

Aquia Creek

STREVENSON
1991

A SURVEY OF THE FRESHWATER MUSSEL FAUNA
IN AQUIA CREEK ABOVE SMITH LAKE IN
STAFFORD COUNTY, VIRGINIA

by

VIRGINIA DEPARTMENT OF CONSERVATION AND RECREATION
DIVISION OF NATURAL HERITAGE
203 GOVERNOR STREET, SUITE 402
RICHMOND, VIRGINIA 23219

for

DEPARTMENT OF UTILITIES
COUNTY OF STAFFORD
P. O. BOX 339
STAFFORD, VIRGINIA 22554

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Natural Heritage Technical Report #91-4

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This report should be cited as follows:
Stevenson, P. H. 1991. A survey of the freshwater mussel fauna in
Aquia Creek above Smith Lake in Stafford County, Virginia. Virginia
Natural Heritage Technical Report #91-4. Virginia Department of
Conservation and Recreation. Division of Natural Heritage.
Richmond, Virginia. 5 pages.

INTRODUCTION

The County of Stafford is performing a feasibility study of raising the water level of Smith Lake in Stafford County, Virginia. This reservoir occupies a portion of the drainage of Aquia Creek, a tributary of the Potomac River. The area of Aquia Creek most affected by the proposed project is located approximately 1 mile north northwest of the town of Garrisonville. The Virginia Department of Conservation and Recreation, Division of Natural Heritage (DCR-DNH) was requested by the County to undertake a survey of lower Aquia Creek to determine the status of the freshwater mussel fauna and possible impacts of this project on these species and their habitat.

METHODS

Aquia Creek in Stafford County, Virginia was surveyed for the presence of rare freshwater mussels. The area most intensively surveyed was from below the confluence of Aquia Creek and Long Branch downstream to slackwater of the existing impoundment, Smith Lake. The area surveyed is indicated on Figure 1, a selected portion of the U.S.G.S. topographic 7.5 minute map of the Stafford quadrangle. The species of particular focus was the dwarfwedge pearlymussel (Alasmidonta heterodon) a federally and state listed endangered species known to occur in Aquia Creek, Stafford County, Virginia. A review of database records at DCR-DNH indicated that the recent collections of the dwarfwedge pearlymussel in Aquia

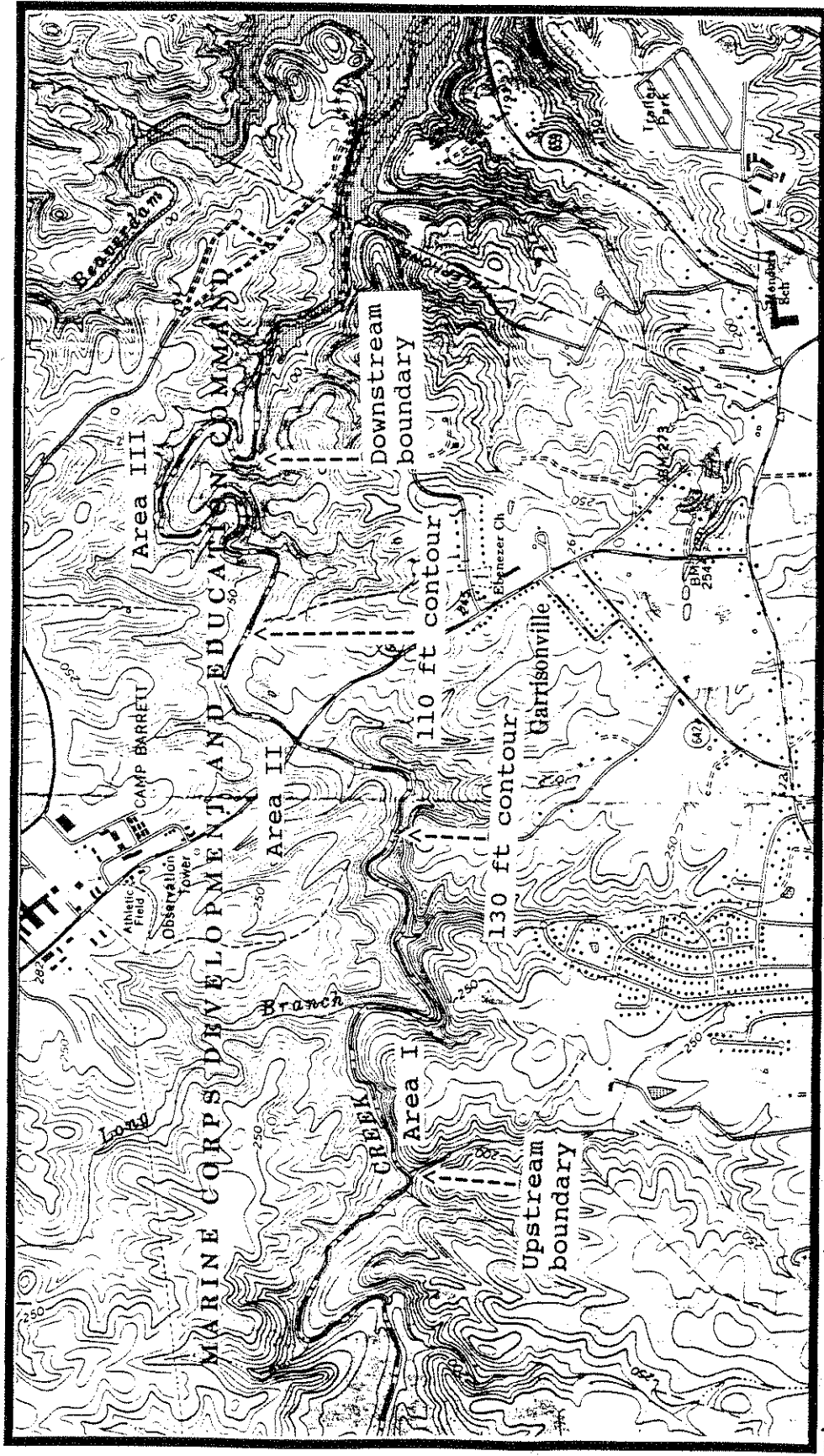


Figure 1 Aquia Creek Survey Area, Stafford County, Virginia

Creek were from the vicinity of the County Route 643 bridge and further upstream. Survey methods included waterscoping, handpicking, and raking the substrate. In addition, stream banks were searched for muskrat middens of discarded shells. Two man days were spent performing field surveys on July 23 and August 2, 1991. Phil Stevenson of DCR-DNH conducted the field survey. Mussel identifications were preliminarily made in the field and then confirmed by M. L. Lipford of DCR-DNH. Voucher specimens will be deposited in the Virginia Museum of Natural History.

RESULTS AND DISCUSSION

The eastern elliptio (Elliptio complanata) was the only mussel found during this survey. This is a very tolerant species which occupies a broad geographic range and a diversity of habitats. The exotic clam, Corbicula fluminea, was also found in the area.

In the survey area, Aquia Creek is typically composed of alternating pools and riffles/rapids. Figure 1 indicates the boundaries of the survey area. The survey area was roughly divided into three reaches of similar character. Area I extended from the upstream boundary of the search area downstream to approximately 0.2 mile below the 130 foot contour level. Stream width tends to be very narrow in this section's riffles. Riffles tend to be under 3 feet in width during summer flow conditions. Pools generally fill the stream bed, are from 20 to 30 feet wide, and represent under 50 percent of linear stream length. In Area I, there is frequently exposed bedrock at the banksides. Area II extends from

Area I downstream to approximately the 110 foot elevation contour. Aquia Creek tends to be composed of long shallow pools with shorter and broader intervening riffles than in Area I. Area III extends from Area II to the downstream end of the survey area. There is a noticeable increase in the extent of riffles; and, this area resembles Area I. Riffles are the dominant habitat again with an exceptionally long riffle leading to the reservoir headwaters.

Riffle habitats tend to have a very coarse substrate, cobbles being the dominant substrate type. They are bordered by lush emergent beds in many situations. The pools tend to have a sandy or muddy substrate type. Pool bottoms, especially in Area II, tend to have a significant growth of filamentous algae on the bottom. All live bivalves were found in the pools. It should be noted that there is much beaver activity on Aquia Creek. Beaver dams were common; 12 active beaver dams were noted in the survey area. A small amount of oil sheeting was observed in the upstream portion of Area II. Also, it was noted that the private landowner immediately downstream of the Route 641 bridge has installed riprap on the stream bank with the related construction activity apparently eliminating the emergent vegetation there.

* The eastern elliptio was an uncommon species in Aquia Creek, only 15 live individuals were found with an additional 20 relict and fresh shells being found. This would indicate that it exists in this portion of Aquia Creek in low numbers. No evidence of any other mussel species was found during this survey. The exotic clam was found to be very common in the pools, especially in sandy or less muddy areas.

Raising the reservoir pool level would alter the lowermost section of Aquia Creek changing it from lotic to lentic habitats. This should not directly effect the population of the dwarfwedge mussel found over 5 miles upstream of the current limit of slackwater. The main influence of reservoir operation would be on the possible fish host of the mussel. Since the reservoir has been in place for many years without the extirpation of the dwarfwedge mussel to date, it is reasonable to assume that the fish that is the mussel's required host for reproduction has not been eliminated from the stream. A rise in reservoir pool level of 20 feet would result in the loss of approximately 0.6 miles of stream habitat. It should not be expected to have a decidedly negative impact on the existing habitat of the dwarfwedge mussel population in upper Aquia Creek.

RECOMMENDATIONS

Evidence of the dwarfwedge pearlymussel's presence was not found within the study area. The anticipated loss of stream habitat should not negatively effect the population of the dwarfwedge mussel found upstream. The proponents of this project should consult directly with the U. S. Fish and Wildlife Service and the Virginia Department of Game and Inland Fisheries to receive management recommendations and to assure that the project meets the requirements of the federal and state endangered species acts.