

Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

August 5, 1998

Mr. Ronald W. Carmichael
Division Administrator
Federal Highway Administration
228 Walnut Street, Room 558
Harrisburg, PA 17101-1720

Dear Mr. Carmichael:

The Fish and Wildlife Service has reviewed the project plans and Biological Assessment for the proposed replacement of the Utica (Third Street) bridge (S.R. 3017, Section B00), located in Utica Borough, Venango County, Pennsylvania. Your February 23, 1998, request for formal consultation was received on February 26, 1998. The enclosed document represents the Service's Biological Opinion on the effects that the proposed activity will have on two federally listed endangered freshwater mussel species: the clubshell mussel (*Pleurobema clava*) and northern riffleshell mussel (*Epioblasma torulosa rangiana*). This Biological Opinion is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended, (16 U.S.C. 1531 *et seq.*).

This Biological Opinion is based on information provided in the Biological Assessment (dated January 1998), field investigations, meetings (see consultation history), and other information available in our files. A complete administrative record of this consultation is on file in this office.

With respect to the mussel translocation, we have reviewed the translocation and monitoring proposals submitted by EnviroScience (translocation contractor) and the Biological Resources Division (BRD) of the U.S. Geological Survey (translocation and follow-up monitoring contractor), and have found them to be acceptable. The protocols employed by these two contractors at the Kennerdell bridge site shall also be employed at the Utica bridge site, in accordance with the Terms and Conditions of the Biological Opinion. One substantive difference is that EnviroScience should thoroughly search for mussels within the top 7 cm of substrate within the primary impact area to maximize the success of the salvage operation. Translocated mussels and the resident communities into which they are transferred will be monitored for four years in accordance with BRD's proposal. It is vital that PennDOT, EnviroScience, and BRD familiarize themselves with the content of this Biological Opinion, particularly the Reasonable and Prudent Measures, and detailed Terms and Conditions, before beginning the translocation.

Unlike the Kennerdell Biological Opinion, the Utica Biological Opinion does not include a requirement that certain project-related indirect effects to mussels and mussel habitat be monitored. This type of pre- and post-construction monitoring was deferred for this project, but will likely be required for the next bridge project utilizing a large causeway structure.

Due to questions about whether or not this project can be completed in the 1999 construction season, we have included Term and Condition, No. 7, which places certain restrictions upon construction timing and sequencing, and mussel sampling and translocation. When a project implementation, timing, and sequencing schedule becomes available, please provide us with a copy.

If you have any questions regarding this Biological Opinion, please contact Carole Copeyon of my staff at 814-234-4090.

Sincerely,

David Densmore
Field Supervisor

Enclosure

cc:

PennDOT (District 1) - Baker

PFBC - Shiels

PGC - Grabowicz

COE - Pittsburgh

DEP - NWRO

PNDI - Firestone

EnviroScience - Zimmerman

BRD - Dave Smith

- Rita Villela

WPC - Bier

ES file - issuance of nonjeopardy BO

Readers file

Project file

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BIOLOGICAL OPINION

REPLACEMENT OF THE UTICA BRIDGE
OVER FRENCH CREEK
(S.R. 3017, SECTION B00)

VENANGO COUNTY, PENNSYLVANIA

Prepared by:

Pennsylvania Field Office
U.S. Fish and Wildlife Service
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

August 5, 1998

This document represents the Fish and Wildlife Service's Biological Opinion on the effects that the proposed replacement of the Utica Bridge (S.R. 3017, Section B00) over French Creek, in Venango County, Pennsylvania, will have on two federally listed endangered freshwater mussel species: the clubshell mussel (*Pleurobema clava*) and northern riffleshell mussel (*Epioblasma torulosa rangiana*). This Biological Opinion is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended, (16 U.S.C. 1531 *et seq.*).

This Biological Opinion is based on information provided in the Biological Assessment (dated January 1998), field investigations, meetings (see consultation history), and other information available in our files. A complete administrative record of this consultation is on file in the Service's Pennsylvania Field Office.

CONSULTATION HISTORY

The history of this consultation is as follows:

- 01/19/95 Service meets with the Pennsylvania Department of Transportation (PennDOT) to discuss endangered mussels (e.g., habitat requirements, threats, distribution), bridge projects within the range of endangered mussels, the need for mussel surveys prior to conducting in-stream work, and section 7 consultation under the Endangered Species Act.
- 03/16/95 Based on Service input, PennDOT identifies the Utica bridge replacement project as one of the projects in French Creek requiring a mussel survey.
- 08/19/96-08/27/96 PennDOT's consultant, Aquatic Systems Corporation, conducts a mussel survey in project area.
- 01/02/97 PennDOT submits the Utica mussel survey report to the Service.
- 02/19/97 PennDOT (via their consultant) requests updated information on listed and proposed species which may occur in project area.
- 09/19/97 Service letter of response to 02/19/97 letter, stating that no other federally listed species, besides the northern riffleshell, are known to occur within the project area.
- 09/25/97 Service provides PennDOT with comments on the mussel survey report (indicating it is adequate). Service recommends that PennDOT investigate alternatives which would avoid and minimize adverse effects to endangered mussels, and advises PennDOT that

if adverse effects cannot be avoided, formal consultation will be necessary. Service offers to meet with PennDOT to discuss project alternatives and potential effects to endangered mussels.

- 11/06/97 PennDOT submits to the Service, for review, the Draft Biological Assessment for the proposed project.
- 12/03/97 PennDOT, consultants, Federal Highway Administration (FHWA), Pennsylvania Fish and Boat Commission (PFBC), and Service meet to discuss comments on the Draft Biological Assessment.
- 12/10/97 Service provides written comments on the draft Biological Assessment, based on review of the document and discussions at the 12/03/97 meeting. The Service recommends that project Alternative 4A, which has the potential to avoid adverse effects to endangered mussels, be further evaluated.
- 02/23/98 FHWA requests in writing the initiation of formal consultation, transmitting PennDOT's revised Biological Assessment (dated 01/98). Service receives this request on 02/26/98.
- 04/24/98 Service acknowledges receipt of FHWA's request to initiate formal consultation, indicating that most required information has been supplied, and expecting to provide FHWA with a Biological Opinion before 07/11/98. The Service requests of FHWA clarification regarding the bridge replacement alternative and species to be addressed in the Biological Opinion, as well as additional information regarding project Alternative 4A. Although the clubshell mussel was not found during the August 1996, mussel survey, it may occur within the project area in low densities. The Service, therefore, recommends that the clubshell be addressed in the Biological Opinion.
- 05/08/98 FHWA provides the Service with the information requested in its 04/24/98 letter.
- 06/09/98 PennDOT, FHWA, Service, Biological Resources Division (BRD) of the U.S. Geological Survey, and EnviroScience meet to discuss potential reasonable and prudent measures, including mussel translocation and follow-up monitoring.
- 07/06/98 Service requests 30-day extension of formal consultation, expecting to transmit its Biological Opinion to FHWA on or before 08/10/98.
- 07/13/98 FHWA acknowledges and agrees to the Service's 30-day extension.

- 07/23/98 Service requests detailed information about project timing and sequencing, and length of time causeway will be in the river (information lacking in the Biological Assessment).
- 07/27/98 PennDOT responds to the Service's 07/23/98 request, indicating that project will begin in June or July of 1999, and last 40 weeks, pausing during the winter months and extending into the summer of 2000. Conference call between PennDOT, FHWA and the Service to discuss this issue. Based on the contents of the Biological Assessment, FHWA and Service both assumed work would be confined to the 1999 construction season.
- 07/29/98 PennDOT proposes to the Service that the mussel translocation occur in 1998, and that an additional mussel survey be done in 1999 to determine if a second translocation effort would be necessary. FHWA, PennDOT, and the Service concur via conference call on this issue. FHWA believes that the project can be fully constructed within the 1999 construction season, but agrees to the Service's recommendation that the Terms and Conditions of the Biological Opinion take into account one or two construction seasons. Service provides a draft copy of the Terms and Conditions to FHWA and PennDOT.
- 08/05/98 Service transmits its Biological Opinion to FHWA.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The following project and project area descriptions are taken from PennDOT's January 1998, *Biological Assessment of the Replacement of the Utica Bridge over French Creek (S.R. 3017, Section B00) in Venango County, Pennsylvania*.

Project Area

French Creek begins in Chautauqua County, New York, and flows for 117 miles through Crawford, Erie, Mercer, and Venango Counties in northwestern Pennsylvania, eventually entering the Allegheny River. The French Creek drainage basin encompasses approximately 1270 square miles, and provides habitat for more species of fish (70) and freshwater mussels (25) than any other stream in Pennsylvania. The Utica bridge is located approximately eight miles upstream from the French Creek confluence with the Allegheny River (R.M. 124) at Franklin. The river within the project area has a designated use of "warm water fishery," as assigned by the Pennsylvania Department of Environmental Protection. At the bridge site, French Creek is approximately 195 feet wide, with a watershed size of 1,030 square miles.

The town of Utica, which consists primarily of permanent residences and small businesses, is located on the south side of French Creek. The Western Pennsylvania Conservancy owns a parcel of land along the north shore, just upstream of the bridge. A public boat ramp is located on this land parcel. This segment of French Creek is used primarily for recreational purposes, such as swimming, fishing, and canoeing.

A small island exists near the north side of the stream channel, from approximately 400 to 900 feet downstream of the bridge. Flow within the backchannel of the island is not continuous.

A U.S.G.S. gaging station is located just upstream of the bridge. Within the project area, river level estimates are as follows: normal mean water level (in May) is 1021 feet above mean sea level (amsl), and the 2-year, 50-year and 100-year flow levels are approximately 1025, 1033 feet and 1035 feet amsl, respectively.

Project Description

PennDOT proposes to completely remove the existing Utica bridge and replace it with a new bridge along an upstream alignment. The existing bridge is a 266.5-foot long, 24.4-foot wide Pratt through-truss style bridge, which was built in 1886. The existing bridge has two spans, two abutments, and one pier which is located approximately 60 feet from the north shore. The proposed replacement bridge will be an unequal three-span, prestressed concrete or steel multi-girder bridge. The new bridge will have three spans, two abutments, and two piers. The dimensions of the new bridge will be 37.5 feet wide by 281 feet long.

Construction is expected to begin in the spring or summer of 1999 and take approximately 40 weeks to complete. During construction, no detour will be necessary since the existing bridge will not be removed until the new bridge is complete.

The new bridge will be constructed on a slightly upstream alignment from the existing bridge, with the shoreline end points of the new bridge located approximately 50 feet (on the south bank) and 100 feet (on the north bank) from the existing bridge. The new bridge will be constructed on two piers, one located approximately mid-channel and one located out of the channel (at the 2-year water level) along the north bank. The mid-channel pier will result in 71 m² of permanent in-stream impacts due to the pier, sheetpile cofferdam, and rock fill for scour protection. The two abutments will be constructed in upland areas, but the cofferdam for the south bank abutment will encroach into French Creek, resulting in 5 m² of permanent in-stream impacts due to the sheetpile cofferdam, and subsequent rock fill for scour protection.

Demolition of the existing bridge will begin immediately following the opening of the new bridge. The bridge trusses will be removed using two cranes per truss, with one crane located on either the north or south shore and one on an in-stream work platform (causeway). Each truss will be lifted from its pier

and abutment supports and lowered onto land. Sheetpile and/or concrete barrier cofferdams will be required to remove the existing pier and south shore abutment, resulting in 77 m² and 14 m² of in-stream impacts, respectively. The area within the cofferdam surrounding the south shore abutment will be dewatered to facilitate work, and then filled with clean rock prior to cofferdam removal to prevent scouring along the south bank. A cofferdam will also be placed around the existing pier, which will be removed to two feet below the normal stream bed elevation, and then backfilled to grade with appropriate fill material.

Construction of the new bridge and removal of the existing bridge will require use of a causeway (an in-stream, rock-filled work platform) for truss lifting, placement, and removal; cofferdam installation and removal; and pier construction and removal. The causeway will be situated between the existing and new bridge, and will consist of a 9 m by 21 m (30 foot by 70 foot) work platform constructed of clean rock-fill material, connected to the north shore by a temporary bridge, approximately 40 feet in length (BA, Figure 6). Water will be able to flow under the temporary bridge, which is being used to minimize the amount of fill in the river channel. In addition, the rock fill comprising the work platform will be contained within a concrete barrier or sheet pile cofferdam in order to further minimize impacts to mussels. A narrow work platform “finger” will extend upstream from the platform, adjacent to the proposed location of the new mid-channel pier. The total area of disturbance associated with the work platform consists of approximately 239 m² of temporary fill placed on the river bed. The causeway will be in place for approximately 30 weeks of the 40-week construction period.

A temporary construction access road from S.R. 3017 to the causeway will be built on the north bank of French Creek. The Service assumes that one or more construction staging areas (e.g., areas to store and retrieve equipment, materials, vehicles, and fuel) will also be required; however, none are mentioned in the Biological Assessment.

Conservation Measures

In association with this project, PennDOT proposes to implement several conservation measures (referred to as “commitments” in the BA, pp. 43-46). These commitments include:

1. Delineate the direct and indirect impact areas;
2. Limit project construction to one construction season (which PennDOT interpreted as occurring in one calendar year or portions of two calendar years);
3. Ensure construction equipment is free of zebra mussels;
4. Minimize use of rock fills and completely remove them after construction;
5. Use a temporary bridge in conjunction with a rock fill construction staging platform to minimize in-stream impacts;
6. Revegetate disturbed upland areas;

7. Develop and implement an erosion and sedimentation (E&S) control plan. The E&S plan is subject to review and approval by the Service. Daily site monitoring will be conducted to ensure plan implementation;
8. Identify mussel translocation areas in coordination with the Service;
9. Translocate mussels from the direct impact area to suitable habitat upstream, and conduct follow-up monitoring; and
10. Implement pollution prevention and control measures to reduce the potential for toxic spills into French Creek.

STATUS OF THE SPECIES

General Biology of Freshwater Mussels in the Family Unionidae

Freshwater mussels are sedentary filter-feeders, filtering oxygen and food from the water column across their gills. The breeding season is initiated by changes in water temperature. Females hold unfertilized eggs in water tubes within specialized regions of the gills called marsupia. Males liberate sperm into the water and females lying downstream uptake the sperm with incoming water. The eggs are then fertilized in the water tubes within the marsupium. The fertilized eggs develop into minute bivalve larvae, or glochidia, which, in turn, develop over a period of days to months. While in the marsupium, developing glochidia are exposed to the adult's circulatory fluid, but not directly to the water column (Gardiner *et al.* 1991, Richard *et al.* 1991).

The glochidia of most unionids are believed to be obligate parasites, with fish serving as the host organism. Although many unionids are probably host-specific, the degree of host specificity and the host species for most unionid species, including the clubshell and northern riffleshell, are unknown (U.S. Fish and Wildlife Service 1994). However, preliminary data indicate that the following species may serve as hosts (Watters 1996, 1997):

Clubshell

striped shiner
 blackside darter
 central stoneroller
 logperch

Northern riffleshell

banded darter
 bluebreast darter
 brown trout
 banded sculpin

Methods of host infestation depend on how glochidia are released. Some unionid species expel glochidia out the exhalant siphon. Host fishes either take in suspended glochidia and pass them over their gills, where they attach, or they contact them on the substrate, where they attach to fins or skin. Other unionids bind glochidia into long mucus conglutinates which resemble prey items. Gills become infested when fish eat the conglutinates (U.S. Fish and Wildlife Service 1994).

After encysting on the host fish, the glochidia transform into juveniles. They fall from their host and burrow into the substrate or attach to larger objects.

Clubshell mussel (*Pleurobema clava*). The clubshell was listed as endangered, without critical habitat, in 1993. This is a small to medium-size mussel, up to three inches long. The shell exterior is yellow to brown with bright green blotchy rays. The shell interior is white. The shell is wedge-shaped and solid, with a pointed, and fairly high umbo.

Historically, this species was once abundant throughout Ohio River tributaries in Illinois, Indiana, Kentucky, Michigan, Ohio, Pennsylvania, and West Virginia. It was widespread in Ohio River basin rivers such as the Ohio, Allegheny, Scioto, Kanawha, Little Kanawha, Licking, Kentucky, Wabash, White, Vermillion, Mississinewa, Tippecanoe, Tennessee, Green, and Salt Rivers. The clubshell was also located in the Maumee River basin, and tributaries of western Lake Erie such as the Huron River and the River Raison (Stansbery *et al.* 1982). This species has declined drastically with a greater than 95 percent range reduction. The largest remaining population is in the Tippecanoe River, Indiana. French Creek supports what appears to be a sparse viable population, but with low numbers and a discontinuous distribution (i.e., within suitable habitat areas scattered over several miles).

Clubshell populations are presently known to occur in the following streams:

<u>State</u>	<u>River System</u>	<u>County</u>	<u>Reproducing?</u>
Indiana	Tippecanoe River	Kosciusko, Fulton, Pulaski, Tippecanoe	yes
Kentucky	Green River	Taylor, Green, Hart	probably
Michigan	East Fork of the West Branch of the St. Josephs River	Hillsdale	unknown
Ohio	Fish Creek	Williams	probably
	Little Darby Creek	Madison	yes
	Pymatuning Creek	Ashtabula	no
	St. Joseph River	Williams	possibly
	West Branch of the St. Joseph River	Williams	possibly
Pennsylvania	Walhonding River	Coshocton	possibly
	Allegheny River	Clarion, Forest, Warren, Venango	yes
	Conneaut Outlet	Crawford	unknown; nearly extirpated
	Conneauttee Creek	Crawford	unknown
	French Creek	Crawford, Erie, Mercer, Venango	yes
	LeBoeuf Creek	Erie	yes
	Muddy Creek	Crawford	probably
West Virginia	Elk River	Kanawha	yes
	Hackers Creek of the West Fork River	Lewis	unknown
	Meathouse Fork	Doddridge	unknown

The clubshell inhabits clean, packed, or loose, coarse sand and gravel in runs, often just downstream of a riffle, in medium to small rivers and streams (Stansbery *at al.* 1982). It cannot tolerate mud or slack water conditions (U.S. Fish and Wildlife Service 1994). The clubshell typically burrows completely beneath the substrate two to four inches, apparently relying on water to percolate between the sediment particles (Watters 1990).

The clubshell has a life span of 20 years or more. It is a short-term breeder (tachytictic); i.e., fertilization takes place in mid-spring and the embryos (glochidia) are discharged into the water column in mid-summer (Ortman 1919). Many aspects of the life history of this rare mussel are not known.

Northern Riffleshell (*Epioblasma torulosa rangiana*). The northern riffleshell was listed as endangered, without critical habitat, in 1993. It is a small to medium-size mussel, up to three inches long. The shell exterior is brownish-yellow to yellowish-green with fine green rays. The shell interior is white, rarely pink. The species is sexually dimorphic; male shells are irregular ovate in outline, with a

wide shallow sulcus just anterior to the posterior ridge. Female shells are obovate in outline, and greatly expanded post-ventrally.

The historical range of this species was somewhat similar to that of the clubshell, but with extensions further north into Michigan and Ontario tributaries of Lake Erie, Lake St. Clair, and the Detroit and St. Clair Rivers (U.S. Fish and Wildlife Service 1994). Like the clubshell, the northern riffleshell has suffered a range reduction of over 95 percent.

The present range of the northern riffleshell has been reduced to:

<u>State</u>	<u>River System</u>	<u>County</u>	<u>Reproducing?</u>
Indiana/Ohio	Fish Creek	Dekalb, Williams	no, possibly extirpated
Kentucky	Green River	Edmonson, Hart	unknown
Michigan	Detroit River drainages	Sanilac	unknown
Ohio	Big Darby Creek	Franklin, Pickaway	no, near extirpation
Pennsylvania	Allegheny River	Clarion, Forest, Venango, Warren	yes
	French Creek	Crawford, Erie, Mercer, Venango	yes
West Virginia	Elk River	Kanawha	yes, but only 2 live young animals have been found

In 1992, a population of the northern riffleshell in the Detroit River in Michigan was found to be threatened by invasion of the exotic zebra mussel (*Dreissena polymorpha*). Divers collected 30 to 40 individuals which were relocated to the St. Clair River in Michigan. About a dozen individuals were kept in captivity. Conditions of the populations in the St. Clair and Detroit Rivers are unknown at this time (T. Weise, Michigan Department of Natural Resources 1995, pers. comm.). Zebra mussels have also been documented from the Maumee River.

The largest remaining populations occur in the Allegheny River and in French Creek, Pennsylvania. In the Allegheny River, the subpopulations range from viable to those with apparently depressed vigor, with an overall known distribution scattered over 80 miles (C. Bier, WPAC, *in litt.* 6 January 1994; *in* U.S. Fish and Wildlife Service 1994). The species has been documented to occur in good numbers at several locations in French Creek, but its distribution is discontinuous (i.e., localized to areas of suitable habitat).

The northern riffleshell occurs in clean, packed, coarse sand and gravel in riffles and runs of small and large streams (Stansbery *et al.* 1982, Watters 1990). The species buries itself to the posterior margin

of the shell, although females may be more exposed, especially during the breeding season (U.S. Fish and Wildlife Service 1994).

The northern riffleshell is a long-term breeder (bradyctictic), with fertilization in the late summer and glochidial release the following spring or summer (Ortmann 1919).

Decline of, and Continued Threats to, the Clubshell and Northern Riffleshell

Because mussels are sedentary, they are extremely susceptible to environmental degradation. The range reductions of these mussels are attributed to physical loss of habitat and degraded water quality related primarily to water impoundments, channelization, streambank clearing, and agriculture. Impacts associated with run-off from human waste, chemical outfalls, and coal mining have also affected many tributaries.

The greatest diversity and abundance of mussels are associated with clean-swept sand and gravel substrates. Chronic increases in turbidity and suspended sediments decrease the depth and amount of light penetration, affect primary productivity, decrease oxygen levels, increase water temperature, irritate or cause clogging of gills, and result in a blanket of silt on the substrate. Mussels may be directly affected by siltation through smothering. Siltation also affects mussels by smothering eggs or larvae of the fish host populations and by reducing food availability. Siltation also fills interstitial spaces, eliminating spawning and habitat critical to the survival of young fish.

Pollution from municipal, agricultural, and industrial waste discharges have decreased or eliminated mussel populations directly, and indirectly through elimination of significant species of fish hosts resulting in reproductive failures (U.S. Fish and Wildlife Service 1994).

The exotic, prolific zebra mussel, accidentally introduced to North America in the mid-1980's, poses a severe threat to all native mussel fauna through competition for space, food, and survival of glochidia. Presently, the zebra mussel, which was conveyed to the United States through ship ballast water from interior European ports, is abundant in the lower Great Lakes and is increasing in other portions of the range of these federally listed species. It is not known to occur in French Creek at this time.

ENVIRONMENTAL BASELINE

Status of the Species (within the action area)

For the purposes of this Biological Opinion, the action area is defined as extending from approximately 150 feet upstream to 100 feet downstream of the centerline of the existing Utica bridge. This encompasses the area where project-related direct and indirect effects to the clubshell and northern riffleshell are likely to occur.

As described above, the clubshell and northern riffleshell occur in low to moderate numbers (respectively) and are discontinuously distributed in French Creek in Erie, Crawford, Mercer, and Venango Counties, Pennsylvania. Prior to the freshwater mussel surveys conducted in relation to planning for the subject bridge replacement project, the northern riffleshell was not known to occur within the immediate project area. However, the northern riffleshell and clubshell had been documented to occur within two miles upstream and downstream of the Utica bridge site. The clubshell mussel has still not been documented in the project area, but may occur there in low densities.

Aquatic Systems Corporation and Dr. Arthur Bogan conducted a mussel survey for PennDOT at the Utica bridge site in August 1996. The survey was conducted in accordance with the Service's July 19, 1996, survey protocol (*Mussel Survey Protocol: Allegheny River and French Creek*). The survey zone extended from 300 feet upstream to 1200 feet downstream of the existing bridge, and encompassed those areas most likely to be directly and indirectly affected by the project. Techniques employed during the survey included the use of clear-bottom buckets in shallow areas (< 2.5 feet deep) and diving gear in deeper areas (> 2.5 feet deep) to conduct searches along line transects (i.e., qualitative surveys); inspection of middens and other shell concentration areas; and excavation of 1 m² quadrats (i.e., quantitative surveys).

At the time of the survey, river depths within the survey zone ranged from one to seven feet. While the majority of the study area was less than three feet in depth, an area six to seven feet deep occurred under and downstream of the bridge. Substrate in the main channel consisted primarily of cobble and small boulders, interspersed with gravel and sand. Some areas had minimal silt deposition, but this was variable depending upon water velocity.

The survey revealed the presence of a rich mussel community in terms of species diversity, relative abundance, and density. A total of 1,516 live mussels representing 19 species were found in the study area. One additional species was represented by only relict shells. Combining results from all survey methods, 27 northern riffleshell (13 live, 1 fresh dead and 13 relict) were found. The northern riffleshell was the tenth most abundant species collected during the survey. The clubshell mussel, however, was not located, and Dr. Bogan indicated that he did not find suitable clubshell habitat within the area surveyed.

A total of 902 live mussels of 19 different species were collected via clear-bottom bucket surveys, including three live northern riffleshell. A total of 420 individuals of 16 species were located during the diving surveys, including three northern riffleshell located at depths of six to seven feet. The mucket (*Actinonaias ligamentina*) and fluted shell (*Lasmigona costata*) were the most abundant species found, representing 64.8 percent and 12.7 percent (respectively) of the mussels found using qualitative sampling methods.

Twenty 1 m² quadrats were excavated to determine the presence of juvenile mussels, to estimate mussel densities, and to search for the clubshell, which often occurs several inches below the

water/substrate interface. Most of these quadrats were concentrated in the shallow area near the north bank, within 100 feet upstream and 200 feet downstream of the bridge. The substrate within each quadrat was excavated to a depth of four inches. During quadrat sampling, 194 live mussels representing 13 species were located (n = 20 quadrats; = 9.7 mussels/m² and 4.5 species/m²; range = 0-24 mussels/m² and 0-8 species/m²). Seven live northern riffleshell were found in six quadrats, indicating that this species occurs in greater densities than evidenced by qualitative sampling methods. Some of these northern riffleshell were young, indicating that recruitment is occurring at this site.

Neither Asiatic clams (*Corbicula fluminea*) nor zebra mussels were located in the study area.

As evidenced by substrate quality, flow, and mussel density and diversity, moderate quality habitat for mussels, including the northern riffleshell, occurs within the project area. Based on survey results, however, it appears that the northern riffleshell, even though showing signs of recruitment, may exist at a relatively low density within the project area.

Other than mammalian predation, and non-point source pollution in the French Creek watershed, there are no identified threats to these species within the action area.

Effects of the Action

It is expected that all clubshell and northern riffleshell not relocated outside of the 310 m² footprint of the causeway and cofferdams (surrounding the new mid-channel pier and existing south bank abutment) will be killed due to suffocation and/or crushing under the weight of the rock fill. Due to the small size of the endangered mussels (especially juveniles), and the tendency of the clubshell to be found up to four inches below the water/substrate interface, the Service anticipates that some of the clubshell and northern riffleshell within the direct impact area will not be found during the translocation, and will therefore perish.

Juvenile and adult clubshell and northern riffleshell, and fishes which serve as hosts for their glochidia, could also be affected (i.e., killed, injured, or stressed) by substrate disturbance (e.g., scouring), increased turbidity, sediment deposition, and introduction of petroleum products into the river. These impacts would occur during bridge demolition and removal; causeway construction, use, and removal; on-bank construction activities associated with upland abutment and pier removal and construction; construction and use of staging areas and access roads near the river; construction activities on the bridge deck; and crane and heavy equipment operation on the causeway.

The extent of these impacts will depend on construction practices, river flows during construction, silt load in disturbed substrates, and the effectiveness of erosion and sedimentation control measures. The greatest potential for substrate scouring and deposition would occur in association with construction

and removal of the causeway, piers and abutments, as well as the presence of the causeway and cofferdams during construction, especially during high flows.

PennDOT prepared a *Hydraulic Analysis Report* (BA, Appendix D) to assess causeway-related impacts to stream flow, based on stream velocities resulting from a 2-year storm. They estimated that approximately 30 feet upstream of the causeway, stream velocities will decrease from 6.22 to 6.03 feet per second (fps). Immediately downstream of the causeway, they estimated that velocities would increase approximately 1 fps (from 7.29 to 8.40 fps). Within 44 feet downstream of the causeway, they predict that stream velocities will not be changed from existing conditions.

Based on predicted changes in hydrology, the abrupt profiles of the work platform and cofferdams, and the relatively long period of time during which the work platform will be in place (approximately 6 to 9 months) there will likely be scouring of the substrate due to increased water velocities within several feet of these in-stream structures during high flows. The material will be redeposited downstream when water velocity decreases. Scouring may cause mussels to become dislodged from the substrate, and either carried downstream by the current, or smothered when sediments redeposit. Those mussels not killed or injured during this process may still suffer death, injury, or increased predation risk if they are unable to right themselves and reburrow into suitable habitat downstream. Mussels downstream of the causeway will be subject to the impacts (e.g., gill clogging, suffocation) of sediment redeposition.

A long-term reduction in habitat quality may occur within the footprint of the work platform, and in the vicinity of the work platform. Sand and fine gravel may be scoured from mussel habitat located in the shallow waters surrounding the platform, and under the temporary bridge during high flows. In addition, removal of the causeway material is not likely to be complete. The presence of large rock material within the endangered mussels' habitat may reduce the quality and availability of habitat post-project. Scouring may also result in subtle changes in area hydrology, as channels are formed in the river bottom, and substrate composition is altered.

No direct effects to mussels or their habitat are expected from construction of the abutments and north pier of the new bridge because these structures and their associated cofferdams and rock fill will occur above the mean river level, at approximately the 2-year flow level. Indirect effects may result, however, due to construction and the long-term presence of these features, however, may result. These effects would include scouring, sediment redeposition, and changes in flow patterns, resulting in loss or injury of mussels and a reduction in habitat availability and/or quality.

As filter feeders on microscopic food items, the northern riffleshell and clubshell are very susceptible to smothering by silt and other sediments in the water (Ellis 1936, *in* U.S. Fish and Wildlife Service 1994). Siltation also may result in reduced dissolved oxygen and increased organic material at the substrate level (Ellis 1936, Harman 1974, both *in* U.S. Fish and Wildlife Service 1994). At sublethal levels, silt interferes with feeding and metabolism in general (Aldrige *et al.* 1987, *in* U.S. Fish and

Wildlife Service 1994). Because the clubshell typically burrows completely beneath the substrate, it is particularly susceptible to siltation, which clogs the substrate interstices and suffocates the animal.

Mussels will be smothered, buried and/or have their gills clogged from project-related silt and other sediments. Mortality, injury, and stress to mussels is expected from siltation and other types of sedimentation caused by both in-stream construction (i.e., causeway and cofferdam construction) and onshore construction (i.e., realignment of the bridge approaches, abutment construction, staging areas, and access road construction). Access to the causeway will require construction of a road on the north side of the river, directly up to the river bank. This will increase the likelihood of sediment and other pollutants reaching the river. Implementation of erosion and sedimentation control practices should help to minimize these sources of sediment.

Sediment and silt will also be resuspended due to project-related scouring. Deposition of silt/sediment from the project, and that already in the water column is most likely in those areas where project-related hydrological modifications reduce the water's capability to carry sediments (i.e., decreased water velocity). This is particularly likely to occur 1) upstream of the causeway as flow decreases, creating a minor pooling effect; 2) immediately downstream of the causeway, where flow has not yet redistributed across the river channel and sediments scoured from the vicinity of the work platform are likely to redeposit; and 3) immediately downstream of the cofferdams.

The causeway is designed such that high water events will overwash it. Therefore, materials staged on the causeway, or sediments that are part of the causeway may be deposited into the river, possibly impacting mussels downstream.

Project-related changes in hydrology that would result in pooling upstream of the causeway may result in decreased oxygen levels, and decreased food and sperm availability. Pooling resulting from the work platform and mid-channel cofferdam/pier are anticipated to be minimal, however. The clubshell generally is found in clean, coarse sand and gravel in runs; it cannot tolerate mud or slackwater conditions. The northern riffleshell also occurs in riffles and runs. It, too, may be intolerant of slackwater conditions.

The physical presence of the causeway and the altered flow conditions associated with it may also affect clubshell and northern riffleshell reproduction upstream and downstream of the causeway by affecting transport of sperm and glochidia, or by modifying host fish behavior, travel patterns, or habitat use.

Some mortality of individuals translocated out of the direct impact area is also expected due to translocation-induced stress, and/or placement in habitat potentially less suitable than that previously occupied.

After fully considering the direct and indirect effects of the proposed action, the Service believes that the northern riffleshell and clubshell will eventually recover to levels slightly below their present levels within the action area. This conclusion is based upon the following factors: 1) the French Creek populations of the northern riffleshell and clubshell are intermittently distributed over several miles of French Creek, including habitat immediately upstream and downstream of the project area; 2) recruitment has been documented for the northern riffleshell within the action area; 3) the most significant project-related river modifications are, for the most part, temporary; 4) PennDOT will implement conservation measures to minimize impacts, including the translocation of endangered mussels outside of the construction area; 5) there will be some mortality and stress of individuals within the action area, and 6) there will probably be some long-term reductions in mussel habitat quality due to the causeway.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, 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 would require separate consultation pursuant to section 7 of the Act.

There are no future activities identified for the action area that may result in impacts to the clubshell and northern riffleshell.

CONCLUSION

After reviewing the current status of the clubshell and northern riffleshell, the environmental baseline for the action area, and the effects of the proposed Utica bridge replacement project, it is the Service's biological opinion that replacement of the Utica bridge, with implementation of the conservation measures (i.e., commitments) proposed by PennDOT, is not likely to jeopardize the continued existence of the clubshell or the northern riffleshell. No critical habitat has been designated for these species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of 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 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 the 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.

The measures described below are non-discretionary, and must be undertaken by the Federal Highway Administration so that they become binding conditions of any funding, permits, and/or approvals, as appropriate, issued to PennDOT for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to require PennDOT to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, authorization, or funding document, 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. In order to monitor the impact of incidental take, the FHWA or PennDOT must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(I)(3)].

AMOUNT OR EXTENT OF TAKE

The Service anticipates that clubshell and northern riffleshell will be taken during replacement of the Utica bridge through direct mortality, injury, and stress. Take is predicted to occur within the footprint of the work platform, piers, and cofferdams associated with the existing and new bridge; in the vicinity of the bank abutments of the new and existing bridge; and in an area surrounding each of these features.

Even assuming that a thorough search is implemented to remove and relocate clubshell and northern riffleshell from the direct impact area, not all individuals will be located. It is expected that all clubshell and northern riffleshell that are not translocated outside of the direct impact area will be killed.

Direct mortality and injury will also occur outside the direct impact area due to sedimentation resulting from construction activities, scouring, and changes in hydrology due to the causeway. Some mortality of mussels dislocated during scouring is expected due to predation or injury.

Stress, short-term reproductive impairment, and limited mortality due to changes in hydrology, including ponding and scouring, are predicted to occur at least 150 feet upstream to 100 feet downstream of the centerline of the existing Utica Bridge. Stressors include low oxygen, decreased food and sperm availability in the water column, and increased silt and other sediment loading. The project will also result in loss or decreased suitability of mussel habitat due to ponding, sedimentation and scouring. These events could result in harm to adult clubshell and northern riffleshell, the glochidial life stage of these species, and populations of host fishes.

Mortality, injury, and stress are also expected to occur from translocation activities. In addition, when handling northern riffleshell during translocation activities during the late summer, spontaneous abortion of glochidia may occur.

The Service anticipates that clubshell and northern riffleshell within the action area will recover to levels slightly below their present levels. It is anticipated that post-project, much of the mussel habitat will be restored following removal of the causeway, and that mussels will eventually recolonize the area.

The actual level of incidental take will be difficult to detect or quantify for the following reasons: 1) as indicated by the results of the mussel survey within the project action area, the northern riffleshell represents a small component of the mussel community; 2) the clubshell, if present, occurs in small, and possibly undetectable numbers; 3) individuals (juveniles and adults) of both species are small, and often buried in the substrate, making them difficult to locate; and 4) finding dead or injured specimens is unlikely.

Based on available information regarding project impacts, and species abundance and spatial distribution, however, the Service has estimated the level of expected take for the northern riffleshell (Table 1). Implementation of the proposed project would be expected to result in the take of up to 389 northern riffleshell within the “primary impact area” (defined under Terms and Conditions, No. 1). Take within the primary impact area is expected to be in the form of mortality and harm. If a thorough survey and effective translocation are conducted, this level of take should be reduced to 74 northern riffleshell, assuming 1) mussels visible at or residing within 7 cm of the substrate/water interface will be located and retrieved during the translocation; 2) translocation retrieval for the northern riffleshell will be approximately 90 percent; and 3) translocation-associated mortality will not exceed 10 percent.

No density information is available for the clubshell at this site, and surveys failed to reveal its presence; therefore, the Service has not attempted to estimate a numerical level of take for this species. Accordingly, take for this species is defined as the loss of all clubshell within the primary impact area that are not retrieved during the translocation, plus any clubshell lost due to translocation-induced stress.

The numerical take levels in Table 1 are intended to provide estimates of the level of take due to direct effects, since the Service is unable to quantify the expected levels of take outside the primary impact area due to uncertainties regarding the extent of adverse effects expected (e.g., scouring, sedimentation, and pooling upstream and downstream of the causeway). Any take that may occur outside the primary impact area is expected to be minimal and in the form of harm.

To further clarify and encompass all levels of take (direct and indirect), the Service is providing the following narrative statements:

1. Loss (due to death and injury) of all mussels not found and removed from the “primary impact area” (see Terms and Conditions, No. 1) during the translocation. However, it is anticipated that recolonization by mussels will gradually occur in this area post-construction;
2. Loss of a small percentage (#10 percent) of the translocated mussels, due to factors such as translocation-induced death, migration out of monitoring plots, and/or predation;
3. A maximum loss of 5 percent of mussel habitat within the primary impact area due to incomplete removal of project-related materials (e.g., causeway rocks, demolition debris) from the river following construction;
4. The spill or release of petroleum products or other hazardous substances into French Creek during construction; and
5. The discharge of large amounts of sediment during construction, as defined by a noticeable sediment plume extending more than 200 feet downstream of the causeway.

If criteria 4 or 5 (above) occur, the FHWA shall immediately take remedial action(s), and contact the Service for recommendations and to determine if reinitiation of consultation will be required. If criteria 2 or 3 are exceeded, the FHWA should initiate with the Service an evaluation to determine the cause. If evidence suggests that the cause was related to the construction activities, remediation and/or reinitiation of consultation may be required.

**Table 1. Utica Bridge Replacement
Estimated Take of Northern Riffleshell
within the Primary Impact Area¹**

ESTIMATES	NORTHERN RIFFLESHELL
Mussel density ²	0.35/m ²
Size of primary impact area potentially supporting this density	1112 m ²
Take expected <i>without</i> translocation	389
Translocation retrieval ³	350
Mussels not found during translocation (= TAKE)	39
Mortality associated w/translocation ⁴ (= TAKE)	35
TOTAL TAKE	74

¹ Approximately 310 m² consisting of the work platform and mid-channel piers/cofferdams, plus 802 m² surrounding these structures (totaling 1112 m²). Note that the 14 m² consisting of the existing south abutment/cofferdam, and 60 m² surrounding this structure are subject to translocation, but were omitted from the area used to estimate the number of northern riffleshell taken due to lower habitat quality in this area. (See also Term and Condition 1a.)

² Based upon the 20 excavated quadrat samples taken during the August 1996 mussel survey, within which seven northern riffleshell were located. This is likely to be an overestimate because it appears that quadrats were concentrated in areas of high quality habitat.

³ Number of mussels expected to be retrieved during the translocation, if the top 7 cm of substrate is inspected, and assuming 90 percent collection efficiency.

⁴ Assuming up to 10 percent mortality of retrieved mussels.

EFFECT OF THE TAKE

In the accompanying Biological Opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the clubshell or northern riffleshell.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of *Pleurobema clava* and *Epioblasma torulosa rangiana*:

1. Prior to project construction, conduct an intensive survey of the “primary impact area” (defined under Terms and Conditions, No. 1) and translocate all native mussels encountered to suitable habitat upstream of the project area.
2. Any barge, other floating craft, anchors, anchor chains, propellers, outboard motors, cranes, bulldozers, or other equipment that originates from, or has come in contact with waters known or suspected to contain zebra mussels (such as the Mississippi or Ohio Rivers), shall be free of zebra mussel adults and veligers. This shall include equipment deployed during the translocation of *P. clava* and *E. t. rangiana*.
3. Measures shall be implemented to minimize adverse effects to *P. clava* and *E. t. rangiana* and their habitat due to project-related hydrological impacts.
4. Control measures shall be implemented to minimize project-related erosion and sedimentation.
5. Control measures shall be implemented to ensure that hazardous substances do not enter French Creek.
6. Following construction, the primary impact area shall be surveyed to determine the extent of construction-related impacts to mussel habitat.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and outline reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. Prior to bridge demolition (i.e., in July, August, or September of 1998 or 1999, prior to demolition and construction activities), translocate all live native mussels, including *P. clava* and

E. t. rangiana, from the “primary impact area” to suitable habitat upstream of the project area (BA, commitments 8-9, p. 44).

- a. The primary impact area includes the habitat most likely to be occupied by *E. t. rangiana*, and most likely to be directly affected by construction and demolition activities. For the purposes of the translocation, the primary impact area includes the 1) construction staging platform with cofferdam; 2) new mid-channel pier with cofferdam; 3) existing pier with cofferdam; 4) existing south bank abutment with cofferdam; 5) a 20-foot-wide zone upstream, downstream and lateral to the construction staging platform with cofferdam, and new mid-channel pier with cofferdam; and 6) a 10-foot-wide zone upstream, downstream, and lateral to the existing pier with cofferdam, and existing south bank abutment with cofferdam.
- b. Develop and implement a plan for translocating mussels from the primary impact area to an appropriate relocation site(s). The plan should include: a protocol for maximizing the probability of finding the endangered mussels; a protocol for removing mussels from the substrate (searching substrate to a depth of at least 7 cm); protocols for handling, holding, and marking mussels; and a delineation of the area(s) to which mussels will be relocated. All procedures and techniques will require Service approval through the Pennsylvania Ecological Services Field Office. The mussel translocation plan shall be submitted to the Service for approval at least one month prior to initiating any in-stream translocation activities.
- c. Prior to the translocation effort, the primary impact area shall be clearly marked. Temporary and/or permanent marking shall be done in such a manner as to assist the translocation team. Permanent bank and in-stream reference marking shall be done for the purposes of defining the construction platform and new mid-channel pier cofferdam limits (i.e., the proposed corners of these structures should be marked in-stream) for the following construction season and for post-construction monitoring.
- d. Collection and relocation must be done only when the water temperature is above 55 degrees Fahrenheit and water clarity is good.
- e. Surveys and translocation of mussels will be performed by approved, qualified personnel who are thoroughly briefed on the techniques to be used. These personnel shall survey the primary impact area via diving, wading, and/or snorkeling, as appropriate. All mussels located shall be collected by hand and removed.
- f. All mussels shall be identified to species, counted, and if possible, sexed, processing all *P. clava* and *E. t. rangiana* immediately upon finding. Live specimens of *P. clava* and *E. t. rangiana* shall be measured, and sexed (*E.t. rangiana* only), and specimens

that are of sufficient size shall be individually marked with tags. In addition, a sufficient number of live non-endangered mussels shall be measured and tagged to assist in post-translocation monitoring of the endangered mussels.

- g. While awaiting identification, marking, and relocation, *P. clava* and *E. t. rangiana* shall be held temporarily using a Service-approved protocol that will maximize survival and minimize stress (e.g., held in containers circulating river water to ensure appropriate and consistent water temperature and oxygen levels). During boat (or other vehicle) transfer to the relocation site, *P. clava* and *E. t. rangiana* shall be held in containers with fresh river water. Relocation of individual *P. clava* and *E. t. rangiana* shall take place within three hours of collection.
- h. *P. clava* and *E. t. rangiana* removed during the pre-construction survey shall be relocated to suitable habitat upstream of the bridge. The relocation site shall be no closer than 500 feet, and no farther than two miles, from the existing bridge. Suitable habitat includes an area: 1) with stable sand/gravel or sand/gravel/cobble substrate below the ordinary low water elevation; 2) with similar mussel species diversity, including the presence of the *E. t. rangiana*; and 3) not currently subject to mixing zones associated with point-source discharges, or subject to evident sources of non-point source pollution.

Non-endangered mussels should be translocated in such a manner as to 1) increase their chances for survival; 2) facilitate monitoring of endangered mussels; and 3) answer research questions regarding translocation methods and/or project impacts.

- i. Individual *P. clava* and *E. t. rangiana* shall be hand-placed securely in the substrate by a professional malacologist or other qualified individual. The siphons of *P. clava* and *E. t. rangiana* shall be exposed at the substrate/water interface. This will avoid dislodging of the mussels during high flow events. Due to the compacted nature of the substrate in certain areas it may be necessary to excavate a place in the substrate with a tool or by hand for the endangered mussels.
- j. Any *P. clava* and *E. t. rangiana* accidentally killed, or that are moribund or freshly-dead and contain soft tissues, are to be preserved according to standard museum practices, properly identified or indexed (date of collection, complete scientific and common name, latitude and longitude of collection site, description of collection site), and submitted to the Biological Resource Division, Leetown Science Center, 1700 Leetown Road, Kearneyville, WV 25430. The appropriate person at BRD should be contacted regarding proper specimen preservation and shipping procedures.

In addition, the Service's Region 5 Division of Law Enforcement must be notified within 24 hours of this take.

- k. Notification must be made to the following Service offices at least two weeks prior to beginning in-stream translocation activities:
 - < Service's Region 5 Division of Law Enforcement, 300 Westgate Center Drive, Hadley, MA 01035-9589 (telephone: 413-253-8343)
 - < Service's State College, Pennsylvania Field Office, (Attn: Endangered Species Specialist), 315 South Allen Street, Suite 322, State College, PA 16801 (telephone: 814-234-4090).
- l. A report documenting the translocation effort shall be prepared and submitted to the Service's Pennsylvania Field Office and the Pennsylvania Fish and Boat Commission within three months of completion of the translocation. The report shall include an introduction, methods section, results section, conclusion and/or summary, and any relevant supplementary information (e.g., names and qualifications of surveyors). The methods section should detail protocols used for surveying, holding, handling, marking, and translocating mussels; and establishment and location of the relocation site, and of monitoring plot(s) within the site. The results section should include: the total number of individuals of each mussel species collected and relocated; date collected; water and air temperatures; river stage; total number of live and dead *P. clava* and *E. t. rangiana* collected; condition, size and approximate age of live *P. clava* and *E. t. rangiana*; data regarding non-endangered mussels; and maps or figures showing 1) project features (causeway, old bridge, new bridge), and primary impact area; 2) the relocation site(s) and the design of its monitoring grids and cells; and 3) the number and kind of mussels placed within relocation sites, grids, and cells.
- m. A follow-up inspection of the relocation site(s) will be conducted one to two months after the translocation to ensure that transplanted individuals have established themselves in the substrate and are siphoning properly. A brief report summarizing the findings of this inspection shall be prepared and submitted to the Service and the PFBC within one month after the inspection.
- n. Develop and implement a plan for monitoring translocation success for at least three years following translocation to assess the health (e.g., growth) and survival of the translocated mussels, particularly *P. clava* and *E. t. rangiana* and appropriate surrogate species. Reports detailing monitoring methods and results shall be provided to the Service within three months after field work is completed. Monitoring shall occur when water temperatures are above 55 degrees Fahrenheit, and shall attempt to occur

outside of the spawning period for *E. t. rangiana*. A draft monitoring protocol, which details mussel marking methods, the targeted number of individuals of each species to be marked (i.e., the surrogate species), monitoring grid/cell establishment, sampling protocols and frequency, and expected products shall be submitted to the Service for comment prior to the scheduled translocation. The final monitoring plan shall be submitted for Service approval within two months following the translocation.

2. Evidence shall be provided to the Service that all equipment to be used in French Creek (during construction or mussel relocation) has never been in zebra mussel-infested waters, or that equipment has been appropriately cleaned, disinfected, and inspected for zebra mussel adults and veligers, using accepted protocols.
3. Implement the project modifications and commitments (numbers 2, 4, and 5 as described in the January 1998 Biological Assessment, pp. 43-45) designed to minimize project-related hydrological and hydraulic impacts (e.g., ponding and scouring) and other impacts (e.g., presence of causeway rock material following construction) to *P. clava* and *E. t. rangiana* and their habitat, plus the following measures:
 - a. The causeway shall be constructed of clean rock material held within a containment structure. The causeway shall be completely removed following construction.
 - b. The span of the causeway's temporary bridge shall be maximized to reduce the amount of rock fill required.
 - c. All construction shall be completed in one construction season (approximately March to December of one calendar year), or in accordance with Terms and Conditions, No. 7.
 - d. The existing pier shall be removed to two feet below the normal stream bed elevation, and then backfilled to grade with substrate suitable for mussels (i.e., a sand, gravel, and cobble mixture similar to natural river substrate at this site). At least the top one foot of the fill material should be derived from the top one foot of material excavated to construct the new mid-channel pier, if this material is a sand/gravel, or sand/gravel/cobble mixture.
4. Develop and implement a project erosion and sedimentation (E&S) control plan (BA, commitment 7, p. 44-45) . This plan will address all sources of project-related erosion and sedimentation, including the causeway, any sedimentation basins on the causeway, construction access road, changes in roadway approaches, staging areas, pier and abutment removal and replacement, etc. This plan shall be submitted to the Service for review and approval at least three months prior to beginning construction activities.

- a. Best Management Practices for erosion and sedimentation control shall be in place before, during, and, as appropriate, after any work is conducted.
 - b. PennDOT or FHWA will monitor the project site daily to ensure the E&S control practices are implemented, and to identify any project-related impacts from scouring or sedimentation.
 - c. Contractors should be instructed on the importance of the natural resources in the project area and the need to ensure proper implementation of the required E&S control practices.
 - d. Implement a penalty system for contractors that do not fully implement the E&S control plan.
 - e. Reports on implementation of these measures, and on evidence of scouring and sediment deposition, should be provided monthly to the Service. If it appears that scouring or sediment deposition are beyond that considered normal, the Service should be contacted promptly.
5. Prevent hazardous materials (e.g., petroleum products, solvents, paints, etc.) from entering French Creek or contaminating soils or waters within the watershed (BA, commitment 10, p. 44-45). If a spill does occur, implement emergency remediation procedures to contain the spill and/or prevent the spill from entering French Creek.
- a. Develop and implement a spill avoidance/remediation plan based on the most effective prevention and remediation practices. Such measures may include stationing of emergency response equipment at the project site, and designation of contained fueling and fuel storage areas away from the river. This plan should be submitted to the Service for review and approval at least three months prior to construction.
 - b. PennDOT or FHWA will monitor the project site daily to ensure that spill avoidance practices are implemented.
 - c. Contractors should be instructed on the importance of the natural resources in the project area and the need to ensure proper implementation of the required spill avoidance/remediation practices.
 - d. Implement a penalty system for contractors that do not fully implement the spill avoidance/remediation plan.

- e. Monitor weather and river stages to allow removal of any hazardous materials from the causeway and the floodplain in the event that flooding is expected.
 - f. The Service shall be notified immediately of any spills of hazardous materials.
6. Document and remediate causeway-related impacts to mussel habitat within the primary impact area. Within six months following causeway removal, the primary impact area shall be surveyed to 1) determine the percent cover of project-related material (e.g., rock from causeway, and demolition and construction debris) remaining in the river, and 2) identify any areas of noticeable scouring or sediment deposition. A sampling plan shall be submitted to the Service for review and approval at least three months prior to conducting this sampling.
7. If this project will not be completed in its entirety during the 1999 calendar year, the following terms and conditions also apply.
- a. Complete the entire project during the year 2000, OR construct the abutments and north bank pier of the new bridge in 1999, and complete the remainder of the project during the year 2000 (so that impacts associated with the work platform occur within one construction season instead of two).
 - b. Timing of mussel translocation:
 - i. Conduct the mussel translocation, as described under Terms and Conditions, No. 1, in 1999, OR
 - ii. Conduct the mussel translocation, as described under Terms and Conditions, No. 1, in 1998, AND conduct an intensive mussel survey within the primary impact area during the summer of 1999 to determine whether or not a second translocation effort within the primary impact area will be necessary in 1999, prior to beginning in-stream work in the year 2000.

This survey effort shall include sampling 120 to 150, 0.25m² (0.5 m by 0.5 m) quadrats, excavating one-third to one-half of the total number of quadrats in order to estimate the density and total number of *E. t. rangiana* within the primary impact area. The protocol and study design for the sampling shall be submitted to the Service at least 3 months prior to undertaking this activity. Based on their expertise in the areas of mussel ecology, mussel sampling, statistics and study design, we recommend that the Leetown Science Center of the Biological Resources Division of the U.S. Geological Survey conduct this sampling.

Any *E. t. rangiana* found in the primary impact area would likely be individuals that migrated or washed into the area, juveniles that colonized the area, and/or individuals that grew to a more detectable size during the year following the translocation. If, based upon this sampling, \$50 *E. t. rangiana* are estimated to occur within the primary impact area, a second translocation shall be conducted in accordance with Terms and Conditions, No. 1.

CONSERVATION RECOMMENDATIONS

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

The Service has identified the following actions which, if undertaken by PennDOT and/or the FHWA, would further the conservation and assist in the recovery of *P. clava* and *E. t. rangiana*.

1. Monitor the primary impact area at least twice over the next 10 years to determine species-specific rates of natural recolonization following construction.
2. Produce a video documenting the mussel translocation, emphasizing the methods used.
3. Support research to determine the natural fish host species for *P. clava* and *E. t. rangiana*.
4. Within the Allegheny River and French Creek watersheds, implement and/or support projects which would improve water quality by reducing non-point source pollution. Such projects include, but are not limited to, wetland preservation, wetland restoration, streambank fencing, and streambank restoration (via establishment of native plant species).

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the information presented with the Federal Highway Administration's February 23, 1998, request for initiation of formal consultation. 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 (or is authorized by law), and 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 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. Note that failure to remove the existing bridge immediately following construction of the new bridge (e.g., which may necessitate its removal during a different construction season) would be an example of a significant project modification requiring reinitiation of consultation.

Date

Supervisor, Pennsylvania Field Office