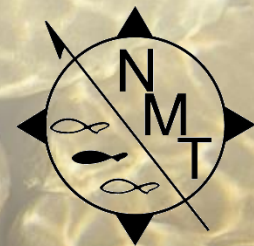


# Optimizing Detection of Coded Wire Tags



Northwest Marine Technology, Inc.  
April, 2006



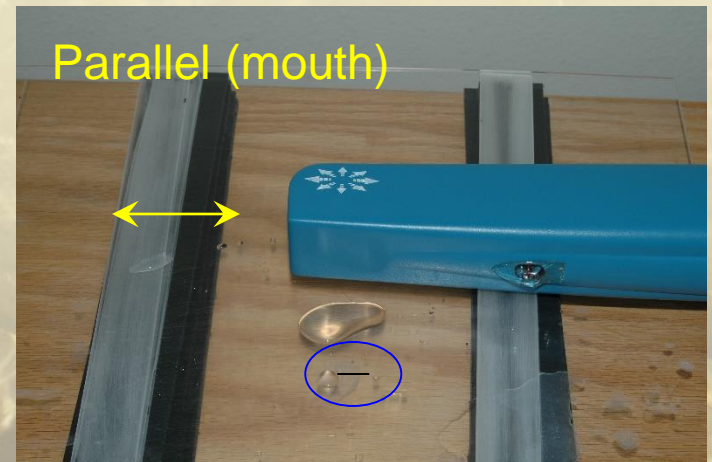
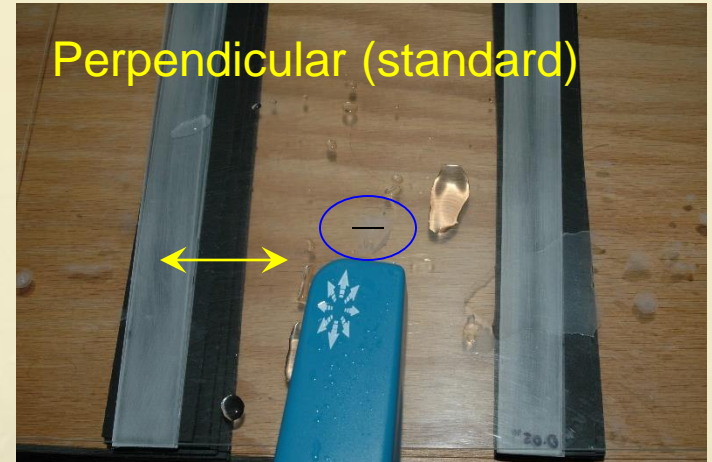
# Wand Detection Range

- What is the detection range of handheld wands?
- How does this relate to tag size selection for electronic detection?
- 6 tag lengths were tested:
  - 0.6 mm ( $\frac{1}{2}$ )
  - 0.825 mm ( $\frac{3}{4}$ )
  - 1.1 mm (1)
  - 1.375 mm ( $1\frac{1}{4}$ )
  - 1.6 mm ( $1\frac{1}{2}$ )
  - 2.0 mm (2)



# Methods

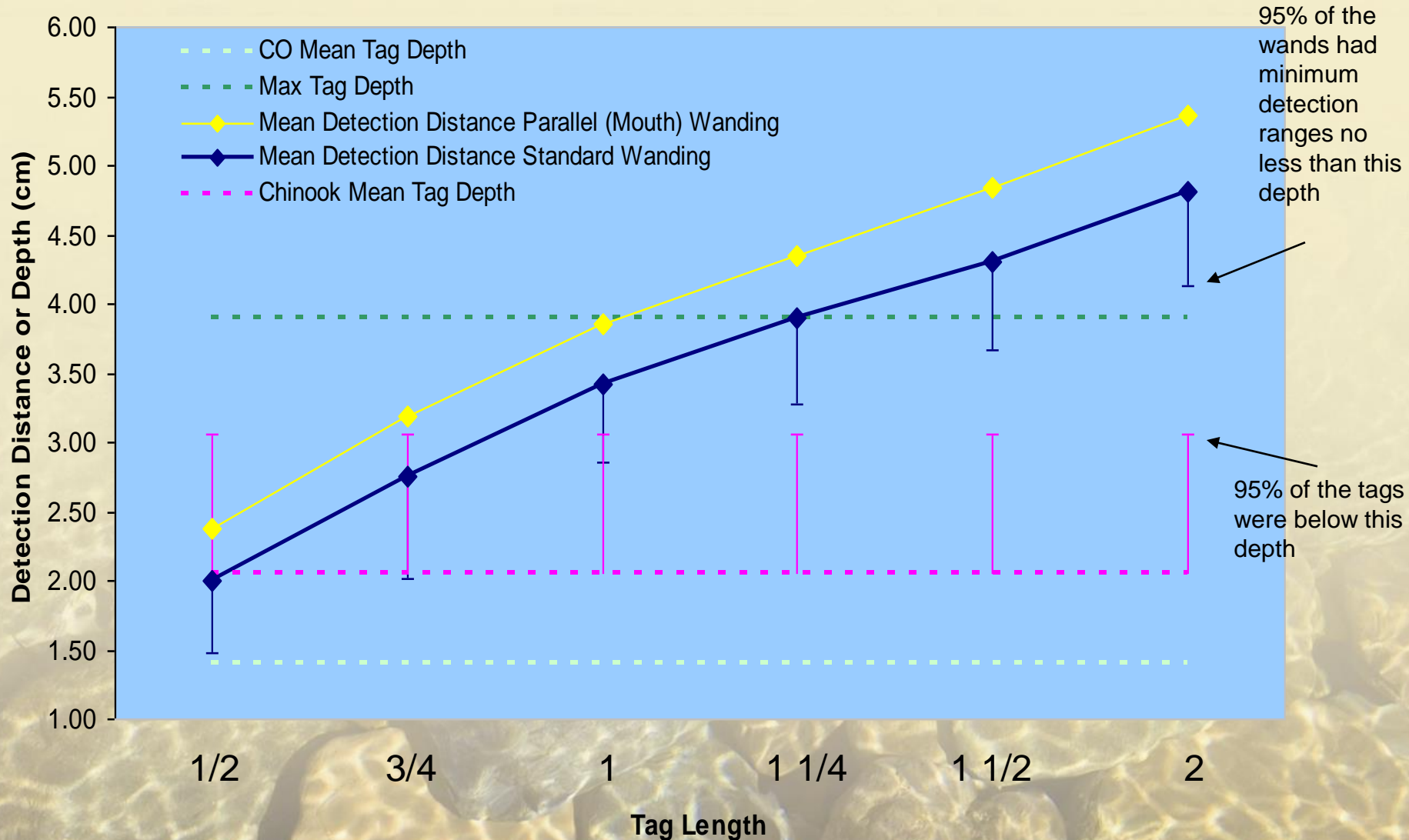
- Three samples of each tag length were tested for each wand.
- 56 wands were used in perpendicular orientation.
- 7 wands were also tested in parallel orientation .
- The plexiglass was raised and lowered in increments of 1/20 inch.
- The detection distance was measured when the wand could not clearly detect the tag.



# Tag Depth Studies

- Previous work by WDFW showed tag depths of:
  - Coho
    - Mean = 1.41 cm
    - Maximum = 3.9 cm
  - Spring Chinook
    - Mean = 2.06 cm
    - Maximum = 3.9 cm

# Detection Range and Tag Depth



	Detection Range (cm)			
	Blue wand with 3.2 range			
Tag Length	Perpendicular (regular wanding)	Parallel (mouth wanding)		
0.6	2.0	2.4		
1.1	3.4	3.9		
1.5	4.3	4.8		
2.0	4.8	5.4		



# Tag Fit

	1.5	1.25	1.0	0.75
Thompson & Blankenship	66 (70)	57 (60)	52 (55)	43 (45)
Abeyta	63 (68)	53 (55)	49 (52)	37 (39)



1.5 length CWT in Chinook (63 mm FL)



# Electronic Detection of Standard and 1.5 Length CWT in Coho Salmon



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# Introduction and Methods

- Previous work by Blankenship & Thompson (2003) showed that 1.5 length tags do not compromise survival in coho.
- In 2000 (1998 brood year), side by side groups of coho were tagged with following combinations (but not all combos occurred at each hatchery):
  - AD+CWT (1.1)
  - AD+CWT (1.6)
  - CWT only (1.1)
  - CWT only (1.6)

# Methods

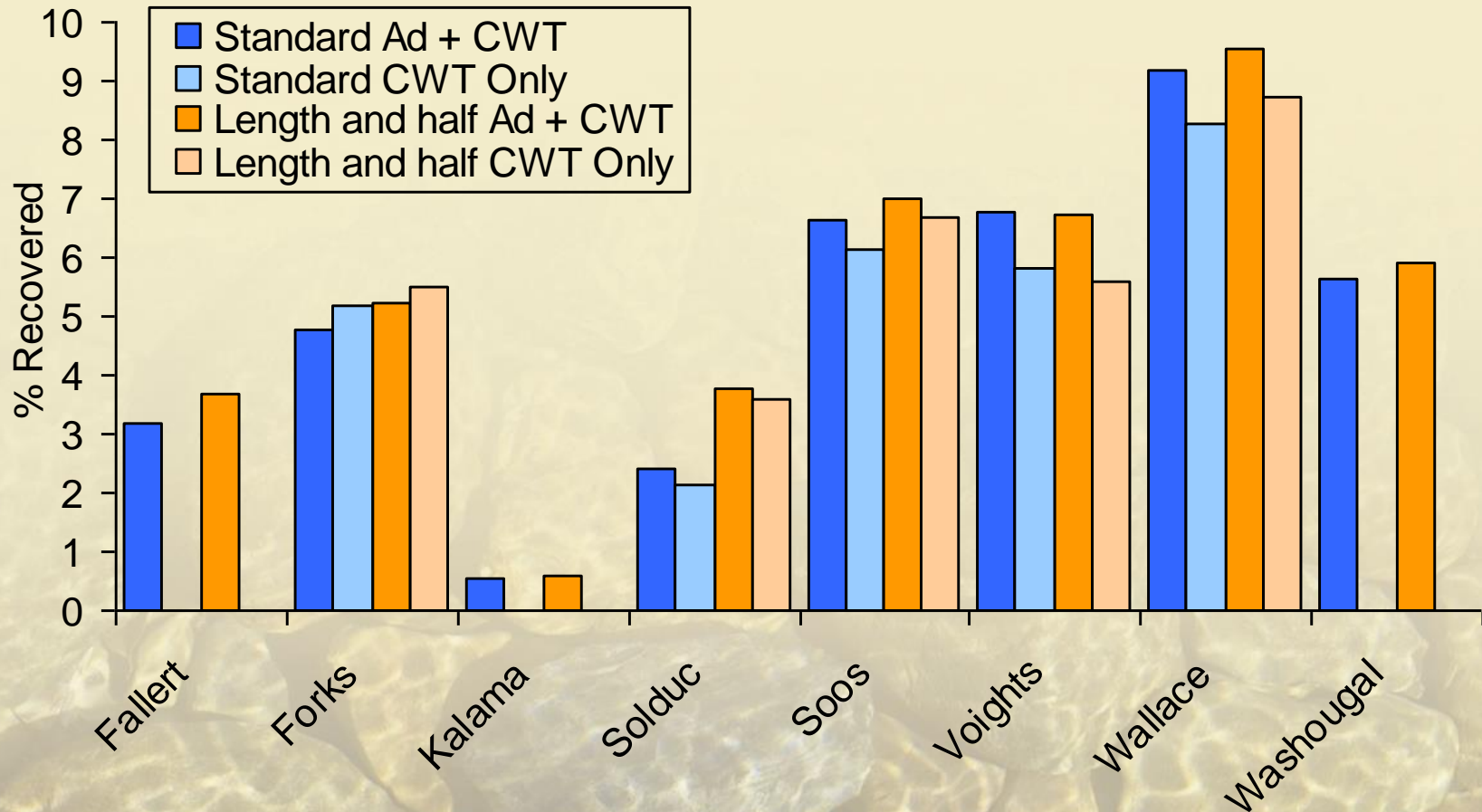
- 8 WDFW hatcheries:
  - Fallert Creek (30 fpp)
  - Forks Creek (30 fpp)
  - Kalama Falls (30 fpp)
  - Solduc (30 fpp)
  - Soos Creek (40 fpp)
  - Voights Creek (45 fpp)
  - Wallace River (45 fpp)
  - Washougal (40 fpp)
- Fish were combined in ponds after tagging.
- All fish were released in 2000 and subject to normal fishery and sampling efforts.

# Results

- We retrieved records of tag recoveries in all fisheries and escapement (hatchery and spawning grounds).
- Most recoveries in 2001.
- Over 20,000 estimated recoveries in data set.

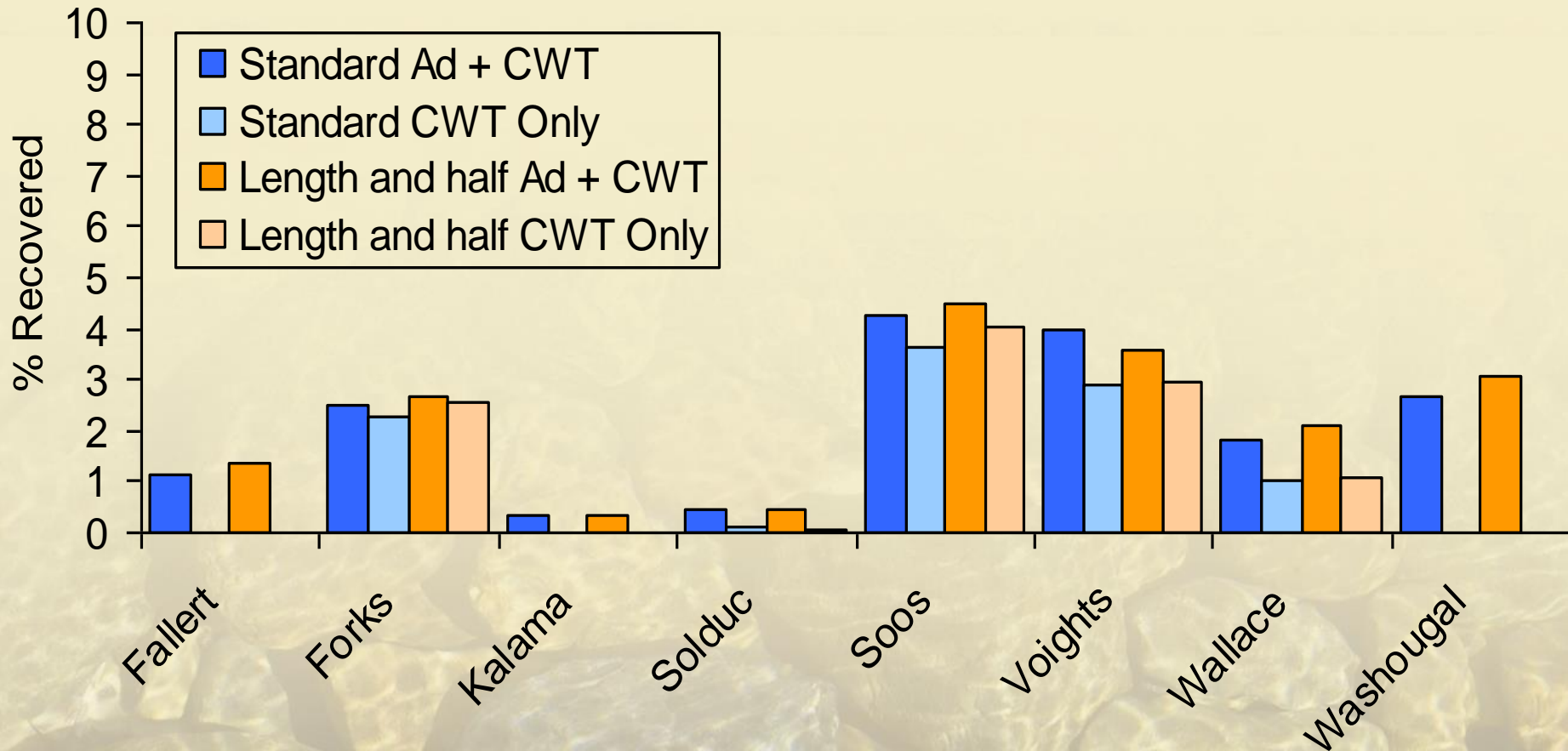


# All Fisheries and Escapement Recoveries



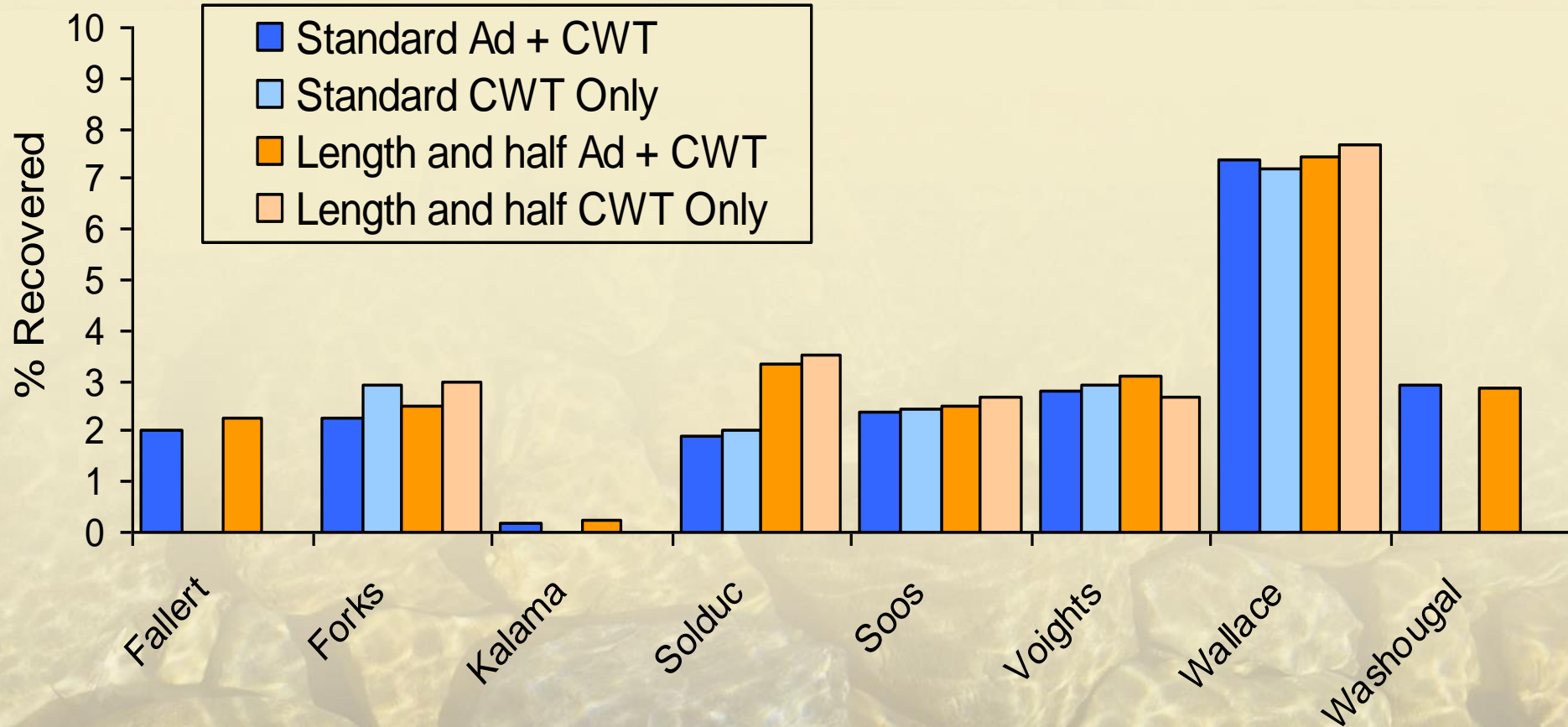
- Significantly more 1.5 length tags recovered than standard length
- Expect larger difference for chinook

# Fishery and Spawning Ground Recoveries



- Recovered significantly more Ad+CWT than CWT Only
- Selective fishery effect?

# Hatchery Rack Recoveries



- Recovered significantly more CWT Only than AD+CWT.
- Selective fishery effect?



# Discussion

- Use the largest tag size your fish can reasonably accommodate.
  - Beginning to establish guidelines
  - Every increase in tag size gains detection range; is there interest in using intermediate tag lengths?
  - $\frac{1}{2}$  length tags are inadequate for electronic detection.
- While the parallel wandling technique essentially gains a tag size in detection range, this technique is very awkward in the field, and we don't recommend it except for mouth wandling.
- Larger tags can minimize concerns about the differences in tag recovery rates between wands and tunnel detectors.
- Larger tags can minimize any errors due to sampling technique.