REPORT OF THE COMMISSION OF GAME AND INLAND FISHERIES

TO DETERMINE THE NEED FOR

FISH LADDERS ALONG THE JAMES RIVER

TO

THE GOVERNOR

AND

GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 5

COMMONWEALTH OF VIRGINIA
RICHMOND
1982

COMMONWEALTH of VIRGINIA

COMMISSION OF GAME AND INLAND FISHERIES
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December 17, 1981

Honorable John N. Dalton
Governor of Virginia
State Capitol
Richmond, Virginia 23219

Dear Governor Dalton:

The report contained herein is pursuant to the House Joint Resolution No. 233 of the 1981 Session of the General Assembly of Virginia.

This report comprises the response by the Commission of Game and Inland Fisheries to the request that the Commission and certain State and Federal agencies determine a need for and coordinate efforts in regard to the placement of fish ladders along the James River.

Respectfully submitted,

R. H. Cross, Jr.
Executive Director

RHC:na

HOUSE JOINT RESOLUTION NO. 233

Offered January 15, 1981

Requesting certain State and federal agencies to determine a need for an coordinate efforts in regard to the placement of fish ladders along the James River

Patrons-Axselle and Thomas

Referred to the Committee on Conservation and Natural Resources

WHEREAS, the stocks of anadromous striped bass, American shad, hickory shad, alewife, blueback herring, and Atlantic sturgeon have seriously declined in the Chesapeake Bay and its tributaries; and

WHEREAS, the James River and its tributaries have sustained this loss of anadromous fishes; and

WHEREAS, anadromous fishes are prevented by low profile dams at Richmond, Virginia, from moving upstream to their historical spawning and rearing areas and

WHEREAS, the placement of devices to overcome obstructions to upstream movement of anadromous fishes to historical spawning and rearing areas is permitted pursuant to § 29-151 of the Virginia Code; and

WHEREAS, a significant problem exists with the stocks of anadromous fish in Virginia waters; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Commission of Game and Inland Fisheries is requested, in coordination with the Marine Resources Commission, the Virginia Institute of Marine Science, and local political subdivisions to determine such need, from both a technological and an economic point of view, as may exist for the construction and maintenance of devices to pass fish along the James River and subject to availability of adequate federal matching funds, to take such action as may be feasible and effective in providing access for anadromous fishes to their historical spawning and rearing sites; and, be it

RESOLVED FURTHER, That the efforts of the Commission of Game and Inland

Fisheries and other State agencies be, to the extent practicable, assisted by the United States Fish and Wildlife Service and the National Marine Fisheries Service; and, be it

RESOLVED FINALLY, That the Clerk of the House of Delegates forward a copy of this resolution to the United States Fish and Wildlife Service and to the National Marine Fisheries Service so as to apprise them of the sense of this body.

I Procedure

On June 8 and July 14, 1981, meetings were held to discuss the resolution and proposed activities. In attendance were representatives from:

Virginia Commission of Game and Inland Fisheries
Virginia Institute of Marine Science
Virginia Marine Resources Commission
U. S. Fish and Wildlife Service
National Marine Fisheries Service

To address the feasibility of the study, the following topics have been or will be addressed:

I. Study Goal

To restore self-sustaining populations of anadromous fishes to their historic ranges in the James River Basin to provide benefits to the widest spectrum of users.

II. Target Species

Alewife

Blueback Herring

American and Hickory Shad

American Eel

Atlantic Sturgeon

Striped Bass

III. Population Densities

Field personnel from the Virginia Commission of Game and Inland Fisheries have conducted recent investigations in the project area to assess the population densities and upstream range of the various anadromous species. In addition, the commercial harvest statistics in the James River system for many of the target

species will be supplied by Virginia Marine Resources Commission.

IV. Identifiable Benefits

A) An increase in the fish spawning and nursery habitat

B) An increase in the forage fish base for resident upper river species

C) Enhancement of the sport hook and line fishery in the affected river area

D) Enhancement of the commercial lower river fishery

E) Expansion of urban fishing opportunities in the Metropolitan Richmond area

F) Increased use of fishing - related facilities and businesses.

V. Cost

Personnel from the U. S. Fish and Wildlife Service tentatively agreed to supply an engineering analysis of the various obstructions in the system.

VI. Comparative Analysis With Other Systems

The anadromous fish programs listed provide data on several restoration projects, introduced species, and indicate the concern for the welfare of anadromous species.

Information indicates that some early fish ladders provided access to historical spawning habitat but many ladders did not work properly. The latter, dams with no ladders and canals severely reduced or decimated anadromous fish runs in many streams. The fact that fish ladders were constructed in the early 19th century shows the concern for these species.

Most states are showing concern for these conditions through studies and joint state-federal cooperation.

Pawcatuck River

The Rhode Island Division of Fish and Wildlife in 1980 reported that shad

has returned to the Pawcatuck River after a period of nearly 100 years, thanks to many State and Federal agencies.

A total of 165 American shad were counted at the Potter Hill Fish Ladder near the Town of Westerly and about five miles from tidewater. These fish were four-year-old males and were the progeny of approximately 2,500 adult shad stocked into the Pawcatuck River during the Spring of 1976. These adults were transported to the river from the Holyoke Fish Lift located on the Connecticut River.

This is the first time a depleted shad run has been successfully restored.

Connecticut River (Connecticut, Massachusetts, New Hampshire and Vermont)

Lawrence Stolte, Atlantic Salmon Planner, U. S. Fish and Wildlife Service, states in his book "The Forgotten Salmon of the Merrimack" concerning restoration of the anadromous Atlantic salmon:

> "The endeavor undertaken in the Connecticut River was indeed a failure. Over-fishing within the river, and the lack of fishways at the various dams were the two most important factors leading to the abandonment of the project. The following quote from the New Hampshire Fish and Game Commission in 1878 describes the status of the restoration effort in the Connecticut River at that time."
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> > "It is the pounds and gill-nets at the mouth of the river which have rendered all labors on the Connecticut useless, and, until the legislature of Connecticut abolishes them and gives the fish an opportunity to ascend the river, neither Massachusetts nor New Hampshire proposes to spend any money in stocking the stream."

Presently, Atlantic salmon, American shad, blueback herring and striped bass are moving upstream to the first fishway--a fish lift--at Holyoke Dam.

By July 20, 1981, a total of 515 Atlantic salmon had been counted in the Connecticut River system along with 419,000 blueback herring, 377,000 American shad and for the first time, 500 one- and two-year-old striped bass.

Many shad and thiry salmon were passed above Holyoke Dam to move to Turners Falls Dam fish ladder. The salmon, which were released from hatcheries

as smolts, moved on up to the Vernon, New Hampshire trap where they were captured by Vermont State Fish Commission personnel and transported by hatchery trucks beyond Bellows Falls Dam where they were released to spawn naturally.

Prior to 1978 there were no important returns of Atlantic salmon to the river. In 1978 there were 86, in 1979 there were 47 and in 1980, 160. Fall returning fish are expected to increase the 1981 total of 515 salmon.

This progress has been possible through the cooperation of the power companies (who own the power dams) with state and federal fish and wildlife agencies.

Schuylkill River

The City of Philadelphia, PA funded the construction of a fish ladder on Fairmont Dam, within the city limits in 1979 which provides an opportunity for people to sit in the viewing chamber and watch fish moving up and down the ladder. Anadromous lishes using the ladder come from the Delaware River populations. A few shad were observed in 1981. Other fishways are required to permit fish to move upstream to historical spawning habitat in the Schuylkill River.

Susquehanna River

A cooperative program for restoring historical runs of American shad, alewife and blueback herring to the Susquehanna River has been in progress since the 1960's. There are four dams that will require fishways--Conowingo (100'), Holtwood, Safe Harbor, and York Haven--to permit these fishes access to over 250 miles of suitable spawning and rearing habitat in the main stem and over 200 miles in the tributaries.[5]

Maryland has recently closed the fishing season on shad to protect the dwindling stocks in the Susquehanna River, the Upper Chesapeake Bay and tributaries.

South Carolina

The Division of Wildlife and Freshwater Fisheries, Office of Conservation, Management and Marketing, is conducting a baseline study on blue back herring in the Santee and Cooper Rivers.

The Marine Resources Division is doing a similar study on American shad.

Georgia

The Coastal Resources Division, Georgia Department of Natural Resources, is conducting a shad catch-effort study to provide basic data on the fishery.

Merrimack River

The Merrimack River rises in New Hampshire and flows 180 miles south and east through Massachusetts to empty into the Atlantic Ocean at Newberryport. In the 1890's there were fishways at five of the seven dams on the Merrimack and Pemigewasset Rivers. These facilities did not permit adequate numbers of salmon to move upstream to spawn and provide adequate reproduction to maintain the population which apparently disappeared.

These early fishways were not adequate to maintain a run of fish because of 1) improper location of ladder and/or ladder entrance, 2) attraction flow at entrance was too low, 3) ladder pools were too small which created excessive water velocities and insufficient resting areas.

In 1975, no salmon and only a remnant population of American Shad existed. In 1980, long-range plans were developed to provide a population of approximately 3,000 salmon within the river by 1995. Properly designed and constructed fishways will be required as well as management and law enforcement.

Lamprey River

The State of New Hampshire is attempting to restore runs of American shad to this stream through the stocking of adult shad secured from the fish trap at

Holyoke Dam on the Connecticut River.

St. Croix River[3]

Prior to 1825, Atlantic salmon, American shad and alewives were abundant in this river which forms the boundary between Maine (USA) and New Brunswick (Canada). Dams and pollution took their toll and the runs of these anadromous species diminished rapidly. Fishways installed in 1869 on the five main stem dams were generally ineffective and poorly operated.

Alewives and landlocked Atlantic salmon movement has been verified at Grand Falls Dam, the third of five dams on the main stem.

The potential for this river after implementation of a pollution abatement program, installation of upstream and downstream passage facilities at Milltown Dam and initiation of a salmon stocking program, is estimated at:

Atlantic Salmon:	Approximately 8,500 fish
Alewife (Gaspereau):	5,665 tons
American Shad:	Approximately 50,000 fish
American Eel:	Approximately 50,000 pounds

Columbia River

American shad stocked from the East Coast in the late 19th century, as fry have utilized fish ladders on the Columbia River for years. While the shad was an exotic fish to the area, the use by shad of fish ladders built for Pacific salmon is another example of the value of fishways in a restoration program.

Since 1968 over 90 percent of the shad passing the Bonneville Dam have passed the Dalles Dam, 46 miles upstream on the Columbia River, indicating fish passage facilities can be very efficient.

VII. Historical Precedence

James River

Anadromous fish runs in the James River were finally halted when the C & O

Railroad closed the gates on the Kanawha Canal around 1890.

Table 1 is presented to document the presence of shad and striped bass above Richmond prior to the construction of Boshers Dam c. 1850. The data for Table 1 were obtained from the Diary of Col. William Cabell, of Union House, Nelson County, Virginia 1769-1795 as reported by S. F. Baird in 1887.[7]

Mansueti and Kalb report that "Prior to the erection of these obstructions (dams) large numbers of shad ascended as far as the junction of the Jackson and Cowpasture Rivers, and were taken in considerable quantities in those two tributaries over 335 miles from Chesapeake Bay." [8]

The upper James River, from Boshers Dam to Clifton Forge, could provide approximately an additional 200 miles of spawning and rearing area in the mainstem above for shad and striped bass if passage facilities were provided on all dams in the river.

Fishing mortality, another factor in the decline of anadromous fish runs, accounted for 73 percent in 1957. [4]

Table 1. HISTORICAL CATCH OF SHAD AND STRIPED BASS IN THE JAMES RIVER IN NELSON COUNTY 1769 - 1795

	Norwood Island		Swift Island		Total	
	Shad	Striped Bass	Shad	Striped Bass	Shad	Striped Bass
1769		100+				100
1770						
1771						
1772						
1773						
1774		1+				1
1775	128				128	
1776						
1777						
1778						
1779	2212	24			2212	24
1780	73	2			73	2
1781	3219+				3219	
1782	(no data)					
1783	(no data)					
1784	40				40	
1785	76				76	
1786	2582		3676		6258	
1787		1	832		832	1
1788						
1789	64				64	
1790						
1791						
1792	1216		100		1316	
1793	70			1	70	1
1794						
1795						

Combined Annual Catch at Norwood Island and Swift Island Fisheries of Col. William Cabell, of Union House, Nelson County, Virginia, 1769-1795.

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6. Kimball, Dan and Bill Whalen. 1980. First Time Ever for Depleted Shad Run. NEWS. U.S. Fish and Wildlife Service, Newton Corner, MA. 2 pages.

7. Baird, S.F. 1887. The Fisheries and Fishery Industries of the United States. U.S. Comm. of Fish & Fisheries, Washington, Government Printing Office. P. 637-642.

8. Mansueti, Romeo and Haven Kolb. 1953. A Historical Review of the Shad Fisheries of North America. Pub. No. 97. Chesapeake Biological Laboratory, Solomons, MD. p. 54.

II. SUMMARY

A tentative project outline has been prepared by the committee for consideration by Virginia Institute of Marine Science. The resultant study would address the following items:

I. Historical background of the James River Basin anadromous fishery and the life history of the subject species.

II. Physical problems and obstructions in the system.

III. Feasibility based on success or failure elsewhere and proposed solutions.

IV. Benefits to be derived both to the locality and to the resource.

V. Potential Cost estimates.

VI. Proposed sources of funding.

III. Conclusion

Virginia Institute of Marine Science is preparing a draft study which will address the James River Basin anadromous fishery and the feasibility of passing these fish through the several obstructions at Richmond.