

# MID-COLUMBIA SUBYEARLING CHINOOK SALMON PASSAGE SURVIVAL WORKSHOP

June 21, 2016  
 Red Lion Hotel Seattle Airport  
 18220 International Blvd, SeaTac, Washington 98188  
 Final Agenda

Session	Timeframe	Applicable Mark-Recapture Model Assumptions	Objectives	Data / Information Sources / Reports	Speakers / Presenters
1. Workshop Introduction: Purpose and Goals	0900 – 0915				<ul style="list-style-type: none"> <li>John Ferguson, Denny Rohr</li> </ul>
2. Fish Passage Survival Model Updates	0915 – 1000	<ul style="list-style-type: none"> <li>All assumptions                             <ul style="list-style-type: none"> <li>Tagger effects</li> <li>Tag lot effects</li> <li>Handling mortality and tag shedding</li> <li>Effect of tailrace release location on survival</li> <li>Effect of time fish is in river on survival</li> <li>Fish distributions</li> <li>Tag life corrections</li> <li>Arrival distributions</li> <li>Downstream mixing</li> <li>Tagged fish represent the population at large</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>List and discuss key study assumptions that must be addressed for subyearling migrants, and whether there is any flexibility in violating an assumption before test results are in question</li> <li>Present latest survival models used to estimate subyearling Chinook survival at Snake and lower Columbia River dams</li> <li>How do U.S. Army Corps of Engineers (USACE) studies address active migrants versus rearing life histories?</li> </ul>	<ul style="list-style-type: none"> <li>Annual reports by Skalski et al. on Snake and lower Columbia River dams; Buchanan et al. (2009)</li> </ul>	<ul style="list-style-type: none"> <li>John Skalski</li> </ul>
3. Snake River Chinook Salmon Life History Patterns	1000 – 1030		<ul style="list-style-type: none"> <li>Update Committees members on subyearling Chinook salmon behaviors observed in the lower Snake River</li> <li>Place observed mid-Columbia Chinook salmon behavior into a broader (species) context</li> </ul>	<ul style="list-style-type: none"> <li>Connor et al. 2002, 2005</li> </ul>	<ul style="list-style-type: none"> <li>Billy Connor</li> </ul>
BREAK	1030 – 1045				
4. Subyearling Chinook Life History Diversities Observed in the Mid-Columbia	1045 – 1200	<ul style="list-style-type: none"> <li>All study fish have an equal chance of survival and being recaptured</li> <li>Effect of time in-river, arrival distribution, and tag life corrections are similar across release groups</li> <li>Residualization probabilities are the same for upstream and downstream release groups, and the probability of residualization is independent of dam passage</li> <li>Tagged fish represent the population-at-large</li> </ul>	<ul style="list-style-type: none"> <li>Present latest information on life history diversity, timing, distribution observed in the mid-Columbia region</li> <li>Inform future discussions of whether current survival models address observed behaviors</li> </ul>	<ul style="list-style-type: none"> <li>PIT-tag data from the Entiat, Okanogan, Methow, and Wenatchee rivers</li> <li>WDFW scale data and analysis</li> <li>Smolt-to-adult return (SAR) data</li> </ul>	<ul style="list-style-type: none"> <li>Tom Kahler – Post-Emergent Behavior of Subyearling Chinook in the Wells Reservoir and Implications for the Measurement of Passage Survival through the Wells Project</li> <li>Casey Baldwin – Juvenile (and Adult) Subyearling Chinook Salmon Life History Information from the Okanogan River and Wells Pool</li> <li>Tom Desgroseillier – The Life History of Subyearling Migrants from the Entiat River</li> <li>Peter Graf – Comparing the Migration Patterns and Timing of Yearling Spring Chinook Salmon and Subyearling Summer Chinook Salmon through the Mainstem Columbia River Using Available PIT-Tag Data</li> <li>Andrew Murdoch – The Life-History Strategies of Upper Columbia Summer/Fall Chinook as Determined by Scale Analysis of Returning Adults</li> </ul>
LUNCH	1200 – 1245	Note: Lunch will be provided by Grant PUD			
5. Discussion	1245 – 1315				<ul style="list-style-type: none"> <li>Facilitators – Denny and John</li> </ul>
6. Availability of Study Fish	1315 – 1400	<ul style="list-style-type: none"> <li>Individuals marked for the study are available and are representative of the population of interest</li> </ul>	<ul style="list-style-type: none"> <li>Characterize the availability of test fish to meet study design requirements                             <ul style="list-style-type: none"> <li>Source (locations)</li> <li>Size (percent available for tagging)</li> <li>Timing</li> <li>Abundance</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Grant PUD pilot studies                             <ul style="list-style-type: none"> <li>2001–2003, 2008, 2009</li> </ul> </li> <li>Chelan PUD                             <ul style="list-style-type: none"> <li>Can fish be obtained from the Rocky Reach bypass systems (based on Data Access Real Time data)?</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Peter Graf – Grant PUD Subyearling Survival and Behavior Pilot Studies: Application of Age-0 Fall Chinook Salmon</li> <li>Lance Keller – Subyearling Data from the Rocky Reach Juvenile Bypass System</li> <li>Tom Kahler – Results of Wells Reservoir Fish</li> </ul>

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			<ul style="list-style-type: none"> <li>- Hatchery/wild</li> <li>• Body size of study fish vs. size of wild/target population</li> <li>• Timing of studies <ul style="list-style-type: none"> <li>- Paired with other survival studies</li> <li>- Rock Island smolt index</li> <li>- River flow and temperature conditions during testing</li> </ul> </li> <li>• Behavior of study (hatchery) fish vs. target (wild) fish</li> </ul>	<ul style="list-style-type: none"> <li>• Douglas PUD life history studies</li> </ul>	Collection Studies
7. Discussion	1400 – 1430				• Facilitators – Denny and John
BREAK	1430 – 1445				
8. Tagging Effects and Available Tags and Detection Equipment	1445 – 1530	<ul style="list-style-type: none"> <li>• Survival and capture probabilities are not affected by tagging</li> <li>• Tagged animals have the same probabilities as untagged individuals</li> <li>• Tagger effects</li> <li>• Tag life vs. size</li> <li>• Minimum size at tagging</li> </ul>	<ul style="list-style-type: none"> <li>• Perspectives on tagging effects and available hardware from researchers</li> <li>• Latest American Fisheries Society or USACE tagging protocols</li> <li>• Do the tagging protocols and current tag hardware support a survival study in the mid-Columbia?</li> <li>• Surgery and handling</li> <li>• Tag burden</li> <li>• Holding period</li> <li>• Battery life</li> <li>• Effect of barotrauma on fish and study design</li> <li>• Detection probability</li> <li>• Receiver technology</li> <li>• Cost</li> </ul>	<ul style="list-style-type: none"> <li>• USGS publications</li> <li>• Barotrauma – Brown et al. (2010) and Carlson et al (2012)</li> </ul>	<ul style="list-style-type: none"> <li>• Alison Colotelo – Barotrauma</li> <li>• Curt Dotson – Tag Hardware</li> <li>• Marty Leidtke – Tagging Effects</li> </ul>
9. Conclusions and Discussion	1530 – 1630		<ul style="list-style-type: none"> <li>• Open discussion among Committees members</li> </ul>		• Facilitators – Denny and John

#### Attendees

Name	Organization	Name	Organization
John Ferguson	Anchor QEA, LLC	Jim Craig*†	USFWS
Kristi Geris	Anchor QEA, LLC	Billy Connor	USFWS
Denny Rohr	Denny Rohr Consultants	Tom Desgroseillier	USFWS
Orlene Hahn	Denny Rohr Consultants	Jeff Korth*†	WDFW
Lance Keller*	Chelan PUD	Mike Tonseth	WDFW
Steve Hemstrom*	Chelan PUD	Andrew Murdoch	WDFW
Keith Truscott	Chelan PUD	Kirk Truscott*†	CCT
Alene Underwood	Chelan PUD	Casey Baldwin	CCT
Tom Kahler*	Douglas PUD	(+1)	CCT
Shane Bickford*	Douglas PUD	Bob Rose*†	YN
(+1)	Douglas PUD	(+2)	YN
Peter Graf	Grant PUD	Marty Liedtke	USGS
Tom Dresser†	Grant PUD	John Skalski	UW, Columbia Basin Research
Curt Dotson†	Grant PUD	Alison Colotelo	PNNL
Scott Carlon*†	NMFS		
(+2)	NMFS		

\* Denotes HCP Coordinating Committees member or alternate

† Denotes Priest Rapids Coordinating Committee member or alternate