2018 Imnaha River Chinook Salmon and Bull Trout summaries

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Noteable Highlights/Data issues

- Imnaha Weir installation date: **11 June, 2018**.
  - A staff injury on June 11th precluded the ladder from being watered to allow fish passage.
  - The ladder was potentially watered either Tuesday the 12th or Wednesday the 13th. **(check with weir staff)**
- On June 11th, 2018 we discoved that IR5 had not been uploading tag detections to PTAGIS since 5/26. Joseph contacted BioMark staff to help diagnose and fix the problem. All other tag detection sites were working correctly (e.g. IR4 & IML).
  - Last tag detected before IR5 went offline was on May 25th at 3:14 a.m.
  - IR5 was brought back online on June 13th and almost immediately started detecting Bull trout tags at 1:10 p.m.
  - The cause of the downtime was attributed to a faulty master controller.

Unique PIT-tag observations within the Imnaha Basin by species

Mark.Species	Origin	Unique_Tags
	Unk	1
Bull Trout	Nat	74
Chinook	Hat	8
Chinook	Nat	35
Chinook	Unk	6

Unique PIT-tag observations within the Imnaha Basin by obervation site, species, origin and release site

Mark.Species	Origin	Release.Site.Code	Unique_Tags
	Unk		1
Bull Trout	Nat	IMNAHW	10
Bull Trout	Nat	IMNTRP	7
Bull Trout	Nat	SNAKE3	3
Bull Trout	Nat	SNAKE4	54
Chinook	Hat	IMNAHR	1
Chinook	Hat	IMNAHW	6
Chinook	Hat	LGRLDR	1
Chinook	Nat	IMNTRP	5
Chinook	Nat	LGRLDR	30
Chinook	Unk	BONAFF	6

Unique PIT-tag observations within the Imnaha Basin by species, SiteID and origin

Mark.Species	SiteID	Origin	Unique_Tags
	IR1	Unk	1
	IR2	Unk	1
Bull Trout	BSC	Nat	8
Bull Trout	IML	Nat	1
Bull Trout	IMNAHW	Nat	1
Bull Trout	IR1	Nat	47
Bull Trout	IR2	Nat	66
Bull Trout	IR3	Nat	39
Bull Trout	IR4	Nat	22
Bull Trout	IR5	Nat	10
Chinook	BSC	Nat	5
Chinook	IML	Hat	2
Chinook	IML	Nat	1
Chinook	IMNAHW	Nat	1
Chinook	IR1	Hat	8
Chinook	IR1	Nat	35
Chinook	IR1	Unk	6
Chinook	IR2	Hat	7
Chinook	IR2	Nat	31
Chinook	IR2	Unk	6
Chinook	IR3	Hat	7
Chinook	IR3	Nat	20
Chinook	IR3	Unk	3
Chinook	IR4	Hat	2
Chinook	IR4	Nat	3

Unique PIT-tag observations within the Imnaha Basin by species, origin and arrival date

Do we want to truncate the dates for Bull trout observations?
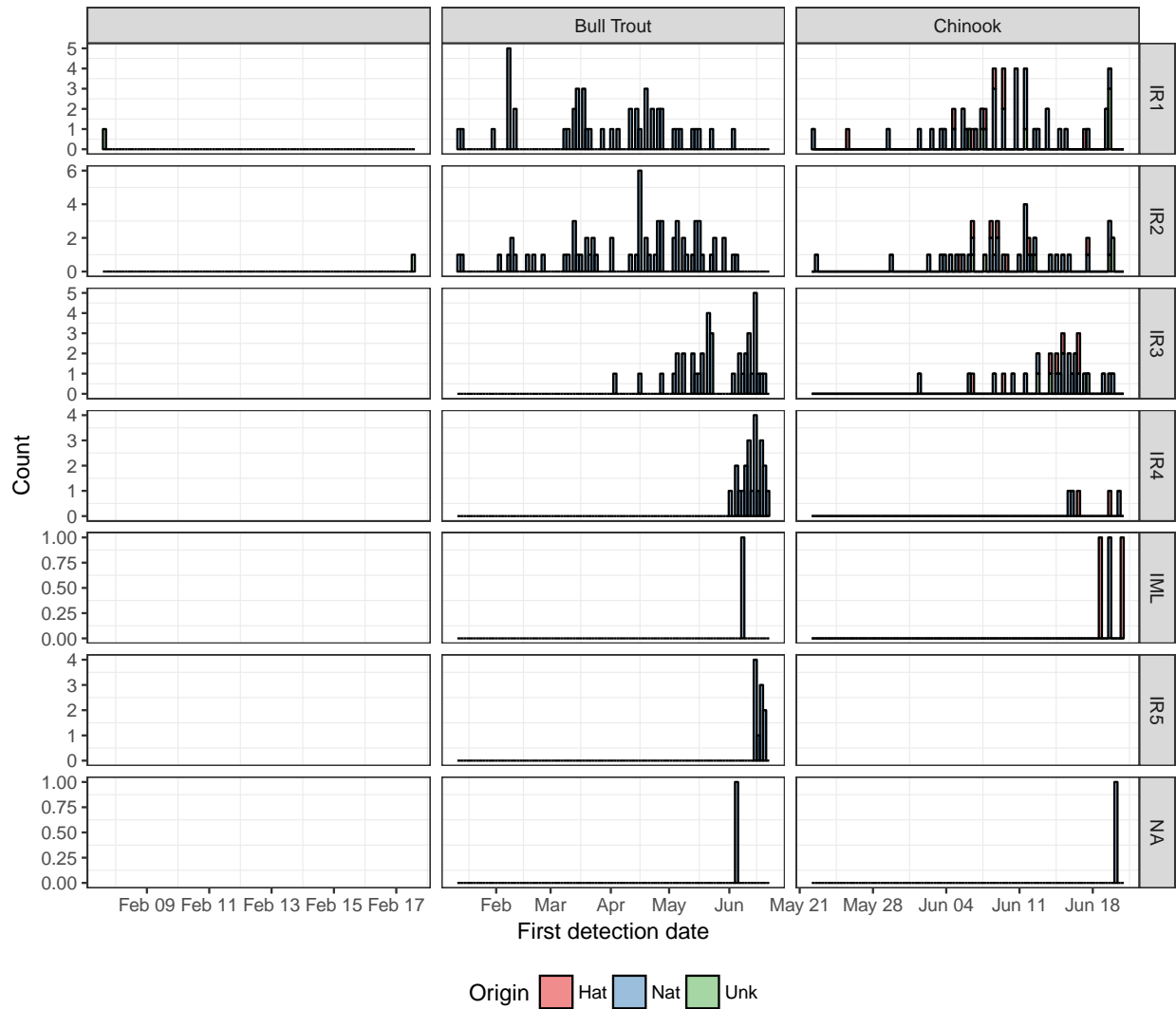
Unique PIT-tag observations by site, detection efficiencies and estimated tags

Mark.Species	SiteID	Unique_Tags	det_eff	N_tags	lwr_N	upr_N	Conversion
	IR1	1	1	1	1	1	NA%
	IR2	1	NA	NA	NA	NA	NaN%
Bull Trout	IR1	47	0.64	73.57	71.75	75.38	NA%
Bull Trout	IR2	66	0.87	75.66	70.72	80.6	103%
Bull Trout	IR3	39	0.78	50.14	45.69	54.6	66%
Bull Trout	IR4	22	1	22	22	22	44%
Bull Trout	IML	1	0	Inf	Inf	Inf	NA%
Bull Trout	IMNAHW	1	1	1	1	1	0%
Bull Trout	IR5	10	1	10	10	10	45%
Chinook	IR1	49	1	49	49	49	NA%
Chinook	IR2	44	0.9	48.89	45.42	52.36	100%
Chinook	IR3	30	1	30	30	30	61%
Chinook	IR4	5	1	5	5	5	17%
Chinook	IML	3	1	3	3	3	NA%

Mark.Species	SiteID	Unique_Tags	det_eff	N_tags	lwr_N	upr_N	Conversion
Chinook	IMNAHW	1	1	1	1	1	33%

Unique PIT-tag observations by tag status

| Mark.Species	Origin	TagStatus	Unique_Tags
Bull Trout	Nat	At Weir	4
Bull Trout	Nat	Last obs: BSC	6
Bull Trout	Nat	Last obs: IML	1
Bull Trout	Nat	Last obs: IR1	1
Bull Trout	Nat	Last obs: IR2	19
Bull Trout	Nat	Last obs: IR3	25
Bull Trout	Nat	Passed	10
Bull Trout	Nat	Passed: <11 June	7
Bull Trout	Nat	Trapped	1
Chinook	Hat	Attempting Ladder	2
Chinook	Hat	Last obs: IR2	1
Chinook	Hat	Last obs: IR3	5
Chinook	Nat	At Weir	2
Chinook	Nat	Last obs: BSC	5
Chinook	Nat	Last obs: IR1	2
Chinook	Nat	Last obs: IR2	8
Chinook	Nat	Last obs: IR3	17
Chinook	Nat	Trapped	1
Chinook	Unk	Last obs: IR2	3
Chinook	Unk	Last obs: IR3	3

Tag status: last detection at IR4/IR5/IML/IMNAHW after 5/31/18
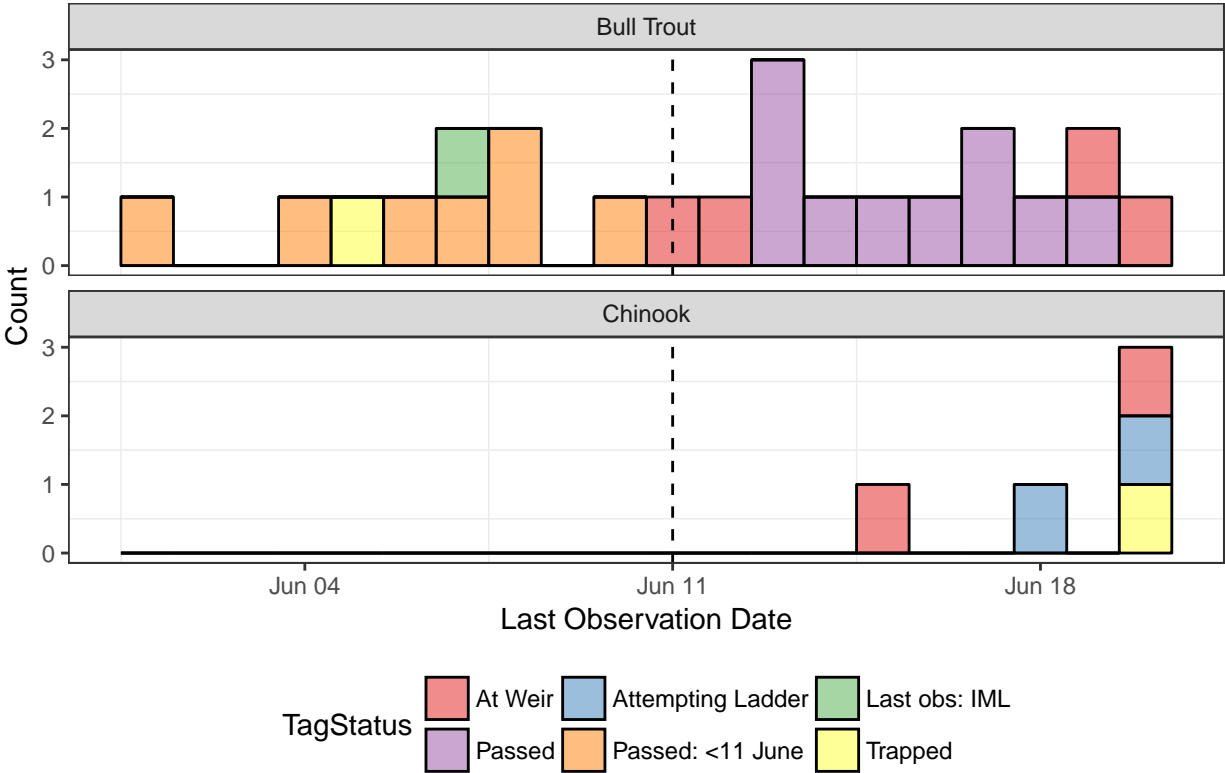
Travel time between sites
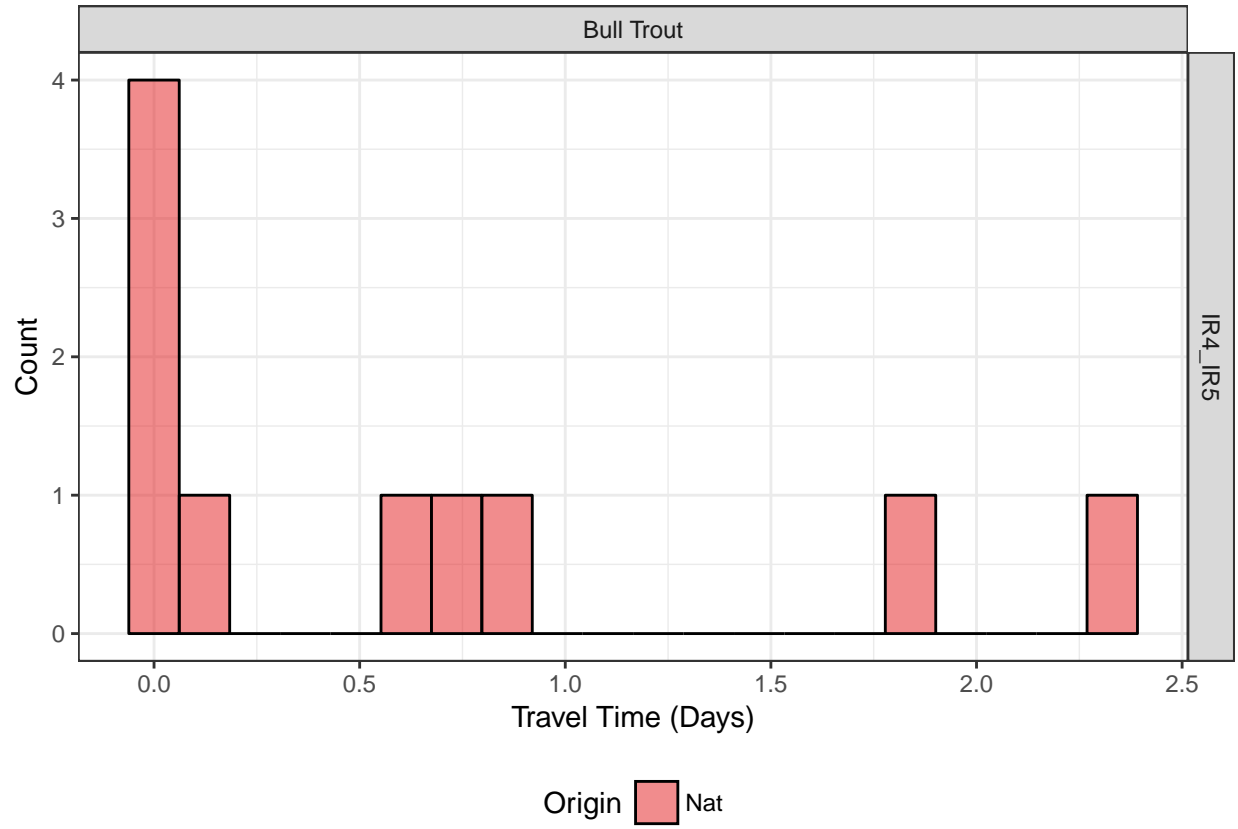
Number of days spent at a site
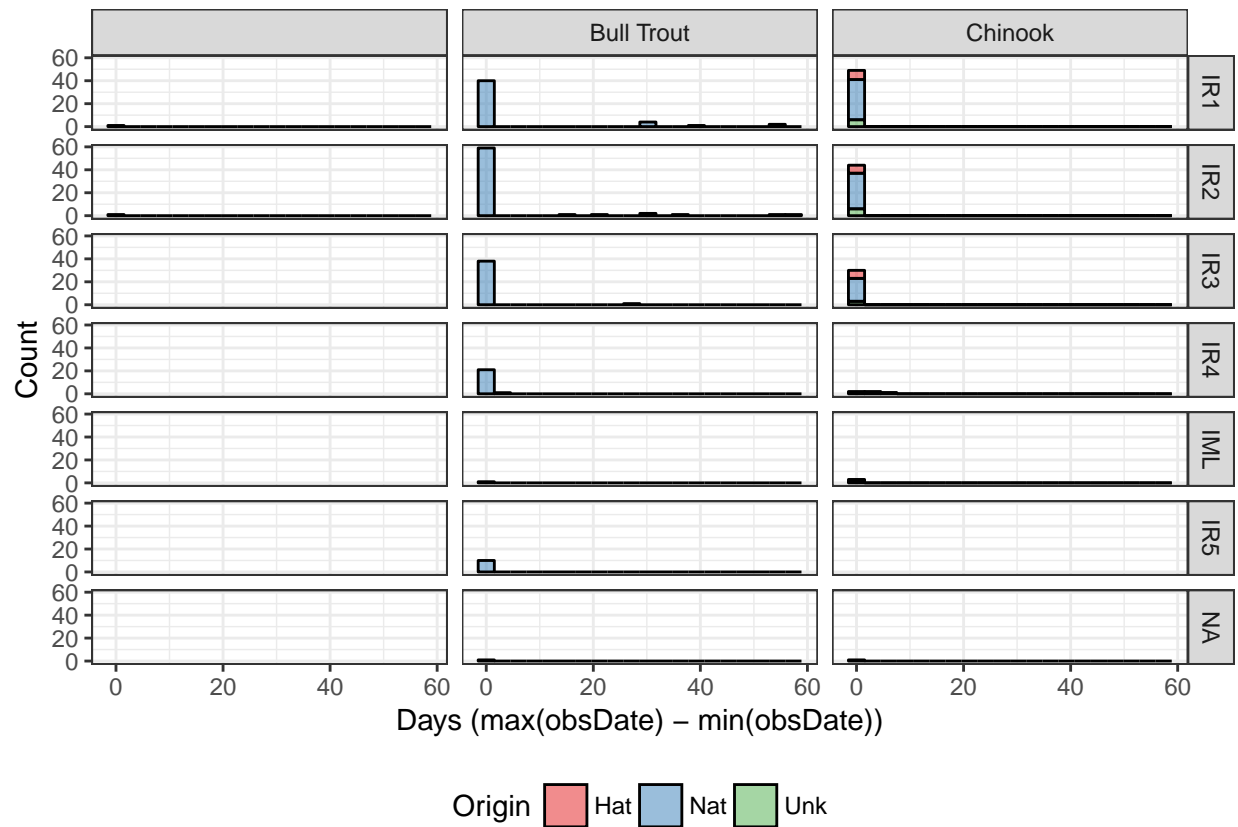
Source Data

The complete PIT-tag histories for Chinook Salmon and Bull trout detected during 2018 in the Imnaha River Basin were downloaded as two seperate files located on the PTAGIS ftp server. The files are the result of running "Complete Tag History" queries that were parameterized on the PTAGIS website and set-up to run and save automatically at 6:00 a.m. each day. The first file contains Chinook Salmon PIT-tag detections and is stored at the "*feldhauj/2018_Imnaha_CompleteTagHistory.csv*" file path within the ftp server. The second file contains Bull trout detections and is stored within the "*rkinzer/Imnaha_Bull_Complete_Tag_History.csv*" filepath. We are then using an R-script to download the files from the PTAGIS ftp server and combine them into a single file. Once the file is combined all Chinook Salmon and Bull trout tag detections are processed using the R package PITcleanR. The final dataset provides a simplified tag history with the first and last detection dates at each PIT-tag detection node (i.e., a single spanning array or antenna) and information regarding upstream and downstream movements and a more general migration direction.

Creating the PTAGIS Chinook Complete Tag History report:

- *Tag list #1:* Static Tag list for all Chinook tagged in 2018 and released at BONAFF or LGRLDR.

- *Tag list #2:* Static Tag list for Chinook released into the Imnaha River for MY2015-2017 and detected at a mainstem adult ladder interrogatoin site in 2018.

- *Event Date:* Between 5/1/2018 and 10/1/2018
- *Event Sites:* IR1, IR2, IR3, IR4, IR5, IML, IMNAHW, BSC, IMNAHR

- *Mark Species:* Chinook
- *Event Type:* Observation, Recapture, Recovery

Creating the PTAGIS Bull Trout Complete Tag History report:

- *Query:* All PIT-tagged Bull trout detected in the Imnaha River Basin in 2018.

- *Event Date:* Between 1/1/2018 and 10/1/2018
- *Event Sites:* IR1, IR2, IR3, IR4, IR5, IML, IMNAHW, COC, BSC, IMNAHR
- *Mark Species:* Bull Trout
- *Event Type:* Observation, Recapture, Recovery

Output Files:

- *PITcleanr_2018_chs_bull.xlsx*: The complete tag histories from 2018_Imnaha_ComploeteTagHistory.csv and Imnanha_Bull_Complete_Tag_Histories.csv combined into a single file and processed with the PITcleanr R-package.

- *detect_hist.xlsx*: A pivot table style summary. Each row = a unique PIT tag code. Columns correspond to first detection dates at IR1-IR5, IML, and IMNAHW. The LastObs date is the last obsevation date/time in the complete tag history file. This file contains the Trap Status, TagPath, Passage Route, and TagStatus fields. Trap status references the dates the weir was opeating (ryan, want to expand). TagPath is a character string representing detections at PIT tag observations sites. TagStatus represents the last known location of the tag and whether the tag has arrived at the weir, has attempted the ladder (i.e., detected at IML), passed the weir (i.e., detected at IR5), or has been trapped (i.e., detected at IMNAHW). The tag pathway describes the passage route through the weir.