

Resilience and Salmon Management

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Outline

- Salmon, the resilient species
 - Resilience vignettes
- Anti-resilient management
- Pro-resilient management



Salmon, the Resilient Species

- Multiple reproducing populations
 - Reduced extinction risk
- High reproductive capacity
 - Strong capacity to recover
- Metapopulation structure
 - Optimize habitat use
- High genetic diversity
 - Adaptive capacity



Salmon, the Resilient Species

- Phenotypic plasticity
 - Flexible response to environment
- Variable life history tactics
 - Well stocked adaptive tool kit
- Opportunistic use of habitat
 - Rapid response to new opportunities



Resilience Vignettes

- Pacific salmon species have existed for around 10 million years. During that time they have survived prolonged periods of warm climate, tectonic upheaval that changed drainage patterns and, over the past 2 million years, multiple periods of prolonged glaciation.

Resilience Vignettes

- Pacific salmon species have also survived extreme habitat alterations caused by European colonization of western North America (e.g., large scale forest removal, wetland destruction, flow regulation, channelization, urbanization, discharge of toxic chemicals, nutrient enrichment, dams and diversions, etc.)



Anti-Resilience Management

- Allowing small populations to go extinct
- Reducing life history variation by targeting and enhancing the dominant tactic
- Domestication and genetic swamping
- Managing for maximum yield
- Encouraging big boats and big gear



Pro-Resilience Management

- Maintaining habitat quality and diversity
- Allowing surplus escapement
- Fishing to sustain diversity
- Smaller, targeted fisheries
- Enhancing to sustain and increase diversity

Conclusions

- Salmon are resilient. They have persisted in the face of extreme habitat alteration because of they are resilient
- Our management of salmon and their habitat has progressively reduced resilience
- Alternative forms of management can restore some of the resilience that has been lost.