An overview of factors affecting ecological interactions between hatchery and wild anadromous salmonids

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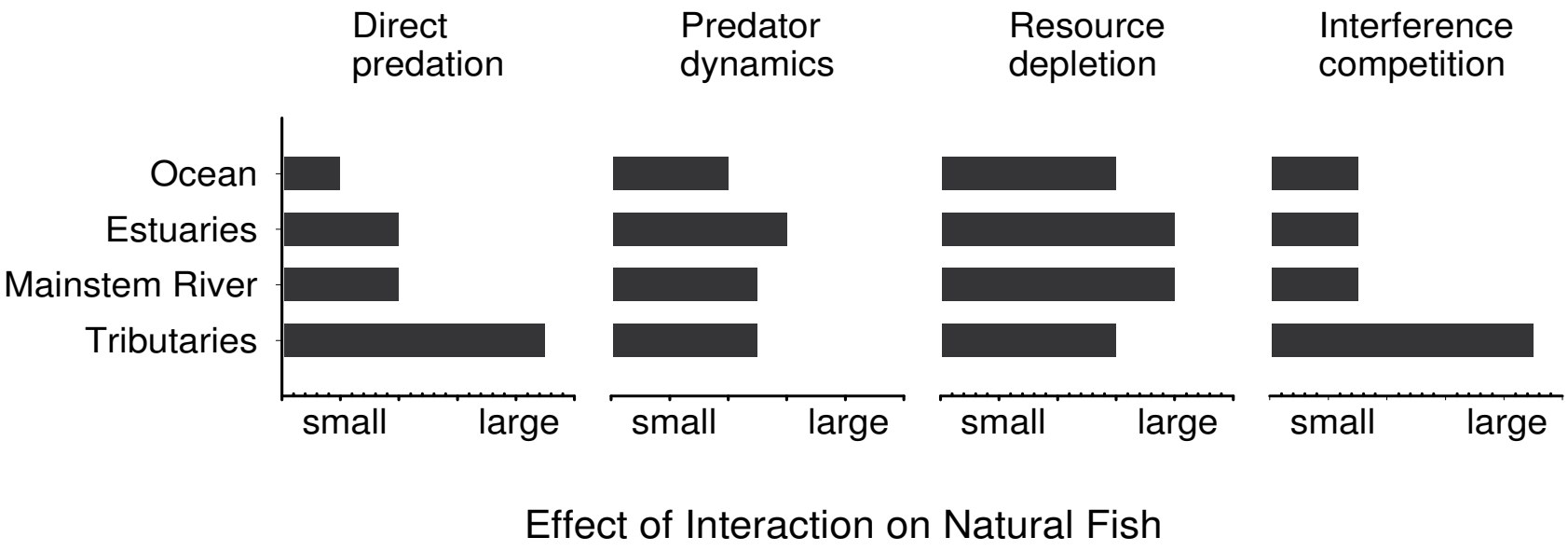
Ecological Interactions

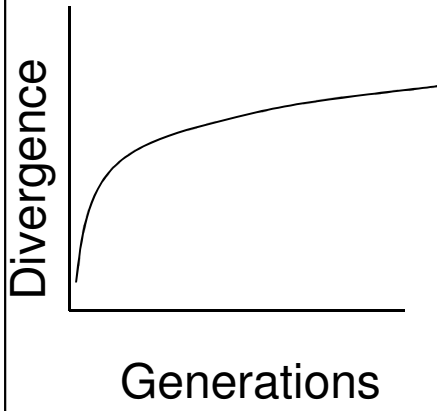


Types of hatchery programs

Genetically segregated

Hatchery

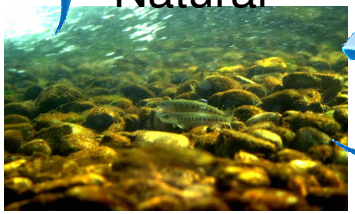
Natural

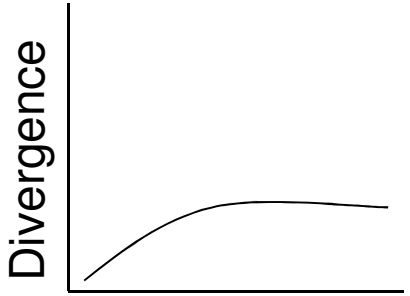


Genetically integrated

Hatchery

Natural

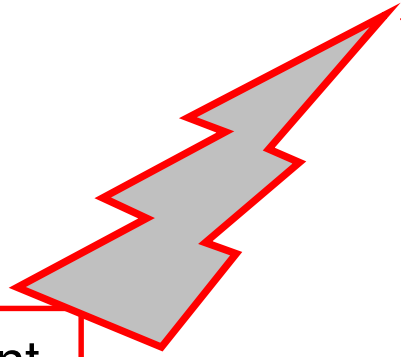




Refer to www.hatcheryreform.us for more info

Factors that can affect ecological interactions

Hatchery practices	*Phenotypic traits*
•Release	
Body size (juvenile)	
Number of fish	
Timing	
Location	
•Angling/harvest	
•Fish condition/health	
•Broodstock management & husbandry	



Evidence for genetic (domestication) effects based on 'common garden' experiments

	Number of published studies			
Trait	Local brood	Trait difference	Non-local brood	Difference detected
Anti-predator response	5	5	4	4
Aggression	4	2	1	0
Growth	2	2	2	2
Other	3	3	--	--

Caveats: i) maternal effects; ii) small differences; iii) negative results?, iv) does not include farmed Atlantic salmon

See review by Fraser (2008) *Evolutionary Applications*

Evidence for environmental (hatchery rearing) effects

Environmental Variable	Aggression and competition	Age-at-maturity	Smolt physiology or migration	Homing, imprinting & straying	Spawning behavior
Feeding regimes	XX	XX	X		
Rearing density	XX		X		
Rearing and release location				XX	
Structural complexity	X				

Plenary session

- Juvenile salmon and smolts in freshwater

	Topic
• Jim Winton	Disease risks
• Seth Naman	Predation
• Eric Buhle	Population dynamics
• Chris Tatara	Competition

- Post-smolts in the estuarine/ coastal shelf environments

1. Dan Bottom	Estuaries
2. Elizabeth Daly	CA Current
3. Greg Ruggerone	High seas
4. Masahide Kaeriyama	North Pacific

- Adults migrating and spawning from coast to spawning grounds

1. Mark Scheuerell	Large scale effects
2. Andrew Dittman	Spatial temporal overlap
3. Steve Schroder	Reproductive behavior
4. Rich Brenner	Straying