

Ocean Ranching



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Presentation Overview

- **Background information**
- **RCW's**
- **Potential benefits**
- **Potential issues**
- **Summary**

Ocean Ranching

- **Broad definition**
 - **The cultivation of marine organisms under controlled conditions**
- **International Symposium on Stock Enhancement and Sea Ranching**
 - **First held in 1997, 5th symposium was held in 2015**
 - **Restocking, stock enhancement, and sea ranching**
 - **Bell (2008)**
 - **“The release of cultured individuals into unenclosed marine and estuarine environments for harvest at a larger size in put, grow and take operations”**

Ocean Ranching

- **Some form of Ocean Ranching used extensively around the world**
- **70 countries stocking over 180 species**
 - **Japan**
 - **90 species ranched or researched for eventual stocking**
 - **Norway**
 - **Cod, European lobster**
 - **Australia**
 - **Barramundi**
 - **Iran**
 - **Sturgeon**
 - **USA**
 - **Pacific Salmon**
- **Salmonids are the most widely stocked group of fish**

Ocean Ranching - Japan

- **JASFA – Japan Sea-Farming Association**
 - **16 National sea farming centers**
 - **Species/method development**
 - **Subsidized by national government**
 - **Regional sea farming centers**
 - **Production and release of juveniles**
 - **Funded by fisherman's co-op associations, prefectural/municipal governments and landing tax**
 - **Local sea farming/Co-op association centers**
 - **Mostly sedentary species**
 - **Sale of juveniles**
 - **Management actions**
 - **Scientific assessment**
 - **Bigger role of fishermen**
 - **Generally regarded as successful**

Ocean Ranching - Norway

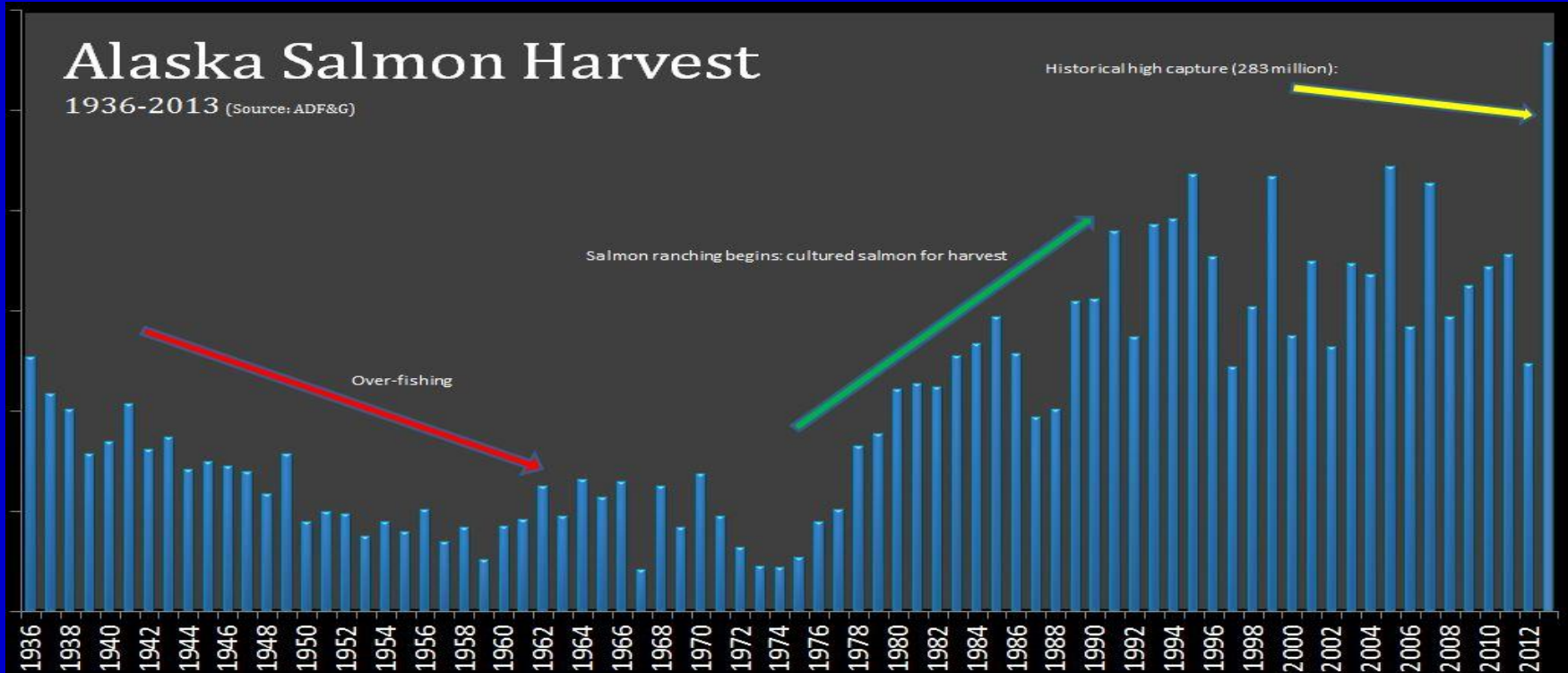
- **Norwegian Sea Ranching Program (PUSH)**
 - **1990 through 1997**
 - **Biological and economic bases**
 - **4 species**
 - **Atlantic salmon**
 - **Arctic charr**
 - **Cod**
 - **European lobster**
 - **Not economically viable**
 - **NPV analysis**
 - **Return rates**
 - **Juvenile costs**
- **Stock enhancement**
 - **Cod**
 - **European lobster**

Salmon Ranching - Alaska

- **Division of Fisheries Rehabilitation, Enhancement, and Development (FRED)**
 - **Established in 1971**
 - **Manage state hatcheries and promote private hatcheries**

- **Private non-profit hatcheries**
 - **Funded by Enhancement Revolving Loan Fund**
 - **Cost Recovery**
 - **Landing tax**
 - **Special harvest areas**

Salmon Ranching - Alaska



- **2013, 283 million salmon harvested, 112 million (40%) from ocean ranching**
- **Economic viability**
- **Hatchery/Wild interactions**
- **Depressed market for hatchery fish**

Salmon Ranching - Oregon

- **Private for-profit Hatcheries**
 - **12 sites at its peak**
 - **Chinook, Coho, Chum and Pink salmon**
 - **Fish harvested upon return to the facility**
 - **No longer in operation**
 - **Issues**
 - **Prior interception**
 - **Economic feasibility**
 - **Impacts to natural-origin fish**

Salmon Culture - Willapa Bay

- **RFEG's and Volunteer Cooperatives**
 - **2016 Future Brood Document**
 - **200,000 Chum**
 - **1.5 million Coho**
 - **Un-marked releases**
 - **Contribution unknown**
- **Net pen releases**
 - **Last release in 1998**
 - **South Bend, Bay Center and Nahcotta**
 - **Chinook, Coho, Chum and Pink**
 - **Some tagged releases**
 - **Predation control**
 - **Disease**
 - **Organic waste**

Ocean Ranching

- **RCW 77.95.260 - Private ocean ranching not authorized**
 - **Released smolts are property of state**
- **RCW 77.95.320 Program utilizing department - partnership agreements to operate and manage certain hatcheries**
 - **State-private partnerships authorized in Hood Canal**
 - **Non-profit, for profit, or federally recognized tribes eligible**

Ocean Ranching

- **RCW 77.95.060 - Regional Fisheries Enhancement Groups authorized**
 - **RFEGs can operate facilities on a strictly non-profit basis**
 - **Revenue from surplus fish sales returns to facility for project funding**
 - **Improve salmon resources for all citizens of the state**

Potential Benefits

- **Local community involvement and conservation incentive**
- **Opportunity to increase catch**
- **Provides alternatives in mixed stock fisheries**
- **Reduce government cost**
- **Marine derived nutrients**
- **Small smolts can serve as prey for Coho and Chinook smolts**

Potential Issues

- **Impacts to wild fish**
- **Impacts to other natural resources (shellfish)**
- **Disease**
- **Degradation of habitat (water quality)**
- **Water rights**
- **Long term source of funding**
- **Economic viability?**

Ocean Ranching Summary

- **Multiple forms of Ocean Ranching used worldwide**
- **Economic viability is unclear**
- **Not legal in Washington State**
- **Costly Start-up and M & E**
- **Can be used to increase harvest**
- **Ecological benefits/issues**
- **Hatchery/Wild interactions**

