

Why Whooshh?

2015 YAKIMA BASIN SCIENCE & MANAGEMENT CONFERENCE

JUNE 17, 2015



PRESENTATION OVERVIEW:

WHO WE ARE

WHAT WE'VE DONE

WHERE WE'RE GOING

WDFW'S WASHOUGAL WEIR
MOBILE SYSTEM
OPERATES AS PART OF FALL
CHINOOK HATCHERY
PROGRAM.

The weir is used to collect hatchery and natural origin fish for broodstock.

The weir is also used for controlling hatchery fish on the spawning grounds.



WASHOUGAL WEIR MOBILE SYSTEM

- Takes half the time to load truck or surplus excess hatchery returns
- Time saving allows for higher number of hatchery fish removed - control pHOS
- System was funded by Pacific Coast Salmon Recovery Funds (PCSRF)

SUPPORTING STUDIES TO DATE

2011

CRRL Testing

- 50' system
- No difference finding
- Results published in 2013 - Mesa

2013 & 2014

Norway

- 250' and 460' systems
- Excellent hygiene and handling
- Up to 1,000 fish/hr in 460' system

2013-14

YN Roza Facility

- 40' system
- Mortalities 1/2 of traditional system
- Egg survival=98.7%

SUPPORTING STUDIES TO DATE

SPRING 2014

- 250' system
- WDF&W
- Live steelhead
- No difference in survival v. control group

FALL 2014

- 120' mobile system
- WDF&W
- Moved 10,000 in half the time
- Better for fish and people

FALL 2014

- 40' and 250' systems
- PNNL/DOE
- No evidence of damage
- Egg survival = better than control group

Roza Dam: Yakama Nations Controlled Study



“The fish fly right through without so much as a scratch. Also, you won’t have to divert water, as you do in a ladder system. Out here, the economy is all about agriculture, and water is gold. That’s what makes Whooshh such a great concept.”

--Mark Johnston, Research Scientist – Yakama Nation Fisheries

ROZA DAM STUDY RESULTS

Summary:

40' Whooshh Fish Transport System

554 Spring Chinook
(Wild & Hatchery Control)

Collected: May - June

Held: May - October

Spawned: September - October

Results:

Mortality rate of “whooshed” fish
= half of traditional method

CHINOOK	H&H	WHOOSHH
Mortality Females	4.2%	2.3%
Mortality Males	14.6%	9.1%
Mortality Total	8.8%	4.6%

Egg survival percentage statistically
equivalent (783,495 eggs)

CHINOOK	H&H	WHOOSHH
Hatchery Control	98.3%	98.7%
Wild/Natural	94.6%	92.1%

PNNL STUDY: SLIME, STRESS, AND SURVIVABILITY



PNNL STUDY RESULTS

PNNL Study:

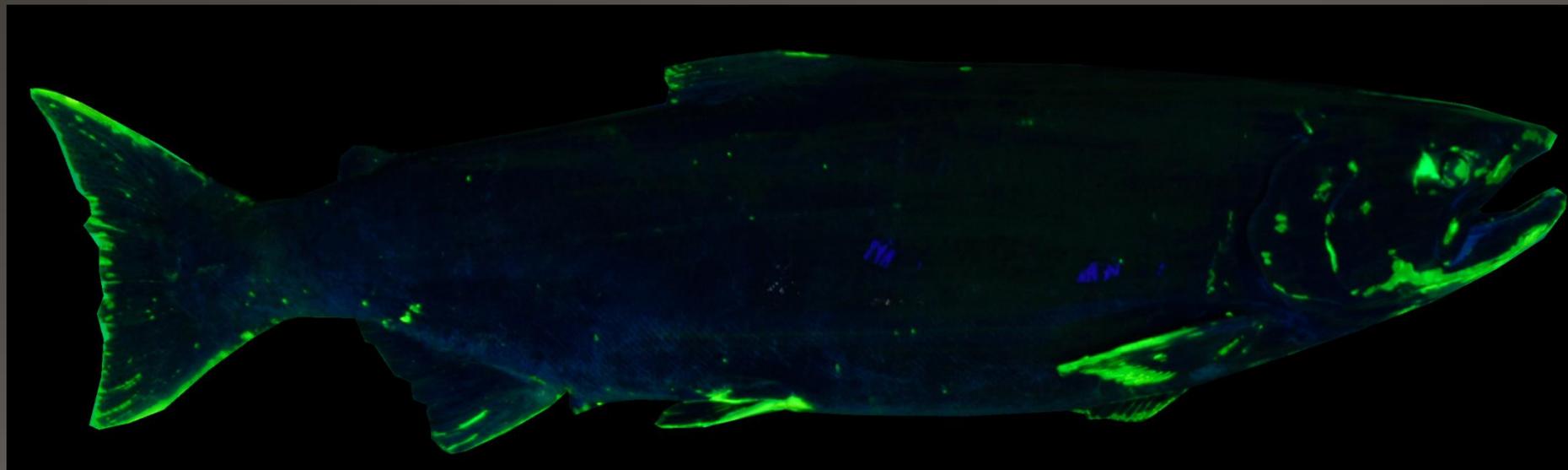
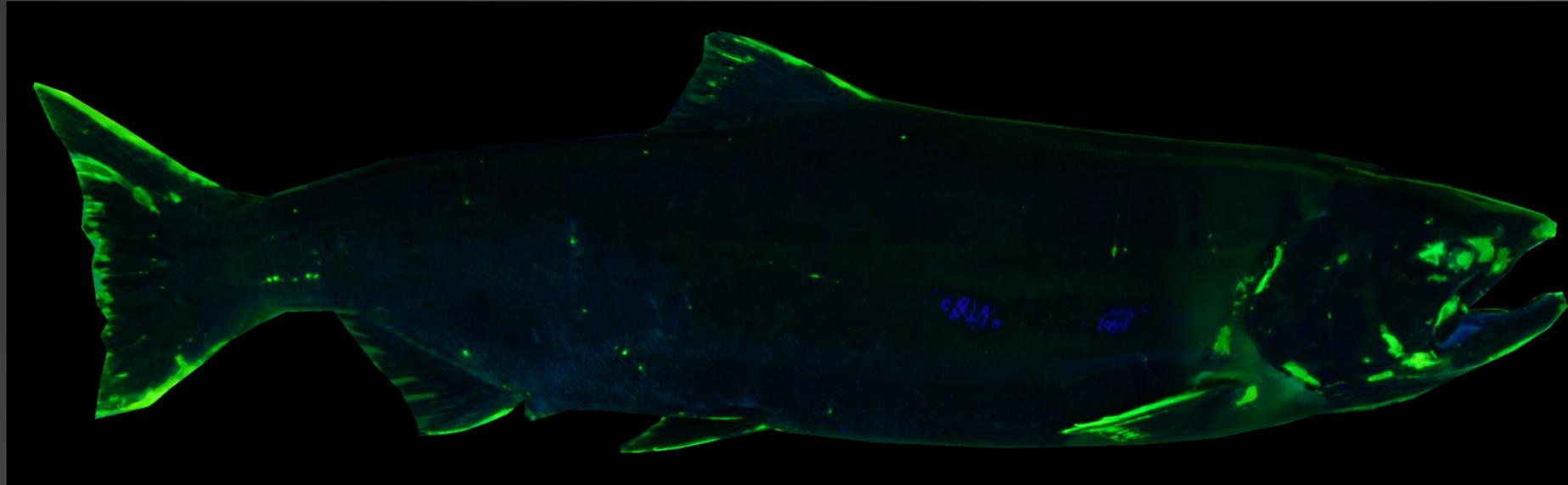
PNNL evaluated the efficacy of this technology with adult fall Chinook Salmon (*Oncorhynchus tshawytscha*) by comparing the physical, physiological, and reproductive effects of passage through two different lengths (40' and 250') of the Whooshh Fish Transport System (WFTS) to trap and haul, a standard method used to move fish around in-river barriers.



Key Findings:

- ✓ No mortalities or obvious signs of injury to fish.
- ✓ Immune responses and egg survival similar between Whooshh and trap and haul.
- ✓ Effects of Whooshh comparable or better to that of a trap and haul.

PNNL FLUORESCENCE COMPARISON CONTROL V. WHOOSH



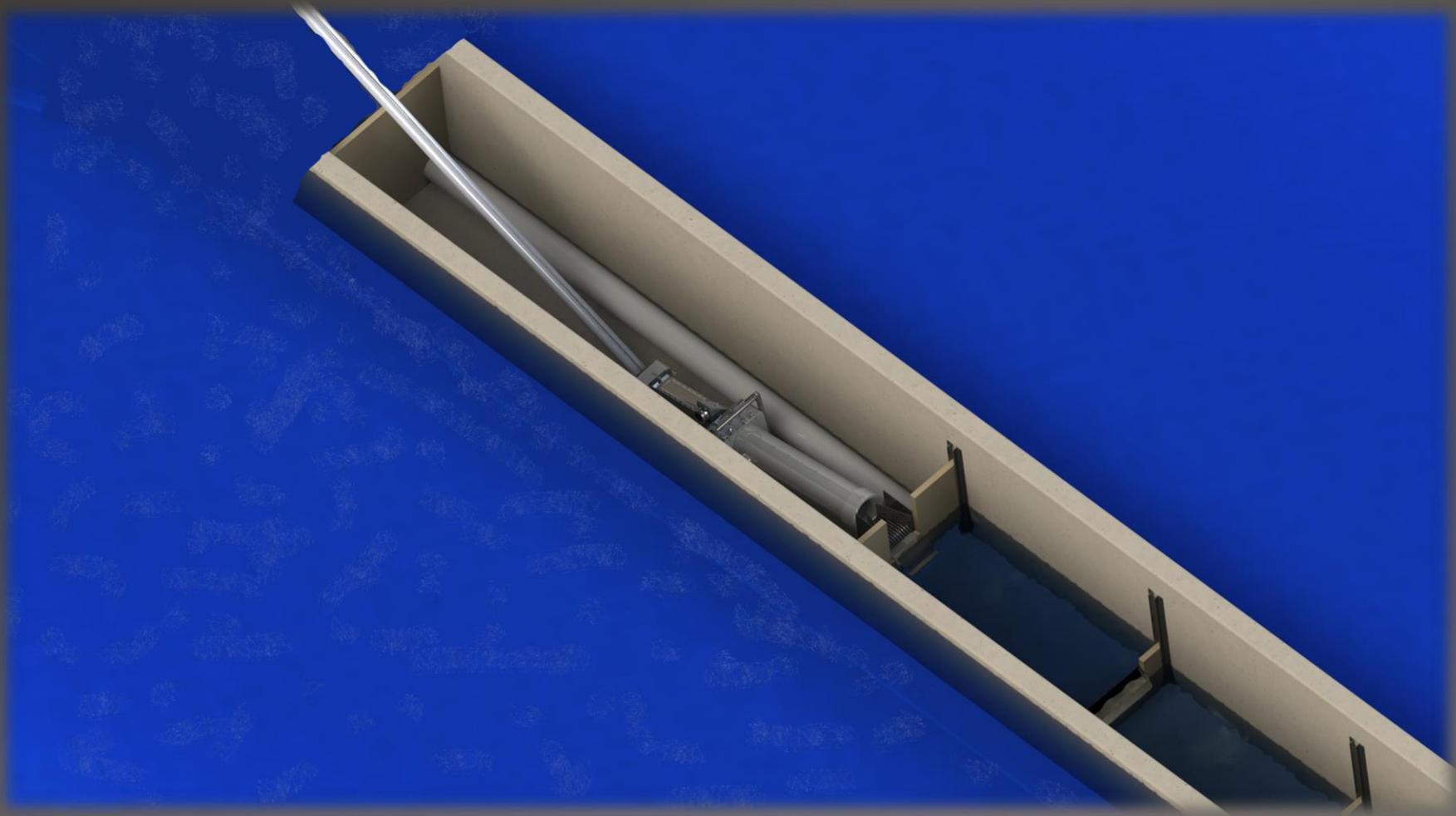
REPRESENTATIVE APPLICATIONS



VOLITIONAL ENTRY - SIDE CHANNEL



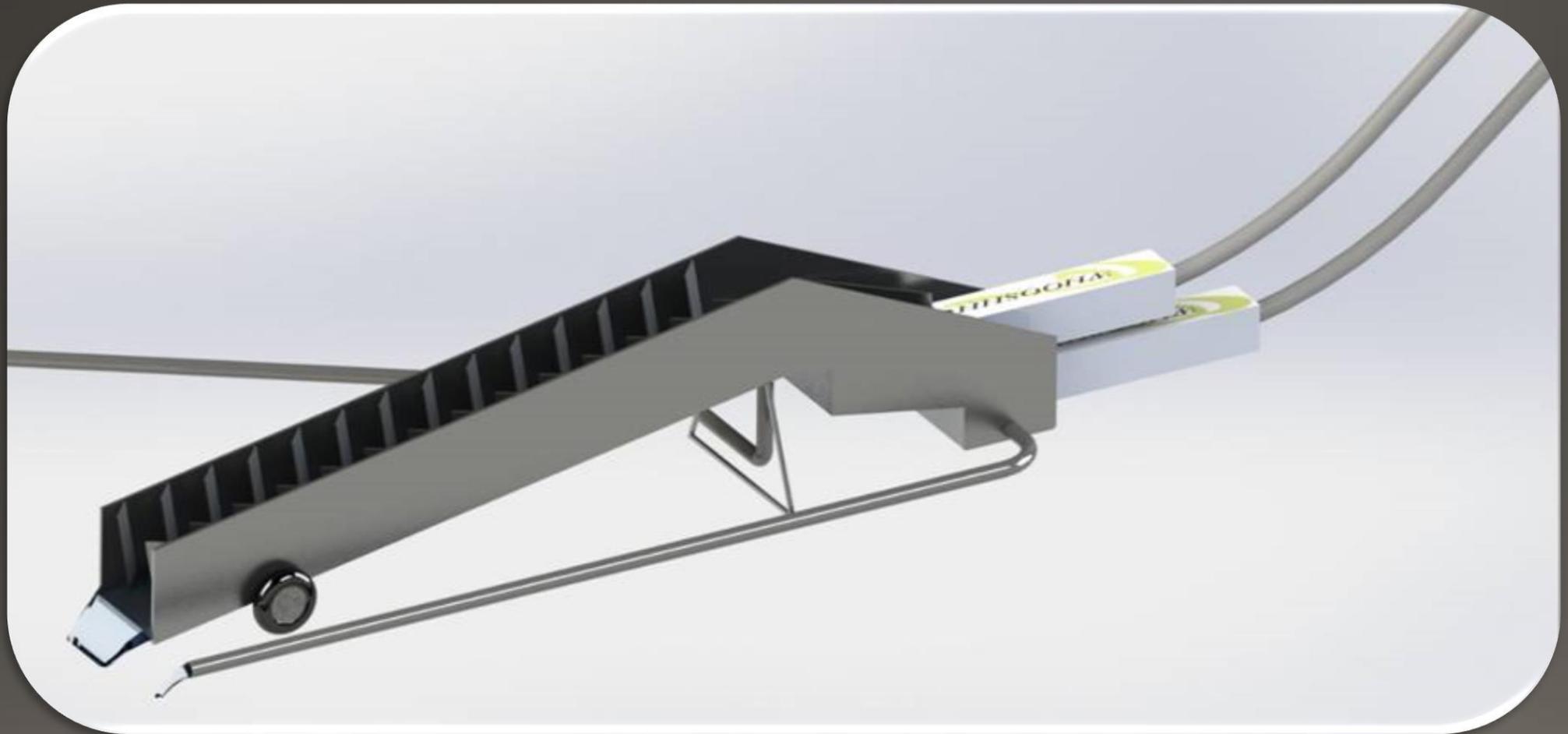
VOLITIONAL ENTRY - MID-RIVER



VOLITIONAL ENTRY - PERMANENT



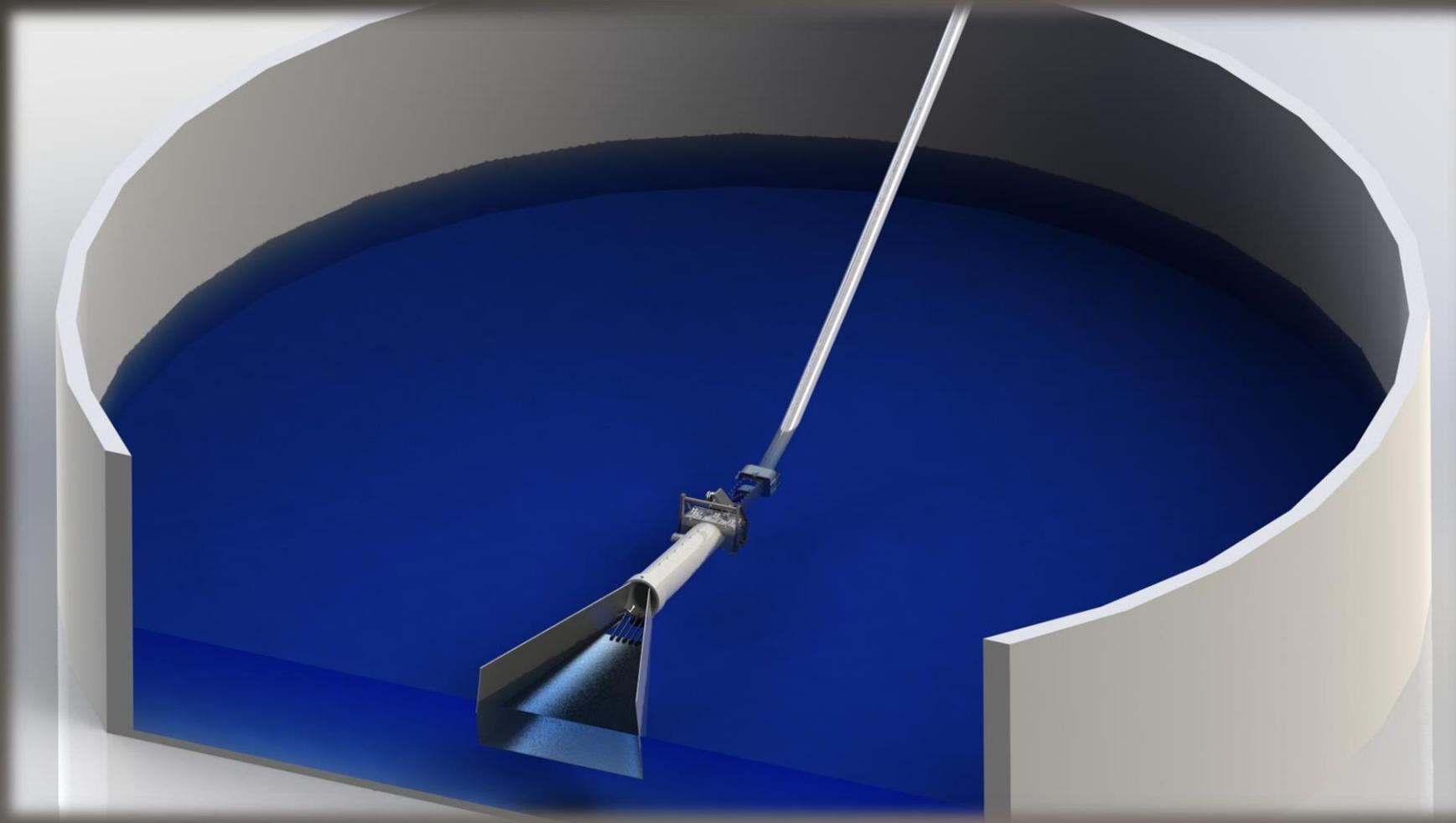
VOLITIONAL ENTRY – SEASONAL



VOLITIONAL ENTRY - SEASONAL



ASSISTED ENTRY – MID-TANK/TRAP

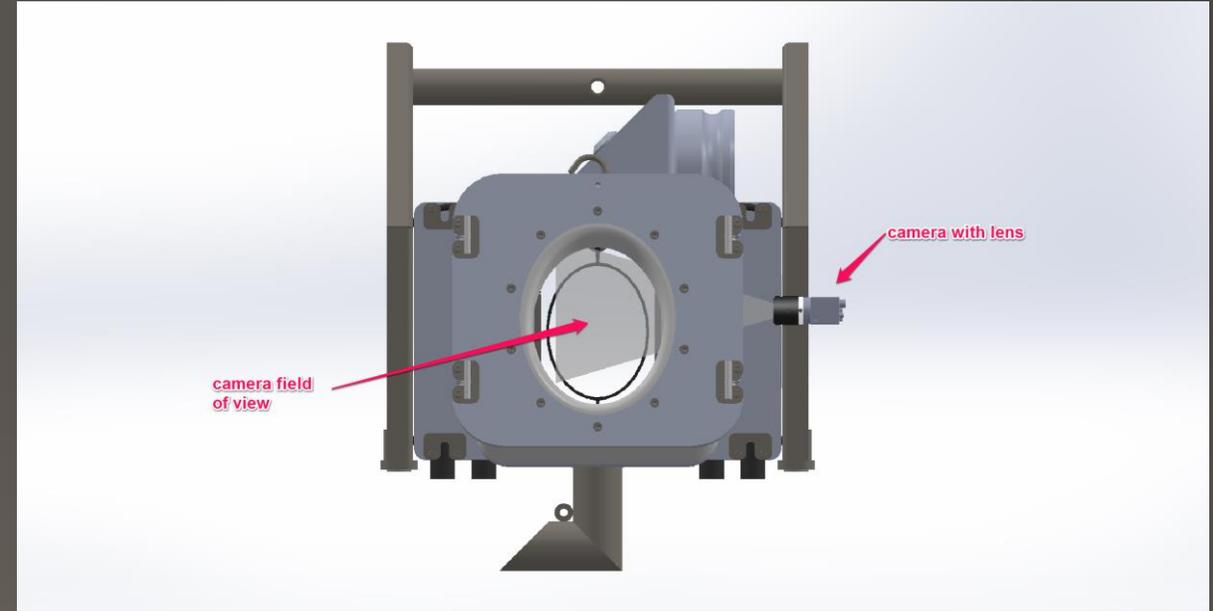
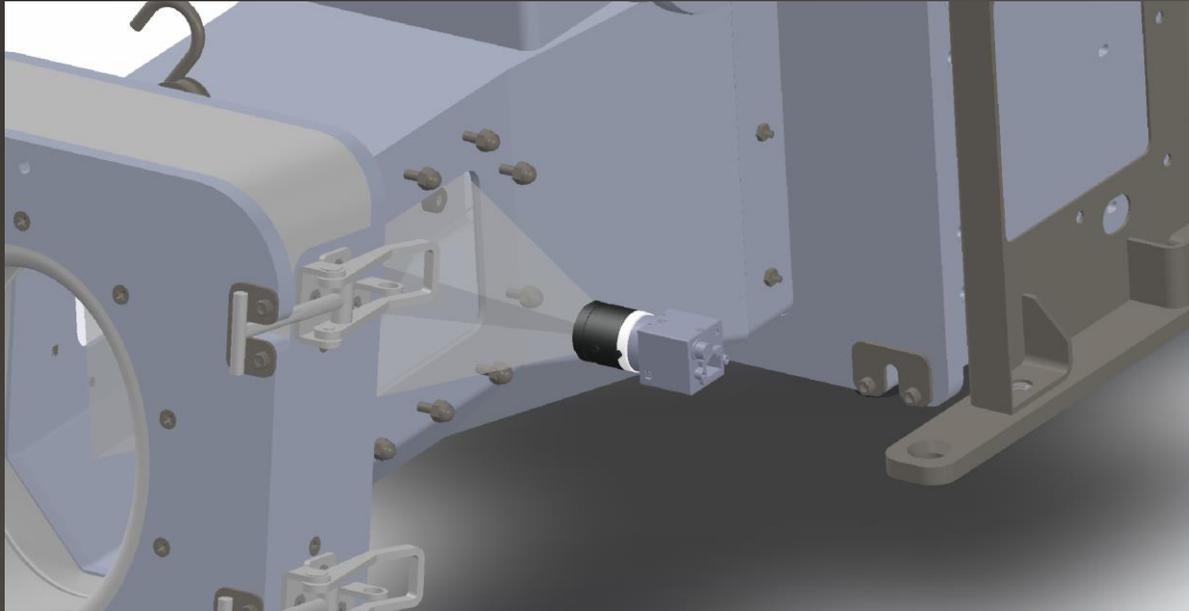


MOBILE FISH RESCUE UNIT

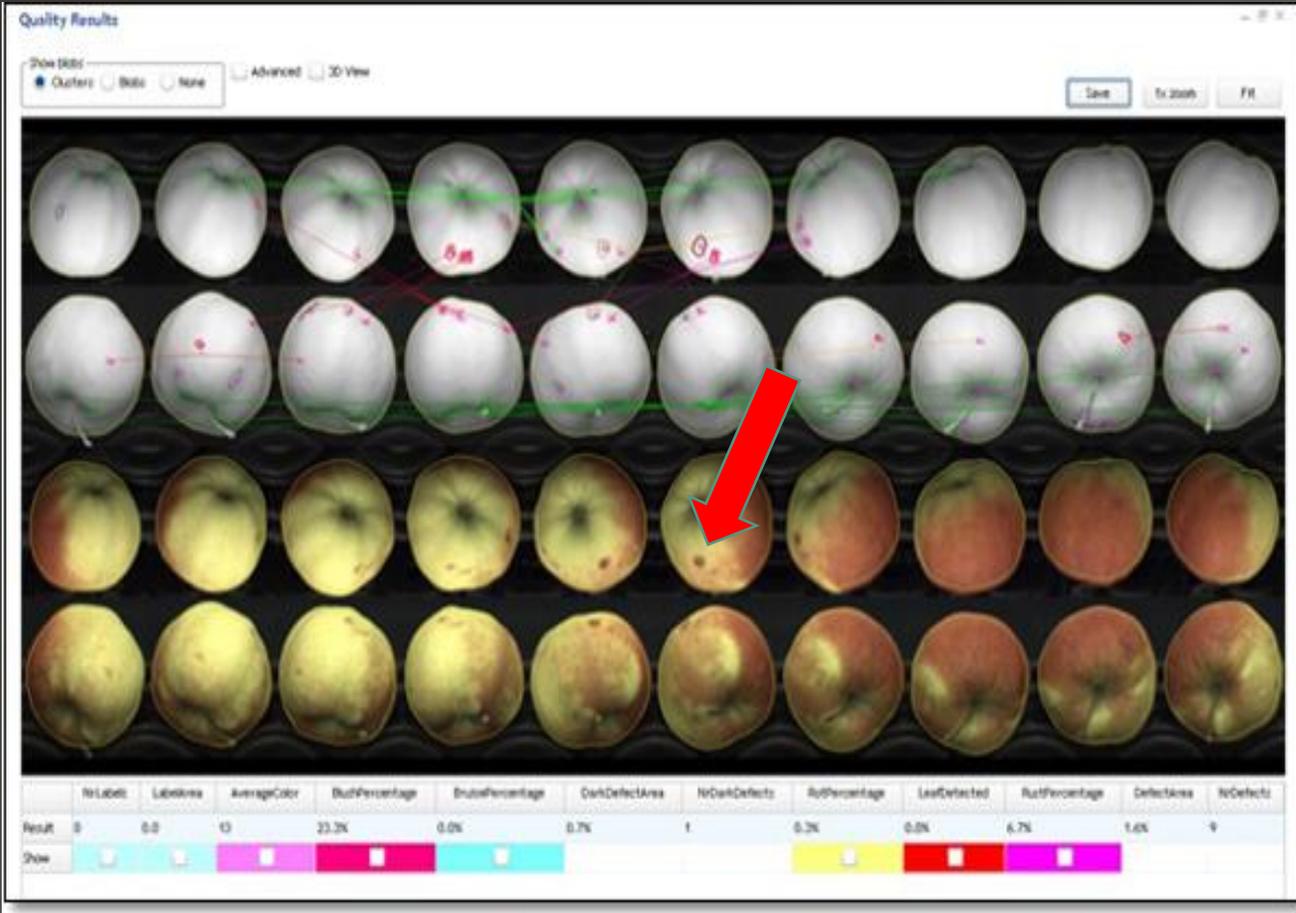


COMPONENT OPTIONS

SCANNING/SORTING/DATA COLLECTION



COMPONENT OPTIONS SORTING – HATCHERY V. WILD



COMPONENT OPTIONS SORTING - SPECIES

Chinook
Oncorhynchus tshawytscha
 Other names: king, tye, blackmouth (immature)
 Average size: 10-15 lbs, up to 135 lbs
 Chinook salmon are the largest of the Pacific salmon, with some individuals growing to more than 100 pounds. These huge fish are rare, as most mature chinook are under 50 pounds.

Steelhead
Oncorhynchus mykiss
 Other names: steelhead trout, sea-run rainbow trout
 Average size: 8-11 lbs, up to 40 lbs
 Steelhead and rainbow trout are the same species, but rainbow are freshwater only, and steelhead are anadromous, or go to sea. Unlike most salmon, steelhead can survive spawning, and can spawn in multiple years.

Chum
Oncorhynchus keta
 Other names: dog salmon, calico
 Average size: 10-15 lbs, up to 33 lbs

Coho
Oncorhynchus kisutch
 Other names: silver
 Average size: 6-12 lbs, up to 31 lbs
 Coho are a very popular sport fish in Puget Sound. This species uses coastal streams and tributaries, and is often present in small neighborhood streams. Coho can even be found in urban settings if their needs of cold, clean, year-round water are met.

Sockeye
Oncorhynchus nerka
 Other names: red salmon, blueback (Columbia and Quinault Rivers), kokanee or "silver trout" (landlocked form)
 Average size: 5-8 lbs, up to 15 lbs

Bull Trout

Pink
Oncorhynchus gorbuscha
 Other names: humpie, humpback salmon
 Average size: 3-5 lbs, up to 12 lbs
 Male pink salmon develop a large hump on their back during spawning, hence the nickname humpback salmon. This is the smallest of the fall-spawning Pacific salmon. In Washington, pink salmon runs only occur in odd-numbered years.

Color results

Blush 52.4 %
 Base Color 21

Uncorrected Color Image 1x zoom Fit

Show	Blush	Base Color
Image 1	41.9 %	34
Image 2	13.2 %	30
Image 3	55.7 %	8
Image 4	87.7 %	7
Image 5	96.9 %	8
Image 6	84.9 %	32
Image 7	40.4 %	31
Image 8	12.2 %	31
Image 9	29.4 %	15
Image 10	62.3 %	8

WHY NOT WHOOSHH?

THANK YOU!

WHOOSHH.COM

