

UNITED STATES
DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Region
State, Federal & Constituent Programs Office

FINAL REPORT

Grantee: VIRGINIA DEPARTMENT OF GAME & INLAND FISHERIES

Project No: N/A

Grant No: NA86FU0307

Project Title: ANADROMOUS FISH RESTORATION – STATE OF VIRGINIA

Period Covered: 07/01/98 – 06/30/01

Prepared: _____

Approved by: L. ALAN WEAVER

Date: OCTOBER 31, 2001

Statutory Funding Authority: Anadromous Fish Conservation Act (P.L. 89-304)
 Chesapeake Bay Studies
 Endangered Species Act
 Interjurisdictional Fisheries Act (Title III of P.L. 99-659)
 Magnuson Act
 Oyster Disease Research
 Saltonstall-Kennedy
 Unallied Industry Projects
 Unallied Science Projects

Final report for the period July 1, 1998 to June 30, 2001
for the project:

Anadromous Fish Restoration - State of Virginia

Submitted by:

L. Alan Weaver, Fish Passage Coordinator
Virginia Department of Game & Inland Fisheries
12108 Washington Highway
Ashland, Virginia 23005

October 31, 2001

Objectives

The purpose of this project is to coordinate fish passage and American shad restoration efforts in Virginia's portion of the Chesapeake Bay.

Direct Components of this study:

1. To provide funding for a Virginia Fish Passage Coordinator position with the Virginia Department of Game and Inland Fisheries to direct the Fish Passage Program (e.g. fish passage projects) and directly aid in supporting all other anadromous fisheries initiatives in Virginia (e.g. monitoring, trap and transport of river herring, American shad fry stocking).
2. To provide funding for Fish Passage Technicians to assist the Fish Passage Coordinator in accomplishing fish passage and restoration goals in Virginia.
3. To provide funding for a portion of the Virginia American Shad Restoration Project which involves stocking American shad fry in major Bay tributaries in Virginia.

AMENDMENTS:

Amendment 1: This grant was amended to allow for using unobligated funds from the American Shad Restoration Project job to fund the design phase of the Abutment Dam Fishway Project and to purchase a push net boat package for the Fish Passage juvenile monitoring project.

Amendment 2: This grant was amended again to extend the funding period to June 30, 2001 and to redirect approximately \$10K of remaining unobligated funds to be used toward the design phase of the Abutment Dam fishway project.

Job I: Fish Passage Coordination

Job Objective: Provide necessary coordination and assistance to complete several fish passage projects and projects related to the enhancement of the program.

Coordination for several fishway projects was provided during this grant period. On August 1, 1999 a new coordination and monitoring grant began (#NA96FU0316). The final report for that grant was filed in November 2000 and incorporates progress made during the first year of this grant (NA86FU0307). Please refer to that final report dated November 30, 2000 for further detail.

Job II: American Shad Restoration

Job Objective: As part of the effort to reestablish an American shad population to historical spawning areas by stocking tagged shad fry into the James River, juvenile shad will be monitored for the presence of OTC tags as a measure of evaluating the success of this program.

In January 1999 this project began receiving its funding from a different source (Federal Aid in Sportfish Restoration via the Virginia Marine Resources Commission). This grant was amended in June of 1999 to redirect unused funding from "Shad" (~ \$41,000) to the design phase of the Abutment Dam fishway project. The Shad Project produces annual reports that are available upon request from the Ashland Field Office of VDGIF.

Job III: River Herring Trap and Transport (Spring 1999)

Job Objective: To reestablish a river herring population to historical spawning areas by trapping, transporting and stocking pre-spawned adults. Juvenile herring will be monitored above Boshers Dam to evaluate success of the program.

In the spring of 1999, VDGIF collected a total of 1,720 pre-spawned blueback herring from the Chickahominy River at Walker's Dam and transported those fish to the James River at Maidens Landing which is 21 miles upstream of Boshers Dam. Only three stockings took place in 1999 on April 13, 14 and 15 and the percent mortality was 0.6%. Although no juvenile herring were collected above the dam in subsequent juvenile monitoring (push net and electrofishing) the possibility remains that herring juveniles were produced and may return as adults to spawn in the upper James as a result of imprinting.

Job IV: Anadromous Fish Monitoring (summer 1998 – spring 1999)

Job Objective: To monitor anadromous fish populations of coastal and piedmont streams in Virginia to gain a better understanding of relative abundance, and spatial and temporal distribution. This information will aid in setting fish passage priorities and evaluate the efficiency of existing passage facilities, trap and transport of herring, and stocking of American shad fry.

Note: Additional funding became available from the "competitive pool" of Chesapeake Bay Program funds after the original award of this grant. As mentioned above, this grant was subsequently amended to provide funding for a push net boat package to be used in juvenile alosid sampling. The outfit was received in November 1999 after conducting a competitive bid process. The package consists of a 17' welded jon boat with a side console, a 50 horsepower 4-stroke outboard motor, and a compatible trailer. The total cost was approximately \$10,000. The new push net boat was first put into service in late spring 2000 to begin that year's juvenile push net surveys on several rivers including the James and Rappahannock.

Juvenile Sampling (1998)

Monitoring for juvenile alosids was conducted in the pool upstream of Boshers Dam and in the tidal James River downstream of Richmond. We used a push net (3' x 4' area; ¼" mesh size) mounted on the bow of a 17' jon boat with a 40 hp motor (older, shared rig). A flow meter mounted to the push net frame enabled us to calculate the volume of water sampled during a push (5 to 10 minutes) to determine CPUE in the form of fish per 100 ml of water. These density estimates are used to track inter-annual relative abundance trends.

A total of 10 push net sample nights consisting of six 10 minute rushes per night was conducted from July to November of 1998. The sites were chosen randomly (Excel). All of this effort resulted in the collection of only two American shad juvenile (one in July and one in November). One American shad juvenile was collected with the push net in the tidal James in July of 1998. No blueback herring were taken upstream of Boshers Dam in 1998 but herring were collected consistently in the tidal James in the summer and fall.

Three electrofishing sample nights consisting of six, 15 minute transects per night were conducted from July to November of 1998. This resulted in the collection of one American shad juvenile in July and three shad juveniles in early November.

Subsequent juvenile sampling seasons proved to be more productive. Please refer to the final report for NOAA Grant NA96FU0316 for further detail (November 30, 2000).

Adult Sampling (Spring 1999)

In order to monitor the relative strength of anadromous fish spawning runs, boat electrofishing was conducted on a routine basis on several streams throughout the spring. Relative abundance of target species was recorded as catch per unit of effort (time) or CPUE. The catch and environmental conditions data was entered into the Department's warm water stream database (Access) for storage and analysis. Figure 1 shows the comparison between three selected rivers that were sampled in 1999. This type of data is used in time series for each river to analyze inter-annual abundance trends to detect if populations are increasing or decreasing.

Figure 2 shows the inter-annual abundance trend of American shad in the Rappahannock River as an example. Reopening habitat by constructing fishways or removing dams is expected to have positive effects on alosid populations and this type of information will be one useful tool in the analysis of restoration projects. American shad numbers are currently extremely low on the Rappahannock in Fredericksburg and we will be tracking shad relative abundance leading up to and following the removal of Embrey Dam (2004-2005) to see if shad numbers begin to improve. Other systems will be evaluated in a similar manner to aid in evaluating fish passage restoration efforts.

Job V: Abutment Dam Fish Passage Design

Job Objective: To provide the final design for a suitable fish passage facility on the Abutment Dam. Initially, when fish passage is provided at the Abutment Dam, 1.3 miles of the Appomattox River would be reopened. This action would lead to the completion of the fish elevator on Brasfield Dam (currently 90% complete) at some point in the future. Total mileage reopened on the Appomattox above the Abutment Dam would be 121.4.

The VDGIF executed a grant contract with the City of Petersburg, the owner of the dam, in September 1999. The City and VDGIF conducted a competitive interview process and Timmons was selected and hired by the City to complete the final design and engineering based on the USFWS conceptual plan for a Denil structure.

The final plan is to build a 4' wide Denil fishway on the Abutment Dam (5' to 7' vertical drop) near the north bank of the Appomattox River. All necessary construction permits have been obtained by Timmons for the City of Petersburg. Invoicing for the Timmons' contract was completed as of June 30, 2000. Timmons issued a construction cost estimate of approximately \$300K and a construction management estimate of approximately \$29K.

We are currently working the City to establish a grant contract to pass EPA CBP funds (EPA grant) through the City to Timmons to perform construction management services. This \$175K grant (CB-983276-01-00) is being matched with state funds on a 1:1 basis and will also be used toward actual construction. The USFWS recently granted Virginia an additional \$40K to be applied to the Abutment Dam fishway project.

Gaining construction access to the riverbank has been somewhat challenging. One of the landowners has concerns over granting long-term access across his property to the site. We (City and VDGIF) decided to pursue a temporary construction easement given the situation. One landowner has signed a temporary construction access easement and the concerned landowner is expected to sign the easement in the near future.

Once Timmons' construction management services are secured, the next step will be to advertise for competitive construction bids. If the low bid falls within the bounds of the project's budget, the City would then award the contract to the lowest qualifying bidder. The City and the VDGIF will establish an additional grant contract to cover the actual construction phase. Construction is expected to occur in 2002 and if completed on time the fishway will be opened for passage in the spring of 2003.

Job VI: Boshers Dam Vertical Slot Fishway Construction

Job Objective: To construct a vertical slot fishway on Boshers Dam to reopen historic spawning habitat to anadromous fish species such as American shad and river herring. The fishway will complete passage through Richmond and reopen 137.6 miles of the James River mainstem up to Lynchburg, VA. Funding for construction was provided by several sources including federal, state, local, corporate, and private.

State funds spent on the Boshers fishway, and not involved in any other matching strategies, were applied to this current grant as the non-federal match. The vertical slot fishway was completed at Boshers Dam in time for the 1999 spawning run. The final report for NOAA grant #NA96FU0316 was filed in November 2000 and incorporates updates on the Boshers Dam fishway project including 1999 and 2000 monitoring results. Please refer to that final report dated November 30, 2000 for further detail.

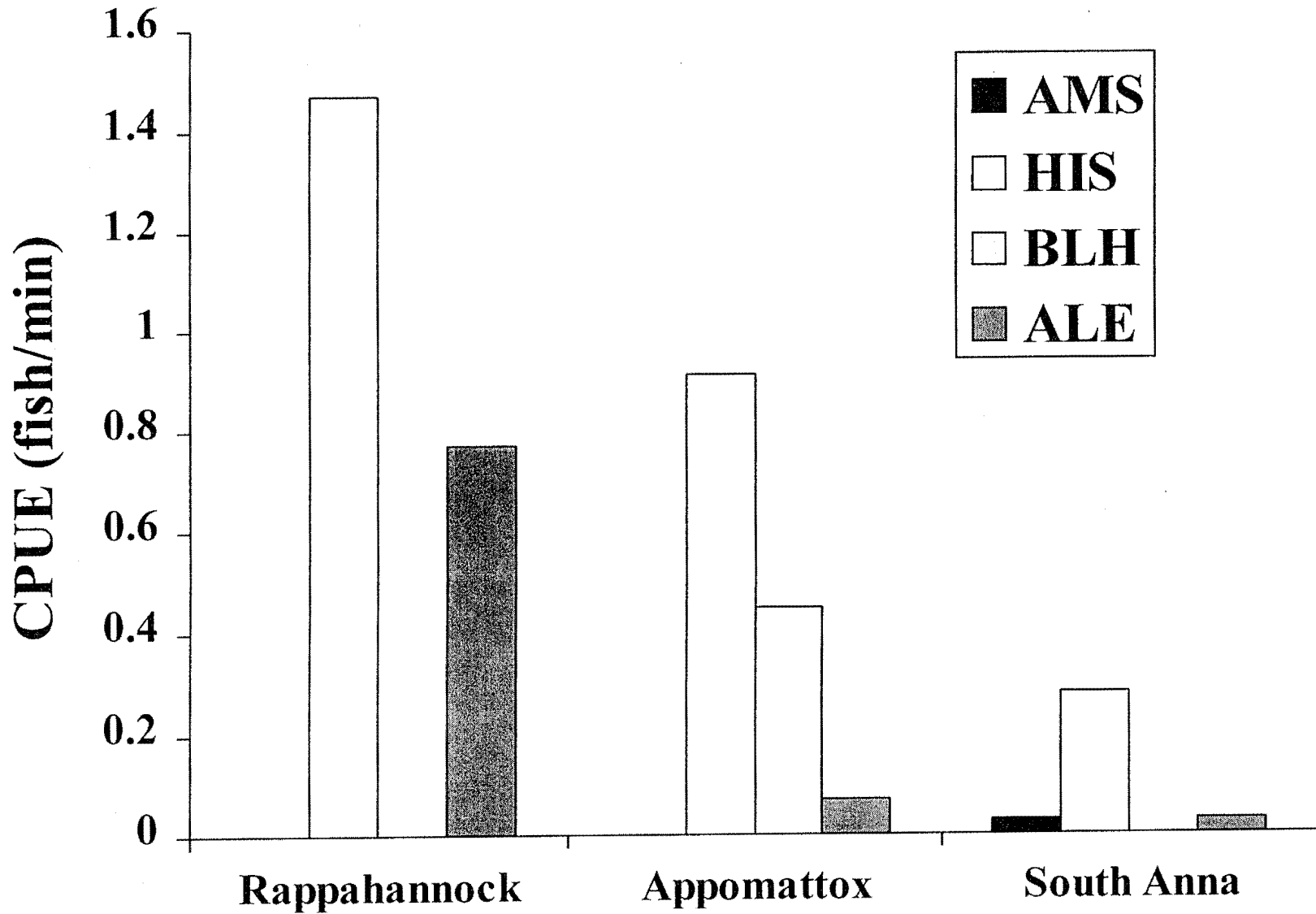


FIGURE 1. - Relative abundance of adult alosids from electrofishing in the fall zone of selected Virginia Chesapeake Bay tributaries during spring 1999. Values represent the combined CPUE for n = 1-3 sampling dates per site.

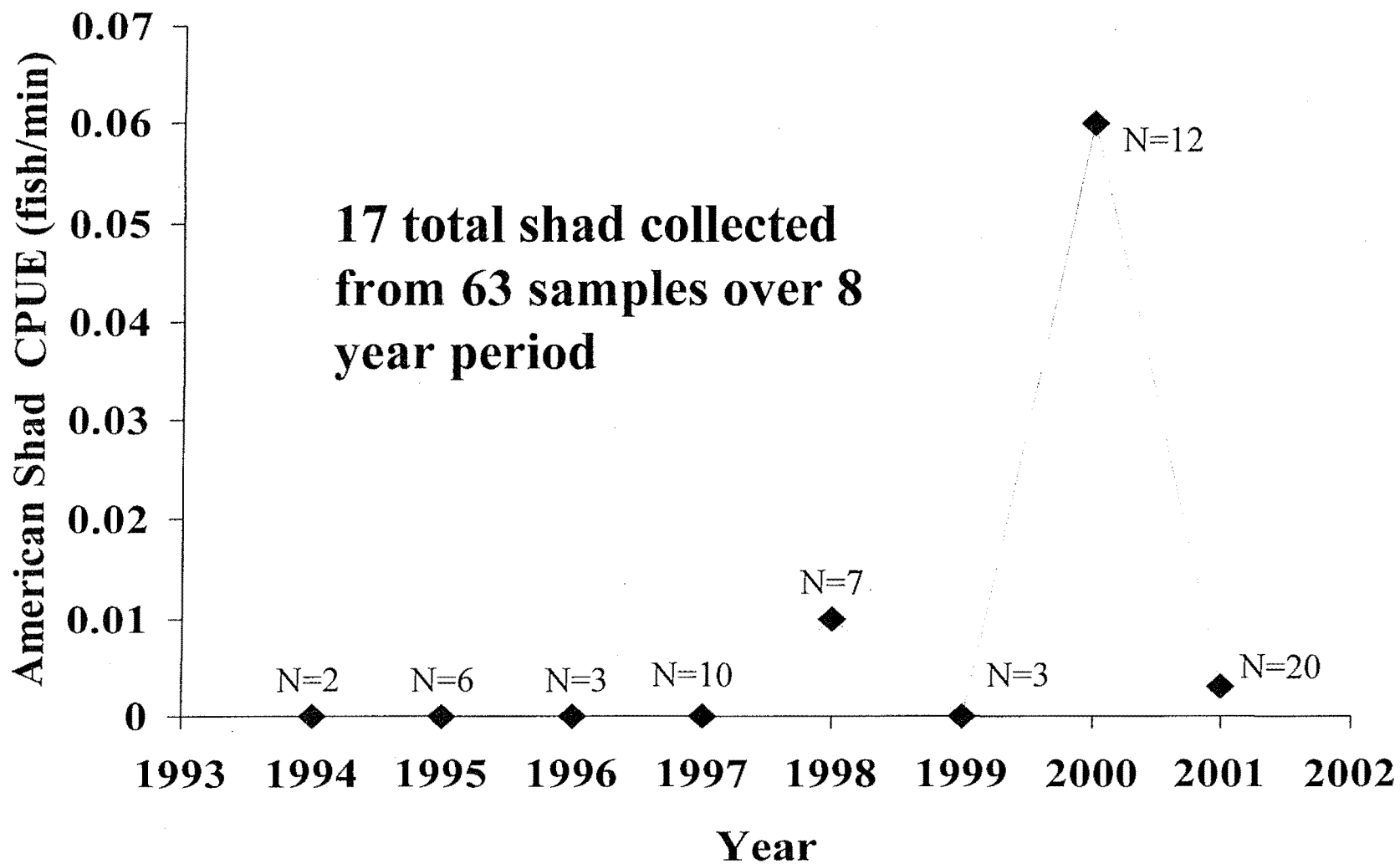


FIGURE 2. - Inter-annual relative abundance trend of American shad from spring electrofishing in the fall zone of the Rappahannock River at Fredericksburg. Values represent the combined CPUE for a given year's sampling effort.