

**DRAFT**  
**Environmental Assessment**

**Augmentation and Reintroduction Plan for the Clubshell (*Pleurobema clava*)  
and Northern Riffleshell (*Epioblasma torulosa rangiana*) in Illinois**

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## 1. Purpose and Need

- 1.1. Purpose: The purpose of this Environmental Assessment (EA) is to consider alternatives for augmenting existing populations of the clubshell (*Pleurobema clava*) and/or reintroducing the northern riffleshell (*Epioblasma torulosa rangiana*) to waters within their historic range in Illinois. Both species are federally listed as endangered. Preparation of this EA is in response to a request for federal assistance under section 6(d) of the Endangered Species Act of 1973, as amended (Act). The purpose of the augmentation and reintroduction is to implement a recognized recovery action for these two listed mussel species.
- 1.2. Need: The U.S. Fish and Wildlife Service's (USFWS) recovery plan for the clubshell and northern riffleshell identified a recovery objective of establishing viable populations, including as many subpopulations as possible to maintain genetic variability, of each species in ten separate drainages in order to downlist each species from endangered to threatened. The recovery plan identifies the presence of the clubshell in nine drainages and the northern riffleshell in only seven drainages. Although the species may be present, not all occurrences represent viable, reproducing populations. In order to establish these species in at least ten drainages and maintain population viability, it is necessary to augment existing populations and reintroduce these species within their historic range.
- 1.3. Decisions To Be Made: The USFWS's Regional Director, Great Lakes/Big Rivers Region, will select one alternative or a combination of the alternatives analyzed in detail and will determine, based on the facts and recommendations contained herein, whether this EA is adequate to support a Finding of No Significant Impact (FONSI) decision, or whether an Environmental Impact Statement (EIS) will need to be prepared.
- 1.4. Background: The clubshell and northern riffleshell were once widespread throughout the Ohio River and Maumee River drainages, and the clubshell appears to have been quite common. Both species were listed as endangered, pursuant to the Act, on 22 February 1993 (Department of the Interior 1993). Reasons for declines of both species include siltation from runoff, pollutants such as pesticides and fertilizers, habitat alteration from dams and impoundments, in-stream sand and gravel mining, and invasive species such as zebra and quagga mussels (USFWS 1994).

The clubshell historically occurred in the Ohio River watershed in New York, Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Kentucky, Tennessee and Alabama. The clubshell also occurred in the Lake Erie watershed in the Maumee River drainage in Michigan, Indiana and Ohio. Extant populations of the clubshell are found in West Branch St. Joseph River in Ohio and Michigan; Fish Creek in Ohio and Indiana; Tippecanoe River in Indiana; Green River in Kentucky; Little Darby Creek in Ohio; Elk River in West Virginia; Hackers Creek in West Virginia; Pymatuning Creek in Ohio; and Allegheny River, French Creek, Conneaut Outlet, Conneauttee Creek and LeBoeuf Creek in Pennsylvania (USFWS 1994). In Illinois, the clubshell existed in Vermilion River, including the mainstem and North, Middle and Salt Forks. The clubshell was

believed to be extirpated from this river system (Cummings et al. 1998); however, a live clubshell was recently found in the Middle Branch of North Fork Vermilion River (Szafoni et al. 2000).

The northern riffleshell historically occurred in many of the same Ohio River watersheds in Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Kentucky, Tennessee and Alabama. The riffleshell also was found in the Lake Erie drainage in Ohio and Indiana, but the riffleshell's range extended farther north into the Detroit and St. Clair River watersheds in Michigan and Ontario, Canada. Extant populations of the northern riffleshell are found in Fish Creek in Ohio and Indiana; Green River in Kentucky; Big Darby Creek in Ohio; Elk River in West Virginia; and Allegheny River, French Creek and LeBoeuf Creek in Pennsylvania (USFWS 1994). Although the riffleshell occurred in Michigan in Black and Detroit Rivers as recently as the 1980s, it is likely extirpated from those waterways due to channelization activities and zebra mussel infestations (Badra 2004). Metcalfe-Smith et al. (2003) recently confirmed the presence of the riffleshell in East Branch Sydenham River in Ontario. In Illinois, sub-fossil shells have been collected from North Fork and Vermilion Rivers; however, the riffleshell has not been reported alive in Illinois in more than 70 years (Cummings et al. 1998). Of the remaining populations in the Ohio River watershed, the only reproducing population is in French Creek (Allegheny River drainage) in Pennsylvania (Watters, personal communication, 2005).

The recovery plan for these two species identified eight Priority 1 Recovery Tasks. In the last fourteen years since publication of the recovery plan, several of these tasks have been accomplished, and many are ongoing. For example, the USFWS's Ohio River Ecosystem Team identified priority streams for watershed protection/restoration to benefit mussel fauna. The population status of clubshell and northern riffleshell continues to be monitored at existing sites. Other ongoing recovery tasks include participation in the regulatory compliance processes and enforcement of laws and regulations pertaining to the collection of mussel specimens. Some studies into the mussels' life histories have been conducted, such as identification of fish hosts for the clubshell and riffleshell (O'Dee and Watters 2000). To address the conservation needs of freshwater mussels, the National Native Mussel Conservation Committee published a "National Strategy for the Conservation of Native Freshwater Mussels" (1998). Among its recommendations, the Committee identified a goal of developing, evaluating and using the technology to propagate and reintroduce juvenile mussels on a large scale.

## 2. Alternatives, Including the Proposed Action

### 2.1. Alternative 1 - No Action

Under this alternative, clubshells and northern riffleshells would not be reintroduced into streams within their historic range nor would existing populations of these two mussel species be augmented. Recovery activities would remain focused on current recovery actions such as monitoring of populations, participating in regulatory compliance processes, and enforcing laws and regulations pertaining to the collection of mussel

specimens. Existing populations of listed mussel species would continue to receive protection under the Act. The USFWS and Illinois Department of Natural Resources (IDNR) would continue to manage fish and wildlife resources under their respective areas of jurisdiction.

2.2. *Alternative 2 - Augment existing populations of clubshell and establish nonessential experimental populations of clubshell and northern riffleshell within their historic range*

The USFWS, in cooperation with partner agencies and organizations, would release clubshell and northern riffleshell mussels in Illinois. The clubshells would be released at sites with existing populations. As the existing populations are protected under the Act, these released mussels would also receive full protection. Additional clubshells and the northern riffleshell would be reintroduced to uninhabited waters within their historic range. These reintroduced mussels would be designated a Nonessential Experimental Population (NEP) in accordance with section 10(j) of the Act. Experimental populations are treated as if they were listed as threatened species for purposes of protection under the Act, with the exception that nonessential populations that do not occur within the National Wildlife Refuge System or the National Park System are treated as proposed for listing for consultations with federal agencies under section 7 of the Act.

The proposed NEP area would include the Vermilion River basin in Illinois and Indiana, with the exception of the clubshell in North Fork. Both of these two states are within the historic ranges of the clubshell and northern riffleshell. We expect most reintroduced mussels would be concentrated within the streams of release in Illinois; however, some reintroduced mussels may become established in the bordering state of Indiana through drift of juvenile mussels and/or transport by host fish infested with glochidia.

Experimental populations are designated as such only when the population is wholly separate geographically from non-experimental populations of the same species. As North Fork has an existing population of clubshell, this area cannot be designated as part of the NEP area. We expect the Lake Vermilion Dam on North Fork to act as a barrier, isolating the existing clubshell population from other forks and tributaries in the basin; thus, areas downstream of the dam could be included in the NEP area.

2.3. *Alternative 3 (Proposed Action) - Augment existing populations of clubshell and establish populations of clubshell and northern riffleshell, classified as endangered under the Act, within their historic range*

This alternative would be carried out in the same manner as Alternative 2 except that the reintroduced mussels would receive full protection under the Act. This protection would extend throughout the mussels' range, wherever they reside. The only exceptions would be takings by special permit "for scientific purposes or to enhance the propagation or survival of the affected species" or through an incidental take permit. The USFWS would not prepare and issue a separate rulemaking to designate NEPs for clubshell and northern riffleshell.

#### 2.4. Alternative 4 - *Augment existing populations of clubshell*

Under this alternative, clubshells would be released at sites with existing populations in order to make these populations viable. As the existing populations are currently protected under the Act, these released mussels would also receive full protection against take with the same exceptions described in Alternative 3. Mussels would not be reintroduced at locations without existing populations. Because the northern riffleshell is extirpated from Illinois, this alternative involves only the clubshell.

#### 2.5. Implementation Techniques Common to Action Alternatives 2, 3 and 4

*More detailed information on these techniques is available in the Augmentation and Reintroduction Plan.*

##### 2.5.1. Mussel Propagation

Clubshell and northern riffleshell mussels will be propagated at the Columbus Zoo & Aquarium Freshwater Mussel Conservation Facility (FMCF), located in Shawnee Hills, Ohio. Captive propagation requires the removal of gravid females from existing wild populations to a facility or hatchery for the purpose of breeding or extracting mature glochidia. In addition, adult mussels can be collected and bred within the facility for the purpose of generating progeny. Methods of propagation (as well as methods for captive rearing) will be tested and refined using surrogate mussel species prior to attempts to propagate either clubshell or northern riffleshell.

##### 2.5.2. Release of Host Fish Infected with Glochidia

Glochidia propagated at the FMCF or harvested from gravid females in the wild will be used to infect host fish. Appropriate host fish species will be collected from the Augmentation/Reintroduction (A/R) sites, parasitized with glochidia on site and then released back into the A/R locations. All or a portion of newly parasitized fish will be enclosed in a wire mesh cage so that the newly transformed juveniles can be collected and monitored at the sites over a period of several months to years. The wire mesh cage is about the size of a three-foot box and may have a mesh or solid bottom. The cages are placed by hand and anchored to the substrate.

##### 2.5.3. Release of Newly Metamorphosed Juvenile Mussels

Glochidia propagated at the FMCF will be used to infect host fish. The host fish are placed in Aquatic Habitat units (AHABs) at the FMCF until glochidia transform into juvenile mussels and drop off onto the substrates in the holding vessels. After a short holding time (less than 30 days), the newly metamorphosed juvenile mussels will be moved to the A/R sites.

##### 2.5.4. Release of Sub-adult Mussels Reared in Captivity

This technique follows the method outlined above for obtaining newly metamorphosed mussels. The juvenile mussels will be reared for two months to a year at the FMCF until the juvenile mussels reach sub-adult stage. The sub-adults will then be released at the A/R sites.

### 2.5.5. Translocation of Adult Mussels

This option would remove a subset of individual adult mussels, including gravid females, from existing populations and release them at the A/R sites. The adult mussels would likely come from streams in Pennsylvania. Under the proposed action (Alternative 3), initial translocation of adults will occur in the Middle and North Forks.

## 3. Affected Environment

The Illinois portion of the Vermilion River basin is found along the Illinois/Indiana border (Figure 1). In Illinois, the basin encompasses most of Vermilion County, sizeable parts of Champaign and Ford Counties, and much smaller portions of Iroquois, Livingston, and Edgar Counties. Vermilion River drains a total of 1,434 square miles of which 1,286 square miles occur in east central Illinois. The Vermilion River watershed is within the physiographic region of the Bloomington Ridged Plain, which is characterized by wide stretches of nearly flat to gently rolling till plains, crossed by low, broad end moraines. Roughly 90% of the land is level or gently sloping (0-4% slope). About 80% of the soils in the area have poor or somewhat poor natural drainage. Approximately 1,750 miles of rivers and streams traverse the watershed in Illinois. In general, most streams are poorly incised and provide relatively poor natural drainage; however, the western portion of the watershed contains an extensive network of artificial drainage ditches and channelized streams.

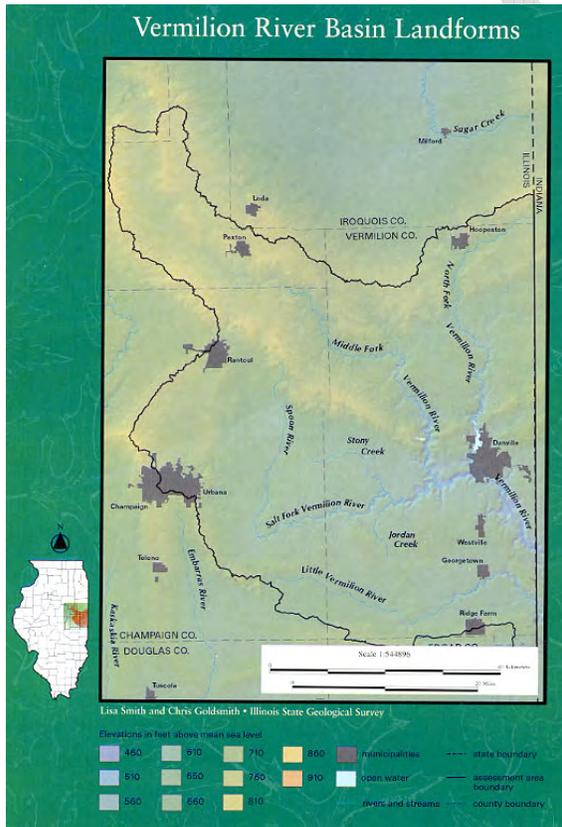


Figure 1. Vermilion River watershed (from IDNR 2000)

### 3.1. Physical Characteristics

#### 3.1.1. Vermilion River mainstem

The mainstem of the river is formed by the confluence of the Middle and Salt Forks north of Catlin, Illinois. The total length is roughly 28 miles with an average width of 109 feet. Eleven miles downstream of the state line, the mainstem flows into Wabash River near Cayuga, Indiana.

#### 3.1.2. North Fork Vermilion River

The North Fork originates in Iroquois County and joins the mainstem at Danville. The stream is 62 miles long, has a drainage area of 307 square miles. A dam and spillway were constructed in 1925 to form Lake Vermilion. Modifications to the spillway were made in 1992 to increase the normal pool level by five feet (IDNR 1999b). The depth of the river ranges to five feet and the width varies from 10 feet in the headwaters to 70 feet in the lower reaches.

#### 3.1.3. Middle Fork Vermilion River

The Middle Fork originates in Livingston County, is 83 miles long and has a drainage area of 449 square miles. Of the three tributaries to the Vermilion, the Middle Fork has the best water quality and is a free-flowing, relatively intact representative of what once occurred in the basin (IDNR 2000).

#### 3.1.4. Salt Fork Vermilion River

The Salt Fork, which acquired its name from the salt springs found along its banks, has its headwaters near Rantoul and drains much of Champaign County. It is 71 miles in length and has a drainage area of 509 square miles.

### 3.2. Biological Environment

#### 3.2.1. Habitat/Vegetation

##### 3.2.1.1. Vermilion River

The mainstem of the river has a substrate of sand, gravel, and rubble with a small amount of localized silt. The Illinois Environmental Protection Agency (IEPA) rates the mainstem as “Full Use Support” for aquatic life uses (IEPA 2004).

##### 3.2.1.2. North Fork Vermilion River

The substrate consists of sand and gravel with some silt and cobble. Stream habitats include gravel riffles, sand bars, pools, roots of trees, and slight bends. Some areas have aquatic vegetation. A narrow forested riparian zone is bounded by row crops or pasture throughout most of the river’s length. The lower reaches of North Fork are designated as providing “Full Use Support” for aquatic life uses; the upper 24 miles provide “Partial Use Support” (IEPA 2004).

### 3.2.1.3. Middle Fork Vermilion River

The substrate is predominantly sand and gravel. IEPA rates Middle Fork as “Full Use Support” for aquatic life uses (IEPA 2004).

Seeps—wetland communities characterized by a constant diffuse flow of ground water—are localized and commonly associated with the forested riparian area bordering Middle Fork. One of these seep communities is found within Windfall Prairie Nature Preserve, which consists of a gravel bluff prairie on the east bank of Middle Fork River and a seep spring at the base of the bluff. With a groundwater pH of 8.4, the seep is calcareous (alkaline) with deposits of tufa, which are concretions of calcium carbonate. This two-acre site accounts for 13.8% of the total undegraded calcareous seep remaining in Illinois. Within the seep spring is a large stand of grass-of-parnassus, a rare species in Illinois, and Wolf’s bluegrass, a state listed endangered species. The population of Wolf’s bluegrass is found at the base of a seep that has been actively slumping. As a result, the population is not secure and could soon be extirpated (IDNR 2000).

### 3.2.1.4. Salt Fork Vermilion River

Salt Fork has a gravel, rubble, and sand substrate. Approximately 35 miles are designated as “Partial Use Support” for aquatic life uses (IEPA 2004).

A rare plant community in the Vermilion River basin is the eroding bluff community, a vertical exposure of eroded material such as glacial drift, maintained by the erosive action of streams. Four and a half acres of this community are associated with Salt Fork, representing 15% of the undegraded eroding bluff community in Illinois (IDNR 2000).

## 3.2.2. Listed, Proposed and Candidate Species

### 3.2.2.1. Mussels

The clubshell was believed to be extirpated from the Vermilion River system. A live clubshell was recently found in the Middle Branch of North Fork Vermilion River (Szafoni et al. 2000). The northern riffleshell and fanshell (*Cyprogenia stegaria*), both federally listed endangered species, are known in the watershed from weathered dead shells only.

The clubshell generally is found in clean, coarse sand and gravel in runs, often just downstream of a riffle, in medium to large rivers. The riffleshell occupies packed sand and gravel in riffles in medium to large rivers. The fanshell also occurs in gravel riffles in medium to large rivers.

Mussels in this family, Unionidae, require a fish host to complete their life cycle. Male mussels release sperm into the water, and females downstream take up the sperm with incoming water. The eggs are fertilized and develop into larvae in the gill chamber of the female. The minute larvae, called

glochidia, are shed into the water where they must attach to the gills or fins of a fish host. The glochidia grow to juvenile mussels, which then detach from the fish. The currently known host fish species for the clubshell are the blackside darter (*Percina maculata*), striped shiner (*Luxilus chrysocephalus*), central stoneroller (*Campostoma anomalum*), and logperch (*Percina caprodes*). Known host fish for the northern riffleshell include the banded darter (*Etheostoma zonale*), bluebreast darter (*Etheostoma camurum*), and brown trout (*Salmo trutta*) (O'Dee and Watters 2000).

#### 3.2.2.2. Other species

Other federally listed species within the watershed include the Indiana bat (*Myotis sodalis*), which is listed as endangered. The Indiana bat occupies wooded stream corridors as well as upland and bottomland forests. Indiana bats roost under loose tree bark on dead or dying trees. During the summer, males roost alone or in small groups, while females roost in larger groups, which may number 100 bats or more. Indiana bats eat a variety of flying insects found around rivers and streams or along the edges of forested areas.

#### 3.2.3. Other Wildlife Species

Vermilion River and its tributaries support a large diversity of aquatic species: 97 species of fishes, 45 species of mussels, 16 species of large crustaceans, and 540 species of aquatic macroinvertebrates (IDNR 2000). Of the 45 mussel species known from the basin, 35 have been collected alive in the past 20 years. A complete list of the mussel species occurring in the basin is included in Appendix 1.

Within the Vermilion River system, the headwaters are dominated by creek chubs and orangethroat darters; the creeks by sand and striped shiners, stonecats, and johnny darters; and the larger river habitats by bluntnose minnows, golden redhorses, longear sunfish, and spotted bass. Several state-listed fish species, including the bluebreast darter, are found in the Vermilion system. This darter species is found in Illinois within the Vermilion River area only and is the westernmost location known for this fish. The bluebreast darter occurs in the Middle Fork from Potomac to the mainstem, in the Salt Fork south of Oakwood, and in Vermilion River east of Westville. Once near extirpation in Illinois, this species has made a dramatic comeback following recent improvements in water quality (IDNR 2000).

### 3.3. Land Use

#### 3.3.1. Urban Areas

The major urban areas in the watershed include Danville (Vermilion County), which is situated at the confluence of North Fork and the mainstem, and Rantoul and part of Champaign/Urbana in Champaign County. Although the area's population has dropped by nearly 10% in the last 20 years, urban land use has grown by 15% (IDNR 1999d).

### 3.3.2. Agriculture

Most of the surrounding land use, approximately 89% of the watershed, is agricultural in nature (IDNR 1999a). Cropland predominates with 77% of the total land cover in the watershed. Rural grassland, which includes pastureland, alfalfa and hay fields, roadsides and fencelines, accounts for 12% of the watershed. Approximately 55% of all acres are farmed with conservation tillage methods. Survey data from 2004 show that roughly 85 to 96 per cent of the region's farm acreage was meeting "T"<sup>1</sup> (Illinois Department of Agriculture 2004).

### 3.3.3. Natural Areas

Forest/woodland, wetlands, and lakes and streams account for 6.7% of the land cover in the Vermilion River basin (IDNR 1999a). Of this land, 15,243 acres (1.6% of the watershed) has been set aside by state or county governments as parks, fish and wildlife areas, or forest preserves (IDNR 1999c).

Middle Fork Vermilion River is the setting for both of the area's major state-owned sites, Kickapoo State Park and Middle Fork Fish and Wildlife Area. Kickapoo State Park, located west of Danville, was the first park in the nation to be built on strip-mined land. The park offers a variety of recreational activities and ranks 13th in attendance among 130 IDNR sites. Located north of Kickapoo State Park, the Middle Fork Fish and Wildlife Area provides canoe access to the river. Within these two areas reside three Illinois Nature Preserves: Horseshoe Bottom, Windfall Prairie and Middle Fork Woods.

In addition to the state-owned sites, both Champaign and Vermilion Counties have several recreation areas in the Vermilion River system. The Champaign County Forest Preserve District operates Middle Fork River Forest Preserve, which encompasses about four miles of Middle Fork River, and Homer Lake Forest Preserve, which borders approximately two miles of Salt Fork River. The Vermilion County Conservation District maintains Kennekuk County Park on Middle Fork River, Heron County Park on North Fork River, and Forest Glen Preserve on the mainstem of the river south of Danville. Forest Glen Preserve is home to four Illinois Nature Preserves, including Forest Glen Seep and Howard's Hollow Seep.

In 1989, the U.S. Department of the Interior designated a seventeen-mile stretch of Middle Fork Vermilion River as a scenic river under the National Wild and Scenic Rivers System (Department of the Interior 1989). It begins in the vicinity of Higginsville, north of Kennekuk County Park, and ends at Kickapoo State Park.

### 3.3.4. Transportation

The transportation network in the watershed covers more than 3,000 miles of roadway, including two interstates. According to the Illinois Department of Transportation (IDOT 2008), proposed road work in Fiscal Years 2009-2014

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<sup>1</sup> "T" denotes tolerable soil loss levels, typically between three and five tons per acre per year. This is the amount of soil loss that theoretically can occur and be replaced by natural soil building processes.

includes the following projects:

3.3.4.1. Vermilion County

ILL 1	North Fork 2 miles north of Rossville	Culvert replacement
ILL 119	North Fork 2 miles east of ILL 1	Bridge replacement

3.3.4.2. Champaign County

CH 22	Middle Fork 3.3 miles north of Penfield	Bridge replacement
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3.3.5. Dams

Ten dams occur on streams within the Vermilion River watershed. Of these, seven are on small tributaries. Three of these dams impede fish passage. The Danville Dam is located on the mainstem Vermilion River. The Inter-State Water Company's dam on North Fork at Danville forms Lake Vermilion.

3.3.6. Wastewater Plants/Discharges

Within the Vermilion River watershed, 49 discharges are permitted under the National Pollution Discharge Elimination System (NPDES). Of these, five are within the North Fork drainage, eight in the Middle Fork drainage, and 18 in each of the Salt Fork and mainstem drainages.

3.4. Cultural, Historical and Archaeological Resources

Archaeological information for the Vermilion River area indicates that the region was continuously occupied for the last 12,000 years. A total of 913 archaeological sites have been recorded within the watershed (IDNR 1999d). The Collins Site is a cluster of Late Woodland settlements and a platform mound, covering more than 42 acres on a Middle Fork River terrace remnant. The site has been identified as a major Late Woodland and Mississippian ceremonial complex and is listed on the National Register of Historic Places as an archaeological district (Collins National Register District).

3.5. Local Socio-economic Conditions

Vermilion County has three cities and 17 villages ranging in population from 182 to 33,828. Danville is the largest municipality in the county and is still the county seat. In terms of both employment and earnings, the county's economy has declined. For the past 25 years, employment has fallen an average of 0.2% annually, while it has grown 1.2% statewide. Per capita income is \$5,000 lower than the statewide average, ranking the county 59th out of 102 counties in the state.

Although in decline since the 1970s, manufacturing accounts for 18% of employment in Vermilion County. The service sector has steadily increased over the years and now represents 25% of employment in the county. The largest service employers are the Veterans Health Administration and Provena Health Care in Danville.

Although farm income accounts for only 3% of Vermilion County's earnings,

agriculture is a significant employer for residents in the north, west-central, and south-central parts of the county. Of the county's total farm receipts, 93% are from crops and 7% are from livestock. Corn and soybeans dominate; Vermilion County ranks in the top ten statewide in the production of both.

Today, sand and gravel are the most economically important geologic resources produced in the area. In 1997, six pits were producing sand and gravel. In addition, limestone is produced from one quarry. At one time, the coal industry was an important component of the local economy; however, only one operational coal mine, an underground mine near Georgetown, remains in the Vermilion area.

Outdoor recreation also contributes to the local economy. Visitors to Kickapoo State Park and Middle Fork Fish and Wildlife Area generate approximately \$7.9 million in total economic output and 125 jobs (IDNR 1999d). Vermilion County accounts for 3.3% of fishing licenses and 1.0% of hunting licenses sold in Illinois, compared to the county's 0.7% share of the state's population.

#### 4. Environmental Consequences

##### 4.1. Alternative 1 – *No Action*

Under the “No Action” alternative, clubshell and northern riffleshell mussels would not be released into the waters of Illinois. This alternative would not affect any local land uses, cultural resources or the physical environment. Recovery of the clubshell and northern riffleshell would be delayed while alternative recovery strategies were formulated to establish viable populations of each species in other watersheds. No other fish and wildlife resources would be affected by the “No Action” alternative.

The cumulative impacts associated with the “No Action” alternative include the continued absence of a federally listed species (except in North Fork), which, whether part of a NEP or a fully protected population, may create incentive or increase funding opportunities for conservation-related activities in the watershed. The clubshell and northern riffleshell would continue to be at risk of extinction.

##### 4.2. Action Alternatives

###### 4.2.1. Physical Environment

None of the action alternatives is expected to impact the physical environment of the Vermilion River watershed. The use of cages would require some disturbance of the stream bottom. These impacts would be minor and temporary. No detectable changes to the stream environment are expected.

###### 4.2.2. Biological Environment

None of the action alternatives is expected to affect the aquatic habitat values of the watershed. The use of cages would be temporary and would not significantly alter the aquatic habitat. Access to the river channels would avoid any areas of rare plants and/or natural communities within the watershed.

The release and establishment of new mussel populations may increase inter-specific competition with existing mussel populations. Appropriate host fish would be collected from the selected A/R sites, infected with glochidia on site, and be released immediately back to the water body. This would cause minimal disruption to the fish. Furthermore, host fish show few ill effects from glochidia parasitism (USFWS 1994).

#### 4.2.3. Listed, Proposed, and Candidate Species

Under Alternatives 2, 3 and 4, the sources for clubshell and northern riffleshell individuals are likely to be streams in Pennsylvania. How removal of adults, either permanently or temporarily, for propagation and/or translocation purposes may affect the source mussel individuals will not be addressed in this EA. Once the streams and source populations are identified, these effects will be analyzed in separate documents, involving the relevant agencies.

Populations of mussels from various watersheds may vary genetically from each other due to adaptations to dissimilar microhabitats found in separate river systems. Alternatives 2, 3 and 4 would release clubshells obtained from Pennsylvania or another outside source. If these released clubshells interbreed with clubshells currently existing in the Vermilion system, the offspring will differ genetically from the native parents. This may result in offspring with reduced fitness to the Vermilion system and may limit the viability of the existing clubshell population.

To address this issue, the U.S. Geologic Survey (USGS) is currently performing genetic analyses to compare populations of clubshell across the species' range. Decisions regarding the source population(s) for the clubshell will be determined once the USGS has completed this analysis.

Under Alternatives 2 and 3, northern riffleshell would also be reintroduced into the Vermilion system. Results of recent genetic analysis (Zanatta and Murphy 2007) suggest that recovery efforts involving artificial propagation and translocations use the geographically closest population as a source; however, Zanatta and Murphy also recommend efforts to maintain the significant levels of genetic diversity within populations. The northern riffleshells in Allegheny River in Pennsylvania are likely the only populations of sufficient size for translocation nearest to the Vermilion River drainage. Interbreeding with a native population is not a concern in Illinois because the riffleshell has been extirpated from the state.

The three dams that impede fish passage would also likely be impediments to mussel distribution in the watershed. But overall, Alternatives 2 and 3 would result in net benefits to clubshell and northern riffleshell by establishing viable populations within their historic distribution and would move these species toward recovery. Alternative 4 would improve the viability of the existing clubshell population and would aid its recovery but would not help to recover the northern riffleshell.

Releasing mussels would not require removal of trees or other impacts to Indiana bat habitat. None of the action alternatives would affect the Indiana bat.

#### 4.2.4. Land Use

##### 4.2.4.1. Alternative 2

For purposes of section 9 of the Act, endangered species designated as NEPs are treated as threatened species; therefore, special rules can be written that lessen restrictions regarding take of the covered listed species from the NEP area. These special rules could be written to cover private activities that occur within the Vermilion River watershed and may have effects to mussels. Examples of private activities include agriculture, residential development, recreation, and operation of non-federally licensed dams.

For purposes of consultations with federal agencies under section 7 of the Act, endangered species designated as NEPs are treated as species proposed for listing. For species proposed to be listed, federal agencies must confer with the USFWS only if the proposed federal action is likely to jeopardize the continued existence of the species proposed for listing. Thus, designating a NEP results in lower regulatory requirements for federal agencies.

##### 4.2.4.2. Alternative 3

This alternative is expected to have minimal impacts to agricultural activities. Some modifications to farming operations on land directly adjacent to river channels may be necessary. For example, suggested alterations to farm land could include establishment of buffer zones between fields and waterways to minimize soil erosion into stream channels, creation of filter strips along water courses to reduce runoff of nutrients or pesticides, and additional fencing to prevent livestock from entering stream channels. The presence of federally listed mussels may create incentives or increase funding opportunities for these conservation activities.

Although most of the land use in the watershed is agricultural in nature, future conversions to residential use could require restrictions, such as set-backs from waterways, detention basins to prevent runoff of silt, fertilizers and pesticides, and limitations on storm water outfalls. Similar activities could be recommended in existing urban areas with inputs to the river system.

This alternative would not adversely affect recreational land use within the watershed. Stream improvement activities to benefit mussels would also benefit other aquatic inhabitants, potentially improving the recreational fishing opportunities in the watershed. Education materials, especially for canoeists and canoe livery operators on Middle Fork, may be developed and distributed.

Pursuant to section 7 of the Act, federal agencies must consult with the

USFWS when a federal action may affect a listed species. Under the existing conditions, federal agencies consult with the USFWS for activities occurring within the North Fork drainage area, due to the potential presence of the clubshell. Re-establishing populations of federally listed mussels in other parts of the Vermilion watershed would increase the need for federal agencies to consult on activities elsewhere in the watershed. For example, the proposed transportation projects that are funded by the Federal Highway Administration and/or require a permit from the U.S. Army Corps of Engineers would likely be the subject of a section 7 consultation. Proposed bridge work may need to be designed to avoid direct impacts to in-channel habitat and/or mussel beds and to minimize siltation and bank erosion. The need to complete consultation could result in longer review times for projects with federal involvement.

Other federal activities that would require additional review for impacts to listed mussels include issuance of NPDES permits (including future reauthorization of existing permits) and licensing of new dams by the Federal Energy Regulatory Commission (FERC). Mussels are susceptible to harm from toxins and changes in water chemistry and temperature. Adjustments to discharge permits and/or dam operations as well as modifications to existing wastewater treatment plants to reduce permit exceedance incidences may be recommended to minimize these impacts.

Although potential adjustments to land use practices or modifications to future or existing facilities have been suggested here, information from IDNR and IEPA indicate that water quality in the watershed has improved over time, possibly negating the need for these adjustments. This may also indicate that historic degradation of water quality, which adversely affected mussels, has been reversed and that conditions are right for successful mussel release.

#### 4.2.4.3. Alternative 4

This alternative would affect a smaller subset of landowners within the watershed. The prohibition against take of clubshells already affects private individuals who own land adjacent to streams supporting existing clubshell populations. More landowners would be affected if augmentation is successful in increasing the size of the clubshell population. Modifications to farming practices and residential development, as discussed under Alternative 3, would also be appropriate under Alternative 4.

As the only existing population of clubshell is in North Fork, the effects of Alternative 4 would be restricted to that drainage area. Because of the clubshell's presence, proposed federal actions are already subject to section 7 consultation. Thus, the regulatory burden for federal agencies and length of time to review proposed federal actions would not change. Modifications to proposed projects in order to minimize impacts to mussels would be more likely in the future if the clubshell population expands into currently

uninhabited reaches of river or stream.

#### 4.2.5. Local Socio-economic Conditions

None of the action alternatives would have significant socio-economic impacts. Potential modifications of land use practices and facility operations, as discussed in Section 4.2.4, along streams or rivers supporting released mussels may have initial costs associated with them but are not expected to change the overall socio-economic conditions of the area. These modifications could also provide net societal benefits in the form of improved water quality. Increased funding opportunities from government or non-governmental organizations may become available to assist local landowners.

#### 4.2.6. Cultural, Historical and Archaeological Resources

None of the action alternatives would affect cultural, historical, or archaeological resources. Access to the river would not occur at the Collins Site. The release of mussels and use of cages would occur directly in the river channels and would not impact the river terrace or the Collins Site.

None of the action alternatives would affect the Middle Fork's Scenic River designation. Consultation with the NPS is discussed in section 6 of this document.

#### 4.2.7. Environmental Justice

The Executive Order 12898, issued on February 11, 1994, requires all federal agencies, to the greatest extent practicable and permitted by law, to identify and address, as appropriate, disproportionately high and adverse environmental effects of its programs, policies, and activities on minority populations and low-income populations.

Due to the rural nature of most of the proposed augmentation and reintroduction sites, no identifiable group of individuals can be considered to have lower incomes in relation to local averages. Low-income and minority populations will not bear disproportionately high and adverse effects from any of the action alternatives.

#### 4.2.8. Cumulative Impacts

Northern riffleshell and clubshell populations have severely declined due to a combination of past actions as described in Section 1.4. Successful establishment of released mussels under all three of the action alternatives would begin to reverse this decline and move these species toward recovery. Success of any of the action alternatives could also lead the IDNR to propagate mussel species of state concern and release them in the Vermilion River basin or the USFWS to conduct additional reintroductions of these federally listed mussel species into other watersheds within their historic range. Selection of Alternative 2 or Alternative 3 could influence, but would not necessarily determine, the status (NEP versus full protection) of any future reintroductions the USFWS might consider.

### 4.3. Summary of Environmental Consequences by Alternative

	<b>Alternative 1 No Action</b>	<b>Alternative 2 NEP</b>	<b>Alternative 3 Full Protection</b>	<b>Alternative 4 Augmentation</b>
<b>Physical Environment</b>	None	Minor – Temporary use of cages in streams	Minor – same as Alternative 2	Minor – same as Alternative 2
<b>Biological Environment</b>	None	Minor impacts to fish and other mussel species	Minor – same as Alternative 2	Minor – same as Alternative 2
<b>Threatened, Endangered, and Candidate Species</b>	Threat to survival of clubshell and northern riffleshell	Step in recovery of clubshell and northern riffleshell	Same as Alternative 2	Step in recovery of clubshell
<b>Land Use</b>	None	Voluntary adjustments to some agricultural practices, residential development and storm- or waste-water discharges; Slight increase in review of federal projects	More likely than Alternative 2 to result in adjustments to some agricultural practices, residential development and storm- or waste-water discharges; Increase in section 7 consultations for federal projects	Could result in adjustments to some agricultural practices, residential development and storm- or waste-water discharges but restricted geographically; No increase in review of federal projects
<b>Local Socio-economic conditions</b>	None	Initial cost for project modifications voluntary; Increased funding opportunities for conservation; No overall change in local conditions	Initial cost for project modifications; Increased funding opportunities for conservation; No overall change in local conditions	Initial cost for project modifications; Increased funding opportunities for conservation; No overall change in local conditions
<b>Cultural, Historical and Archaeological Resources</b>	None	None	None	None
<b>Environmental Justice</b>	None	No adverse environmental effects to minority or low-income populations	No adverse environmental effects to minority or low-income populations	No adverse environmental effects to minority or low-income populations

## 5. List of Preparers

Barbara Hosler  
Fish and Wildlife Biologist  
U.S. Fish and Wildlife Service  
East Lansing Field Office  
2651 Coolidge Road, Suite 101  
East Lansing, Michigan 48823

## 6. Consultation and Coordination with the Public and Others

Coordination with the IDNR occurred throughout the EA planning and development process. Consultation with the National Park Service regarding Middle Fork's designation under the Wild and Scenic River Act was initiated on November 17, 2005. This correspondence is included in Appendix 2.

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## 8. Appendices

Appendix 1. Unionid Mussel Distribution in the Vermilion River Watershed

Species and Status	North Fork	Middle Fork	Salt Fork	Main stem
Pistolgrip ( <i>Tritogonia verrucosa</i> )	✓	✓	✓	✓
Mapleleaf ( <i>Quadrula quadrula</i> )	✓	✓	✓	✓
Rabbitsfoot ( <i>Quadrula cylindrica</i> )	✓			
Monkeyface ( <i>Quadrula metanevra</i> )		✓	✓	✓
Pimpleback ( <i>Quadrula pustulosa</i> )		✓	✓	✓
Threeridge ( <i>Amblema plicata</i> )	✓	✓	✓	
Wabash pigtoe ( <i>Fusconaia flava</i> )	✓	✓	✓	✓
Purple wartyback ( <i>Cyclonais tuberculata</i> ) <sup>ST</sup>	✓	✓	✓	✓
Clubshell ( <i>Pleurobema clava</i> ) <sup>SE, FE</sup>	✓			
Round pigtoe ( <i>Pleurobema sintoxia</i> )	✓	✓	✓	
Giant floater ( <i>Pyganodon grandis</i> )	✓	✓	✓	
Cylindrical papershell ( <i>Anodontoides ferussacianus</i> )	✓	✓		
Creepers ( <i>Strophitus undulatus</i> )	✓	✓	✓	✓
Elktoe ( <i>Alasmidonta marginata</i> )	✓	✓	✓	
Slippershell ( <i>Alasmidonta viridis</i> ) <sup>SE</sup>	✓	✓		
White heelsplitter ( <i>Lasmigona complanata</i> )	✓	✓	✓	✓
Flutedshell ( <i>Lasmigona costata</i> )	✓	✓	✓	
Creek heelsplitter ( <i>Lasmigona compressa</i> )	✓	✓		
Kidneyshell ( <i>Ptychobranhus fasciolaris</i> ) <sup>SE</sup>	✓			
Threehorn wartyback ( <i>Obliquaria reflexa</i> )				✓
Mucket ( <i>Actinonaias ligamentina</i> )		✓	✓	✓
Deertoe ( <i>Truncilla truncata</i> )	✓			✓
Fragile papershell ( <i>Leptodea fragilis</i> )	✓			✓
Pink papershell ( <i>Potamilus ohioensis</i> )				✓
Pink heelsplitter ( <i>Potamilus alatus</i> )				✓
Lilliput ( <i>Toxolasma parvus</i> )	✓	✓		
Purple lilliput ( <i>Toxolasma lividus</i> ) <sup>SE</sup>	✓			
Black sandshell ( <i>Ligumia recta</i> )				✓
Rainbow ( <i>Villosa iris</i> ) <sup>SE</sup>	✓		✓	
Little spectaclecase ( <i>Villosa lienosa</i> ) <sup>SE</sup>	✓	✓		
Yellow sandshell ( <i>Lampsilis teres</i> )				✓
Fatmucket ( <i>Lampsilis siliquoidea</i> )	✓	✓	✓	✓
Plain pocketbook ( <i>Lampsilis cardium</i> )	✓	✓	✓	✓
Wavy-rayed lampmussel ( <i>Lampsilis fasciola</i> ) <sup>SE</sup>	✓	✓	✓	✓

Appendix 2: Correspondence from NPS regarding Wild and Scenic River Act

DRAFT



# United States Department of the Interior



National Park Service

Midwest Region  
601 Riverfront Drive  
Omaha Nebraska 68102-4226

L7615 (MWR-PL/C)

DEC 9 2005

Mr. Richard C. Nelson  
Field Supervisor  
U.S. Fish and Wildlife Service  
Rock Island Field Office  
4469 48<sup>th</sup> Avenue Court  
Rock Island, Illinois 61201

Dear Mr. Nelson:

Thank you for your early coordination letter of November 17, requesting technical assistance for mussel augmentation and reintroduction into the Middle Fork of the Vermilion River (MFVR). The Fish and Wildlife Service is supporting a multi-agency effort to reintroduce the Federally listed endangered clubshell (*Pleurobema clava*) and northern riffleshell (*Epioblasma torulosa rangiana*) mussels into parts of their historic range. This may include augmentation and reintroduction activities into the MFVR, as described in the September 28 draft Augmentation and Reintroduction (A/R) Plan for the Clubshell (*Pleurobema clava*) and Northern riffleshell (*Epioblasma torulosa rangiana*) in Ohio and Illinois (A/R Plan).

The techniques proposed include the placement of cages containing glochidia-infected fish and juvenile mussels. The mussel broodstock will be taken from the nearest available sources and the host fish will be collected from the Vermilion River. Three-foot square cage(s) would be anchored to the substrate of the MFVR. It may be necessary to place tubes in the substrate to hold the newly metamorphosed juvenile mussels. Tubes may be a few inches in diameter and up to a foot in height. No permanent physical disturbance to the bed or shoreline is anticipated. There may be negligible effects to the flow of the river from the fish cages lying on the bottom or from the tubes inserted into the substrate. The exact methods and locations may vary depending on stream characteristics, access, and availability of mussels. Our comments are as follows:

The MFVR is a component of the Wild and Scenic Rivers System, (System) pursuant to section 2(a)(ii) of the Wild and Scenic Rivers Act (Act). As such, the State of Illinois is the river administering agency, and the National Park Service (NPS) on behalf of the Secretary of the Interior (SOI), retains section 7(a) responsibilities under the Act. Each component of the System is to be preserved in its free-flowing condition, and managed to protect and enhance the outstandingly remarkable values (ORVs) for which the river was designated, while providing for public recreation and resource uses which do not adversely impact or degrade those values. The MFVR ORVs are scenic, geologic, fish and wildlife, ecological, recreational and historic resources. The rivers unique mussel resources are specifically mentioned in documents related to the rivers designation.

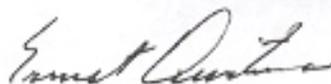


DEC 9 2005

A final section 7(a) determination will be provided at the time of permit notification with the COE.

Please note, the State of Illinois is the river administering agency for the LMR, and is responsible for the day-to-day management of the river, including implementing the requirements under section 10 of the Act (protection and enhancement of the river's ORVs), and the States approved corridor management plan for the MFVR (see enclosure). Please coordinate with the appropriate State office.

Our office is available for assistance to ensure any recommendations resulting from the proposed project are compatible with provisions under the Act, including Section 7(a) A. For further information please contact Ms. Sue Jennings, of my staff, at 402-661-1848.



Ernest Quintana  
Regional Director

Enclosure

Director Joel Brunsvold  
Illinois Department of Natural Resources  
One Natural Resources Way  
Springfield, Illinois 62702

Mr. Dick Westfall  
Manager, Greenways & Trails Section  
Illinois Department of Natural Resources  
One Natural Resources Way  
Springfield, Illinois 62702

Components of the System are protected by section 7(a) of the Act. Section 7(a) states, in part:

*... no department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.*

A section 7(a) evaluation, pursuant to the Act, is used to analyze impacts of a proposed water resources project and determine whether any impacts would have a direct and adverse effect on the values for which the river was established, namely its free-flowing condition, water quality, and designated ORVs. Federal water resources projects that are determined to have a direct and adverse effect on the values for which designated rivers were added to the System are prohibited. Water resources projects include, but are not limited to: dams, water diversion projects, fisheries habitat and watershed restoration/enhancement projects, bridge construction or demolition, bank stabilization projects, boat ramps and other activities that require a section 404 or 10 permit from the Corps of Engineers (COE). Projects located within a designated reach or upstream/downstream or on tributaries to the designated reach may be subject to section 7(a) review.

The mussel reintroduction project is located within the designated river, and may meet the definition of a water resources project. As such, the project is likely subject to the requirements of section 7(a) of the Act. The Act requires the SOI to make a section 7(a) determination. The NPS, on behalf of the SOI, is responsible for evaluating the effects of water resource projects on the MFVR and making such a determination.

The NPS fully supports all efforts to restore native mussel species to their historic range. We recognize and greatly appreciate the considerable efforts in developing a comprehensive A/R Plan that will enhance one of the ORVs of the MFVR, pursuant to section 10 of the Act. We note the A/R Plan may include activities in the Little Darby and Big Darby Creeks (BDC), both of which are also components of the System, pursuant to section 2(a)(ii) of the Act. Mussel resources are a protected ORV on the BDC. Please continue to coordinate with this office for activities on the BDC that may be subject to section 7(a) of the Act.

It is our preliminary finding that the project would not constitute a "direct and adverse" affect to the free-flowing condition or to the ORVs of the MFVR, provided the following measure is adhered to:

- The protocols contained in the draft A/R Plan are strictly followed in order to prevent the accidental spread of zebra mussels into the MFVR. We recommend all equipment (i.e., boats, motors, trailers, nets, electro shock gear, boots, buckets, live wells, waders, and dive gear) that has been exposed to waters where zebra mussels have been found is decontaminated using hot water wash procedures outlined in item 5 of the A/R Plan, with a minimum dry time of 5 days, prior to use in the MFVR.

## WILD AND SCENIC RIVERS ACT

The Wild and Scenic Rivers Act (Act) was passed by Congress in October 1968. The Act established a method for federal protection for the nation's remaining free-flowing rivers, and a policy of preserving these rivers and their immediate environments for the use and enjoyment of present and future generations. Section 1(b) of the Act contains a congressional declaration of policy:

*It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.*

### SECTION 7(A) DETERMINATIONS

Section 7 of the Act affords substantial protection to rivers included in the National Wild and Scenic Rivers System (the System) and to congressionally authorized study rivers. Section 7(a) states, in part:

*... no department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.*

A Section 7(a) evaluation, pursuant to the Act, is used to analyze impacts of a proposed water resources project and determine whether any impacts would have a direct and adverse effect on the values for which the river was established, namely its free-flowing condition, water quality, and ORV's. Federal water resources projects that are determined to have a direct and adverse effect on the values for which designated rivers were added to the System are prohibited. Water resources projects include, but are not limited to: dams, water diversion projects, fisheries habitat and watershed restoration/enhancement projects, bridge construction or demolition, bank stabilization projects, channelization projects, boat ramps and other activities that require a Section 404 permit from the Corps. Projects located within the designated reach or upstream/downstream or on tributaries to the designated reach may be subject to Section 7(a) review.

### OUTSTANDINGLY REMARKABLE VALUES

To be eligible for designation, a river must be free-flowing and contain at least one Outstandingly Remarkable Value (ORV), i.e. scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar value. Agency resource professionals develop and interpret criteria in evaluating river values (unique, rare, or exemplary) based on professional judgment on

a regional, physiographic, or geographic comparative basis. "Other similar" ORVs may include botanical, hydrological, paleontological, or other unique/rare resources, and scientific or heritage values.

Section 16(b) of the Act defines free-flowing as "*existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.*"

#### **NON-DEGRADATION AND ENHANCEMENT POLICY**

The Act provides management mandates to agencies responsible for administering components of the System. Section 10(a) states that:

*Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values.*

The *Final Revised Guidelines for Eligibility, Classification and Management of River Area*, promulgated by the Department of the Interior and the Department of Agriculture (Federal DOI and Department of Agriculture 1982), interpret Section 10(a) as a non-degradation and enhancement policy for all designated rivers, regardless of their classification as wild, scenic, or recreational. The guidelines state that although each classification permits certain existing development at the time of designation, the criteria for classification do not imply that additional inconsistent development is permitted in the future.

In Summary, each component of the System is to be preserved in its free-flowing condition, and managed to protect and enhance the values for which each river was designated, while providing for public recreation and resource uses which do not adversely impact or degrade those values.

#### **State Federal Wild and Scenic Rivers:**

State administered components of the National Wild and Scenic Rivers System must meet the same standards of resource protection as congressionally designated rivers. As the river managing agency, the State of Illinois is responsible for ensuring that the provisions of the Wild and Scenic Rivers Act are met, including the implementation of non degradation standards for discharges into this nationally significant river. On state-administered National Wild and Scenic Rivers without adjacent federal ownership, the Secretary of the Interior, through the NPS, is responsible for making Section 7(a) determinations of effect on designated rivers.



## United States Department of the Interior



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Rock Island Field Office  
4469 48<sup>th</sup> Avenue Court  
Rock Island, Illinois 61201  
Phone: (309) 793-5800 Fax: (309) 793-5804

IN REPLY REFER  
TO:

FWS/RIFO

November 17, 2005

Ms. Susan Jennings  
National Park Service  
601 Riverfront Drive  
Omaha, NE 68102

Dear Ms. Jennings:

This letter is in regard to a mussel conservation project in the Vermilion River of Illinois. Our agency is supporting a multi-state effort to reintroduce the federally listed endangered clubshell (*Pleurobema clava*) and northern riffleshell (*Epioblasma torulosa rangiana*) mussels into parts of their historic range. This may include augmentation and reintroduction of these species into the Middle Fork of the Vermilion River (MFVR). A seventeen-mile reach of the MFVR is designated under the Wild and Scenic Rivers Act (WSRA). We request technical assistance for the option of mussel augmentation and reintroduction into the MFVR.

These two mussel species are believed to be extirpated from Illinois except for a single specimen of clubshell that was found in the Middle Branch of the North Fork of the Vermilion River during a 1998 survey. We wish to use your preliminary findings to help plan the augmentation and reintroduction project and in our Environmental Assessment. The draft Augmentation and Reintroduction Plan is enclosed. We hope to publish the draft Environmental Assessment for public comment by January 2006.

The techniques that will be used include the placement of cages containing glochidia-infected fish, newly metamorphosed juvenile mussels, and grown-out juvenile mussels. The mussel broodstock will be taken from the nearest available source (see Augmentation and Reintroduction Plan for details). Host fish will be collected from the Vermilion River. The cage is about the size of a three-foot box and is anchored to the substrate. It may be necessary to place tubes in the substrate to hold the newly metamorphosed juvenile mussels. The tubes may be a few inches in diameter and up to a foot in height. No permanent physical disturbance of the bed or of the shoreline is planned for this project. There may be negligible affects to the flow of the river from the fish cages lying on the bottom or from tubes inserted into the substrate. Any of the project aspects carried out in the MFVR may enhance the

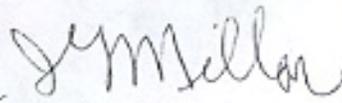
Ms. Susan Jennings

2

resource values for the reach which was designated under the WSRA. The exact methods and locations may vary depending on stream characteristics, access, and availability of mussels.

We will advise your office once we decide on the specific methods and locations for this effort in order that we may proceed in accordance with the WSRA. Please contact Mike Coffey of my staff at extension 206 if you have any questions or comments. Thank you and we look forward to your assistance.

Sincerely,

  
for Richard C. Nelson  
Field Supervisor

cc: FWS R3 ES (Tewinkel)  
FWS ELFO (Hosler)  
ILDNR (Kath)