

# **Preliminary Results of a Wand Study on Hatchery Chinook**

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# Background

Previous wand studies on Chinook have shown variable results

# Early Chinook Wandering Studies

Study	Detection Rate
ADFG (1995)	98 %
NWIFC/USFWS (1999)	99 %
CDFO (1999)	96 %
WDFW (1999)	91 %

# Results of Chinook Mouth Wandering Studies

		% Detections		
Study	# CWTs	Standard Wandering	Combined Wandering	Tube Detector
WDFW, 2001 Hatchery	1,332	90.5	99.3	100
NWIFC, 2001 Hatchery	368	99.7	99.7	100
ADFG, 2004-06 Troll	2,534	98.2	99.9	
CDFO, 2003-04 Gill net	115		61.7	
CDFO, 2006 Troll	435		94.0	
CDFO, 2004-05 Spawning ground	591		91.0	



# Background cont.

- Current Chinook Wanding  
Recommendations are to use both methods (external and mouth) on large Chinook
- NMT now has the ability to improve the detection capability of many wands
- Wands with detection depths of  $\geq 32$  mm are identified with a silver battery cap.

# Purpose

- Measure the detection rate of “tuned up” wands on adult Chinook
- Determine if the additional step of mouth wandling is still necessary

# Variables

- Sampling Location (3)
- Fish length
- Fish sex
- Samplers (4)
- Wands (4)

# Controls

- All fish were mature fall Chinook from hatchery broodstock
- All stocks/locations had CWT returns from DIT groups (2 x 200K)
- All returning CWTs were standard length and of the latest generation of wire
- All wands had silver caps and titanium shields

# Nisqually Clear Creek Hatchery





# Clear Creek CWT Sampling



# Clear Creek Fish Give-a-Way





# Suquamish Grovers Creek Hatchery





# Grovers Creek Hatchery



# Quinault Lake Hatchery



# Quinault Lake Far-North Migrating Coastal Fall Chinook Stock





# Procedures



Initial Wandering on Exterior Surface

# Validation with “Tube” or “Tunnel” Detector





# Sorting Gate on Tube



# Post-Tube Check With Mouth Wanding





# Length and Sex Recorded for all CWT Detections





# Snout Removal for Laboratory Dissection





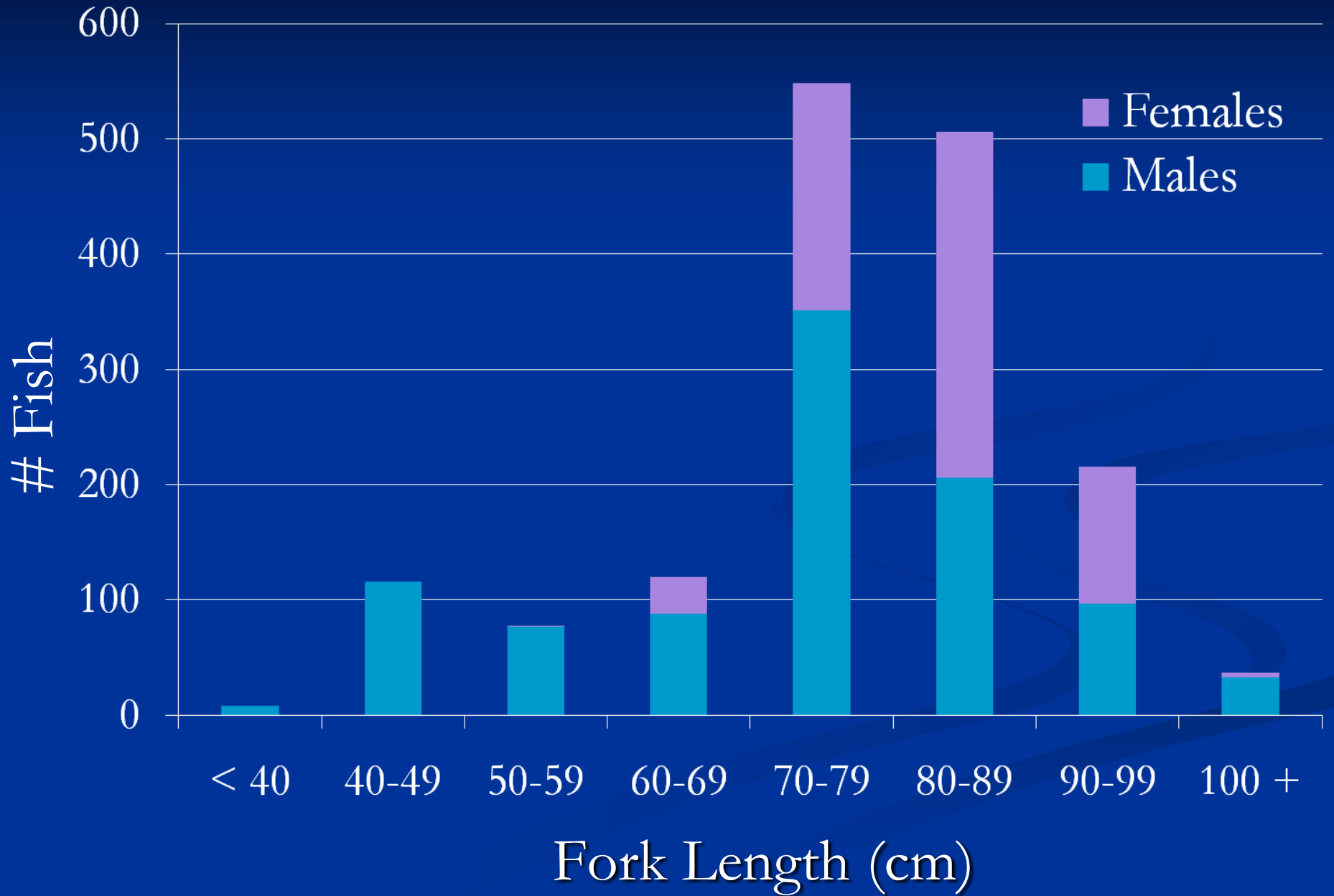
# Results



# Detection of CWTs, by Location

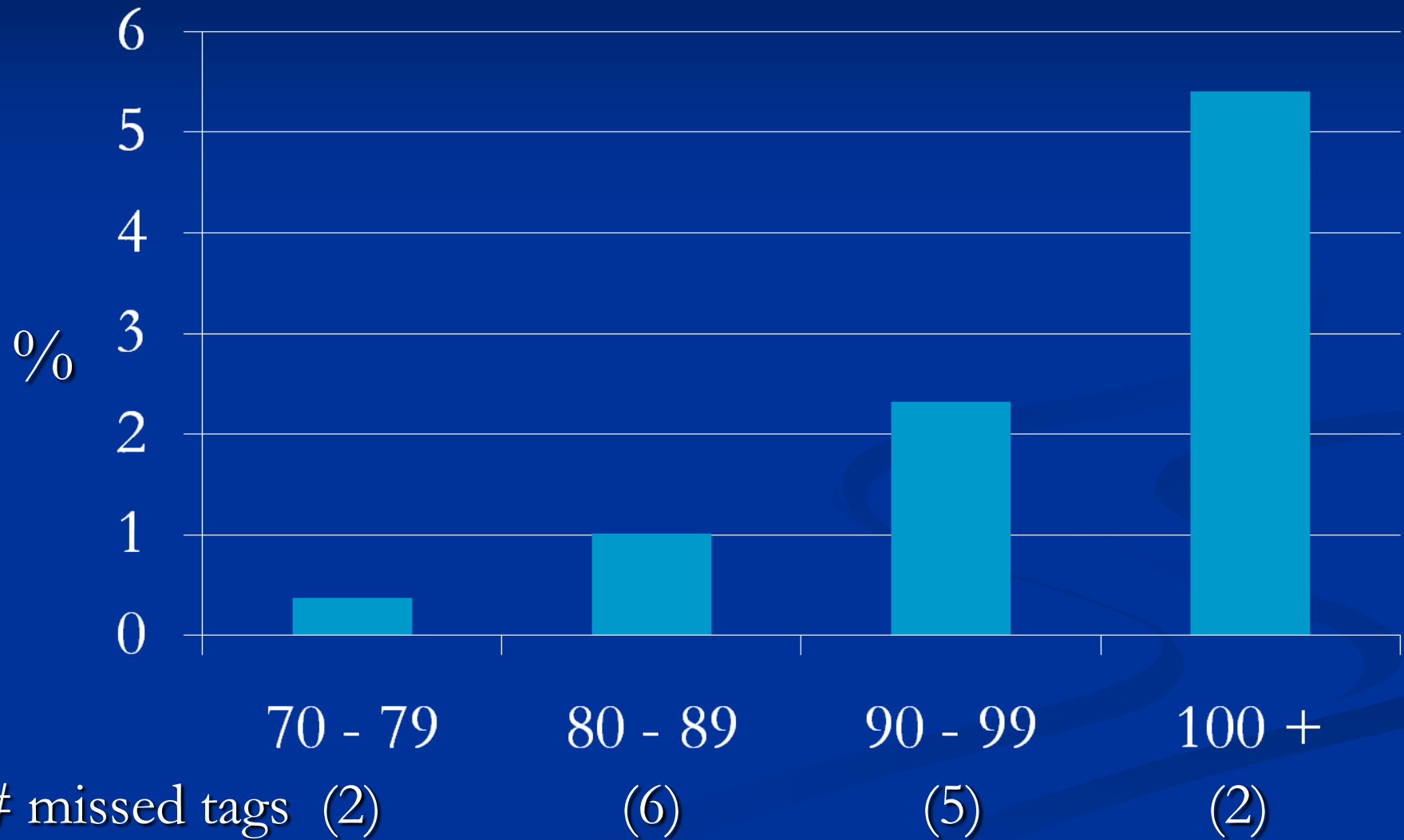
Hatchery	# Fish Sampled	# CWTs	# CWTs Missed	Detection %
Clear Cr.	1,298	94	5	94.7
Grovers	1,614	1,343	2	99.9
Quinault	246	191	8	95.8
total/mean	3,158	1,628	15	99.1

# Length-Frequency of CWT Fish





# Percent of missed tags, by FL (cm)



# Detection of CWTs, by Sex

Sex	# CWTs ( $\geq 70$ cm FL)	% Detection	# Missed CWTs
Male	687	98.9	12
Female	620	99.5	3

# Detection of CWTs, by Sampler

Sampler	# Fish Sampled	# CWTs in Sample	Detection %
RO	736	303	97.4
BP	761	372	98.7
AS	843	710	99.7
KP	818	243	100

# Detection of CWTs, by Wand

Wand	# Fish	# CWTs	# CWTs Missed	Detection %
10485	900	440	12	97.3
11254	1,206	370	1	99.7
11255	278	240	0	100
11263	774	578	2	99.7



# CWT Detection Depth of Wands

Wand	Pre-Season depth (mm)	Post-Season depth (mm)	# Missed Tags
10485	38	36	12
11254	39	40	1
11255	40	37	0
11263	40	38	2

# Signal Strength of Test Standard

Wanding in short axis to standard			
Wand #	Yes	Intermittent	No
10485			X
11254		X	
11255		X	
11263		X	

Wanding in long axis to standard			
Wand #	Yes	Intermittent	No
10485	X		
11254	X		
11255	X		
11263	X		

# Details of the 15 Missed Tags

Depth range (mm from snout surface)	Mean Depth (mm from snout surface)
18 – 48	30.2

# Secondary Wanding of the 15 fish with Missed Tags

# Detections w/ mouth wanding	# Detections w/ second surface wanding
13 (87 %) *	7 (47 %)

\* Theoretical total detection rate of 99.9%

# Summary

- 3,158 adult Chinook were sampled with “tuned up” wands at three hatcheries
- Out of 1,628 CWTs, 15 were missed, for a total detection rate of 99.1%
- The percent of missed tags was correlated w/FL
- Males had slightly lower detection rates than females

## Summary Cont.

- 12 of the 15 missed tags (80%) were from one wand
- The offending wand had the shortest detection depth and the weakest test signal
- Combination wanding would have detected 13 of the 15 missed CWTs

# Preliminary Recommendations

- The “tuned up” wands had high detection rates and should be the model used for Chinook sampling
- Agencies may want to test the detection depth (or signal strength) of their wands and use the most sensitive ones for Chinook sampling

# Recommendations Cont.

- It seems prudent to continue with the Mark Committee / PSC SFEC recommendation to use the combination wandling technique on larger fish (i.e.  $\geq 80$  cm FL)
- Agency programs need to have good quality control measures in place to ensure proper wandling technique & functional equipment





The End