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THE POTOMAC RIVER AMERICAN SHAD RESTORATION PROJECT 2004 SUMMARY REPORT



Fishing at Great Falls, circa 1802

By James D. Cummins

Conducted in cooperation with:
U.S. Army Corps of Engineers, Baltimore District
U.S. Fish & Wildlife Service
District of Columbia Fish and Wildlife Program
Virginia Division of Game and Inland Fisheries
Chesapeake Bay Foundation
Living Classrooms
Anacostia Watershed Society

Acknowledgments

Each year since this project started in 1995 it has been the fortunate recipient of a significant amount of volunteer help. The following individuals assisted the project in 2004, they worked into the late hours of night, in all kinds of weather, and deserve special praise. This list, arranged in order of appearance, also includes a few who were scheduled but missed due to weather and other cancellations:

1. Brood Stock Collections at Dogue Creek, Ft. Belvior: Sandy Burk, Mary Lou Carmack, Brandon Grilli, Annette Chambers, Don Leach, King Montgomery, Rob Roberts, Dameon Shriver, Kurt Moser, Erik Hagen, Julie Kiang, Katherine Lim, Steve Saari, Caroline Cummins, Neil Gilles, Steve Mitchell, Sandi Geddes, Steve McKinley Ward, John McKinley Ward, Mike Carter, Paula Phillips, Tom Gray, Clarke Gray, George Winn, Joe Winn, Carl Onesty, Chris Williams, Andrew Partan, Rebecca Partan, Elizabeth Partan,

2. List of Schools-in-Schools Participants, 2004

<u>Virginia Schools:</u>	<u>City</u>	<u>Teachers, Staff</u>
Liberty Middle School	Clifton	Mary Lou Carmack, Annette Chambers
Glebe Elementary School	Arlington	Greg Taylor

Maryland Schools:

Dodge Park Elementary School	Landover	Derrick Grubb Jennifer Cooper
Piney Branch Elementary School	Takoma Park	Leila Campbell
Sligo Creek Elementary School	Silver Spring	Charles Gale
Chevy Chase Elementary School	Chevy Chase	Edward Fisher
Matsunaga Elementary School	Germantown	JoAnne Kress
North Bend Elementary School	Jarrettsville	Judy Valle
Westbrook Elementary School	Bethesda	Sandra Geddes
Poolesville High School	Poolesville	Billie Bradshaw

Maryland Environmental Education Facility:

Alice Ferguson Foundation	Accokeek	Kelly Matthews
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District of Columbia Schools:

Stuart Hobson Middle School	DC	Sandra Jenkins
Anacostia High School	DC	Rebecca Denkin
Murch Elementary School	DC	Lola Boxley
Whittier Elementary School	DC	Kathy Patterson

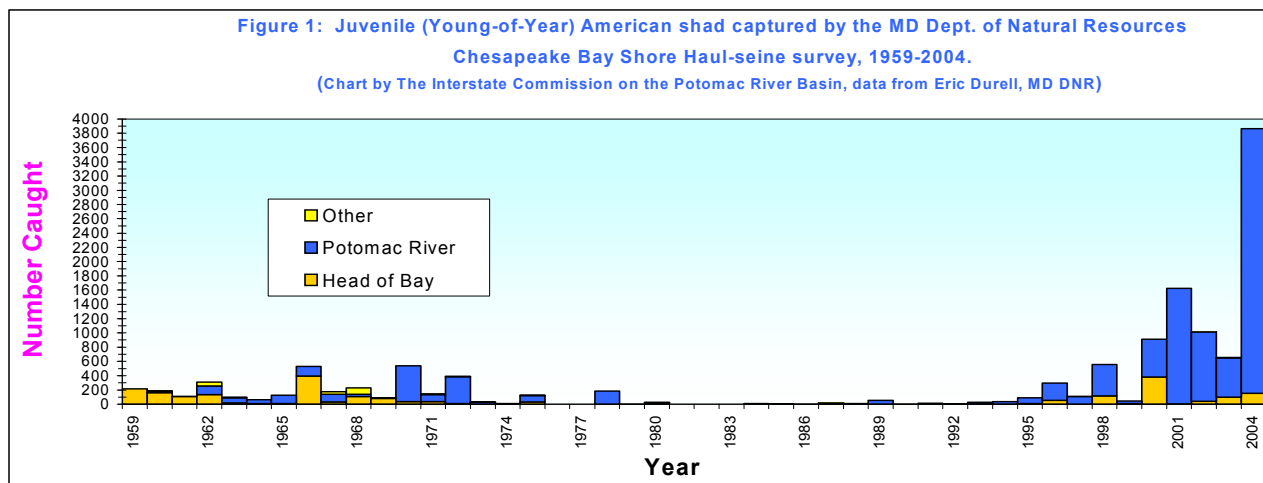
POTOMAC RIVER AMERICAN SHAD RESTORATION PROJECT

2004 SUMMARY REPORT

Background and Summary

American shad, *Alosa sapidissima*, were once the most abundant and commercially important fish species in the Potomac River and Chesapeake Bay. However, over-fishing, pollution and loss of habitat so reduced their numbers that commercial and recreational fisheries were closed in 1980 in Maryland and 1982 in the Potomac River. An American shad stocking project for the Potomac River began in 1995 as part of an effort by a coalition of federal, state, regional and local agencies and nonprofit groups, organized as a Task Force¹, to open historic spawning and nursery habitat for native and anadromous fishes. An important milestone for this project was accomplished in January of 2000 with the completion of a fishway at the Little Falls (Brookmont) Dam by the US Army Corps of Engineers (USCOE).

During the eight year stocking phase of the project, which concluded in 2002, over 15.8 million shad fry were stocked into the Potomac River. By 2002, the American shad population in the Potomac had rebounded to levels judged sufficient by the Little Falls Task Force to naturally support a continued recovery.



Since the stocking program started in 1995, juvenile shad have become substantially more numerous, the numbers of young fish captured in Maryland's bay-wide shore haul-seine monitoring surveys have eclipsed historical records for six of the last seven years (See above, Figure 1.). The number of adult American shad collected during the Spring brood-stock collections has tripled (See Figure 2, page 2). With the continued increase in juvenile shad in the river, American shad numbers in the Potomac River should significantly increase each year for at least the next seven years (foreseeable future). The American shad population in the Potomac is again strong enough to allow some harvest. The commercial fishery was opened a bit in 2003, allowing watermen to keep 1 bushel/day. Potomac shad are back in the marketplace. The recreational fishery, which is primarily at and upstream from Washington, DC, remains closed. Hopefully, in the not too distant future, we will be able to catch, eat and enjoy the Potomac River's American shad as did our ancestors.

¹Members of the Little Falls Fish Passage Task Force come from Virginia, Maryland, the District of Columbia, the Interstate Commission on the Potomac River Basin, the Potomac River Fisheries Commission, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, the National Biological Survey, the U.S. Environmental Protection Agency, the National Park Service, the National Marine Fisheries Service, Montgomery County, Maryland, the Chesapeake Bay Foundation, and The Potomac Conservancy.

Two public participation components have been important to the projects success. First, hundreds of volunteers have helped, many of them spending very late, sometimes very chilly and wet, spring nights helping to collect adult shad for brood stock. Second, the “Schools-in-Schools” partnership with the Chesapeake Bay Foundation, the Living Classrooms Foundation, the Anacostia Watershed Society and others has successfully involved many area schools. Through this program, thousands of students have participated, both on the river and raising shad fry in the classroom. Through the student’s efforts approximately 193,000 additional shad fry have been released.

The project’s current focus is monitoring restoration progress and assisting the Virginia Department of Game and Inland Fisheries American shad recovery efforts for the Rappahanock River. Monitoring is more important than ever as we work to re-open the commercial and recreational American shad fisheries that were once so valuable to our economy and way of life. This report summarizes the results of the 2004 monitoring effort.

2004 Activities

Methods: Four methods are currently being employed to help monitor the recovery: 1) Gill-net collections of adult shad, begun to collect brood stock but which continue as the main monitoring component of the shad’s recovery, 2) Dip-net collections of adults at Great Falls, 3) Young-of-the-year (YOY) American shad abundance information obtained from the Maryland Department of Natural Resources Chesapeake Bay Shore Haul-Seine Survey which has been conducted since 1959, and 4) Push-net surveys for YOY American shad in tidal freshwater portions. The first two methods are used during the springtime runs and the last two are conducted during the summer and early fall. The catch-per-unit-effort (CPUE, or the average number of shad captured per gear-type each year) information from these collections are then used to characterize the strength of the American shad population for the Potomac.

From 1995 to 2002, the ICPRB and the U.S. Fish & Wildlife Service (USFWS) jointly conducted a monitoring program to assess the progress of the project. However, since 2003, the USFWS has been unable to continue their previous level of support for the field component of this project due to budget constraints. The ICPRB became the primary monitoring entity. Fortunately, the USFWS continues to provide limited but critical help during adult monitoring at Great Falls. The push-net surveys, which were discontinued after 2002 by the USFWS and ICPRB, are now being conducted by the District of Columbia’s Fish and Wildlife Division in their portion of the Potomac River.

Results: As a general note, for the second year in a row an unusually wet spring with much higher than normal flows (See Appendix I: Spring flows in 2004 as measured at Little Falls Gage, Potomac River.) was a constraint during all elements of work, especially during the spring spawning season.

1. Adult gill net collections: Gill-net collections, conducted just off shore from Fort Belvoir, started April 15 and concluded May 14th (See Appendix II: Dates of Collections, Number of American Shad Captured and Used in 2004. For a detailed description of this collection process, see the ICPRB’s *American Shad Restoration, Year 2000*, Appendix III, Report #2001-01).

Restoration stocking was concluded for the Potomac in 2002 but an additional brood-stock component of this program was added in 2003 at the request of the Virginia Division of Game

and Inland Fisheries (VDGIF) as part of an American shad stock enhancement program for the Rappahannock River. VDGIF turned to the Potomac River after they were not finding enough shad in the Rappahannock necessary for egg supply, and sought assistance in the form of adult shad collections and eggs source. Since 2003, this monitoring program has assisted the VDGIF in obtaining fertilized eggs for their Rappahannock recovery program.

While higher than average rainfall and river flows made collections difficult at times, American shad were abundant enough that 1852 were captured, with 956 shad used for broodstock (See Figure 2). Of the 896 shad released from the gill nets, 329 were obviously green (un-ripe) females and 547 were surplus males. Of the 976 shad kept, 387 of the females were used as an eggs source, 435 males for fertilization, and 154 females were found not quite ripe or spent. From these Potomac brood-fish, approximately 3.4 million American shad fry were stocked in the Rappahannock River. A portion of the hatchery-raised fry are also returned to the Potomac River as a replacement stocking and this year 220,000 were stocked back into the Potomac River near the collection site at Fort Belvoir, Virginia. If 1 in 337 (.3%) return², the 2004 stocking should result in an estimated 10,970 shad returning.

Figure 2: Summary of the Number of American Shad Landed (Used and Kept), Eggs Collected, Fry Released, and Catch-Per-Unit-Effort (CPUE) of Shad Landed for Project Period 1995-2004, Including Estimates of Shad Returns

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Totals
# Ripe females	135	166	245	105	119	373	338	245	240	387	2,353
# Green (unripe) Females	78	51	92	50	44	93	135	141	120	127	931
# Spent (post-spawn) Females	3	1	0	8	10	9	27	25	15	27	125
# Males	78	157	207	153	116	282	235	247	240	435	2,150
# Total Shad (Used)	294	375	544	316	289	757	735	658	615	976	5,559
# Eggs Collected x 1000	2,405	4,353	5,744	2,626	2,594	6,383	6,565	5,943	5,327	5,773	47,713
# Collections/# nets set	11/22	11/22	12/24	14/28	15/30	11/22	16/32	18/36	10/16	14/25	132/257
CPUE (# Shad Used³/net-set)	13.4	17.0	22.7	11.3	9.6	34.4	22.9	18.3	38.4	39.0	22.4
# Eggs/Ripe-female	17,800	26,200	23,400	25,000	24,400	17,100	19,400	24,260	22,195	14,917	21,467
# Fry Stocked x 1000	1,175	1,989	1,535	1,589	1,304	3,176	3,336	1,531	1,400⁴	3,639³	20,535
# Fry Stocked Each Shad Captured	4,000	5,300	2,800	5,000	4,500	4,200	4,500	2,326	2,435	3,586	3,865
Estimated # of Shad Returning	3,487	5,902	4,555	4,715	3,869	9,424	9,674	4,444	4,060	10,970	61,605
Est. # Shad Returning Each Shad Captured	11.9	15.7	8.4	14.9	13.4	12.4	13.5	6	5.9	10.6	10.8

²Based on monitoring data from the Conowingo Dam fish lifts (Hendricks 2000) which found that it takes 373 hatchery fry stocked in the Susquehanna River to get one returning adult shad.

³The "Shad Landed" Catch-Per-Unit-Effort, or CPUE of shad used, is based upon numbers of shad actually kept for collection of eggs for re-stocking the Potomac and, starting in 2003, the Rappahannock Rivers. It does not include green or spent females and surplus males which were netted but then released. Starting in 2002, all fish netted were also counted. The total number of shad netted in 2002 was 1801, of which 1143 were released. The total in 2003 was 1,494, of which 879 were released. The total number of shad netted in 2004 was 1852, with 896 released.

⁴In 2003 and 2004, most shad were stocked into the Rappahannock River.

2. Adult Dip-Net Collections at Great Falls: Twenty-nine American shad were captured by dip-netting at Great Falls. This year there was a reduced sampling window due to heavy flows which characterized this spring. We can effectively net at flows up to 14,000 cubic feet per second (cfs), but do best at 10,000 cfs, which is the rough mean flow for April-May. This year we only had 8 days with flows below 14,000 cfs. In 2003, the really wet year, we captured 5, but then had only a couple of days, early in the season, with flows close to 10,000 cfs. Most of the time flow was above 20,000. There appeared to be a trend developing during the three drier preceding years; in 2000 (the first year the fishway was opened), we captured 3, then 12 in 2001, and 43 in 2002.



The USFWS's Mike Odom with one of the first shad captured at Great Falls in 2000.
Photo by Mike Bailey



Figure 5: The author dipnetting on “shad rock” at Great Falls. Photo by Mike Bailey.

3. The push-net survey for young-of-the-year (YOY) shad: No data available from the District of Columbia at the time of writing this report. In 2003, 469 young-of-year shad were collected, but, due to the change in collecting dates and the reduction in spacial coverage, this data is not directly comparable to previous data.. In 2002, which set a project record for YOY, 1044 shad were collected, compared to 486 in 2001, 111 in 2000, 12 in 1999, and 148 in 1998 and zero in 1997.

4. The Schools-in-Schools. The “Schools-in-Schools” partnership with the Chesapeake Bay Foundation, the Earth Conservation Corps’ Living Classrooms and the Anacostia Watershed Society, which started with herring this year, also went well with 16 schools participating and about 30,000 shad fry stocked. In 1996, when we started the program, five schools participated. In 2003, for a recent comparison, 17 schools and 1421 students participated and released approximately 10,400 shad fry.

Discussion

Since this project started in 1995, the number and CPUE of adult American shad collected during the Spring brood-stock collections has more than tripled. Young-of-the-year shad have also become substantially more numerous, doubling and in 2004, eight-fold pre-restoration records in Maryland surveys (See Figure 1), American shad numbers in the Potomac River should significantly increase each year for the next seven years (foreseeable future).

The American shad population in the Potomac is again strong enough to allow some harvest. Since 2003 the commercial fishery was opened a bit, allowing watermen to keep 2 bushels/day.

Potomac shad are back in the marketplace. The recreational fishery, which is primarily at and upstream from Washington, DC, remains closed but could probably withstand a one fish/day harvest. For now, and until necessary regulatory hurdles are passed, anglers can practice catch-and-release fishing for shad. This is a good way to re-learn about the shad; how much fun and challenge they can be to catch on hook and line, how pretty they are, and important they are to the ecosystem. Perhaps the most spectacular settings for this is the stretch of river from Great Falls down to Fletcher's Boat House near Little Falls. Hopefully, in the not too distant future expect to be able to catch, take home and enjoy the fish as our ancestors once did.

There were a number of interesting historical notes uncovered during the year;

- 1) From: Report of a Commissioner of Fisheries of Maryland, January 1876. By T.B. Ferguson.
(Note, this MD Commission was created in 1874, and this is from their first report, **bolding** is by the author for emphasis):

Page 5, regarding the fisheries declines which led to the creation of the Maryland Fish Commission the "Shad (*Alosa sapidissima*)", section begins "**This being the most important of the food fishes of our waters**, your Commissioners immediately sought for means of their increase..."

- 2.) In 1898, in "The Shad Fisheries of the Atlantic Coast of the United States, Report of Commissioner of Fish and Fisheries" Charles H. Stevenson relates on page 203;

"At Great Falls there are a few bow nets used each spring from the last week in April to the first or second week of June. These nets are operated from a point known as "**Shad Rock**," which projects into the water on the Virginia shore just below the principal falls. Three bow nets were reported from that locality in 1896, the yield numbering 360 roe shad and 240 bucks."

This rock is the same rock used during the dip-net surveys for this project. Therefore, not only did the project bring shad back to Great Falls, it is also bringing back the "Shad Rock."

The ICPRB and the USFWS successfully completed an eight-year American shad stocking program, the fishway at Little Falls was constructed by the U.S. Army Corps of Engineers, and our understanding of the shad in the Potomac River continues to expand. Interest in angling for American shad is growing rapidly thanks to a strong public outreach and participation component. The efforts of the multi-state, multi-agency/organization Little Falls Task Force are coming to fruition.

Future Needs

The need to monitor and keep track of the restoration progress still remains. In addition, due to the long time that this fishery has been closed and changes in tastes since they were abundant, more education is necessary to restore public interest in this remarkable fish, not only as a delicious food and exciting gamefish, but also because of its importance in river and coastal ecosystems and its significance in the history of this country.

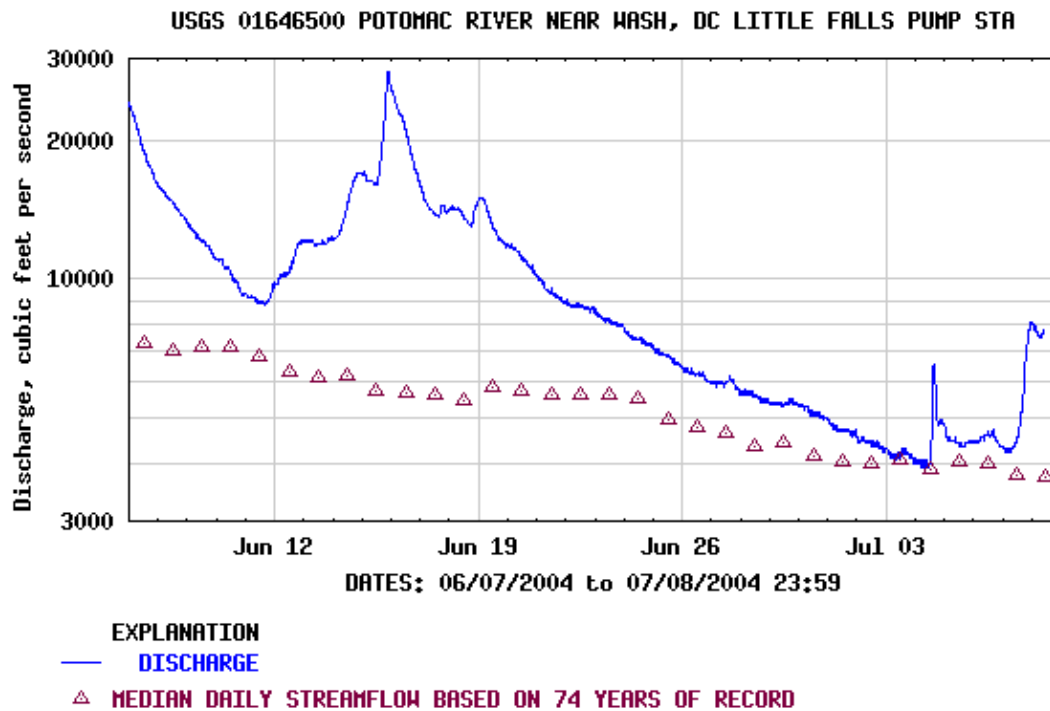
Past Funding Support

Virginia's Department of Game and Inland Fisheries provided \$2,400 for the compensation of the Virginia waterman, Louis Harley. The Maryland Chesapeake Bay Trust, via the Living

Classrooms, have contributed \$5,000.

Since the project's inception in 1995 it has been supported by a number of collaborating agencies and organizations including the Virginia Chesapeake Bay Restoration Fund, the Maryland Chesapeake Bay Trust, the Potomac River Fisheries Commission, the National Fish and Wildlife Foundation, the U.S. Fish & Wildlife Service, the US Army Corps of Engineers, the US EPA's Chesapeake Bay Program, Maryland's Department of Natural Resources, and private donations from members of the Congressional Sportsmens Caucus.

Appendix I. **Spring Flows in 2004 as measured at Little Falls.**



Appendix II **Dates of Collections, Number of American Shad Captured and Used in 2004**

Date ¹	4/15	4/21	4/22	4/23	4/26	4/29	4/30	5/03	5/04	5/6	5/7	5/10	5/11	5/14	Total
Shad Captured/net	21/1	167/2	200/2	170/1	120/2	32/2	140/2	164/2	149/2	138/2	180/2	215/2	80/1	76/2	1852/25
Females	13	74	52	104	52	19	50	39	25	63	96	157	71	55	870
Males	8	93	148	66	68	13	90	125	124	75	84	58	9	21	982
Ripe Females Used	0	16	38	60	33	4	30	33	16	22	28	69	22	16	387
Green Females Kept	0	17	14	17	6	0	1	0	1	10	15	12	10	24	127
Spent Females Kept	0	0	0	2	4	0	0	2	0	5	7	6	0	1	27
Males Used	0	19	42	64	30	5	48	38	22	45	65	32	9	16	435
Eggs Collected ³	0	0	0	0	927	55	869	816	412	738	764	907	285	0	5,773
Number of Fry ³	0	0	0	0	756	45	435	604	237	372	472	535	183	0	3,639
River stocked					Rapp	Rapp	Rapp	Rapp	Pot.	Rapp	Rapp	Rapp	Pot.		
Water Temp.	9	18	18.6	21	20	18	16.5	17	16	17	19	21	22	24	
Tidal Stage/Time	H5	L4.5	L5.8	L7.5	L8	H4	H5	H8	H9	L5.5	L6	L7.5	L8	H6	

¹ No scheduled collection events were cancelled due to bad weather.

³Times 1000