

**North American Commission**

**NAC(06)4**

***Report on US Atlantic Salmon Management and  
Research Activities in 2005***

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#### **Adult Returns**

Based upon the sum of documented trap returns and redd count estimates, the total number of returns of Atlantic salmon to US rivers for 2005 was 1,313, a 20% decrease from returns in 2004. Changes by river from 2005 were: Connecticut (+170%), Merrimack (-73%), Penobscot (-26%), Saco (+32%), and Narraguagus (+18%). Adult returns were calculated using catches at traps and weirs (1,255) and redd count estimates. Most documented returns occurred in the Penobscot River (Maine), which accounted for 75% of the total US returns. The estimated combined returns to the endangered Gulf of Maine (GOM) Distinct Population Segment (DPS) were 71 fish (90% CI= 44-110). The majority of US returns (78%) were of hatchery-smolt origin and the remaining 22% as the products of natural spawning or hatchery-fry stocking.

#### **Stock Enhancement Programs**

During 2005, about 13,811,600 juvenile salmon (92% fry) were released into 14 river systems. The number of fish released was less than that in 2004. Fry were released into the following rivers: Connecticut, Merrimack, Saco, Penobscot, and six of the rivers within the range of the GOM DPS. The 353,000 parr released in 2005 were primarily the by-products of smolt production programs and included ages 0 and 1 fish. Smolts were also stocked into US rivers: Penobscot (530,600), Merrimack (50,000), Connecticut (85,100), Dennys (56,700), Pleasant (5,900), and Pawcatuck (16,600) rivers. In addition to juveniles, 3,657 (spent/excess broodstock) adult salmon were released into US rivers to enhance spawning, and in some cases, support a recreational fishery.

#### **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 648,258 salmon released in US waters in 2005 was marked or tagged using the following types of tags/marks: floy, carlin, HI-Z Turb'N, PIT, radio and acoustic, fin clips, and visual implant elastomer. Approximately 13% of the marked fish were released into the Connecticut watershed, 69% into the Penobscot River, and 15% into the Dennys River watershed.

#### **Description of Fisheries**

Commercial 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). In some years a limited recreational fishery has been conducted on reconditioned surplus broodstock released in the Merrimack River. The State of Maine is considering authorizing a 30-day catch and release recreational fishery in the Penobscot River on an experimental basis in 2006. Any salmon incidentally taken in other fisheries must be released immediately, alive and uninjured, without being removed from the water. Despite this policy and associated regulations, there is the potential for illegal harvest. Suspected

poaching in specific areas has, in the past (2003), resulted in the closure of those sections of the river and increased enforcement presence on other rivers. No illegal harvest of Atlantic salmon was documented in 2005.

### **Commercial Aquaculture Production**

Production of farmed salmon in Maine was 5,263 metric tonnes (t) in 2005, a decrease from the 8,515 t produced in 2004. Production in three of the last four years has been less than half of the 13,202 t produced in 2001. Production has declined due to ISAv outbreaks and changes in the industry.

### **Habitat Conservation, Enhancement, and Restoration**

- NOAA's National Marine Fisheries Service (NMFS), in conjunction with other federal and state agencies, Universities, and non-governmental organizations, continues to work cooperatively on the Water Chemistry Committee to investigate the potential to implement a pilot liming project on a portion of the Dennys River, Maine. Based on data from the 2004 and 2005 streamside study, the Water Chemistry Committee has determined that (1) low pH events in the Dennys River are not the major cause of reduced survival of stocked smolts and (2) it would be premature to conduct a liming project on the Dennys River for the purpose of mitigating low pH and high aluminum impacts on smolts. Additionally, the Water Chemistry Committee has concluded that a liming project on the Dennys River, or any river in Eastern Maine, may in fact enhance Atlantic salmon productivity regardless of low pH and high aluminum, because rivers with high limestone influence are often far more productive than rivers that have very little limestone influence. The committee believes that an *in situ* liming experiment would be the most effective tool for assessing the ecological effects of liming in Eastern Maine rivers. A liming project on a small tributary would allow for more intense monitoring of the response of juvenile Atlantic salmon and the surrounding ecosystem to liming and would reduce costs associated with monitoring and labor. This project should be designed to mitigate acidic conditions where they appear to be present, including the Pleasant River and some tributaries. The study proposed above is very different from the whole river treatment initially planned. Based on existing data, the SalmonPVA, and our current understanding of how acidification affects salmon survival, acidification does not appear to be having a significant population effect on the GOM DPS. The committee recommends that until new information becomes available, it would be premature to assume that river liming on a large scale would contribute significantly to the recovery of the GOM DPS.
- Project SHARE (Salmon Habitat and River Enhancement) organized a collaborative multiple agency and private landowner educational opportunity/field workshop on improving fish (aquatic) passage using stream simulation design. The workshop resulted in the design and installation of a bottomless culvert on a tributary of the West Branch Machias River.
- Project SHARE, watershed stakeholders, and Watershed Councils with funding from a variety of sources including the National Fish and Wildlife Foundation and the Maine Atlantic Salmon Commission, were involved in restoration projects that included revegetating non-point source pollution (NPS) sites and reforesting riparian buffers. NPS sites were selected for restoration in 2005 based on priority criteria

established by the SHARE Restoration Working group in cooperation with landowners.

- In 2004, the multi-agency New Hampshire River Restoration Task Force continued to work on identifying dams for removal in the Merrimack River watershed. On the Contoocook River (Henniker, NH) the West Henniker Dam was breached in August of 2004. Breaching this dam dewatered a small impoundment and exposed run and pool habitat for a distance of approximately 1.5 km upriver. Run and pool complexes have continued to develop over the last year in the dewatered reach, creating and improving juvenile salmon rearing habitat. A number of other dam removal projects are currently being evaluated.

### **The Endangered Gulf of Maine (GOM) Distinct Population Segment (DPS)**

The federally endangered GOM 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. The total estimated adult returns for the DPS was 71 fish (90% CI= 44-110). This estimate is based on counts conducted at trapping facilities on the Dennys, Pleasant, and Narraguagus Rivers along with redd counts from five other rivers within the range of the GOM DPS. NMFS and the US Fish and Wildlife Service (USFWS) (collectively referred to as the Services) have worked with the Maine Atlantic Salmon Commission to develop a final Recovery Plan for the populations of Atlantic salmon that have been listed as endangered. The draft was reviewed by technical staff at both state and federal agencies during 2003. During 2004, the draft was subject to public review. The Recovery Plan was then revised to address public comments received during the public review process. A final draft was completed in November of 2005. A copy of the Final Recovery Plan is available at the following link: <http://www.nmfs.noaa.gov/pr/recovery/>. The Services have convened a Recovery Team representing a diversity of expertise in order to implement the Recovery Plan. The Recovery Team is being asked to develop recommendations to the Services as to what actions identified in the Plan are the most critical to carry out over the next several years. The Recovery Team will be asked to review and revise their recommendations annually based upon recovery activities that have been completed or are ongoing and any new information on the species or threats.

In 2003, the Services assembled an Atlantic Salmon Biological Review Team (BRT) to review and evaluate all relevant scientific information necessary to evaluate whether the populations in the Penobscot River and other large rivers should be included in the GOM DPS. The populations in the Penobscot and the other large rivers of Maine were not included in the GOM DPS at the time it was listed under the ESA in November of 2000 because of a lack of genetic data. Since the listing in 2000, new information (including detailed genetic surveys) has become available; that data was evaluated in the Draft Status Review. The Draft Status Review was completed in January 2006 and is currently undergoing peer review. Depending on the findings in the Status Review and the results of the peer review, the Services may be required to take some action under ESA.

### **Additional Items of Interest**

- NMFS, ASC, and USDA Wildlife Services developed a study to determine the effectiveness of non-lethal methods to remove or displace foraging double-crested cormorants from the Narraguagus estuary. The objectives of the cormorant

harassment study are twofold: 1) to reduce predation on migrating Atlantic salmon smolts by excluding double-crested cormorants from the lower Narraguagus River and Narraguagus Bay; 2) to assess the efficacy of non-lethal predator exclusion as a means of reducing predation on migrating Atlantic salmon smolts. In order to measure success in meeting the first objective, smolt survival during times of active harassment and non-harassment was monitored. Smolt survival was monitored with ultra-sonic telemetry gear. In addition, cormorant abundance before, during, and after the smolt run was also monitored with automated digital cameras that were programmed to take pictures (i.e., point counts) at fixed intervals every day. The telemetry data generated during the study showed that fewer than 20% of tagged smolts were removed from the system when harassment was occurring.

- The ASC, USFWS, and NMFS have agreed to jointly pursue an independent review of Atlantic salmon hatcheries supporting the GOM DPS and Penobscot River. The hatchery review process was initiated with the goal of providing direction and operational guidelines to develop hatchery reform programs that are scientifically founded and thoroughly evaluated. NMFS, USFWS, and ASC are in the process of drafting a Request for Proposals (RFP) and seeking funding to support the review. Compilation of reference materials to be provided to the reviewers in order to expedite the review process is underway.
- Since 1997, NMFS has conducted ongoing assessments of smolt migration using ultrasonic telemetry. In 2005, naturally reared (n=65) and hatchery produced (n=311) smolts were released at various locations and stocking dates into three different watersheds (Narraguagus, Dennys, and the Penobscot Rivers). This was the first year that ultrasonic telemetry was used to assess emigrating hatchery reared Atlantic salmon smolts in the Penobscot estuary. Fish movement was monitored throughout riverine, estuarine, and near-shore marine environments to observe migration dynamics of the outmigrating smolts. Survivorship of each group of tagged smolts to the furthestmost quantitative marine array ranged from 11 to 63%.
- Tissues from more than 5,000 fish of 22 different species collected between 2000 and 2005 were assayed in efforts to identify potential reservoirs of salmonid pathogens. Fish were taken from the natural environment and net pens containing Infectious Salmon Anemia (ISA)-diseased salmon. Assays included cell culture for listed salmonid pathogens, direct fluorescent antibody test for *Renibacterium salmoninarum*, and reverse transcriptase-polymerase chain reaction specific for ISAV. The results indicate that salmonid viruses in wild fish populations in Maine are extremely low, and the source of ISAV in cultured salmon in Maine remains to be determined.
- Maine Department of Inland Fisheries and Wildlife and the ASC have joined in a collaborative effort to determine the status of northern pike in Pushaw Lake and to explore the potential options for pike eradication from Pushaw which is in the Penobscot drainage. An education and outreach campaign has been started to educate local anglers and citizens on the implications of the illegal introduction, and a bioengineering company is being used to assess exclusion technology to prevent pike from entering other areas.
- The Adopt a Salmon Family Program has been operating for the past 13 years. The Adopt a Salmon Family Program is an education and outreach program that operates

in the three states where there are active Atlantic salmon restoration and recovery programs (Maine, New Hampshire, and Massachusetts). The Program gives students opportunities to be involved with Atlantic salmon restoration, understanding of watershed health in general, and the importance of river health to all species of fish and aquatic life.