Chesapeake Executive Council

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Annual Progress Report

Implementation Plan for Removing Impediments to Migratory Fishes in the Chesapeake Bay Watershed

Chesapeake Bay Program

December 1990

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Implementation Plan for Removing Impediments to Migratory Fishes in the Chesapeake Bay Watershed

A Commitment Implementation Plan from
the Chesapeake Executive Council

Annapolis, Maryland
December, 1990

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1990 Progress Reports

PENNSYLVANIA

I. Establish an Ongoing Baywide Fish Passage Workgroup

Personnel from the Pennsylvania Fish Commission participated in the Fish Passage Workgroup under the Chesapeake Bay Program's Living Resources Subcommittee. Pennsylvania's fish passage efforts were coordinated with other state and federal fish passage activities through the Workgroup.

II. Update a Comprehensive Inventory of Obstructions

Pennsylvania continued to inventory obstructions on the Susquehanna River and to reassess priorities. This will be completed as fish passage is obtained at each of the four major dams on the Susquehanna River. The first segment, from Conowingo to Holtwood Dam, is scheduled for completion in 1991 to help accommodate herring runs into appropriate or suitable tributaries entering between these two dams.

III. Establish a Multi-Faceted Approach to Migratory Fish Impediments

With the new fishway at Conowingo Dam becoming operational in 1991, Commission staff are anticipating the introductions of various diadromous fishes, other than American shad, into the Conowingo Reservoir and several upstream tributaries such as Conowingo, Fishing, and Muddy Creeks. These and other tributaries will receive inventory updates for dam structures and other obstructions, in conjunction with Chesapeake Bay Fish Passage Work Group activities in 1991. Fishways or other means to allow species such as the river herring and American eels to use these waters for spawning and/or nursery habitat will be sought as soon as practicable after inventory update.

The Pennsylvania Fish Commission and the Pennsylvania Department of Environmental Resources have completed the reclassification of Elk Creek Basin in Chester County, for migratory fishes and water quality purposes. Regulations for Elk Creek are now in effect which prohibit harvest of river herring over eight inches in length, to protect spawning stocks. All of these measures have been taken in a cooperative effort with the Maryland Department of Natural Resources for the joint restoration of river herring and possibly other diadromous species in Elk Creek.

Even though a permanent fish passage facility will be operational at Conowingo Dam for the 1991 season, the lack of fishways at the upstream Holtwood, Safe Harbor and York Haven Dams still present formidable problems in the successful restoration of American shad and other diadromous species in the Susquehanna. Recently, however, a consultant for the upstream hydropower project owners completed a preliminary study of various options for fish passage development at each project. Alternative scenarios for different types of facilities and structures

were examined, including those necessary for downstream passage of juvenile and post-spawned adult American shad. Although the report has not been released for joint discussions with the resource agencies at the time of this report, these discussions are scheduled to take place in the near future. The overall goal of having operational fishways at all projects by the year 2000 is realistic and achievable.

The Pennsylvania Fish Commission's Van Dyke Fish Cultural Station produced 13,011,000 American shad fry, of which approximately 10 million were stocked into the Juniata and Susquehanna Rivers as part of the Susquehanna River Anadromous Fish Restoration Committee (SRAFRC) program, and 90,000 fingerlings were stocked from other Commission facilities. The SRAFRC is a joint cooperative state, federal, and utility program for shad restoration in the Susquehanna basin. It includes representatives for Maryland, Pennsylvania, New York, the U.S. Fish and Wildlife Service, Conowingo Power Corporation, Pennsylvania Power and Light, Safe Harbor Water Power Corporation, and Metropolitan Edison.

Research being conducted as part of the SRAFRC program continued, including activities in juvenile shad marking, radiotelemetry, hydroacoustics and strobe light studies. Juvenile chemical marking has been highly successful in helping differentiate fish produced by artificial culture from naturally reproduced progeny of prespawning adults moved upstream above all dams. A second marking study involving otolith microstructure analysis continues and is showing encouraging results through analysis of the circulii, or growth rings, on each otolith from wild and hatchery fish. Significant reliability among several observers has been demonstrated which permits differentiation of stocks without chemical marking. Future adoption of this method of analysis may offer a valuable alternative to chemical marking.

Radiotelemetry involving the use of small transmitters attached to juvenile fish continues to be employed, primarily to determine survival of fingerlings passing through project turbines at Safe Harbor Dam. Preliminary survival rates appear to be higher than anticipated and are encouraging. Radiotelemetry is also being employed to help determine migratory or movement patterns at Holtwood Dam, specifically as these relate to possible safe bypass of downmigrating American shad through the existing log chute at the station, rather than through the turbines.

Other American shad research being conducted at Holtwood includes determining the effect of thermal discharge from the steam generation, when the hydropower section of the plant is non-operational.

Finally strobe light testing at York Haven Dam continues to show encouraging results for repelling downmigrating American shad from the turbine units, towards the existing trash gate. The gate can be periodically opened to allow passage of these fish.

IV. Supplement Technical Resources in the Bay Watershed

Personnel of the Pennsylvania Fish Commission participated in the Fish Diversions and Passageways Course held in Annapolis, MD, during January 1990. The U.S. Fish and Wildlife Service, with support from the agencies and organizations represented on the Fish Passage Workgroup, sponsored this course which focused on design criteria for East Coast anadromous fish.

Communications and coordination have been maintained between Pennsylvania and the U.S. Fish and Wildlife coordinator concerning research needs and assistance.

MARYLAND

I. Establish an Ongoing Baywide Fish Passage Workgroup

Personnel from the Maryland Department of Natural Resources (MD DNR) participated in the Baywide Fish Passage Workgroup. Coordination with other state and federal agencies concerning fish passage issues was maintained through the workgroup.

II. Update a Comprehensive Inventory of Obstructions

A comprehensive list of 887 obstructions including 445 dams was developed by the Department of Natural Resources in 1984. During 1990, this inventory was updated and development of a computer data base of this information was initiated.

The inventory will be updated annually by prioritizing 30 blockages each year.

III. Establish a Multi-Faceted Approach to Migratory Fish Impediments

The Maryland Fish Passage Program is administered within the Fisheries Division of the Tidewater Administration, Department of Natural Resources. Four major components of the Maryland Fish Passage Program are the removal or by-passing of blockages, restoration of diadromous fish species, biomonitoring, and information/education. Work progressed in each of these areas during 1990. The first three components are discussed below while information/education activities are covered under Section IV. Supplement Technical Resources.

Removal or By-Passing of Blockages

Susquehanna River Fish Lift

Construction began on a $12.5 million fish lift (elevator) at Conowingo Dam on the Susquehanna River. Construction should be completed in time for the lift to begin operation at the onset of the spring 1991 anadromous fish spawning runs. The new lift will be operated in conjunction with an existing smaller fish lift which was constructed in 1972.

Patapsco River

Seven fish passage projects were initiated or completed in the Patapsco River watershed. Final engineering design work began for Bloede and Daniels Dams, the first and fourth dams on the River. Preliminary discussions were held with the owners of Simkins Dam, the second dam on the river, regarding construction of a Denil fish ladder. An existing breach was modified to facilitate fish passage at Union Dam, the third dam on the river.

A small dam owned by J. H. Seagram's Company was removed from Stony Run, a tributary to the lower Patapsco River. This project follows the 1988 removal of a second dam owned by Seagram's on Deep Run, another river tributary. Engineering design was initiated for a second fish passage on Deep Run farther upstream, at the CSX railroad pipe culvert.

Winters Run

A Denil fish ladder was completed at Van Bibber Dam, the U.S. Army's water supply dam on Winters Run. A watershed improvement group of local, state, and federal agencies has been established for Winters Run, as a pilot project for fish passage streams.

Big Elk Creek

Final engineering design work began for a Denil fish ladder at the town of Elkton's water supply dam on Big Elk Creek.

Little Patuxent River

Construction of a Denil fish ladder began in November, 1990, at the Fort Meade water supply dam on the Little Patuxent river.

Tuckahoe River

A preliminary conceptual design was completed for a Denil fish ladder at Tuckahoe Dam on the river in Tuckahoe State Park on the Eastern Shore.

Potomac River

Cooperative state/federal agency work was performed to effect fish passage at Little Falls Dam on the Potomac River at Washington, D. C., and also for projects in the upper Anacostia River.

South River

Construction was initiated for fish passage projects in the North River and Bacon Ridge Branch, two tributaries in the Upper South River watershed near Annapolis.

Culvert and Highway Impediments

The Department of Natural Resources and the State Highway Administration are cooperating in a joint study to develop design criteria for remedial actions and assure fish passage at new installations.

Summary of Progress

Removing impediments to migratory fishes is on schedule according to fiscal year funding. As of December 1990, a total of 25 miles had been reopened with construction underway to reopen an additional 20 miles. In fiscal year 1990, 9.4 miles of stream were made available. Species population restoration is underway on the newly accessible streams.

State laws currently require fish passage at all blockages as deemed necessary by MD DNR. A bill will be introduced during the 1991 legislative session to amend the Natural Resources Article, §4-502 to provide injunctive relief concerning fish ladders on dams.

Restoration of Diadromous Fish Species

Four million post-larval American shad fry provided by the Pennsylvania Fish Commission's Van Dyke Hatchery were released in the lower Susquehanna River at Lapidum, MD. Ten thousand pre-spawning adult alewife and blueback herring were released in April and May upstream of dams scheduled for the construction of fish ladders. The herring were collected in native spawning streams, transported by tank truck, and stocked. Approximately 2,100 were released into the Patapsco River at Ellicott City and Daniels, Maryland; 1,800 into the Little Patuxent River at Brock Bridge Road and Savage, Maryland; 500 into Big Elk Creak at Fair Hill, Maryland; 1,900 were released above Tuckahoe Dam into Mason Branch and German Branch; and 3,700 into Winters Run above the Van Bibber Dam.

Relocation of prespawning adult yellow perch occurred in February and March and juvenile stocking began in late May. Approximately 20,000 adults were stocked in the Patuxent River, 9,400 in Tuckahoe Creek, and 3,500 in Marshyhope Creek. Juvenile stocking included 341,600 fish in Marshyhope Creek and 258,900 in the Corsica River.

The trap, transport and release program that began in 1988 was continued in 1990. The 1991 goal is to trap, transport, and release 25,000 pre-spawning adult river herring. SRAFRC has been requested to continue, and raise, if possible, Maryland's allocation of 5,000 river herring from the Conowingo fish lift. Two commercial watermen on the Nanticoke River have agreed to sell to MD DNR, all or part of their 1991 herring catch alive and in good shape. Arrangements have also been made with the National Aquarium in Baltimore to utilize their specially equipped boat to transport fish from pound nets to trucks waiting at dockside. Herring will be released upstream of dams retrofitted with, or scheduled for retrofit, of a fish ladder or other passage device.

Various trap and transport equipment was acquired to facilitate reintroduction activities. A five ton truck equipped with a 1,000-gallon tank, and a trailer equipped with a 600-gallon tank, were acquired. In addition, a 3/4 ton truck, an electroshocker, and a Hydrolab were acquired along with miscellaneous trap/transport and biomonitoring equipment.

Development of Fish Culture Facilities

Construction of four shad grow-out ponds, one at Havre de Grace, MD and three at Elkton, MD, was completed in July, 1990. Approximately 162,600 juvenile American shad were released from these ponds in October 1990, into the lower Susquehanna river at Havre de Grace and the Upper Elk River at Elkton. The two shad culture facilities may provide a future source of juvenile fish for anadromous fish restoration in other streams. Currently the shad grow out and release facilities provide for fish restoration associated with the Conowingo and Elkton fish passage projects.

Biomonitoring

Biomonitoring for the presence of fish species was conducted twice weekly from early March to early June 1990, in watercourses undergoing fish passage development. Electroshocking, trapping, and ichthyoplankton sampling were performed in both monitored and stocked streams. Radio telemetry tagging of river herring was performed in Big Elk Creek and Tuckahoe Creek to better assess stocking and to guide future anadromous fish trap and transport efforts. A biomonitoring, stocking, and tagging program was provided by MD DNR Fish Passage Program, University of Maryland and RMC Environmental Services, for spring fish passage program operations. Preliminary work was performed for a joint study report which is scheduled for release in early 1991.

MD DNR and the Maryland Department of the Environment (MDE) will cooperate in establishing a stream classification system to protect migratory fishes and evaluate the adequacy of existing water quality, habitat, and instream flow standards. A new stream classification system is proposed for streams which includes an anadromous fish spawning stream category and appropriate water quality standards.

IV. Supplement Technical Resources in the Bay Watershed

The Maryland Department of Natural Resources helped design and participated in the Fish Diversions and Passageways Course held in Annapolis, January 1990. In addition, the Department hosted the Maryland portion of the field trip.

A Patapsco River Fish Passage and Restoration Plan intended for public distribution will be published in January 1991, in cooperation with the Chesapeake Bay Foundation and the U.S. Fish and Wildlife Service.

Fish passage staff are participating in the Winters Run Watershed Protection Program in cooperation with MDE, Harford County Department of Public Works, Aberdeen Proving Ground, and the Harford County Teacher's Association. In addition, the fish ladder projects at Elkton and Fort Meade include an observation room and underwater viewing window, which will be used for public education and scientific data gathering. A public educational kiosk has also been designed for the Elkton project in cooperation with the Chesapeake Bay Foundation.

VIRGINIA

I. Establish an Ongoing Baywide Fish Passage Workgroup

Personnel from the Council on the Environment and the Department of Game and Inland Fisheries participated in the Baywide Fish Passage Workgroup during the year. Intra-state coordination was maintained through the workgroup and through telephone conversations and informal meetings with personnel from other state agencies involved in fish passage.

II. Update a Comprehensive Inventory of Obstructions

Personnel from the Department of Game and Inland Fisheries gathered information on existing impediments to fish passage from a number of sources, compiled these facts into a usable format, and developed a GIS-based database to utilize these data. This computer program provides information on the occurrence of migratory fishes (historical and current), existing barriers, and habitat characteristics in specific streams within the major watersheds of the state. Additional studies will be required to develop information concerning the quantity and quality of habitat behind impediments. Such information will be extremely valuable in expanding the utility of this database in establishing priorities for future fish passage projects.

III. Establish a Multi-Faceted Approach to Migratory Fish Impediments

Hydroelectric Facilities

Files have been maintained on Federal Energy Regulatory Commission (FERC) licenses for existing facilities, and FERC has been contacted for a comprehensive listing of licensed facilities and associated data. This information is being incorporated into Virginia's computerized database on impediments to fish passage. Information concerning fish passage needs has been provided to FERC and the utility developers as appropriate.

Reintroduction

Investigations have been initiated to evaluate the feasibility of establishing a pilot reintroduction program on the James River in 1991. A small-scale program to stock American shad in the river probably will begin next year.

To assure adequate water quality in targeted streams, important spawning habitats for migratory fishes are being classified during the Virginia Warmwater Streams Survey. When complete, this classification will be provided to the Virginia Water

Control Board. In the interim, the needs of migratory fishes are being addressed during routine project review and evaluation

Culverts and Highway Impediments

The Council on the Environment corresponded with the Virginia Department of Transportation concerning the fish passage strategy and the need for passage at culverts. The Department of Transportation has sponsored studies to identify highway impediments, and the Department of Game and Inland Fisheries provides information concerning fish passage needs on highway projects.

Virginia Fish Passage Grant and Revolving Fund

The 1989 General Assembly established the Virginia Fish Passage Grant and Revolving Fund and assigned its administration to the Council on the Environment. The fund is designed to provide 75% cost-share grants with 25% low-interest loans for fishway construction on municipally-owned dams. The Council, the Department of Game and Inland Fisheries, and the Marine Resources Commission established priorities on the James River (Williams Island Dam) and the Rappahannock River (Embrey Dam); the Council requested funding to finance these projects. Financial support for these projects was not available for the 1990-92 biennium; however, monitoring studies on the James River supported the need for a reintroduction program for American shad and hickory shad. Planning is underway to initiate a program to supplement shad stocks in this river.

Embrey Dam, Rappahannock River

Officials from the U.S. Fish and Wildlife Service, the Council on the Environment, and the Department of Game and Inland Fisheries, met with representatives from the City of Fredericksburg and its consultant to discuss the need for fish passage, to review the dam and its facilities, and to exchange information concerning passage requirements for migratory species. The City conducted a preliminary investigation for fish passage at this dam as an element of a larger feasibility study concerning its water supply. This precursory study indicated that passage of target species was feasible, included recommendations for counting stations and educational facilities, and provided cost estimates. The Council is maintaining some funding for further fish passage design work for Embrey Dam.

James River Fishways

The first phase of the plan to restore runs of migratory fishes to the upper James River was realized when the Manchester and Browns Island Dams were breached in January 1989. A monitoring study, funded by the Council on the Environment, was conducted during the spring spawning seasons in 1989 and 1990 to determine the utilization of the breaches and the distribution of migratory fishes within the area of the breached dams and an upstream dam (Williams Island Dam). Striped bass and American shad were collected upstream of the breaches; however, no alewife or blueback herring were collected above the breaches in either year although they (particularly blueback herring)

were abundant below Manchester Dam. The absence of herring above the breaches is somewhat perplexing since the passage requirements for herring are generally less rigorous than those for shad.

Only 19 American shad and one hickory shad were collected during the 2-year study. These results strongly support the need to develop and implement additional components (supplemental to passage) to the restoration strategy. Planning is ongoing to initiate a pilot program of supplemental stockings of these species and for investigating interspecific interactions between the shad species and freshwater species in the upstream environment. Monitoring of migratory fish passage by the Council will continue.

Harrison Lake Fish Hatchery (On Tributary to James River)

The U.S. Fish and Wildlife Service constructed a Denil fishway at the hatchery's water supply dam on Herring Creek in 1988. Cursory investigations in 1989 provided insufficient information concerning the utilization of this facility. Assessments of this facility were also limited during 1990; however, personnel from the U.S. Fish and Wildlife Service and the Department of Game and Inland Fisheries recognized several problems including stream blockages below Harrison Dam, heavy exploitation by dip net fishermen downstream from the dam, and the need to properly evaluate the facility. Strategies were developed to address each of these matters during the 1991 spawning season.

Walkers Dam, Chickahominy River (A Tributary to the James River)

Two Denil fishways were constructed on this dam by the City of Newport News in 1988 and were operational in 1989. Studies by the Department of Game and Inland Fisheries and the Virginia Institute of Marine Science in 1989 revealed that large numbers of herring were using the fishways. Biologists from the Department observed large congregations of herring spawning throughout Chickahominy Lake and in the river above the lake in 1990. Surveys of the river above the observed limits of spawning indicate that impediments are not present as far upstream as the Route 106 Bridge. Hopefully, the herring will continue to move farther upstream during successive spawning seasons.

IV. Supplement Technical Resources in the Bay Watershed

Personnel from the Department of Game and Inland Fisheries participated in the Fish Diversions and Passageways Course and hosted the Virginia portion of the field trip. To encourage FWS assistance in the Bay, region communications and coordination have been maintained between the state and the FWS Coordinator concerning research needs and assistance in initiating pilot reintroduction programs. In addition, communications concerning fish passage needs with several universities have occurred throughout the year.

The Virginia Cooperative Fish and Wildlife Research Unit has participated in several fish passage/stream survey projects, and communications with the Unit concerning fish passage issues occur regularly.

The Virginia Cooperative Fish and Wildlife Research Unit has participated in several fish passage/stream survey projects, and communications with the Unit concerning fish passage issues occur regularly.

DISTRICT OF COLUMBIA

I. Establish an Ongoing Baywide Fish Passage Workgroup

Personnel from the District of Columbia Fisheries Management Program participated in the Baywide Fish Passage Workgroup to coordinate fish passage issues with other federal and state agencies.

II. Update a Comprehensive Inventory of Obstructions

A comprehensive inventory of impediments to fish passage was completed in 1989. During 1990, this inventory was reviewed to prioritize impediments for subsequent restoration. Working with the National Park Service, five impediments on Rock Creek were selected.

III. Establish a Multi-Faceted Approach to Migratory Fish Impediments

Both an ichthyoplankton and a juvenile/adult sampling program were conducted in 1990 in conjunction with the MD DNR and the Interstate Commission on the Potomac River Basin to determine fish presence and movement above and below Little Falls Dam on the Potomac River.

IV. Supplement Technical Resources in the Bay Watershed

Personnel from the D.C. Fisheries Management Program participated in the Fish Divisions and Passageways Course. To encourage FWS assistance in the Bay, region communications and coordination have been maintained between the state and the FWS Coordinator concerning research needs and assistance in initiating pilot reintroduction programs.

U.S. FISH AND WILDLIFE SERVICE

I. Establish an Ongoing Baywide Fish Passage Workgroup

Personnel from the U.S. Fish and Wildlife Service participated in the Baywide Fish Passage Workgroup to coordinate fish passage issues with other federal and state agencies.

II. Update a Comprehensive Inventory of Obstructions

The Service did not participate in this activity since development of the comprehensive inventories is the responsibility of the individual states.

III. Establish a Multi-Faceted Approach to Migratory Fish Impediments.

Hydroelectric Facilities

The Service reviewed one FERC license application that involved anadromous fish. Trap and transport facilities for river herring were recommended for the Fairfax County Water Authority Project for the Occoquan River. These recommendations were rejected by both the applicant and FERC. Negotiations are continuing in an attempt to resolve this issue.

Monitoring

The Service assisted the Virginia Department of Game and Inland Fisheries in monitoring the American shad run at the Emporia Hydro Project, Meherrin River, Virginia in the spring of 1990.

The Service monitored its Harrison Lake National Fish Hatchery fish ladder on Herring Creek, Virginia, for blueback herring. Problems with passage included possible overharvesting; beaver dams, and a temporary road crossing culvert. This site is being considered for an experimental video monitoring program. The temporary construction road has been removed. Any beaver dams will be removed prior to the 1991 run. Discussions with Virginia continue to identify the best ways to control harvest at downstream areas.

IV. Supplement Technical Resources in the Bay Watershed

The U.S. Fish and Wildlife Service co-sponsored, assisted in developing the agenda and participated in the Fish Diversions and Passageways Course. FWS Coordinators continued to provide assistance to the states.

The Services' Regional Engineer provided technical assistance and/or conceptual designs for fish passage facilities for the following projects:

- Big Elk Creek Dam, Elkton, MD
- FCWA Occoquan Hydro Project
- Daniels Dam, Patapsco River
- Tuckahoe Creek Dam, Tuckahoe State Park
- Seagram's Dams on Deep Run and Stony Run
- Van Bibber Dam, Winters Run
- Ft. Meade Dam, Little Patuxent River
- Modifications to Walkers Dam, Chickahominy River
- Operational modifications to Harrison Lake NFH Dam on Herring Creek
- Embrey Dam, Rappahannock River

The U.S. Fish and Wildlife Service designed and produced a scale model Denil fish ladder for display at educational activities in the Chesapeake Bay Region. Also, U.S. Fish and Wildlife Service developed a stand-up display showing various federal and state fish passage activities taking place throughout the Bay and it has been used throughout the region at various functions.

U.S. NATIONAL MARINE FISHERIES SERVICE

I. Establish an Ongoing Baywide Fish Passage Workgroup

Personnel form the U.S. National Marine Fisheries Service (NMFS) participated in the Baywide Fish Passage Workgroup to coordinate fish passage issues with other federal and state agencies.

II. Update a Comprehensive Inventory of Obstructions

NMFS did not participate in this activity since development of the comprehensive inventories is the responsibility of the individual states.

III. Establish a Multi-Faceted Approach to Migratory Fish Impediments

Hydroelectric Facilities

NMFS reviewed several FERC actions many of which involved anadromous fish. Trap and transport facilities for river herring were recommended to the Fairfax County Water Authority Project for the Occoquan River. These recommendations have been rejected by both the applicant and FERC. Negotiations are continuing in an attempt to resolve this issue.

IV. Supplement Technical Resources in the Bay Watershed

Personnel from NMFS helped develop the agenda for the Fish Diversions and Passageways Course, and staff participated in the course.

NMFS worked with the Fish Passage Workgroup to develop the overall educational activities for the Implementation Plan.