Mr. James M. Tumlin
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Federal Highways Administration
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Colonel Andrew M. Perkins, Jr.
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

ATTN: Mr. Bob McCarty, FHWA
Ms. Alice Allen-Grimes, Corps

Re: Route 40, Nottoway and Lunenburg Counties
VDOT Project #: 0040-067-V02,PE-101

Gentlemen:

This responds to the March 4, 1994 request from the Federal Highway Administration (FHWA) 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 Virginia Department of Transportation (VDOT) permit application 0040-067-V02,PE-101 on the dwarf wedge mussel (Alasmidonta heterodon), a Federally listed endangered species. VDOT has applied for a permit to replace the existing bridge over the Nottoway River in Nottoway and Lunenburg Counties, Virginia with a 4-lane bridge including the replacement of the six existing piers. This letter constitutes the Biological Opinion of the U.S. Fish and Wildlife Service (Service) on this permit application, as required by Section 7(b) of the Endangered Species Act.

SCOPE OF THE BIOLOGICAL OPINION

VDOT has applied for a Federal permit to replace the structurally insufficient and functionally obsolete 2-lane bridge over the Nottoway River with a new 4-lane bridge. The new bridge will consist of a total of six piers, four of which will be located in the Nottoway River. The geographic limits of this project and its potential impacts to the dwarf wedge mussel will include the area of the Nottoway River located between 200 meters upstream of the existing bridge and 800 downstream of the bridge.

During a recent survey conducted by Dr. Richard Neves of the Virginia Polytechnic Institute and State University for VDOT, five specimens of dwarf wedge mussels were surveyed within the 1000 meter zone located between 200 meters upstream and 800 meters downstream of the Route 40 bridge. Four of these specimens were found approximately 450 meters downstream of the existing bridge. The other specimen was collected approximately 10 meters downstream of the existing bridge.

The existing bridge measures 25 feet wide by 255 feet in length and is supported by six piers. Four of the existing piers are currently in the water and the footprint of these piers totals 113 square feet. The proposed bridge will be 44.5 feet wide by 285 feet long and will be supported by six piers.
The proposed bridge will be built during two phases of construction. In order to remove the existing bridge and construct the new one, construction of a workbridge will be necessary. Wood pilings driven into the river bottom will be necessary for workbridge construction.

During phase one, a superstructure 16 feet, 8 inches wide with pier caps 25.5 feet wide will be constructed adjacent to and on the downstream side of the existing bridge. Three piers will be built to support this bridge but only two of these piers will be located in the Nottoway River. The footprint of these piers will have a total footprint area of 214 square feet. Each pier will include two columns.

Upon completion of this new section, traffic will be diverted from the old bridge to the new bridge section and the old bridge will be dismantled by the use of a workbridge. The old bridge piers will be removed at the level of the river bottom. Explosives will be used to fracture the old pier footers before removal of all footer material.

Phase two of the project will consist of construction of the second half of the new bridge by use of a workbridge. This will include construction of a 31 foot-wide superstructure on the same alignment as the old bridge using cofferdams. Only two of the three piers will be located in the Nottoway River, the footprint of which will displace 440 square feet of river bottom.

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 stable streambed with little silt deposition and well-oxygenated water that is free of pollutants.

The dwarf wedge mussel was Federally listed as endangered on March 14, 1990. It was found historically in the Atlantic coastal plain from North Carolina to New Brunswick. It was found in about 70 locations in 15 major drainages; however, it is now extant in only 28 locations in eight drainages. In Virginia, extant populations are known from Aquia Creek (Stafford County), Nottoway River (Nottoway and Lunenberg Counties), Cedar and Carter Runs (Fauquier County), Po River (Spotsylvania County), and South Anna River (Louisa County). Historic records are known from Mountain Run (Culpeper 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) categorized the status of the Aquia Creek population as fair to good, while the populations in the South Anna and Nottoway Rivers were considered poor. He listed reproductive status for these three sites as unknown. During a recent survey conducted by Dr. Richard Neves of the Virginia Polytechnic Institute and State University for VDOT, five specimens of dwarf wedge mussels were found within the 1000 meter zone located between 200 meters upstream and 800 meters downstream of the Route 40 bridge. Four of these specimens were found approximately 450 meters downstream of the existing bridge. The other specimen was collected approximately 10 meters downstream of the existing bridge.

The dwarf wedge mussel is considered to be a long-term brooder. Long-term brooders typically spawn in late summer and become 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 tesselated darter (Etheostoma olmstedi), 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 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. Mussels may be killed or stressed due to siltation of the stream from construction-related activity. Cofferdam construction and use may kill or injure mussels by crushing or covering them, creating high turbidity in the water column, or by dewatering the streambed within the cofferdam. Mussels may also be removed from the streambed 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. As stated above, direct effects will occur downstream and slightly upstream due to siltation. Siltation will result in harm to mussels through impairing their ability to feed as discussed in Biology and Status of Dwarf Wedge Mussel.

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 to adult and larval mussels will result from siltation during rain events both during and after construction. Removal and disturbance of streamside vegetation will encourage erosion from the site thereby increasing turbidity in the Nottoway River.

The geographic scope of the direct and indirect effects resulting from this project will be that portion of the Nottoway River between 200 meters upstream of the existing bridge and 800 meters downstream

of this bridge. Impacts of this project may be avoided or minimized by limiting the time of year in which instream construction occurs, employing necessary measures to limit siltation in the waters of the Nottoway River, and by translocating individuals located in this portion of the river to safer areas up or downstream.

OPINION OF THE SERVICE

Given the relatively minor scope 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 this species. 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.

Pursuant to 50 CFR 402.14(g)(7), the Service is to formulate a statement concerning the incidental take of a listed species. This statement must include the level of take that is anticipated to occur due to the Federal action. The Service is to develop, and the Federal agency and/or applicant is to implement, reasonable and prudent measures that will minimize the impacts of the action on the species. In addition, the Service must set the terms and conditions with which the Federal agency must comply. If the level of incidental take is exceeded, formal consultation under Section 7 must be reinitiated.

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

The Service anticipates that incidental take of dwarf wedge mussels may occur during construction in the form of direct killing of an unknown but small number of individuals and harm of an unknown

number of individuals due to physical disturbance, siltation, and other water quality degradation, in that portion of the Nottoway River from 200 meters upstream of the Route 40 bridge to 800 meters downstream of the bridge.

REASONABLE AND PRUDENT MEASURES TO MINIMIZE TAKE

The incidental take statement provides measures that are necessary or appropriate to minimize take of the listed species. Such measures should decrease the level of take to the maximum extent possible or describe methods by which to replace the capability of the population or habitat to support preactivity levels. These measures are to be reasonable and prudent, meaning that the nature of the corrective action required is commensurate with the impact on the species/habitat. Such measures are to be within the authority or capability of the agency or applicant to perform, and should not alter the basic purpose, location, scope or duration of the Federally permitted action.

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize take:

o Construction must be conducted during the time of year when impacts to the dwarf wedge mussel reproductive cycle is minimized. The worst time of the year for construction is during April through June and August through September when dwarf wedge mussels are releasing glochidia and spawning, respectively.

o Siltation of the water column of the Nottoway River must be minimized to the maximum extent possible to avoid stress or death of dwarf wedge mussels.

o Activity within the Nottoway River must be minimized to avoid siltation and physical injury to dwarf wedge mussels. No machinery will be allowed in the river and human traffic in the river must be minimized and confined to the area of the existing bridge. Workbridge supports and cofferdams must be located as close to the existing bridge as possible.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, the Virginia Department of Transportation should be made responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions must be incorporated as binding conditions of any Corps permit or any funding agreement issued by FHWA.

1. No instream work will be allowed during the time period of April 15 through June 30 and

August 15 through September 30 (inclusive), of any year to allow for spawning and glochidial release of the dwarf wedge mussel.

2. No mechanized equipment will be allowed in the river or its adjacent waters. Any equipment operated from the adjacent shoreline will operate from a rock construction pad or be placed on a mat to reduce sedimentation into the Nottoway River.

3. Construction access to the northwestern quadrant of the work area must be provided across the intermittent portion of the unnamed tributary only and not the permanently flooded arm of the Nottoway River (see Figure 1). Construction vehicle passage across the intermittent portion of the unnamed tributary will be provided by a pipe culvert. The associated roadway must be treated for sediment and erosion control as specified in the Virginia Erosion and Sediment Control Handbook. All floodplain and wetland fill must be removed from the construction area immediately upon the termination of construction and resultant exposed soils will be stabilized and seeded immediately following disturbance.

4. Causeway construction will not be allowed for bridge construction within the Nottoway River. Workbridge construction in subaqueous bottom will be allowed no further upstream than within 20 feet of the most upstream portion of the existing bridge.

5. Vegetation removal adjacent to the streambank will be minimized. Trees will be felled on land rather than into the waters of the Nottoway River.

6. To minimize potential runoff, stumps/root wads will not be removed after vegetation clearing.

7. Instream work must be completed in the dry using non-erodible cofferdams. Water within the cofferdams will be pumped into sedimentation control basins.

8. Human traffic within the river during construction will be minimized.

9. No excavation of the stream bottom will be allowed outside of cofferdams.

10. Sediment and erosion controls must be strictly adhered to in accordance with the Virginia Erosion and Sediment Control Handbook. All exposed soils will be stabilized and seeded immediately following disturbance.

11. All portions of the existing bridge will be removed from its existing location and will not be allowed to enter the river after removal from the bridge. All debris will be contained and removed from the site.

12. VDOT biologists must visit the project site weekly during construction to assure that all

reasonable and prudent measures are adhered to. If violations of these reasonable and prudent measures occur, VDOT must stop work and notify FHWA, the Corps, the Service, and the VDOT Aquatic Ecology Chief immediately, and remedial measures to correct the violation must be completed within 24 hours of their discovery.

13. During September 1 through October 15 of each year prior to and during construction, FHWA will contract a Service-approved mussel expert (see attached list) to remove all dwarf wedge mussels from the Nottoway River from 40 meters upstream to 40 meters downstream of the bridge. The Service must approve the methods used to relocate and mark the mussels.

Any dwarf wedge mussels collected will be placed in the Nottoway River in a site approved by the Service. Prior to release, all mussels will be marked using standard marking techniques to allow for monitoring survival rates the following year.

REPORTING AND MONITORING REQUIREMENTS

VDOT must contact the Service four weeks before initiation of construction to ensure proper coordination on this project and implementation of the terms and conditions of the incidental take statement.

To monitor any effects on the dwarf wedge mussel from this project, a dwarf wedge mussel survey must be conducted by a qualified individual (see attached list) each year prior to and during construction and the year after construction is completed in that area from 200 meters upstream to 800 meters downstream of the bridge. The design of the survey plan must be approved by the Service. During these surveys, the surveyor will record the number and species of all specimens marked during translocation the previous year and whether the specimens were found alive or dead. VDOT must submit a copy of survey and monitoring results to the Service within 30 days after completion of the survey and monitoring. 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

Upon locating a dead mussel specimen, initial notification must be made to the following Service Law Enforcement office:

Division of Law Enforcement
U.S. Fish and Wildlife Service
P.O. Box 187
Yorktown, VA 23690
(804) 890-0003

Care should be taken in handling dead specimens to preserve biological material in the best possible state. In conjunction with the preservation of biological materials for a dead animal, the finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

CONSERVATION RECOMMENDATIONS

The Service may provide with the biological opinion a statement containing discretionary conservation recommendations. Conservation recommendations are advisory and are not intended to carry any binding legal force. In order to protect the diverse mussel fauna in the Nottoway River near the construction area and in order to provide protection for the Federal candidate and State threatened Atlantic pigtoe mussel (Fusconia masoni), the Service recommends removing all mussels from the Nottoway River from 40 meters upstream to 40 meters downstream of the bridge. All mussels collected will be placed in the Nottoway River in a site approved by the Service.

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, all activities that are causing such take must cease until such time as any necessary consultation is completed in order to avoid violation of Section 9 of the Endangered Species Act.

The Service appreciates the opportunity to work with FHWA and the Corps in fulfilling our mutual responsibilities under the Endangered Species Act. Please contact William Hester 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

Attachment

cc: Mr. Steve Long
VDOT, Richmond, VA

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

10-93 Final report submitted to VDOT by Dr. Richard Neves of Virginia Polytechnic and State University, on the survey of the freshwater mussel fauna at the proposed project location.

11-23-93 Interagency site visit to proposed project location.

12-07-93 VDOT presents project at the interagency coordination meeting.

12-17-93 Service letter to FHWA stating that the project "may affect" the dwarf wedge mussel (Alasmidonta heterodon) and informing FHWA that formal consultation would be necessary.

3-7-94 Service receives request from FHWA to initiate formal consultation.

5-6-94 Letter from Service to FHWA acknowledging receipt of letter to initiate formal consultation and stating that the Biological Opinion for this project would be due no later than July 20, 1994.

SURVEY CONTACTS FOR
ATLANTIC SLOPE FRESHWATER MUSSELS

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Inclusion of names on this list does not constitute endorsement by the Service nor any other U.S. Government agency.
November 5, 1993

bcc: DARD-ES(FO) Hadley, MA
Supervisor, CBFO
(ATTN: Andy Moser)
VDGIF, Richmond, VA
(ATTN: Bret Preston)
(ATTN: Mike Pinder)
Division of Natural Heritage
Virginia Department of Conservation and Recreation
USFWS-LE, Yorktown, VA
VAFO, White Marsh, VA
(ATTN: Cindy Schulz)
(dwarf wedge mussel file)

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