



Smolt to Smolt Survival and Travel Time: CJH 2015

Chief Joseph Hatchery
2016 Annual Program Review

15 March 2016

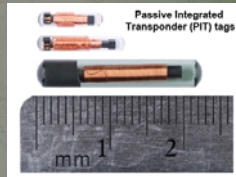
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KQM 4: Are the hatchery post-release targets met for survival and total catch contribution?



Methods: mark-recapture



Methods:

- DART (Data Acquisition in Real Time)
 - Data Courtesy of Pacific States Marine Fisheries Commission
 - http://www.cbr.washington.edu/dart/query/pit_sum_tagfiles
- The survival estimates tool uses Cormack-Jolly-Seber (CJS) estimates.
- Estimates from release site to Rocky Reach (RRJ) and McNary Dam (MCN) juvenile bypass facilities.
 - requires downstream detections (JD, BON, trawl) to determine capture probabilities.

Columbia Basin Research Columbia River DART Status & Trends Inseason Forecasts Tools & Models Publications

University of Washington
School of Aquatic & Fishery Sciences
Columbia Basin Research

Columbia River DART
 Research team access to integrated Columbia Basin regional environmental hydrograph operations, modeling, science and strategic data resources. Includes raw and summary data, aggregate data analysis, such as daily CDO, population, commercial rates and fish environment abundance information. All resources are publicly available.

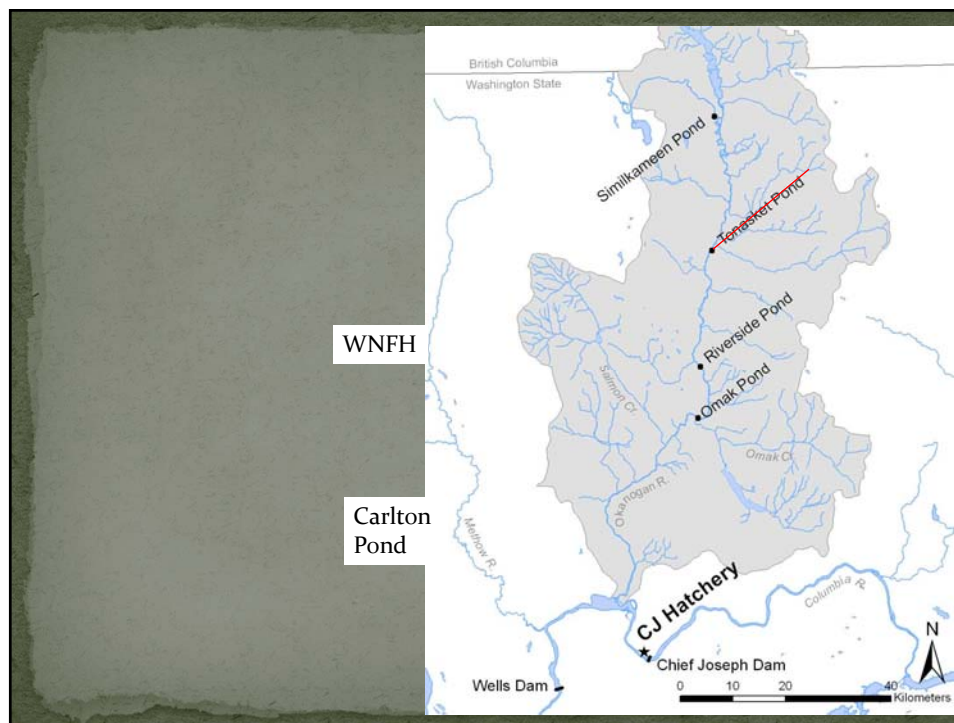
Status & Trends
 In-season regional monitoring and regional performance analysis. Adult and smolt survival estimates include environmental assessment and passage timing. Adult assessment, juvenile survival and trend time estimates. V&T estimates, RCE/ERD, Great Ocean Survival and Transportation Effects. Smoltling results, and RRJ Columbia salmon index. Environmental analysis includes RRT temperature and ocean index.

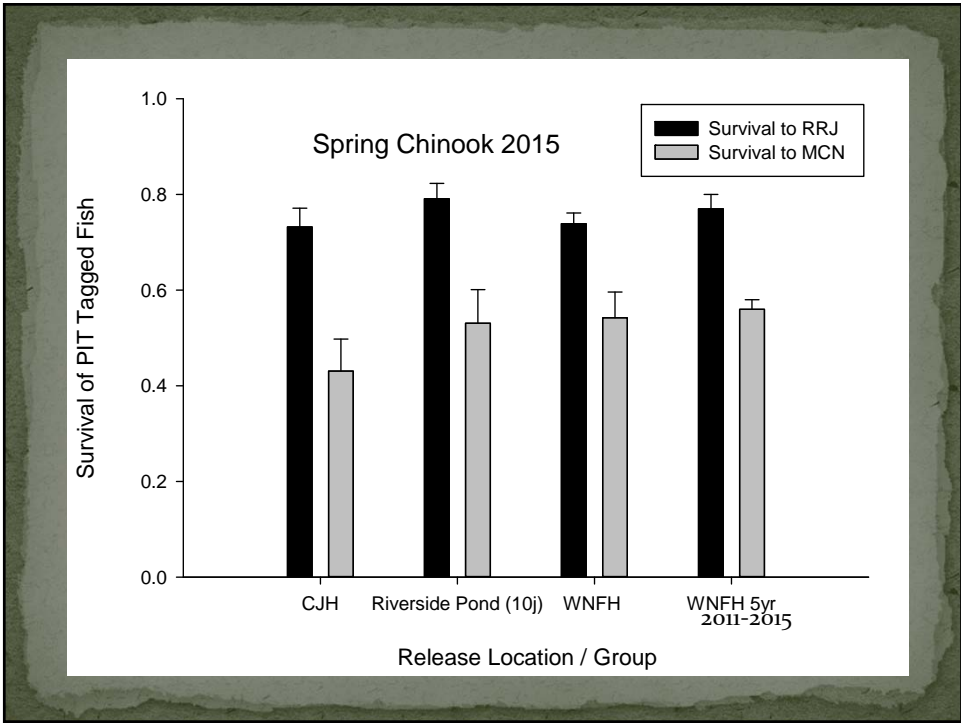
Inseason Forecasts
 Regional salmon "heat line" index and predictions of juvenile and adult salmon populations, run timing, adult run size, and heat conditions of Columbia Basin dams. Combines real time information on index of Columbia Basin juvenile and adult operations with current hydrographic information to predict future progress of fish migrating through the hydrograph.

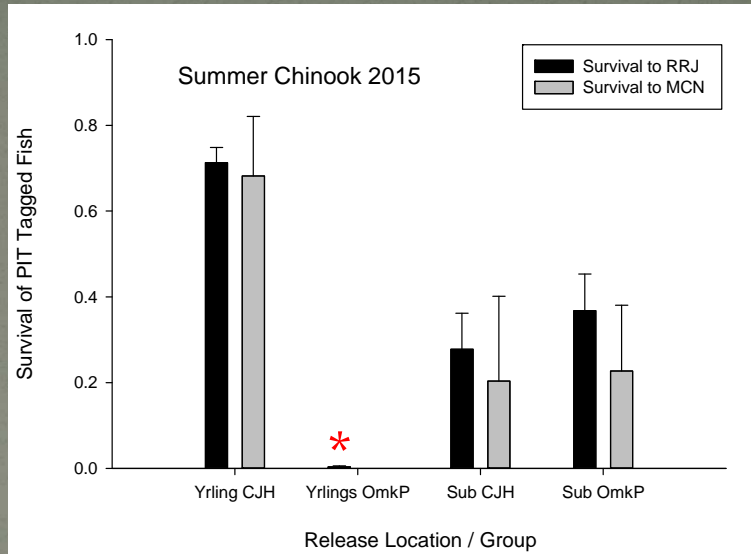
Analytical approach:

Qualitative comparison of CJH 2015 to:

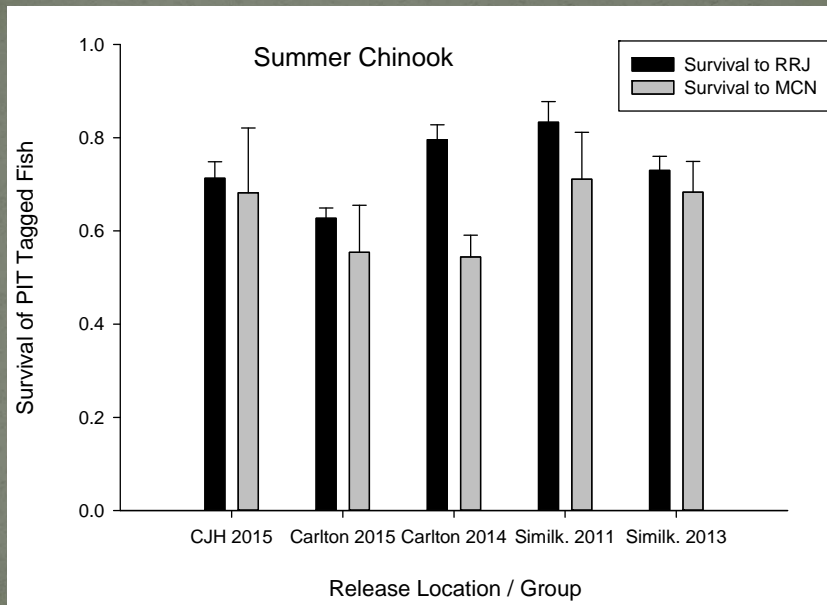
- Winthrop NFH (Methow Spring Chinook)
- Carlton Pond (Methow) Summer Chinook Yearlings
- Previous years at Similkameen Pond (2011, 2013)
- Natural origin (wild) summer Chinook subyearlings captured and tagged in Wells Pool (mostly at the mouth of the Okanogan)
- survival = “apparent survival”

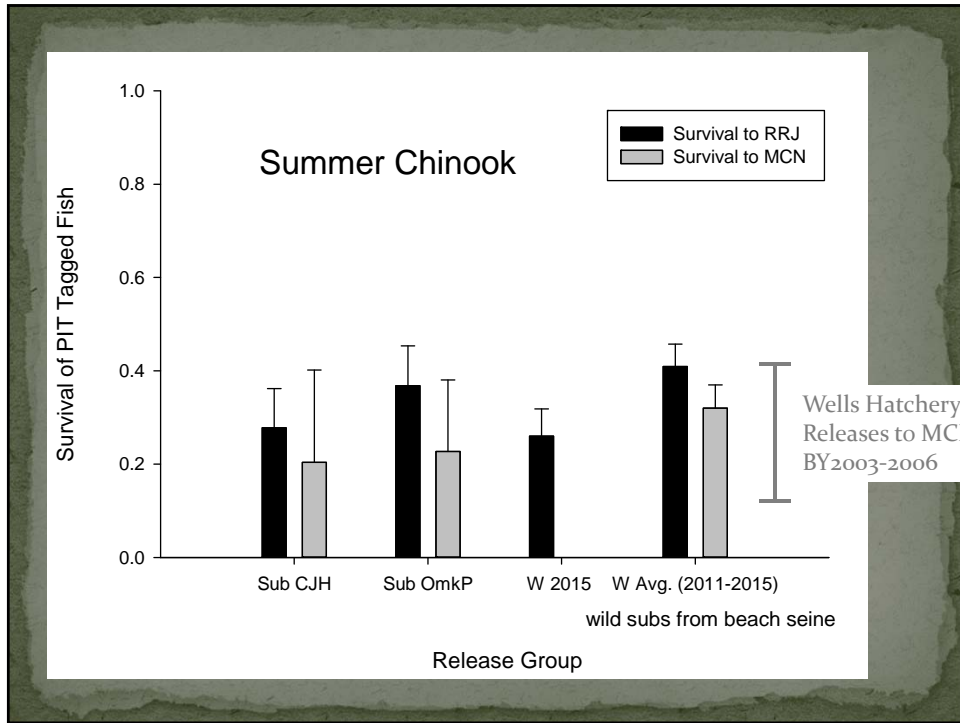






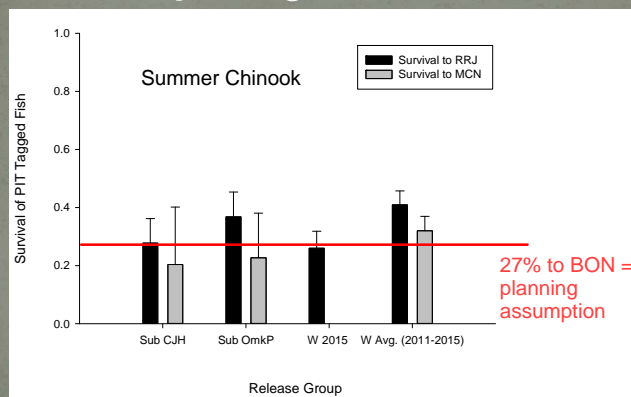
* No estimate for Omak yearlings due to late tagging and poor in-hatchery survival





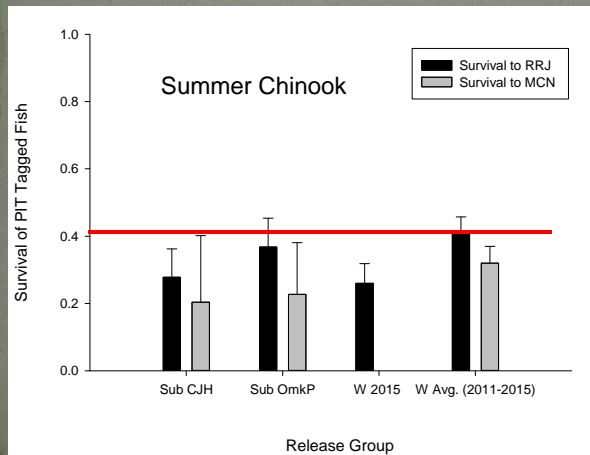
How do 2015 results compare to CJH planning assumptions?

Planning assumption = 27% (HSRG; FCRPS BiOp?)
-wild subyearling



Survival assumptions, extend to BON:

- $27\% = 0.865^9$
- Would need 41% to MCN = 27% to BON

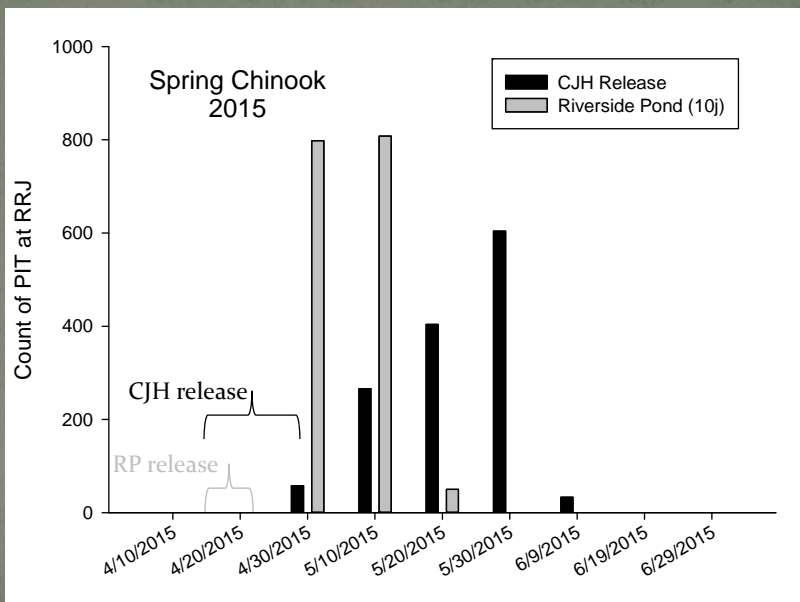


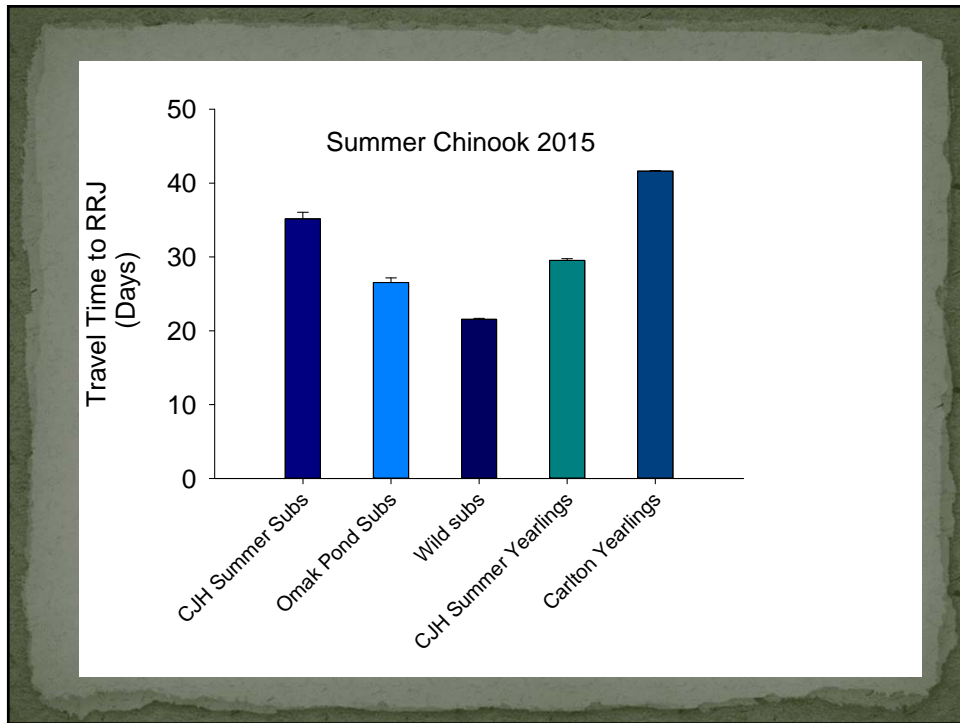
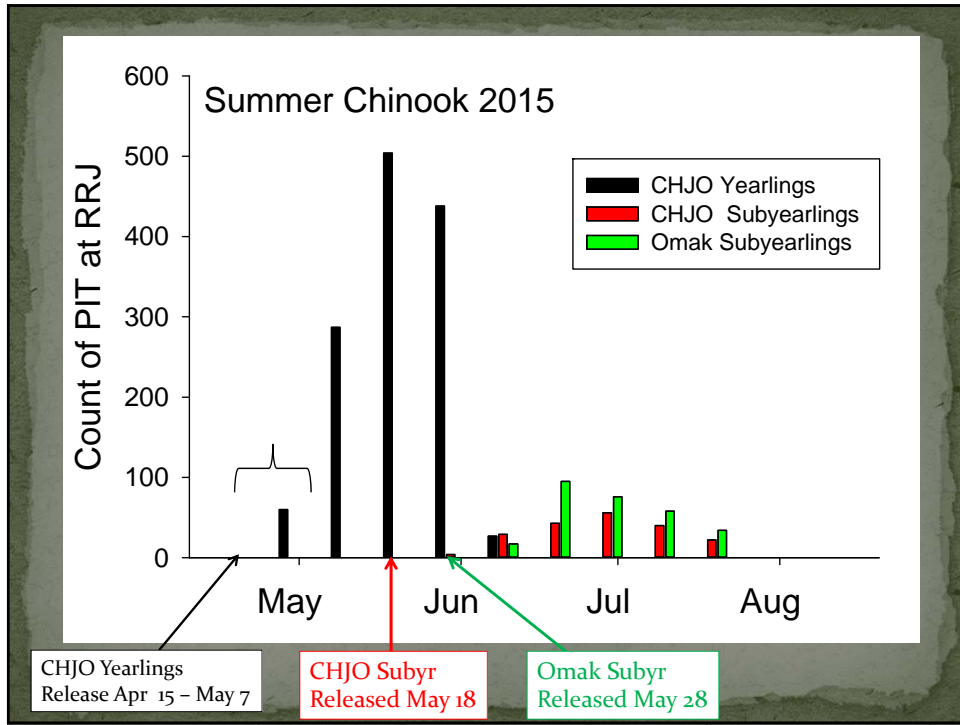
Yearling survival compared to assumptions:

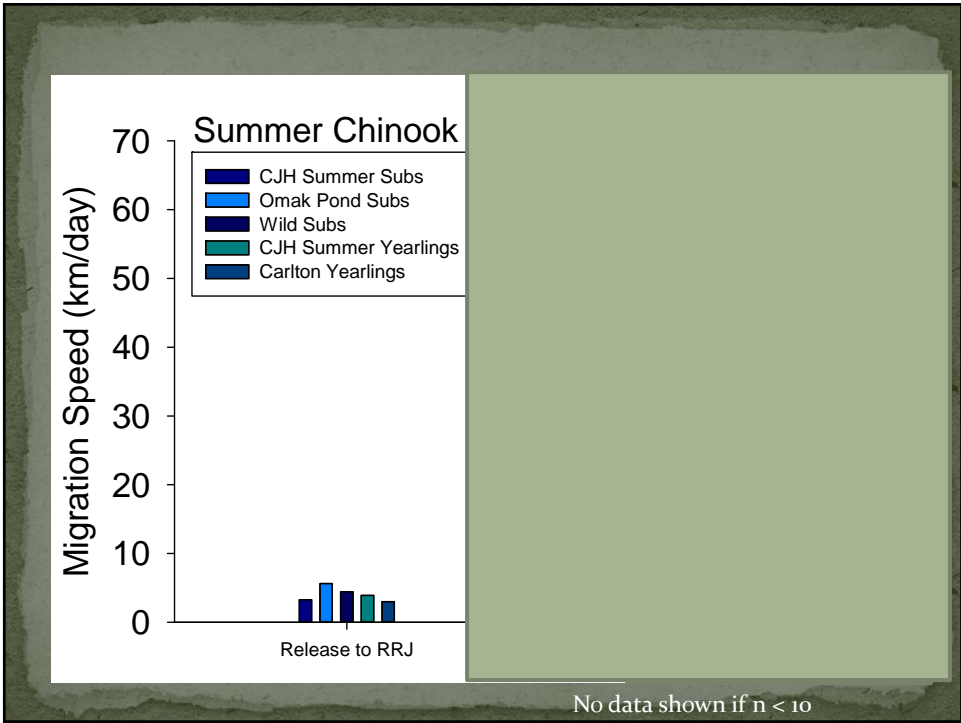
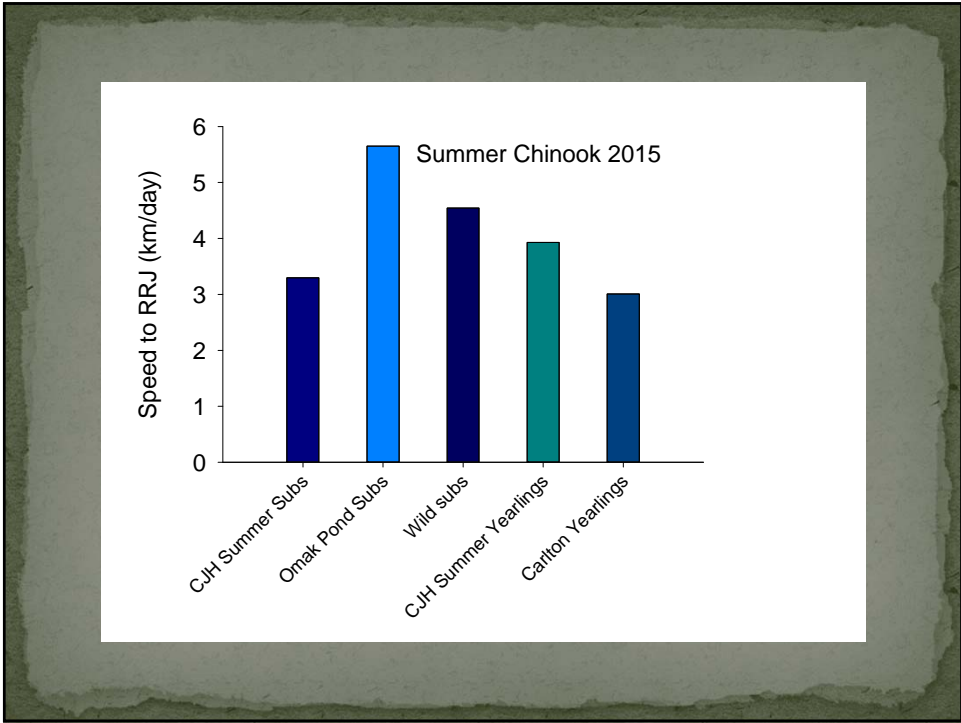
- Yearling hatchery Chinook – ISIT/AHA model use SAR so smolt-to-smolt validation is not needed.
- NOAA reports 1999-2015 avg. survival to MCN 55%
 - CJH 2015 yrllings to MCN were:
 - 43% CJH Spr Chk
 - 53% Riverside Pond Spr Chk
 - 73% CJH Sum Chk
 - avg. = 56%

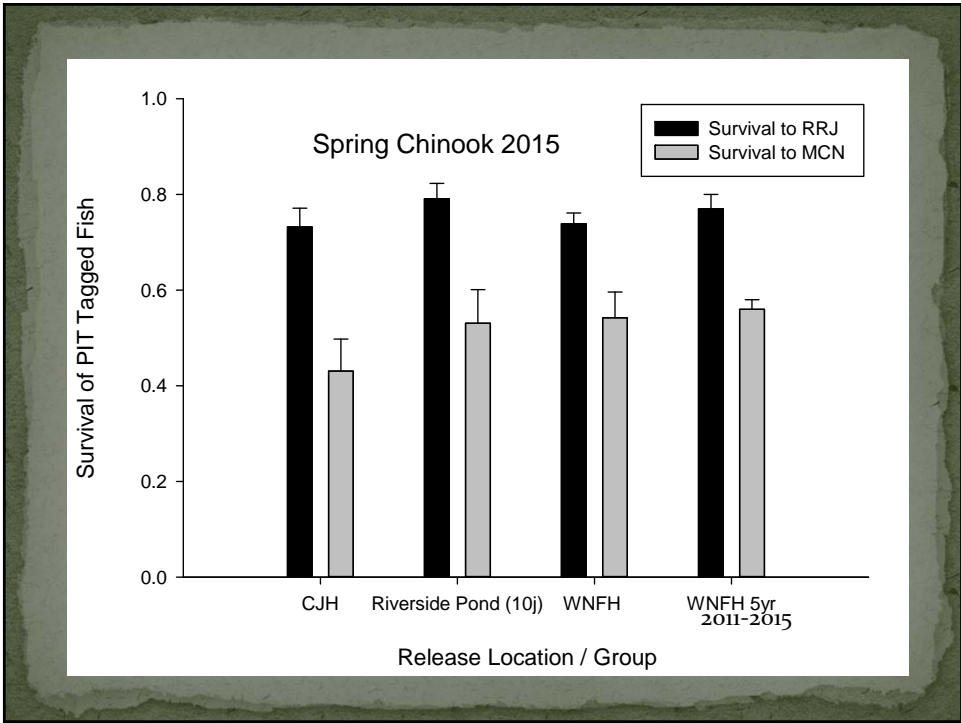
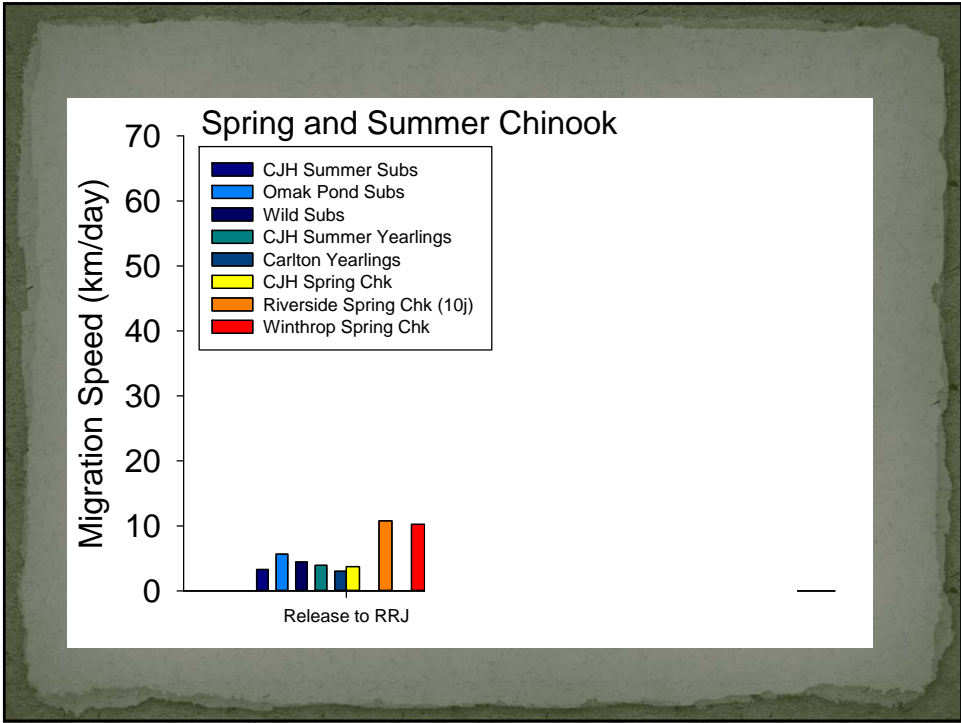
Travel Time

- Using DART program for standard mean \pm SE
- PTAGIS for distribution of arrival time
- Comparisons of 2015 CJH releases to each other and to Carlton (summer Chk) and WNFH (Spr Chk)
- Release to Rocky Reach (RRJ)
- RRJ to MCN
- MCN to BON









Conclusions

- No initial red flags on CJH juvenile survival
- Omak subyearlings traveled surprisingly fast
 - No apparent survival advantage
- Speed difference for WNFH/Okan 10j springers to RRJ was gone by MCN
 - No apparent survival advantage
- Initial analysis suggests 27% survival to BON for wild summer Chinook subyearlings may be too high.

Next Steps:

- Consider developing an analytical framework for comparisons and statistics.
- Paired releases to evaluate 'forced' vs. 'volitional' release strategy.
- Include size at release and/or multi-variate approach