

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6669 Short Lane
Gloucester, VA 23061

Colonel David L. Hansen
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510-1096

Attn: Ms. Alice Allen-Grimes
Regulatory Branch

Re: Corps Permit Applications 02-4073
and 02-4074, VDOT, Botetourt
County, Virginia

Colonel Hansen:

The U.S. Fish and Wildlife Service (Service) has reviewed project plans for the referenced projects, Virginia Department of Transportation (VDOT) project numbers 0817-011 and 0770-011. The U.S. Army Corps of Engineers (Corps) proposes issuing two Department of the Army permits under Nationwide Permit Number 3 (in effect for 5 years) pursuant to Section 404 of the Clean Water Act. The permits would authorize the maintenance of two existing fords in Botetourt County, Virginia. Both fords cross Craig Creek, one between County Route (CR) 817 and the Hanner property, the other between CR 770 and the Carter property (enclosed map). The Service received a request for formal consultation from the Corps on March 29, 2002. This document represents the Service's biological opinion on the effects of these actions on the James spiny mussel (*Pleurobema collina*) 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

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| 5/01/00 | Letter from VDOT to Service requesting comments regarding potential impacts of maintenance of twelve open fords to the James spiny mussel. |
| May, 2000 | Service recommends James spiny mussel surveys at eight of the maintained fords. |
| 12/04/00 | Service receives survey results reporting occurrence of James spiny mussel in vicinity of |

Hanner and Carter fords.

- 3/29/02 Service received the Corps' request to initiate formal consultation.
- 04/09/02 Letter from Service to the Corps stating that a biological opinion would be provided to the Corps by August 11, 2002.
- 05/14/02 Service participated in site visit with VDOT.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

VDOT has applied to the Corps for two Federal permits under Section 404 of the Clean Water Act to grade streambed materials (cobble and gravel) to maintain two existing vehicle fords across Craig Creek in Botetourt County, Virginia. As vehicles use the fords, rocks along the streambed are shifted to the downstream side of the ford. The shifted rocks eventually form a small berm in the streambed, which makes the fords too deep for vehicles to cross. VDOT proposes using a motor grader to move the rocks back upstream to the fords. The motor grader is a diesel fueled, wheeled vehicle slightly larger than a pickup truck with a hydraulically-operated bulldozer-like attachment on the front to spread the rocks. This action will disturb an approximate 10 meter wide strip across the creek, immediately downstream of the ford, and the ford itself. This maintenance would be conducted twice a year, once in fall and once in spring, over a period of five years.

RANGEWIDE STATUS OF THE JAMES RIVER SPINYMUSSEL

Life History - The James spiny mussel is a small, filter-feeding freshwater mussel with a maximum size of approximately 3 inches. This species is endemic to the James River Basin in Virginia, although recent evidence indicates it may also occur in the Roanoke Basin of Virginia and North Carolina. It feeds on plankton collected from water passed over its mucous-lined gills, thereby consuming large quantities of micro-organisms and inert organic material from the water column (Fuller 1977).

The shell of the James spiny mussel is subrhomboid in juveniles with an obliquely subtruncated posterior, widely-spaced concentric striations, a shiny, straw-colored periostracum, and with or without spines on each valve. With growth the shell becomes more ovate or even arcuate, develops a rounded posterior and a brownish-black periostracum, and in most cases loses any spines it may have had. In the adult, the posterior ridge is also broad and rounded, hinge teeth are medium-sized but strong and completely developed, and nacre is whitish and with or without pink or bluish suffusions (Clarke and Neves 1984).

The James spiny mussel is considered to be a short-term brooder. Both spawning and glochidial (larval) release occur between approximately May 15 and July 31. Male mussels release sperm into the water

column in the spring; the sperm is then taken in by females during siphoning. Fertilized eggs are retained in the gills, which serve as brood pouches for the developing glochidia. The glochidia eventually drop off the female's gills, enter the water column, and attach to an appropriate host fish. Known fish hosts include the bluehead chub (*Nocomis leptcephalus*), rosyside dace (*Clinostomus funduloides*), blacknose dace (*Rhinichthys atratulus*), mountain redbelly dace (*Phoxinus oreas*), rosefin shiner (*Notropis ardens*), satinfin shiner (*Notropis analostanus*), common shiner (*Luxilus cornutus*), pumpkinseed (*Lepomis auritus*), fantail darter (*Etheostoma flabellare* Rafinesque) and stoneroller (*Campostoma anomalum*).

Status of the Species Within its Range - The James spiny mussel was listed as a federally endangered species on July 22, 1988 (50 CFR 17.11). It was historically widespread in the James River drainage. A.H. Clarke surveyed 73 potential and/or historic locations for the species, but was able to find the James spiny mussel at only six of these sites (Clarke and Neves 1984). Based on this extensive field sampling of potential and historic habitats, in addition to other more recent survey data including two new assumed populations found in 2000 and 2002 year in the South Mayo and Dan waterways, the species is now known to inhabit sites in 17 waterways in Albemarle, Alleghany, Amherst, Botetourt, Craig, Henry, and Patrick County, Virginia, Caswell Rockingham, and Stokes Counties, North Carolina, and Monroe County, West Virginia (U.S. Fish and Wildlife Service 1990) (R. J. Neves, Virginia Tech, personal communication, 2002, D. Suiter, U.S. Fish and Wildlife Service, personal communication, 2002, Beaty and Neves 1997, Stephenson 1997, Lipford 1991, Hove 1990).

Although it is probable that the decline of the James spiny mussel began with municipal growth and industrialization of cities and towns in the James River watershed, much of the decline has occurred in the last 30 years. A 2000 survey documented a 23 percent decline in the South Fork Potts Creek population between 1995 and 2000 (Ensign and Neves 2000). The species remained widespread through the mid-1960s, but now appears to be extirpated from approximately 90 percent of its historic range, with survival documented only in a few creeks and small rivers in the upper James River and Roanoke drainages. This restricted distribution makes the species vulnerable to threats such as water quality perturbations, disease, and displacement by expanding populations of the exotic Asian clam (*Corbicula fluminea*) (U.S. Fish and Wildlife Service 1990)

Threats to the Species - The main causes for decline of this species are thought to be siltation, invasion of the Asian clam, impoundment of rivers, and water pollution. Siltation generated by road and urban construction, agriculture, and forestry practices have contributed to water quality problems and the decline of the James spiny mussel. Suspended sediment can clog the gills of filter feeding mussels and eventually suffocate them. Asian clams often reach high population densities in freshwater streams and have been shown to remove between 40 to 60 percent of the phytoplankton from one stretch of river (Cohen et al. 1984). Impoundment construction changes the habitat from lotic to lentic conditions, which many mussel species cannot survive, and often causes increased downstream siltation and decreasing flow rates. Due to changes in flows below impoundments, water temperatures may be changed and host fish communities may be eliminated (Bates 1962). Water pollutants that impact

mussel populations include such substances as fly ash and sulfuric acid (Cairns et al. 1971, Raleigh et al. 1978), acid mine drainage (Neel and Allen 1964), organic wastes (Schmidt 1982), insecticides (Salanki and Varanka 1978), and chlorinated effluent from sewage treatment plants (Goudreau 1988).

Recovery Goals and Accomplishments - To recover the James spiny mussel, existing populations must be maintained and viable populations must be restored to a significant portion of its historic range, resulting in ultimate removal of this species from the federal list of endangered and threatened species. This can be accomplished by (1) protecting and enhancing habitat containing *P. collina* populations and (2) establishing or expanding populations within rivers and river corridors that historically contained this species (U.S. Fish and Wildlife Service 1990).

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 1990) for this species was published. They are listed below:

- o 2002: Ongoing cooperative agreement between FWS, Partners for Fish and Wildlife and the Thomas Jefferson Soil and Water Conservation District for riparian restoration to restore water quality upstream of documented James spiny mussel populations.
- o 1995-2000: Survey and landowner education of James spiny mussel in the South Fork of Potts Creek, Monroe County, West Virginia. This effort was conducted by the U.S. Fish and Wildlife Service and Virginia Polytechnic Institute and State University.
- o 1993: Production of educational video, brochure, and poster entitled: Help Save America's Pearly Mussels. This material was funded by the U.S. Fish and Wildlife Service and Virginia Polytechnic Institute and State University.
- o 1990: Release of the document entitled: Distribution and life history of the endangered James spiny mussel (Bivalvia: Unionidae) by Mark C. Hove of Virginia Polytechnic Institute and State University.
- 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 James River spiny mussel surveys, since the species was listed in 1988, to document its current distribution.

ENVIRONMENTAL BASELINE

Description of the Action Area - 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 action

area for this biological opinion consists of the portions of Craig Creek from 100 meters upstream of the existing fords to 400 meters downstream of the fords. The reach of stream containing the Hanner ford, in the proximity of Route 817, is approximately 30 to 35 meters wide with a substratum consisting of bedrock (25 percent), rock, cobble, gravel, sand, and silt. Water is approximately 0.4 to 0.6 meters deep and consists of slow flowing runs upstream of the ford, and slow flowing runs, riffles and pools downstream. Mangum and Neves (2000a) characterized this stretch of creek as excellent for freshwater mussels. The reach of stream containing the Carter ford, in the proximity of Route 770, is approximately 20 to 40 meters wide with a substratum consisting of bedrock (25 percent), rock, cobble, gravel, sand, and silt. Water ranges from approximately 0.2 to 1.0 meters deep and consists of slow flowing runs, riffles, deeper pools, and a gravel shoal upstream of the ford, and shallow, fast flowing runs and riffles downstream. Mangum and Neves (2000b) characterized this stretch of creek as good for freshwater mussels. Each of the two fords is used by one family and the Service estimates that the fords are crossed by two-axled vehicles no more than 6 to 10 times daily.

Status of the Species in the Action Area - Mangum and Neves (2000a) surveyed 100 meters upstream and 400 meters downstream of both the Hanner and Carter ford. They found one live James spiny mussel in Craig Creek approximately 200 meters downstream from the existing Hanner ford and 3 meters from the north bank. At the Carter ford, Mangum and Neves (2000b) found one live James River spiny mussel approximately 75 meters upstream and 2 meters from the south bank. Prior to these site specific surveys, the James spiny mussel had been documented approximately 300 meters downstream of the Hanner ford and more than 10 kilometers upstream of the Carter ford.

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 James spiny mussel associated with this project include the potential to kill and/or injure mussels, by crushing them, during maintenance through use of the motor grader. Mussels may be killed or stressed due to siltation of the stream from maintenance activity. As stated above, direct effects will occur downstream and slightly upstream due to siltation. Siltation will result in harm to mussels by necessitating the closing of their gills, which may impair their ability to feed as well as suffocating larvae. Maintenance activities may also result in small leakages of petroleum-based fluids, which may result in a reduction of health in affected mussels.

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 when vehicles use the ford immediately after maintenance.

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 to adult and larval mussels may result from siltation and leakage of petroleum-based fluids as private vehicles use the fords throughout the five year period the permits are valid.

CONCLUSION

After reviewing the current status of the James spiny 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 proposed actions are not likely to jeopardize the continued existence of the James spiny mussel. The proposed actions are also not likely to destroy or adversely modify designated critical habitat, since no critical habitat has been designated for this species.

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 James spiny mussels may occur during maintenance activities in the form of harm or death of an unknown but small number of individuals due to crushing or siltation. Incidental take of James spiny mussels may be difficult to quantify and detect because any mussels killed during ford maintenance will be difficult to observe or locate due to their coloring and small body size and the relocation of cobble and large rocks. However, the level of take of this species can be estimated by areal extent of the habitat affected and survey results within the action area. Craig Creek is approximately 30 meters wide at the Hanner ford and approximately 40 meters wide at the Carter ford. The Service expects the motor grader to disturb and compact the streambed in a strip approximately 10 meters wide immediately downstream of the berms as the grader is positioned to grade the berm back on to the ford. The Service anticipates harm or death of mussels and permanent habitat loss in the aforementioned strips, which total 300 square meters below the Hanner ford and 400

square meters below the Carter ford. Quadrat sampling has shown that two-thirds to three-quarters of mussels are subsurface, and not visible, so if a 100 percent efficient visual survey (unlikely) found one mussel in this stretch of Craig Creek, there are at least three, but probably more, James spinymussels present (R. J. Neves, Virginia Tech, personal communication, 2002) in the action area. The Service further anticipates harm of mussels from siltation, which will result from the actions of the grader on the aforementioned strip and the actual fords. Siltation will affect mussels in the area from 100 meters upstream of the fords to 400 meters downstream of the fords (approximately 15,000 square meters for both the Hanner and Carter fords). These impacts will occur twice every year for five years.

REASONABLE AND PRUDENT MEASURES

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 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 the Federal funding agreement, 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 James spinymussel:

- o VDOT should conduct Ford maintenance during the time of year when impacts to the James spinymussel reproductive cycle will be minimized.
- o VDOT should minimize activity within Craig Creek to avoid siltation resulting in physical injury or death to James spinymussels.
- o VDOT should utilize all practicable measures to reduce physical injury or death of James spinymussels in Craig Creek due to leakage of petroleum-based fluids.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Endangered Species Act, the Corps and VDOT 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 James spinymussel are likely to be affected by the proposed project and the anticipated take is minimal. These terms and conditions are nondiscretionary.

1. No maintenance of the Hanner or Carter fords will occur during the time period of May 15 through July 31 of any year to protect water quality during egg fertilization and glochidial release

of the James spinymussel.

2. The motor grader may only access the stream bed from the ford the maintenance is being conducted on and must limit its movements to the ford and 10 meters downstream of the berm to be graded.
3. The motor grader must be well-maintained and recently checked for fluid leaks prior to accessing the stream bed. No refueling shall occur near the waterway.
4. Sediment and erosion controls must be strictly adhered to in accordance with the Virginia Erosion and Sediment Control Handbook (Virginia Department of Conservation and Recreation 1992).
5. 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 Condition 6.
6. 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
6669 Short Lane
Gloucester, VA 23061
Phone (804) 693-6694
Fax (804) 693-9032

The Service believes that a small number of individuals within the action areas will be incidentally taken as a result of the proposed actions. It is difficult to quantify incidental take; however, the Service anticipates a reduction in the numbers of mussels using these stretches of Craig Creek. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures. The Corps

must immediately provide an explanation of the causes of the take, and review with the Service the need for possible modification of the reasonable and prudent measures and the terms and conditions.

IV. 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.

The Service appreciates the opportunity to work with the Corps in fulfilling our mutual responsibilities under the Endangered Species Act. Please contact Jolie Harrison of this office at (804) 693-6694, ext. 208 if you require additional information or wish to discuss this document further.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosure

LITERATURE CITED

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cc: FWS, RO, ES, Hadley, MA (Paul Nickerson)
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VDOT, Salem, VA (Kevin Bradley)
VDGIF, Richmond, VA (Tom Wilcox)
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