

North American Commission

NAC(01)9

Report on US Atlantic Salmon Management and Research Activities in 2000

(Tabled by USA)

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Stocking Data: A total of 15,235,000 juvenile salmon (fry, parr and smolts) was stocked in 2000 in the Connecticut, Merrimack and Maine rivers. This represented a 10.3% increase over that of 1999. A total of 6,653 mature adult salmon were stocked by the Maine, Merrimack and Connecticut programs.

Returns: Total documented adult returns to rivers in New England amounted to 803 salmon in 2000. The majority (66.6%) returned to the Penobscot River in Maine. Approximately 28% of returning adults were of wild origin (from natural reproduction or fry plants) and the balance (72%) were of hatchery smolt origin. Documented returns of 1SW salmon to New England Rivers (270) were down considerably from 1999 (380). MSW returns in 2000 (533) were half of those in 1999 (1,072). Overall the total returns were 55% of those in 1999.

Sport Fisheries: The catch and release fishery for Atlantic salmon in Maine was closed in December of 1999. The only fishery that now remains is for domestic brood-stock in the Merrimack River. A total of 898 salmon was landed in this fishery in 2000.

Connecticut River Program

In 2000, the Connecticut River Atlantic Salmon Commission (CRASC) focused on efforts to improve the effectiveness of hatchery releases, hydro-relicensing, research, environmental education partnerships, fishway construction, dam removal, and habitat restoration. A total of 77 sea-run Atlantic salmon returned to the Connecticut River watershed in 2000. A record total of 9,337,900 Atlantic salmon (fry and smolt) was stocked into the Connecticut River watershed in 2000. The Connecticut River Atlantic Salmon Association, Trout Unlimited, and the White River Partnership carried out educational activities in the watershed involving 71 schools and over 2,500 students. The U.S. Forest Service conducted 10 miles of stream habitat surveys within the Green Mountain National Forest. Eight stream and riparian habitat projects were implemented in the West and White River watersheds.

Merrimack River Program

A total of 85 Atlantic salmon returned to the Merrimack River in 2000. The rate of return (adults produced per 1,000 juveniles stocked) for fry-origin adults continued to be relatively low for the ninth consecutive cohort (0.0178). The rate of return for smolt origin adults increased for the sixth consecutive cohort, and increased 15% from the rate for the 1997 cohort. Approximately 2.22 million juvenile Atlantic salmon were released into the Merrimack River in 2000. In 2000, 3,745 surplus broodstock were released to provide angling opportunities. Approximately 100 schools in the Merrimack River watershed participated in the Adopt-A-Salmon Family program.

Maine Program

Adult Atlantic salmon counts were obtained at fishway trapping facilities on the Androscoggin, Aroostock, Narraguagus, Penobscot, Saco, St. Croix, Dennys, Pleasant and Union Rivers in 2000. The Maine aquaculture industry reared river-specific salmon eggs to

maturity and provided 1,054 pen-reared adults for stocking into the Dennys, Machias, East Machias and St. Croix Rivers.

A total of 535 adult salmon was captured on the Penobscot River, the smallest catch recorded since trap operations began at the Veazie dam in 1978. A total of 50 salmon was captured on the St. Croix River, 20 of these were of hatchery origin and the remaining 30 were aquaculture escapees. Returns to other Maine Rivers are as follows: Androscoggin River 3; Saco River 51; Union River 8, 6 of which were suspected aquaculture escapees; and Aroostock River 17. Returns and redd counts for rivers with native Atlantic salmon are as follows: Dennys River 2 returns, 29 aquaculture escapees, 60 redds; East Machias River 10 redds; Machias River 23 redds; Pleasant River 3 returns 1 redd; Narraguagus River 23 returns, 21 redds; Ducktrap River 4 redds; and the Sheepscot River 16 redds.

A total of 2,472,000 million salmon was stocked into eight Maine rivers in 2000. Some of the redds on the Dennys and Machias Rivers were made by river-specific adults that were stocked from the cooperative program with the aquaculture industry. It is also important to note that the aquaculture escapees were removed from the river.

Instream Flow Incremental Methodology studies were conducted in 2000 to support a water use management plan for three Maine Rivers. These studies were initiated due to concern over the impact of water withdrawal for agriculture on salmon habitat. The studies provide data on the relationship between discharge and habitat for small and large parr and spawning adults.

The U.S. Atlantic Salmon Assessment Committee report for 2000 is available at: www.fws.gov/r5csrc/stuff/ascom00.html.

Listing of the Gulf of Maine Distinct Population Segment as Endangered under the Endangered Species Act

On November 17, 2000 the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (Services) listed the Gulf of Maine distinct population segment (DPS) of Atlantic salmon as endangered under the federal Endangered Species Act (ESA). The DPS is comprised of Atlantic salmon populations in the following eight rivers: Dennys, East Machias, Machias, Narraguagus, Pleasant, Sheepscot and Ducktrap River and Cove Brook, a tributary to the lower Penobscot River. This listing became effective on December 18, 2000. It is a violation of the ESA to “take” Atlantic salmon from any of these eight river populations. “Take” is defined by the ESA to include harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or to attempt to engage in any such conduct. Harm is further defined to include any act which would actually kill or injure fish, such as acts that may include significant habitat modification or degradation that significantly impairs essential behavioral patterns including spawning, rearing, migrating, feeding, or sheltering.

In addition to a general prohibition against “taking” listed fish, the ESA requires all federal agencies to consult with the Services to insure that any action they authorize, fund or carry out is not likely to jeopardize the continued existence of any endangered species. The Services are now working with the Maine Atlantic Salmon Commission to prepare a recovery plan for the Gulf of Maine distinct population segment of Atlantic salmon. The plan must include site-specific management actions necessary to achieve conservation and survival; objective, measurable criteria which, when met, would result in a determination that the species be removed from the list; and estimates of the time required and the cost to carry out measures needed to achieve the plan’s goals.

Recovery actions underway include continued implementation of the State of Maine's Conservation Plan, land purchases and easements, a river-specific conservation hatchery program, habitat protection and restoration, and water quality monitoring. Participants in these activities include local Watershed Councils that have been formed on each of the eight rivers, industry groups, state agencies, federal agencies, conservation organizations, and local citizens.

More information on the listing can be found at: <http://www.nero.nmfs.gov/atsalmon/>

2001 Returns to date (as of June 4, 2001)

Penobscot River: 59 salmon trapped
Merrimack River: 33 (as of June 3, 2001)
Connecticut River: 23
Narraguagus River: 2

Highlighted Research Activities from 2000

Smolt Assessments: Monitoring of the emigration of Atlantic salmon smolts in the Narraguagus and Pleasant Rivers was conducted in 2000. A total of 563 smolts was captured in the Narraguagus River and an estimate of the emigrant smolt population of 1940 was calculated – the lowest estimate of the 5-year time series. An average overwinter survival rate of 13% was calculated. A total of 160 smolts was captured on the Pleasant River, only 26% of the 1999 total catch of 617 smolts.

River-Specific Aquaculture Reared Adult Stocking: During 2000, netpen-reared, 2SW, mature Atlantic salmon were stocked in the following rivers: St. Croix 750; Dennys 96; and Machias 176. A comprehensive Assessment Plan was developed to monitor the progress of these adults and their progeny over the next 6 years in the Dennys River. This assessment program consists of the following 8 objectives: 1) riverine movements of netpen-reared adults using ultrasonic telemetry; 2) evaluation of spawning characteristics of these stocked adults compared to wild adults; 3) assess spawning habitat selection; 4) post-spawning disposition (immediate out-migrants, kelts, or presumed deceased) and timing of estuary entrance; 5) monitoring the stage-specific contribution attributable to natural reproduction by these stocked adults; 6) estimate fry emergence rates for progeny of these stocked adults; 7) develop stage-specific survival estimates within a control site; and 8) evaluate the reproductive success of progeny originating from these stocked adults.

Current Research Activities: To follow is a listing of topics that are the focus of current research programs. Additional information on any or all projects is available upon request.

Smoltification and Smolt Ecology

Assessment of Intra-basin Smolt Production Dynamics

Nearshore Ecology of Smolts and Post-smolts

Dennys River Smolt Stocking Assessment

Penobscot Hatchery Smolt Assessment

Initiation of Post-Smolt Trawling Survey in the Penobscot Bay Estuary

An Investigation of Drift of Atlantic Salmon Fry Immediately after Stocking

Use of Pit-Tags to Examine the Effects of Release Timing on Migration of Hatchery-Reared and "Wild" Atlantic Salmon Smolts in the Connecticut River

Post-Release Changes in Salmon Smolts from Pittsford National Fish Hatchery

Use of a Pit-Tag “Electronic Weir” to Examine Atlantic Salmon Smolt Migration and Winter Survival
Downstream Migration and Survival of Fry-Stocked Atlantic Salmon Smolts in the Lower Connecticut River Mainstem

Marking

Retention of Visual Implant Elastomer Tags in Anadromous Atlantic Salmon
Detection of Fluorescing Marks in Age-5 Atlantic Salmon Immersed as Sac-Fry in Calcein Solutions
Differential Predation on Calcein-marked vs. Non-marked Atlantic salmon Parr by Captive Wild Brook Trout
Using Natural Strontium Isotopic Signatures as Fish Markers: Methodology and Application

Culture/Life History

Integrative Measures of Consumption Rates in Fish: Expansion and Application of a Trace Element Approach
Establishing the Links Between Consumption, Growth and Survival of Juvenile Atlantic Salmon
Effects of Short-Term Light Deprivation upon Milt Production of Feral Atlantic Salmon
Hydrography and Plankton in the Narraguagus – Pleasant Bay System
Pleasant River Parr Production Studies
Forecasts of Atlantic Salmon Transoceanic Migration: Climate Change Scenarios and Anadromy in the North Atlantic
Evaluation of Alkalinity Enhancement of Craig Brook National Fish Hatchery Water on Atlantic Salmon Production
Factors Affecting the Growth of Age-1 and Older Atlantic Salmon Parr in Vermont Tributaries of the Connecticut River
Across-Year Variability in the Size of Juvenile Atlantic Salmon in the Connecticut River: Insights for Restoration
A Multi-scale Assessment of Juvenile Atlantic Salmon Production in the Connecticut River Hotspots and Pits: Assessing Basin-wide Mechanisms for Survival and Growth of Juvenile Atlantic Salmon Sites Throughout the Connecticut River Basin
Within-basin Variation in the Immediate Effects of a Major Flood on Stream Fishes and Invertebrates
Implications of Climate Change for Growth Opportunity and Recruitment Limitation on Stream Salmonids in New England

Conservation Management

Stocking Marine-reared Adult Atlantic Salmon in Eastern Maine: a Unique Enhancement Tool?
Spawning Activity of Broodstock Atlantic Salmon in the Baker River Merrimack River Watershed Fall 2000
Tag Retention and Survival of Age-0 Atlantic Salmon Following Surgical Implantation with Passive Integrated Transponder (PIT) Tags

Stock Identification

Origin of Atlantic Salmon Captured in a Mixed Stock Fishery at West Greenland
Stable Isotope Composition of Atlantic Salmon Scales

Genetics

Stock-Specific Measures of Marine Growth for Three (Cage Reared) Remnant Populations of Atlantic Salmon from Eastern Maine

Use of Genetic Marking Techniques to Assess Immigration vs. In Situ Survival of Age-0 Atlantic Salmon

Relative Importance of Heritable vs. Environmental Variation in Age-0 Atlantic Salmon Growth and Survival in the Connecticut Basin

Fish Health/Nutrition

Wild Fish Disease Screening

Evaluation of Commercially Prepared Transport Systems for Non-lethal Detection of *Aeromonas salmonicida* in Salmonid Fish

Population Estimates/Tracking

Individual-level Modeling of Growth and Survival of Atlantic Salmon Parr in Shorey Brook, ME

Effects of Repeated Anesthetizing of Juvenile Atlantic Salmon with MS-222, Clove Oil and Alka-Seltzer

A Night Seining Technique for Sampling Juvenile Atlantic Salmon in Streams