

Stream Salmonid Simulator (SSS)

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SSS: Klamath Basin Model

- Now
 - Mainstem Klamath
 - Tributary inputs
- Next
 - Add Mainstem Trinity
 - Trinity Tributary inputs



Source: USBR Klamath Basin Area Office

Will Koenig/Capital Press

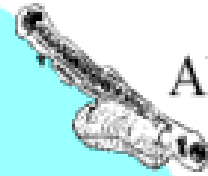
Egg



Spawning



Alevin

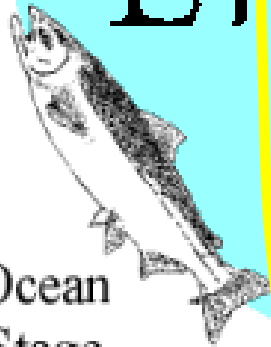


Salmon Life Cycle

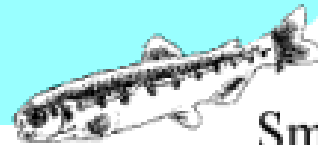
Fry



Ocean
Stage



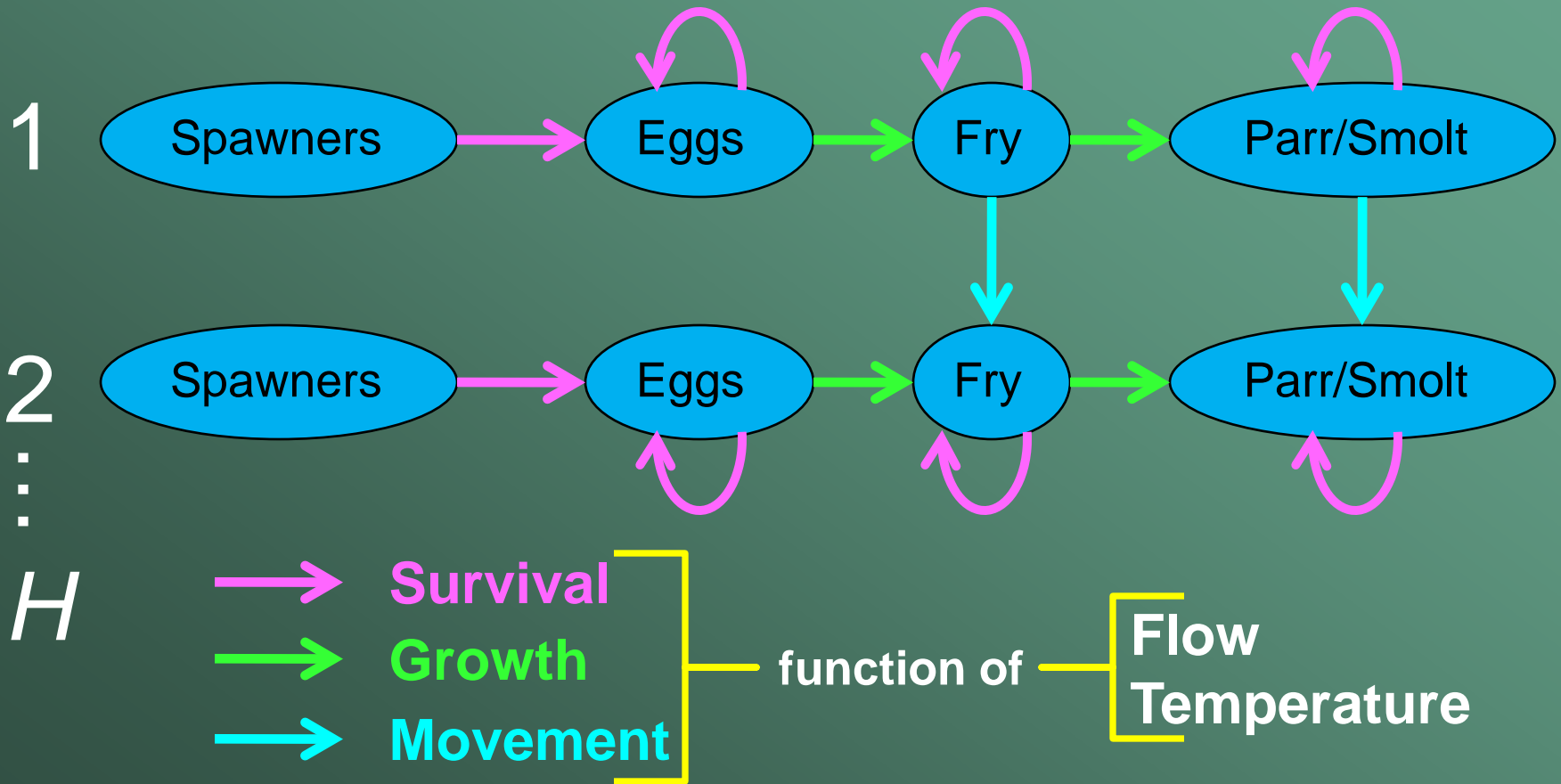
Smolt



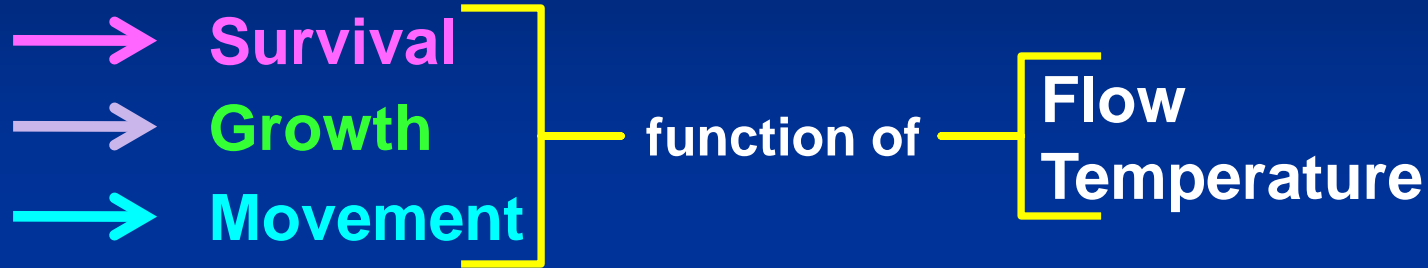
N
E
X
T

N
O
W

Demographic Processes at each (daily) time step



Complex Dynamics



- n Multiple components of each
- n Sub-models
 - n Data
 - n Literature/meta-analysis
 - n Flexible

Physical and Biological Inputs

§ Daily Flow and Temperature

- § New water temperature model

- § Calibrated to extensive historical data

- § Historic or projected

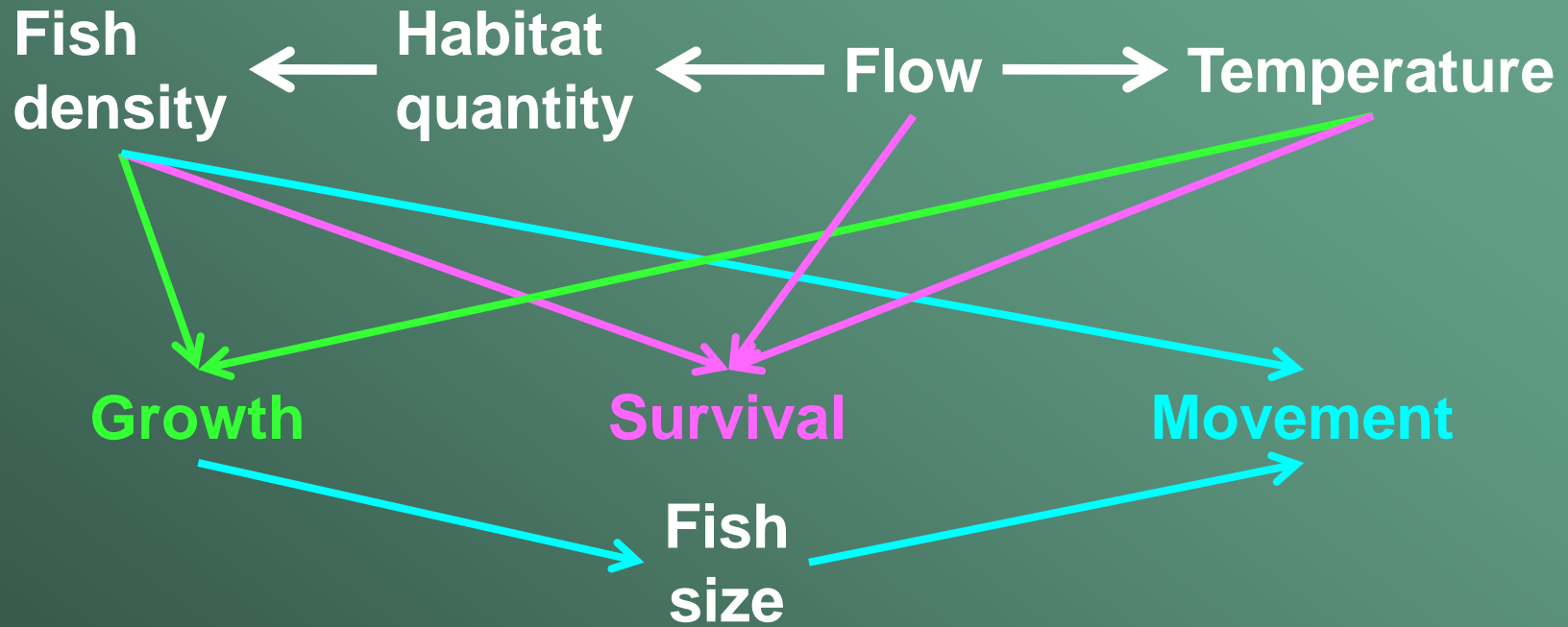
§ Habitat Template

§ Daily Mainstem Spawners

§ Juveniles Entering from Tributaries



Physical Drivers: Discharge and Temperature



- Varies by life stage
 - Both direct and indirect links
-

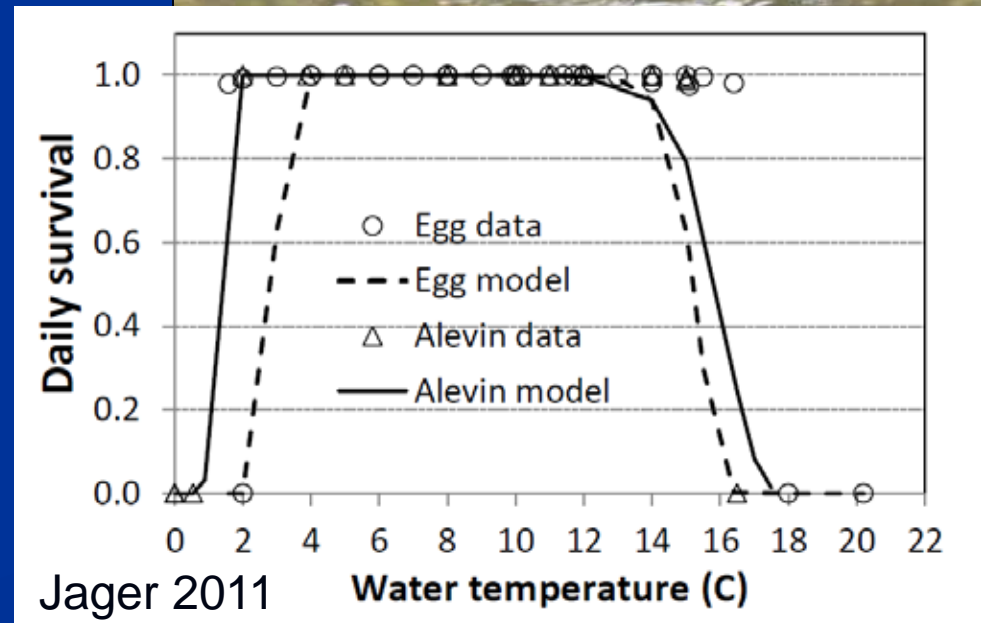
Physical Drivers: Discharge and Temperature



- Varies by life stage
- Both direct and indirect links

Spawning and Egg Life Stages

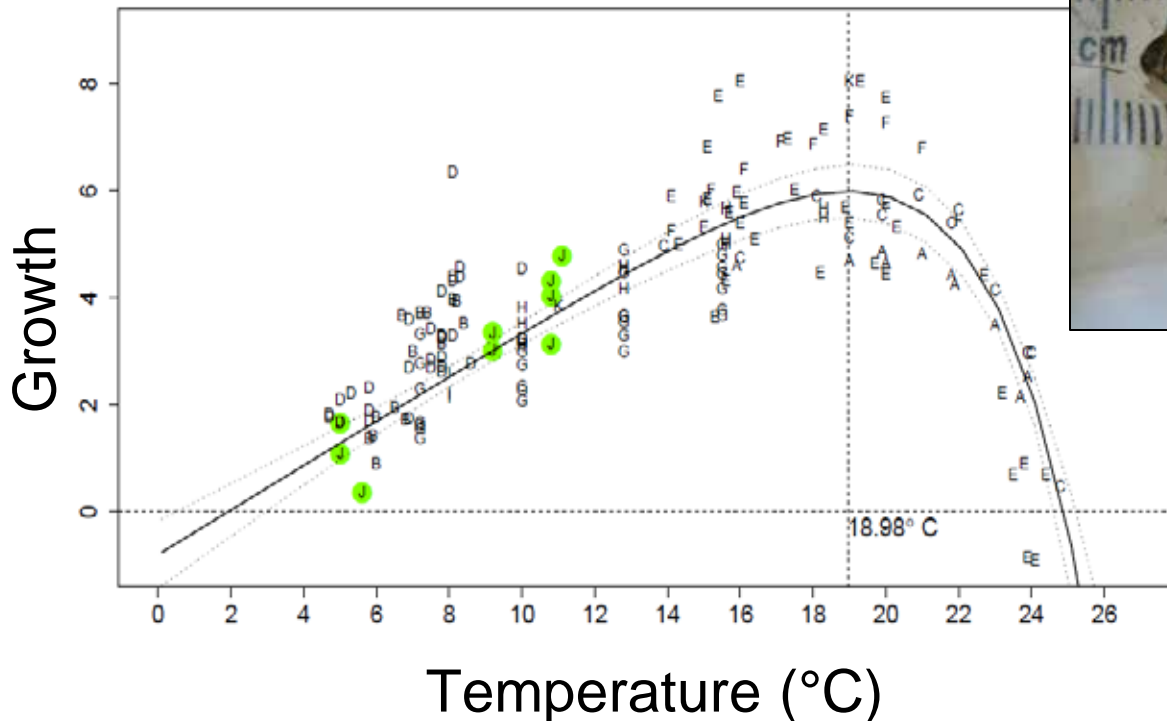
- n Redds
 - n Superimposition
 - n Scour
- n Eggs
 - n Survival
 - n Development



Juveniles

n Growth

- n Mass and temperature dependent
- n Bioenergetics
- n Density dependent

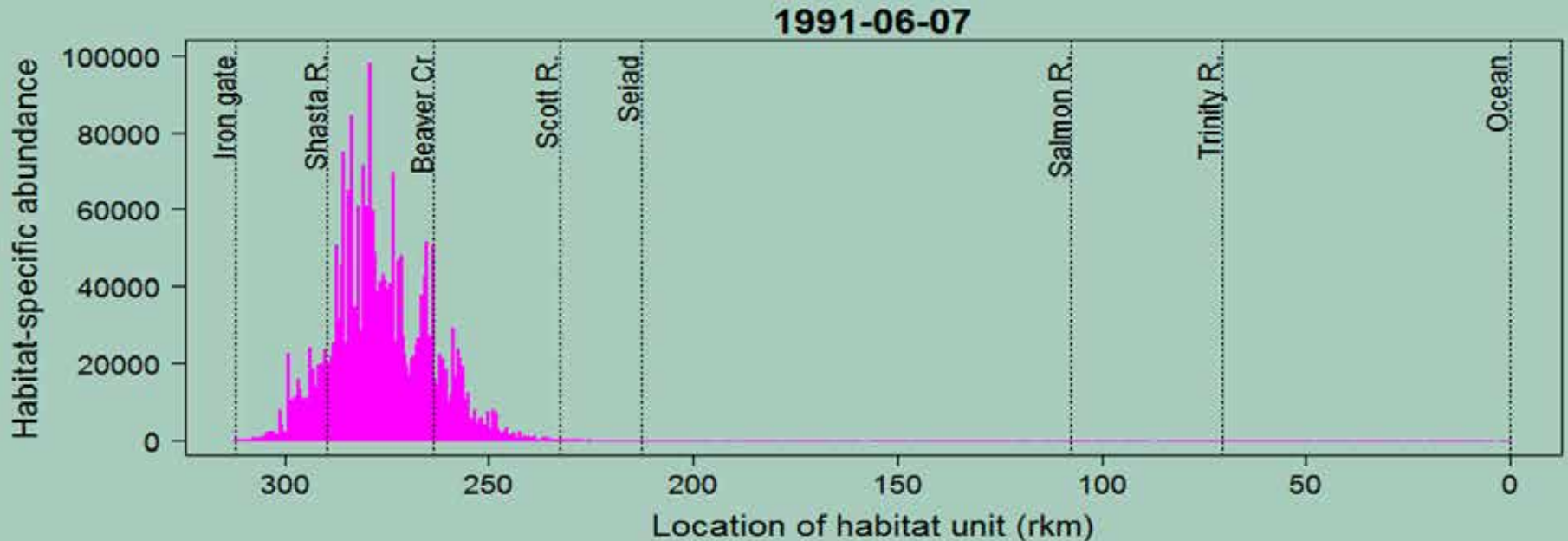
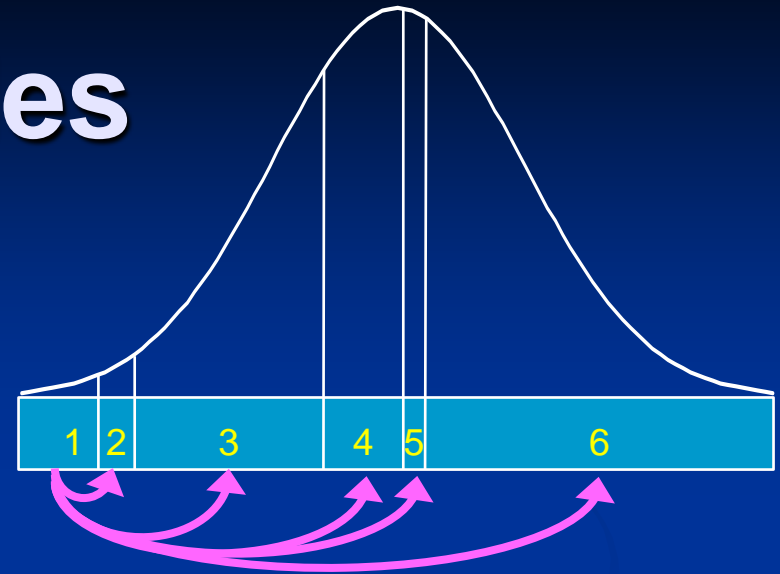


Juveniles

▫ Movement

▫ Advection-diffusion

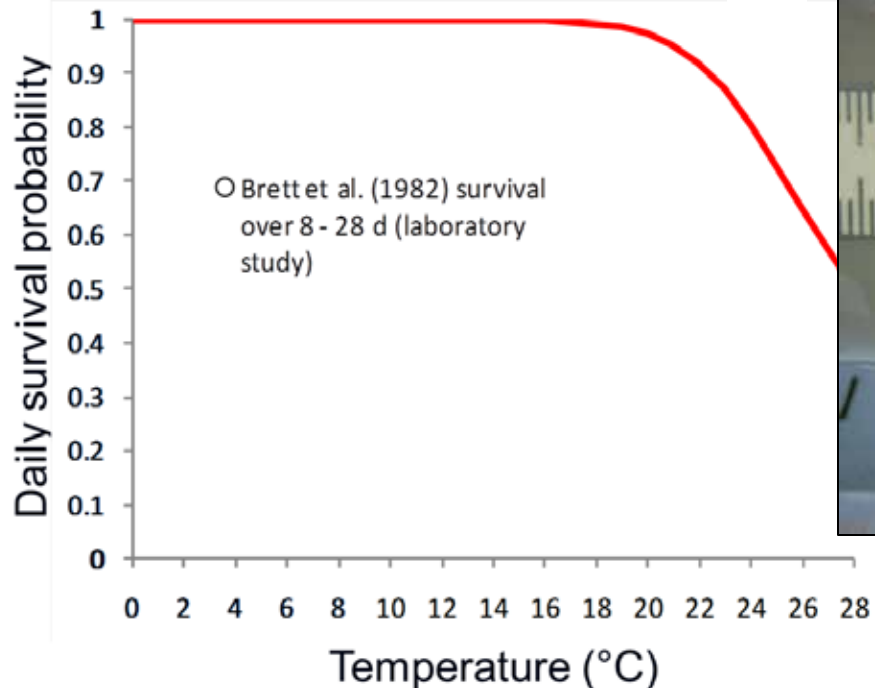
▫ Based on size and density



Juveniles

n Mortality

- n Baseline, thermal, density-dependent, disease

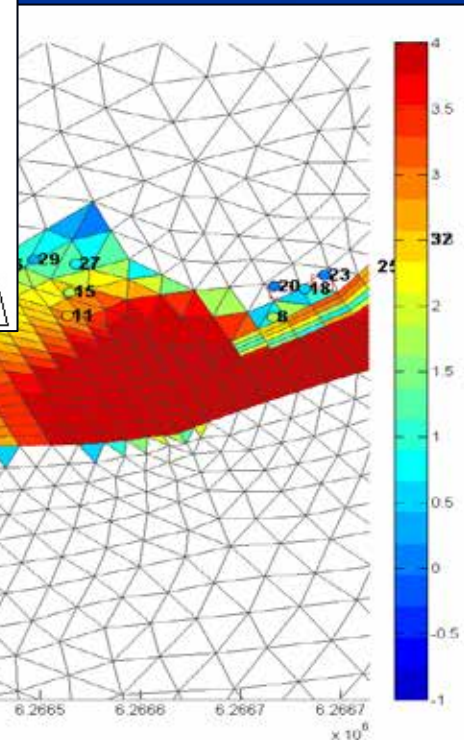
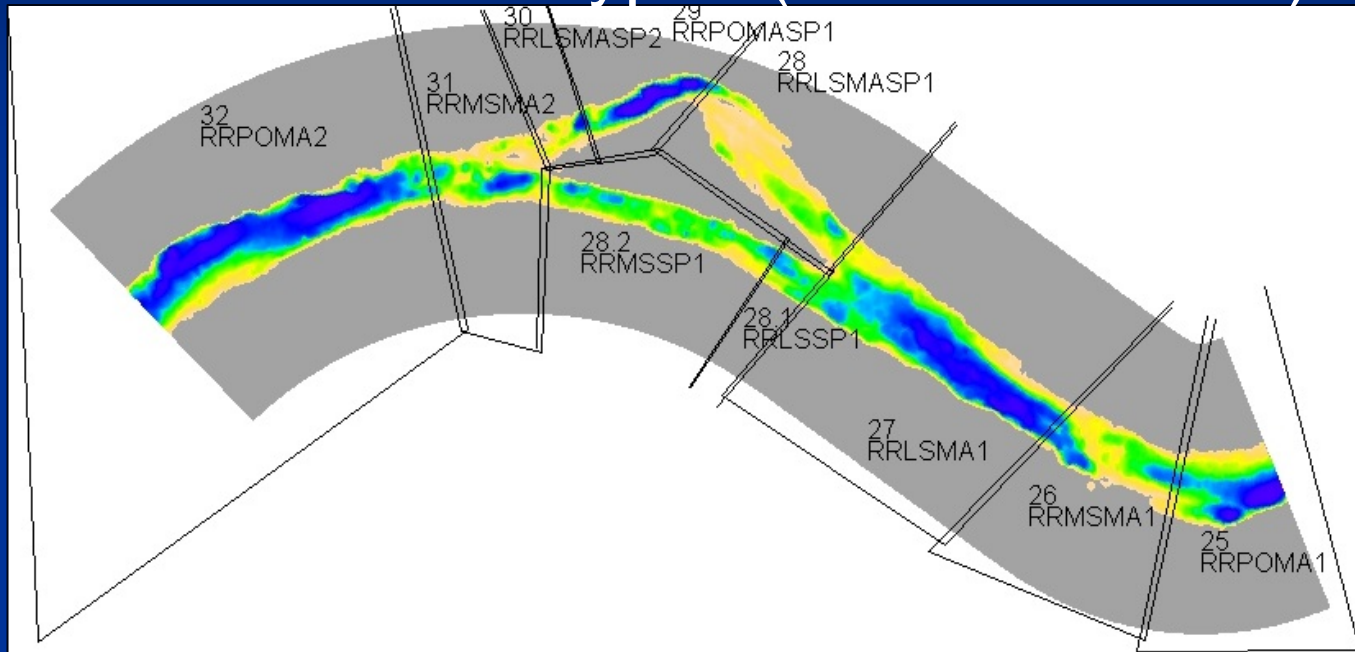


Density

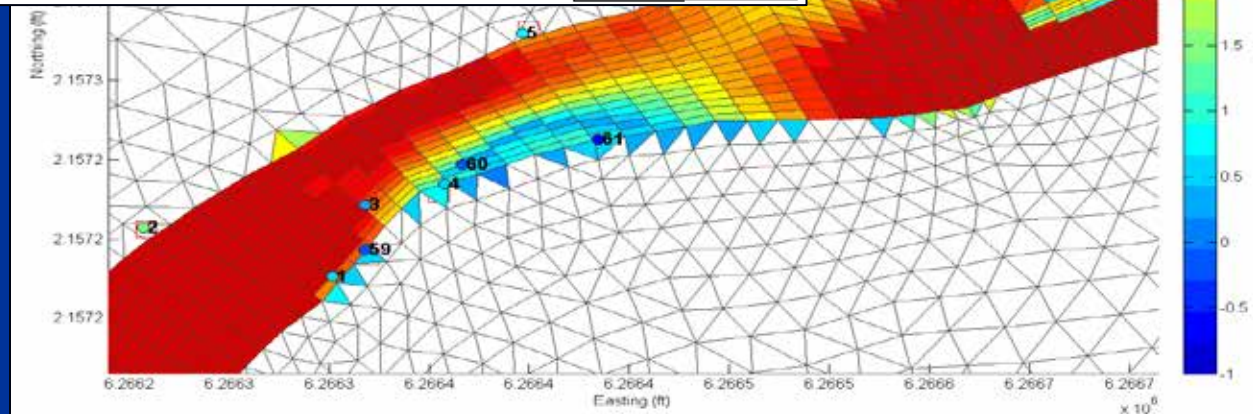


Habitat Template

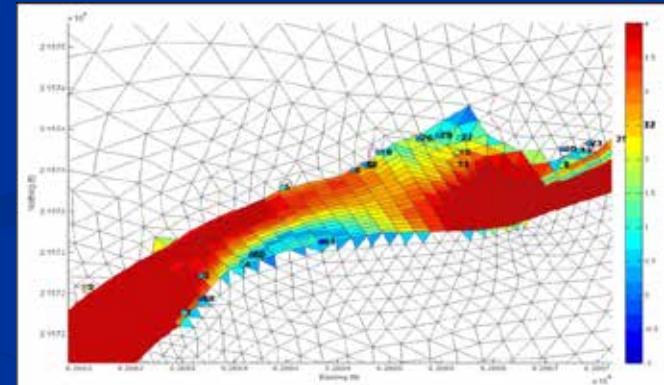
Meso-habitat types (~ 10s - 100s m)



2-D Model
(~ 1 - 10s m)



Juvenile Density



Questions?

