

North American Commission

NAC(04)7

***Report on US Atlantic Salmon Management and
Research Activities in 2003***

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Adult Returns

In 2003, there were a total of 1,396 documented adult Atlantic salmon returns to US rivers; 43.5% more than observed in 2002. The inclusion of estimated returns using redd counts improves this number slightly to 1,436 total returns. Most documented returns (1,112) occurred in the Penobscot River (Maine), which accounted for 77% of the total US returns. Returns to other New England rivers were as follows: Merrimack (145), Connecticut (43), Saco (39), Narraguagus (21), Dennys (9), and less than five returns to each of the remaining rivers. The estimated combined returns to the eight Maine rivers that comprise the endangered distinct population segment (DPS) ranged from 61 to 86 fish, or twice the observed returns for 2002. These estimates for DPS rivers were obtained through a redd-return regression model developed specifically for these rivers. The majority of US returns (89%) were of hatchery-smolt origin, with the remaining 11% as the products of natural spawning or hatchery-fry stocking.

Stock Enhancement Programmes

During 2003, approximately 13,060,600 juvenile salmon were released into 17 river systems in the US. The majority (91.3%) were released as fry into the Connecticut (7.1 million), Merrimack (1.3 million), Saco (0.5 million), and Penobscot (0.7 million) rivers. The 375,000 parr released in 2003 were by-products of smolt production programmes. Smolts were stocked in the Penobscot (547,300), Merrimack (50,600), Connecticut (90,100), Saco (3,200), Dennys (55,200), Pawcatuck (5,200), and St. Croix (3,200) rivers. In addition to juveniles, 4,671 adults (spent/excess broodstock) were released into US rivers to support recreational fisheries where angling is permitted. Egg sources for US salmon culture programmes included sea-run salmon, captive salmon (collected as parr, grown to maturity in hatcheries), domestic broodstock (all lifestages completed within hatcheries), and reconditioned sea-run kelts.

Tagging and Marking Programmes

Tagging and marking programmes facilitated the following research and assessment programmes: 1) identifying the life stage and location of stocking, 2) evaluating juvenile growth and survival, 3) assessing in-stream adult and juvenile movement, and 4) assessing estuarine smolt movement. A total of 502,866 salmon released into US waters in 2003 were tagged or marked using the following types: Floy, Carlin, Passive Integrated Transponder (PIT), radio/ultrasonic, Visual Implant Elastomer (VIE), and fin clips. Approximately 63% of tagged/marked individuals were released into the Penobscot River watershed, 18% into other Maine rivers, 18% into the Connecticut River watershed, and 1% into the Merrimack River watershed.

Description of Fisheries

Commercial and recreational fisheries for sea-run Atlantic salmon are closed in US waters, including freshwater systems, coastal/estuarine systems, and marine waters within the US Exclusive Economic Zone (EEZ). Any incidental catch must be released immediately, alive and uninjured, without being removed from the water. Despite this policy and regulations, there was likely an illegal harvest of five 2SW salmon during 2003. The section of river where this poaching occurred was subsequently closed to all fishing. A controlled recreational fishery for 1,959 stocked adults (spent/excess broodstock) occurred in the Merrimack River during 2003.

Commercial Aquaculture Production

Production of Atlantic salmon by the aquaculture industry in Maine was 6,435 metric tonnes (t) in 2003, a 5% decrease from the 6,804 t produced in 2002. Production in each of the last two years has been approximately half of the 13,154 t produced in 2001. Only 2.5 million smolts were commercially stocked in 2003, compared to almost 4 million in 2002 and 2001. In 2003, the Maine salmon farming industry suffered many setbacks including ISA outbreaks, harmful algal blooms and “superchill” which greatly affected production. ISA outbreaks in June 2003, following 13 months of negative surveillance, were found at two Cobscook Bay sites in Maine. The Maine Department of Marine Resources established new regulations and a Bay Management Programme for Cobscook Bay to address fish health issues, including single year class stocking and site allocation, which contributed to an overall decrease in smolt stocking for the Maine industry.

Habitat Conservation, Enhancement, and Restoration

- The Penobscot River restoration project, announced in October 2003, could result in significantly improved access to over 800 kilometers of habitat for sea-run fish previously blocked by hydropower facilities. This large-scale cooperative effort will re-balance the hydropower production and ecological integrity of the entire Penobscot River system. Cooperators on the project include conservation groups, Tribal groups, hydropower operators, and State/Federal agencies. If sufficient funding is obtained, two major dams (Veazie and Great Works) will be removed and a fish passage channel will be installed at the existing Howland dam. Additionally, upgraded fish passage facilities will be installed at four other hydroelectric facilities. Implementation of this project could occur between 2006 and 2010.
- The Silk Mill dam on Yokum Brook in the Connecticut River watershed was removed in 2003. Two additional dams in this watershed (West Swanzey dam and Fiske Mill dam) on the Ashuelot River, continue to be evaluated for possible removal.
- The New Hampshire River Restoration Task Force continues to work towards identifying dams for removal in the Merrimack River watershed. The Badger Mill dam on the Winnepesaukee River was breached during the fall of 2003.
- A cooperative study of fish passage, habitat connectivity, and non-point source pollution began on Maine Rivers during 2003. This project includes the evaluation of the effects of various structures (bridges, culverts, etc.) on flow, passage, etc. and to recommend improvements where needed.

- The Instream Flow Incremental Methodology (IFIM) study on the Dennys River in 2002 has resulted in the adjustment of water releases at the Meddybemps dam during 2003 to more effectively manage the system's flow regime to benefit salmon.
- In December 2003, a permanent conservation easement of 18,443 acres was established within the riparian zone of the Machias River and several tributaries. A land management plan was also developed for recently acquired land along the Dennys River.
- An effort to mitigate the impacts of acidification on salmon in Maine rivers has been initiated by NOAA-Fisheries. Long-term data in the Northeastern US and Canada has demonstrated that acid deposition has reduced the buffering capacity of many rivers and their watersheds to the point where the low pH, and associated toxicity of aluminum, may be a significant mortality factor of emigrating smolts. In April 2003, a water chemistry enhancement (liming) committee was formed, with representation from various state/federal agencies, universities, and other experts in this field, to serve as an advisory group for the pilot liming project. During 2003, the committee reviewed existing water chemistry data and habitat features of the Dennys, Pleasant, and Narraguagus Rivers for the optimal location of the project and ultimately decided on the Dennys River. The decision of the committee to implement a pilot liming project that will restore a section of the Dennys River's buffering capacity lost to acidification has been reinforced in the NRC report (see *Additional Items of Interest*, below) as a recommended tool towards salmon recovery. The committee decided that a streamside-doser would be the most effective method to apply a calcium-based product (most likely limestone) during episodic acidic pulses resulting from storm events and/or snowmelt. Pre-assessment work has begun on the Dennys River and will continue through 2004. The project is estimated to become fully operational during 2005.

The Endangered Gulf of Maine Distinct Population Segment (DPS)

The federally endangered DPS of Atlantic salmon, as listed in 2000, includes Cove Brook (a tributary to the lower Penobscot River), the Dennys, Machias, East Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot Rivers. Total 2003 estimated returns (61 to 86 for all rivers) increased markedly since 2002, but were the second-lowest observed for the 1991 – 2003 time-series. Annual returns are estimated using data from traps located on the Dennys, Pleasant, and Narraguagus Rivers, combined with redd count data from the other five DPS rivers. Estimated returns are extrapolated from redd count data using a return-redd regression model based on actual return data from the Narraguagus (1991 to 2000) and the Pleasant (2000) River traps. The regression model is updated tri-annually and is scheduled for another update in 2004; next year's returns will be reflective of this update. NOAA-Fisheries and US Fish and Wildlife Service plan to release a draft version of the Recovery Plan for the Gulf of Maine DPS of Atlantic salmon during 2004. Public comments will be solicited and considered prior to the final approval of the Recovery Plan by both agencies. Presently, a status review is underway to determine the relationship of large river systems (e.g., Penobscot, Kennebec) to the DPS as currently delineated. This review will also determine the status of current salmon populations within these large river systems, as well as any other additional salmon populations present within the geographic range of the DPS. The outcome of this review may have implications for the recovery strategy of Atlantic salmon in Maine.

The use of salmon egg incubators in schools within the Connecticut River watershed continued to expand in 2003. Through the help of various cooperators, this programme reached 5,176 students at 119 different schools in the watershed. In the Merrimack River watershed, 12,750 eggs were shipped to 37 schools for incubation in the classroom and will be released as fry into selected tributaries during the spring. The salmon in schools programme has also spread to a number of schools in Vermont, Rhode Island and Maine. Visitation to the Amoskeag Fishways Visitor & Learning Center on the Merrimack River was approximately 13,010 students and 8,991 adults.

Additional Items of Interest

- Efforts continue in the development and structure of the NASCO habitat database for North American rivers. During 2003, information regarding juvenile production, smolt emigration, aquaculture production, and in-river captures of aquaculture escapees was added to the database. An Atlantic Salmon Information System (AS-IS) database is also being developed for the Maine Atlantic salmon programme to facilitate data sharing between state/federal agencies and other organizations.
- The Atlantic salmon restoration programme for two small New Hampshire coastal rivers has not met its stated objectives and has been discontinued beyond 2003.
- In January 2004, the National Research Council (NRC) released the report “Atlantic Salmon in Maine”, which assessed the causes of salmon decline and to suggest strategies for the rehabilitation of Atlantic salmon in Maine. An earlier NRC report (2002) described the unique genetic makeup of Atlantic salmon in Maine. The current report identified the major threats to salmon in Maine as; (1) Habitat obstruction by dams; (2) Mortality of emigrating smolts likely associated with stream acidification; and (3) Adverse genetic and ecological impacts of salmon farming on wild populations. The report recommended the following actions as “urgently needed” to reverse the decline of salmon populations. (1) A programme of dam removal should be implemented; (2) Liming projects should begin on some rivers; (3) Hatchery programmes should continue to supplement wild populations, with some effort to evaluate the relative stocking efficiency for different lifestages. The hard-copy of the full report will be available soon and can be viewed online at: <http://www.nap.edu>
- The current year and previous annual reports of the US Atlantic salmon assessment committee can be accessed at: <http://www.nefsc.noaa.gov/USASAC/>