



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6669 Short Lane
Gloucester, VA 23061



June 22, 2005

Colonel Yvonne J. Prettyman-Beck
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

Attn: Kathy Perdue
Regulatory Branch

Re: Route 460 Bridge Replacement,
Tazewell County, Virginia VDOT
Project # 0460-092-1007, Permit
No. 03-4009-09

Dear Colonel Prettyman-Beck:

This letter constitutes a modification to the U.S. Fish and Wildlife Service's July 19, 2004 biological opinion (BO) regarding the Virginia Department of Transportation's (VDOT) proposed Route 460 bridge replacement located in Cedar Bluff, Tazewell County, Virginia, and its effects on the federally listed endangered purple bean (*Villosa perpurpurea*) and tan riffleshell (*Epioblasma florentina walkeri*). This letter is submitted in accordance with Section 7 of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

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 the biological 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.

Since submitting the BO, new information has become available regarding the population status of the purple bean and tan riffleshell, and the time of year when maximum glochidial release of these species occurs. Also, on August 31, 2004, critical habitat for the purple bean and the rough rabbitsfoot mussel (*Quadrula cylindrica strigillata*) was designated and consists of Indian Creek, from its confluence with Clinch River upstream to the fourth Norfolk Southern Railroad crossing at Van Dyke, Tazewell County, Virginia (FR Vol. 69, No. 168). This new information may affect these species in a manner not considered in the BO.

Status of the Species in the Action Area - Based on surveys (Watson 1999) from the late 1990s, and assumptions by Neves (2003), the Service estimated the purple bean and tan riffleshell populations in Indian Creek to be 702 and 3,510 individuals respectively. Rogers et al. (2001), based on surveys by Watson (1999), estimated there to be approximately 2,000 tan riffleshell individuals in Indian Creek. Within the project action area, in March 2003, Neves (2004b) conducted an abbreviated mussel survey in Indian Creek from 30 feet upstream to 35 feet downstream of the existing Route 460 bridge. Neves found two live purple bean mussels and two fresh dead tan riffleshell mussels in this 65-foot section. During the 1996/1997 survey, Watson (1999) found 4 purple bean and 25 tan riffleshell mussels in a 1,066 foot survey section of lower Indian Creek, which encompasses the Route 460 action area and Neves' 2003 abbreviated survey area. In the original BO, the Service estimated that there could be 18 purple bean and 115 tan riffleshell in the action area.

A comprehensive, quantitative mussel survey was conducted by Jones and Neves (2004) during July 2004 in the same area of Indian Creek surveyed by Watson (1999). In this survey, conducted since the BO was released, the Indian Creek purple bean and tan riffleshell populations were estimated to be 465 and 366 individuals respectively (Jones and Neves 2004). Within the action area, the 80-foot section of stream between the Route 460 bridge and the Clinch River was surveyed quantitatively. The 100-foot portion of the action area upstream of the Route 460 bridge contained habitat considered only marginally suitable for mussels since the substratum was composed primarily of bedrock, sand, and fine sediment. Surveyors used the quadrat sampling method and conducted 50 quadrat excavations in this 80-foot section. The survey consisted of 45 person-hours. One purple bean and no tan riffleshell mussels were found during this survey in the action area. Based on this survey, Jones (2005 pers. comm.) estimated that approximately 13 purple bean and 10 tan riffleshell may be located in the Route 460 action area. These estimates are based on the mean densities of the survey reaches, multiplied by the area of suitable habitat within the action area (Jones 2005 pers. comm.).

The survey results show that the population of the tan riffleshell in Indian Creek has undergone a precipitous decline since the late 1990s. The Indian Creek population of the tan riffleshell is the only known reproducing population left in Virginia and the entire Tennessee River drainage. Therefore, this decline is extremely significant. Biologists are in the process of trying to determine the reasons for this serious decline and what recovery actions are needed to prevent the extirpation or extinction of this species.

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) requires the Service to evaluate the direct and indirect effects of the action on the species. Direct impacts include the potential to kill and/or injure purple bean or tan riffleshell mussels during construction through the use of heavy equipment, construction materials, siltation, and human traffic in and near Indian Creek. Mussels inhabit the substratum of the streambed and are not highly mobile, and thus may be

crushed by the placement of the cofferdam, concrete, or rock-filled timber crib, removal of the existing pier, and/or during removal of the old bridge. The purple bean and tan riffleshell may also be killed or stressed due to siltation in Indian Creek from construction activities. Heavy siltation can result in the impairment of feeding, spawning, and larval survival of these mussels, and can also result in reduced oxygen levels, which can adversely impact the mussels' metabolic processes.

In the original BO, the Service estimated that direct effects to the purple bean and tan riffleshell would occur throughout the action area, 100 feet upstream of the existing bridge and 80 feet downstream of the bridge to the confluence of Indian Creek and the Clinch River. The estimated number of individual mussels that would be affected were 18 purple bean and 115 tan riffleshell. Based on the quantitative mussel survey conducted by Jones and Neves (2004), it appeared that the 100 foot section of the action area above the Route 460 bridge contained only marginally suitable habitat for these species. The stream substrate was composed primarily of bedrock, sand, and fine sediment (Jones 2005 pers. comm.). Within the action area below the Route 460 bridge, the current estimated number of purple bean and tan riffleshell is now 13 and 10 animals, respectively (Jones 2005 pers. comm.).

The original BO contained two terms and conditions to minimize and mitigate the potential take of purple bean and tan riffleshell mussels. VDOT had agreed to survey and translocate all mussels found within the action area to another location. VDOT had also agreed to provide, within three years of the initiation of the project, total replacement of the lost value of any mussels that were killed or injured during project construction (a total of 918 purple bean and 6,289 tan riffleshell).

Since the July 19, 2004 BO was issued, and based on the new information that the tan riffleshell population in Indian Creek has declined significantly, VDOT has verbally agreed to translocate the mussels in the action area using a more comprehensive method. This translocation will use a quadrat sampling method and sieves to collect mussels over a minimum of two surveys prior to project construction, with a third if determined necessary by the Service and the Virginia Department of Game and Inland Fisheries. The excavated and sieved substrate from each quadrat sample will be placed back into its original location in the action area. This technique will substantially minimize damage to mussel habitat.

The additional surveys will increase the likelihood that more of the mussels within the action area would be found and moved. Assuming an 80% efficiency rate in locating mussels within the action area (Neves 2005 pers. comm.), it is estimated that the multiple surveys will locate approximately 10 purple bean and 8 tan riffleshell. Therefore, it is estimated that 3 purple bean and 2 tan riffleshell mussels would be left in the action area.

As stated in the original BO, it is not expected that all of the mussels left within the action area will be killed by the project, since the project will not impact the entire creek bottom. VDOT will still replace the lost “resource equivalency” of the original number of mussels assumed to be in the action area. Therefore, while the overall number of tan riffleshell mussels within Indian Creek has declined significantly, the impacts from the Route 460 bridge replacement will be minimized and mitigated in a manner that should result in no net reduction in their population in Indian Creek over time due to this project.

Since submittal of the BO, species experts have recommended modifications to the time-of-year restrictions found in item #1 of the Terms and Conditions section of the BO (Jones, Watson, and Neves via electronic mail, 2005). Based on these comments, the time-of-year restrictions have been changed in item #1 below. Since VDOT has agreed to conduct 2-3 quantitative surveys and translocations prior to initiation of construction, additional adjustments have been made to the time-of-year restrictions.

Critical habitat for the purple bean and the rough rabbitsfoot mussels has been designated in Indian Creek since the issuance of the BO, including the action area. Approximately 481 square feet of streambed will be temporarily filled during emplacement of the temporary work bridge and cofferdams. This material will be removed and the streambed restored at the completion of the project. Siltation during construction may temporarily reduce habitat suitability for mussel spawning and feeding. The mid-creek support pier from the original bridge will be removed and the new bridge will not have an instream pier. This action should help stabilize the substrate of Indian Creek in this location. VDOT will perform a bank stabilization project on a 200 foot long eroding bank upstream of the action area to reduce a current source of sedimentation. This stream stabilization should have long-term positive effects on the Indian Creek mussel fauna by improving water quality and bottom habitat. The Service does not believe that the project will result in destruction or adverse modification of critical habitat.

CONCLUSION

After reviewing the current status of the purple bean and tan riffleshell throughout their ranges 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 purple bean or tan riffleshell nor result in the destruction or adverse modification of critical habitat for the purple bean and rough rabbitsfoot.

AMOUNT OR EXTENT OF ANTICIPATED TAKE

The Service anticipates that incidental take of the purple bean and tan riffleshell may occur during construction in the form of harm, harassment, or killing of approximately 13 purple bean and 10 tan riffleshell. Of this number, it is anticipated that approximately 10 purple bean and 8 tan riffleshell will be moved upstream of the action area. The estimated remaining number of mussels (approximately 3 purple bean and 2 tan riffleshell) would remain in the action area and could be harmed or killed by construction-related activities.

TERMS AND CONDITIONS

In order to further reduce take of the purple bean and tan riffleshell, the Service hereby modifies the July 19, 2004 BO. The modification involves Terms and Conditions #1 and #2, found on page 18 of the BO. These Terms and Conditions are modified as follows:

1. No instream construction may occur during February 15 through June 15 of any year, in order to protect the purple bean and tan riffleshell during the time period of maximum glochidial release. Work within cofferdams may occur during any time of year.
2. VDOT must perform a minimum of two surveys, and potentially a third survey, of the action area, prior to initiation of construction in order to move all mussels found, out of the action area. The reach of Indian Creek between 100 feet upstream and 80 feet downstream of the Route 460 bridge must be surveyed. Surveys must include snorkeling and quadrat sampling of the streambed. Surveys must be conducted a minimum of one week apart. Following termination of the second survey, the Service, in conjunction with the Virginia Department of Game and Inland Fisheries, will determine whether a third survey is required. If a third survey is required, the Service will coordinate with VDGIF and VDOT on the timing of the survey.

Surveys must include a qualitative and quantitative component. The qualitative survey must consist of at least four snorkelers abreast of each other, moving slowly upstream to search and collect all freshwater mussels within the approximate 180 feet of stream bottom upstream, beneath, and downstream of the existing Route 460 bridge. Mussel locations must be flagged during the first snorkeling run to delineate the areas where most mussels occur. At least two complete snorkeling passes of the stream reach must be conducted. The quantitative survey of this stream reach must consist of 0.25 m² quadrat sampling, with the intent of collecting a target of at least 80% of the endangered mussels within this zone. Following the second quantitative sampling effort, raw data must be provided to the U. S. Fish and Wildlife Service and the Virginia Department of Game and Inland Fisheries to determine whether any additional sampling will be required.

Upon collection, all purple bean and tan riffleshell mussels must be held in mesh bags in Indian Creek pending transport to the release site in water-filled containers. Mussels must be released into suitable substrate in Indian Creek, in the vicinity of the Route 631 bridge closest to the Route 460 bridge. A final report must be prepared summarizing results, to include effort, species and numbers collected during the qualitative and quantitative sampling efforts, and the relocation sites for all mussels.

All other terms and conditions in the BO remain unchanged and must be implemented as stated therein. This concludes reinitiation of formal consultation on this permit application. This letter should be affixed to the July 19, 2004 BO.

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

cc: Leo Snead, VDOT Headquarters, Richmond, VA
George Young, VDOT Bristol District, Bristol, VA

References

- Jones, J. W. and R. J. Neves. 2004. Survey of freshwater mussel populations in Indian Creek, Tazewell County, Virginia. Final Report to U. S. Fish and Wildlife Service, Abingdon, VA. 33 pp.
- _____ 2005. Electronic mail dated January 13, 2005. U.S. Fish and Wildlife Service, Blacksburg, Va.
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- Neves, R. J. 2004. Biological assessment: the potential effects of the Route 460 business repair project on the mussel fauna of Indian Creek, Tazewell County, Va.
- _____ 2005. Electronic mail dated January 22, 2005. Virginia Tech, Blacksburg, Va.
- Rogers, Susan O., B.T. Watson, and R.J.Neves. 2001. Life history and population biology of the endangered tan riffleshell (*Epioblasma florentina walkeri*) (Bivalvia: Unionidae). J. N. Am. Benthol. Soc. 20(4): 582-594.
- Watson, B. 1999. Population biology and fish hosts of several federally endangered freshwater mussels (Bivalvia: Unionidae) of the upper Tennessee River drainage, Virginia and Tennessee. MS Thesis, Virginia Tech, Blacksburg, Va. 134 pp.
- _____ 2005. Electronic mail dated January 12, 2005. Virginia Department of Game and Inland Fisheries, Forest, Va.

bcc: ARD-ES, Hadley, MA (Attn: Glenn Smith)
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(WHester/KMayne: 6-22-05)