

SURVEY OF MIGRATORY FISHES IN THE BEAVER DAM CREEK,  
SAMPLED AS PART OF A RESERVOIR CONSTRUCTION STUDY FOR GLOUCESTER COUNTY  
FINAL REPORT

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## BEAVER DAM CREEK ANADROMOUS FISH SURVEY

### INTRODUCTION

Beaver Dam Creek is a small tidal creek which winds through Gloucester County north of Route 17. It is most easily reached where it crosses Route 616, just north of Gloucester Courthouse, and again where it crosses Route 14 just south of it. Just below the Route 14 crossing it widens considerably then enters the Northwest Branch of the Ware River (a tributary of Mobjack Bay).

At the request of Mr. Wesley Jones, Gloucester County Engineer, a preliminary survey of Beaver Dam Creek was made in mid-April 1982. We sampled at the two route crossings with a 10 ft. common sense minnow seine. Six hauls were taken in the vicinity of Route 616 bridge north of Gloucester Courthouse; two upstream of the bridge and four downstream. Only a few grass shrimp were taken in the six hauls. However, visual inspection indicated that water conditions in that area appeared suitable for fish.

In addition, three seine hauls were made downstream in the vicinity of the highway crossing on Route 14; two above the bridge and one below it. One small American eel, along with numerous aquatic insects were taken in one of these hauls. Insects were not observed at the upriver site. The abundance of these aquatic insects and what appeared to be unpolluted conditions indicated that this creek should be suitable for anadromous fishes. The lack of a confirming fish catch was believed due to the high water conditions and inadequate gear. Daylight sampling in this clear water probably frightened the fish from the immediate vicinity and contributed to our lack of success.

In conjunction with our survey, we reviewed VIMS files of previous surveys made on this creek. A survey conducted by Joe Miller (unpublished VIMS data) as part of a study of alosine fishes, was run twice in April and once in May of 1972. Using plankton nets, experimental gill nets, and trap nets, Miller caught adult striped bass, alewives, white perch, white catfish, and common carp. Some of the striped bass and alewives were gravid when taken. Most adult fish were taken with gill nets. April plankton samples produced some blueback herring sac fry and one unidentified larval fish. May samples were taken with plankton nets. These samples included numerous gammarid shrimp, snails, oligochete and nematode worms. The fact that few aquatic insects were taken indicated that their samples had come from slightly salty water. This differed from our recent surveys which were made in relatively fresh water.

Evidence of adult herring running into the creek was reported, as was the fact that people had been seen dip netting herring near one of the bridges across this creek. Unfortunately, attempting to verify this "evidence", we found that the information was incorrect.

As it appeared that our attempts to catch fish had failed because of inadequate gear, future surveys were scheduled with different gear.

### Methods and Materials

## Summer 1982

On August 10, 1982, we set gill nets at the two sites described in the Introduction. These were one inch stretch mesh gill nets about 30 feet long; not long enough to effectively close off the creek to migrating fish. Catches obtained at these sites were low (Table 1). One fish, a golden shiner, was taken at the Route 616 bridge site after six days fishing.

Results at the Route 14 bridge site were slightly better. For the same period of fishing we caught one redbfin pickerel, two white perch, and one blue crab. Another blue crab was observed in the vicinity of the net, but wasn't taken.

The water at neither site was checked for salinity, but tasting the water did not reveal any salt, so the salinity was probably 2 ppm or less.

Further sampling was again rescheduled for next season.

## Spring 1983

Two different types of nets were tried in Beaver Dam Creek during the spring of 1983. On March 23, a 3 inch stretch monofilament gill net was set at the upper site (Route 616 bridge) and a hoop net with hoops about 3 feet in diameter, with 1-3/4 inch stretch mesh netting was set at the lower site (Route 14 bridge). Both nets were set so that they effectively closed off the entire stream to fish passage. They were checked every other day, except on weekends. No fish were taken in the gill net. Hoop net catches are presented in Table 2.

No fish were taken until late April when one blueback herring was taken at the Route 14 hoop net site. The posterior of this fish had been eaten by turtles, but the anterior portion was intact. Turtles proved to be a problem, especially with the hoop nets. They tore holes in the nets, and had probably eaten some fish from the nets. A black crappie, a redbreast sunfish, and a white perch were taken in the hoop net. Nothing was taken in the gill net upriver, and on May 15 the nets were switched. We then took a redbreast sunfish in the hoop net at the Route 616 site. Shortly thereafter the nets were removed because fishermen indicated that the anadromous run, especially the herring run, was over for the year.

On May 12, 1983 several schools of juvenile fish were observed in the shallows at the route 14 site, but these were mostly killifishes and sunfish. No juvenile anadromous species were seen.

## Spring 1985

Sampling was resumed on Beaver Dam Creek on March 22, 1985; it had not been sampled during 1984. The 3 ft hoop nets were set at both sites and fished until May 15, 1985. Results of this effort are presented in Table 3. The species caught changed; we took several creek chubsuckers, either while they were actually spawning, or moving up to their spawning sites. Although we caught more fish during 1985 than in previous years none were anadromous species. Perhaps our catch would have been better if not for the interference of numerous turtles ripping our nets, as well as eating the trapped fish.

## Spring 1986

Hoops nets were set at both sites on March 28, 1986. Results of this fishing are presented in Table 4. As in the previous year, creek chubsuckers were spawning in the vicinity of our nets and a number of running ripe individuals were taken. Various large sunfishes were also taken.

Again, the most common animals taken were turtles, which ripped our nets, and probably released or ate some fish. One species of anadromous fish was taken on May 31, an adult sea lamprey. No other anadromous species were taken in the nets.

Our apparent failure to capture larger anadromous fish led us to try taking larval or small post-larval fishes with plankton nets. Two half meter 505, micron, plankton nets were set in the stream and left overnight on April 16. The first day's fishing produced many aquatic insects and some amphipods, but no fish. On April 18, a number of small fish were captured in the nets at the Route 14 bridge. Results of this sampling are presented in Table 5.

A post-larval menhaden, five larval minnows, a larval halfbeak and several elvers were taken. The lower site appeared much richer in both fish and insect populations.

## RESULTS

Our sampling has produced a very low yield of fish/net day, a yield that was too small to bother computing. The only relevant point is that our catch did increase as we learned the best gear. The poor catches in the earlier years are believed due to the inappropriateness of the gear, and probably even more to the numerous turtles which tore the net, thus allowing what fish they had not eaten to escape. The 1986 catches with the hoop nets, especially at the Route 14 site were about as expected for a stream of this size.

Only two anadromous species, an adult blueback herring and an adult marine lamprey were taken over the entire course of our study. Catadromous species included two American eel (elvers), and a large juvenile. Estuarine species taken included a post-larval Atlantic menhaden, and a larval halfbeak.

The water, especially at the lower site had many insects and amphipods, and it appears that the stream conditions are adequate to support fishes, both migratory as well as permanent types.

Table 1. Species taken in Beaver Dam Creek with a 30 ft. gill net with 1 inch stretch mesh.

| Date            | Location  | Species Taken    | Number | Size Range |
|-----------------|-----------|------------------|--------|------------|
| August 11, 1982 | Route 616 | Golden Shiner    | 1      | 9'         |
| August 13, 1982 | Route 14  | White Perch      | 1      | 3- 2"      |
|                 |           | Redfin Pickerel  | 1      | 7'         |
| August 20, 1982 | Route 14  | White Perch      | 1      |            |
|                 |           | Blue Crab (Male) | 1      |            |

Table 2. Species of fish taken in Beaver Dam Creek with a 3 ft. hoop net with a 1-3/4 inch stretch mesh.

| Date            | Location  | Species Taken     | Number | Size Range         |
|-----------------|-----------|-------------------|--------|--------------------|
| March 23, 1983  | Route 616 | No Catch          |        |                    |
| -April 23, 1983 | Route 14  | No Catch          |        |                    |
| April 25, 1983  | Route 14  | Blueback Herring  | 1      | Adult<br>(Damaged) |
| May 11, 1983    | Route 14  | Black Crappie     | 1      | 243 mm             |
|                 |           | Redbreast Sunfish | 1      | 198 mm             |
| May 12, 1983*   | Route 14  | White Perch       | 1      | 190 mm             |
| May 16, 1983**  | Route 616 | Redbreast Sunfish | 1      | (Damaged)          |

\* Several schools of young-of the-year fish observed, appeared to be sunfishes and killifishes.

\*\* Nets were removed after sampling.

Table 3. Species taken in Beaver Dam Creek with a 3 ft. hoop net with a 1-3/4 inch mesh.

| Date             | Location  | Species Taken     | Number |
|------------------|-----------|-------------------|--------|
| March 22, 1985   | Route 616 | No Catch          |        |
|                  | Route 14  | Creek Chubsucker  | 1      |
|                  |           | Bluegill          | 1      |
| March 25, 1985 * | Route 616 | No Catch          |        |
|                  | Route 14  | No Catch          |        |
| March 27, 1985 * | Route 616 | No Catch          |        |
|                  | Route 14  | No Catch          |        |
| March 29, 1985 * | Route 616 | No Catch          |        |
|                  | Route 14  | Redbreast Sunfish | 1      |
| April 1, 1985    | Route 616 | No Catch          |        |
|                  | Route 14  | Creek Chubsucker  | 1      |
| April 3, 1985    | Route 616 | Creek Chubsucker  | 1      |
|                  | Route 14  | No Catch          |        |
| April 5, 1985 ** | Route 616 | No Catch          |        |
| -May 15, 1985**  | Route 14  | No Catch          |        |

\* Holes in nets caused by turtles. Species of turtles taken included: snappers, musk, painted and slider.

\*\* Nets were removed after sampling.

Table 4. Species taken in Beaver Dam Creek with a 3 ft. hoop net with a 1-3/4 inch stretch mesh.

| Date           | Location    | Species Taken           | Number | Size            |
|----------------|-------------|-------------------------|--------|-----------------|
| March 28, 1986 | Route 616   | Chub Creeksucker        | 3      | Adults          |
|                |             | Pumpkinseed             | 1      |                 |
|                | Route 14    | Redbreast Sunfish       | 3      |                 |
|                |             | Pumpkinseed             | 1      |                 |
| April 1, 1986  | Route 616   | No Fish - Large Snapper |        |                 |
|                | Route 14    | Hogchoker               | 1      |                 |
| April 2, 1986  | Route 616   | Creek Chubsuckers       | 5      | Spawning Adults |
|                | Route 14*   | No Catch                |        |                 |
| April 3, 1986  | Route 616   | Creek Chubsucker        | 2      | Adults          |
|                | Route 14    | No Fish -Painted Turtle |        |                 |
| April 4, 1986  | Route 616   | Creek Chubsucker        | 1      |                 |
|                | Route 14    | No Fish -Large Snapper  |        |                 |
| April 7, 1986* | Route 616   | No Catch                |        |                 |
|                | Route 14    | No Catch                |        |                 |
| April 9, 1986  | Route 616** | Creek Chubsucker        | 4      | Spawning Adults |
|                | Route 14 ** | No Catch                |        |                 |
| April 16, 1986 | Route 616   | No Catch                |        |                 |
|                | Route 14    | No Catch                |        |                 |
| April 17, 1986 | Route 616   | No Catch                |        |                 |
|                | Route 14    | No Catch                |        |                 |
| April 18, 1986 | Route 616** | No Catch                |        |                 |
|                | Route 14 ** | No Catch                |        |                 |
| May 31, 1986   | Route 616** | No Catch                |        |                 |
|                | Route 14 ** | Sea Lamprey             | 1      |                 |

\* Holes in net.

\*\* Net removed for cleaning.

Table 5. Species taken in Beaver Dam Creek with a half meter, 505 micron plankton net

| Date           | Location      | Species Taken                  | Number | Size           |
|----------------|---------------|--------------------------------|--------|----------------|
| April 17, 1986 | Route 616     | No Fish -Aquatic Insects       |        |                |
|                | Route 14      | No Fish -Many Aquatic Insects  |        |                |
| April 18, 1986 | Route 616     | No Fish -Insects and Amphipods |        |                |
|                | Route 14*     | Eel (Elvers)                   | 3      | About 4"       |
|                |               | Atlantic Menhaden              | 1      | Small Juvenile |
|                |               | Halfbeak                       | 1      | Larval         |
|                | Unid. Minnows | 5                              | Larval |                |

\* Insects and amphipods about 10 times more numerous at the Route 14 site than the Route 616 site.

## Appendix 1

### COMMON AND SCIENTIFIC NAMES OF ANIMALS FOUND IN BEAVER DAM CREEK

#### FISHES<sup>1</sup>

|                         |                                   |
|-------------------------|-----------------------------------|
| alewife                 | <i>Alosa pseudoharengus</i>       |
| Atlantic menhaden       | <i>Brevortia tyrannus</i>         |
| black crappie           | <i>Pomoxis nigromaculatus</i>     |
| blueback herring (glut) | <i>Alosa aestivalis</i>           |
| common carp             | <i>Cyprinus carpio</i>            |
| creek chubsucker        | <i>Erimyzon oblongus</i>          |
| bluegill                | <i>Lepomis macrochirus</i>        |
| American eel            | <i>Anguilla rostrata</i>          |
| golden shiner           | <i>Notemigonus crysoleucas</i>    |
| hogchoker               | <i>Trinectes maculatus</i>        |
| killifishes             | <i>Cyprinodontidae</i>            |
| halfbeak                | <i>Hyporhamphus unifasciatus</i>  |
| minnow                  | <i>Cyprinidae</i>                 |
| pumpkinseed             | <i>Lepomis gibbosus</i>           |
| redbreast sunfish       | <i>Lepomis auritus</i>            |
| redfin                  | <i>Esox americanus americanus</i> |
| striped bass            | <i>Morone saxatilis</i>           |
| sea lamprey             | <i>Petromyzon marinus</i>         |
| sunfishes               | <i>Centrarchidae</i>              |
| white catfish           | <i>Ictalurus catus</i>            |
| white perch             | <i>Morone americana</i>           |

#### OTHER VERTEBRATES<sup>2</sup>

|                 |                              |
|-----------------|------------------------------|
| snapping turtle | <i>Chelydra serpentina</i>   |
| musk turtle     | <i>Sternotherus odoratus</i> |
| painted turtle  | <i>Chrysemys picta</i>       |
| slider          | <i>Pseudemys scripta</i>     |

#### INVERTEBRATES

|           |                            |
|-----------|----------------------------|
| blue crab | <i>Callinectes sapidus</i> |
|-----------|----------------------------|

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1. American Fisheries Society. 1980. Common and Scientific Names of Fishes, Special Publication No. 12.
  2. Blaire, W. Frank et al. 1968. Vertebrates of the United States, McGraw-Hill Book Company, New York.