

September 8, 1998

Colonel Allan B. Carroll
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

Attn: Mr. David Byrd
Regulatory Branch

Re: Route 649, Spotsylvania County,
Virginia - VDOT Project #: 0649-
088-233, C501

Dear Colonel Carroll:

The U.S. Fish and Wildlife Service has reviewed project plans for the Virginia Department of Transportation (VDOT) project number 0649-088-233, C501. VDOT proposes to replace the existing box culvert and bridge over the old Po River channel and the Mill Race at their intersection with Route 649 in Spotsylvania County, Virginia (Figure 1). Your April 27, 1998 request for formal consultation was received by the Service on May 4, 1998. This document represents the Service's biological opinion on the effects of that action on the dwarf wedge mussel (*Alasmidonta heterodon*) in accordance with Section 7 of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 et seq.). A complete administrative record of this consultation is on file in this office.

I. CONSULTATION HISTORY

Consultation history regarding this project is provided in Appendix A.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

VDOT has applied for a Department of the Army permit to reconstruct the existing 2-lane bridge and box culvert over the Po River in Spotsylvania County, Virginia. Construction is scheduled to take place

during the summer through fall of 1999. This portion of Route 649 is currently closed to traffic.

The proposed project involves replacing two separate structures on the existing mill pond dam. The first bridge structure is over the existing mill pond spillway on the original Po River channel. This channel is upper perennial and typically has no flow for approximately 30 days each year. The existing bridge at this location will be replaced with a quadruple box culvert equipped with a special design weir wall to maintain the pool elevation of the existing pond. Instream work to install this box culvert should take a minimum of four months. Construction would involve the excavation of 1053 cubic yards of material over an area of 1800 square feet that includes the removal of the existing crossing. It would also involve the placement of 72 cubic yards of material over an area of 1280 square feet, which includes a 43 foot 4 inch long by 29 foot wide quadruple box culvert, a 50 foot wide by 6 foot 6 inch concrete apron on the downstream side and a 77 foot wide by 10 foot wide riprap splash apron. Construction will also include the placement of a 43 foot 4 inch long by 15 foot wide weir, on the upstream side to maintain existing pond water levels.

The second structure involves replacement of the bridge on the Mill Race channel, which has become the main channel of the Po River. The existing bridge is 26 feet long and will be replaced with a double box culvert, the instream portion of which will take approximately two months to construct. Construction would involve excavation of 146 cubic yards of material and placement of 177 cubic yards of material over an area of 1015 square feet including the placement of the double box culvert measuring 23 feet 6 inches long and 34 feet wide. Construction of this structure would also involve 10 foot long wing walls and a 35 foot long by 10 foot wide riprap splash apron on the downstream side.

Construction will include the filling of approximately 0.06 acres of wetlands and waters of the U.S. Wetland fill will be contained to prevent additional encroachment into waters of the United States. All instream construction will be done in the dry by use of cofferdams or a "Port a dam" type of containment structure.

RANGEWIDE STATUS OF THE DWARF WEDGE MUSSEL

Life History - 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 is considered to be a long-term brooder. Long-term brooders typically spawn in late summer and become gravid in September, with glochidia larvae 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 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*), which occurs within this mussel's range, is a suitable host (Michaelson 1993).

Status of the Species Within its Range - 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 in about 70 locations in 15 major drainages. It is now extant in only 28 locations in eight drainages in Vermont, New Hampshire, Connecticut, New York, Pennsylvania, Maryland, Virginia, and North Carolina. Shells were discovered in the Pequest River drainage, Warren County, New Jersey in 1995 and 1996, but no live specimens have been found. In Virginia, extant populations are known from Aquia Creek (Stafford County), Nottoway River (Nottoway, Lunenburg, and Sussex Counties), Carter Run (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.

Threats to the Species - 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 suffocation and interference with feeding (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).

Recovery Goals and Accomplishments - To recover the dwarf wedge mussel (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). This can be accomplished by (1) protecting and enhancing habitat containing *A. heterodon* populations and (2) establishing or expanding populations within rivers and river corridors that historically contained this species (U.S. Fish and Wildlife Service 1993).

Several accomplishments to further identify the status and initiate recovery of the species have occurred since the recovery plan (U.S. Fish and Wildlife Service 1993) for this species was published. They are listed below:

- o Ongoing research and production of mussels in the laboratory at Virginia Polytechnic Institute and State University for eventual augmentation of existing dwarf wedge mussel populations and reintroduction of the species into potentially suitable habitat. Funding of this project has been provided by the U.S. Fish and Wildlife Service, Virginia Department of Game and Inland Fisheries, and Tennessee Wildlife Resources Agency.
- o Partial completion of Tasks 1 - 7 in the dwarf wedge mussel recovery plan (U.S. Fish and Wildlife Service 1993) since listing of this species as federally endangered. Tasks 1-3 include collecting data to protect existing populations, preserving existing populations and occupied habitats, and fostering species protection through education. Task 4 is to conduct life history studies and identify the ecological requirements of the species. Some host fish species have been verified, additional investigations are ongoing. Studies regarding reproduction, glochidia identification, movement and habitat are also currently underway in the northern portion of the range in Massachusetts and New Hampshire. Tasks 5-7 include re-establishing populations in its former range where feasible, monitoring population levels and habitat conditions, and periodically assessing recovery success and recommending appropriate changes to recovery objectives.
- o Evaluation by Virginia Polytechnic Institute and State University of the effects of sedimentation on mussels and methods to augment or reintroduce populations.
- o Completion of numerous dwarf wedge mussel surveys, since the species was listed in 1990, to document its current distribution. Additional populations have been found in Virginia, New Hampshire, Vermont, Massachusetts, Connecticut, and New Jersey. In Canada however, the dwarf wedge mussel population has been confirmed to be historic.

ENVIRONMENTAL BASELINE

As defined in 50 CFR 402.02, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas. The "action area" is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The direct and indirect effects of the actions and

activities resulting from the federal action must be considered in conjunction with the effects of other past and present federal, state, or private activities, and the cumulative effects of reasonably certain future state or private activities within the action area.

Description of the Action Area - The action area for this biological opinion consists of that portion of the Po River from Route 649 downstream approximately 900 meters and including the Mill Race and the old Po River channel.

Status of the Dwarf Wedge Mussel in the Action Area - A team from Virginia Polytechnic and State University conducted a mussel survey of the action area on May 15, 1998. The survey was conducted from the proposed project location downstream approximately 900 meters. Both the main channel of the Po River and Mill Race were surveyed. One specimen of the dwarf wedge mussel was found in Mill Race approximately 220 meters (VDOT 1998) downstream of the proposed construction area. Fourteen dwarf wedge mussels were found in the Po River channel downstream of the confluence with Mill Race, between approximately 220 and 900 meters downstream of the proposed construction area. Survey procedures and sampling consisted of snorkeling the stream within the designated reach. Stream banks and margins were checked for muskrat middens and incidental shells. The survey consisted of approximately 14 man-hours.

EFFECTS OF THE ACTION

Direct Effects - 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 associated with this project include the potential to kill and/or injure the dwarf wedge mussel during construction through use of heavy equipment. The dwarf wedge mussel may be killed or stressed due to siltation of the stream from construction-related activity. Mussels are found at or below the surface of the streambed and thus may be crushed by instream work. 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 Threats to the Species.

Indirect Effects - 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 after construction. Removal and disturbance of streamside vegetation will encourage erosion from the site thereby increasing turbidity in the Po River and Mill Race.

Cumulative Effects - Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Endangered Species Act. Cumulative effects likely

to impact the dwarf wedge mussel in the future include ongoing siltation, and toxics inputs into the waterway from the bridge and roadway in the action area.

CONCLUSION

After reviewing the current status of the dwarf wedge mussel throughout its range and in the action area, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the dwarf wedge mussel. No critical habitat has been designated for these species, therefore, none will be affected.

III. INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA, 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. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant. 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.

AMOUNT OR EXTENT OF TAKE

The Service anticipates that incidental take of dwarf wedge mussels may occur during construction in the form of harm of an unknown number of individuals due to physical disturbance, siltation, and other water quality degradation, in that portion of the Po River from the construction sites on Route 649 to 900 meters downstream.

REASONABLE AND PRUDENT MEASURES

The measures described below are nondiscretionary, and must be implemented by the Corps of Engineers so that they become binding conditions of any permit issued to the applicant in order for the exemption in Section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) 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, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse. The Service considers the following reasonable and prudent measures to be necessary and appropriate to minimize take of the dwarf wedge mussel.

- o Construction must be conducted during the time of year when impacts to the dwarf wedge mussel reproductive cycle is minimized. Construction must be avoided during in Mill Race during glochidial release and spawning. Construction must be avoided in the old Po River channel during glochidial release.
- o Siltation of the water column of the Po River must be minimized to the maximum extent possible to avoid stress or death of dwarf wedge mussels.
- o Activity within the old Po River channel and Mill Race 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 and box culvert. Cofferdams or “Port a dams” must be located as close to the existing bridge and culvert as possible.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline the required reporting/monitoring requirements. Monitoring is not required for this project because only a small number of the dwarf wedge mussels are likely to be affected by the proposed project and the anticipated take is minimal. These terms and conditions are nondiscretionary.

1. For the Mill Race construction, no instream work will be conducted during the time period of April 15 through June 15 and August 15 through September 30 (inclusive), of any year to allow for glochidial release and spawning of the dwarf wedge mussel.

For the old Po River channel construction, no instream work will be conducted during the time period of April 15 through June 30 (inclusive), of any year to allow for 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 Po River and Mill Race.
3. 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. Vegetation removal adjacent to the streambank will be minimized. Trees will be felled on land rather than into the waters of the old Po River channel and Mill Race.
 5. To minimize potential runoff, stumps/root wads will not be removed after vegetation clearing.
 6. Human traffic within the river during construction will be minimized.
 7. All portions of the existing bridge will be removed from their existing locations and will not be allowed to enter the river after removal from the bridge. All debris will be contained and removed from the site.
 8. All instream construction will be accomplished in the dry using non-erodible cofferdams or "Port a dams." No stream bottom excavation will be allowed outside of cofferdams or "Port a dams."
 9. VDOT will maintain a minimum of 50% of the existing flow downstream of the construction area at all times.
 10. All return flows from the instream construction area shall first pass through a dewatering facility to minimize instream siltation.
 11. All maintenance of temporary and permanent sedimentation and erosion control facilities shall be carried out in accordance with Section 1.7 of the Virginia Erosion and Sediment Control Handbook Regulations (VR 625-02-00). During the period that the project site is under construction, the contractor will be responsible for inspection of the sedimentation and erosion control facilities on a daily basis. Any damage discovered will be repaired promptly by the contractor.
 12. VDOT is required to notify the Service before initiation of construction and upon completion of the project at the address given below. All additional information to be sent to the Service should be sent to the following address:

Virginia Field Office
U.S. Fish and Wildlife Service
P.O. Box 99
6669 Short Lane

Gloucester, VA 23061
Phone (804) 693-6694
Fax (804) 693-9032

13. Care must be taken in handling any dead specimens of proposed or listed species that are found in the project area to preserve biological material in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, notify the Service at the address provided in number 12 above.

IV. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans and other recovery activities, or to develop information to benefit the species.

In order to determine the impacts of this project on the dwarf wedge mussel population within 900 meters downstream of the project construction areas, the Service recommends that VDOT conduct a followup survey of the old Po River channel and Mill Race, post construction. The survey should be conducted during the same season as the last survey prior to construction. Such information would greatly aid the Service in making future recommendations on the need to consult formally on similar projects with the Corps.

In order for the Service to be kept informed of actions that minimize or avoid adverse effects or benefit listed species or their habitats, the Service requests notification of the implementation of this conservation recommendation by the Corps and/or VDOT.

V. REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the Corps request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat 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.

If this opinion does not contain national security or confidential business information, the Service will provide copies to the appropriate state natural resource agencies ten business days after the date of this opinion.

The Service appreciates the opportunity to work with the Corps in fulfilling our mutual responsibilities under the Endangered Species Act. Please contact William Hester of this office at (804) 693-6694, ext. 134 if you require additional information or wish to discuss our comments further.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

Attachment

cc: Mr. Ricky Woody
V DOT Headquarters, Richmond, VA
Mr. Bob Pickett
V DOT, Fredericksburg District 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,

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. M.S.
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122pp.

U.S. Fish and Wildlife Service. 1993. Dwarf wedge mussel (*Alasmidonta heterodon*) recovery plan. Hadley, Massachusetts. 52pp.

Virginia Department of Transportation. July 20, 1998. Letter from Ms. Kimberly A. Vanness of VDOT, to Mr. William Hester.

Appendix A - Consultation History

- 10-21-97 VDOT presents Route 649 project for early coordination at interagency meeting in Richmond, Virginia.
- 12-2-97 VDOT presents Route 649 project for early coordination at interagency meeting in Richmond, Virginia.
- 12-16-97 A visual survey of the project area was completed by Braven B. Beaty and Richard Neves of Virginia Polytechnic Institute and State University. The surveyors concluded that suitable dwarf wedge mussel habitat existed at the project site.
- 1-20-98 Letter to Service from VDOT stating that the project has the potential to affect the dwarf wedge mussel and stating numerous conditions to which VDOT would be willing to adhere in lieu of entering into formal Section 7 consultation.
- 2-17-98 VDOT presents Route 649 project at interagency meeting in Richmond, Virginia.
- 5-4-98 Service receives request from Norfolk District Corps of Engineers to initiate formal consultation.
- 5-98 Final report submitted to VDOT by Braven B. Beaty and Dr. Richard Neves of Virginia Polytechnic and State University, on the survey of the mussel fauna at the proposed project location.
- 6-5-98 Letter from Service to Corps acknowledging receipt of letter to initiate formal consultation and stating that the Biological Opinion for this project would be due no later than September