merwin Hydro Control Center

ACC Representatives Present (16)

Kim McCune, PacifiCorp
 Chris Karchesky, PacifiCorp
 Erik Lesko, PacifiCorp
 Jeremiah Doyle, PacifiCorp
 Todd Olson, PacifiCorp
 Jim Byrne, Trout Unlimited
 Bryce Glaser, WDFW
 Peggy Miller, WDFW
 Josua Holowatz, WDFW
 Aaron Robert, WDFW
 Steve West, LCFRB
 Joshua Ashline, NMFS
 Ruth Tracy, USFS
 JD Jones, USFS
 Eli Asher, Cowlitz Indian Tribe
 Amanda Froberg, Cowlitz PUD

Guests (2)

Mark Weiland, Four Peaks Environmental
 Sam Haffey, Four Peaks Environmental

Calendar:

February 13, 2020	ACC Meeting	Merwin HCC
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Assignments from January 9, 2020	Status
McCune: Distribute ACC Structure and Ground Rules document for ACC review and possible edits.	Complete 1/9/20

Assignments from December 12, 2019	Status
McCune: Distribute November 14, 2019 meeting notes to the ACC that were edited by WDFW.	Complete 12/13/19
Olson: The ACC attendees requested an email update regarding the In Lieu process to date.	Complete 1/9/20
McCune: Email ACC and provide additional 7-day review period for H&S and comprehensive review extension of time to December 31, 2020.	Complete 12/13/19

Assignments from November 14, 2019	Status
Miller and West: Assist with Salmon Port review at December ACC meeting.	Complete 1/9/20

Parking Lot Items	Status
Tracy: Stage 0 webinar PowerPoint presentation to ACC. As of 11/14/19 Tracy is asking for an update from USFS staff regarding timeline for presentation in early winter 2020 or spring 2020.	Tentative

Opening, Review of Agenda and Meeting Notes

Erik Lesko (PacifiCorp) called the meeting to order at 9:35am and reviewed the agenda. Chris Karchesky (PacifiCorp) would like to move the Merwin Dam ATE Memorandum review topic to the February or March ACC meeting.

Lesko also reviewed the November 14, 2019 meeting notes. The ACC approved the November 14, 2019 meeting notes at 10:00am with clarifying edits received from WDFW. The ACC would like an opportunity to review the edits received on the December 12, 2019 meeting notes so the ACC agreed to add the review and approval to the February 2020 ACC meeting agenda.

Public Comment

None

Swift Floating Surface Collector (FSC) Collection Efficiency Evaluation Report Discussion; Four Peaks Environmental Presentation (Attachment A)

Karchesky reminded ACC Member that the 2019 Swift Reservoir FSC Collection Efficiency Evaluation Report had been sent for 30-day review on December 6, 2019. Comments to the report are due January 10, 2020.

Sam Haffey and Mark Weiland with Four Peaks Environmental attended the meeting and provided the ACC with presentation summarizing the 2019 report and answered questions regarding the study objectives, data collection and analysis, and how recent modifications to the FSC have influenced collections efficiency. They discussed in detail the fish patterns within the zone of influence, approach and collection timing. They also analyzed the time at large and length related to probability of rejection and larger fish appear to have a higher probability of rejecting the collector after entering the collection channel.

The presentation in its entirety is attached to these meeting notes and at the following link on the Lewis River website:

https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/energy/hydro/lewis-river/license-implementation/acc/FSC_final_report_meeting.pdf

<Break & working lunch 11:20am>

<Reconvene 11:35am>

Salmon Port Review – Peggy Miller (WDFW)

Peggy Miller (WDFW) and Steve West (LCFRB) reviewed the SalmonPORT map page as a useful tool to guide the ACC in its Lewis River Aquatic Fund evaluation process (see the following links):<https://www.lowercolumbiasalmonrecovery.org/mappage#b>

Recovery Plan link: <https://www.lcfrb.gen.wa.us/librarysalmonrecovery>

- The purpose of the overview of SalmonPort was to stimulate discussion and identify relevant elements that could be used to evaluate Aquatic Fund proposals

- SalmonPort uses EDT that is standardized for the Lower Columbia Basin region
- Info presented in SalmonPort is a wrap up of EDT and the Recovery Plan therefore is general in nature
- Information is reach specific
- Example screen shots from SalmonPort

Lewis 25
(Reach Information)

Tier: 1
Reach Length: 1585 ft.
Multi-Species Values
 Restoration: 37%
 Preservation: 63%

Description: Cussed Hollow Creek to Crab Creek; Confinement: confined; Fish Species present: Potential chinook and steelhead

Species ^A	Designation	Reach Potential	Restoration Needs	Multi-Species Priority [*]
Spring Chinook	Primary	H	Floodplain function and channel migration processes	H
Winter Steelhead	Contributing	H	Instream flows	H
Coho	Contributing	L	Off channel & side channel habitat	H
Summer Steelhead	Stabilizing		Riparian conditions & functions	H
			Stream channel habitat structure & bank stability	H
			Watershed conditions & hillslope processes	H
			Access to blocked habitats	L
			Regulated stream management for habitat functions	L
			Water quality	L

Bull trout may be present in the upper reaches of the NF Lewis

Note: ^{*}Multi-Species Priority are derived from conditions of limiting factors and not from field observation
^ASpecies without a reach potential are present in the subbasin not in the reach

Lewis 25
 NF Lewis Spring Chinook (Primary)
 Tier: 1

Primary limiting factors for Spring Chinook in Reach Lewis 25:
 Key Habitat Quantity
 Sediment
 Channel Stability
 Habitat Diversity

Top 5 Ranked Life Stages:	Primary Limiting Factors (in order of importance to life stage):
Egg Incubation	Sediment, Key Habitat Quantity, Channel Stability
0-Age Rearing/Migration	Key Habitat Quantity
0-Age Rearing/Migration	Key Habitat Quantity, Habitat Diversity
Fry Colonization	Key Habitat Quantity
Spawning	Key Habitat Quantity

- Definitions:
 - Multi-Species Values: Comparing potential between Restoration and Preservation for all species present in the river segment
 - Restoration: Level of current degradation that provides potential for restoration. A high percentage value represents the relative benefit to all species present in the river segment from habitat improvement
 - Preservation: Level of impact that future habitat degradation would have on the population. A high percentage value represents an area where protection of the river segment would benefit the population.
 - Reach Potential: [Also known as Species Reach Potential (SRP)] an evaluation of a river segment for the level of benefit provided by recovery actions for each species population using the river segment.
- Multi-Species Values are a wrap up of tornado charts, VSP parameters for each species are wrapped up into single value for a given reach. The ACC determine this element is less useful for evaluating proposals and should be used with caution.
- Restoration needs and multi-species priority are a summary of Habitat Factor analysis figures in the Recovery Plan.
- Primary limiting factor for each species are stripped down version of the consumer reports charts. Consumer reports for each reach and each species are not provided in the Recovery Plan. Consumer Reports for each reach and each species in the lower Basin can be obtained from LCFRB. Consumer Reports are not available for the upper Basin.

- How the EDT elements are wrapped up should be taken into consideration when using the information to evaluated proposals. For example, is the information for all species in the reach or for an individual species?

The ACC had a good discussion and it was reinforced that SalmonPort is just one tool and there are other good tools available for evaluating proposals as well. Reach Potential has value for identifying reaches that have high level of benefit for spring Chinook, but spring Chinook is not the only consideration.

2019 ACC Funds Year-end Accounting

Kim McCune (PacifiCorp) provided the following year-end accounting for the ACC accounts:

Lewis River License Implementation					
Lewis River Aquatics Fund - Resource Projects					
Sections 7.5.1, 7.5.3, 7.5.3.1 & 7.7					
Release Date	Funds Received	Expense	Interest	Balance	Notes
12/31/2018				\$ 2,183,431.50	
4/30/2019	\$ 301,640.03	\$ -	\$ -	\$ 2,485,071.53	0
12/31/2019	\$ -	\$ -	\$ 112,538.44	\$ 2,814,405.02	0
			Total Spent to Date:	\$ (2,229,281.00)	
			Balance Remaining:	\$ 2,814,405.02	

Lewis River License Implementation					
Lewis River Aquatics Fund - Bull Trout					
Sections 7.5, 7.5.1, 7.5.3, 7.5.3.1, & 7.7					
Release Date	Funds Received	Expense	Interest	Balance	Notes
12/31/2018				\$ 765,287.72	
12/31/2019	\$ -	\$ -	\$ 27,044.68	\$ 806,264.55	0
			Total Spent to Date:	\$ (234,547.92)	
			Balance Remaining:	\$ 806,264.55	

Lewis River License Implementation					
Lewis River LWD Fund - Resource					
Section 7.1.1					
Release Date	Funds Received	Funds Dispersed	Balance	Notes	
12/26/2019			\$ 101,500.00	7.1.1 Large Woody Debris Program, ILR-LWD	
			Total Spent to Date:	\$ (18,500.00)	
			Balance Remaining:	\$ 101,500.00	

The next contribution to the 7.5 Aquatics Resource Fund is Q2 - \$225,000 escalated. No additional contributions will be made to the Bull Trout Fund according to the Settlement Agreement.

Study/Work Product Updates

In Lieu Update

No update provided by the Services this month regarding the ADR process. PacifiCorp is assembling draft applications for License amendments in preparation for a filing with the FERC. The draft applications will be released within the next two weeks for 90-day review and comment period.

WDFW noted a concern that once FERC approves the application and attachments, the monitoring plan, and strategy are also approved by FERC and become finals. Todd indicated that the Settlement Agreement allows for similar situations where plans are approved at a later date. It was

also noted that the Settlement Agreement states plans will be prepared and in this case plans are being submitted at the same time so the situation is different.

Josh Ashline (NMFS) had to leave the ACC meeting early; he submitted an email with an update which is attached to the meeting notes. This email was not noticed by PacifiCorp until after the ACC meeting ([Attachment B](#)).

Flows/Reservoir Conditions Update

Lesko informed the ACC attendees that there is currently 43' of hole in the reservoirs. Natural flows at Merwin are currently about 15,000 cfs. At the December ACC meeting the reservoirs were at about 83 feet of hole, so we have gained about 40 feet of reservoir elevation since then.

Project inflows are at 13,000 cfs; close to equaling outflows. PacifiCorp is likely in full generation for the next week or so. Anything greater than 11,500 cfs we are capturing in the reservoir.

H&S/ATS Update

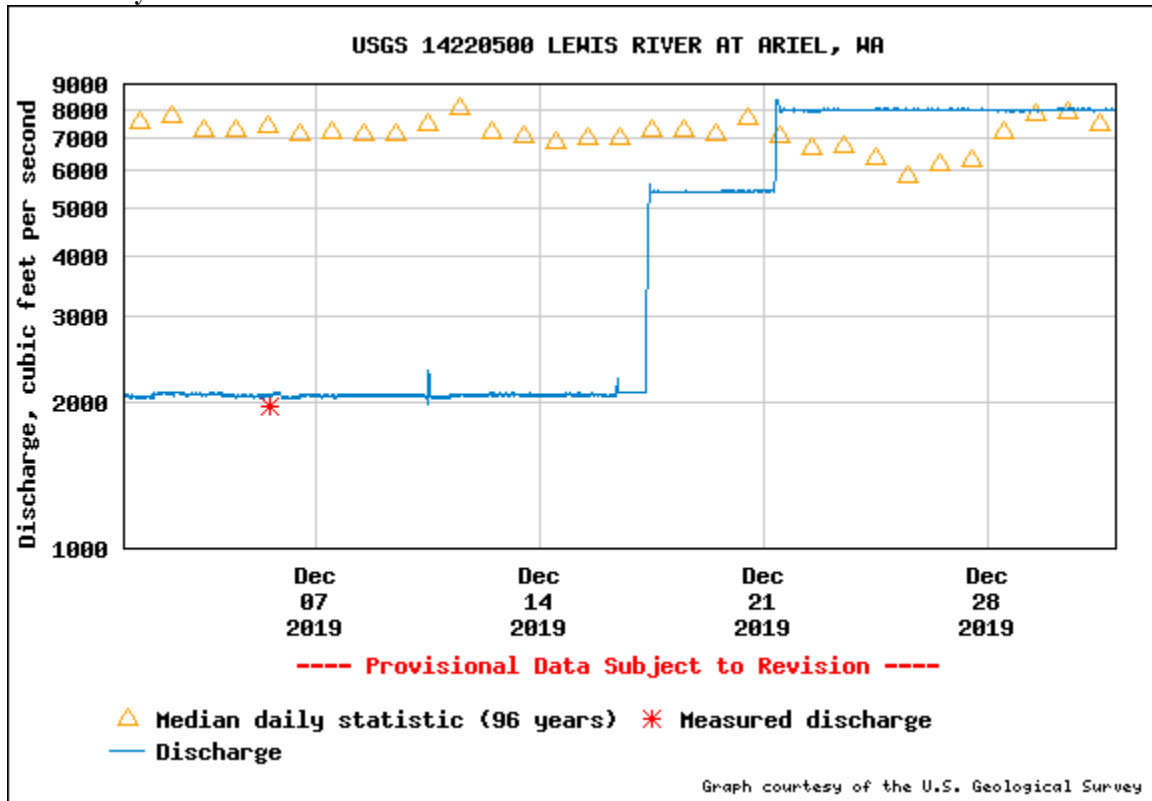
Lesko informed the ACC attendees that the Aquatic Technical Subgroup (ATS) plans to meet again January 16, 2020 from 9:00am – noon. PacifiCorp submitted an extension request the FERC asking for a December 31, 2020 submittal for the independent review study. The ATS is planning on submitting a draft of the comprehensive review team by the end of the month. Once the review is complete the Utilities will distribute the final draft to the ACC for 60-day review.

Merwin Fish Collection Facility and General Operations ([Attachment C](#))

During the month of December, a total of 854 fish were captured at the Merwin Dam Adult Fish Collection Facility (MFCF). The majority of these fish were late-run Coho (61.4 %).

The Merwin Dam Fish Collection Facility ran continuously for the month of December, with the exception of December 5th, when the facility was shut down for repairs on the vertical crowder. Because the majority of fish that were being collected were of hatchery origin, PacifiCorp implemented a 5 day per week fish transport schedule starting on December 28th. Under this schedule, the crowder and fish lift remain in operation 7 days per week, with fish sorting and transport taking place Monday through Friday. Flow below Merwin Dam was maintained at approximately 2,050 cfs until December 17th, when it was increased to approximately 5,400 cfs. Flow was increased again on December 21st, to approximately 8,000 cfs, where it remained for the remainder of the month. (Table 1).

Table 1. Discharge in cubic feet per second recorded at the USGS Ariel, WA gauge (14220500) located immediately downstream of Merwin Dam.



Upstream Transport (Attachment C)

Eight (8) Blank Wire Tag (BWT) winter steelhead were captured by the end of December 2018 and were transported upstream as part of the 2019 run year. An additional 38 adults were taken upstream in January 2019 and another 30 in February, 106 in March, 705 in April, 110 in May, and 4 in June for a total of 1,001 BWT winter steelhead transported as part of the 2019 run year. Twelve (12) additional winter steelhead of natural origin (NOR) containing PIT tags from the upper basin were also transported upstream as part of the 2019 run year. A combined total of 1,013 adult winter steelhead have been transported upstream of Swift Dam as part of the 2019 run year (Table 2). A total of three (3) BWT winter steelhead were collected in December 2019 (1 female/2 male). These fish will be included in the 2020 run year.

Table 2. Total number of adult winter steelhead transported upstream of Swift Dam in 2019.

Run Year	Male	Female	Total adult winter steelhead taken upstream of Swift Dam
2012	141	48	189
2013	440	301	741

2014	452	581	1,033
2015	746	477	1,223
2016	378	376	754
2017	331	261	592
2018	682	535	1,227
2019	527	486	1,013

Thirty three (33) NOR (12 female/12 male/9 jack) and an additional 76 hatchery origin jack (HOR) spring Chinook have been taken upstream through December 2019.

By the end of December, 5,320 adult Coho (2,947 male/2,373 female) had been transported upstream along with 268 jacks (< 20 inches). During the month of December, six (6) NOR Coho that were PIT tagged in the upper basin had been detected as returning adults at the MFCF. All of these fish were tagged at the Swift FSC in the spring of 2018 and returned as adults.

Swift Floating Surface Collector ([Attachment C](#))

The Swift Reservoir Floating Surface Collector was returned to service on October 14, 2019, following the summer maintenance outage. The Swift Floating Surface Collector (FSC) ran continuously until December 19th, when it was taken out of operation so that the trestle stairs could be replaced, and modifications could be made to the starboard side smolt flume. The FSC remained off for the remainder of the month. A total of 125 fish were collected at the Swift FSC during the month of December. The majority of the fish collected were juvenile Chinook (59.2 %) and juvenile Coho (33.6 %).

Karchesky (PacifiCorp) provided a brief update on the Swift FSC, and reminded ACC members that the Swift FSC was currently off due to a number of construction projects scheduled in January and February 2020. Karchesky mentioned that PacifiCorp would continue to keep the ACC informed as these projects move forward. All construction activities are planned to be complete by March, 1, 2020.

Hatchery Broodstock Update

Bryce Glaser (WDFW) informed the ACC that the need has been met for early winter steelhead broodstock. Coho need was also met.

Other

The ACC would like to review and possibly edit the ACC & TCC Structure and Ground Rules document. Kim McCune (PacifiCorp) will email the link to the document for ACC review and add this topic to the February 12, 2020 ACC meeting agenda.

Aquatic Fund Review Schedule

Full proposals are due from the applicants by February 3, 2020 at which time McCune will send to the ACC for a 30-day review period on February 4, 2020.

Agenda items for February 12, 2020

- December 12, 2019 and January 9, 2019 Meeting Notes
- In Lieu License Amendment Application 90-day review; Phil Roni Consultant Presentation
- Merwin Dam ATE Memorandum Review (tentative)
- ACC Structure and Ground Rules Discussion
- In Lieu /ADR Update
- Study/Work Product Update

Adjourn 1:00pm

Next Scheduled Meeting:

February 12, 2020
Merwin Hydro Control Center
9:30 a.m. – 12:00 p.m.

Meeting Handouts & Attachments:

- Meeting Notes from 11/14/19
- Agenda from 1/9/20
- **Attachment A** – Swift Reservoir 2019 Floating Surface Collector Efficiency Evaluation, Annual Report Review Meeting
- **Attachment B** – Email from Jos Ashline; ADR Update dated January 9, 2020
- **Attachment C** – Lewis River Fish Passage Report (December 2019)



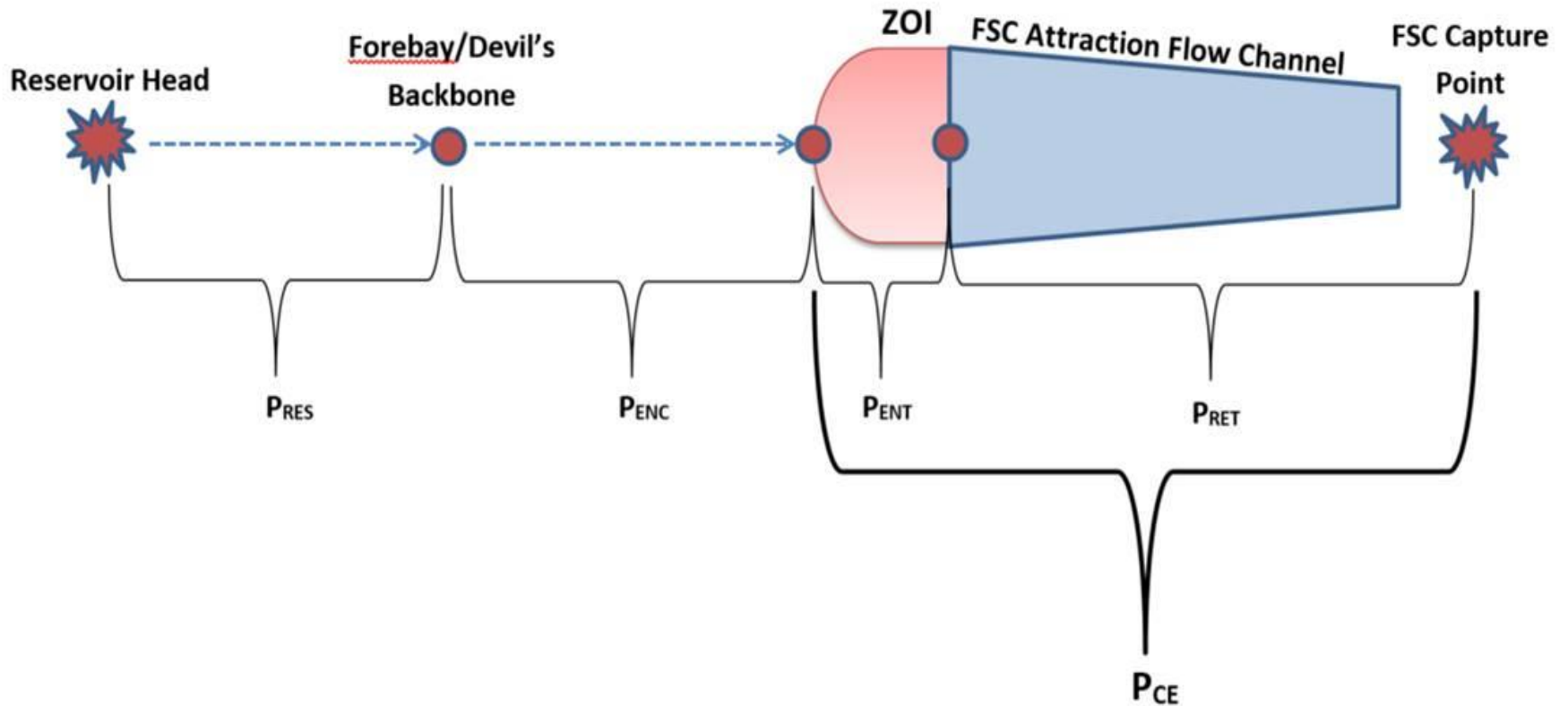
Swift Reservoir 2019 Floating Surface Collector Efficiency Evaluation

Annual Report Review Meeting

2019 Study Objectives

- Evaluate how recent modifications to the floating surface collector (FSC) have influenced collection efficiency (P_{CE})
 - Reprogramming the FSC pumps to reduce vibration
 - Adjusting baffles along the primary screens to further reduce vibrations
 - Increasing the attraction flow velocity at the mouth of the collector
- Estimate passage metrics and investigate fish behavior in the forebay and collector

Passage Metrics

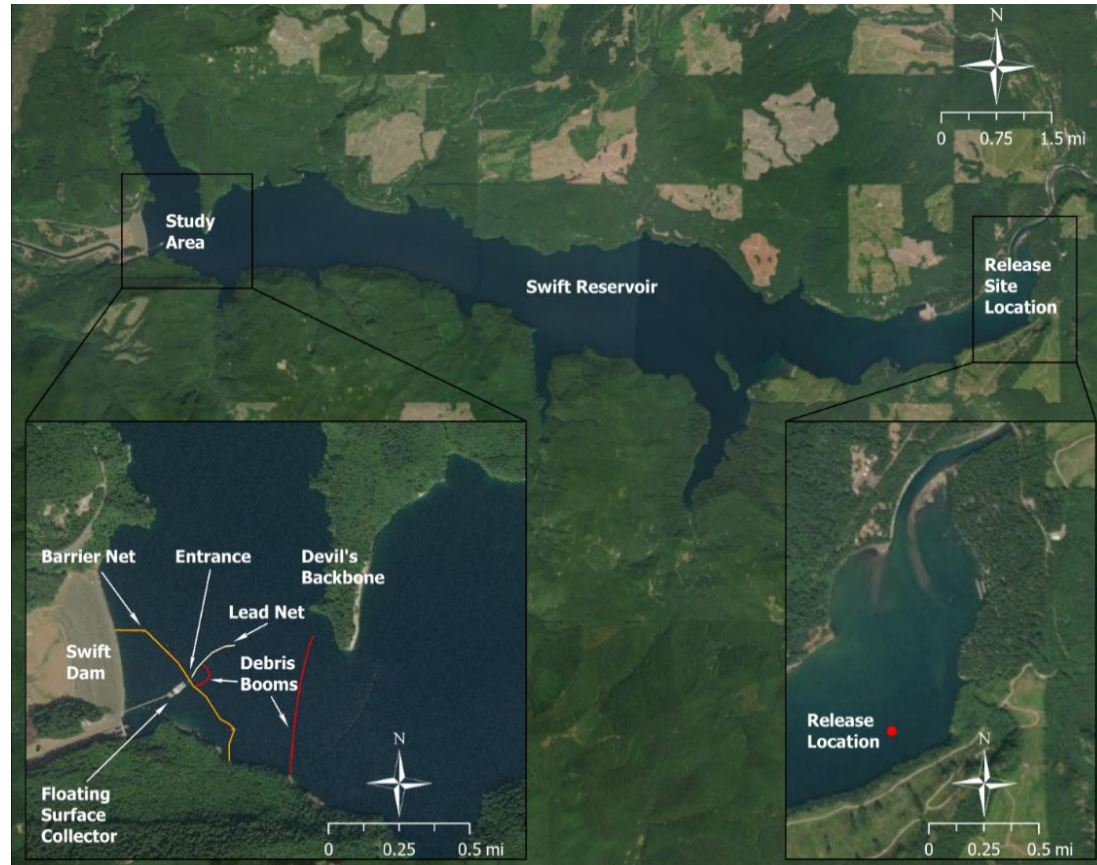


Methods Overview

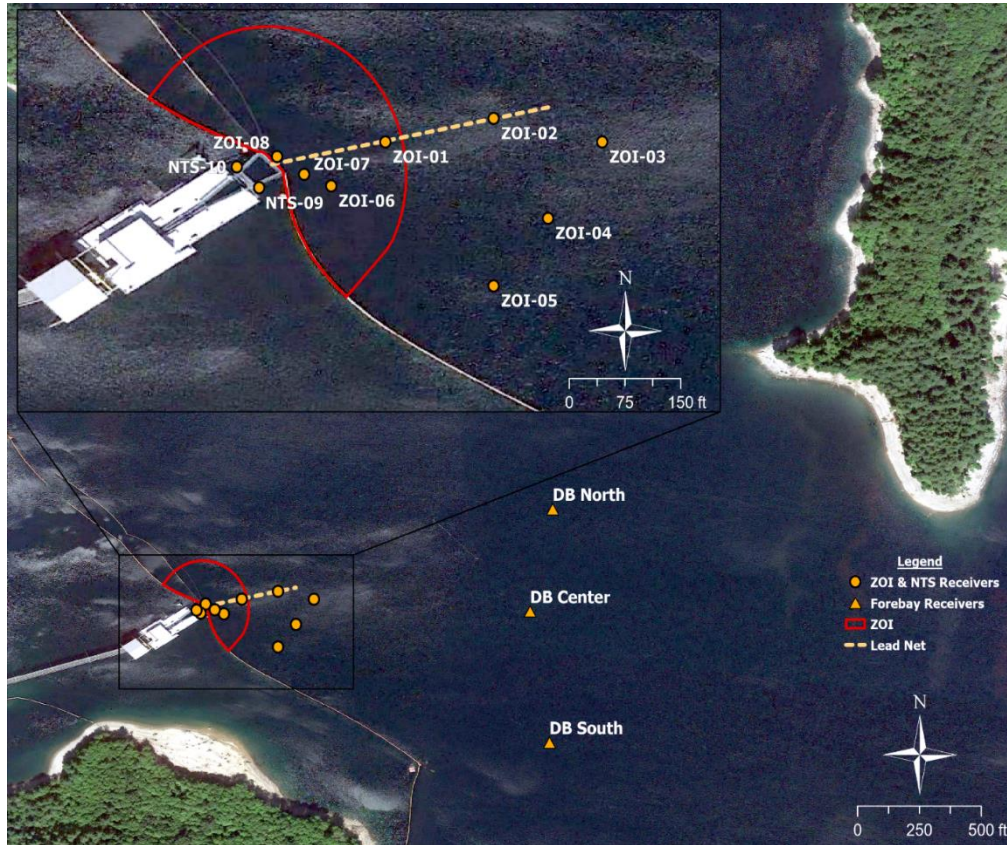
- Use acoustic telemetry to track fish through the ZOI and into the collector
 - Estimate 2D position within the ZOI
 - Track fish through the ZOI and into the NTS
- Analyze the acoustic telemetry data to estimate passage metrics and investigate fish behavior in the forebay and collector
 - Use presence/absence data to determine when fish entered the forebay
 - Evaluate behavior in the ZOI using 2D position estimates
 - Analyze detection signatures to track fish in the NTS and collection channel

Field Study Overview

- 525 dual PIT/acoustic-tagged fish released 9 miles upstream of the FSC between 3/26 and 6/26
 - 300 Coho Salmon
 - 155 Chinook Salmon
 - 70 steelhead
- Fish tracked via acoustic telemetry from Devil's Backbone to the NTS
- Fish tracking continued until July 22
 - Each tag has an estimated 45 day battery life from time of release
- Collection confirmed with PIT tags



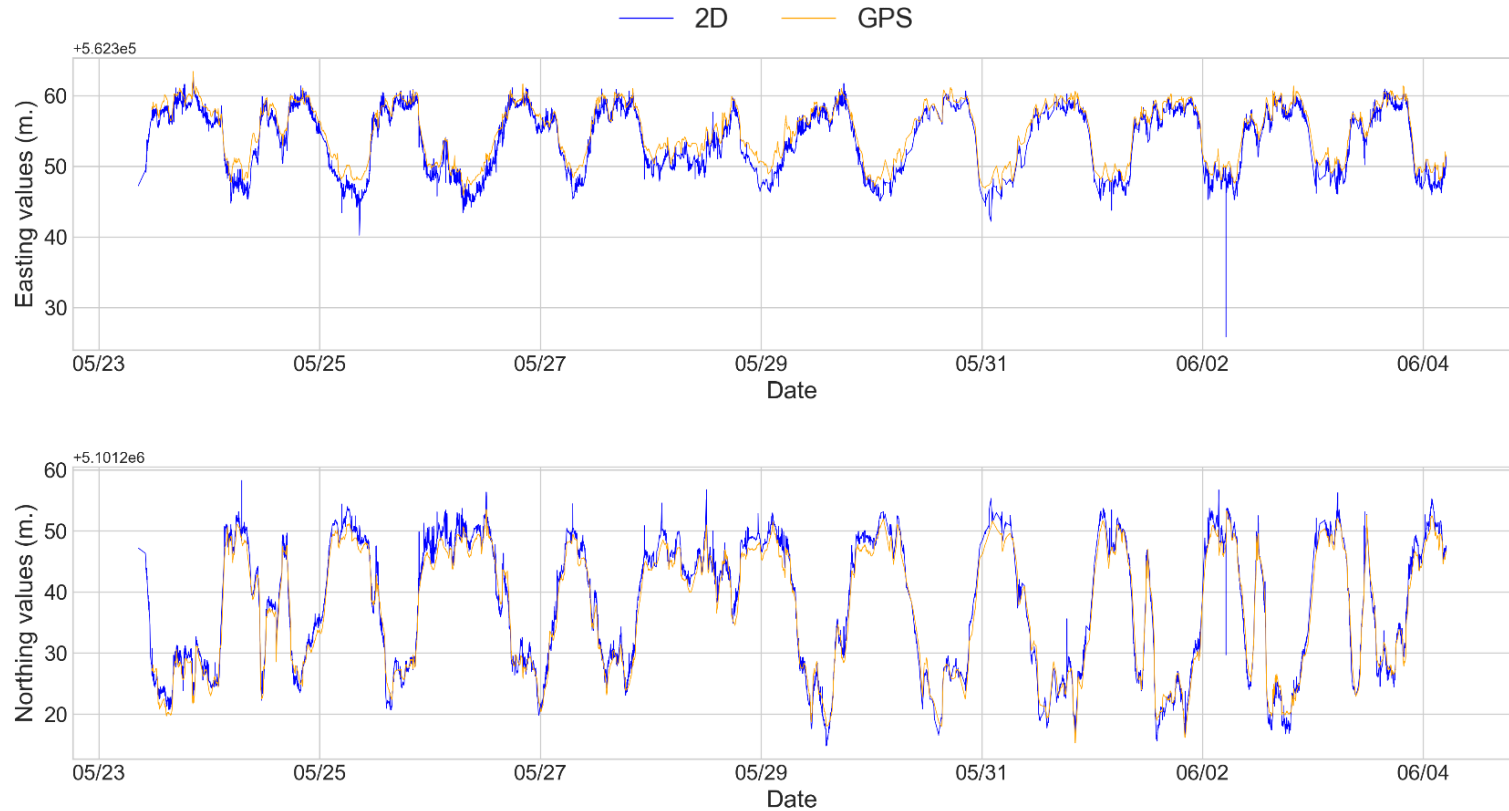
Acoustic Telemetry Arrays



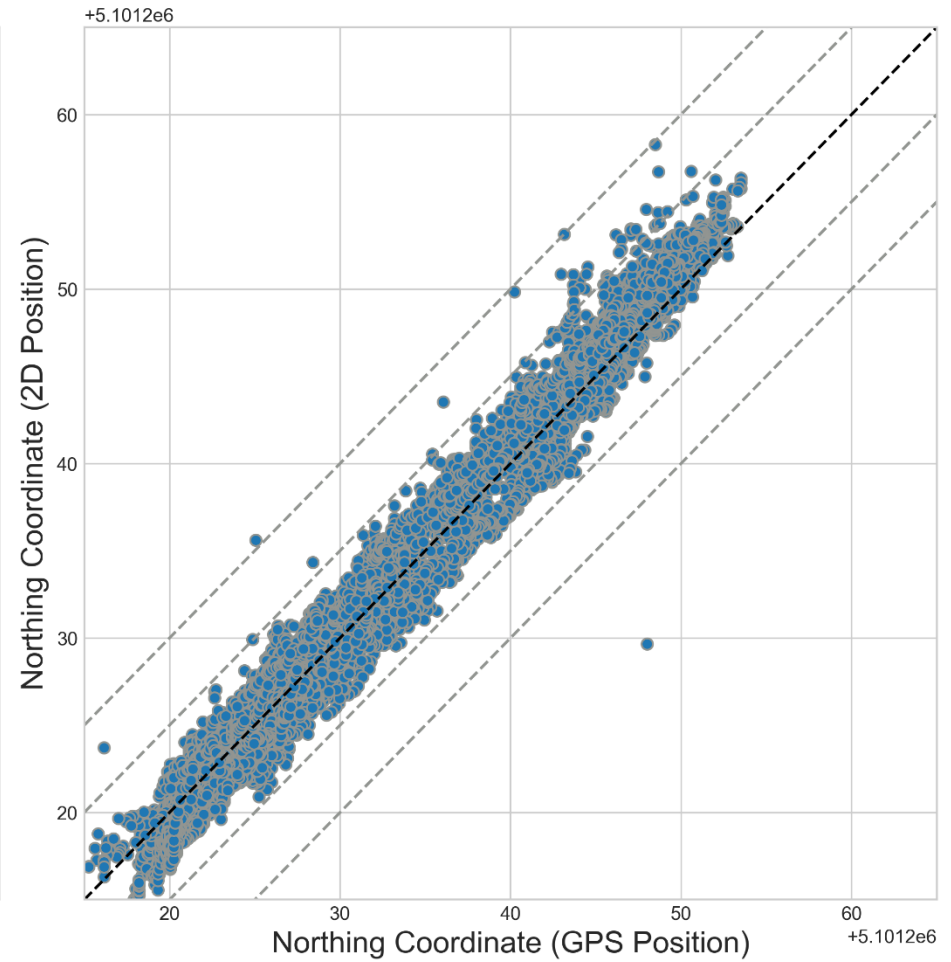
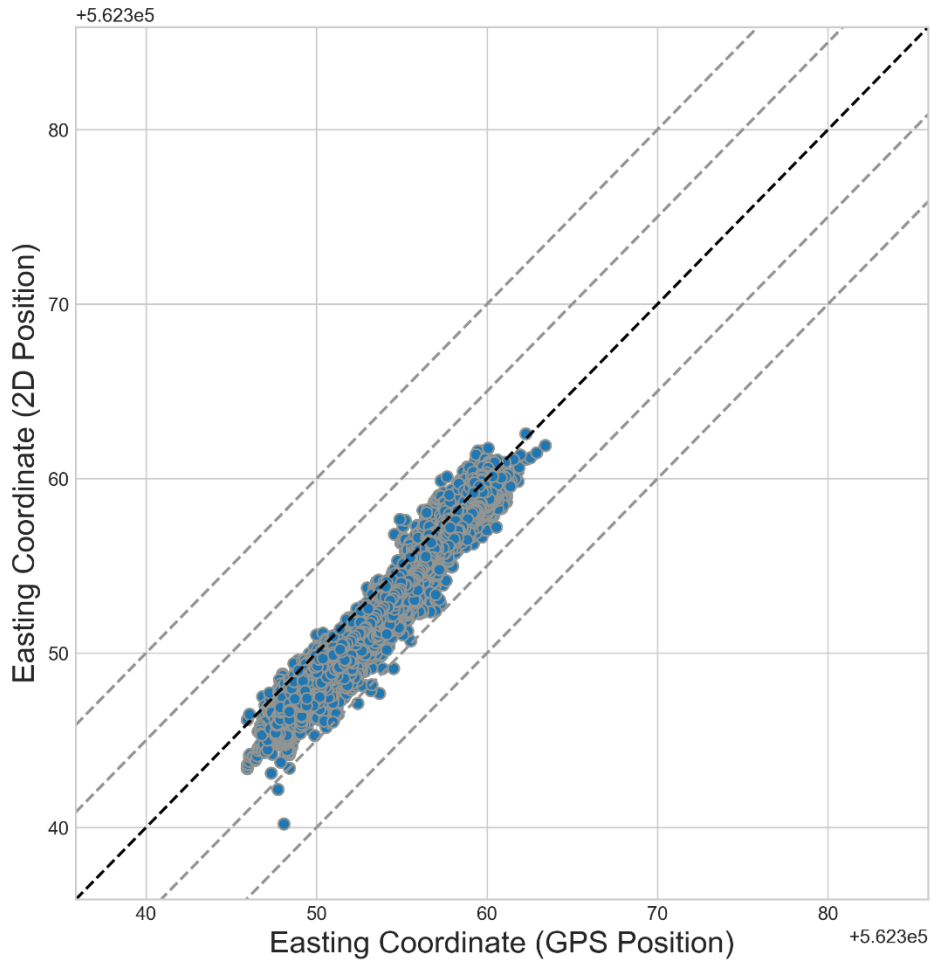
- 13 receivers
 - 3 presence/absence: monitor forebay entrance
 - 8 positioning with beacon tags: track fish in the zone of influence (ZOI)
 - 2 positioning: track fish through the NTS and into the collector
- 22-week deployment: February 18 to July 22
- Data downloaded and processed semi-monthly
 - Processing included computation of 2D position estimates and passage metrics

2D Tracking Accuracy

Evaluated by comparing beacon tag position estimates with receiver GPS data



2D Tracking Accuracy (continued)



Detection/Tracking Efficiency

Species	Forebay Array (%)	ZOI Array (%)	Missed on ZOI	NTS Array (%)	Missed on NTS
Chinook Salmon	100	100	0	97 (84, 100)	1
Coho Salmon	100	100	0	98 (93, 100)	2
Steelhead	100	100	0	100	0
All	100	100	0	98 (94, 99)	3

Metric Calculations

Metric	Calculation (uncorrected)	Calculation (corrected)
Rate of Reservoir Passage (P_{RES})	$P_{RES} = \frac{DET_{Swift}}{R}$	$\hat{P}_{RES} = \frac{(C/R)}{P_{ENC} \cdot P_{ENT} \cdot P_{RET}}$
ZOI Encounter Rate (P_{ENC})	$P_{ENC} = \frac{DET_{ZOI}}{DET_{Swift}}$	$\hat{P}_{ENC} = \frac{(DET_{ZOI}/D_{EFF-ZOI})}{DET_{Swift}}$
Entrance Efficiency (P_{ENT})	$P_{ENT} = \frac{DET_{ENT}}{DET_{ZOI}}$	$\hat{P}_{ENT} = \frac{(DET_{ENT}/D_{EFF-ENT})}{(DET_{ZOI}/D_{EFF-ZOI})}$
Retention Efficiency (P_{RET})	$P_{RET} = \frac{C}{DET_{ENT}}$	$\hat{P}_{RET} = \frac{C}{(DET_{ENT}/D_{EFF-ENT})}$
Collection Efficiency (P_{CE})	$P_{CE} = \frac{C}{DET_{ZOI}}$	$\hat{P}_{CE} = \frac{C}{(D_{ZOI}/D_{EFF-ZOI})}$

R = number of unique tagged fish released
 DET_{Swift} = number of juveniles detected entering Swift Dam forebay (i.e., at any receiver in Swift forebay array)
 $D_{EFF-Swift}$ = detection efficiency of the Swift forebay array
 DET_{ZOI} = number of unique tagged fish identified in the vicinity of the floating surface collector (i.e., in the ZOI)

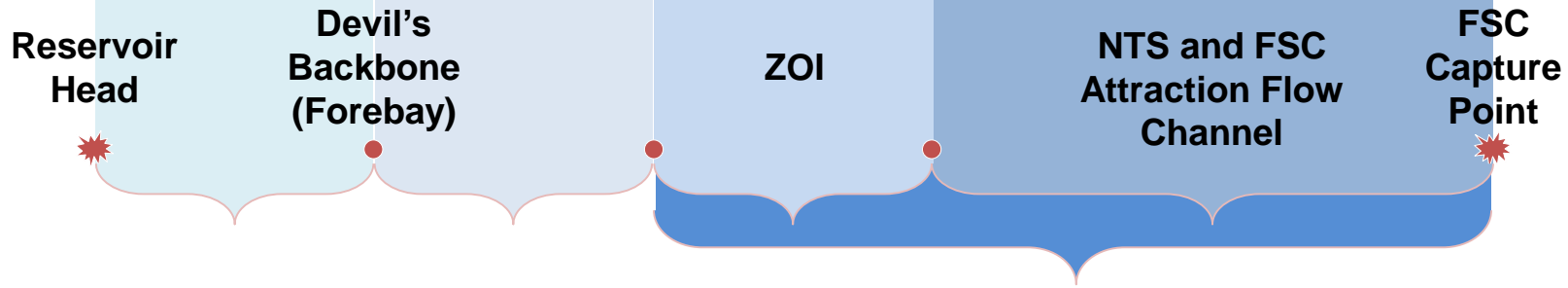
$D_{EFF-ZOI}$ = detection efficiency of the ZOI array
 DET_{ENT} = number of tagged fish detected inside the entrance of the net transition structure
 $D_{EFF-ENT}$ = detection efficiency of the net transition structure entrance array
 C = number of unique tagged fish identified in the fish collection ponds inside the floating surface collector (i.e., collected)

Metric Calculation Methods

- DET_{SWIFT} determined using presence/absence on the forebay array
- DET_{ZOI} determined using 2D tracking through the ZOI
 - A minimum of 5 position estimates within the ZOI in a 10-minute window was used as the criteria for presence in the ZOI
- DET_{ENT} determined using time-of-arrival on NTS receivers with amplitude filtering
 - 2D position estimates used for verification of filter accuracy
- C determined using PIT detections in the collector (any array)

Passage Metrics

Species	P _{RES} (%)	P _{ENC} (%)	P _{ENT} (%)	P _{RET} (%)	P _{CE} (%)
Chinook Salmon	63	85	78	65	51
	(55, 70)	(76, 91)	(67, 86)	(53, 77)	(39, 62)
Coho Salmon	86	95	98	65	64
	(82, 90)	(91, 98)	(93, 100)	(57, 72)	(53, 74)
Steelhead	63	93	97	28	27
	(52, 74)	(79, 84)	(83, 100)	(13, 42)	(17, 37)
All	78	92	93	60	55
	(75, 82)	(89, 95)	(89, 96)	(53, 66)	(44, 67)



Comparison to Past Studies

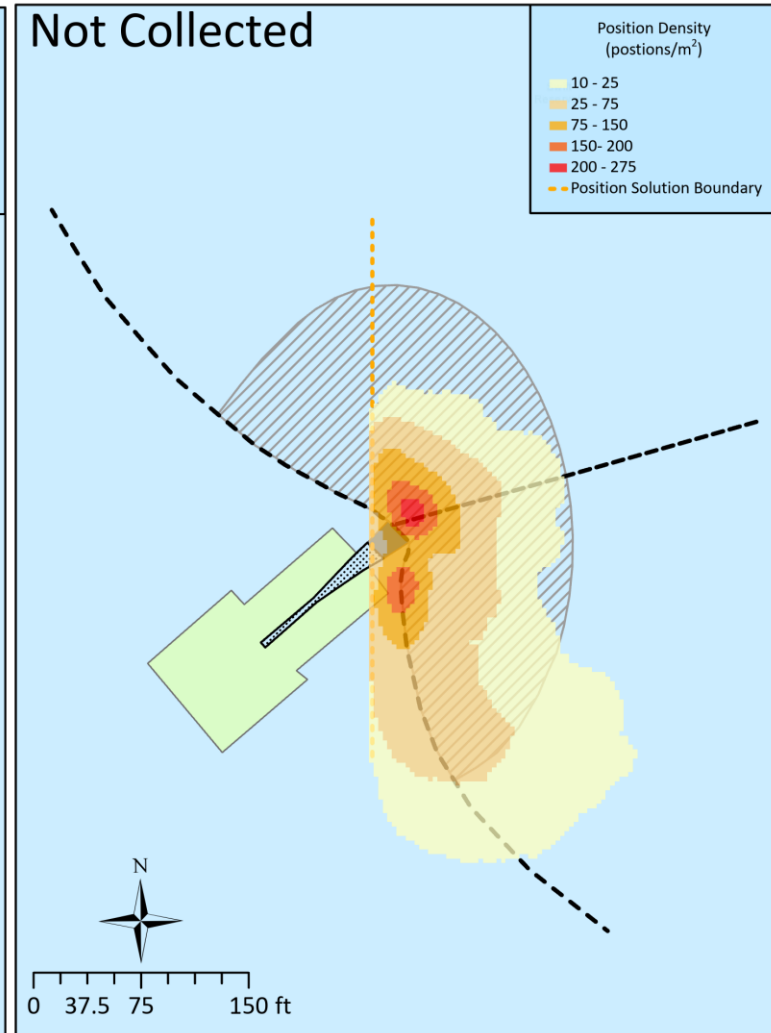
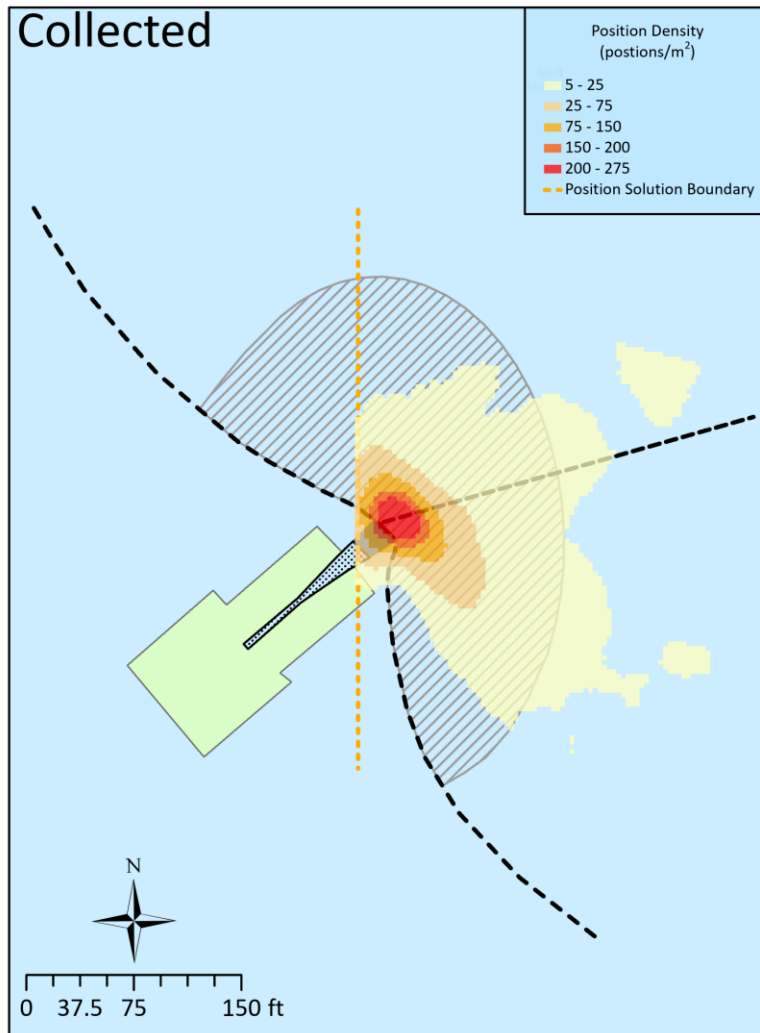
Year	Species	P _{RES} (%)	P _{ENC} (%)	P _{ENT} (%)	P _{RET} (%)	P _{CE} (%)
2017	Chinook Salmon	69.4	82.7	46.8	24.1	11.3
	Coho Salmon	81.0	91.6	65.1	41.1	26.7
	Steelhead	66.7	89.2	48.6	40.4	19.7
2018	Chinook Salmon	--	--	--	--	23.7*
	Coho Salmon	--	--	--	--	39.5*
	Steelhead	--	--	--	--	48.9*
2019	Chinook Salmon	62.8	85.2	78.1	64.9	50.7
	Coho Salmon	85.9	95.4	98.3	64.6	63.5
	Steelhead	62.8	92.5	97.3	27.8	27.0

* In 2018, survival probability through reservoir (S_{RES}) was used as a surrogate for collection efficiency

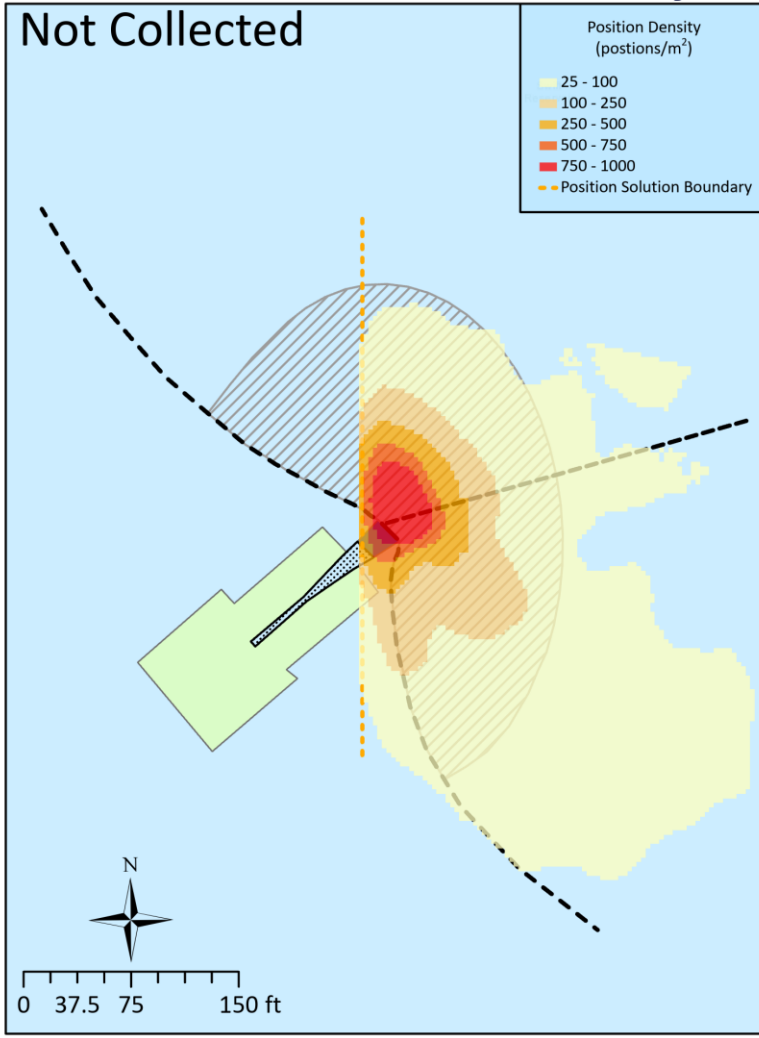
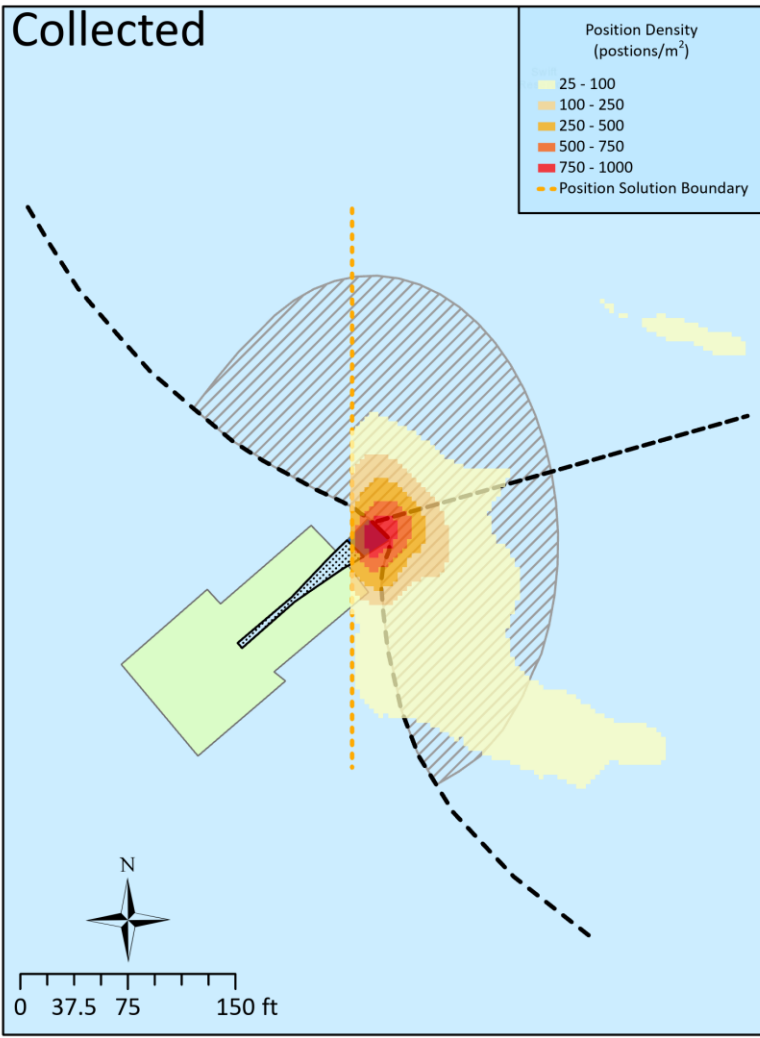
ZOI Position Analysis

- Investigate patterns in fish positions within the ZOI and NTS
 - Develop heat maps of all position estimates
 - Conducted in ArcGIS software using point density analysis routines (ESRI 2011)
- Comparison by species and collected versus non-collected fish
- Patterns indicate that all fish, whether collected or not, congregate at and immediately within the entrance of the NTS

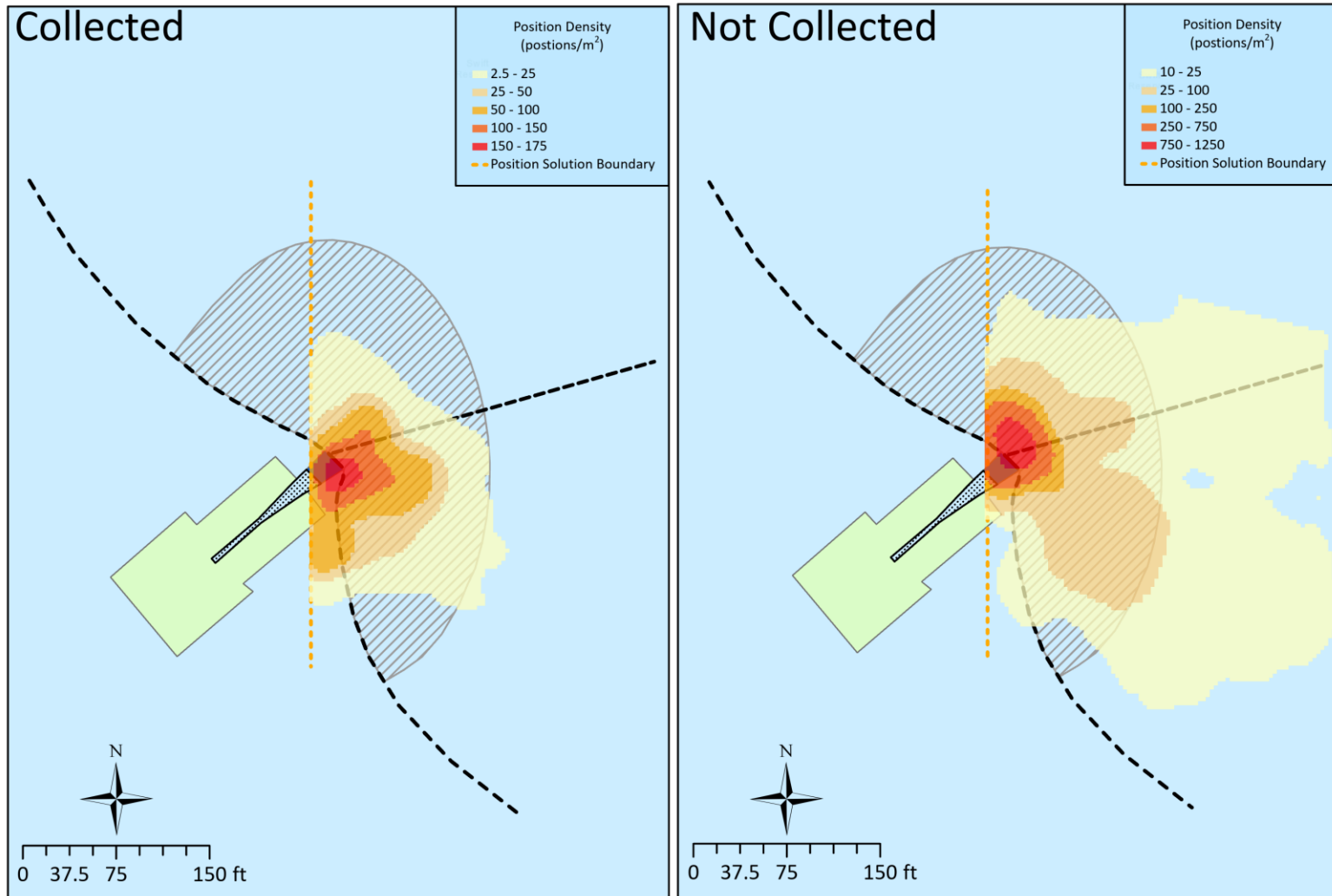
Chinook Salmon Position Density



Coho Salmon Position Density



Steelhead Position Density



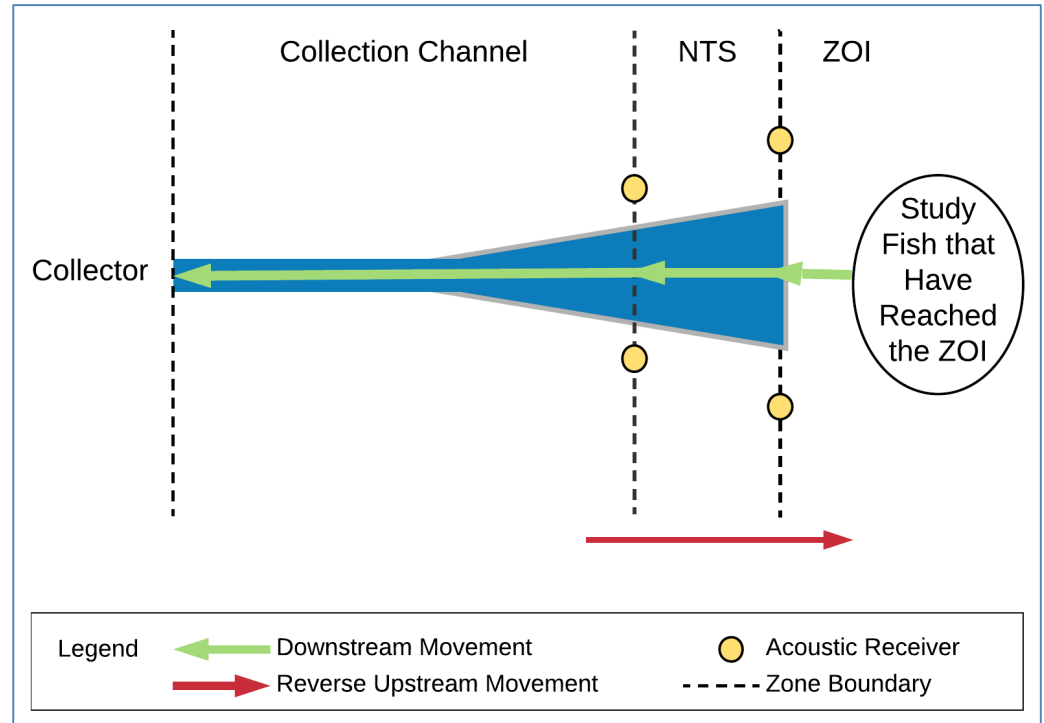
Time of Arrival Analysis

- ZOI approach timing
 - Steelhead that arrived at night more likely to be collected than those that arrived during the day
 - Unrelated to collection for both Chinook Salmon and Coho Salmon
- Collection timing

Species	Collection Timing	
	Day	Night
Chinook Salmon	13%	87%
Coho Salmon	61%	39%
Steelhead	56%	44%

Rejection Inside the Collector

- Investigate patterns in probability of fish exiting the collector after entering the collection channel
- Multivariate analysis included
 - Length
 - Species
 - Number of visits
 - Diel period
 - Release week
 - Last week detected



Rejection Analysis Results

- Time at large and length related to probability of rejection

Variable	P Value
Last Week Detected in Collection Channel	0.00001
Length	0.00013
Number of Visits to the Collection Channel	0.20
Species	0.24
Diel Period	0.26
Release Week	0.76

Summary

- Highest P_{CE} to date for Coho and Chinook
 - Steelhead P_{CE} highest of any acoustic study, though P_{CE} in 2018 PIT study was higher
- Gains observed in P_{ENT} since 2017 suggest that collector modifications have been effective at encouraging fish to enter the collector
- Retention within the collector (P_{RET}) currently the limiting factor to achieving P_{CE} targets
- Larger fish had a higher probability of rejecting the collector after entering the collection channel

Summary (Continued)

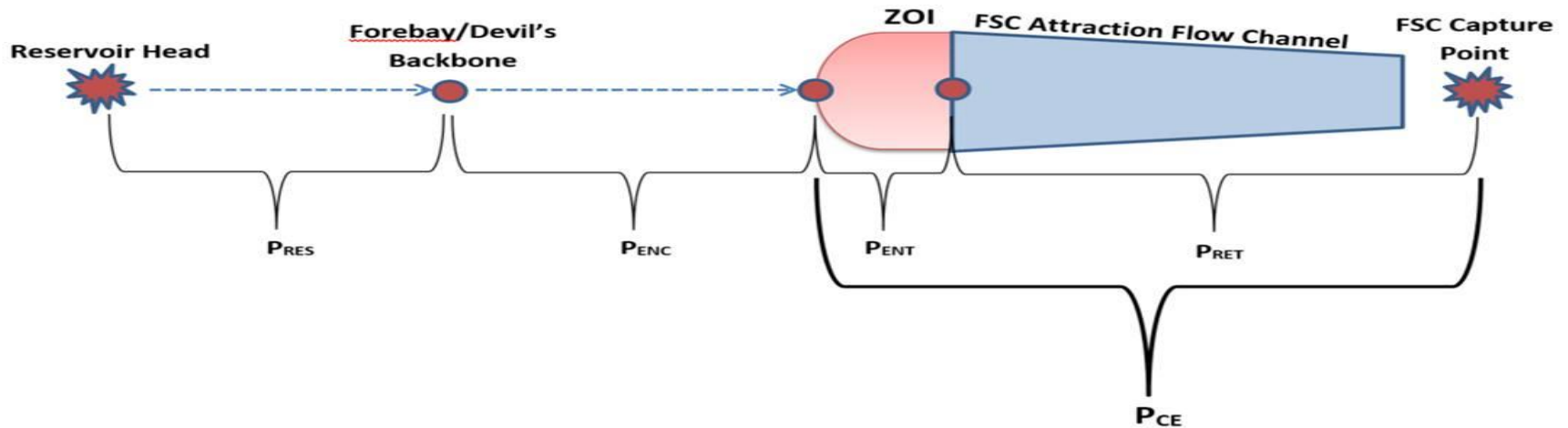
- Some steelhead metrics declined in 2019
 - P_{RET} lower than in 2017
 - P_{CE} lower than in 2018 (PIT only)
- Possible explanations
 - Low adult numbers taken upstream in 2017, so fewer out migrants
 - Fewer fish present overall (no “pied-piper” effect, higher risk of predation)
 - Differences in handling between 2018 (PIT only) and 2019 (acoustic + PIT)?



Backup Slides

Passage Metrics

Species	P_{RES} (%)	P_{ENC} (%)	P_{ENT} (%)	P_{RET} (%)	P_{CE} (%)
Chinook Salmon	63 (55, 70)	85 (76, 91)	78 (67, 86)	65 (53, 77)	51 (39, 62)
Coho Salmon	86 (82, 90)	95 (91, 98)	98 (93, 100)	65 (57, 72)	64 (53, 74)
Steelhead	63 (52, 74)	93 (79, 84)	97 (83, 100)	28 (13, 42)	27 (17, 37)
All	78 (75, 82)	92 (89, 95)	93 (89, 96)	60 (53, 66)	55 (44, 67)



Passage Metrics

Metric	Definition
Rate of Reservoir Passage (P_{RES})	Proportion of released smolts that migrate to the forebay of Swift Dam
Encounter Rate (P_{ENC})	Proportion of released smolts that enter the forebay and are detected in the zone of influence (ZOI)
Entrance Efficiency (P_{ENT})	Proportion of released smolts that enter the ZOI and the net transition structure (NTS)
Retention Efficiency (P_{RET})	Proportion of released smolts that enter the NTS and are successfully collected
Collection Efficiency (P_{CE})	Proportion of released smolts that enter the ZOI and successfully collected

Comparison to Past Studies

Study Attributes					Detection Estimates (Total)				
Year	Study Type	Capture Location	Release Location	Species	P _{RES} Estimate (%)	ZOI Detection Rate (%)	P _{ENT} Estimate (%)	P _{RET} Estimate (%)	P _{CCE} Estimate (%)
2013	Radio Telemetry	FSC	<3.1 miles east of FSC	Chinook Salmon	--	79.3	--	--	0.0
				Coho Salmon	--	53.7	--	--	6.0
				Steelhead	--	--	--	--	--
2014	Radio Telemetry	FSC	2 miles east of FSC	Chinook Salmon	--	15.0	--	--	0.0
				Coho Salmon	--	19.7	--	--	29.0
				Steelhead	--	25.0	--	--	25.0
2015	Dual PIT/ Acoustic Telemetry	Eagle Cliff Rotary Screw Trap/Hook and Line	Eagle Cliff	Chinook Salmon	64.3	42.9	--	--	0.0
				Coho Salmon	90.6	79.1	--	--	11.8
				Steelhead	91.5	91.5	--	--	18.6
2016	Dual PIT/ Acoustic Telemetry	FSC and Eagle Cliff Rotary Screw Trap	Eagle Cliff	Chinook Salmon	33.3	33.3	--	--	0.0
				Coho Salmon	89.7	62.8	--	--	30.6
				Steelhead	70.0	42.5	--	--	23.5
2017	Dual PIT/ Acoustic Telemetry	FSC	Eagle Cliff	Chinook Salmon	69.4	82.7	46.8	24.1	11.3
				Coho Salmon	81.0	91.6	65.1	41.1	26.7
				Steelhead	66.7	89.2	48.6	40.4	19.7
2018	PIT	FSC	Eagle Cliff	Chinook Salmon	--	--	--	--	23.7'
				Coho Salmon	--	--	--	--	39.5'
				Steelhead	--	--	--	--	48.9'
2019	Dual PIT/ Acoustic Telemetry	FSC	Eagle Cliff	Chinook Salmon	62.8	85.2	78.1	64.9	50.7
				Coho Salmon	85.9	95.4	98.3	64.6	63.5
				Steelhead	62.8	92.5	97.3	27.8	27.0

Tag Activation Correction

- Unknown portion of tags appear to have not activated, biasing P_{RES}
- Remove bias in downstream metrics (P_{ENC} , P_{ENT} , P_{RET} , and P_{CE}) by considering only tags detected in the forebay as released in the mark/recapture model
- Solve for P_{RES}

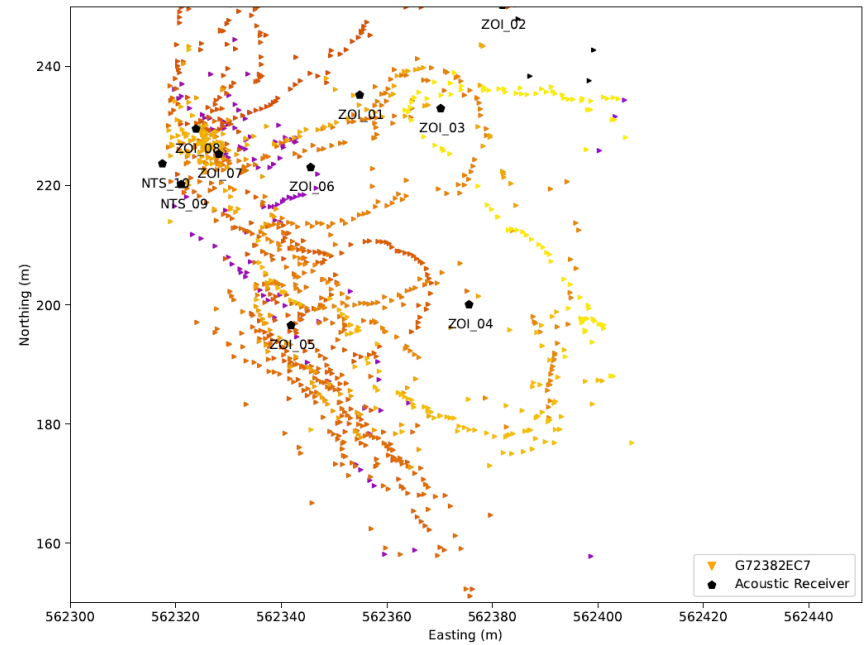
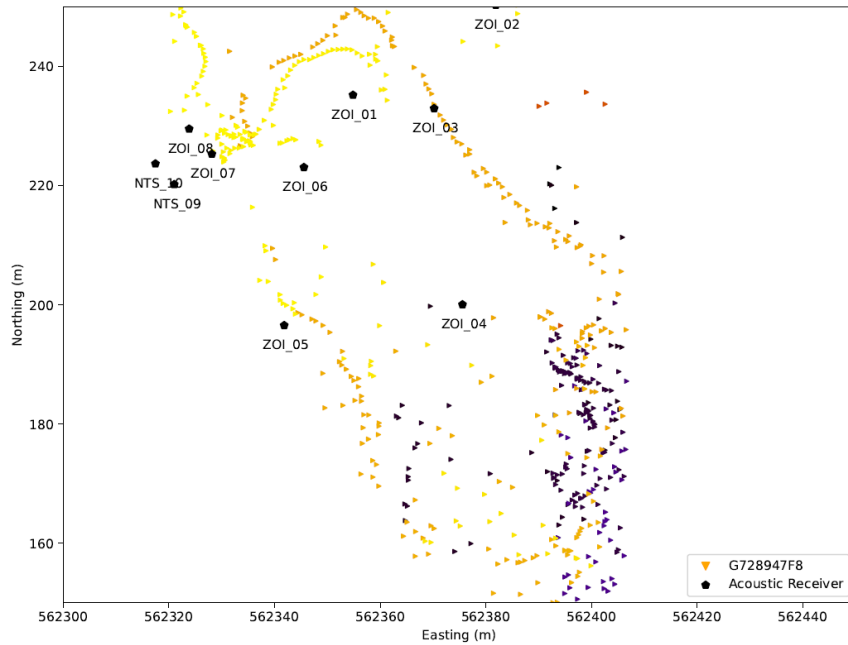
$$\frac{\text{collected}}{\text{released}} = P_{RES} * P_{ENC} * P_{ENT} * P_{RET}$$

Passage Metrics (continued)

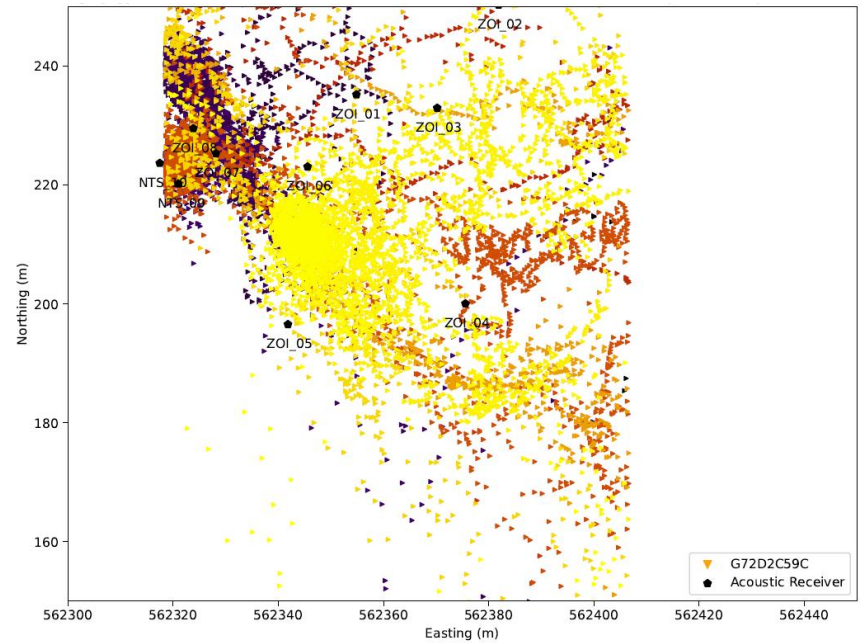
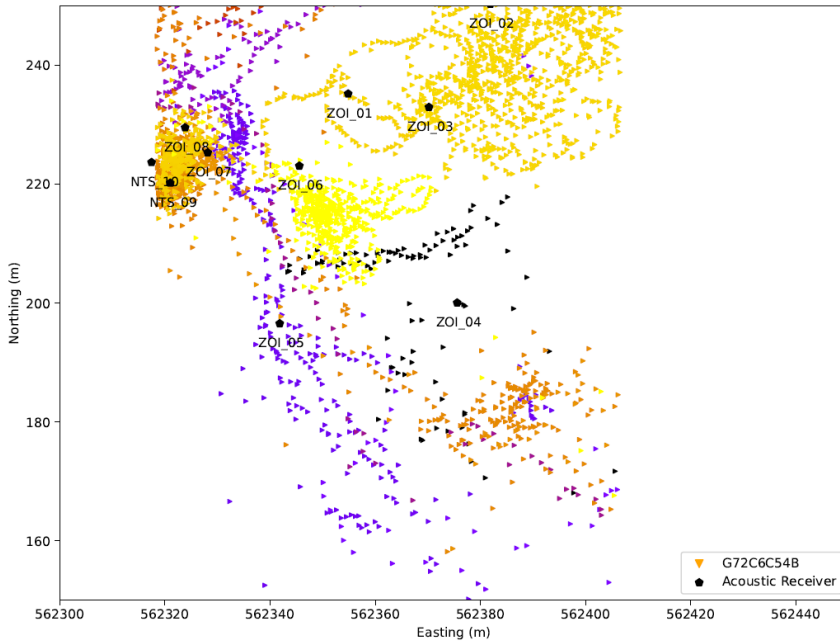
Species	N_{rel}	N_{fb}	N_{fb} (corrected)	N_{ZOI}	N_{NTS}	N_{NTS} (corrected)	N_{col}	N_{col} (activated)
Chinook Salmon	155	88	97	75	57	59	42	38
Coho Salmon	300	175	258	167	161	164	156	106
Steelhead	70	40	44	37	36	36	11	10
All	525	303	399	279	254	259	209	154

Milling Behavior Approach

Use fish tracks to identify areas in the ZOI where fish hold or delay migration

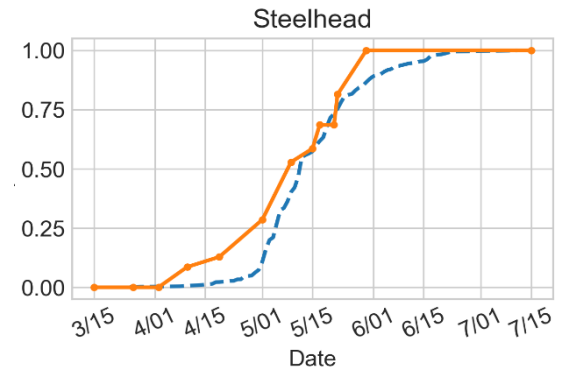
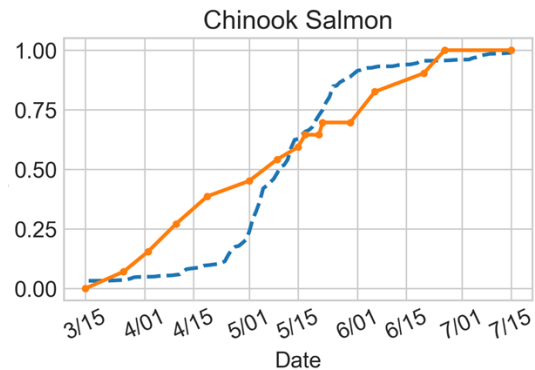
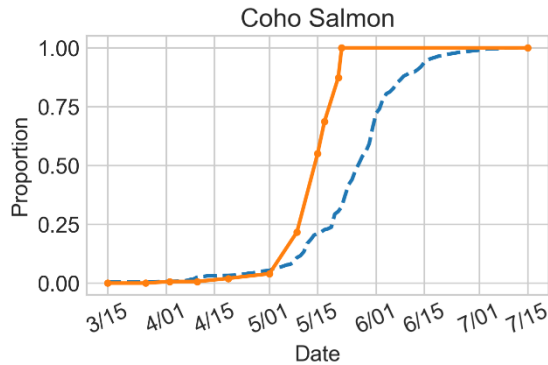


Milling Behavior Approach (continued)



Fish Releases

- 525 study fish released between March 26 and June 26
 - 300 Coho salmon
 - 155 Chinook salmon
 - 70 steelhead



	Chinook Salmon			Coho Salmon			Steelhead		
Release Date	Tagged	Detected	Known Inactive	Tagged	Detected	Known Inactive	Tagged	Detected	Known Inactive
3/26/2019	11	8							
4/2/2019	13	9		2	2				
4/10/2019	18	8					6	1	
4/19/2019	18	8		4	4		3	1	
5/1/2019	10	10		6	5		11	5	
5/9/2019	14	12	1	53	50	3	17	16	
5/15/2019	8	6		100	57	9	4	3	
5/17/2019	8	3		41	24	13	7	3	
5/21/2019				56	15	18			
5/22/2019	8	1		38	18	7	9	2	1
5/30/2019							13	9	
6/6/2019	20	5	3						
6/20/2019	12	7							
6/26/2019	15	11							
Total	155	88	4	300	175	50	70	40	1

Note: "Known Inactive" are fish that were PIT detected at the collector but never detected on the acoustic receivers.

McCune, Kimberly

To: Joshua Ashline - NOAA Federal
Subject: 1/9/2020; NMFS ADR Update

From: Joshua Ashline - NOAA Federal [mailto:joshua.ashline@noaa.gov]
Sent: Thursday, January 9, 2020 11:04 AM
To: McCune, Kimberly <Kimberly.McCune@pacificorp.com>; Lesko, Erik <Erik.Lesko@pacificorp.com>; Karchesky, Chris <Chris.Karchesky@pacificorp.com>
Subject: NMFS ADR Update

I need to sign off earlier than 11:30, and don't want to interrupt the FSC presentation.

The following is the NMFS update:

Staff time off during the holidays has delayed the release of the NMFS response to the disputing parties. Our response is still in legal review and needs to be cleared by West Coast Region leadership before being released to the disputing parties. We anticipate the response letter will be sent to the disputing parties before the February ACC meeting. If any ACC members have questions please send myself or Jennifer Quan an email.

Thanks!

--

Joshua Ashline
Fish Biologist
National Marine Fisheries Service
510 Desmond Drive SE
Lacey, WA 98503
Joshua.Ashline@noaa.gov
360-753-9456

Lewis River Fish Passage Report

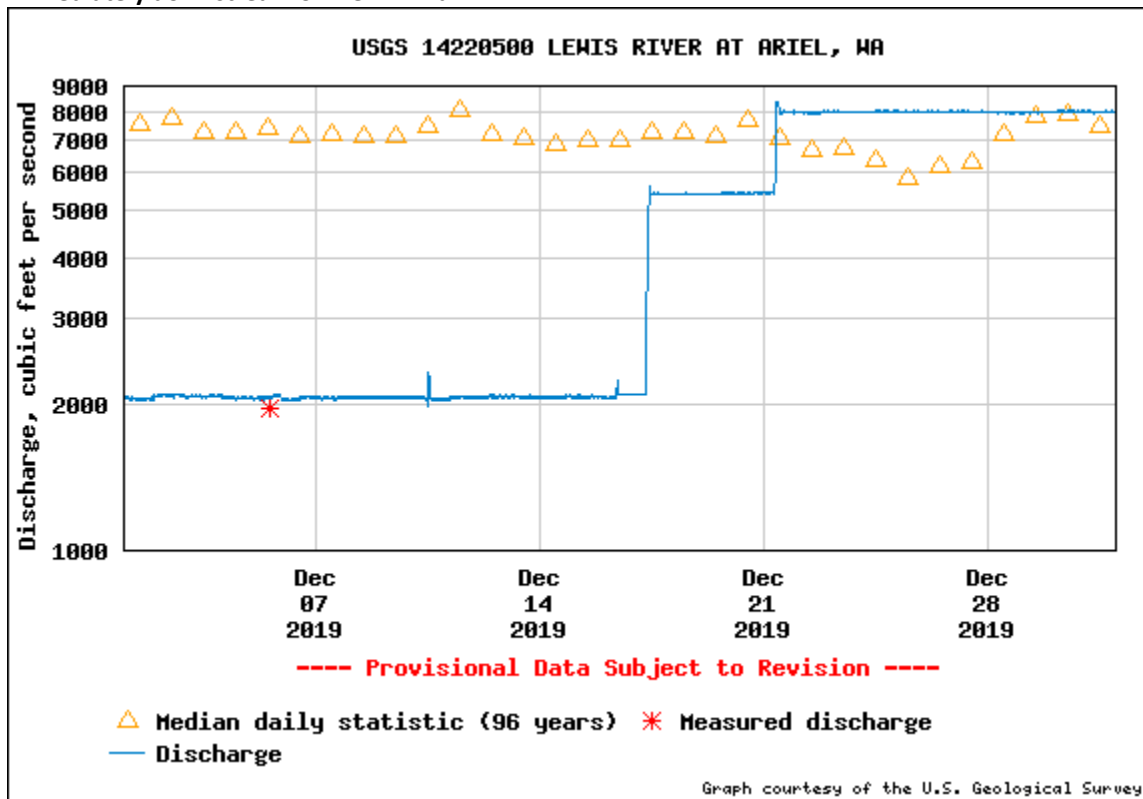
December 2019

Merwin Fish Collection Facility and General Operations

During the month of December, a total of 854 fish were captured at the Merwin Dam Adult Fish Collection Facility (MFCF). The majority of these fish were late-run Coho (61.4 %).

The Merwin Dam Fish Collection Facility ran continuously for the month of December, with the exception of December 5th, when the facility was shut down for repairs on the vertical crowder. Because the majority of fish that were being collected were of hatchery origin, PacifiCorp implemented a 5 day per week fish transport schedule starting on December 28th. Under this schedule, the crowder and fish lift remain in operation 7 days per week, with fish sorting and transport taking place Monday through Friday. Flow below Merwin Dam was maintained at approximately 2,050 cfs until December 17th, when it was increased to approximately 5,400 cfs. Flow was increased again on December 21st, to approximately 8,000 cfs, where it remained for the remainder of the month. (Table 1).

Table 1. Discharge in cubic feet per second recorded at the USGS Ariel, WA gauge (14220500) located immediately downstream of Merwin Dam.



Upstream Transport

Eight (8) Blank Wire Tag (BWT) winter steelhead were captured by the end of December 2018 and were transported upstream as part of the 2019 run year. An additional 38 adults were taken upstream in January 2019 and another 30 in February, 106 in March, 705 in April, 110 in May, and 4 in June for a total of 1,001 BWT winter steelhead transported as part of the 2019 run year. Twelve (12) additional winter steelhead of natural origin (NOR) containing PIT tags from the upper basin were also transported upstream as part of the 2019 run year. A combined total of 1,013 adult winter steelhead have been transported upstream of Swift Dam as part of the 2019 run year (Table 2).

Table 2. Total number of adult winter steelhead transported upstream of Swift Dam in 2019.

Run Year	Male	Female	Total adult winter steelhead taken upstream of Swift Dam
2012	141	48	189
2013	440	301	741
2014	452	581	1,033
2015	746	477	1,223
2016	378	376	754
2017	331	261	592
2018	682	535	1,227
2019	527	486	1,013

Thirty three (33) NOR (12 female/12 male/9 jack) and an additional 76 hatchery origin jack (HOR) spring Chinook have been taken upstream through December 2019.

By the end of December, 5,320 adult Coho (2,947 male/2,373 female) had been transported upstream along with 268 jacks (< 20 inches). During the month of December, six (6) NOR Coho that were PIT tagged in the upper basin had been detected as returning adults at the MFCC. All of these fish were tagged at the Swift FSC in the spring of 2018 and returned as adults.

Floating Surface Collector (FSC)

The Swift Reservoir Floating Surface Collector was returned to service on October 14, 2019, following the summer maintenance outage. The Swift Floating Surface Collector (FSC) ran continuously until December 19th, when it was taken out of operation so that the trestle stairs could be replaced, and modifications could be made to the starboard side smolt flume. The FSC remained off for the remainder of the month. A total of 125 fish were collected at the Swift FSC during the month of December. The majority of the fish collected were juvenile Chinook (59.2 %) and juvenile Coho (33.6 %).

Fish Facility Report
Swift Floating Surface Collector
December 2019

Day	Coho			Chinook			Steelhead				Cutthroat			Bull Trout	Planted Rainbow	Total
	fry	parr	smolt	fry	parr	smolt	fry	parr	smolt	kelt	fry	<13 in	> 13 in			
1		8				3								0	0	11
2	1	4	3			3								0	0	11
3		1	1			4				1				0	0	7
4						4								0	0	4
5			1			1				1		1		0	0	4
6																
7	1	6				2								0	0	9
8		1				1								0	0	2
9		1				2								0	0	3
10		1				6				1				0	0	8
11		1	1			2								0	0	4
12						1								0	0	1
13						3								0	0	3
14														0	0	0
15		3				2								0	0	5
16						1				1		2		0	0	4
17		1	1			9						1		0	0	12
18		2	1			19								0	0	22
19		2	1			11				1				0	0	15
20																
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Monthly Total	2	31	9	0	0	74	0	0	3	2	0	4	0	0	0	125
	2792	4521	91744	64	2834	8053	8	63	2950	64	1	903	44	5	4405	118451