

Colonel Andrew M. Perkins, Jr.  
U.S. Army Corps of Engineers  
Norfolk District  
803 Front Street  
Norfolk, Virginia 23510-1096

Attn: Ms. Nancy Bland  
Regulatory Branch

Re: Permit Application 93-1240-05,  
Chesapeake Bay Local Assistance Department, Caroline County, Virginia

Dear Colonel Perkins:

This responds to your January 18, 1994 request for formal consultation under Section 7(a)(2) of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), regarding effects of the Department of the Army (DOA) permit application 93-1240-05 by the Chesapeake Bay Local Assistance Department (CBLAD) on the dwarf wedge mussel (Alasmidonta heterodon), a Federally listed endangered species. It should be noted that the dwarf wedge mussel has not been documented at the project site. However, CBLAD has chosen to assume that the species is present since a survey cannot be done at this site during this time of the year and continued funding is of concern. CBLAD has applied for a permit to install scientific measuring devices at five stations in Polecat Creek and its tributaries in Caroline County, Virginia. This letter constitutes the U.S. Fish and Wildlife Service's (Service) Biological Opinion on this permit application, as required by Section 7(b) of the Endangered Species Act.

#### SCOPE OF THE BIOLOGICAL OPINION

CBLAD has applied for a Federal permit to install stilling wells, gage houses, and intake structures in the floodplain of Polecat Creek and its tributaries to monitor physical (e.g., flow), chemical (e.g., nutrients), and biological data over a ten-year period. Polecat Creek is a perennial tributary to the Mattaponi River flowing generally east-southeast across the southern half of Caroline County. The purpose of this project is to determine the effectiveness of land use regulations designed to control nonpoint source pollution. These regulations are being implemented by local governments under the authority of the Chesapeake Bay Preservation Act and Regulations. Funding for this 10-year project is from the Coastal Zone Management Act, U.S. Environmental Protection Agency, and the Virginia General Assembly.

There are five monitoring locations (stations A through E) for this project. Dwarf wedge mussel surveys were conducted at stations A through D, but the species was not found. Since stations A through D are located a significant distance upstream from station E, activities at those stations are not likely to result in adverse effects on any dwarf wedge mussels that may exist at station E. Therefore, the biological opinion will pertain only to station E, which is on the mainstem of Polecat Creek.

The monitoring station will be established through the construction of a stilling well and intake pipe(s) in Polecat Creek. The stilling well will be placed in a hole excavated adjacent to the creek (four to six feet deep with a six-foot radius). The placement of the intake pipe(s) will require the excavation of a trench four feet wide and approximately 10 feet long, at the same depth as the stilling well. The excavation for the intake pipe(s) will be conducted "in the dry" through the use of a sandbag cofferdam that will obstruct approximately one-half of the stream width. The trench will be backfilled; with the entire construction lasting no more than two days. There will be no root grubbing or removal of trees greater than six inches in diameter at elbow height. The streambank will be stabilized with biologs.

The intake pipe will consist of either two, two- to three-inch diameter pipes or one three-inch diameter pipe.

The second pipe is to be used if the first pipe gets clogged. CBLAD will place mesh over the intake pipe(s) to prevent clogging, but some sediment will be sampled through the mesh. Stream water will be sampled once every 28 to 35 days; one liter will be taken. CBLAD will also take 2.5 gallons of water during high flow periods (especially during the spring), as often as once a week. Flow will be measured via a float in the stilling well.

### CONSULTATION HISTORY

Consultation history regarding this project is provided in Appendix A.

### BIOLOGY AND STATUS OF THE DWARF WEDGE MUSSEL

The dwarf wedge mussel is a small (1.5 inches long) freshwater mussel. It is the only North American freshwater mussel that has a right valve with two lateral teeth and a left valve with only one tooth (opposite of all other North American species having lateral teeth). There is some sexual dimorphism in the shape and size of the shell. The dwarf wedge mussel lives in Atlantic drainage rivers and creeks of various sizes where the current is moderate. This species lives on muddy sand, sand, and gravel bottoms (USFWS 1993). To survive, it needs a silt-free, stable streambed and well-oxygenated water that is free of pollutants.

Little is known of the reproductive biology of the dwarf wedge mussel (USFWS 1993). However, reproductive biology appears to be similar among almost all species of freshwater mussels (USFWS 1993). The dwarf wedge mussel is a long-term brooder, spawning in late summer and becoming gravid in September with glochidia maturing in November. Michaelson (1993) estimated that glochidia release occurs in April in North Carolina. Three host fish have been found for this mussel: the tessellated darter (*Etheostoma olmstedii*), the Johnny darter (*E. nigrum*), and the mottled sculpin (*Cottus bairdi*) (Michaelson 1993). The mottled sculpin is not found in the principal range of the dwarf wedge mussel, but it is likely that the slimy sculpin (*C. congatus*) that occurs within this mussel's range is a suitable host (Michaelson 1993).

The dwarf wedge mussel was Federally listed as endangered on March 14, 1990. It is found in the Atlantic coastal plain from North Carolina to New Brunswick. It has been found at about 70 locations in 15 major drainages, however it has been extirpated from all but 20 locations in eight of the 15 drainages (USFWS 1993). In Virginia, extant populations are known from Aquia Creek (Stafford County), Nottoway River (Nottoway and Lunenburg Counties), Cedar and Carter Runs (Fauquier County), Po River (Spotsylvania County), and South Anna River (Louisa County). Historic records are known from Mountain Run (Culpepper County), Marsh Run (Fauquier County), Blue River (Orange County), Ni River (Spotsylvania County), Maury River at Lexington (Rockbridge County), and South Anna River (Hanover County). Michaelson (1993) found that the status of the Aquia Creek populations were fair to good, while the populations in the South Anna and Nottoway Rivers were poor. He listed reproductive status for these three sites as unknown.

The main cause of decline for this species is water quality degradation (Michaelson 1993). Agricultural, domestic, and industrial pollution have resulted in the continuing decline and ultimate loss of this species from previously occupied habitat (USFWS 1993). Impoundments have also resulted in the elimination of mussels from their former habitat (USFWS 1993). Siltation from construction, agriculture, silviculture, and removal of streambank vegetation is also an important factor in the decline of many freshwater mussels, including the dwarf wedge mussel (USFWS 1993). Sediment loads in waterways during periods of high discharge may be abrasive to mussel shells. This erosion of the outer shell may result in the corrosion of the underlying shell layers (USFWS 1993). Feeding mollusks will close their valves during periods of heavy siltation to avoid irritation and clogging of feeding structures (Loar et al. 1980). Excessive siltation can result in death from interference with feeding and suffocation (Ellis 1936). Land use changes may also affect the dwarf wedge mussel. Removal of streambank vegetation affects the physical and biological processes of streams (USFWS 1993). Tree removal alters the amount of organic material and light reaching the stream, impacting both the temperature and dissolved oxygen, which are critical factors for both mussels and fish (USFWS 1993).

Most of the dwarf wedge mussel populations are small and geographically isolated from each other (USFWS 1993). This isolation restricts exchange of genetic material between populations and reduces genetic variability within populations (USFWS 1993). "It is likely that several of these populations are now below the level required to maintain long-term genetic viability" (USFWS 1993). The small population sizes also make this species vulnerable to over-collecting (USFWS 1993). To recover this species (i.e., remove it from the Federal list of threatened and endangered species) habitat with extant populations must be protected and enhanced and populations must be established or enhanced within rivers and river corridors that historically contained the species (USFWS 1993).

#### EFFECTS OF THE FEDERAL ACTION ON THE DWARF WEDGE MUSSEL AND ITS HABITAT

In evaluating the effects of the Federal action under consideration in this consultation, 50 CFR 402.2 and 402.14(g)(3) require the Service to evaluate the direct and indirect effects of the action on the species. Direct impacts to the dwarf wedge mussel associated with this project include the potential to kill and/or injure mussels during construction through use of heavy equipment to excavate the trench for the intake pipe(s). Mussels may also be removed from the stream bed during excavation, resulting in death. Mussels are found at or below the surface of the streambed and thus may be crushed or removed from the stream by heavy equipment. Additional direct effects will occur downstream and slightly upstream resulting from siltation. Siltation will result in harm to mussels through impairing their ability to feed as discussed in Biology and Status of Dwarf Wedge Mussel. However, since instream work will last one to two days, adverse effects from sedimentation will be minimal.

Indirect effects are defined as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). Indirect effects will result from the intake of water during sampling periods that may result in the removal of sperm or glochidia from the water column.

Removal of streamside vegetation is minimal and therefore, not likely to adversely affect the dwarf wedge mussel or its host fishes. Also, since excavating the trench for the intake pipe will not take more than one day and the site will be backfilled within one day, habitat loss is not likely to affect the dwarf wedge mussel.

#### OPINION OF THE SERVICE

Given the minor effects of this project on the total dwarf wedge mussel population, it is the opinion of the Service that this project is not likely to jeopardize the continued existence of the dwarf wedge mussel. No critical habitat has been designated for this species, therefore, none will be affected.

#### INCIDENTAL TAKE

Sections 4(d) and 9 of the Endangered Species Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be implemented by the Corps so that they become binding conditions of any permit issued to the applicant in order for the exemption in 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity that is covered by this incidental take statement. If the Corps fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, the protective coverage of 7(o)(2) may lapse.

### Amount and Extent of Take

Because the population density and total habitat of the dwarf wedge mussel within the project area has not been determined and the actual number of mussels that will be taken during construction by crushing or removal from the streambed or during water sampling is unknown, the amount of take shall be defined by the areal extent of the potential habitat affected. This incidental take statement authorizes the taking of dwarf wedge mussels from 200 meters upstream of station E to 500 meters downstream of station E resulting from construction and water sampling activities.

### Reasonable and Prudent Measures

In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, the Corps and CBLAD must comply with the following reasonable and prudent measures. These measures are mandatory.

The following measures must be taken during construction and maintenance activities associated with the project:

1. The intake trench will be backfilled on the same day it is excavated.
2. Immediately after trench backfill, the disturbed area will be seeded and/or revegetated.
3. Vegetation removal adjacent to the streambank will be minimized.
4. To minimize potential runoff, stumps/root wads will not be removed after vegetation clearing.
5. Instream work must be completed in the dry utilizing non-erodible coffered construction sites.
6. There will be no use of broad scale or aerial herbicide applications in wetlands.

### Reporting and Monitoring Requirements

To monitor any effects on the dwarf wedge mussel from the project, a dwarf wedge mussel survey must be conducted by a qualified individual (see attached list). The survey must be conducted 200 meters upstream and 500 meters downstream of station E between April 1 and September 30, 1994. The Service must be notified of the survey results within 30 days of completion of the survey. The contact for these reporting requirements is as follows:

Virginia Field Office  
U.S. Fish and Wildlife Service  
Mid-County Center, U.S. Route 17  
P.O. Box 480  
White Marsh, VA 23183  
(804) 693-6694

### REINITIATION OF FORMAL CONSULTATION

This concludes formal consultation on this Federal action. As required by 50 CFR 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an adverse effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The Service appreciates the opportunity to work with the Corps in fulfilling our mutual responsibilities under the Endangered Species Act. Please contact Cindy Schulz of this office at (804) 693-6694 if you require additional information or wish to discuss our comments further.

Sincerely,

Karen L. Mayne  
Supervisor  
Virginia Field Office

## REFERENCES

- Ellis, M. M. 1936. Erosion silt as a factor in aquatic environments. Ecology 17:29-42.
- Loar, J. M., L. L. Dye, R. R. Turner, and S. G. Hildebrand. 1980. Analysis of environmental issues related to small-scale hydroelectric development 1. Dredging. ORNL, Environ. Sci. Div. Publ. No. 1565, Oak Ridge, TN. 134pp.
- Michaelson, D. L. 1993. Life history of the endangered dwarf wedge mussel Alasmidonta heterodon (Lea 1829) (Pelecypoda: Unionidae), in the Tar River, North Carolina and Aquia Creek, Virginia. M.S. Thesis. Virginia Tech, Blacksburg, VA. 122pp.
- U.S. Fish and Wildlife Service. 1993. Dwarf wedge mussel (Alasmidonta heterodon) recovery plan. Hadley, Massachusetts. 52pp.

## Appendix A - Consultation History

- 11-05-93 The Service received the Corps' request to review this project for potential impacts to Federally listed species and/or critical habitat.
- 11-18-93 The Service sent the Corps a letter indicating no comment on this project regarding Federally listed species or critical habitat.
- 11-22-94 The Corps notified the Service that Polecat Creek was on the Virginia Department of Game and Inland Fisheries' (VDGIF) list of streams that contained potential habitat for the dwarf wedge mussel.
- 11-22-94 The Service sent the Corps a letter indicating that a survey for the dwarf wedge mussel was necessary.
- 01-18-94 The Service received the Corps' request for initiation of formal consultation.
- 01-25-94 The Service visited the five stations associated with this project with the Corps, VDGIF, Department of Environmental Quality, a mussel consultant, and CBLAD.
- 02-10-94 The Service received a copy of the dwarf wedge mussel survey results.

SURVEY CONTACTS FOR

ATLANTIC SLOPE FRESHWATER MUSSELS

Dr. Richard J. Neves  
Virginia Cooperative Fish and Wildlife Research Unit  
106 Cheatham Hall  
Virginia Polytechnic Institute and State University  
Blacksburg, VA 24061  
(703) 231-5927

Sue Bruenderman  
Virginia Department of Game and Inland Fisheries  
2206 S. Main Street  
Blacksburg, VA 24060  
(703) 552-6992

Phil Stevenson  
P.O. Box 17144  
Richmond, VA 23226  
(804) 282-6473

Dr. Tom Watters  
171 Wells Street  
Marietta, OH 45750-3461  
(614) 373-9501

Dr. Arthur Bogan  
36 Venus Way  
Sewell, NJ 08080  
(609) 582-9113

Steve Roble  
Virginia Department of Conservation and Recreation  
Division of Natural Heritage  
1500 East Main Street, Suite 312  
Richmond, VA 23219  
(804) 786-7951

Mr. John Alderman  
Route 4, Box 518  
Pittsboro, NC 27312  
(919) 542-5331

Dr. Bill Adams  
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Wilmington, NC 28402-1890

Dr. Gene Kieferi  
Department of Natural Science  
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Brunswick, GA 31523  
(912) 264-7233

Inclusion of names on this list does not constitute endorsement by the Service nor any other U.S. Government agency.

November 5, 1993

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bcc: DARD-ES(FO) Hadley, MA  
Supervisor, CBFO  
Andy Moser, CBFO  
VDGIF, Richmond, VA  
    (ATTN: Bret Preston)  
    (ATTN: Sue Bruenderman)  
Division of Natural Heritage  
    Virginia Department of Conservation and Recreation  
LE, Richmond