

The Role of the Washington Department of Fish and Wildlife in Atlantic Salmon Management



LAWS AND REGULATIONS

- Federal Law
- State Law

FEDERAL (IMPORTATION REQUIREMENTS)

- Title 50 (1973) USFW Rules
 - Regulations designed for protection of native fish and wildlife species
 - Puts strict requirements on importation of viable fish and fish products from outside the United States
 - Sets specific requirements for importation of salmonids

WASHINGTON STATE AQUACULTURE RULES

- Chapter 77.115 RCW (Aquaculture Disease Control)
- Chapter 77.125 RCW (Marine Fin Fish Aquaculture Programs)

WASHINGTON STATE AQUACULTURE DISEASE CONTROL RULES

- Chapter 77.115 RCW
- Chapter 220-76 WAC
 - Last amended in February 2002

WASHINGTON STATE AQUACULTURE RULES

- Chapter 77.115.010 RCW Disease Inspection and control for aquatic farmers....
 - (1) The director of agriculture and the director shall jointly develop a program of disease inspection and control for aquatic farmers as defined in RCW 15.85.020. The program shall be administered by the department under rules established under this section. The purpose of the program is to protect the aquaculture industry and wildstock fisheries from a loss of productivity due to aquatic diseases or maladies....

Chapter 220-76 WAC AQUACULTURE

- [220-76-001](#) Aquaculture.
- [220-76-010](#) Aquatic farm registration required.
- [220-76-015](#) Aquatic farm -- Definition.
- [220-76-020](#) Aquatic farm registration form
- [220-76-030](#) Aquaculture -- Disease -- Control.
- [220-76-100](#) Approval permit for marine finfish aquaculture.
- [220-76-110](#) Escape prevention plan required.
- [220-76-120](#) Escape reporting and recapture plan required.
- [220-76-130](#) Aquaculture facility inspection authority.
- [220-76-140](#) Atlantic salmon watch program established.
- [220-76-150](#) Educational program for marine finfish aquatic farmers

WASHINGTON STATE AQUACULTURE CONTROL RULES

- Chapter 220-76-030 WAC Aquaculture Disease Control.
 - Outbreaks of disease affecting food fish, shellfish, and aquatic animals in fish farm facilities shall be reported immediately to the department. If such outbreaks represent a serious threat to fisheries resources of the state, the director may immediately order such actions as deemed necessary to protect the fisheries resource of the state such as, but not limited to, quarantining, destruction of stock, sterilization of facilities and disposal of mortalities.

WASHINGTON STATE AQUACULTURE CONTROL RULES

- Chapter 220-76-100 WAC Marine finfish aquaculture – Approval permit for marine finfish aquaculture.
 - Any aquatic farmer must have in their possession a valid marine finfish aquaculture permit from the director for that species, stock and race at that specific location of rearing or holding.
 - Prohibits use of transgenic fish
 - Requires marking of all fish hatched after January 1, 2004

WASHINGTON STATE AQUACULTURE CONTROL RULES

- Chapter 220-76-110 WAC Escape Prevention Plan required. Plan must include:
 - Best Management Practices
 - Monitoring and evaluation procedures for mortality, predation, training employees and contractors

WASHINGTON STATE AQUACULTURE CONTROL RULES

- Chapter 220-76-120 WAC Escape reporting and recapture plan required. Major components of the plan include:
 - Reporting procedures and requirements
 - Procedures to recapture escaped fish
 - Procedures to minimize escaped fish
 - Notification schedule

WASHINGTON STATE AQUACULTURE CONTROL RULES

- Chapter 220-76-130 WAC Marine finfish aquaculture – Aquaculture facility inspection authority
 - Authorized employees shall have access to conduct inspections to determine conformity with the law and rules of the department to preventing escaped finfish and/or the recapture of escaped finfish.

WHAT HAS WASHINGTON DONE WITH ATLANTIC SALMON?

- Atlantic salmon in Washington are from long-term local hatchery broodstocks
- The last importation of Atlantic salmon from outside North America into Washington was in 1990 from Australia/New Zealand
- Juvenile populations are certified by licensed veterinarians to be free of specific fish pathogens prior to their transfer to saltwater

WHAT HAS WASHINGTON DONE WITH ATLANTIC SALMON? (CONTINUED)

- Effective January 1, 2004 ALL Atlantic Salmon reared in Washington will be marked.
- Escape Prevention and Recapture plans have been developed (WAC 220-76-110 and WAC 220-76-120).

SURVEYS FOR ATLANTIC SALMON



Photo © 1996-2003 Creative Publishing International.
from the book *The Complete Guide to Freshwater Fishing*

THE ECONOMICS OF COMMERCIAL ATLANTIC SALMON AQUACULTURE IN WASHINGTON AND BRITISH COLUMBIA

- Washington has eight active marine net pen sites, B.C. has 121 as of June 2003.
- Washington produced 16.7 million pounds of Atlantic Salmon, with a farmgate value of \$14.7 million in 2001.
- British Columbia produced about 150 million pounds with a farmgate value of \$197.5 million (approximate US Dollars) in 2001.



Photo courtesy B.C. Salmon Farmer's Association

GROWTH IN THE INDUSTRY

- British Columbia marine net pen sites are predicted to increase from 121 currently to approximately 300 by 2013.
- Washington State is expected to remain at status quo of eight sites.



Photo courtesy
<http://www.bio.umass.edu/biology/conn.river/salmon.html>

BRITISH COLUMBIA ATLANTIC SALMON MARINE NET PEN FARMS

British Columbia's 121 Atlantic Salmon farms are primarily located in and around the northeast and west coasts of Vancouver Island.



WASHINGTON'S ATLANTIC SALMON MARINE NET PEN FARMS



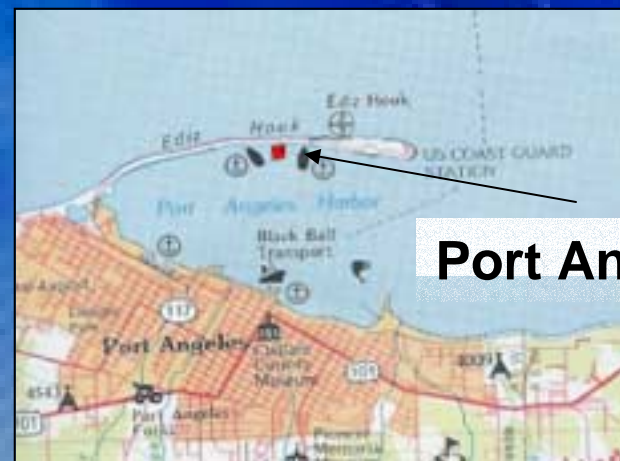
**Rich Passage-
Kitsap Co**



Cypress Island



**Hope Island
Skagit County**

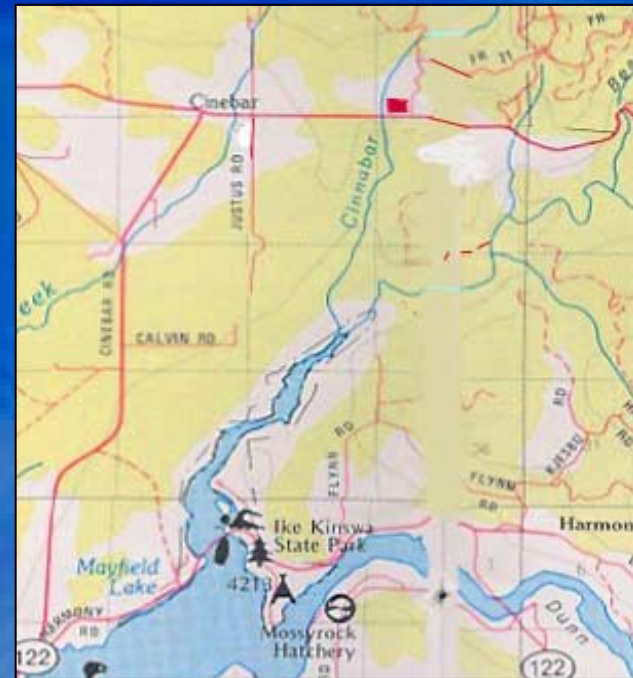


Port Angeles

EXISTING ATLANTIC SALMON FRESHWATER HATCHERY LOCATIONS IN WASHINGTON



Scatter Creek, West of Interstate 5



Cinnabar Creek, NE Mayfield Lake

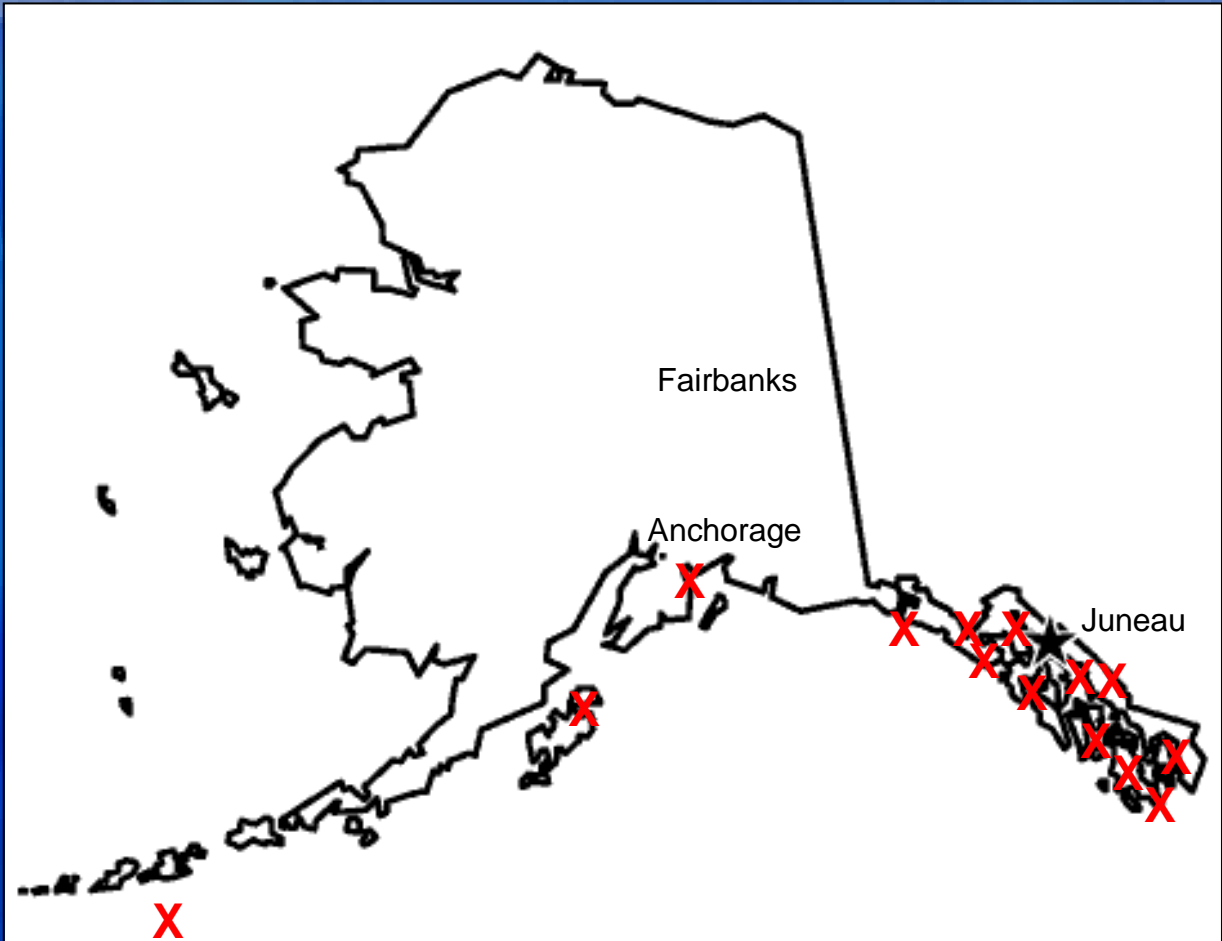
ESCAPE INFORMATION

- Between 1996 and 1999 more than 613,000 Atlantic Salmon escaped from Washington marine net pens.
- Between 1987 and 2000 more than 309,000 Atlantic Salmon escaped from B.C. marine net pens.
- Less than 4% of these fish were recovered.

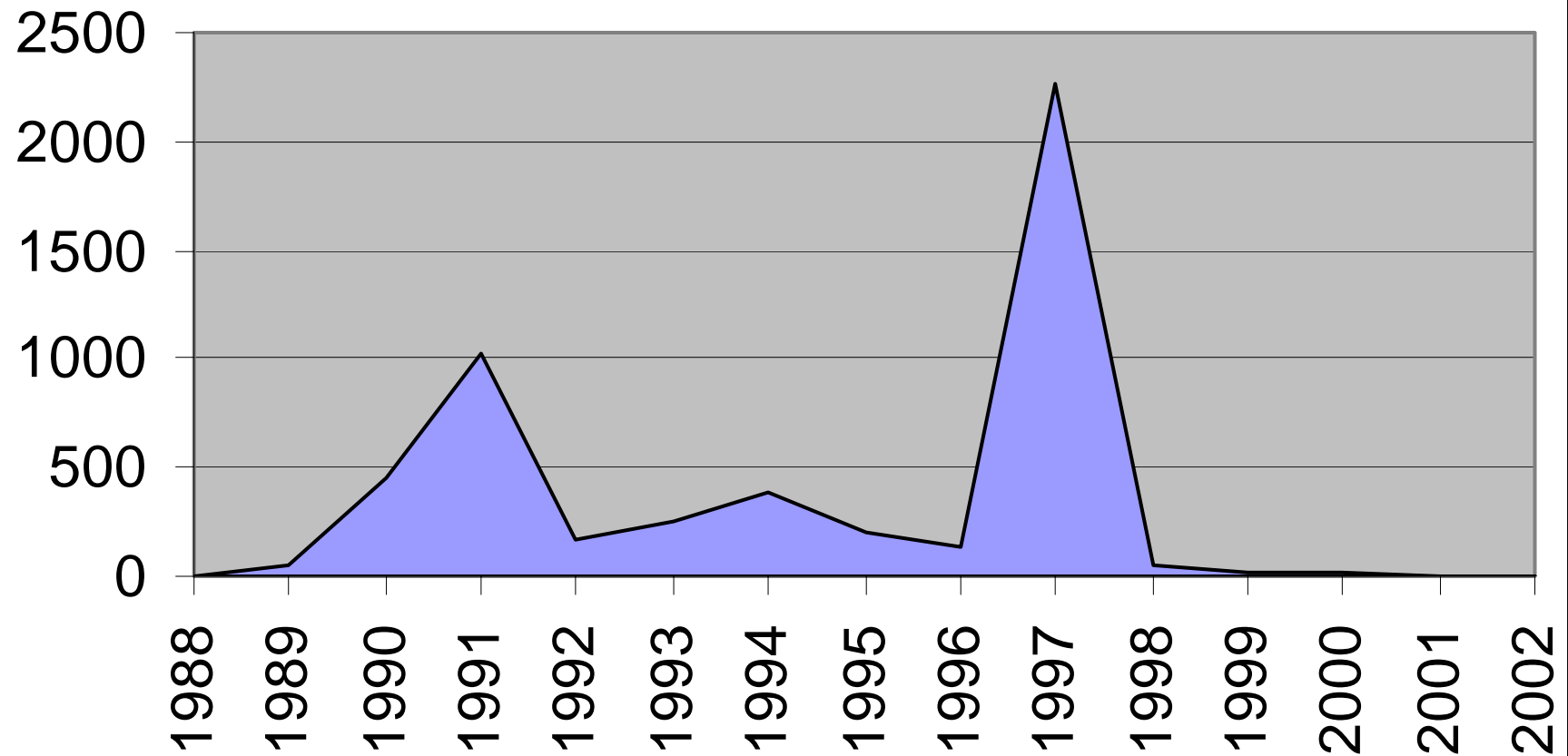


Photo courtesy B.C. Salmon Farmer's Association

ATLANTIC SALMON LANDINGS IN ALASKA, 1994 - 2002



Atlantic Salmon Landings in Washington State 1988 - 2002



WDFW SMOLT TRAP RESULTS

- WDFW has been trapping downstream migrating salmonid smolts since 1975.
- Smolt traps have been used in 14 basins in Western Washington and 109 rivers and streams.
- Downstream smolt traps were active in 42 streams and rivers during 2002.
- No juvenile Atlantic Salmon have been captured except in the Chehalis and Cowlitz (Mayfield Dam) traps.

ATLANTIC SALMON SMOLTS CAUGHT IN WDFW SMOLT TRAPS

Year	Mayfield Trap (Cowlitz River)	Chehalis River Trap
1989	0	0
1990	0	0
1991	No data	0
1992	18	No data
1993	17	5
1994	49	8
1995	58	24
1996	8	183
1997	2	5
1998	25	7
1999	59	9
2000	125	22
2001	18	0
2002	12	17
2003	1	1

WHY ARE WE SURVEYING FOR ATLANTIC SALMON IN WASHINGTON WATERS?



Photo courtesy greatcanadianrivers.com

REPRODUCTIVE POTENTIAL

- Are naturally reproducing in two rivers in British Columbia
- Atlantic Salmon have been observed on the spawning grounds in the Cedar River.
- We do not have any evidence of natural reproduction occurring in Washington.



Photo courtesy B.C. Salmon Farmer's Association

DETERMINING PRESENCE AND IMPACTS



Photo courtesy Bill Curtsinger

DEFINING THE SCOPE OF THE PROBLEM

- WDFW is conducting surveys to:
 - Determine geographic distribution
 - Estimate number of escapees
 - Develop plans for removal



Photo courtesy U.S. Fish & Wildlife Service

FUNDING

- Congress made funds available to Alaska, Washington, Oregon, and California to assess the scope of the problem.
- WDFW received a grant from the Pacific States Marine Fisheries Commission to survey selected freshwater streams to assess the presence and distribution of Atlantic Salmon.



METHODS

- Snorkel surveys are accurate, cost effective, and do not have a negative impact on native species.
- In very shallow streams electrofishing is used.



PROTOCOLS

- Prior notification to private land owners and verbal permission for access.
- WDFW has adopted strict scientifically-based protocols for conducting Atlantic Salmon surveys.
 - Staff participating in the surveys have received training in Snorkel and Survey Methods and Atlantic Salmon Identification Course – Malaspina University, Nanaimo, B.C., Canada.

PROTOCOLS (continued)

- Disinfecting to avoid spreading fish pathogens or parasites
 - All equipment used by the snorkel teams are hosed clean, disinfected and air dried between uses.
 - Disinfecting – immersion of equipment in a 100 ppm Iodophor solution for minimum of ten minutes and air dried.
 - Additionally, all equipment is disinfected when moving between watersheds, or when moving upstream from below an anadromous fish barrier.



FINDINGS



Photo courtesy H. Berthoule
Photo Researchers, Inc.

SURVEY RESULTS TO DATE

Scatter Creek	Atlantics found numerous sizes
Morse Creek	No Atlantics found
Tilton River	No Atlantics found
Dungeness River	No Atlantics found
McDonald Creek	No Atlantics found
Independence Creek	No Atlantics found
Green River	No Atlantics found
Garrard Creek	No Atlantics found
Chehalis River	No Atlantics found
Cinnebar Creek	3 Atlantics found juvenile size
Salt Creek	No Atlantics found
Skookumchuck	No Atlantics found
Lyre River	No Atlantics found
Tolt River	No Atlantics found
Snoqualmie River	No Atlantics found
Sultan River	No Atlantics found
Pilchuck River	No Atlantics found
Woods Creek	No Atlantics found
North fork Skykomish	No Atlantics found
Buck Creek	No Atlantics found
North Fork Sauk River	No Atlantics found
Sauk River	No Atlantics found
South Fork Stillaguamish River	No Atlantics found
Waddel Creek	No Atlantics found

SCATTER CREEK

- Atlantic Salmon of various ages were found in Scatter Creek during the survey.



Photo courtesy Roger Tabor USFWS

SCATTER CREEK - SCALE AND OTOLITH ANALYSIS OF 17 ATLANTIC SALMON

- Two fish had scale patterns typical of age 1 wild salmonids.
- One fish had scale pattern typical of age 1 cultured salmonid.
- One larger fish exhibited a scale pattern usually indicative of spawning.
- The other 13 fish were age 0 and no origin determinations could be made.



CINNABAR CREEK

- Three Atlantic Salmon of juvenile size were found in Cinnabar Creek during the survey.



Photo courtesy www.aquatext.com

CINNABAR CREEK

- Due to low flow levels, electrofishing was used in Cinnabar.
- Three Atlantic Salmon that appear to be juvenile were caught approximately 200 meters downstream from the hatchery.



A blue-tinted photograph of a hallway with a door at the end, overlaid with a grid pattern. The text "PARTNERING FOR SOLUTIONS" is centered in the upper half of the image.

PARTNERING FOR SOLUTIONS

ACTIONS

1. Hatchery owners have been urged to act aggressively in correcting the problems.
2. Hatchery owners have been asked to install redundant protection against fish escape.
3. Hatchery on Scatter Creek will de-populate the pollution abatement ponds.
4. WDFW biologists have attempted to remove as many Atlantic Salmon as possible without impacting naturally produced species in the creek.

REGULATORY INFORMATION

The background of the slide is a blue-tinted photograph of a modern building's interior. It features a staircase with a glass railing and a large glass wall, creating a sense of depth and architectural design.

Department of Ecology

- Regulates the discharge from net pens, to include Atlantic Salmon which are classified as pollutants by the Puget Sound Pollution Control Hearings Board.
- Issues National Pollution Discharge Elimination System (NPDES) permits to net pens and freshwater hatcheries. The permits list operational measures to be followed by operators. The Department of Ecology consults with WDFW.

Washington Department of Fish and Wildlife

- Management and regulatory authority over all free ranging fish and wildlife in the state.
- Authority to regulate commercial aquaculture for disease control.
- Atlantic Salmon may be regulated as Food Fish, Game Fish, or under the Invasive Species Act as a prohibited or regulated species.

Department of Agriculture

- Jointly develops regulations for commercial aquaculture with WDFW.
- Responsible for marketing and commodity boards for aquaculture.

Department of Natural Resources

- Leases aquatic lands to net pen operators.

Counties of Washington State

- Issue Shoreline Permits to net pens.

Treaty tribes of Washington State

- Tribes co-manage natural resources in Washington and have input into aquaculture disease control regulations developed by WDFW.

National Oceanic and Atmospheric Administration (formerly National Marine Fisheries Service)

- NOAA administers ESA for anadromous salmonids.

U.S. Army Corps of Engineers

- The Corp requires net pens to have “Section 404” navigation permits.



SCATTER-CREEK

↑ 11 years OLD.

↑ 11-YEARS-OLD

↑
Eight
YEARS
OLD