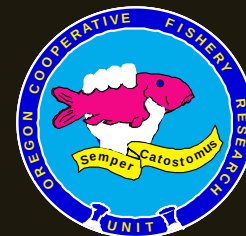


Born to Behave Wild? Development of a Wild Chinook Surrogate



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OHRC 12 March 2012



The Catch and Hook

- Rear surrogates reflecting morphology, physiology and behavior of wild fish in Upper Willamette Basin.
- Provide for field studies to be conducted in UWR reservoirs.



The Willamette Basin

LEGEND

- Projects operating in 1964
- Projects added since 1964
- Re-regulating Dams

0 5 10 15 20 25 30
APPROXIMATE MILES



Tagging Study Releases

Detroit (JSATS)

- 95 – 180 mm

Cougar (JSATS)

- 95 – 180 mm

Lookout P. & Dexter (PIT & Genetic)

- 65 mm
- 45 mm

Justification for Utilizing Wild Surrogates

- ESA-listed species - surrogate wild fish are crucial for studies requiring large sample sizes.
- Morphological, behavioral and physiological differences between wild and hatchery fish may confound estimation of passage and survival.

Objectives

- Identify “Wild” phenotypes from published literature & reports
- Determine environmental conditions that contribute to these phenotypes
- Produce surrogates with desired attributes for field studies
- Develop procedures and protocols applicable for production scale rearing.

What makes Hatchery fish different? (eg.)

— Morphology

Gross examination: Tiffan & Connor 2011

Brain size: Kihlslinger et al. 2006

— Physiology

Proximate Analysis: Wood et al. 1957

Early maturation: Larsen et al. 2004

— Behavior

Predator Avoidance: Fritts et al. 2007.

Out-migration Behavior: Kostow 2004.

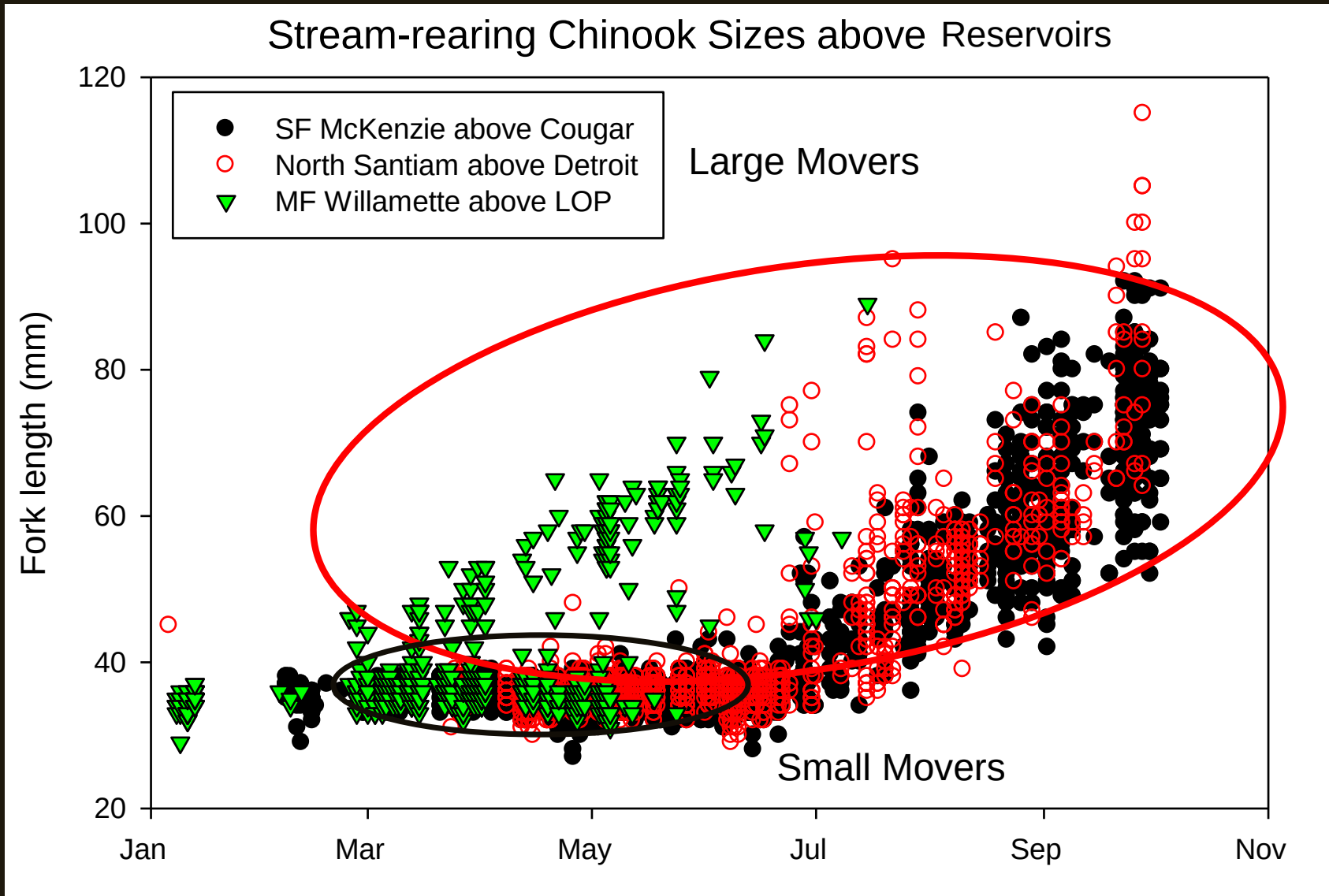


Wild Chinook

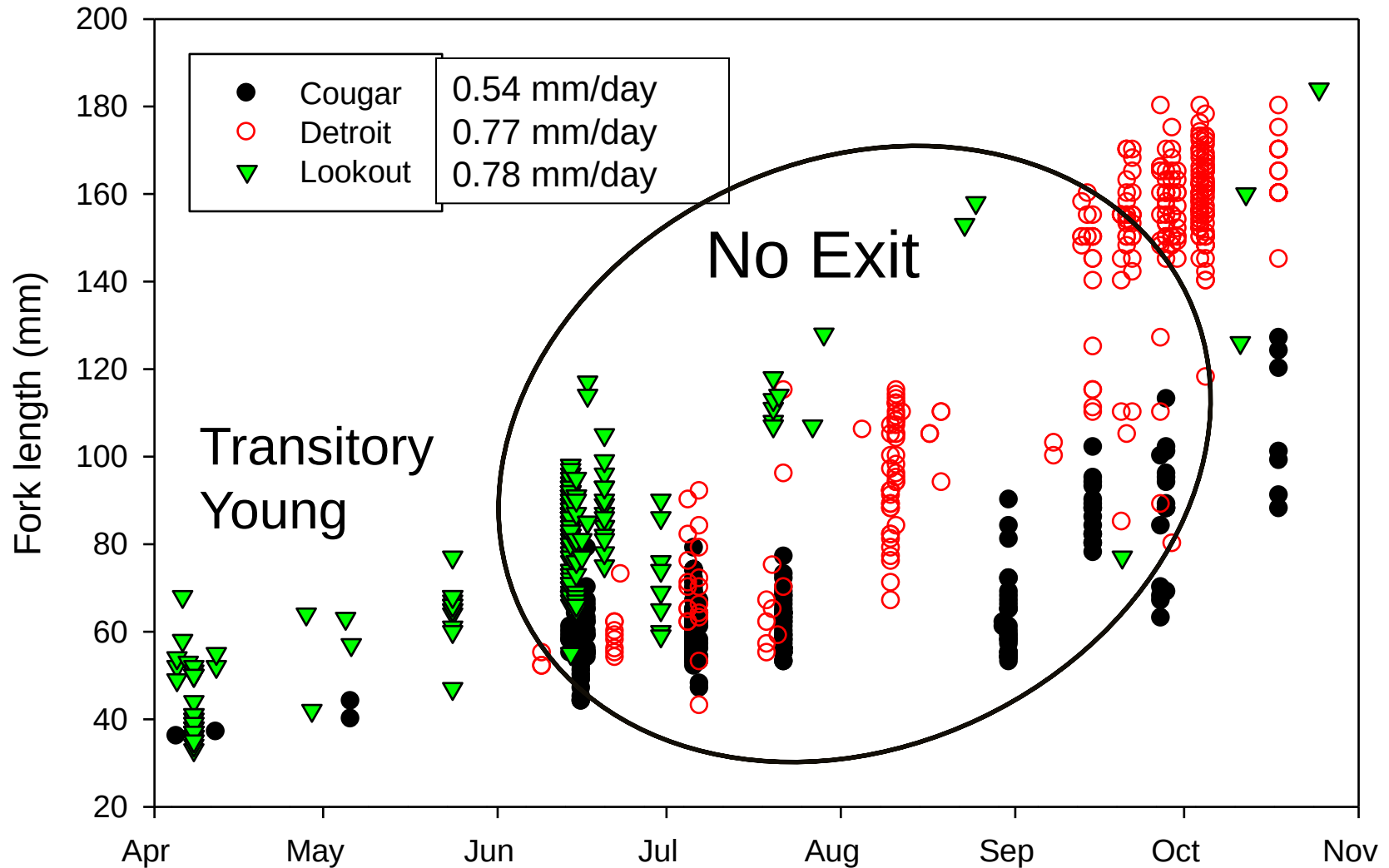


Courtesy Peter Moyle, U.C. Davis

Wild Chinook in Upper Basin



In-reservoir Chinook Sizes



Release & Experimental Treatments



Fish Performance &
Genetics Laboratory
Corvallis, OR

Oregon Hatchery
Research Center
Alsea, OR



- **September 2011**
 - 10,000 BY 2010 sub-yearlings (Marion Forks) to FPGL.
- **October 2011**
 - 25,000 BY 2011 Eggs (McKenzie Hatchery) to FPGL & OHRC
- **Spring 2012**
 - BY '10 yearlings for JSATS study at Cougar & Detroit
 - BY '11 at Willamette Hatchery for PIT & Genetic Tag study at Dexter & Lookout Point.
- **Fall 2012**
 - BY '10 yearlings & BY '11 subyearlings for JSATS study.
- **Spring and Fall 2013**
 - BY '11 yearlings for JSATS study at Cougar & Detroit.

Treatments

BY 2010
@ FPGL

F10S12HIWW
MCDBBCT

F10F12HIWW
MCDBBCT

F10RBSHIWW
LCDBBCT

F10RBHIWW
MCDBBCT

F10RBHIWW
LCDBBCT

BY 2011
@ FPLG

F11F12WIW
WMADBBCT

F11S13WIW
WMADBBCT

F11F13WIW
WMADBBCT

F11ETWIWW
MCDBBCT

F11ETWIWW
MADGBCT

F11ETWIW
WLADGBCT

F11ETCIWW
LADVSCT

F11ETCIW
WLADGBTT

BY 2011
@ OHRC

O11ETCIHWM
CDBBCT

O11ETCICWM
CDBBCT

O11ETCIHWM
ADBBCT

O11ETCICWM
ADBBCT

O11ETCICWH
CDBBCT

O11ETCICWM
ADGBTT

F11ETWlWWLADGBCT

F – Facility (FPGL)

11- Brood Year (2011)

ET- Treatment (Experimental)

Wl- Incubation Temp. (Well Water ambient)

WW- Rearing Temp. (Well Water ambient)

L – Density (Low)

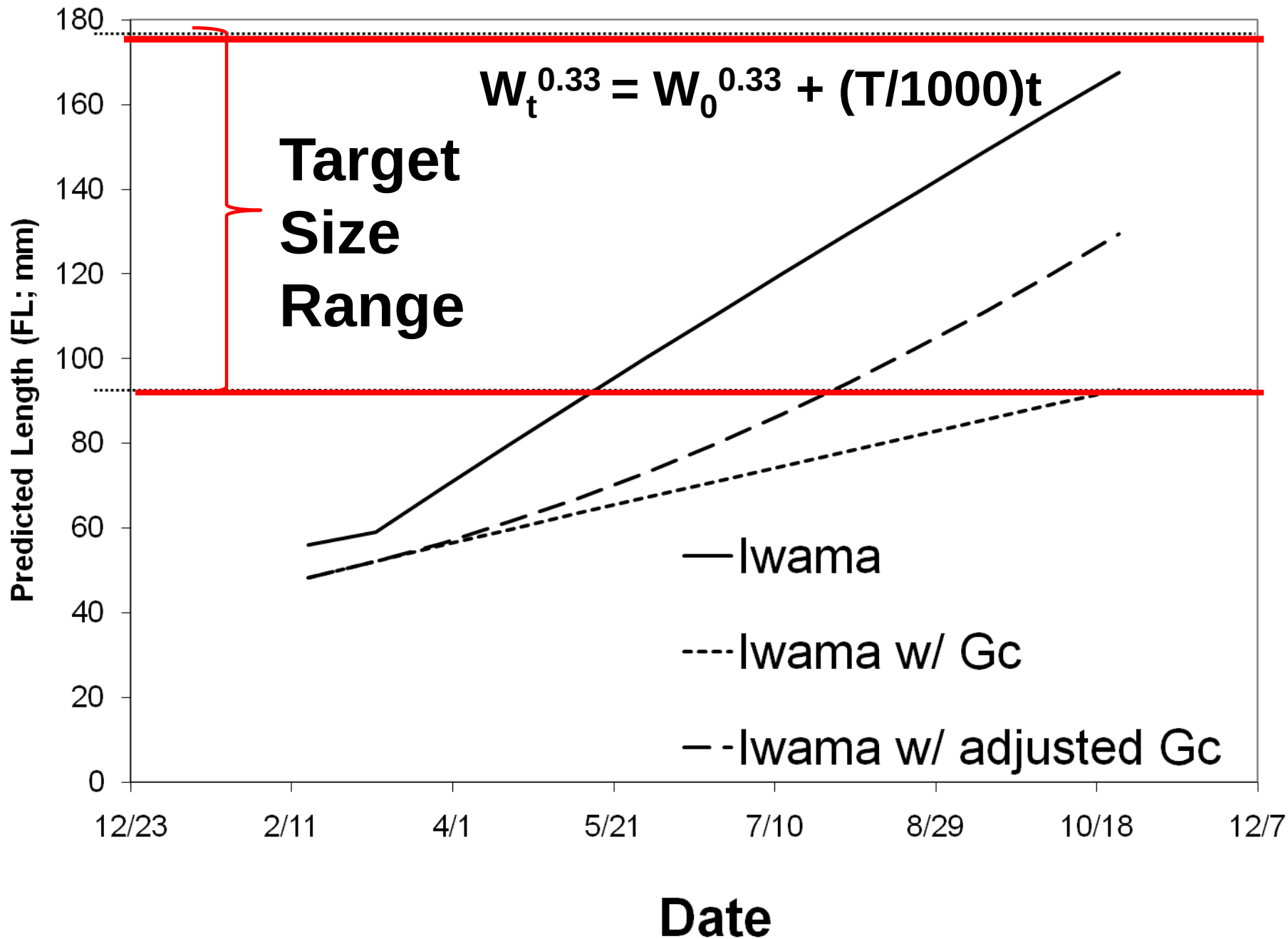
AD – Abernathy (Experimental Diet # 1)

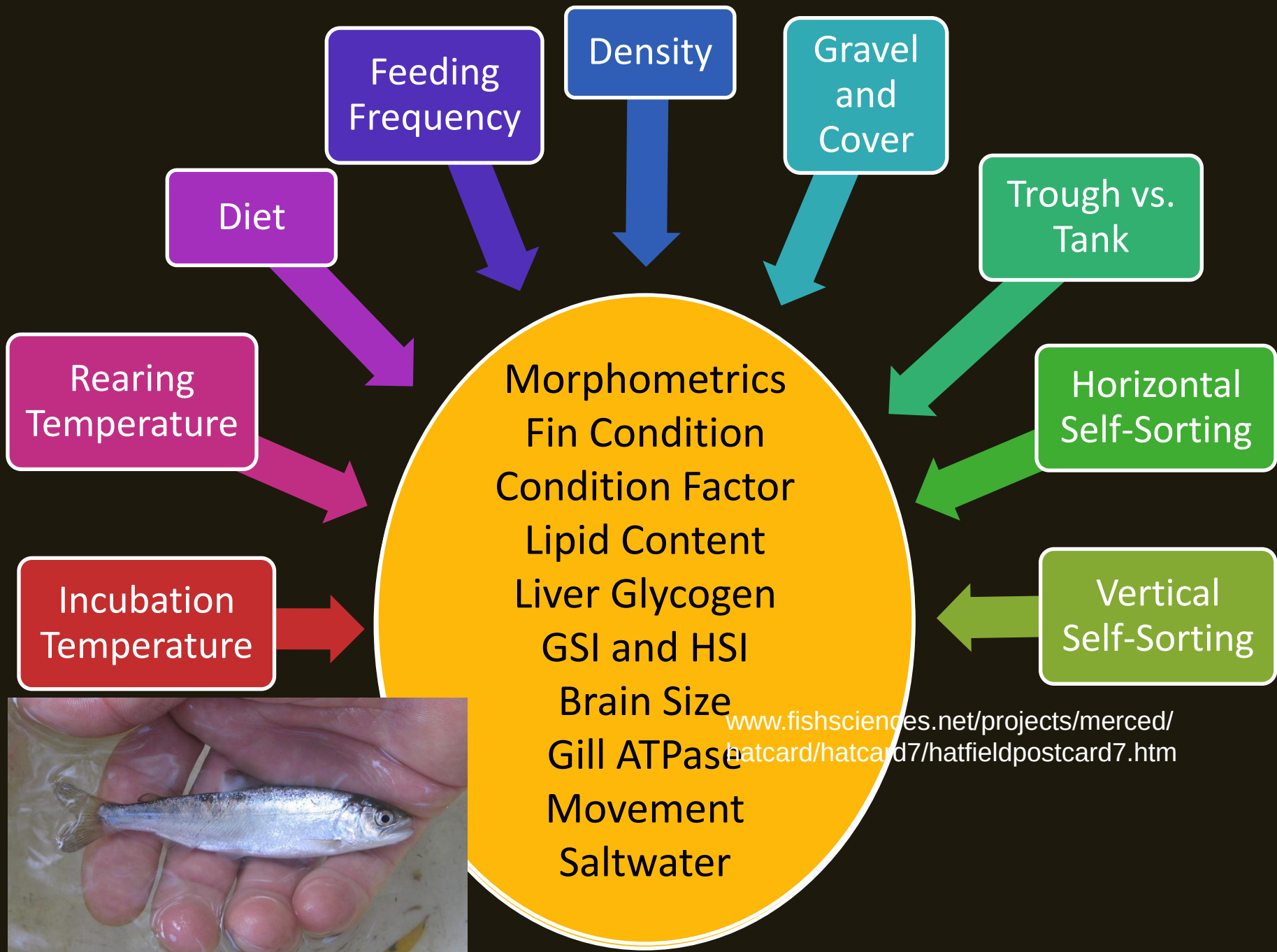
GB- Substrate (Gravel Bottom)

CT – Container (Circular Tank)



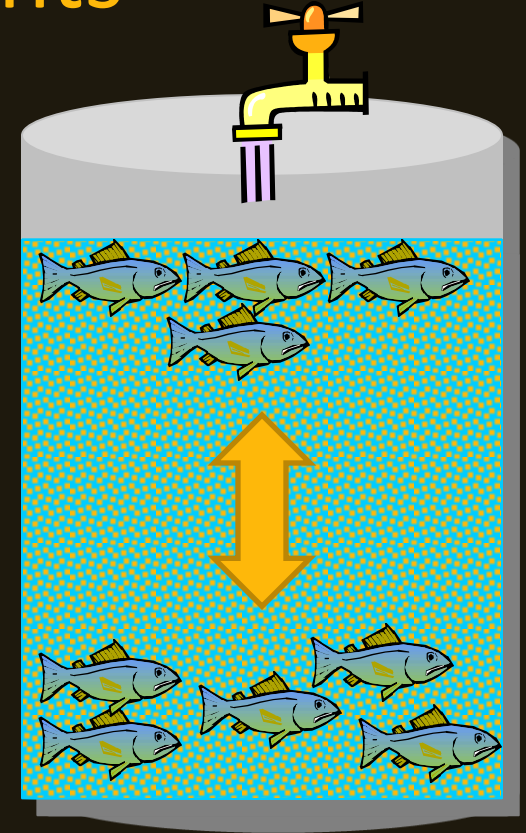
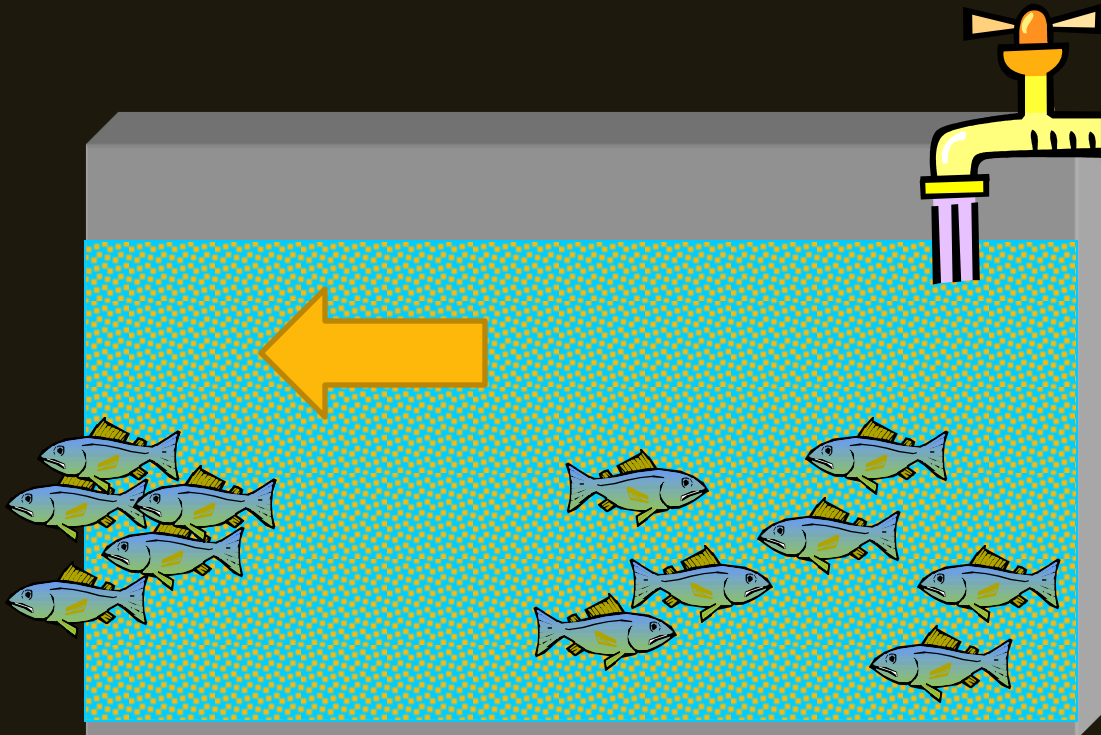
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www.OceanLight.com





Self- Sorting Experiments

Horizontal Trough:
Movers vs. Stayers



Vertical: Surface vs.
Bottom Oriented

Questions?

