

North American Commission

NAC(03)7

***Report on US Atlantic Salmon Management and Research Activities
in 2002***

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Returns

The documented adult salmon return to US rivers was 962 fish in 2002, representing only 1.7% of the estimated 2SW spawner requirement for the US. Most returns were recorded in Maine, with the Penobscot River accounting for 81% of all US returns. Overall, 45% of the adult returns were 1SW salmon and 55% were MSW. Most returns (88%) originated from hatchery smolts and others (12%) originated from either natural spawning or hatchery fry.

Stock Enhancement Programs

During 2002, over 12 million salmon fry were released into 20 river systems. Smolts were also stocked in the Penobscot (54,700), Merrimack (51,900), Connecticut (560), Saco (4,100), Dennys (49,000) and St. Croix Rivers (4,100).

Tagging and Marking Programs

Tagging and marking programs facilitated research and assessment programs including: identifying the life stage and location of stocking, evaluating juvenile growth and survival, instream adult and juvenile movement, and estuarine smolt movement. A total of 373,259 salmon released into USA waters in 2002 were marked or tagged. Tags used on parr, smolts and adults included: Floy, Carlin, PIT, radio and acoustical, fin clips, and visual implant elastomer. Calcein immersion was used to experimentally mark fry. The calcein immersion study is in its second year and is comparing mortality between calcein-marked and unmarked fry stocked in the Sheepscot River in Maine. The ability to evaluate the performance of fry stocking has been hindered by the lack of practical technology that allows mass marking of fry with subsequent non-lethal mark detection. Therefore, the use of calcein immersion to produce an externally visible mark could potentially offer a significant solution.

About 0.5% of all marked fish were released into the Connecticut River watershed, 1.6% into the Merrimack River watershed, 75.4% into the Penobscot River watershed, and 22.5% into other Maine rivers.

Description of Fisheries

Commercial and recreational fisheries for sea-run Atlantic salmon are closed in US waters. Salmon incidentally caught must be released immediately, alive and uninjured, without being removed from the water. A highly regulated recreational fishery for 2,271 surplus broodstock occurred in the Merrimack River.

Aquaculture Production

Production of farmed fish in 2002 was 6,804 mt, a decrease from 13,154 mt produced in 2001. Depopulation of aquaculture operations in Cobscook Bay due to Infectious Salmon Anemia virus (ISAv) reduced production. ISAv was detected in US waters in 2001. Since

the confirmed outbreak in US waters, the US Department of Agriculture has implemented an aggressive control program involving the following components: Bio-security, Surveillance (including monthly mandatory veterinarian inspections), Testing, Disease Reporting, Quarantine, Depopulation and Indemnity. The US program resulted in depopulation in 2002 of 1.1 million fish, with subsequent equipment decontamination and site fallowing. Monitoring suggests that US sites near Canadian waters may have been exposed again to the virus, and industry representatives and regulators remain highly vigilant for new occurrences of ISA_v in US waters.

The Gulf of Maine Distinct Population Segment (DPS) of Atlantic Salmon

The Gulf of Maine DPS was listed as endangered in 2000. Since 1991, the total number of returning salmon to the DPS has been estimated. This estimate is calculated using capture data on all DPS rivers with trapping facilities (Narraguagus, Dennys and Pleasant Rivers) combined with redd count data from the other 5 rivers of this group. Estimated returns are extrapolated from redd count data using a return-redd regression established from the 1991-2000 Narraguagus River and 2000 Pleasant River assessments by the Maine Atlantic Salmon Commission. The 90% probability estimate for returns to the DPS in 2002 ranged from 26 to 41. This range represents a 64-70% decline from 2001 return estimates. Additionally, this estimate is the lowest on record for the 1991-2000 time series.

A population viability analysis (PVA) model has been developed for Atlantic salmon in Maine. The model incorporates uncertainty in juvenile and adult survival rates, direct and indirect linkages among populations in different rivers, and a number of potential human removals or stocking in a flexible, modular program. Results from this model will form the basis for delisting and recovery criteria for the Gulf of Maine DPS of Atlantic salmon.

Litigation Update

Following the decision to list the Gulf of Maine distinct population segment of Atlantic salmon as endangered in 2000, the State of Maine along with 8 other Plaintiffs filed motions for summary judgement challenging the validity of this listing as arbitrary and capricious. In response to this lawsuit, the National Marine Fisheries Service and the US Fish and Wildlife Service compiled an extensive administrative record documenting the scientific basis for the listing decision. The court reviewed the administrative record to determine if the decision-making process to list the GOM DPS was reasonable in light of the best available scientific information. On April 24, 2003, the court determined that decision to list the GOM DPS of Atlantic salmon as endangered was not arbitrary and capricious and thereby denied the State's request for summary judgement. In addition to challenging the listing, the 8 other Plaintiffs in the lawsuit had requested summary judgement on four other claims, all of which the court dismissed due to a lack of standing.

Connecticut Program

In 2002 the Connecticut River Atlantic Salmon Commission (CRASC) was recognized with the Department of Interior Conservation Service Award for its cooperative commitment to restoring Atlantic salmon and other migratory fish to the Connecticut River.

This award highlights the strength of the Connecticut program which continues to emphasize hatchery releases, dam relicensing and removal, and research. In addition, the CRASC

devoted increased time to environmental education partnerships, fishway construction, dam removal, habitat restoration and increased federal government support. A total of 44 sea-run Atlantic salmon were observed returning to the Connecticut River watershed. Approximately 7.3 million juvenile Atlantic salmon were stocked and 1,151 adult domestic broodstock were stocked in the Connecticut River.

The Connecticut River Salmon Association (CRSA) and the Deerfield/Millers River Chapter of Trout Unlimited are carrying conservation messages to over 2,000 students in 80 schools in the lower watershed annually by their sponsorship of salmon egg incubation activities (for educational purposes) in classrooms in Connecticut and Massachusetts. The CRSA assisted the Southern Vermont Natural History Museum and the Vermont Institute of Natural Science to establish a similar project for over 300 students in 18 schools in Vermont.

Merrimack Program

A total of 56 sea-run Atlantic salmon returned to the Merrimack River in 2002. Approximately 1.46 million juvenile Atlantic salmon were released in the Merrimack River basin, this release included 1.41 million unfed fry, 1,900 parr, 1,200 two-year smolts, and 50,000 yearling smolts. Other efforts underway in the Merrimack Program include effort by the multi-agency NH River Restoration Task Force to identify dams for removal in the state, and continuing support for the Adopt-A-Salmon program which marked its 10th anniversary in 2002.

Dam Removals

Two major dam removals occurred in 2002 in Maine. These were the Smelt Hill Dam on the Presumpscot River and Sennebec Dam on the St. George River. The Smelt Hill Dam was completely removed opening up seven miles of riverine habitat in the lower Presumpscot River. The Sennebec Dam was also completely removed. To ensure that water levels in Sennebec Pond remained at historic levels and provide upstream and downstream fish passage, a rock ramp was constructed at the natural outlet of the pond. One major dam removal occurred in 2002 in New Hampshire. The Winchester Dam on the Ashuelot River, a tributary of the Connecticut River, was completely removed. The Winchester Dam was the 5th dam in a series of 6 dams on the Ashuelot River. Removal of the West Swanzey Dam, the 6th dam, is currently being investigated.

Salmon Habitat Enhancement and Conservation

Salmon habitat enhancement and conservation efforts in New England in 2002 focused on habitat restoration projects including dam removals, habitat protection projects including the development of conservation easements, implementation of stream restoration assessment tools, and the development of an optimal flow methodology for a dam to optimize salmon habitat. These cooperative efforts have involved state and federal fishery resource agencies, watershed councils, non-government organizations, corporate sponsors, volunteers, and numerous other public and private groups. Habitat protection projects in New England have included technical assistance to local conservation groups, federal, state and private funding for land acquisition projects, riparian and stream channel restoration, and state-sponsored fish habitat programs that generate revenues to support salmon habitat enhancement and conservation.

Databases and Geo-referencing Systems

Microsoft Access and Environmental Systems Research Institute (ESRI), GIS products have been employed to manage Atlantic salmon tabular and spatial data for Maine rivers in a common, standardized, compatible and expandable format. Standardized nomenclature and a shared linear geo-referencing system have been developed and are incorporated into a “hub and spoke” system of relationally linked databases. This system can be used to register interagency research activities into “real space” and to enable linear distance analyses between locations of research activities.

Other Research and Items of Interest

Efforts to investigate the role of acidity from acid rain on Atlantic salmon parr and smolt survival in Maine DPS rivers is underway. The adult returns of remnant populations of wild Atlantic salmon in Maine have reached historic lows. One potential issue that could be compounding low survival is the low acid-neutralizing capacity of water in these rivers, and precipitation is acidic due to acid rain. Studies in Norwegian and Canadian rivers have shown that rivers with low Ph and aluminum concentrations that exceed 100µg/L can have adverse effects on smolt survival. Therefore, gill tissue samples were taken from smolts in several DPS rivers and captive hatchery populations to investigate ATPase activity and aluminum deposition. The results obtained during this study were compared with samples taken from smolts in Norwegian rivers. While enzyme analysis does indicate that river-produced smolts have abnormally low activity levels, there is no indication that river acidity is the cause.

The Annual Report of the US Atlantic Salmon Assessment Committee, Report Number 15 – 2003 Activities, can be accessed at: <http://www.fws.gov/r5cneafp/atsasscom.htm>