

# Physics versus Biology:

## Implications for Predation on Juvenile Salmon



### Physics

**Contaminants**  
Increase predation  
Reduce evasion

**Bathymetry**  
Salmonids shallow  
Predators deep

**Warm Water**  
Increase food demand  
Increase disease

**Complexity**  
Salmonids complex  
Predators simple

**Hydrodynamics**  
Food, migration, encounters

**Structures**  
Ambush locations  
Bad hydrodynamics

**Turbidity**  
Predation → suffocation

**Light**  
Aids predators  
Especially at night

Anthropogenic impacts to Central Valley aquatic and riparian habitat favor predatory fish over juvenile salmonids.

Flow impacts most of the factors influencing predation (yellow circles).

Restoring habitat to address these factors can reduce predation.

### Biology

**Density**  
Low ↑ vulnerability  
High swamp predators

**Timing**  
Influences habitat conditions

**Abundance**  
Swamp predators  
Attract predators

**Condition**  
Well fed, better evasion

**Size**  
Small size increases vulnerability

**Residence Time**  
Increase migration time & predation

**Hatchery Impacts**  
Smaller egg size  
Aggressive foraging

**Distribution**  
Changes encounter rate & habitat

