



# FEDERAL REGISTER

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Vol. 80

Thursday,

No. 83

April 30, 2015

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Part III

Department of the Interior

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Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Neosho Mucket and Rabbitsfoot; Final Rule

**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****50 CFR Part 17**

[Docket No. FWS-R4-ES-2013-0007; 4500030114]

RIN 1018-AZ30

**Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Neosho Mucket and Rabbitsfoot**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), designate critical habitat for two species of mussels, the Neosho mucket (*Lampsilis rafinesqueana*) and rabbitsfoot (*Quadrula cylindrica cylindrica*), under the Endangered Species Act of 1973, as amended (Act). In total, approximately 777 river kilometers (483 river miles) in Arkansas, Kansas, Missouri, and Oklahoma fall within the boundaries of the critical habitat designation for the Neosho mucket and approximately 2,312 river kilometers (1,437 river miles) in Alabama, Arkansas, Illinois, Indiana, Kansas, Kentucky, Mississippi, Missouri, Ohio, Oklahoma, Pennsylvania, and Tennessee, fall within the boundaries of the critical habitat designation for the rabbitsfoot. The effect of this rule is to extend the Act's protections to these mussels' critical habitats.

**DATES:** This rule is effective on June 1, 2015.

**ADDRESSES:** This final rule is available on the Internet at <http://www.regulations.gov> and the Arkansas Ecological Services Field Office's Web site at <http://www.fws.gov/arkansas-es/>. Comments and materials received, as well as some supporting documentation we used in preparing this rule, are available for public inspection at <http://www.regulations.gov>. All of the comments, materials, and documentation we considered in this rulemaking are available by appointment, during normal business hours, at: U.S. Fish and Wildlife Service, Arkansas Ecological Service Field Office, 110 South Amity Road, Suite 300, Conway, AR 72032; telephone 501-513-4470; facsimile 501-513-4480.

The coordinates, plot points, or both from which the maps are generated are included in the administrative record for this critical habitat designation and are available at <http://www.fws.gov/>

[www.regulations.gov](http://www.regulations.gov), at <http://www.regulations.gov> at Docket No. FWS-R4-ES-2013-0007, and at the Arkansas Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**). Any additional tools or supporting information we developed for this critical habitat designation will also be available at the U.S. Fish and Wildlife Service Web site and Field Office outlined above, and also may be included in the preamble, at <http://www.regulations.gov>, or both.

**FOR FURTHER INFORMATION CONTACT:** For general information about this rule, and information about the final designation in Arkansas, contact Melvin Tobin, Acting Field Supervisor, U.S. Fish and Wildlife Service, Arkansas Ecological Services Field Office, 110 South Amity Road, Suite 300, Conway, AR 72032; telephone 501-513-4470; facsimile 501-513-4480. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339.

For information about the final designation in Alabama, contact Bill Pearson, Field Supervisor, U.S. Fish and Wildlife Service, Alabama Ecological Services Field Office, 1208 Main Street, Daphne, AL 36526; telephone 251-441-5181; facsimile 251-441-6222.

For information about the final designation in Illinois, contact Richard C. Nelson, Field Supervisor, U.S. Fish and Wildlife Service, Rock Island Ecological Services Field Office, 1511 47th Avenue, Moline, IL 61265; telephone 309-757-5800; facsimile 309-757-5807.

For information about the final designation in Indiana, contact Scott Pruitt, Field Supervisor, U.S. Fish and Wildlife Service, Bloomington Ecological Services Field Office, 602 South Walker Street, Bloomington, IN 47403-2121; telephone 812-334-4261; facsimile 812-334-4273.

For information about the final designation in Kansas, contact Heather Whitlaw, Field Supervisor, U.S. Fish and Wildlife Service, Kansas Ecological Services Field Office, 2609 Anderson Avenue, Manhattan, KS 66502; telephone 785-539-3474; facsimile 785-839-8567.

For information about the final designation in Kentucky, contact Lee Andrews, Field Supervisor, U.S. Fish and Wildlife Service, Kentucky Ecological Services Field Office, 330 West Broadway, Suite 265, Frankfort, KY 40601; telephone 502-695-0468; facsimile 502-695-1024.

For information about the final designation in Mississippi, contact Stephen Ricks, Field Supervisor, U.S.

Fish and Wildlife Service, Mississippi Ecological Services Field Office, 6578 Dogwood View Parkway, Suite A, Jackson, MS 39123; telephone 601-965-4900; facsimile 601-965-4340.

For information about the final designation in Missouri, contact Amy Salveter, Field Supervisor, U.S. Fish and Wildlife Service, Columbia Ecological Services Field Office, 101 Park DeVille Drive, Suite A, Columbia, MO 65203-0057; telephone 573-234-2132; facsimile 573-234-2181.

For information about the final designation in Ohio, contact Dan Everson, Field Supervisor, U.S. Fish and Wildlife Service, 4625 Morse Road, Suite 104, Columbus, OH 43230; telephone 614-416-8993; facsimile 614-416-8994.

For information about the final designation in Oklahoma, contact Jontie Aldrich, Acting Field Supervisor, U.S. Fish and Wildlife Service, Oklahoma Ecological Services Field Office, 9014 East 21st Street, Tulsa, OK 74129-1428; telephone 918-382-4500; facsimile 918-581-7467.

For information about the final designation in Pennsylvania, contact Lora Zimmerman, Field Supervisor, U.S. Fish and Wildlife Service, Pennsylvania Ecological Services Field Office, 315 South Allen Street, Suite 322, State College, PA 16801; telephone 814-234-4090; facsimile 814-234-0748.

For information about the final designation in Tennessee, contact Mary Jennings, Field Supervisor, U.S. Fish and Wildlife Service, Tennessee Ecological Services Field Office, 446 Neal Street, Cookeville, TN 38501; telephone 931-528-6481; facsimile 931-528-7075.

**SUPPLEMENTARY INFORMATION:**

**Executive Summary**

*Why we need to publish a rule.* Under the Endangered Species Act of 1973, as amended (Act), when we determine that a species is an endangered or threatened species, we are required to designate critical habitat, to the maximum extent prudent and determinable. Designations of critical habitat can only be completed by issuing a rule.

On October 16, 2012, we published in the **Federal Register** a proposed rule to list the Neosho mucket and rabbitsfoot and designate critical habitat (77 FR 63440). We issued the final rule listing the Neosho mucket as endangered and the rabbitsfoot as threatened on September 17, 2013 (78 FR 57076).

The critical habitat units we are designating in this rule constitute our current best assessment of the areas that meet the definition of critical habitat for

Neosho mucket and rabbitsfoot. We are designating:

- For the Neosho mucket, in total, approximately 777 river kilometers (rkm) (483 river miles (rmi)) in 7 units in the Elk, Fall, Illinois, Neosho, Shoal, Spring, North Fork Spring, and Verdigris Rivers as critical habitat in Benton and Washington Counties, Arkansas; Allen, Cherokee, Coffey, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson, and Woodson Counties, Kansas; Jasper, Lawrence, McDonald, and Newton Counties, Missouri; and Adair, Cherokee, and Delaware Counties, Oklahoma.

- For the rabbitsfoot, in total, approximately 2,312 rkm (1,437 rmi) in 31 units (3 with 2 subunits each) in the Neosho, Spring (Arkansas River system), Verdigris, Black, Buffalo, Little, Ouachita, Saline, Middle Fork Little Red, Spring (White River system), South Fork Spring, Strawberry, White, St. Francis, Big Sunflower, Big Black, Paint Rock, Duck, Tennessee, Red, Ohio, Allegheny, Green, Tippecanoe, Walhonding, Middle Branch North Fork Vermilion, and North Fork Vermilion Rivers and Bear, French, Muddy, Little Darby, and Fish Creeks as critical habitat in Colbert, Jackson, Madison, and Marshall Counties, Alabama; Arkansas, Ashley, Bradley, Clark, Cleburne, Cleveland, Drew, Fulton, Hot Spring, Independence, Izard, Jackson, Lawrence, Little River, Marion, Monroe, Newton, Ouachita, Randolph, Searcy, Sevier, Sharp, Van Buren, White, and Woodruff Counties, Arkansas; Massac, Pulaski, and Vermilion Counties, Illinois; Carroll, Pulaski, Tippecanoe, and White Counties, Indiana; Allen and Cherokee Counties, Kansas; Ballard, Edmonson, Green, Hart, Livingston, Logan, Marshall, McCracken, and Taylor Counties, Kentucky; Hinds, Sunflower, Tishomingo, and Warren Counties, Mississippi; Jasper, Madison, and Wayne Counties, Missouri; Coshocton, Madison, Union, and Williams Counties, Ohio; McCurtain and Rogers Counties, Oklahoma; Crawford, Erie, Mercer, and Venango Counties, Pennsylvania; and Hardin, Hickman, Humphreys, Marshall, Maury, Montgomery, Perry, and Robertson Counties, Tennessee.

- Compared to the proposed rule, this rule results in a net decrease of approximately 3 rkm (2 rmi) for the Neosho mucket and a net decrease of approximately 349 rkm (217 rmi) for the rabbitsfoot.

*What this rule contains:* This rule designates critical habitat for the Neosho mucket and rabbitsfoot.

*We have prepared an economic analysis and environmental assessment*

*for the designation of critical habitat.* In accordance with Section 4(b)(2) of the Act, we prepared an analysis of the economic impacts of the critical habitat designations and related factors. We announced the availability of the draft economic analysis (DEA) and draft environmental assessment in the **Federal Register** on May 9, 2013 (78 FR 27171), allowing the public to provide comments on these documents. In response to requests we received, we reopened the comment period for the proposed critical habitat rule, DEA, and draft environmental assessment from August 27, 2013, to October 28, 2013 (78 FR 52894), and again from May 14, 2014, to July 14, 2014 (79 FR 27547). We have incorporated the comments and completed the final economic analysis (FEA) and associated summary memorandum describing our revised forecast calculations concurrently with this final determination.

Additionally, we have prepared an environmental assessment pursuant to the National Environmental Policy Act (NEPA). Based on the review and evaluation of the information contained in the environmental assessment, we determined that the designation of critical habitat for the Neosho mucket and rabbitsfoot does not constitute a major Federal action having a significant impact on the human environment under the meaning of section 102(2)(c) of NEPA.

*Peer review and public comment.* We sought comments from three independent specialists to ensure our designation is based on scientifically sound data and analyses. We obtained opinions from one knowledgeable individual with scientific expertise to review our technical assumptions and analysis, and to determine whether or not we had used the best available information. The peer reviewer generally concurred with our methods and conclusions and provided additional information, clarifications, and suggestions to improve this final rule. Information we received from peer review is incorporated in this final designation. We also considered all comments and information we received from the public during the comment period.

#### Previous Federal Actions

Please refer to the proposed listing and critical habitat rule for the Neosho mucket and rabbitsfoot published in the **Federal Register** on October 16, 2012 (77 FR 63440), for a detailed description of previous Federal actions concerning these species and protection under the Act (16 U.S.C. 1531 *et seq.*). The final rule listing the Neosho mucket as an

endangered species and rabbitsfoot as a threatened species under the Act was published in the **Federal Register** on September 17, 2013 (78 FR 57076).

#### Summary of Comments and Recommendations

We requested written comments from the public on the proposed designation of critical habitat for the Neosho mucket and rabbitsfoot during four comment periods. The first comment period opened with the publication of the proposed rule on October 16, 2012, and closed on December 17, 2012 (77 FR 63440). Second, we requested comments on the proposed critical habitat designation and associated DEA and draft environmental assessment during a comment period that opened May 9, 2013, and closed on June 10, 2013 (78 FR 27171). Third, we re-opened the comment period for another 60 days from August 27, 2013, through October 28, 2013 (78 FR 52894). Based on continued significant interest in Arkansas regarding the proposed rule, we announced an additional reopening of the comment period for 60 days from May 14, 2014, through July 14, 2014 (79 FR 27547). We held public information meetings in Joplin, Missouri, on May 21, 2013; Greenville, Missouri, on May 23, 2013; Batesville, Arkansas, on June 4, 2014; and Benton, Arkansas, on June 5, 2014. The dates, times, and locations of these meetings were coordinated with interested stakeholders and noticed in newspapers and other media outlets. We also contacted appropriate Federal, State, and local agencies; tribes; scientific organizations; and other interested parties and invited them to comment on the proposed rule, DEA, and draft environmental assessment. In addition, we published a total of 27 legal public notices in the affected States at the beginning of the comment period for the proposed rule published on October 16, 2012.

During the first comment period, we received 10 comment letters directly addressing the proposed listing and critical habitat designation. During the second, third, and fourth comment periods, we received 11, 6, and 68 comment letters, respectively, addressing the proposed critical habitat designation, DEA, or draft environmental assessment. All substantive information provided during the comment periods has either been incorporated directly into this final determination or is addressed below. Comments are addressed in the following summary and incorporated into the final rule as appropriate.

### Peer Review

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinions from three knowledgeable individuals with scientific expertise on freshwater mussel conservation and biology, with familiarity of Neosho mucket and rabbitsfoot, the geographic region and river basins in which they occur, and conservation biology principles associated with these species. We received responses from all of the peer reviewers we contacted, but only one peer reviewer commented on the proposed critical habitat designation.

We reviewed all comments we received from the peer reviewer for substantive issues and new information regarding critical habitat for the Neosho mucket and rabbitsfoot. The peer reviewer generally concurred with our methods and conclusions, and provided additional information, clarifications, and suggestions to improve the final critical habitat rule. The peer reviewer's comments on the designation of critical habitat for these mussels are addressed in the following summary and incorporated into the final rule as appropriate.

### Peer Reviewer Comments

(1) *Comment:* The peer reviewer noted the proposed critical habitat designation for rabbitsfoot references the oyster mussel (*Epioblasma capsaeformis*) as a listed species with overlapping critical habitat in the Duck River unit. The reviewer noted the oyster mussel in this river has been renamed the Duck River dartersnapper (*Epioblasma ahlstedti*) and is separate and distinct from the oyster mussel.

*Our Response:* We agree with the reviewer and acknowledge the oyster mussel and Duck River dartersnapper are distinct and separate species. However, the Service has not yet made a listing and critical habitat determination for the new entity, the Duck River dartersnapper. We incorporated language in this final determination to clarify the species distinction and name change, but at this time, the Duck River dartersnapper and oyster mussel are considered synonymous according to our regulations. Until such time as the regulations are revised, the critical habitat that overlaps rabbitsfoot critical habitat in the Duck River will be identified as that of the oyster mussel.

### General Comments

(2) *Comment:* Multiple commenters expressed concern about interagency consultation under section 7 of the Act,

particularly any differences in process between consultation on impacts to the listed species and consultation on the species' designated critical habitat. They also expressed concern about impacts on non-Federal property owners and other entities from the new restrictions resulting from the designation of critical habitat.

*Our Response:* Section 7(a)(2) of the Act, and its implementing regulations at 50 CFR part 402, subpart B, requires Federal agencies to consult with the Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Only projects that have a Federal nexus (projects that are funded, authorized, or carried out by Federal agencies) are subject to this requirement under section 7 consultation. In fulfilling these consultation requirements, each Federal action agency and the Service must use the best scientific and commercial data available.

In occupied critical habitat, consultation for potential impacts to the species and potential impacts to critical habitat occur at the same time. The health of both mussels is closely tied to the health of their habitat. Therefore, the Service does not expect to recommend additional conservation efforts for projects to avoid adverse modification of critical habitat above and beyond what would already be required to avoid jeopardizing the continued existence of the listed species. In addition, other federally listed mussels occur in the same reaches as certain areas of designated critical habitat for Neosho mucket or rabbitsfoot; the conservation efforts already required for these listed mussels through consultation will provide the same conservation for Neosho mucket or rabbitsfoot.

As a result, we conclude that additional (incremental) project modification costs are unlikely from this designation of critical habitat. Any incremental costs, as predicted in our final economic analysis (FEA), are primarily a result of the additional requirement of considering impacts to critical habitat during these section 7 consultations. These costs are borne by the Service, the Federal action agency, and the third-party participants (generally the project proponents), including State and local governments and private parties. For a summary of the parties involved in section 7 consultations and their respective unit costs, see Exhibit 2-1 of the FEA. Chapter 3 of the FEA provides a detailed

discussion of the types of third parties participating in consultations.

### Federal Agency Comments

(3) *Comment:* The U.S. Army Corps of Engineers (ACOE) Pittsburgh District (COEPD) expressed concern that designating critical habitat for the rabbitsfoot may affect the COEPD's navigation and maintenance dredging activities in the Allegheny River, its operation of Allegheny Reservoir, and its regulatory program. ACOE stated that additional avoidance measures will be required to adequately protect habitat for rabbitsfoot.

*Our Response:* The federally endangered clubshell (*Pleurobema clava*), northern riffleshell (*Epioblasma torulosa rangiana*), rayed bean (*Villosa fabalis*), and snuffbox (*Epioblasma triquetra*) mussels occur in the same reach of the Allegheny River as rabbitsfoot. Therefore, section 7 requires consultation by Federal agencies for these listed species (see our response to Comment 2). Project modifications that minimize effects to these species would also minimize effects to rabbitsfoot.

Thus, we do not expect any conservation measures or project modifications and costs for rabbitsfoot critical habitat beyond those already required for these other endangered mussels.

(4) *Comment:* The COEPD asked how tributary streams to the Allegheny River will be affected by designation of critical habitat for rabbitsfoot.

*Our Response:* French Creek (proposed Unit RF23; Unit RF22 in this rule) and Muddy Creek (proposed Unit RF25; Unit 24 in this rule) are the only two tributaries of the Allegheny River designated as critical habitat for rabbitsfoot. The Service will work with COEPD to determine whether any of the current, ongoing, or planned COEPD projects may have an effect on other tributaries within their district. As stated previously, the Service does not expect to recommend any project modifications in order to minimize effects to rabbitsfoot beyond those already required for other listed mussels in the Allegheny River basin.

(5) *Comment:* The ACOE Huntington District stated that the designation of critical habitat for rabbitsfoot in the Walhonding River (proposed Unit RF27) is not consistent with the definition of critical habitat (that lakes and impoundments are not included). They stated that 40 percent of the Walhonding River upstream of Mohawk Dam in Ohio is impounded for flood control.

*Our Response:* Mohawk Dam is a dry dam, meaning during normal flows,

water passes through the dam unimpeded and there are no permanent pools of water (areas of inundation) upstream resulting from the structure. During high flow events, the dam temporarily reduces flows downstream of the structure to maintain flows within the river banks. Hoggarth (1995–1996, pp. 163–164) found a stable and diverse mussel assemblage, including adult and juvenile rabbitsfoot, upstream of Mohawk Dam. Because Mohawk Dam does not inundate riverine habitat by forming a lake or reservoir and a diverse and abundant mussel assemblage inhabits upstream reaches behind the dam, we believe the habitat there contains the primary constituent elements for rabbitsfoot critical habitat (see *Primary Constituent Elements for Neosho Mucket and Rabbitsfoot*, below).

Section 3.3.1 of the FEA has been amended to add information about the presence of the dam in the study area of proposed Unit RF27; however, the Service does not expect to recommend additional conservation efforts for the dam, above and beyond what would be required to protect against jeopardy of the species, to protect against adverse modification of critical habitat.

(6) *Comment*: The ACOE Little Rock District stated that the designation will result in increased costs for energy development and that the estimated cost of timing restrictions and limiting project scope are too low, as projects may be delayed or denied due to permitting and modification issues.

*Our Response*: The discussion of potential baseline impacts in the FEA has been updated to reflect additional information provided by the ACOE regarding impacts to energy development associated with avoidance and delays related to the presence of the species. Exhibit 4–2 of the FEA (“Ranges of Costs of Common Conservation Efforts for Mussel Species”) notes that the cost of conservation efforts may be higher than the estimates shown. A key conclusion of the analysis is that the listing of the species may lead to many conservation efforts (such as those presented in Exhibit 4–2) that would not have been required previously. However, as outlined in our response to Comment 2, designation of critical habitat is not anticipated to generate additional conservation measures for these two mussels beyond those generated by the species’ listing.

#### State Agency Comments

Section 4(i) of the Act states, “the Secretary shall submit to the State agency a written justification for [her] failure to adopt regulations consistent

with the agency’s comments or petition.” The designation of critical habitat for Neosho mucket includes streams in Arkansas, Kansas, Missouri, and Oklahoma, and for rabbitsfoot includes streams in Alabama, Arkansas, Illinois, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Ohio, Oklahoma, Pennsylvania, and Tennessee. We received comments from the States of Illinois, Kansas, Pennsylvania, Ohio, and Oklahoma regarding the proposal and address them below.

(7) *Comment*: The Pennsylvania Fish and Boat Commission (PFBC) supported the designation of critical habitat for rabbitsfoot. PFBC recommended extending the critical habitat designation for rabbitsfoot upstream from Kidds Mill Road to Pymatuning Dam on the Shenango River. Western Pennsylvania Conservancy (WPC) submitted a public comment with the same recommendation. PFBC provided a report by Bursey (1987) documenting the presence of rabbitsfoot at Porter Road, 8.5 rkm (5.3 rmi) upstream of Kidds Mill Road. PFBC stated that without critical habitat designation in this location, any newly discovered rabbitsfoot populations in this river reach would not be protected by the Act.

*Our Response*: We appreciate PFBC’s support and look forward to continuing work with the PFBC and WPC to recover rabbitsfoot. Considering the information in Bursey (1987), we agree the extent of critical habitat designation in the Shenango River should be extended 8.8 rkm (5.4 rmi) upstream to Porter Road. This modification is reflected in this final determination. As described under *Criteria Used to Identify Critical Habitat*, we reviewed available information pertaining to the habitat requirements of rabbitsfoot. In accordance with the Act and its implementing regulation at 50 CFR 424.12(e), we considered whether designating additional areas—outside those currently occupied as well as those occupied at the time of listing—are necessary to ensure the conservation of the species. However, we respectfully disagree that there is sufficient scientific information from which to conclude that the reach from Pymatuning Dam to Porter Road is occupied by rabbitsfoot. While this reach appears to contain sufficient physical or biological features to support the life history of mussels, possibly including rabbitsfoot, we determined that designating unoccupied critical habitat for rabbitsfoot was not essential for the conservation of the species in this reach due to the altered natural stream hydrology and

geomorphology. Unoccupied areas exhibit limited habitat availability, degraded habitat, or low potential value for management, and there are no historical records of occurrence within the stream reach for rabbitsfoot (see also *Criteria Used to Identify Critical Habitat*).

This does not mean, however, that this reach will be without protection if the rabbitsfoot is later found to occupy that reach. The protections of the Act brought about by the species’ listing are in effect wherever the species is found. In addition, the reach upstream of Porter Road will continue to be protected through the conservation actions implemented for the other listed mussels (e.g., clubshell) that currently occur in that area.

(8) *Comment*: PFBC suggested that by restricting critical habitat to occupied areas, the Service appears to be unintentionally inhibiting recovery of rabbitsfoot, as habitat loss outside of critical habitat areas cannot be avoided under a section 7 jeopardy analysis.

*Our Response*: It is correct that section 7 consultation would not be triggered for potential rabbitsfoot habitat that is not occupied by the species or designated as critical habitat (although some areas may be occupied by other listed species and/or critical habitat for other listed species that would trigger section 7 consultations on Federal actions). However, we disagree that recovery of either species will be inhibited because we are not designating unoccupied habitat. We have found that unoccupied stream reaches are not essential for the conservation of either species for one or more of the following reasons:

- (a) Unoccupied habitats are isolated from occupied habitats due to reservoir construction and dam operations;
- (b) Unoccupied areas exhibit limited habitat availability, degraded habitat, or low potential value for management;
- (c) Collection records for both species indicate that these species have been extirpated from unoccupied areas for several decades or more, and, in some cases, reintroduction efforts have not been successful at re-establishing populations; or
- (d) There are no historical records of occurrence within the stream reach for Neosho mucket, rabbitsfoot, or both.

While we recognize the importance of unoccupied habitat to recovery of listed species, in this case unoccupied habitat does not at this time provide habitat for reintroduction or reduce the level of stochastic and human-induced threats (see *Criteria Used to Identify Critical Habitat* for more detailed information).

(9) *Comment:* The Ohio Department of Transportation (ODOT) inquired about costs for highway departments and other public infrastructure entities and whether normal consultation time would increase due to the designation of critical habitat. ODOT believes the estimated economic impact of \$1.4 million to the transportation and utility sectors over the next 20 years is an underestimate. This conclusion is based on the assumption that no instream work will be allowed for any project over or near critical habitat. ODOT provides an example of replacing a multiple span bridge with a single span structure increases cost by an average of 260 percent, or from \$2.2 million to \$5.6 million, exceeding the Service's estimate of economic impacts. The agency also expressed the belief that replacement or maintenance costs to improve or maintain 23 bridge structures over designated critical habitat areas will increase and the economic impact to ODOT alone will exceed the estimated \$1.4 million forecast in the economic analysis for transportation and utility activities without considering increased costs associated with coordination, survey, reporting, mitigation, and monitoring.

*Our Response:* Future section 7 consultations concerning transportation and utilities are expected to occur in 35 critical habitat units, including the Walhonding River and Little Darby and Fish Creeks (proposed Units RF27, RF28, and RF30; Units RF26, RF27, and RF29 in the final rule) in Ohio. Collectively, transportation and utilities consultations in these three critical habitat units are forecast to cost \$15,000 over the next 20 years or \$980 annually (one percent of total transportation and utilities costs). For comparison, the total transportation and utilities cost for all critical habitat units are forecast to cost \$1,400,000 over the next 20 years or \$93,000 annually (Exhibit 3–9 in the FEA). The designation of critical habitat will not preclude the construction of instream bridge support structures or maintenance to existing piers.

The designation of critical habitat does not change the time frames required to complete consultation under section 7 of the Act and its implementing regulations at 50 CFR part 402, subpart B. As previously stated, conservation measures required to avoid jeopardizing the continued existence of the species are expected to be similar to those required to avoid adversely modifying critical habitat (that is, we foresee no conservation actions specifically due to critical habitat). We do not expect the designation of critical habitat to lengthen the consultation

process. Thus, the best available economic data do not support ODOT's assertion.

(10) *Comment:* The ODOT inquired about how the Service ensures consistent consultation on critical habitat throughout the range of rabbitsfoot. ODOT concluded that the term "adverse modification" is vague and interpretations, policies, and level of effort could vary among Service offices.

*Our Response:* In 1986, the Service and the National Marine Fisheries Service (collectively referred to as the Services) established a definition for "destruction or adverse modification" (50 CFR 402.02) that was later found to be invalid by the U.S. Court of Appeals for the Fifth (2001) and Ninth (2004) Circuits. The Services each issued guidance to discontinue the use of the 1986 adverse modification regulation. Specifically, in evaluating an action's effects on critical habitat as part of interagency consultation, the Services began applying the definition of "conservation" as set out in the Act, which defines conservation (and conserve and conserving) to mean "to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary" (16 U.S.C. 1532(3)). Further, after examining the baseline and effects of the action, the Services began analyzing whether the implementation of the Federal action under consultation, together with any cumulative effects, would result in the critical habitat remaining "functional" (or retain the current ability for the primary constituent elements to be functionally established) to serve the intended conservation role for the species.

Section 7(a)(2) of the Act defines the consultation process, which is further developed in regulations set forth at 50 CFR part 402 and in the Service's section 7 handbook (guidance). The handbook ensures consistent implementation of consultation procedures by Service field offices responsible for carrying out section 7 activities throughout the range of rabbitsfoot. Furthermore, the Service and the Federal action agency are required to use the best available science in conducting the consultations (see our response to Comment 2).

On May 12, 2014, we published a proposed rule in the **Federal Register** (79 FR 27060) to adopt the following definition of destruction or adverse modification: "Destruction or adverse modification means a direct or indirect

alteration that appreciably diminishes the conservation value of critical habitat for listed species. Such alterations may include, but are not limited to, effects that preclude or significantly delay the development of physical or biological features that support the life-history needs of the species for recovery." On June 26, 2014 (79 FR 36284) we extended the public comment period on the proposal to October 9, 2014. We have not yet published a final rule for this action, but expect to do so in the spring of 2015.

(11) *Comment:* The ODOT requested an exclusion from critical habitat designation for portions of the river underneath and directly adjacent to roadway bridges in the Walhonding River and Little Darby and Fish Creeks. ODOT concluded that since bridge structures already exist and areas under the bridge are subject to regular maintenance activities that section 7 consultation for other listed mussels in these streams would be adequate to protect rabbitsfoot while streamlining consultation.

*Our Response:* Under section 4(b)(2) of the Act and its implementing regulations at 50 CFR 424.19, we may exclude an area from designated critical habitat based on economic impacts, impacts on national security, or any other relevant impacts. In considering whether to exclude a particular area from the designation, we identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and evaluate whether the benefits of exclusion outweigh the benefits of inclusion. If the analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, the Secretary may exercise her discretion to exclude the area only if such exclusion would not result in the extinction of the species.

This area is not subject to exclusion based on impacts to national security or other relevant impacts, such as the presence of a conservation plan (for example, a habitat conservation plan (HCP)), status as a tribal land, or an existing partnership. In evaluating whether it should be excluded due to economic impacts, we concluded that no change in economic activity levels or the management of economic activities is expected to result from the critical habitat designation (see our response to Comment 2). Some additional costs reflect additional administrative effort as part of future section 7 consultations in order to consider the potential for activities to result in adverse modification of critical habitat. Section 7 consultation is required in occupied habitat with or without a critical habitat

designation. We acknowledge it is unlikely additional conservation measures beyond those identified to avoid jeopardy for the species would be required to avoid adverse modification. Accordingly, the Secretary is not exerting her discretion to exclude any areas in the Wallhonding River and Little Darby and Fish Creeks from the designation based on economic impact, national security impact, or other relevant impacts.

(12) *Comment:* The Oklahoma Department of Wildlife Conservation (ODWC) stated that it does not support designation of critical habitat for Neosho mucket and rabbitsfoot. ODWC questioned potential benefits of critical habitat designation cited in the proposed rule (77 FR 63472), which ODWC stated are not compelling arguments in favor of designation. ODWC concluded:

(a) The presence of Neosho mucket or rabbitsfoot in a stream segment already is a trigger for section 7 consultation and the designation of critical habitat does not change this requirement;

(b) The focusing of conservation activities on the most essential features and area for each mussel species should be addressed through development and implementation of a recovery plan, and the designation of critical habitat is not essential to this prioritization process and can be articulated just as effectively in the recovery plan;

(c) The educational benefits derived from critical habitat can be conveyed through Federal, State, and private entities more effectively with an informative, detailed, and publicly accessible Web site; and

(d) It is not clear how designation of critical habitat prevents “people from causing inadvertent harm to the species” as the designation only applies to Federal actions and not those of the general public.

ODWC further concluded, based on these four arguments, that there is no unique added value to the designation of critical habitat.

*Our Response:* Section 4(a)(3)(A) of the Act requires that, to the maximum extent prudent and determinable, we designate critical habitat at the time a species is determined to be endangered or threatened. Our regulations at 50 CFR 424.12(a)(1) state that designation of critical habitat is not prudent when one or both of the following situations exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species. The Service determined

that there is no threat of take attributed to collection or vandalism under Factor B for either species, and identification and mapping of critical is not expected to initiate any such threat. We also believe that designating critical habitat will be beneficial to the species, as described in the proposed rule (77 FR 63440, p. 63472) (see also our response to Comment 52, below). We address ODWC’s specific conclusions below.

(a) We acknowledge that presence of Neosho mucket or rabbitsfoot is a trigger for section 7 consultation with or without the designation of occupied critical habitat. We also acknowledge occupied areas outside the final critical habitat designation will continue to be subject to conservation actions implemented under section 7(a)(1) of the Act, regulatory protections afforded by the section 7(a)(2) jeopardy standard, and the prohibitions of section 9 of the Act. However, if designated critical habitat should become unoccupied at some point in the future, the designation of critical habitat ensures regulatory protections afforded by section 7(a)(2).

(b) We acknowledge that critical habitat designation is not essential to establish recovery criteria and prioritize recovery actions during development and implementation of recovery plans. However, critical habitat designations identify, to the extent known using the best scientific data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat), which can be very beneficial both in focusing conservation efforts on specific activities, areas, or features and in establishing future recovery efforts. Designation can often help to focus recovery efforts and ensure these features, areas, and activities receive priority during section 7 consultations and the planning efforts of both the Service and its partners.

(c) We agree that the Internet and social media are effective venues to convey the benefits of designating critical habitat. We also agree there are many misperceptions by entities and individuals regarding designation of critical habitat. The Service maintains a publicly accessible Internet site, social media, and other educational materials related to critical habitat and the Act, in general, to inform the public and abate concerns. In outlining benefits of designating critical habitat for Neosho mucket and rabbitsfoot, our intent was not to imply that designation of critical habitat is only an educational tool for the recovery of Neosho mucket and rabbitsfoot. To the contrary, critical habitat is a tool within the Act which

identifies areas essential to the conservation of endangered and threatened species and that may require special management considerations. Through identification of physical or biological features essential to the conservation of Neosho mucket and rabbitsfoot, critical habitat informs agencies, entities, and individuals about habitats and specific features of these habitats essential to the conservation of Neosho mucket and rabbitsfoot and helps focus efforts. Accordingly, even though designation is not the sole educational tool in the recovery process, it may still provide educational benefits.

(d) Federal agencies must consult with the Service to ensure that any action authorized, funded, or carried out will not destroy or adversely modify critical habitat for listed species. This rule identifies the primary constituent elements of the physical or biological features essential to the conservation of Neosho mucket and rabbitsfoot. These primary constituent elements will help Federal agencies (and those for which they are providing funding, providing authorization, or completing activities) in planning or evaluating projects. In addition, it may be beneficial to those who wish to conserve this species to know which areas have been determined to be essential to the conservation of the species through this designation. The maps in the designation spatially depict the areas we have identified as critical habitat, assisting with these efforts.

(13) *Comment:* ODWC stated that the Service (a) did not identify and quantify the relative importance of potential threats in each critical habitat unit, and (b) cannot determine whether Federal actions are important to the recovery of Neosho mucket and rabbitsfoot. ODWC further concluded that if Federal actions are not relevant then designation of critical habitat has no recovery value.

*Our Response:* In each unit description in the proposed designation, the Service identified physical or biological features that may require special management considerations or protections to address threats such as land use conversion; alteration of water chemistry and water and sediment quality; changes in stream bed material composition and quality from activities that release sediments and nutrients into the water, such as urban development and associated construction projects; livestock grazing; and releases from municipal effluents. In addition, in the Effects of Critical Habitat Designation, *Section 7 Consultation and Application of the “Adverse Modification” Standard* (77

FR 63440), we discuss the Federal process concerning section 7 consultations and review of projects for adverse modification of designated critical habitat. We provide a description of the actions and activities that may result in adverse effects to occupied Neosho mucket and rabbitsfoot critical habitat. This is not an exhaustive list, and we note that the activities listed may be able to be modified by measures which would sufficiently offset the potential adverse effects so that the value of the habitat for its intended conservation function is not appreciably reduced. The occurrence of the actions we described will not always result in adverse modification of critical habitat if the available compensation can reduce the effects of these actions on the habitat.

These types of activities would require section 7 consultation only in cases where there is Federal involvement (see response to Comment 2). The FEA examined the Service's section 7 consultation record as a means to project future consultations. The FEA also accounts for projected increases in section 7 consultations, by activity category, based on communication with Service field offices and Federal agencies. Additional supporting information and documentation for the FEA is contained within our administrative record. The ACOE, Bureau of Land Management, U.S. Department of Energy, Federal Energy Regulatory Commission, U.S. Department of Transportation (DOT), U.S. Department of Agriculture (USDA) Forest Service, Environmental Protection Agency (EPA), and Tennessee Valley Authority are Federal agencies who may fund, permit, or conduct actions that may potentially affect designated critical habitat for Neosho mucket or rabbitsfoot and are expected to consult with the Service under section 7 of the Act. Recovery of these mussels will not be attained without the valuable contribution of our Federal partners, in accordance with section 7(a)(1) of the Act, as well as our State and nongovernmental partners.

(14) *Comment:* The ODWC recommended modification to Unit RF2 (Verdigris River) for rabbitsfoot. ODWC indicated that the critical habitat unit includes a portion of the Verdigris River downstream of Oklahoma Highway 266, which has been substantially modified by dredging and channel modification to create the upper end of the McClellan-Kerr Arkansas River Navigation System.

*Our Response:* In response to this comment, we have re-evaluated Unit RF2, and, based on the best available

scientific information, we are modifying it in this final rule. For further information, see Summary of Changes from Proposed Rule, below.

(15) *Comment:* The ODWC questioned the biological benefit of including Unit NM1 for Neosho mucket due to existing State water quality standards. ODWC also suggested that the designation of critical habitat may hinder recreational activity in the Illinois River.

*Our Response:* Please refer to our responses for Comments 12 and 13. Since recreational activities on the Illinois River are not regulated by a Federal agency, we do not anticipate any effects to recreational activities due to the designation of critical habitat in Unit NM1.

(16) *Comment:* The Pennsylvania Department of Transportation (PDOT) opposed the designation of critical habitat for the rabbitsfoot due to the financial hardship it believes the designation will bring to Pennsylvania taxpayers. PDOT concluded it would not be a prudent expense of transportation dollars to engage in all the coordination and expense associated with the critical habitat designation.

*Our Response:* All PDOT activities authorized or funded, in whole or part, by the Federal Highway Administration (FHA) or permitted by a Federal agency such as the ACOE (such as, placement of bridge piers in a navigable stream) are required to adhere to section 7(a)(2) of the Act (see our response to Comment 2). PDOT projects that have no Federal nexus are not subject to section 7 consultation. However, as previously stated, four other federally endangered mussels occur in the same reaches of the Allegheny and Shenango Rivers and French and Muddy Creeks as the rabbitsfoot. Although no critical habitat has been designated for these mussels, we believe that project modifications that have been implemented to minimize effects to these listed mussel species are the same types of measures that would be implemented to minimize effects to rabbitsfoot and its critical habitat. Therefore, we expect the additional cost to taxpayers to be minimal.

(17) *Comment:* The PDOT stated there will be additional costs associated with section 7 consultation with FHA due to the requirement to prepare a biological assessment in designated critical habitat regardless of species presence. PDOT requested evaluation of all financial impacts to the agency associated with designating critical habitat. PDOT also suggested adverse modification has not occurred previously at completed bridge projects as evidenced by the Service's

willingness to utilize these sites for reintroduction of endangered mussels.

*Our Response:* FHA is required under section 7(a)(2) of the Act to evaluate beneficial and adverse effects associated with their actions in areas containing listed species. While the Service agrees some completed bridge project sites may serve as suitable sites for mussel augmentation and reintroduction, potential effects of future bridge projects to listed species and their critical habitat will vary depending on a variety of factors, including, but not limited to, the location and type of structure being proposed, as well as the extent to which rabbitsfoot occurs in the project area. Under section 7(a)(2) of the Act and its implementing regulations at 50 CFR part 402, subpart B, Federal agencies are not required to prepare biological assessments for actions that they determine will have no effect, or that may affect but are not likely to adversely affect, a species and its designated critical habitat. Therefore, if a bridge project is deemed not likely to adversely affect this species or other listed species or their critical habitat, no biological assessment would be required by the agency.

One of the main conclusions of the FEA is that the Service does not expect critical habitat designation to result in project modification costs beyond what would be requested to avoid jeopardy to the species. As a result, we expect incremental economic impacts of considering critical habitat as part of the forecast section 7 consultations will be limited to additional administrative costs to the Service, Federal agencies, and third parties. Future section 7 consultations concerning transportation and utilities are expected to occur in 34 critical habitat units, including French Creek, the Allegheny River, and Muddy Creek (Units RF22, RF23, and RF24 in this rule) that occur in Pennsylvania. Collectively, transportation and utilities consultations in these three critical habitat units are forecast to cost \$196,000 over the next 20 years or \$12,500 annually. For comparison, the total transportation and utilities cost for all critical habitat units are forecast to cost \$1,400,000 over the next 20 years or \$93,000 annually (Exhibit 3–9 in the FEA; IEc 2014a, p. 1). As outlined in the FEA, these costs are the incremental costs of the critical habitat designation (that is, those costs, such as expenditures related to consultation, which can be attributed solely to critical habitat).

(18) *Comment:* PDOT asked the Service “that if the Rabbitsfoot Mussel is listed and critical habitats are designated, that there is solid scientific



evidence that the species for which the critical habitat is being designated is present and/or uses the habitat.” PDOT asserted that it committed significant monetary resources in the past to mitigate effects to endangered and threatened species in areas with no evidence of species presence.

*Our Response:* The Act and its implementing regulations require the Service to use the best available scientific and commercial data during consultation (see response to Comment 2). The Service will continue to work with PDOT and other partners to ensure procedures to document presence or absence of the mussels is scientifically supported and to avoid and minimize effects to the rabbitsfoot in areas where this and other listed species are present and critical habitat is designated.

(19) *Comment:* PDOT requested minor road work (such as rehabilitation or resurfacing) and bridge work (such as replacement and repair) on existing roads be exempt from formal coordination (consultation), including areas 100 feet (ft) upstream and downstream of the project foot print.

*Our Response:* Only PDOT projects that have a Federal nexus are subject to consultation (see our response to Comment 2). There is no *de minimis* exception from the consultation requirement. However, to streamline the consultation process, a Federal agency’s determination of “no effect” or “no adverse modification” does not require concurrence by the Service.

(20) *Comment:* PDOT expressed concern with its ability to quickly issue hauling permits for oversize and overweight loads and to restrict routing for materials such as fracking brine. The need to restrict routing for a subset of haulers such as hazardous material haulers would preclude PDOT’s ability to electronically permit and route these haulers, resulting in extensive time delays and subsequently a need for a significant increase in manpower. PDOT concluded that manual permit review to assure limited section 9 liability represents significant economic burden to both the State of Pennsylvania (due to increases in manpower) and to many other industries (due to permit delays).

PDOT also identified the DOT’s Federal Motor Carrier Safety Administration and Pipeline and Hazardous Material Safety Administration as the regulatory agencies with oversight for transportation of hazardous materials on main traffic routes. PDOT concluded that a section 7 consultation is required for each load in response to the designation of critical habitat and each tanker truck is subject to those

consultation procedures or detour routes around critical habitat (for example, to avoid crossing designated critical habitat in French Creek).

*Our Response:* The Service appreciates PDOT’s input. We respectfully disagree that the designation of critical habitat for rabbitsfoot would increase PDOT’s section 9 liability and create or increase an economic burden on the State of Pennsylvania and industries transporting hazardous materials. A key conclusion of the FEA for rabbitsfoot critical habitat designation is that the Service does not expect critical habitat designation to generate additional requests for project modification in any of the critical habitat units, including the Allegheny and Shenango Rivers and French and Muddy Creeks. Our conclusion is based on the FEA and that the creeks and rivers where rabbitsfoot occurs are already inhabited by other federally listed mussels. Project modifications that minimize effects to other listed mussel species within these reaches also would minimize effects to rabbitsfoot (see our response to Comment 2).

(21) *Comment:* PDOT indicated it has pre- and post-Marcellus and Utica shale drilling truck accident reports that may be useful in identifying whether increased oil and gas exploration has or has not translated to an increased threat of crashes that may release contaminants.

*Our Response:* The Service appreciates PDOT’s cooperation to further identify potential threats to rabbitsfoot and designated critical habitat. Your comments have been forwarded to our Pennsylvania Ecological Services Field Office so that they may review the information and, if appropriate, work cooperatively with PDOT to minimize any potential threats to rabbitsfoot and its designated critical habitat and other listed mussels from contamination that may result from these accidents.

(22) *Comment:* PDOT stated that the information and data it provided refines the Service’s analysis regarding the proposed designation of critical habitat for rabbitsfoot in proposed Units RF23, RF24, RF25, and RF32 and provided evidence that diminishes, to a significant extent, the threat from chemical contamination as a result of spills at bridge crossings over critical habitat. PDOT requested a detailed list of hazardous materials that pose a threat of adverse modification in order to plan and prepare for actions PDOT must take to reduce their potential liability under section 9 of the Act.

*Our Response:* Due to the vast number of hazardous materials hauled on the nation’s roads and limited toxicity data available for different life stages of freshwater mussels and their potential sensitivity to many of these compounds and effects to their habitat, the Service is unable to provide a comprehensive list of hazardous materials that may affect rabbitsfoot designated critical habitat. However, please refer to the Chemical Contaminants section of the proposed listing and designation of critical habitat rule (77 FR 63440) for further detail on compounds known to adversely affect freshwater mussels and their habitats.

(23) *Comment:* ODOT and PDOT expressed concern that the DEA underestimated impacts to the transportation sector associated with the proposed designation. They asserted that the DEA does not account for the additional consultation, coordination, surveying, reporting, assessment, mitigation, and monitoring costs that will result from the rule. According to one comment, there are 23 existing structures crossing critical habitat in Ohio that will be affected by the rule due to project modifications that will discontinue in-water work. Another comment asserted that permits for roadwork in Pennsylvania will be interrupted as a result of the rule, and that this will result in time delays and traffic diversions.

*Our Response:* Section 3.3.6 of the FEA provides information on the likely incremental impacts of the designation to transportation and utility-related activities. The analysis forecasts future section 7 consultations on these activities using both historical consultation data and information from the Service’s field offices that have jurisdiction in the study area regarding likely future consultations. As the commenters did not provide specific information regarding the number or rate of future consultations in the study area (including Ohio) over the next 20 years, the analysis relies on the estimates provided in section 3.3.6 of the FEA. Specifically, the FEA estimates that over the next 20 years, approximately 13.3 consultations are likely to occur for transportation projects in proposed critical habitat units RF27 and RF28, which are located in Ohio, in addition to approximately 3.3 consultations in proposed critical habitat unit RF30, which is located in Indiana and Ohio.

The designation of critical habitat is not anticipated to generate additional conservation measures for the two mussels beyond those that would be generated by the species being listed.

Regardless of whether critical habitat is designated, the time period for consultation does not change. Therefore, the designation is unlikely to result in incremental project delays due to the consultation process. As a result, we expect the quantified direct incremental impacts of the designation will be limited to additional administrative costs to the Service, Federal agencies, and third parties of considering critical habitat as part of future section 7 consultations (see our response to Comment 2).

(24) *Comment:* The Kansas Department of Wildlife, Parks and Tourism (KDWP) expressed concern regarding the proposed designation of critical habitat for Neosho mucket in the Cottonwood River (Unit NM8). KDWP provided data from 2013 surveys of two Neosho mucket reintroduction sites. Only one live Neosho mucket was located from the original reintroduction effort. KDWP contended that this river reach does not support a self-sustaining population and that there are no data available to suggest reintroduction efforts have been successful; therefore, this habitat should not be considered occupied.

*Our Response:* We agree that the Cottonwood River should not be considered occupied, and we are not designating critical habitat for Neosho mucket in the Cottonwood River. We have clarified our definition of occupied for the Neosho mucket (see Summary of Changes from Proposed Rule).

(25) *Comment:* KDWP suggested that the Cottonwood River population of Neosho mucket be considered an experimental population and propagated individuals be exempted from take under the Act. KDWP also suggested that safe harbor agreements should be made available to any landowner agreeing to release Neosho mucket individuals in the Cottonwood River.

*Our Response:* We are not designating critical habitat for Neosho mucket in the Cottonwood River (proposed Unit NM8), Chase County, Kansas. Recent KDWP data from 2013 (Tabor 2013, pers. comm.) do not support that released individual mussels into the Cottonwood River were able to survive and become established (thriving and sufficiently viable to suggest continuation or permanence without human intervention), and the future success of the reintroduction efforts are unknown at this time (see Summary of Changes from Proposed Rule, below).

The Secretary may authorize the establishment of an experimental population (including offspring arising solely therefrom) by regulation under

section 10(j) of the Act if the location of that population is wholly separate geographically from nonexperimental populations of the same species. However, the Cottonwood River is not outside the current range of Neosho mucket, so such a regulation is not appropriate. If any of the released Neosho mucket individuals are found to have survived, they are protected by the provisions of the Act as an endangered species.

If determined to be appropriate for the landowner and conservation of the mussel, the Service will work with interested property owners to develop a safe harbor agreement and to apply for an enhancement of survival permit pursuant to section 10(a)(1)(A) of the Act. The Service will also assist property owners in identifying actions they can voluntarily undertake or forego to benefit species covered by the safe harbor agreement and permit.

#### *Public Comments*

(26) *Comment:* Several commenters expressed concern that the designation of critical habitat in Arkansas and Kansas gives the Service authority to restrict activities on privately owned land. The commenters specifically expressed concern regarding landowner water development projects, development or modification of livestock and irrigation water rights, normal aquaculture, farming and ranching activities, timber harvests, housing development projects, and development of mineral rights. They wanted to know whether these activities would trigger section 7 consultation and, if so, what the costs would be to private landowners for these consultations.

*Our Response:* The designation of critical habitat will not increase government regulation of private land. Private activities are not subject to the Act's section 7 consultation requirements unless the activities are authorized, funded, or carried out by a Federal agency. Most normal operations for rearing of livestock or fish, or for other land uses common in Arkansas and Kansas, do not require Federal permits or funding and are not carried out by a Federal agency. Therefore, we do not anticipate this designation will impose any additional direct regulatory burdens to private landowners in Arkansas and Kansas (see our response to Comment 2).

(27) *Comment:* One commenter requested that the Service designate critical habitat only in stream reaches with recent live specimen collections and that the designation extend no more than 3 miles upstream and downstream

of collection sites. Similarly, other commenters suggested that the Service should limit the designation to areas that are or have historically been inhabited by the species and that the designation should not include the entire geographical region where a species can or may reside.

*Our Response:* We are designating as critical habitat areas that we have determined to be occupied at the time of listing and contain sufficient elements of physical or biological features to support life-history processes essential to the conservation of the Neosho mucket and rabbitsfoot. River habitats are highly dependent upon upstream and downstream channel habitat conditions for their maintenance. Therefore, where one occurrence record was known from a river reach, we considered the entire reach between the uppermost and lowermost locations of the mussel as occupied habitat, except in lakes and reservoirs. The nearest stream confluence or highway crossing to known localities was used to delineate the upstream and downstream extent of critical habitat. For the Neosho mucket, we have defined occupied habitat as those stream reaches known to be currently extant. For the rabbitsfoot, we have defined occupied habitat as those stream reaches that contain sizeable and small populations as defined by Butler (2005, pp. 88–89), and the marginal populations of Fish Creek and Red River that are the last extant populations in their respective basins (Great Lakes and Cumberland) and Allegheny River as a metapopulation (interconnected populations where there is gene flow). All other areas where populations are classified as marginal are not considered as occupied habitat (see *Criteria Used to Identify Critical Habitat*, below).

(28) *Comment:* One commenter stated a belief that the protections afforded Neosho mucket and rabbitsfoot under Kansas Nongame and Endangered Species Conservation Act (K.S.A. 32–957 through 32–963, 32–1009 through 32–1003) preclude the need to designate critical habitat for these mussels under the Act.

*Our Response:* The Act requires that critical habitat be designated to the maximum extent prudent and determinable for any species that is determined to be an endangered or threatened species under the Act. We acknowledge Kansas State law affords State level protections similar to those afforded by the Act, but there are differences. For example, Kansas State law does not require Federal action agencies to consult with the Service.

Further, Federal listing and designation of critical habitat affords opportunity for funding of recovery actions from Federal sources, and may include cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations.

(29) *Comment:* One commenter asserted there is no information, other than personal communication from the KDWP, to support the presence of a stable, reproductive Neosho mucket population in the Cottonwood River, Kansas. The commenter contended the 1.6-rmi (2.6-rkm) reach of proposed critical habitat in the Cottonwood River is not occupied by Neosho mucket or is only occupied due to reintroduction and, therefore, should not be designated as critical habitat.

*Our Response:* We are not designating critical habitat for the Neosho mucket in the Cottonwood River (see also our response to Comment 24, above, and Summary of Changes from Proposed Rule, below).

(30) *Comment:* One commenter stated our estimate of \$4.4 million for informal and formal section 7 consultations is high, and questioned how these consultations can generate this cost.

*Our Response:* The final total estimated economic impact of the designation related to consultation under the Act is \$4.4 million over the 20-year period of analysis, or \$290,000 on an annualized basis. These figures represent the estimated costs of consultation associated with eight categories of economic activity across the 12 States where critical habitat was proposed. Chapter 3 of the FEA provides detailed information regarding the portion of total cost associated with each category of activity and how many consultation actions are projected to occur over the 20-year period.

(31) *Comment:* Two commenters from Kansas and Missouri stated that the Service did little, if any, outreach to the agricultural community.

*Our Response:* The Service published legal notices during the first comment period in the *Southeastern Missourian* and *Joplin Globe* in Missouri, and *The Morning Sun* (Pittsburgh, Kansas), *Wichita Eagle*, and *Topeka Capitol Journal* in Kansas. The Service sent news releases to 17 additional Missouri and 18 additional Kansas newspapers with readership in the areas affected by the proposed rule, including farmers. Advance notification of the proposed rule and the document making available the draft economic analysis and extending the proposal's comment period was provided to the Kansas Forestry Commission and Missouri

Conservation Commission—Forest Management.

The Service's Missouri field office held two public informational meetings in the area affected by this rule during the second comment period. The first meeting was held in Joplin, Missouri, on May 21, 2013, and the second meeting was held in Greenville, Missouri, on May 23, 2013. Information pertaining to both meetings was disseminated through typical media outlets in the region where the meetings were held, which is predominately agricultural.

At the request of the Kansas Farm Bureau, the Service's Kansas field office scheduled public informational meetings for October 9 and 10, 2013, in Parsons and Strong City, Kansas, respectively, during the third comment period. These meetings were cancelled due to a lapse in appropriations and partial government shutdown. The Service's Kansas field office attempted to reschedule the meetings with the Kansas Farm Bureau during the week of October 22, 2013, but was unable to reschedule the meetings prior to the comment period closing. As an alternative, the Service responded via email on October 22, 2013, to a list of Kansas Farm Bureau questions related to the proposed rule and draft economic analysis.

(32) *Comment:* One commenter expressed concern that the designation of critical habitat in Unit RF4a (Ouachita River) will interfere with many of Camp Ozark's river activities, including expansion in coming years. The commenter asserted the camp is a significant local economic driver, and the inability to both use the river for recreation and to pursue development plans will stymie its ability to provide jobs and wealth to the local economy.

*Our Response:* The originally proposed RF4b has been separated into two units (RF4a and RF4b) in this final designation. The Service has removed the originally proposed critical habitat Unit RF4a from the final designation based on recent survey efforts suggesting the rabbitsfoot population in this area should be classified as marginal based on Butler's (2005) classification (see Summary of Changes from Proposed Rule, below). As a result, the area the commenter expressed concerns about is not included in the final designation of critical habitat.

(33) *Comment:* One commenter stated that the designation of critical habitat will significantly increase the number of consultations required for permitted and non-permitted activities.

*Our Response:* As other listed species already occur in all designated critical habitat units for Neosho mucket and

rabbitsfoot, we do not expect the number of consultations to increase due to this designation.

(34) *Comment:* One group of commenters stated that the Service fails to meet the Act's requirements for lawful designation of critical habitat in two respects: (a) By designating areas occupied by the rabbitsfoot in Arkansas as critical habitat absent an appropriate determination that such areas include features essential to the conservation of the species and which require special management considerations or protection, and (b) by designating areas unoccupied by rabbitsfoot in Arkansas as critical habitat absent an appropriate determination those areas are essential for the conservation of the species.

*Our Response:* In accordance with 50 CFR 424.12(d), the Service concluded designating critical habitat in river reaches between, or in close proximity to, the uppermost and lowermost occupied areas represent an inclusive area essential to the conservation of Neosho mucket and rabbitsfoot. In accordance with 50 CFR 424.12(b), the Service determined all or some primary constituent elements were present in each unit as evidenced by occupied space (that is, stable habitat) for individual growth, feeding, and reproduction, presence of gravid females, availability of fish hosts, and water quality. While all water quality needs may not be completely understood, we estimate some numeric standards have been adopted under the Clean Water Act (33 U.S.C. 1251 *et seq.*) that represent levels essential to the conservation of these mussels (such as dissolved oxygen, ammonia, pH, metals) (see *Physical or Biological Features*). In this final determination and in accordance with 50 CFR 424.12(b), we have identified nine categories of primary threats affecting Neosho mucket and rabbitsfoot habitat that may necessitate special management or protection (see *Special Management Considerations or Protection*). We did not designate as critical habitat any areas that are unoccupied by either species.

(35) *Comment:* One group of commenters stated that the Service's record for the rule does not include sufficient information for the Service to determine critical habitat features essential to the conservation of the species based on descriptions of the physical or biological features, which state "little is known of the specific habitat requirements for the Neosho mucket and rabbitsfoot" and "the ranges of many water quality parameters that define suitable habitat conditions for Neosho mucket and rabbitsfoot have not

been investigated or are poorly understood.” Accordingly, the commenters expressed the belief that the critical habitat units are overly broad and unnecessary for preservation and propagation of these mussels.

*Our Response:* Generally, the Neosho mucket is found embedded in stable substrates associated with shallow riffles (areas where shallow, generally less than 1 meter (m) (3.3 ft) in depth, turbulent water passes through and over stones or gravel of somewhat similar size) and runs (intermediate areas between pools and riffles with moderate current) with gravel and sand substrate and moderate to swift currents (Oesch 1984, p. 221; Harris 1998, p. 5; Obermeyer 2000, pp. 15–16). However, in Shoal Creek and the Illinois River, the Neosho mucket prefers near-shore areas or areas out of the main current (Harris 1998, p. 5). The rabbitsfoot usually occurs in shallow areas along the bank and adjacent runs and riffles with gravel and sand substrates where the water velocity is reduced, but it also may occur in deep runs (Parmalee and Bogan 1998, pp. 211–212). Unlike the Neosho mucket (Barnhart 2003, p. 17), the rabbitsfoot seldom burrows in the substrate, but lies on its side (Watters 1988, p. 13; Fobian 2007, p. 24). Neosho mucket and rabbitsfoot, similar to other mussels, are dependent on areas with flow refuges where shear stress (the stream’s ability to entrain and transport bed material created by the flow acting on the bed material) is low and sediments remain stable during flood events (Layzer and Madison 1995, p. 341; Strayer 1999, pp. 468 and 472; Hastie *et al.* 2001, pp. 111–114). Habitat conditions described above provide space, cover, shelter, and sites for breeding, reproduction, and growth of offspring for the Neosho mucket and rabbitsfoot; are essential to their conservation; and may require special management considerations or protection. These habitat conditions have been accurately captured in the physical or biological features that we have identified to be essential to the conservation of the species. Based on the best available scientific information, we conclude the designation of critical habitat for Neosho mucket and rabbitsfoot meets the criteria set forth in 50 CFR 424.12.

(36) *Comment:* One group of commenters suggested that the Service should limit critical habitat designations for rabbitsfoot in Arkansas to areas where successful host species and rabbitsfoot coexist.

*Our Response:* Based on the best available information, suitable fish hosts for the rabbitsfoot occur in all areas that

we are designating as critical habitat. The Arkansas Game and Fish Commission (AGFC) fish database (2014) includes numerous records for rabbitsfoot fish hosts in the critical habitat units designated in Arkansas. Our administrative record documents the coexistence of rabbitsfoot and its fish hosts in these critical habitat units.

(37) *Comment:* One group of commenters suggested that the Service should remove streams impacted and/or controlled by hypolimnetic (lower thermally stratified portion of a lake) or other cold water releases (such as Mammoth Spring in Arkansas) because those streams are not preferred habitat for rabbitsfoot. Specifically, they referenced the Spring River (proposed Unit RF12) from Hardy downstream to Ravenden, Arkansas, and Ouachita River (proposed Unit RF4b) from Interstate 30 downstream to the Little Missouri River confluence. They stated that the rabbitsfoot cannot survive in these two cold water reaches.

*Our Response:* Our decision record documents the presence of a diverse and abundant mussel assemblage in the Spring River from Hardy, Arkansas, downstream to Ravenden, Arkansas (Rust 1993, Appendix 1.2 and 1.4; Harris *et al.* 2007; AGFC Mussel Database 2014; various museum records). The Ouachita River mussel and fish fauna from Rempel Dam downstream to Interstate 30 is affected by cold water releases (Harris 1999, p. 4–2). Mussel species richness and abundance increases downstream of Interstate 30 (Harris 1999, p. 3–8). Harris (1999, p. 4–2) reported double-digit species richness and higher relative abundance of mussels downstream of the Tenmile Creek confluence compared to sites upstream. Live rabbitsfoot occur in the Spring River between Hardy and Ravenden, Arkansas, and in the Ouachita River downstream of Tenmile Creek to the confluence of the Caddo River (Harris *et al.* 2007, pp. 14–16; AGFC Mussel Database 2014; Harris 1999, p. 3–8). Therefore, the best available scientific information supports that mussels, including rabbitsfoot, can survive in these reaches.

(38) *Comment:* One group of commenters recommended modifications to six critical habitat units for rabbitsfoot. They asserted that the critical habitat units should be restricted to stream reaches where live rabbitsfoot individuals are known to occur. The units are as follows:

(a) Ouachita River (proposed Unit RF4a): Remove entire designation because occurrence of rabbitsfoot is only

reported from Arkansas Highway 379 and 298.

(b) Ouachita River (proposed Unit RF4b): Restrict designation to the confluence of Little Missouri River downstream to U.S. Highway 79.

(c) Saline River (proposed Unit RF5): Restrict designation to 2 miles upstream of Arkansas Highway 15 to the Snake Creek confluence north of the Felsenthal National Wildlife Refuge boundary.

(d) Black River (proposed Unit RF9): Restrict designation to Pocahontas, Arkansas, downstream to Black Rock, Arkansas.

(e) Spring River (proposed Unit RF10): Restrict designation to Ravenden, Arkansas, downstream to confluence with Black River. They also believe water temperatures from Hardy to Ravenden, Arkansas, do not support propagation of rabbitsfoot and, thus, are not essential to the conservation of the species.

(f) South Fork Spring River (proposed Unit RF11): Remove entire designation based on the lack of documentation of live rabbitsfoot despite multiple surveys.

*Our Response:* We have re-evaluated the critical habitat units in question and, based on the best available scientific information, we are removing or modifying the following units in this final rule. For further information, see Summary of Changes from Proposed Rule, below.

(a) Ouachita River (proposed Unit RF4a): We agree, in part, with the commenters and in this final designation have removed the originally proposed Unit RF4a.

(b) Ouachita River (Unit RF4b): We agree, in part, with the commenters and have revised proposed Unit RF4b into two units. The Ouachita River from Arkadelphia downstream to the Little Missouri River confluence has not been comprehensively surveyed for mussels. While the absence of rabbitsfoot from this reach is likely a result of no survey data and not actual absence, the best available scientific information supports designating critical habitat in two Ouachita River units, revised Unit RF4a and revised Unit RF4b (see Summary of Changes from Proposed Rule, below).

(c) Saline River (Unit RF5): We agree, in part, with the commenters and have modified Unit RF5 in this final designation so that the upstream boundary is at the Frazier Creek confluence near Mt. Elba, Arkansas, and the downstream boundary is at the Mill Creek confluence near Stillions, Arkansas.

(d) Black River (Unit RF9): We agree, in part, with the commenters and have modified Unit RF9 in this final

designation so that the downstream boundary is at the Flat Creek confluence downstream of Powhatan, Arkansas.

(e) Spring River (Unit RF10): The best available scientific information supports the designation with a slight adjustment to the upstream boundary of Unit RF10 downstream approximately 3.72 rkm (6 rmi) to the Ott Creek confluence. We have made this change in this final designation.

(f) South Fork Spring River (proposed Unit RF11): The best available scientific information supports categorizing the South Fork Spring River rabbitsfoot population as marginal. Therefore, the Service has removed proposed Unit RF11 (the South Fork Spring River) from this final designation. (Note that units have been renumbered for this final rule and final Unit RF11 is not the same location as proposed Unit RF11).

(39) *Comment:* One group of commenters stated that the Service failed to acknowledge protections afforded to proposed Units RF10 and RF4a under Arkansas Pollution Control and Ecology Commission (APCEC) Regulation 2 (waters designated as Extraordinary Resource Waters (ERW) and Ecologically Sensitive Waterbodies (ESW)), which they stated provide sufficient protection to preserve the physical or biological features essential to the conservation of rabbitsfoot.

*Our Response:* The Service acknowledges there are some protections afforded to ERW and ESW under APCEC's Regulation 2, which was developed pursuant to the Arkansas Water and Air Pollution Control Act and the Clean Water Act (CWA). Significant physical alterations of habitat are not allowed unless: (a) The proposed physical alteration of habitat will not impair water quality, natural flow regime, and the habitat of fish, shellfish, or aquatic life; and (b) there is no feasible alternative to the proposed project. Regulation 2 also allows the short-term activity authorization for a variety of activities that are permitted to exceed water quality standards provided there is no permanent or long-term impairment. However, despite provisions in Regulation 2 that explicitly prohibit short-term activity authorization for activities that result in adverse effects to federally endangered and threatened species or their critical habitat, short-term activity authorizations in ERW and ESW watersheds have been linked to documented take of endangered species (see *U.S. v. Hawk Field Services, LLC* 2011). Furthermore, Regulation 2 allows for the removal of an ERW or ESW designation for the purpose of constructing a reservoir to provide

domestic drinking water, if it can be demonstrated: (a) The sole purpose is to provide domestic drinking water supply; and (b) there is no feasible alternative to constructing a reservoir to meet the domestic water needs of the citizens of Arkansas. Given that a goal of the CWA is to establish water quality standards that protect shellfish and given documented declines of these mussel species still continue due to poor water quality and other factors, we take a conservative approach in favor of the species and conclude that Regulation 2 has been insufficient to significantly reduce or remove threats to the Neosho mucket and rabbitsfoot in Units RF4a and RF10.

(40) *Comment:* One group of commenters commissioned its own study of the economic impacts of the critical habitat designation. Their study compared their results to the Service's DEA and concluded that the DEA "vastly understates" costs of the regulatory action because it does not take into account direct and indirect costs to businesses, State and local governments, and other private property owners resulting from section 7 consultation requirements. Furthermore, these impacts would lead to additional damages to the regional economy in the form of lost tax revenue, increased unemployment claims, damage from unrepaired roads and bridges, increases in transportation costs, and tax increases. Specifically, the evaluation estimated, based on a sample of affected projects, the total cost to affected Arkansas counties would exceed \$19 million, approximately 5 times the cost of \$4.4 million estimated in the DEA for the entire 12-State region of the designation.

*Our Response:* The commenter's evaluation describes the economic impacts that would occur if a variety of hypothetical scenarios were to result from critical habitat designation (for example, if visitation at Camp Ozark declined by 25 percent; visitation at the Pond Creek National Wildlife Refuge decreased by 20 percent; an oil well is not drilled; a poultry farm is closed; the construction of a planned county-road bridge over the Osage River is delayed; or city or county discharges under the National Pollution Discharge Elimination System (NPDES) are restricted). However, the evaluation does not provide evidence to suggest such restrictions will actually occur as a result of the critical habitat designation.

The Service considered whether restrictions are likely to result from the designation of critical habitat and found this to be unlikely. Specifically, the

Service prepared a memorandum describing the likely outcome of future section 7 consultations (see Appendix D of the FEA). The Service is designating critical habitat in river segments that are occupied by the mussels. Section 7 consultation requirements take effect once the mussels are listed under the Act, even if critical habitat is not designated (see response to Comment 2). Thus, the incremental costs of additional regulation designating critical habitat are limited to the administrative costs to the Service, the Federal action agencies, and third parties involved in consultations. The FEA's estimate of \$4.4 million (present value impacts assuming a 7 percent discount rate) results from this additional administrative burden.

(41) *Comment:* Multiple commenters stated that the DEA underestimates the impacts of the proposed critical habitat designation because it utilizes an incremental approach that "only estimates the likely costs of agencies consulting with each other" and does not consider the actual opportunity costs to businesses, State and local governments, and other private property owners related to the required consultations.

*Our Response:* The Service's focus on the incremental impacts of the critical habitat rule is consistent with the U.S. Office of Management and Budget's (OMB's) guidelines for best practices concerning the conduct of economic analysis of Federal regulations. As described in section 2.1 of the FEA, OMB guidelines direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action." The baseline utilized in the FEA is the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat *absent* the designation of critical habitat. The baseline includes protections afforded the species under the Act, as well as under other Federal, State, and local laws and guidelines.

In recognition of the divergent opinions of the courts and to address the Presidential memorandum dated February 28, 2012, the Service promulgated final regulations specifying that it is appropriate for the Secretary to consider impacts of a critical habitat designation on an incremental basis (78 FR 53058, August 28, 2013). This rule discusses the impact analysis for proposed critical habitat through completion of an "incremental analysis." This method of determining

the probable impacts of the designation seeks to identify and focus solely on the impacts over and above those resulting from existing protections.

Accordingly, the FEA employs “without critical habitat” (baseline) and “with critical habitat” (incremental) scenarios. The analysis qualitatively describes how baseline conservation efforts for the two mussels may be implemented across the proposed designation, and, where possible, provides examples of the potential magnitude of costs of these baseline conservation efforts (Chapter 4). The FEA focuses, however, on the incremental analysis, describing and monetizing the incremental impacts due specifically to the designation of critical habitat for the species (Chapter 3). Sections 2.2 and 2.3 of the FEA describe in detail how the analysis defines and identifies incremental effects of the proposed designation.

The incremental approach employed by the Service in its analyses of proposed critical habitat designations does not necessarily limit impacts to administrative costs of consultation. In some cases, designation of critical habitat does result in new project modifications that need to be implemented to avoid possible adverse modification of the habitat. The costs of these project modifications would then be counted in the incremental analysis, regardless of who incurs the cost. In the case of the Neosho mucket and rabbitsfoot, all of the designated critical habitat is occupied by the species, and therefore any project modifications will be required even absent critical habitat (in the baseline) to avoid possibly jeopardizing the species’ existence (see response to Comment 2).

(42) *Comment:* Multiple commenters expressed concern that the proposed critical habitat designation will have an economic impact on Arkansas counties, cities, communities, businesses, and industry sectors through effects on employment, tax revenues, business and industrial operations, and overall quality of life. Commenters suggested that these impacts will occur as a result of new critical habitat-related restrictions, prohibitions, delays, cancellations of activities, and/or additional requirements for conservation and consultation.

*Our Response:* The commenters do not provide information regarding how or why they believe critical habitat will result in new restrictions, prohibitions, delays, cancellations, or conservation requirements. Within the FEA, the Service specifically considered whether additional or different conservation measures would be needed to avoid

destruction or adverse modification of critical habitat above and beyond those measures needed to avoid jeopardizing the continued existence of the species, and found this to be unlikely (see our response to Comment 2). Because all of the units are occupied by at least one of the mussel species, any measures needed to protect habitat would be requested by the Service, even if critical habitat was not designated, to avoid jeopardizing the continued existence of the species.

(43) *Comment:* Multiple commenters expressed concern that the DEA does not address impacts to private landowners (such as farmers and ranchers), and in particular, those impacts associated with property value or third party lawsuits resulting from critical habitat designation. One commenter expressed concern that no small landowners were contacted in accordance with the provisions of the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*).

*Our Response:* Incremental impacts of the designation are expected to be limited to additional administrative costs to the Service, Federal agencies, and third parties of considering critical habitat as part of future section 7 consultations (see our response to Comment 2). The FEA incorporates potential impacts to private landowners as third parties in forecasted consultations on water quality; timber, agriculture, and grazing; and development activities. In addition, Appendix A of the FEA includes an analysis of the distributional impacts of the proposed critical habitat designation on small entities. As described in Appendix A, the only costs expected to be borne by third parties as a result of the proposed designation are portions of the total cost of forecasted section 7 consultations. These costs are relatively minor, ranging from \$260 to \$2,080 per consultation.

Section 2.3.2 of the FEA discusses how the designation of critical habitat may, under certain circumstances, result in indirect impacts such as time delays, regulatory uncertainty, and stigma effects (such as property value impacts). The Service does not expect indirect impacts to result from critical habitat designation for the two mussels. However, as a result of the concern expressed in these comments, we have added new language to the FEA concerning the potential for indirect costs associated with third party lawsuits or property value impacts. Because the nature, timing, and likelihood of future litigation or property value impacts are highly uncertain, the FEA does not quantify

these impacts but instead describes them qualitatively and notes that these are uncertainties in the analysis.

(44) *Comment:* One commenter asserted that the DEA is flawed because it limits the physical scope of its enquiry to the riparian watersheds and census tracts included in those watersheds. The commenter argued that standard practice for an economic impact analysis has been to use county boundaries or a defined local market area as the basis for any comprehensive evaluation of costs and benefits. The use of such narrow boundaries is an attempt to limit the estimated effects by omitting consideration of the interconnectedness of modern economies.

*Our Response:* The commenter is correct that the DEA defines its “study area” as including the watersheds encompassing proposed critical habitat (either the fourth level (8-digit) or sixth level (12-digit) Hydrologic Unit Code (HUC) watersheds defined by the U.S. Geological Survey (USGS)). The study area is used to identify projects (such as oil wells, roads, bridges, etc.) that could have a hydrologic connection to critical habitat. For example, these projects may be sufficiently close to a critical habitat river segment that runoff from the construction site would increase sediment loads to the river, potentially affecting the mussels. If such a hydrologic connection exists, these projects are more likely to require consultation. Defining the study area more broadly would result in the inclusion of projects with no hydrologic connection to critical habitat, and thus no reason for consultation.

Importantly, while the identification of projects requiring consultation is limited to the study area, the consideration of economic impacts that might result if these projects are modified is not limited to this geographic area. However, in the case of Neosho mucket and rabbitsfoot, incremental project modifications are unlikely. Incremental costs are limited to administrative costs, which would be incurred by the agencies or private entities pursuing the projects, regardless of where those entities are headquartered.

(45) *Comment:* One commenter provided an analysis of the economic impacts of the proposed critical habitat designation based on hypothetical project modifications using IMPLAN (an input-output modeling system) multipliers. Such an analysis measures the change in economic output resulting from a policy change. The authors argued that such multiplier analysis is the appropriate framework for answering impact analysis questions,

noting the DOT recommends this approach for construction planning.

*Our Response:* The commenter is correct that economic impact analyses generally rely on input-output or multiplier analysis using tools such as IMPLAN. Examples of such analyses include estimates of the changes in economic output generated by the construction of a new stadium or the loss of a manufacturing facility.

In contrast, the method of economic analysis of proposed Federal regulations is subject to the direction provided by Executive Order 12866 and associated guidance provided by OMB in Circular A-4. As described in Circular A-4, "opportunity cost" is the appropriate concept for valuing benefits and costs of regulatory actions. Costs are incurred when resources are used for one purpose and hence cannot be used for another purpose. The opportunity cost is the value of the benefit that could have been provided by devoting the resources to their best alternative use. Estimates of the change in opportunity cost are sometimes referred to as economic efficiency effects or changes in social welfare.

For example, assume section 7 consultations are required prior to drilling at oil and gas sites potentially affecting the mussels. If delays caused by section 7 consultation cause oil and gas operators to forego the activity without pursuing production at substitute sites, net change in oil and gas production at a national level would represent the opportunity cost of the regulation. If operators pursue production at substitute sites, resulting in no net change in production but redistributing activity away from sites near the mussels, then the marginal cost of reduced profitability associated with the next best alternative location represents the opportunity cost. In either case, the resources used to produce the oil and gas (for example, materials and labor necessary to drill for and transport the oil and gas) are not lost to society. Rather, these resources are still available for other productive uses. As a result, estimates of changes in efficiency effects, or social welfare, are fundamentally different than the estimate of the distributional effects using tools like IMPLAN, and the results are not directly comparable.

Given that the designation of critical habitat for the mussels is unlikely to result in additional project modifications beyond those related to the listing of these species, the types of distributional effects measured using IMPLAN multipliers are likely to be minimal. The opportunity cost of the regulation is limited to the resources

(primarily labor) needed to address the administrative requirements of the section 7 process. Thus, the DEA appropriately captured the incremental opportunity costs of the proposed regulation.

(46) *Comment:* One commenter noted that the DEA predicts an increase in future section 7 consultations on Natural Resources Conservation Service (NRCS) Farm Bill activities in Arkansas. The commenter expressed concern because these consultations are new, and the Service has no way to predict the incremental costs to private landowners associated with new conditions (such as a 180-foot buffer along stream, discharge zones, and karst features and methods to prevent soil erosion and runoff) that will be recommended during section 7 consultation on Farm Bill-related activities.

*Our Response:* Section 3.3.3 of the DEA includes the likely increase in section 7 consultations in Arkansas due to new NRCS Farm Bill program work under the Agricultural Act of 2014 (H.R. 2642, Pub. L. 113-79, which is also known as the 2014 Farm Bill), an act that authorizes nutrition and agriculture programs in the United States for 2014 through 2018, and this section of the DEA provides an estimate of the administrative costs associated with the forecasted consultations. Additionally, the discussion provides information on the likely incremental impacts of the proposed critical habitat designation on timber, agriculture, and grazing activities. As described in section 2.3.2 of the DEA, the designation of critical habitat is not anticipated to generate additional conservation measures for the two mussels beyond those that would be generated by the listing.

We note that the conditions identified by the commenter from the DEA as "specific conservation recommendations identified by the Service" (*i.e.*, a minimum 180-foot buffer and methods to prevent soil erosion and runoff) are mischaracterized in the economic analysis as having been made by the Service, which is incorrect. We have included an Addendum to the FEA (IEc 2014b) to correct information regarding the programmatic consultation with NRCS. It is important to note, however, that although the information was not correctly presented in the economic analysis, it had no bearing on the results of the incremental effects analysis, as that information was incorporated in the baseline.

(47) *Comment:* One commenter stated that the costs presented in the DEA are based on "an unrealistic discount rate of seven percent" and costs should be

presented instead using a discount rate of 5 percent or less.

*Our Response:* The DEA demonstrated the sensitivity of the results of the analysis to the choice of discount rate by presenting costs using discounts rates of both 7 and 3 percent. Specifically, results estimated using both rates are presented in the Executive Summary (see Exhibit ES-3). For presentation purposes, the remainder of the report presents detailed cost estimates using a 7 percent discount rate; however, Appendix B replicates all detailed tables using a 3 percent discount rate for comparison.

The choice of discount rates is consistent with OMB's Circular A-4, which states: "As a default position, OMB Circular A-4 states a real discount rate of seven percent should be used as a base-case for regulatory analysis. The seven percent rate is an estimate of the average before-tax rate of return to private capital in the U.S. economy. The effects of regulation do not always fall exclusively or primarily on the allocation of capital. When regulation primarily and directly affects private consumption (for example, through higher consumer prices for goods and services), a lower discount rate is appropriate. For regulatory analysis, you should provide estimates of net benefits using both three percent and seven percent." The rate of 5 percent recommended by the commenter is captured in this range.

(48) *Comment:* One commenter asserted the RFA analysis does not consider whether or not the proposed critical habitat designation would have a substantial impact on local government jurisdictions because, as stated in the DEA, "potential financial impacts to local government agencies and private landowners are not estimated as a proportion of annual revenues due to lack of data."

*Our Response:* The purpose of the Small Business Regulatory Enforcement Fairness Act (5 U.S.C. 801 *et seq.*) analysis, provided in Appendix A of the DEA, is to assess whether or not the proposed critical habitat designation will have a significant economic impact on a substantial number of small entities. As described in section A.1, the analysis provides information regarding the potential number of third parties participating in consultations on an annual basis in order to ensure a robust examination of the effects of the proposed rule. In addition, the analysis provides information to assist the Service in determining whether these entities are likely to be "small" and whether the number of potentially affected small entities is "substantial."

Importantly, the impacts of the rule must be both significant and substantial to prevent certification of the rule under the RFA and to require the preparation of an initial regulatory flexibility analysis.

As shown in Exhibit A-2 of the DEA, the proportion of small entities in the study area that may be affected in one year by the proposed designation ranges from 0.1 percent to 3.1 percent, which is not considered to be a substantial number. Despite this conclusion, the analysis also provides information on whether the economic impact on these entities is likely to be significant. Specifically, the analysis estimates the likely annualized impact per entity as a proportion of estimated annual revenue. Due to lack of data on the annual revenues of each entity that may be involved in section 7 consultations across the designation, we perform a "threshold analysis"; that is, we determine that for impacts to exceed one percent of an entity's annual revenues, those annual revenues would have to be less than \$47,000. We assume this is very unlikely to be the case for local government agencies in the study area. For example, one of the least populous counties in the study area in Arkansas is Calhoun County, whose total revenues for 2011 were reported at \$8,863,000 (Center for Governmental Research Inc., 2013: <http://www.govistics.com/AR/CALHOUN>).

(49) *Comment:* One commenter stated that for private timber, agricultural, and grazing entities, the RFA analysis relies on the flawed assumptions in chapter 3 of the DEA. The Service concludes there will be no significant impact to small entities when the DEA clearly states the Service has no data with which to predict future incremental costs to such private landowners because there is no history of consultation between the Service and NRCS.

*Our Response:* In Appendix A of the DEA, we note that we are unable to estimate potential financial impacts to local government agencies and private landowners as a proportion of annual revenues due to a lack of data. However, for any entity with greater than \$47,000 in annual revenue, the financial burden of undertaking a project requiring consultation on the mussels would constitute less than one percent of annual revenue because the designation of critical habitat is not anticipated to generate additional conservation measures for the two mussels beyond those that would be generated by the species being listed. Less than one percent of annual revenue would not be considered a significant impact. Therefore, we have determined there

would not be a significant impact to a substantial number of small entities.

(50) *Comment:* One commenter provided information about NPDES permits for direct and indirect discharges into rivers containing proposed critical habitat. The commenter asserted that "serious economic and fiscal impacts will accompany any water-system adjustments that would have to be instituted to divert or avoid discharges into the host rivers." In addition, the commenter stated that the NPDES permits will "be subjected to an increased level of regulation, including potential need for formal and/or informal consultation with [the Service]."

*Our Response:* The commenter does not provide any information regarding the likelihood or nature of "water-system adjustments" resulting from critical habitat designation that would aid in providing greater clarification to address the concern. As outlined in our response to Comment 2 and elsewhere in this document, the designation of critical habitat is not anticipated to generate additional conservation measures for the two mussels beyond those that would be generated by the species being listed. In addition, section 3.3.2 of the DEA provided an estimated number of future water quality-related section 7 consultations, including those on NPDES permit programs. The DEA forecast costs related to water quality activities for all units in which future section 7 consultations concerning water quality management activities are expected to occur.

(51) *Comment:* One commenter stated that although the DEA does address benefits of designating critical habitat, the analysis should account for benefits to other species from the designation of critical habitat for the mussels. Studies have shown these protections promote stream health by preventing erosion, filtering runoff, and providing shade and microhabitats. Other benefits include areas for scientific study and aesthetic value to residents.

*Our Response:* The primary goal of critical habitat designation for the mussels is to support their long-term conservation. Theoretically, conservation and recovery of the species may result in benefits, including use benefits (wildlife-viewing), non-use benefits (existence values), and ancillary ecosystem service benefits (such as public safety benefits of reduced wildfire risks). Section 5.3 of the DEA contained a discussion of potential ancillary benefits of mussel conservation, including improved water quality and aesthetic benefits.

(52) *Comment:* One commenter asked why the critical habitat designation is necessary when no additional conservation measures are required beyond those associated with the listing.

*Our Response:* The Act requires that critical habitat be designated to the maximum extent prudent and determinable for any species that is determined to be an endangered or threatened species under the Act. In the October 16, 2012, proposed rule to list these species and designate critical habitat (77 FR 63440), we identified "the potential benefits" of designating critical habitat to "include: (1) Triggering consultation under section 7 of the Act in new areas for actions in which there may be a Federal nexus where it would not otherwise occur because, for example, it is or has become unoccupied or the occupancy is in question; (2) focusing conservation activities on the most essential features and areas; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species" (see *Prudence Determination*, 77 FR 63472).

(53) *Comment:* Several commenters contended that the designation of critical habitat in Arkansas is an attempt by the Service or Federal government to "take" privately owned property.

*Our Response:* The designation of critical habitat does not authorize the Service or Federal government to purchase, condemn, take through eminent domain, or otherwise confiscate private property through the use of legislation, regulation, or other legal means. In accordance with Executive Order 12630 ("Government Actions and Interference with Constitutionally Protected Private Property Rights"), we have analyzed the potential takings implications of designating critical habitat for Neosho mucket and rabbitsfoot in a takings implications assessment. As discussed above, the designation of critical habitat affects only Federal actions. Although private parties that receive Federal funding, assistance, or require approval or authorization from a Federal agency for an action may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests on the Federal agency.

(54) *Comment:* Multiple commenters requested that the Service conduct a "complete impact study" to include all property owners and businesses.

*Our Response:* Based on a review and evaluation of the information contained in the environmental assessment, we



determined the designation of critical habitat for the Neosho mucket and rabbitsfoot does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of NEPA. Accordingly, an environmental impact statement is not required. See our responses to Comments 41 and 42 regarding economic impacts to private landowners and businesses.

(55) *Comment:* One commenter stated that the designation of critical habitat in Arkansas will close rivers to fishing.

*Our Response:* As discussed above, designating critical habitat has no impact on landowner or citizen activities that do not require Federal funding or permits.

(56) *Comment:* One commenter expressed concern that oral comments were not recorded during public meetings held in Arkansas. Furthermore, the commenter requested policy changes to require public meetings be recorded and entered into the public record.

*Our Response:* The commenter appears to be confusing the requirements for a “public hearing” with those for the “public information meeting” that was actually held. A public hearing, which may be requested on any proposed rule within 45 days after the opening of the comment period, includes oral testimony from participants which is recorded by a court reporter and entered into the public record. With regard to the proposed critical habitat designation for the two mussels, no public hearings were requested during any of the four open comment periods. Instead, the Service was asked to reopen the comment periods to allow additional time for interested parties to review the proposed rule, DEA, and draft environmental assessment. The Service agreed to hold public information meetings during the open comment periods to facilitate a better understanding of the proposed action. In a public information meeting, which is a less formal process than a public hearing, there is no requirement for recording oral testimony. However, the Service voluntarily provided comment cards that participants could fill out during the meetings and submit as formal comments to be entered into the record. These comments have been uploaded onto <http://www.regulations.gov> along with all other comments we received during the comment periods.

(57) *Comment:* One commenter stated predation by raccoon, otter, beaver, and other predators is a greater threat to

Neosho mucket and rabbitsfoot than habitat loss or degradation.

*Our Response:* The Service determined predation was not a significant threat to the overall status of Neosho mucket and rabbitsfoot. A more detailed discussion of this threat is presented in the final listing rule under Summary of Factors Affecting the Species (78 FR 57076, September 17, 2013).

(58) *Comment:* One commenter expressed concern about additional restrictions on the aquaculture industry in Arkansas, specifically on water withdraw or diversion, pond cleanout, pond effluent discharge, and inspection requirements, due to the designation of critical habitat.

*Our Response:* As discussed above, designating critical habitat has no impact on landowner activities that do not require Federal funding and permits. For aquaculture activities that require a Federal permit or assistance, the Service may recommend conservation actions in a section 7 consultation for the affected species that protect not only the species, but also its habitats, regardless of whether or not there is designated critical habitat. Currently, such conservation measures to protect the species and their habitats are in place for other listed mussel species that occur within the Arkansas critical habitat units such that no additional conservation measures or regulatory restrictions are expected to result from this critical habitat designation.

(59) *Comment:* One commenter stated that the Service should release data used to determine critical habitat for Neosho mucket and rabbitsfoot.

*Our Response:* All of the comments, materials, and documentation we considered in this rulemaking are available at the Arkansas Ecological Services Field Office (see **ADDRESSES**, above). Comments and materials received, as well as some supporting documentation we used in preparing this rule, are also available for public inspection at <http://www.regulations.gov>.

(60) *Comment:* Several commenters expressed concern about fluoride as a chemical contaminant affecting Neosho mucket and rabbitsfoot.

*Our Response:* While all the water quality needs for these two mussels may not be completely understood, we estimate some numeric standards have been adopted under the CWA that represent levels essential to conservation of these mussels (such as dissolved oxygen, ammonia, pH, metals) (see *Physical or Biological Features*). In a North Carolina study, effective

concentrations for growth effects were found to be 17 and 8 times as high as the State’s and EPA’s water quality criteria for fluoride, respectively (Keller and Augspurger 2005 in Farris and Van Hassel 2007, p. 162). Fluoride, at concentrations typical of most streams meeting state and EPA water quality criteria, is not toxic to glochidia (freshwater mussel larvae) and juveniles of Unionidae mussels such as the Neosho mucket and rabbitsfoot. In this final designation, and in accordance with 50 CFR 424.12(b), we have identified nine categories of primary threats affecting Neosho mucket and rabbitsfoot habitat that may necessitate special management or protection (see *Special Management Considerations or Protection—Chemical Contaminants*).

(61) *Comment:* Multiple commenters expressed concern regarding “sue and settle” agreements between Federal agencies and nongovernmental organizations. They contend this process is a binding out-of-court settlement that prohibits farmers, small businesses, and private property owners from participating in discussions and providing meaningful input prior to the publication of a proposed rule.

*Our Response:* The multiyear listing workplan under which this critical habitat rule was proposed was developed through settlement agreements with Wild Earth Guardians and the Center for Biological Diversity to resolve multidistrict litigation. It established deadlines for completing listing determinations for each candidate species, including the Neosho mucket (first included in the 2001 CNOR; 66 FR 54808, October 30, 2001) and rabbitsfoot (first included in the 2009 CNOR; 74 FR 57804, November 9, 2009). The Service published a final listing rule for these mussels on September 17, 2013 (78 FR 57076), in accordance with these deadlines. Section 4(a)(3)(A) of the Act requires that we designate critical habitat, when prudent and determinable, concurrently with making a determination to list a species as endangered or threatened. Therefore, in making this final designation at this time, the Service is adhering to the requirements of the listing workplan and settlement agreement and the Act.

(62) *Comment:* One commenter contended that the greatest threat to the Neosho mucket and rabbitsfoot is White River (Arkansas) minimum flows regulated by the ACOE.

*Our Response:* Neosho mucket does not occur in the White River. The construction of a series of six flood control reservoirs on the upper White River in the 1940s and 1950s, including

Bull Shoals and Norfolk Lakes, led to the extirpation of rabbitsfoot from a large section of the White River upstream of Batesville, Arkansas. White River minimum flows provide adequate low flow releases from Bull Shoals and Norfolk Lakes dams to enhance trout habitat and survival in cold tailwater reaches of the White River located upstream of Unit RF8a. There is no evidence to support minimum flows contributing to declines in rabbitsfoot. Minimum flows may be beneficial to the species by providing higher and more consistent flow during low flow periods when mussels may become stranded and be subjected to desiccation (drying).

#### Summary of Changes From Proposed Rule

The information below is provided as a result of the peer and public review process. In this final designation, we have made changes to maps, units, and the rule itself. A change in mapping methodology resulted in a revision to the total number of river kilometers (river miles) for the designation of rabbitsfoot critical habitat. The beginning and ending points of the proposed critical habitat designation, as well as the unit descriptions (as described in the proposed critical habitat rule) will remain the same except where modified for other reasons.

(1) We have made changes to Unit RF7 to correct an oversight in mapping methodology, specifically in methods used for estimating the unit length. The new method uses a better technique for following the curve and meander of the river channel, which results in an additional 1.5 rkm (0.9 rmi) designated as critical habitat for the rabbitsfoot. In addition, this correction resulted in a corresponding increase to the private ownership lands (expressed as river km/mi) adjacent to Unit RF7.

(2) We are not designating critical habitat for Neosho mucket in the Cottonwood River (Unit NM8), Chase County, Kansas, as originally proposed. Recent KDWPT data from 2013 (Tabor 2013, pers. comm.) do not indicate that released individual mussels into the Cottonwood River were able to survive and become established, and the future success of the reintroduction efforts are unknown at this time. We have clarified our definition of extant Neosho mucket populations in this final designation to address reintroduced populations and selection criteria for critical habitat for this mussel (see the *Criteria Used to Identify Critical Habitat*).

(3) We are not designating critical habitat for rabbitsfoot in the Ouachita River (Unit RF4a), Montgomery County,

Arkansas, as originally proposed. Rabbitsfoot was collected live at two sites in 1988 (AGFC Mussel Database 2014). However, an AGFC and Service comprehensive survey in 2007 failed to find any live rabbitsfoot in this reach. In 2013, AGFC resurveyed the two 1988 sites and failed to locate any live or fresh dead (shells still have flesh attached to the valves, retain a luster to their nacre (pearly, innermost layer of the shell), and their periostracum (outermost layer of the shell) is not peeling, indicating relatively recent death (within months)) rabbitsfoot (Harris 2013, pers. comm.). Based on recent survey efforts, the rabbitsfoot population in the Ouachita River upstream of Lake Ouachita should be classified as marginal based on Butler's (2005) classification.

(4) We are not designating critical habitat for rabbitsfoot in the South Fork Spring River (Unit RF11), Fulton County, Arkansas, as originally proposed. Butler (2005, pp. 75–76) categorized the South Fork Spring River as a small population based on a 2002 collection of seven fresh dead specimens upstream of Arkansas Highway 289. Harris *et al.* (2007, p. 22) collected the only live rabbitsfoot from this same reach in 2006. The best available scientific information supports categorizing the South Fork Spring River rabbitsfoot population as marginal based on Butler's (2005) classification.

(5) We have modified or revised six critical habitat units for rabbitsfoot (originally proposed Units RF2, RF4b, RF5, RF9, RF10, and RF32) due to new biological information.

- Verdigris River (Unit RF2): We have revised the downstream extent of Unit RF2. A portion of the Verdigris River from near the Bird Creek confluence downstream to Interstate 44 has been altered by the upper extent of the McClellan-Kerr Arkansas River Navigation System and continues to be dredged. There are no rabbitsfoot records from this reach. Therefore, the Service has modified Unit RF2 in this final designation so that the downstream boundary is at Oklahoma Highway 266 northwest of Catoosa, Oklahoma. This change represents a net reduction of 7.6 rkm (4.7 rmi) from the originally proposed Unit RF2.

- Ouachita River (Unit RF4b): We have divided Unit RF4b into two units (Units RF4a and RF4b in this rule). Harris (1999, pp. 3–8 and 3–9) collected live rabbitsfoot at three sites located from near the confluence of Tenmile Creek downstream to the Caddo River confluence. However, the Ouachita River from Caddo River confluence downstream to the Little Missouri River

confluence has not been comprehensively surveyed for mussels. While the absence of rabbitsfoot from this reach is likely a result of no survey data and not actual absence, the best available scientific information supports designating critical habitat in two Ouachita River subunits due to the distance between the reaches known to be occupied. Therefore, the Service has created Unit RF4a to be from the Tenmile Creek confluence downstream to the Caddo River confluence (22.7 rkm (14.1 rmi)), and Unit RF4b to be from the Little Missouri River confluence downstream to U.S. Highway 79 near Camden, Arkansas (revised Unit RF4b; 43 rkm (26.7 rmi)). Together, the new Units RF4a and RF4b represent a net reduction of 92.2 rkm (57.3 rmi) from the originally proposed Unit RF4b.

- Saline River (Unit RF5): We have revised the upstream and downstream extent of Unit RF5. Collections by several surveyors since 2002 support the presence of a small population of rabbitsfoot in the Saline River from the Frazier Creek confluence near Mount Elba, Arkansas, to the Mill Creek confluence near Stillions, Arkansas (Service, unpublished data, 2013). One live specimen was collected in Grant County in 1993 (Illinois Natural History Survey Mollusk Collection 14549). One live specimen also was collected at U.S. Highway 167 in 2006 (AGFC Mussel Database 2014), but this record and the 1993 Grant County record are disjunct (approximately 48.3 rkm (30 rmi)) from the aforementioned reach downstream of Mount Elba. Historically, rabbitsfoot was reported from sites at Benton, Arkansas, and Jenkins Ferry State Park (University of Michigan Museum of Zoology 67254, 75750). Based on the best available scientific information, the Service has revised the upstream and downstream extent of Unit RF5 in this final designation due to the lack of live records downstream of the Mill Creek confluence near Stillions, Arkansas, and sporadic disjunct records upstream of the core population. This change represents a net reduction of 168.9 rkm (105.0 rmi) from the originally proposed Unit RF5.

- Black River (Unit RF9): We have revised the downstream boundary of Unit RF9. Rust (1993 *in* AGFC Mussel Database 2014) collected one live rabbitsfoot approximately 0.78 rkm (1.25 rmi) downstream of Powhatan, Arkansas. One live rabbitsfoot was collected near Powhatan in 1984 (AGFC Mussel Database 2014). There are no records from the Flat Creek confluence with the Black River downstream to the Strawberry River confluence with the Black River. Therefore, the Service has

modified Unit RF9 in this final designation so that the downstream boundary is at the Flat Creek confluence with the Black River downstream of Powhatan, Arkansas. This change represents a net reduction of 41.0 rkm (25.5 rmi) from the originally proposed Unit RF9.

- Spring River (Unit RF10): We have changed the upstream boundary of the originally proposed Unit RF10. Harris *et al.* (2007, pp. 14–16) collected three live rabbitsfoot in 2005 from a site approximately 1.55 rkm (2.5 rmi) upstream of Williford, Arkansas (or Arkansas Highway 58). They also reported numerous rabbitsfoot from muskrat middens in the reach from Williford to Ravenden Springs, Arkansas. One live specimen was collected in 1983, near the confluence of Ott Creek (AGFC Mussel Database 2014). The AGFC Mussel Database (2014) also contains a 1983 record from near the Pierce Creek confluence located upstream of Ott Creek near Hardy, Arkansas. The Spring River downstream of Hardy, Arkansas, supports a diverse and abundant mussel community as evidenced in our records. Thus, the best available scientific information supports the designation with a slight adjustment (net reduction) to the upstream extent of Unit RF10 downstream by approximately 11.3 rkm (7.0 rmi) to the Ott Creek confluence. Therefore, the Service has revised the upstream boundary of the originally proposed Unit RF10 in this final designation.

- Shenango River (Unit RF32): We have changed the upstream boundary of the originally proposed Unit RF32. Considering new information in Bursey (1987), the best available scientific information supports extending the extent of the originally proposed Unit RF32 (now Unit RF31 in this final designation) upstream 8.6 rkm (5.3 rmi).

The new unit descriptions are provided below in Final Critical Habitat Designation. Because of the removal of the originally proposed Unit RF11, originally numbered Units RF12 to RF32 have been renumbered Units RF11 to RF31. In addition, these revisions resulted in a net decrease of designated critical habitat for the Neosho mucket of approximately 3 rkm (2 rmi) and a net decrease of critical habitat for the rabbitsfoot of 349 rkm (217 rmi). The majority of the changes from the proposed rule are to units occurring in Arkansas, with a net reduction of approximately 350 rkm (218 rmi; a 27 percent decrease). There was only one increase in critical habitat length (originally proposed Unit RF32, now Unit RF31, in this final designation).

(6) The critical habitat in the originally proposed Unit RF19 (now Unit RF18 in this final designation) for rabbitsfoot in the Duck River overlaps with the oyster mussel (*Epioblasma capsaeformis*) critical habitat. In the Duck River, the oyster mussel has been renamed the Duck River dartersnapper (*Epioblasma ahlstedti*) and is separate and distinct from the oyster mussel. We agree that the oyster mussel and Duck River dartersnapper are distinct and separate species. However, the Service has not yet made a listing and critical habitat determination for the new entity, the Duck River dartersnapper. We incorporated language in this final rule to clarify the species distinction and name change, but at this time, the Duck River dartersnapper and oyster mussel are considered synonymous according to our regulations.

(7) In the proposed rule, we inadvertently left out the description of a physical or biological feature for both species that addresses habitats protected from disturbance or representative of the historical, geographic, and ecological distributions of the species. We have added the description into this final rule (see *Physical or Biological Features*, below).

(8) In the proposed rule, Primary Constituent Element 4 for both species stated that fish hosts for each mussel were “currently unknown” and provided a statement regarding natural fish assemblages “until appropriate host fish can be identified.” While we do not currently know all fish species that may act as hosts for one or both of the glochidia of these mussels, this final rule identifies those fish species we believe are or may be host species (see *Primary Constituent Elements for Neosho Mucket and Rabbitsfoot* in this rule and *General Biology* in the proposed rule (77 FR 63442)).

(9) In the proposed rule, we incorrectly labeled the Pond Creek National Wildlife Refuge (NWR) as Cossatot NWR. This has been corrected in this final rule.

(10) Several Counties were inadvertently left out of the Executive Summary of the proposed rule; we added them in this final designation.

(11) In the proposed rule, we incorrectly named Mammoth Cave National Park North Entrance Road as Maple Springs Ranger Station Road in the unit description for Unit RF21. The correct road name is used in this final rule.

#### Summary of the Species' Status

Please refer to the proposed listing and critical habitat rule (77 FR 63440; October 16, 2012) and final listing rule

(78 FR 57076, September 17, 2013) for the Neosho mucket and rabbitsfoot for a summary of species information. Additional information on the associated draft economic analysis and draft environmental assessment for the proposed rule was published in the **Federal Register** on May 9, 2013 (78 FR 27171).

For more information on relative abundance and trends of extant populations of Neosho mucket and rabbitsfoot by river basin please refer to the *Taxonomy, Life History, and Distribution* section of the proposed rule published in the **Federal Register** on October 16, 2012 (77 FR 63440).

#### Critical Habitat

##### Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features

(a) Essential to the conservation of the species, and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge,

wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but even in the event of a destruction or adverse modification finding, the obligation of the Federal action agency and the landowner is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat). In identifying those physical or biological features within an area, we focus on the principal biological or physical constituent elements (primary constituent elements such as roost sites, nesting grounds, seasonal wetlands, water quality, tide, soil type) that are essential to the conservation of the species. Primary constituent elements are those specific elements of the physical or biological features that provide for a species' life-history processes and are essential to the conservation of the species.

Under the second prong of the Act's definition of critical habitat, we can designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. For example, an area currently occupied by the species but that was not occupied at the time of listing may be essential for the conservation of the species and may be included in the critical habitat designation. We designate critical habitat in areas outside the geographical area occupied by a species only when a designation limited to its range would be inadequate

to ensure the conservation of the species.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific and commercial data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106-554; H.R. 5658)), and our associated Information Quality Guidelines provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information developed during the listing process for the species. Additional information sources may include the recovery plan for the species, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, biological assessments, other unpublished materials, or experts' opinions or personal knowledge.

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act, (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to insure their actions are not likely to jeopardize the continued existence of any endangered or threatened species, and (3) section 9 of the Act's prohibitions on taking any individual of the species, including taking caused by actions that affect habitat. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas

may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of this species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of these planning efforts calls for a different outcome.

#### *Physical or Biological Features*

In accordance with section 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied by the species at the time of listing to designate as critical habitat, we consider the physical or biological features essential to the conservation of the species and which may require special management considerations or protection. These include, but are not limited to:

- (1) Space for individual and population growth and for normal behavior;
- (2) Food, water, air, light, minerals, or other nutritional or physiological requirements;
- (3) Cover or shelter;
- (4) Sites for breeding, reproduction, or rearing (or development) of offspring; and
- (5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species.

We derive the specific physical or biological features essential to Neosho mucket and rabbitsfoot from studies of these species' habitat, ecology, and life history as described in the Critical Habitat section of the proposed rule to designate critical habitat published in the **Federal Register** on October 16, 2012 (77 FR 63440), and in the information presented below. Additional information can be found in the final listing rule published in the **Federal Register** on September 17, 2013 (78 FR 57076). We have determined that Neosho mucket and rabbitsfoot require the following physical or biological features:

#### *Space for Individual and Population Growth and for Normal Behavior*

The Neosho mucket is historically associated with the Illinois, Neosho, and Verdigris Rivers and their larger tributaries (Arkansas River basin). Generally, the Neosho mucket is found embedded in stable substrates associated with shallow riffles (areas

where shallow, generally less than 1 m (3.3 ft) in depth, turbulent water passes through and over stones or gravel of somewhat similar size) and runs (intermediate areas between pools and riffles with moderate current) with gravel and sand substrate and moderate to swift currents (Oesch 1984, p. 221; Harris 1998, p. 5; Obermeyer 2000, pp. 15–16). However, in Shoal Creek and the Illinois River, the Neosho mucket prefers near-shore areas or areas out of the main current (Harris 1998, p. 5). These habitats are formed and maintained by water quantity, channel slope, and normal sediment input to the system.

The rabbitsfoot is historically associated with small- to medium-sized streams and some larger rivers in the Lower Great Lakes and Lower Mississippi River sub-basins and Ohio, Cumberland, Tennessee, White, Arkansas, and Red River basins. The rabbitsfoot usually occurs in shallow areas along the bank and adjacent runs and riffles with gravel and sand substrates where the water velocity is reduced, but it also may occur in deep runs (Parmalee and Bogan 1998, pp. 211–212). Unlike the Neosho mucket (Barnhart 2003, p. 17), the rabbitsfoot seldom burrows in the substrate, but lies on its side (Watters 1988, p. 13; Fobian 2007, p. 24).

Neosho mucket and rabbitsfoot, similar to other mussels, are dependent on areas with flow refuges where shear stress (the stream's ability to entrain and transport bed material created by the flow acting on the bed material) is low and sediments remain stable during flood events (Layzer and Madison 1995, p. 341; Strayer 1999, pp. 468 and 472; Hastie *et al.* 2001, pp. 111–114). Flow refuges conceivably allow relatively immobile mussels such as the Neosho mucket and rabbitsfoot to remain in the same general location throughout their entire lives. These patches of stable habitat may be highly important for the rabbitsfoot since it typically does not burrow, making it more susceptible to displacement into unsuitable habitat. However, flow refuges are not created equally and there are likely other habitat variables that are important, but poorly understood (Roberts 2008, pers. comm.).

Natural river and creek channel stability are achieved by allowing the river or creek to develop a stable dimension, pattern, and profile, such that, over time, channel features are maintained and the river or creek system neither aggrades nor degrades. Channel instability occurs when the scouring (flushing) process leads to degradation or excessive sediment deposition results in aggradation. Stable

ivers and creeks consistently transport their sediment load, both in size and type, associated with local deposition and scour (Rosgen 1996, pp. 1–3).

Habitat conditions described above provide space, cover, shelter, and sites for breeding, reproduction, and growth of offspring for the Neosho mucket and rabbitsfoot. These habitats are formed and maintained by water quantity, channel features (dimension, pattern, and profile), and sediment input to the system through periodic flooding, which maintains connectivity and interaction with the flood plain, and are dynamic. Changes in one or more of these parameters can result in channel degradation or aggradation, with serious effects to mussels. Therefore, we identify adequate water quantity, stream channel stability, and floodplain connectivity to be physical or biological features for Neosho mucket and rabbitsfoot that are essential in accommodating feeding, breeding, growth, and other normal behaviors of these species and in promoting gene flow within each species' populations and movement of their fish hosts.

#### Food, Water, Air, Light, Minerals, or Other Nutritional or Physiological Requirements

The Neosho mucket and rabbitsfoot are riverine-adapted species that depend upon adequate water flow and are not found in ponds or lakes. Continuously flowing water is a habitat feature associated with all surviving populations of these species. Flowing water maintains the river and creek bottoms and flow refuge habitats in riffles and runs where these species are found, transports food items to the sedentary juvenile and adult life stages, removes wastes, and provides oxygen for respiration of the Neosho mucket and rabbitsfoot. A natural flow regime that includes periodic flooding and maintains connectivity and interaction with the floodplain is critical for the exchange of nutrients, movement of and spawning activities for potential fish hosts, and maintenance of flow refuges in riffle and run habitats.

Mussels, such as the Neosho mucket and rabbitsfoot, filter algae, detritus, microscopic animals, and bacteria from the water column (Fuller 1974, p. 221; Silverman *et al.* 1997, pp. 1862–1865; Nichols and Garling 2000, pp. 874–876; Strayer *et al.* 2004 pp. 430–431). Encysted (attached) glochidia are nourished by their fish hosts and feed for a period of one week to several months. Nutrient uptake by glochidia is not well understood, but probably occurs through the microvillae (fingerlike outward projections of a

cell's surface) of the mantle (the part of the outer layer of skin (epidermis) of a mollusk that secretes the shell) (Watters 2007, p. 55). For the first several months, juvenile mussels partially employ pedal (foot) feeding, extracting bacteria, algae, and detritus from the sediment, although they also may filter interstitial (pore) water (Yeager *et al.* 1994, pp. 217–221). However, their gills are rudimentary and generally incapable of filtering particles (Watters 2007, p. 56). Adult mussels also can obtain their food by deposit feeding, siphoning in food from the sediment and its interstitial (pore) water and pedal feeding directly from the sediment (Yeager *et al.* 1994, pp. 217–221; Vaughn and Hakenkamp 2001, pp. 1432–1438). Food availability and quality for the Neosho mucket and rabbitsfoot in their habitats are affected by habitat stability, floodplain connectivity, flow, and water and sediment quality.

The ranges of many water quality parameters that define suitable habitat conditions for the Neosho mucket and rabbitsfoot have not been investigated or are poorly understood. The pathways of exposure to a variety of environmental pollutants for all four mussel life stages (free and encysted glochidia, juveniles, and adults) and differences in exposure and sensitivity were previously discussed in the proposed rule (77 FR 63440, see Factor A). Environmental contamination is a causal (contributing) factor in the decline of mussel populations. We estimate most numeric standards for pollutants and water quality parameters (for example, dissolved oxygen, pH, heavy metals) adopted by States under the CWA represent levels essential to the conservation of these mussels. However, some regulatory mechanisms may not adequately protect mollusks in some reaches (77 FR 63440, see Factor D). Other factors that can potentially alter water quality are droughts and periods of low flow, nonpoint-source runoff from adjacent land surfaces (excessive amounts of sediments, nutrients, and pesticides), point-source discharges from municipal and industrial wastewater treatment facilities (excessive amounts of ammonia, chlorine, and metals), and random spills or unregulated discharge events. This could be particularly harmful during drought conditions when flows are depressed and pollutants are more concentrated.

As relatively sedentary animals, mussels must tolerate the full range of environmental stressors that occur within the streams where they persist. Both the amount (flow) and the physical

and chemical conditions (sediment and water quality) where these species currently exist vary widely according to season, precipitation events, and seasonal human activities within the various watersheds. Conditions across their historical ranges vary even more due to geology, geography, and differences in human population densities and land uses. In general, these species survive in areas where the severity, frequency, duration, and seasonality of water flow is adequate to maintain stable flow refuges in riffle and run habitats (sufficient flow to remove fine particles and sediments without causing degradation), and where sediment and water quality is adequate for year-round survival (moderate to high levels of dissolved oxygen; low to moderate exposure to environmental pollutants such as nutrients, dissolved metals, and pharmaceuticals; and relatively unpolluted water and sediments). Adequate water flow, water quality, and sediment quality (as defined above) is essential for normal behavior, growth, and viability during all life stages of the Neosho mucket and rabbitsfoot and their potential larva fish hosts. Therefore, based on the information above, we identify water flow, water quality, and sediment quality to be physical or biological features for both these species.

#### Sites for Breeding, Reproduction, or Rearing

Mussels require a fish host for transformation of larval mussels (glochidia) to juvenile mussels (Williams *et al.* 2008, p. 68); therefore, presence of the appropriate fish host(s) is essential to the conservation of the Neosho mucket and rabbitsfoot (77 FR 63440, see *Taxonomy, Life History, and Distribution*). Neosho mucket and rabbitsfoot juveniles require stable habitats with adequate water quantity and quality as previously described for growth and survival. Excessive sediments or dense growth of filamentous algae can expose juvenile mussels to entrainment or predation and be detrimental to the survival of juvenile mussels (Hartfield and Hartfield 1996, pp. 372–374). Geomorphic instability can result in the loss of interstitial habitats and juvenile mussels due to scouring or deposition (Hartfield 1993, pp. 372–373). Water quality, sediment quality, stable habitat, health of fish hosts, and diet (of all life stages) all influence survival of each life stage and subsequent reproduction and recruitment (Cope *et al.* 2008, p. 452).

Connections between the rivers and adjacent flood plains occur periodically during wet years and provide habitat for

spawning and foraging fish hosts that require flood plain habitats for successful reproduction and recruitment to adulthood. Barko *et al.* (2006, pp. 252–256) found that several fish host or potential host species benefited from exploiting the resources of flood plain habitats that were not typically available for use during normal hydrology years. Furthermore, Kwak (1988, pp. 243–247) and Slipke *et al.* (2005, p. 289) indicated that periodic inundation of floodplain habitats increased successful fish reproduction, which leads to increased availability of native host fishes for mussel reproduction. However, Rypel *et al.* (2009, p. 502) indicated that mussels tended to exhibit minimal growth during high flow years. Therefore, optimal flooding of these habitats would not be too frequent and should occur at similar frequencies to that of the natural hydrologic regime of the rivers and creeks inhabited by the Neosho mucket and rabbitsfoot. Based on the information above, we identify water quality, sediment quality, stable habitat, health of fish hosts, diet (of all life stages), and periodic flooding of floodplain habitat to be physical or biological features for these species.

#### Primary Constituent Elements for Neosho Mucket and Rabbitsfoot

Under the Act and its implementing regulations, we are required to identify the physical or biological features essential to the conservation of Neosho mucket and rabbitsfoot in areas occupied at the time of listing, focusing on the features' primary constituent elements. Primary constituent elements are those specific elements of the physical or biological features that provide for a species' life-history processes and are essential to the conservation of the species.

Based on the above needs and our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, we determine that the primary constituent elements specific to the Neosho mucket and rabbitsfoot are:

(1) Geomorphically stable river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) with habitats that support a diversity of freshwater mussel and native fish (such as stable riffles, sometimes with runs, and mid-channel island habitats that provide flow refuges consisting of gravel and sand substrates with low to moderate amounts of fine sediment and attached filamentous algae).

(2) A hydrologic flow regime (the severity, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found and to maintain connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the mussel's and fish host's habitat, food availability, spawning habitat for native fishes, and the ability for newly transformed juveniles to settle and become established in their habitats.

(3) Water and sediment quality (including, but not limited to, conductivity, hardness, turbidity, temperature, pH, ammonia, heavy metals, and chemical constituents) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.

(4) The occurrence of natural fish assemblages, reflected by fish species richness, relative abundance, and community composition, for each inhabited river or creek that will serve as an indication of appropriate presence and abundance of fish hosts necessary for recruitment of the Neosho mucket and rabbitsfoot. Suitable fish hosts for Neosho mucket glochidia include smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), and spotted bass (*Micropterus punctulatus*). Suitable fish host for rabbitsfoot may include, but are not limited to, blacktail shiner (*Cyprinella venusta*) from the Black and Little River and cardinal shiner (*Luxilus cardinalis*), red shiner (*C. lutrensis*), spotfin shiner (*C. spiloptera*), bluntface shiner (*C. camura*), rainbow darter (*Etheostoma caeruleum*), rosyface shiner (*Notropis rubellus*), striped shiner (*L. chrysocephalus*), and emerald shiner (*N. atherinoides*).

(5) Competitive or predaceous invasive (nonnative) species in quantities low enough to have minimal effect on survival of freshwater mussels.

#### Special Management Considerations or Protection

When designating critical habitat, we assess whether the specific areas within the geographic area occupied by the species at the time of listing contain features which are essential to the conservation of the species and which may require special management considerations or protection.

For Neosho mucket and rabbitsfoot, we have grouped the primary threats affecting their habitat, thus potentially the need to implement special management or protection, into nine categories.

(1) Impoundments (primary constituent elements 1–4). Dams eliminate and alter river flow within impounded areas, trap silt leading to increased sediment deposition, alter water quality, change hydrology and channel geomorphology, decrease habitat heterogeneity, affect normal flood patterns, and block upstream and downstream movement of mussels and fish (Layzer *et al.* 1993, pp. 68–69; Neves *et al.* 1997, pp. 63–64; Watters 2000, pp. 261–264). Within impounded waters, decline of mussels has been attributed to direct loss of supporting habitat, sedimentation, decreased dissolved oxygen, temperature levels, and alteration in resident fish populations (Neves *et al.* 1997, pp. 63–64; Pringle *et al.* 2000, pp. 810–815; Watters 2000, pp. 261–264). Downstream of dams, mussel declines are associated with changes and fluctuation in flow regime, channel scouring and bank erosion, reduced dissolved oxygen levels and water temperatures, and changes in resident fish assemblages (Williams *et al.* 1992, p. 7; Layzer *et al.* 1993, p. 69; Neves *et al.* 1997, pp. 63–64; Watters 2000, pp. 265–266; Pringle *et al.* 2000, pp. 810–815). Dams that are low to the water surface, or have water passing over them (small low head or mill dams) can have some of these same effects on mussels and their fish hosts, particularly reducing species richness and evenness and blocking fish host movements (Watters 2000, pp. 261–264; Dean *et al.* 2002, pp. 235–238). Examples of special management actions that would minimize or ameliorate these threats include: (a) Modified reservoir releases from dams to improve water quality and habitat conditions in many tailwaters, and (b) modified dam operations (for example, TVA's Tims Ford Dam on the Elk River, where water temperature is monitored and dam operation is adjusted to support endangered mussels downstream) and water quality and biological monitoring.

(2) Channelization (primary constituent elements 1–4). Dredging and channelization activities have profoundly altered riverine habitats nationwide. Hartfield (1993, pp. 131–139), Neves *et al.* (1997, pp. 71–72), and Watters (2000, pp. 268–269) reviewed the specific upstream and downstream effects of channelization on freshwater mussels. Channelization affects a stream physically (accelerates erosion, increases sediment bed load, reduces water depth, decreases habitat diversity, creates geomorphic (natural channel dimensions) instability, and eliminates riparian canopy) and biologically

(decreases fish and mussel diversity, changes species composition and abundance, decreases biomass, and reduces growth rates) (Hartfield 1993, pp. 131–139). Channel modification for navigation has been shown to increase flood heights (Belt 1975, p. 684), partly as a result of an increase in stream bed slope (Hubbard *et al.* 1993, p. 137). Flood events are exacerbated, conveying large quantities of sediment, potentially with adsorbed contaminants, into streams. Channel maintenance often results in increased turbidity and sedimentation that often smothers mussels (Stansbery 1970, p. 10). Examples of special management actions that would minimize or ameliorate these threats include: (a) Determining distribution and abundance of mussels, (b) developing dredging protocols and mussel identification booklets to help minimize effects (for example, ACOE–Memphis District in the White River avoids dredging known mussel beds), and (c) funding research on geomorphological requirements of mussels to better inform management decisions.

(3) Sedimentation (primary constituent elements 3–4). Excessive sediments are believed to negatively impact riverine mussel populations requiring clean, stable streams (Ellis 1936, pp. 39–40; Brim-Box and Mossa 1999, p. 99). Adverse effects resulting from sediments have been noted for many components of aquatic communities. Potential sediment sources within a watershed include virtually all activities that disturb the land surface. Most localities occupied by the Neosho mucket and rabbitsfoot, including viable populations, are currently being affected to varying degrees by sedimentation. Specific biological effects include reduced feeding and respiratory efficiency from clogged gills, disrupted metabolic processes, reduced growth rates, limited burrowing activity, physical smothering, and disrupted host fish attraction mechanisms (Ellis 1936, pp. 39–40; Marking and Bills 1979, p. 210; Vannote and Minshall 1982, pp. 4105–4106; Waters 1995, pp. 173–175; Hartfield and Hartfield 1996, p. 373). Examples of special management actions that would minimize or ameliorate these threats include: (a) Restoration and protection of riparian corridors, (b) implementation of best management practices to minimize erosion (such as State and industry practices for forestry activities), (c) stream bank restoration projects, and (d) private landowner programs to promote watershed and soil conservation.

(4) Chemical Contaminants (primary constituent elements 3–4). Chemical contaminants are ubiquitous in the environment and are considered a major contributor to the decline of mussel species (Richter *et al.* 1997, p. 1081; Strayer *et al.* 2004, p. 436; Wang *et al.* 2007, p. 2029; Cope *et al.* 2008, p. 451). Chemicals enter the environment through point- and nonpoint-source discharges including spills, industrial and municipal effluents, and residential and agricultural runoff. These sources contribute organic compounds, heavy metals, nutrients, pesticides, and a wide variety of newly emerging contaminants such as pharmaceuticals to the aquatic environment. As a result, water and sediment quality can be degraded to the extent that results in adverse effects to mussel populations. Examples of special management actions that would minimize or ameliorate these threats include: (a) Revising water quality standards (such as EPA's new ammonia aquatic life criteria), (b) implementing storm water best management practices, (c) promoting green areas along riparian corridors in rapidly developing urban areas (such as the Illinois River), (d) upgrading industrial and municipal treatment facilities to improve water quality in effluents, and (e) participating in private landowner programs to promote watershed conservation (such as USDA Farm Bill programs).

(5) Mining (primary constituent elements 1–4). Gravel, coal, and metal mining are activities negatively affecting water quality in Neosho mucket and rabbitsfoot habitat. Instream and alluvial gravel mining has been implicated in the destruction of mussel populations (Hartfield 1993, pp. 136–138; Brim-Box and Mossa 1999, pp. 103–104). Negative effects associated with gravel mining include stream channel modifications (altered habitat, disrupted flow patterns, sediment transport), water quality modifications (increased turbidity, reduced light penetration, increased temperature), macroinvertebrate population changes (elimination), and changes in fish populations, resulting from adverse effects to spawning and nursery habitat and food web disruptions (Kanehl and Lyons 1992, pp. 4–10). Coal mining activities, resulting in heavy metal-rich drainage, and associated sedimentation has adversely affected many drainages with rabbitsfoot populations (Ortmann 1909 *in* Butler 2005, p. 102; Gordon 1991, pp. 4 and 5; Layzer and Anderson 1992 *in* Butler 2005, p. 102). Numerous mussel toxicants, such as polycyclic aromatic hydrocarbons and heavy metals (copper, manganese, and zinc) from coal mining,

contaminate sediments when released into streams (Ahlstedt and Tuberville 1997, p. 75). Acid mine runoff may have local effects on mussel recruitment and may lead to mortality due to improper shell development or erosion (Huebner and Pynnonen 1990, pp. 2350–2353). Examples of special management actions that would minimize or ameliorate these threats include: (a) Remediating soils contaminated with heavy metals (such as Tri-State Mining Area's reclamation of contaminated areas to improve water quality), and (b) partnering with industry to identify mussel locations to avoid during instream and alluvial sand and gravel mining operations.

(6) Oil and Natural Gas Development (primary constituent elements 1–4). Exploration and extraction of these energy resources can result in increased siltation, a changed hydrograph (graph showing changes in the discharge of a river over a period of time), and altered water quantity and quality even at considerable distances from the mine or well field because effects are carried downstream from the original source. Examples of special management actions that would minimize or ameliorate these threats include: (a) Developing and implementing best management practices for oil and natural gas development activities (such as Fayetteville Shale located in the upper Little Red River watershed), (b) partnering with industry and nongovernmental organizations to restore mussel habitat (such as Southwestern Energy's ECH<sub>2</sub>O (Energy Conserving Water) and the Archey Fork Little Red River Restoration Project), (c) creating conservation memoranda of agreement with industry to conserve mussel habitat (such as Crestwood Midstream in the upper Little Red River watershed), and (d) developing ecologically sustainable flow requirements for mussels.

(7) Invasive, nonindigenous species (primary constituent element 5). Invasive, nonindigenous species, such as zebra mussel, black carp, and Asian clam, have potentially adversely affected populations of the Neosho mucket and rabbitsfoot and their fish hosts, and these effects are expected to persist into the future. Examples of special management actions that would minimize or ameliorate these threats include: (a) Implementation of nonregulatory conservation measures to control Asian carp and other invasive, nonindigenous species, and (b) continued State engagement in efforts to minimize effects of Asian carp (such as eradication) on native fish resources.

(8) Temperature (primary constituent elements 3–4). Natural temperature regimes can be altered by impoundments, tailwater releases from dams, industrial and municipal effluents, and changes in riparian habitat. Low temperatures can significantly delay or prevent metamorphosis in mussels (Watters and O'Dee 1999, pp. 454–455). Cold water effluent below dams may negatively impact populations; rabbitsfoot were less abundant and in poor condition below a cold water outflow on the Little River, compared to two other sites upstream (Galbraith and Vaughn 2011, p. 198). Low water temperatures caused by dam releases also may disrupt seasonal patterns in reproduction (Galbraith and Vaughn 2009, pp. 43–44).

High temperatures can reduce dissolved oxygen concentrations in the water, which slows growth, reduces glycogen stores, impairs respiration, and may inhibit reproduction (Fuller 1974, pp. 240–241). Water temperature increases have been documented to shorten the period of glochidial encystment, reduce righting speed (various reflexes that tend to bring the body into normal position in space and resist forces acting to displace it out of normal position), and slow burrowing and movement responses (Bartsch *et al.* 2000, p. 237; Watters *et al.* 2001, p. 546; Schwalb and Pusch 2007, pp. 264–265). Several studies have documented the influence of temperature on the timing aspects of mussel reproduction (van Snik *et al.* 2002, p. 156; Allen *et al.* 2007, p. 85; Steingraeber *et al.* 2007, pp. 303–309). Peak glochidial releases are associated with water temperature thresholds that can be thermal minimums or maximums, depending on the species (Watters and O'Dee 2000, p. 136). Examples of special management actions that would minimize or ameliorate these threats include: (a) Increase cold water temperature to optimal range for mussels by modification to tailwater releases, (b) improve industrial and municipal water treatment, and (c) protect and restore riparian habitat.

(9) Climate change (primary constituent elements 2–4). As temperature increases due to climate change throughout the range of Neosho mucket and rabbitsfoot, both species may experience population declines as warmer rivers become more suitable for thermally tolerant species. Overall, the distribution of fish species is expected to change, including range shifts and local extirpations (Ficke *et al.* 2005, pp. 67–69; 2007, pp. 603–605). Because freshwater mussels are entirely dependent upon a fish host for

successful reproduction and dispersal, any changes in local fish populations would also affect freshwater mussel populations. Examples of special management actions that would minimize or ameliorate these threats include: (a) Reduce habitat fragmentation; (b) maintain ecosystem function and resiliency; (c) develop and implement strategies to help our native fish, wildlife, and habitats adapt to a changing climate; and (d) reduce non-climate stressors.

The reduction of these threats will require the implementation of special management considerations or protections within each of the critical habitat areas identified in this rule. All critical habitat requires active management to address some or all of the ongoing threats listed. Some of these activities include, but are not limited to, those previously discussed in the Summary of Factors Affecting the Species section in the final listing rule (78 FR 57076, September 17, 2013).

In summary, we find the areas we are designating as critical habitat were occupied at the time of listing and contain the features essential to the conservation of the Neosho mucket and rabbitsfoot, and these features may require special management considerations or protection. Special management considerations or protection may be required to eliminate, or to reduce to negligible levels, the threats affecting each unit and to preserve and maintain the essential physical or biological features the critical habitat units provide to the Neosho mucket and rabbitsfoot. A more detailed discussion of these threats is presented in the final listing rule under Summary of Factors Affecting the Species (78 FR 57076, September 17, 2013). Additional discussions of threats facing individual sites are provided in the individual unit descriptions.

#### *Criteria Used To Identify Critical Habitat*

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. In accordance with the Act and our implementing regulations at 50 CFR 424.12(b), we review available information pertaining to the habitat requirements of the species and identify occupied areas at the time of listing that contain the features essential to the conservation of the species. As discussed above, we are designating critical habitat areas that we have determined to be occupied at the time of listing in 2013 and that contain sufficient elements of physical or biological features to support life-



history processes essential to the conservation of the Neosho mucket and the rabbitsfoot. If after identifying areas occupied by the species at the time of listing, we determine that those areas are inadequate to ensure conservation of the species, in accordance with the Act and our implementing regulations at 50 CFR 424.12(e), we then consider whether designating additional areas—outside those occupied at the time of listing—are essential for the conservation of the species. In this rule, we are not designating any areas outside the geographic area occupied by the species at the time of listing because occupied areas are sufficient for the conservation of the species.

In this rule, we have defined occupied habitat for the Neosho mucket as those stream reaches known to be currently extant. Extant Neosho mucket populations are naturally occurring populations represented by live or fresh dead specimens collected since 1985. For the rabbitsfoot, we have defined occupied habitat as those stream reaches that are sizeable and small populations as defined by Butler (2005, pp. 88–89), and the marginal populations of Fish Creek and Red River that are the last extant populations in their respective basins (Great Lakes and Cumberland) and Allegheny River, a metapopulation (interconnected populations where there is gene flow). All other populations classified as marginal are not considered as occupied habitat.

No unoccupied stream, as defined in the proposed critical habitat rule (77 FR 63440, October 16, 2012), is being designated as critical habitat for Neosho mucket or rabbitsfoot. We find that unoccupied stream reaches are not essential for the conservation of either species for one or more of the following reasons:

(1) Unoccupied habitats are isolated from occupied habitats due to reservoir construction and dam operations (dam water releases have altered natural stream hydrology, geomorphology, water temperature, and native mollusk and fish communities);

(2) Unoccupied areas exhibit limited habitat availability, degraded habitat, or low potential value for management (Muskingum, Elk, Scioto, Little Miami, Licking, East Fork White, Cumberland, Holston, Clinch, Sequatchie, and Buffalo (Duck River system) Rivers);

(3) Collection records for both species indicate that these species have been extirpated from unoccupied areas for several decades or more and, in some cases (such as Cottonwood River), reintroduction efforts have not been successful at re-establishing populations; or

(4) There are no historical records of occurrence within the stream reach for Neosho mucket, rabbitsfoot, or both.

(5) While we recognize the importance of unoccupied habitat to recovery of listed species, in this case, unoccupied habitat does not provide habitat for reintroduction at this time and does not reduce the level of stochastic and human-induced threats for the following reasons:

(a) Unoccupied habitat does not currently contain sufficient physical or biological features or have the ability to be restored to support life-history functions of the Neosho mucket and rabbitsfoot (such characteristics as geomorphically stable channels, perennial water flows, adequate water quality, and appropriate benthic substrates);

(b) Unoccupied habitat does not support the once diverse mollusk communities, including the presence of closely related species requiring physical or biological features similar to the Neosho mucket and rabbitsfoot; or

(c) Unoccupied habitat is not adjacent to currently occupied areas where there is potential for natural dispersal and reoccupation by the Neosho mucket and rabbitsfoot.

Based on the above analysis, a total of 38 units, all of which were occupied at the time of listing, are being designated based on sufficient elements of physical or biological features being present to support Neosho mucket (7 units) and rabbitsfoot (31 units) life-history processes. Some units contain all of the identified elements of physical or biological features and support multiple life-history processes. Some units contain only some elements of the physical or biological features necessary to support the Neosho mucket's or rabbitsfoot's particular use of that habitat.

When determining critical habitat boundaries within this final rule, we made every effort to avoid including developed areas such as dams, piers, and bridges, and other structures because such areas usually lack physical or biological features for the species. Areas designated as critical habitat for the Neosho mucket and rabbitsfoot include only stream channels within the ordinary high-water line and do not contain manmade structures (such as dams, piers and docks, bridges, or other similar structures), or areas inundated by lakes and reservoirs. The ordinary high-water line defines the stream channel and is the point on the stream bank where water is continuous and leaves some evidence, such as erosion or aquatic vegetation. The scale of the maps we prepared under the parameters for publication within the Code of

Federal Regulations may not reflect the exclusion of structures or other developed areas. Any such areas inadvertently left inside critical habitat boundaries shown on the maps of this final rule have been excluded by text in the final rule and are not designated as critical habitat. Therefore, a Federal action involving these areas would not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat.

The critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document in the rule portion. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. We will make the coordinates, plot points, or both on which each map is based available to the public on <http://www.regulations.gov> at Docket No. FWS–R4–ES–2013–0007 on our Internet site <http://www.fws.gov/arkansas-es/>, and at the field office responsible for the designation (see **FOR FURTHER INFORMATION CONTACT**, above).

Three critical habitat units for the Neosho mucket and rabbitsfoot are currently designated as critical habitat for the oyster mussel (*Epioblasma capsaeformis*; now recognized by the scientific community as the Duck River dartersnapper (*Epioblasma ahlstedti*) in the Duck River) and Cumberlandian combshell (*Epioblasma brevidens*) encompassing the Duck River, Tennessee (74 rkm (46 rmi)) and Bear Creek, Alabama and Mississippi (40 rkm (25 rmi)) (50 CFR 17.95(f)), and for the yellowcheek darter (*Etheostoma moorei*) in the Middle Fork Little Red River, Arkansas (23.2 rkm (14.5 rmi)) (50 CFR 17.95(e)). The existing critical habitat for the oyster mussel and Cumberlandian combshell completely overlaps the originally proposed Unit RF16 (Bear Creek, now Unit RF15), but the exact unit descriptions (length) differ due to mapping refinement since the earlier designation. In addition, five critical habitat units being designated for the Neosho mucket and rabbitsfoot are currently designated by the State of Kansas as critical habitat for both species in the Fall, Spring, Neosho, and Verdigris Rivers and for Neosho mucket in Shoal Creek (K.S.A. 32–959; Table 1) and are afforded similar State-level protections as those provided under the Act.

#### Final Critical Habitat Designation

TABLE 1—CRITICAL HABITAT AREAS FOR THE NEOSHO MUCKET AND RABBITSFOOT THAT ARE CURRENTLY DESIGNATED AS CRITICAL HABITAT FOR OTHER FEDERALLY AND STATE LISTED SPECIES

Unit (unit #)	Species present in unit	Federal reference	State reference	Length of overlap in rkm (rmi)
Shoal Creek (NM3)	Neosho mucket, fluted shell, Ouachita kidneyshell, Western fanshell, redspot chub.		K.S.A. 32–959	9.7 (6.0)
Spring River (NM4 and RF1)	Neosho mucket, rabbitsfoot, elktoe, ellipse shell, Neosho madtom, fluted shell, Ouachita kidneyshell, Western fanshell, redspot chub.		K.S.A. 32–959	11.6 (7.2)
Fall River (NM6)	Neosho mucket, Western fanshell		K.S.A. 32–959	90.4 (56.2)
Verdigris River (NM6 and RF2)	Neosho mucket, rabbitsfoot, Ouachita kidneyshell, western fanshell, butterfly.		K.S.A. 32–959	80.6 (50.1)
Neosho River (NM7 and RF3)	Neosho mucket, rabbitsfoot, butterfly, Neosho madtom, Ouachita kidneyshell, western fanshell.		K.S.A. 32–959	245.9 (152.8)
Middle Fork Little Red River (RF7)	Yellowcheek darter	50 CFR 17.95(e)		23.3 (14.5)
Bear Creek (RF15)	Oyster mussel (Duck River dartersnapper), Cumberlandian combshell.	50 CFR 17.95(f)		49.7 (30.9)
Duck River (RF18)	Oyster mussel (Duck River dartersnapper), Cumberlandian combshell.	50 CFR 17.95(f)		74.0 (46.0)
Total				585.2 (363.7)

We are designating seven units, totaling approximately 777 rkm (483 rmi), in four States (Arkansas, Kansas, Missouri, and Oklahoma) as critical habitat for the Neosho mucket (Table 2). We are designating 31 units (3 with subunits), totaling approximately 2,312 rkm (1,437 rmi), in 12 States (Alabama, Arkansas, Illinois, Indiana, Kansas, Kentucky, Mississippi, Missouri, Ohio, Oklahoma, Pennsylvania, and Tennessee) as critical habitat for the rabbitsfoot (Table 2). Four of the 31 units (Units NM4, NM7, RF1, and RF3) are occupied by both Neosho mucket and rabbitsfoot.

Public lands adjacent to Neosho mucket and rabbitsfoot critical habitat units consist of approximately 469 rkm (291 rmi) of riparian lands in the following units:

- Unit NM1: Ozark National Forest, 20.4 rkm (12.7 rmi); ACOE’s Lake Tenkiller Project, 9.0 rkm (5.6 rmi); and Sparrowhawk Wildlife Management Area (WMA), 2.2 rkm (1.4 rmi);
- Units NM4 and RF1: Spring River Wildlife Area, 1.4 rkm (0.9 rmi);
- Unit RF2: ACOE’s Oologah Lake Project, 0.6 rkm (0.4 rmi);

- Unit NM7: Neosho Wildlife Area, 6.1 rkm (3.8 rmi);
- Unit RF6: Little River NWR, 37.6 rkm (23.5 rmi); Ouachita National Forest, 16.1 rkm (10.0 rmi); and Pond Creek NWR, 11.4 rkm (7.2 rmi);
- Unit RF8a: Jacksonport State Park, 2.9 rkm (1.8 rmi) and Henry Gray–Hurricane Lake WMA, 7.9 rkm (4.9 rmi);
- Unit RF8b: White River NWR, 57.9 rkm (36.0 rmi);
- Unit RF10: Harold Alexander WMA, 1.1 rkm (0.7 rmi);
- Unit RF12: Buffalo National River, 113.6 rkm (70.6 rmi);
- Unit RF13: Sam A. Baker State Park, 1.0 rkm (0.6 rmi) and ACOE’s Wappapello Lake Project, 25.3 rkm (15.7 rmi);
- Unit RF15: Tishomingo State Park, 6.1 rkm (3.8 rmi); NPS Natchez Trace Parkway, 4.5 rkm (2.8 rmi); and TVA Pickwick Lake Project, 7.4 rkm (4.6 rmi);
- Unit RF17: Fern Cave NWR, 0.5 rkm (0.3 rmi);
- Unit RF18: Yanahli WMA, 38.9 rkm (24.3 rmi) and Santa Fe County Park, 1.4 rkm (0.9 rmi);
- Unit RF19a: Shiloh National Military Park, 2.6 rkm (1.6 rmi);
- Unit RF19b: Kentucky Dam Village State Resort Park, 0.6 rkm (0.4 rmi) and

unnamed TVA land downstream of Kentucky Lake Dam, 2.4 rkm (1.5 rmi);

- Unit RF20: Massac Forest Nature Preserve, 2.2 rkm (1.4 rmi); West Kentucky WMA, 5.6 rkm (3.5 rmi); Ballard WMA, 2.6 rkm (1.6 rmi); and Chestnut Hills Nature Preserve, 2.4 rkm (1.5 rmi);
- Unit RF21: Mammoth Cave National Park, 17.0 rkm (10.6 rmi);
- Unit RF22: Pennsylvania State Game Land, 277, 2.9 rkm (1.8 rmi) and Pennsylvania State Game Land 85, 0.6 rkm (0.4 rmi);
- Unit RF23: Clear Creek State Forest, 9.9 rkm (6.2 rmi);
- Unit RF24: Erie NWR, 16.2 rkm (10.1 rmi);
- Unit RF25: Prophetstown State Park, 2.1 rkm (1.3 rmi);
- Unit RF26: Muskingum Watershed Conservancy Land, 5.0 rkm (3.1 rmi);
- Unit RF27: Little Darby State Scenic Waterway–River Lands, 8.7 rkm (5.4 rmi);
- Unit RF29: Fish Creek Wildlife Area, 1.6 rkm (1.0 rmi); and
- Unit RF31: ACOE’s Shenango River Lake Project, 8.8 rkm (5.5 rmi).

TABLE 2—APPROXIMATE RIVER DISTANCES CURRENTLY OCCUPIED BY NEOSHO MUCKET AND RABBITSFOOT

Species	Approximate river distances currently occupied by the species	
	River km	River miles
Neosho mucket .....	776.5	482.5
Rabbitsfoot .....	2,312.1	1,436.7
Total .....	3,088.6	1,919.2
Species, Stream (Unit), and State	Currently occupied	
Neosho mucket:		
Unit NM1, Illinois River AR, OK .....	146.1	90.8
Unit NM2, Elk River, MO, OK .....	20.3	12.6
Unit NM3, Shoal Creek, KS, MO .....	75.8	47.1
Unit NM4, Spring River, KS, MO .....	102.3	63.6
Unit NM5, North Fork Spring River, MO .....	16.4	10.2
Unit NM6, Fall and Verdigris Rivers, KS .....	171.1	106.3
Unit NM7, Neosho River, KS .....	244.5	151.9
Total .....	776.5	482.5
Rabbitsfoot:		
Unit RF1, Spring River, MO, KS .....	56.5	35.1
Unit RF2, Verdigris River, OK .....	38.0	23.6
Unit RF3, Neosho River, KS .....	26.6	16.5
Unit RF4a, Ouachita River, AR .....	22.7	14.1
Unit RF4b, Ouachita River, AR .....	43.0	26.7
Unit RF5, Saline River, AR .....	119.4	74.2
Unit RF6, Little River, OK, AR .....	139.7	86.8
Unit RF7, Middle Fork Little Red River, AR .....	24.8	15.4
Unit RF8a, White River, AR .....	188.3	117.0
Unit RF8b, White River, AR .....	68.9	42.8
Unit RF9, Black River, AR .....	51.2	31.8
Unit RF10, Spring River, AR .....	51.5	32.0
Unit RF11, Strawberry River, AR .....	123.8	76.9
Unit RF12, Buffalo River, AR .....	113.6	70.6
Unit RF13, St. Francis River, MO .....	64.3	40.0
Unit RF14, Big Sunflower River, MS .....	51.5	32.0
Unit RF15, Bear Creek, AL, MS .....	49.7	30.9
Unit RF16, Big Black River, MS .....	43.3	26.9
Unit RF17, Paint Rock River, AL .....	81.0	50.3
Unit RF18, Duck River, TN .....	235.3	146.2
Unit RF19a, Tennessee River, TN .....	26.7	16.6
Unit RF19b, Tennessee River, KY .....	35.6	22.1
Unit RF20, Ohio River, KY, IL .....	45.9	28.5
Unit RF21, Green River, KY .....	175.6	109.1
Unit RF22, French Creek, PA .....	120.4	74.8
Unit RF23, Allegheny River, PA .....	57.3	35.6
Unit RF24, Muddy Creek, PA .....	20.1	12.5
Unit RF25, Tippecanoe River, IN .....	75.6	47.0
Unit RF26, Walhonding River, OH .....	17.5	10.9
Unit RF27, Little Darby Creek, OH .....	33.3	20.7
Unit RF28, North Fork Vermilion River and Middle Branch North Fork Vermilion River, IL .....	28.5	17.7
Unit RF29, Fish Creek, OH .....	7.7	4.8
Unit RF30, Red River, KY, TN .....	50.2	31.2
Unit RF31, Shenango River, PA .....	24.8	15.4
Total .....	2,312.1	1,436.7

These critical habitat units include the river channels within the ordinary high-water line. As defined at 33 CFR 329.11, the ordinary high-water mark on nontidal rivers is the line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank; shelving; changes in the character of soil;

destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas. States were granted ownership of lands beneath navigable waters up to the ordinary high-water line upon achieving Statehood (*Pollard v. Hagan*, 44 U.S. (3 How.) 212 (1845)). Prior to Statehood, the American colonies may have made

grants to private parties that included lands below the ordinary high-water mark of some navigable waters that are included in this final rule. However, most, if not all, lands beneath the navigable waters included in this final rule are owned by the States. Although areas designated as critical habitat for the Neosho mucket and rabbitsfoot include only stream channels within the

ordinary high-water line, riparian lands along the waters adjacent to, but not included in, the critical habitat units are either in private ownership, or owned by municipalities, States, or Federal entities. Table 3 summarizes primary adjacent riparian landowners in each of

the Neosho mucket and rabbitsfoot critical habitat units by private, State, Tribal (jurisdictional, not ownership), or Federal ownership. One Neosho mucket and two rabbitsfoot critical habitat units, respectively, are located within Tribal jurisdictional areas: Unit NM1

(Illinois River, Oklahoma; 103.0 rkm (64.0 rmi)), Unit RF2 (Verdigris River, Oklahoma; 38.0 rkm (23.6 rmi)), and Unit RF6 (Little River, Oklahoma; 41.4 rkm (25.7 rmi)).

TABLE 3—OWNERSHIP OF RIPARIAN LANDS ADJACENT TO—BUT NOT INCLUDED IN—THE CRITICAL HABITAT UNITS FOR NEOSHO MUCKET AND RABBITSFOOT

Critical habitat units	Adjacent federal rkm (rmi)	Adjacent state & local government rkm (rmi)	Adjacent private rkm (rmi)	Adjacent tribal* (subset of Private) rkm (rmi)
<b>Neosho Mucket</b>				
Unit NM1: Illinois River .....	29.4 (18.3)	2.3 (1.4)	114.4 (71.1)	103.0 (64.0)
Unit NM2: Elk River .....	0	0	20.3 (12.6)	0
Unit NM3: Shoal Creek .....	0	0	75.8 (47.1)	0
Unit NM4: Spring River .....	0	1.4 (0.9)	100.9 (62.7)	0
Unit NM5: North Fork Spring River .....	0	0	16.4 (10.2)	0
Unit NM6: Fall and Verdigris Rivers .....	0	0	171.1 (106.3)	0
Unit NM7: Neosho River .....	0	6.1 (3.8)	238.3 (148.1)	0
Total .....	29.4 (18.3)	9.8 (6.1)	737.3 (458.1)	103.0 (64.0)
<b>Rabbitsfoot</b>				
Unit RF1: Spring River .....	0	1.4 (0.9)	55.0 (34.2)	0
Unit RF2: Verdigris River .....	0.6 (0.4)	0	37.3 (23.2)	37.3 (23.2)
Unit RF3: Neosho River .....	0	0	26.6 (16.5)	0
Unit RF4a: Ouachita River .....	0	0	22.7 (14.1)	0
Unit RF4b: Ouachita River .....	0	0	43.0 (26.7)	0
Unit RF5: Saline River .....	0	0	119.4 (74.2)	0
Unit RF6: Little River .....	63.9 (39.7)	0	75.8 (47.1)	41.4 (25.7)
Unit RF7: Middle Fork Little Red River .....	0	0	24.8 (15.4)	0
Unit RF8a: White River .....	0	10.8 (6.7)	177.5 (110.3)	0
Unit RF8b: White River .....	57.9 (36.0)	0	10.9 (6.8)	0
Unit RF9: Black River .....	0	0	51.2 (31.8)	0
Unit RF10: Spring River .....	0	1.1 (0.7)	50.4 (31.3)	0
Unit RF11: Strawberry River .....	0	0	123.8 (76.9)	0
Unit RF12: Buffalo River .....	113.6 (70.6)	0	0	0
Unit RF13: St. Francis River .....	25.2 (15.7)	1.0 (0.6)	38.1 (23.7)	0
Unit RF14: Big Sunflower River .....	0	0	51.5 (32.0)	0
Unit RF15: Bear Creek .....	11.9 (7.4)	6.1 (3.8)	31.7 (19.7)	0
Unit RF16: Big Black River .....	0	0	43.3 (26.9)	0
Unit RF17: Paint Rock River .....	0.5 (0.3)	0	80.5 (50.0)	0
Unit RF18: Duck River .....	0	40.5 (25.2)	194.7 (121.0)	0
Unit RF19a: Tennessee River .....	2.6 (1.6)	0	24.1 (15.0)	0
Unit RF19b: Tennessee River .....	2.4 (1.5)	0.6 (0.4)	32.5 (20.2)	0
Unit RF20: Ohio River .....	0	12.9 (8.0)	33.0 (20.5)	0
Unit RF21: Green River .....	17.0 (10.6)	0	158.5 (98.5)	0
Unit RF22: French Creek .....	0	3.5 (2.2)	116.8 (72.6)	0
Unit RF23: Allegheny River .....	0	10.0 (6.2)	47.3 (29.4)	0
Unit RF24: Muddy Creek .....	16.3 (10.1)	0	3.9 (2.4)	0
Unit RF25: Tippecanoe River .....	0	2.1 (1.3)	73.5 (45.7)	0
Unit RF26: Walhonding River .....	0	5.0 (3.1)	12.6 (7.8)	0
Unit RF27: Little Darby Creek .....	0	8.7 (5.4)	24.6 (15.3)	0
Unit RF28: North Fork Vermilion River and Middle Branch North Fork Vermilion River .....	0	0	28.5 (17.7)	0
Unit RF29: Fish Creek .....	0	1.6 (1.0)	6.1 (3.8)	0
Unit RF30: Red River .....	0	0	50.2 (31.2)	0
Unit RF31: Shenango River .....	8.8 (5.5)	0	15.9 (9.9)	0
Total .....	320.7 (199.4)	105.3 (65.5)	1,885.8	82.7 (48.9)
Total for both species .....	350.1 (217.7)	115.1 (71.6)	(1,171.8) 2,623.1 (1,629.9)	185.7 (112.9)

Note: Distances may not sum due to rounding.

\* Tribal Jurisdictional Area only, does not represent riparian land ownership by any tribe and is a subset of the private lands category.

We present brief descriptions of all units, including the upstream and downstream boundaries of each stream reach, and reasons why they meet the definition of critical habitat for the Neosho mucket and rabbitsfoot.

#### Neosho Mucket

Unit NM1: Illinois River—Benton and Washington Counties, Arkansas; and Adair, Cherokee, and Delaware Counties, Oklahoma

Unit NM1 includes 146.1 rkm (90.8 rmi) of the Illinois River from the Muddy Fork Illinois River confluence with the Illinois River south of Savoy, Washington County, Arkansas, downstream to the Baron Creek confluence southeast of Tahlequah, Cherokee County, Oklahoma. This unit contains all or some components of all four physical or biological features and contains primary constituent elements 2, 3, 4, and 5. The physical or biological features in this unit may require special management considerations or protection to address changes in stream channel stability associated with urban development and clearing of riparian areas due to land use conversion in the watershed; alteration of water chemistry or water and sediment quality; and changes in stream bed material composition and quality from activities that would release sediments or nutrients into the water, such as urban development and associated construction projects, livestock grazing, confined animal operations, and timber harvesting. The majority of the riparian lands adjacent to, but not included in, this unit are in private ownership or private lands under tribal jurisdiction (Table 3).

Unit NM2: Elk River—McDonald County, Missouri; and Delaware County, Oklahoma

Unit NM2 includes a total of 20.3 rkm (12.6 rmi) of the Elk River from Missouri Highway 59 at Noel, McDonald County, Missouri, to the confluence of Buffalo Creek immediately downstream of the Oklahoma and Missouri State line, Delaware County, Oklahoma. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The primary biological or physical features in this unit may require special management considerations or protection to address changes in the existing flow regime due to such activities as impoundment, water diversion, or water withdrawal; alteration of water chemistry or water quality; and changes in stream bed material composition and sediment

quality from activities that would release sediments or nutrients into the water, such as urban development and associated construction projects, livestock grazing, confined animal operations (turkey and chicken), timber harvesting, and mining. All the riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit NM3: Shoal Creek—Cherokee County, Kansas; and Newton County, Missouri

Unit NM3 includes approximately 75.8 rkm (47.1 rmi) of Shoal Creek from Missouri Highway W near Ritchey, Newton County, Missouri, to Empire Lake where inundation begins in Cherokee County, Kansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes to the same activities as discussed in Unit NM2, above, and releases of chemical contaminants from industrial and municipal effluents (77 FR 63440, see Factor A). All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit NM4: Spring River—Jasper and Lawrence Counties, Missouri; and Cherokee County, Kansas

Unit NM4 includes 102.3 rkm (63.6 rmi) of the Spring River from Missouri Highway 97 north of Stotts City, Lawrence County, Missouri, downstream to the confluence of Turkey Creek north of Empire, Cherokee County, Kansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes to the same activities as discussed in Unit NM2, above, and releases of chemical contaminants from industrial and municipal effluents. Almost all (99 percent) of the riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit NM5: North Fork Spring River—Jasper County, Missouri

Unit NM5 includes 16.4 rkm (10.2 rmi) of the North Fork Spring River from the confluence of Buck Branch southwest of Jasper, Missouri, downstream to its confluence with the Spring River near Purcell, Jasper County, Missouri. This unit contains all

or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes to the same activities as discussed in Unit NM2, above. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit NM6: Fall River—Elk, Greenwood, and Wilson Counties, Kansas; Verdigris River—Montgomery and Wilson Counties, Kansas

Unit NM6 includes a total of 171.1 rkm (106.3 rmi), including 90.4 rkm (56.2 rmi) of the Fall River from Fall River Lake dam northwest of Fall River, Greenwood County, Kansas, downstream to its confluence with the Verdigris River near Neodesha, Wilson County, Kansas. Unit NM6 also includes 80.6 rkm (50.1 rmi) of the Verdigris River from Kansas Highway 39 near Benedict, Wilson County, Kansas downstream to the Elk River confluence near Independence, Montgomery County, Kansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes to the same activities as discussed in Unit NM2, above. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit NM7: Neosho River—Allen, Cherokee, Coffey, Labette, Neosho, and Woodson Counties, Kansas

Unit NM7 includes 244.5 rkm (151.9 rmi) of the Neosho River from Kansas Highway 58 west of LeRoy, Coffey County, Kansas, downstream to the Kansas and Oklahoma State line, Cherokee County, Kansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes to the same activities as discussed in Unit NM2, above, and releases of chemical contaminants from industrial and municipal effluents and tail water releases downstream of John Redmond Reservoir. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

### Rabbitsfoot

The physical or biological features in units RF1 through RF31 may require special management considerations to address changes in the existing flow regime due to such activities as impoundment, water diversion, or water withdrawal; alteration of water chemistry or water quality; and changes in stream bed material composition and sediment quality from activities that would release sediments or nutrients into the water, such as urban development and associated construction projects, livestock grazing, confined animal operations (turkey and chicken), timber harvesting, and mining, and releases of chemical contaminants from industrial and municipal effluents. Where there are other activities in individual units requiring special management considerations, they are set forth in the individual unit descriptions.

**Unit RF1:** Spring River—Jasper County, Missouri; and Cherokee County, Kansas

Unit RF1 includes 56.5 rkm (35.1 rmi) of the Spring River from Missouri Highway 96 at Carthage, Jasper County, Missouri, downstream to the confluence of Turkey Creek north of Empire, Cherokee County, Kansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection described above. The majority of the riparian lands adjacent to, but not included in, this unit are in private ownership or private lands under tribal jurisdiction (Table 3).

**Unit RF2:** Verdigris River—Rogers County, Oklahoma

Unit RF2 includes 38.0 rkm (23.6 rmi) of the Verdigris River from Oologah Lake dam north of Claremore, Oklahoma, downstream to Oklahoma Highway 266 northwest of Catoosa, Rogers County, Oklahoma. This unit contains all or some components of all four physical or biological features and in part, contains primary constituent elements 3, 4, and 5. It is possible that primary constituent elements 1 and 2 are limiting factors for rabbitsfoot distribution and abundance from Oologah Lake dam downstream to the confluence of the Caney River; thus we are unable to determine at this time whether this reach contains primary constituent elements 1 and 2. The physical or biological features in this unit may require special management considerations or protection as described above and changes in the

existing flow regime due to such activities as impoundment, tail water releases from Oologah Lake dam, and channelization associated with the McClellan-Kerr Arkansas River Navigation System. The majority of the riparian lands adjacent to, but not included in, this unit are in private ownership or private lands under tribal jurisdiction (Table 3).

**Unit RF3:** Neosho River—Allen County, Kansas

Unit RF3 includes 26.6 rkm (16.5 rmi) of the Neosho River from the Deer Creek confluence northwest of Iola, Kansas, downstream to the confluence of Owl Creek southwest of Humboldt, Allen County, Kansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above except for releases of chemical contaminants from industrial and municipal effluents. Approximately 97 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and the remaining lands in State or local ownership (Table 3).

**Unit RF4a:** Ouachita River—Clark and Hot Spring Counties, Arkansas

Unit RF4a includes 22.7 rkm (14.1 rmi) of the Ouachita River from the Tenmile Creek confluence north of Donaldson downstream to the Caddo River confluence near Caddo Valley, Hot Spring and Clark Counties, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. Approximately 82 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and the remaining 18 percent are in Federal ownership (Table 3).

**Unit RF4b:** Ouachita River—Ouachita County, Arkansas

Unit RF4b includes 43.0 rkm (26.7 rmi) of the Ouachita River from the Little Missouri River confluence downstream to U.S. Highway 79 at Camden, Ouachita County, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management

considerations or protection to address changes described above. All the riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

**Unit RF5:** Saline River—Ashley, Bradley, Cleveland, and Drew Counties, Arkansas

Unit RF5 includes 119.4 rkm (74.2 rmi) of the Saline River from Frazier Creek confluence near Mount Elba, Cleveland County, Arkansas, to the Mill Creek confluence near Stillions, Ashley and Bradley Counties, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. All the riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

**Unit RF6:** Little River—McCurtain County, Oklahoma; and Little River and Sevier Counties, Arkansas

Unit RF6 includes 139.7 rkm (86.8 rmi) of the Little River from the Glover River confluence northwest of Idabel, McCurtain County, Oklahoma, downstream to U.S. Highway 71 north of Wilton, Little River and Sevier Counties, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. Riparian lands adjacent to, but not included in, this unit are in private ownership (42 percent), Federal (35 percent), and private land under tribal jurisdiction (23 percent) (Table 3).

**Unit RF7:** Middle Fork Little Red River—Cleburne and Van Buren Counties, Arkansas

Unit RF7 includes 24.8 rkm (15.4 rmi) of the Middle Fork Little Red River from the confluence of Little Tick Creek north of Shirley, Arkansas, downstream to Greers Ferry Reservoir (where inundation begins), Van Buren County, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above and natural gas development and hillside rock harvesting. All riparian lands adjacent

to, but not included in, this unit are in private ownership (Table 3).

Unit RF8a: White River—Independence, Jackson, White, and Woodruff Counties, Arkansas

Unit RF8a includes 188.3 rkm (117.0 rmi) of the White River from the Batesville Dam at Batesville, Independence County, Arkansas, downstream to the Little Red River confluence north of Georgetown, White, and Woodruff Counties, Arkansas. This unit contains all or some components of all four physical or biological features and contains primary constituent elements 2, 3, 4, and 5. The ACOE maintains a navigation channel, which involves routine dredging and snag removal, from Newport, Arkansas, to its confluence with the Mississippi River. The physical or biological features in this unit may require special management considerations or protection described above except for releases of chemical contaminants from industrial and municipal effluents and including tail water releases from a series of reservoirs on the upper White River; row crop agriculture; increasing demand for instream sand from the White River upstream of Newport, Arkansas, to support natural gas development needs; natural gas development; and channelization. Riparian lands adjacent to, but not included in, this unit are in private ownership (94 percent) and State and local ownership (6 percent) (Table 3).

Unit RF8b: White River—Arkansas and Monroe Counties, Arkansas

There are no records of rabbitsfoot from the 160-rkm (100-rmi) reach separating Unit RF8a from Unit RF8b (Butler 2005, p. 66). Unit RF8b includes 68.9 rkm (42.8 rmi) of the White River from U.S. Highway 79 at Clarendon, Monroe County, Arkansas, downstream to Arkansas Highway 1 near St. Charles, Arkansas County, Arkansas. This unit contains all or some components of all four physical or biological features and contains primary constituent elements 2, 3, 4, and 5. The ACOE maintains a navigation channel, which involves routine dredging and snag removal, from Newport, Arkansas, to its confluence with the Mississippi River. The physical or biological features in this unit may require special management considerations or protection described above except for releases of chemical contaminants from industrial and municipal effluents and including tail water releases from a series of reservoirs on the upper White River; row crop agriculture; increasing demand for instream sand from the

White River upstream of Newport, Arkansas, to support natural gas development needs; natural gas development; and channelization. Approximately 84 percent of the riparian lands adjacent to, but not included in, this unit are in Federal ownership and 16 percent are in private ownership (Table 3).

Unit RF9: Black River—Lawrence and Randolph Counties, Arkansas

Unit RF9 includes 51.2 rkm (31.8 rmi) of the Black River from U.S. Highway 67 at Pocahontas, Randolph County, Arkansas, downstream to the Flat Creek confluence southeast of Powhatan, Lawrence County, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above and including row crop agriculture. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit RF10: Spring River—Lawrence, Randolph, and Sharp Counties, Arkansas

Unit RF10 includes 51.5 rkm (32.0 rmi) of the Spring River from the Ott Creek confluence southwest of Hardy in Sharp County, Arkansas, downstream to its confluence with the Black River east of Black Rock, Lawrence and Randolph Counties, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit RF11: Strawberry River—Independence, Izard, Lawrence, and Sharp Counties, Arkansas

Unit RF11 includes 123.8 rkm (76.9 rmi) of the Strawberry River from Arkansas Highway 56 south of Horseshoe Bend, Izard County, Arkansas, downstream to its confluence with the Black River southeast of Strawberry, Lawrence County, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. All riparian

lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit RF12: Buffalo River—Marion, Newton, and Searcy Counties, Arkansas

Unit RF12 includes 113.6 rkm (70.6 rmi) of the Buffalo River from the Cove Creek confluence southeast of Erbie, Newton County, Arkansas, downstream to U.S. Highway 65 west of Gilbert, Searcy County, Arkansas and Arkansas Highway 14 southeast of Mull, Arkansas, downstream to the Leatherwood Creek confluence in the Lower Buffalo Wilderness Area, Arkansas. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. All riparian lands adjacent to, but not included in, this unit are in Federal ownership (Table 3).

Unit RF13: St. Francis River—Madison and Wayne Counties, Missouri

Unit RF13 includes 64.3 rkm (40.0 rmi) of the St. Francis River from the Twelvemile Creek confluence west of Saco, Madison County, Missouri, downstream to Lake Wappello (where inundation begins), Wayne County, Missouri. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. Riparian lands adjacent to, but not included in, this unit are in private (59 percent), Federal (39 percent), and less than 2 percent in State or local ownership (Table 3).

Unit RF14: Big Sunflower River—Sunflower County, Mississippi

Unit RF14 includes 51.5 rkm (32.0 rmi) of the Big Sunflower River from Mississippi Highway 442 west of Doddsville, Mississippi, downstream to the Quiver River confluence east of Indianola, Sunflower County, Mississippi. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above and row crop agriculture and channelization. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit RF15: Bear Creek—Tishomingo County, Mississippi; and Colbert County, Alabama

Unit RF15 includes 49.7 rkm (30.9 rmi) of Bear Creek from the Alabama and Mississippi State line east of Golden, Tishomingo County, Mississippi, downstream to Alabama County Road 4 southwest of Sutton Hill, Colbert County, Alabama (just upstream of Pickwick Lake). Unit RF15 in its entirety is currently designated as critical habitat for the oyster mussel (Duck River dartersnapper) and Cumberlandian combshell. Unit RF15 contains all or some components of all four physical or biological features, except in the Bear Creek Floodway, which has been channelized for flood control and only contains components of physical or biological features associated with the species' nutritional or physiological requirements and contains all five primary constituent elements, except in the Bear Creek Floodway, which has been channelized for flood control and only contains primary constituent elements 3, 4, and 5. The physical or biological features in this unit may require special management considerations or protection to address changes described above. Riparian lands adjacent to, but not included in, this unit are in private (64 percent), Federal (24 percent), and 12 percent in State or local ownership (Table 3).

Unit RF16: Big Black River—Hinds and Warren Counties, Mississippi

Unit RF16 includes 43.3 rkm (26.9 rmi) of Big Black River from Porter Creek confluence west of Lynchburg, Hinds County, Mississippi, downstream to Mississippi Highway 27 west of Newman, Warren County, Mississippi. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above, as well as row crop agriculture and channelization. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit RF17: Paint Rock River—Jackson, Madison, and Marshall Counties, Alabama

Unit RF17 includes 81.0 rkm (50.3 rmi) of the Paint Rock River from the convergence of Estill Fork and Hurricane Creek north of Skyline, Jackson County, Alabama, downstream to U.S. Highway 431 south of New

Hope, Madison and Marshall Counties, Alabama. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above as well as row crop agriculture and channelization. Approximately 99 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 1 percent is in Federal ownership (Table 3).

Unit RF18: Duck River—Hickman, Humphreys, Marshall, Maury, and Perry Counties, Tennessee

Unit RF18 includes 235.3 rkm (146.2 rmi) of the Duck River from Lillard Mill (rkm 288; rmi 179) west of Tennessee Highway 272, Marshall County, Tennessee, downstream to Interstate 40 near Bucksport, Hickman County, Tennessee. Seventy-four rkm (46 rmi) in Unit RF18 from rkm 214 (rmi 133) upstream to Lillard's Mill at rkm 288 (rmi 179) is currently designated as critical habitat for the oyster mussel and Cumberlandian combshell (50 CFR 17.95(f)). Unit RF18 contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above as well as row crop agriculture and channelization. Approximately 83 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 17 percent are in State or local ownership (Table 3).

Unit RF19a: Tennessee River—Hardin County, Tennessee

Unit RF19a includes 26.7 rkm (16.6 rmi) of Tennessee River from Pickwick Lake Dam downstream to U.S. Highway 64 near Adamsville, Hardin County, Tennessee. This unit contains all or some components of all four physical or biological features and contains primary constituent elements 1, 3, 4, and 5. The physical or biological features in this unit may require special management considerations or protection to address changes described above as well as row crop agriculture, channelization, and channel stability associated with tail water releases. Approximately 90 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 10 percent are in State or local ownership (Table 3).

Unit RF19b: Tennessee River—Livingston, Marshall, and McCracken Counties, Kentucky

Unit RF19b includes 35.6 rkm (22.1 rmi) of the Tennessee River from Kentucky Lake Dam downstream to its confluence with the Ohio River, McCracken and Livingston Counties, Kentucky. This unit contains all or some components of all four physical or biological features, and in part, contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. Approximately 93 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership, 7 percent are in Federal ownership, and less than 1 percent is in State or local ownership (Table 3).

Unit RF20: Ohio River—Ballard and McCracken Counties, Kentucky; Massac and Pulaski Counties, Illinois

Unit RF20 includes 45.9 rkm (28.5 rmi) of the Ohio River from the Tennessee River confluence at the downstream extent of Owens Island downstream to Lock and Dam 53 near Olmstead, Illinois. This unit contains all or some components of all four physical or biological features, and in part, contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above, as well as row crop agriculture, channelization, and channel stability associated with tail water releases. Approximately 72 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 28 percent are in State or local ownership (Table 3).

Unit RF21: Green River—Edmonson, Green, Hart, and Taylor Counties, Kentucky

Unit RF21 includes 175.6 rkm (109.1 rmi) of the Green River from Green River Lake Dam south of Campbellsville, Taylor County, Kentucky, downstream to Mammoth Cave National Park North Entrance Road in Mammoth Cave National Park, Kentucky. This unit contains all or some components of all four physical or biological features, and in part, contains all five primary constituent elements. Releases from Green River Lake dam have altered hydrologic flows and temperature regimes in the tail water reach (Butler 2005, p. 39). The physical or biological features in this unit may require special management



considerations or protection to address changes described above and row crop agriculture, channelization, and channel stability associated with tail water releases. Approximately 90 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 10 percent are in Federal ownership (Table 3).

Unit RF22: French Creek—Crawford, Erie, Mercer, and Venango Counties, Pennsylvania

Unit RF22 includes 120.4 rkm (74.8 rmi) of French Creek from Union City Reservoir Dam northeast of Union City, Erie County, Pennsylvania, downstream to its confluence with the Allegheny River near Franklin, Venango County, Pennsylvania. The Allegheny River rabbitsfoot population (Unit RF23) is likely a single metapopulation with the French Creek population (Unit RF22) (Butler 2005, p. 31). This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above as well as row crop agriculture and oil and gas development. Approximately 97 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 3 percent are in Federal ownership (Table 3).

Unit RF23: Allegheny River—Venango County, Pennsylvania

Unit RF23 includes 57.3 rkm (35.6 rmi) of the Allegheny River from the French Creek confluence near Franklin, Venango County, Pennsylvania, downstream to Interstate 80 near Emlenton, Venango County, Pennsylvania. The lower Allegheny River and French Creek (Unit RF22) populations likely represent a single metapopulation because no barriers exist between the streams (Butler 2005, p. 29). This unit contains all or some components of all four physical or biological features and likely functions as a metapopulation to French Creek (Unit RF22). This unit contains primary constituent elements 1, 3, 4, and 5 for the rabbitsfoot. A series of nine locks and dams and Kinzua Dam constructed over the past century has resulted in altered hydrologic flow regimes in the Allegheny River (Butler 2005, p. 29). The physical or biological features in this unit may require special management considerations or protection to address changes described above as well as row crop agriculture, oil and gas development, and

channelization. Approximately 83 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 17 percent are in State or local ownership (Table 3).

Unit RF24: Muddy Creek—Crawford County, Pennsylvania

Unit RF24 includes 20.1 rkm (12.5 rmi) of Muddy Creek from Pennsylvania Highway 77 near Little Cooley, Crawford County, Pennsylvania, downstream to its confluence with French Creek east of Cambridge Springs, Crawford County, Pennsylvania. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above and oil and gas development. Approximately 81 percent of the riparian lands adjacent to, but not included in, this unit are in Federal ownership and 19 percent are in private ownership (Table 3).

Unit RF25: Tippecanoe River—Carroll, Pulaski, Tippecanoe, and White Counties, Indiana

Unit RF25 includes 75.6 rkm (47.0 rmi) of the Tippecanoe River from Indiana Highway 14 near Winamac, Pulaski County, Indiana, downstream to its confluence with the Wabash River northeast of Battle Ground, Tippecanoe County, Indiana, excluding Lakes Shafer and Freeman and the stream reach between the two lakes. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above. Approximately 97 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 3 percent are in State or local ownership (Table 3).

Unit RF26: Walhonding River—Coshocton County, Ohio

Unit RF26 includes 17.5 rkm (10.9 rmi) of the Walhonding River from the convergence of the Kokosing and Mohican Rivers downstream to Ohio Highway 60 near Warsaw, Coshocton County, Ohio. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above.

Approximately 83 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 17 percent are in State or local ownership (Table 3).

Unit RF27: Little Darby Creek—Madison and Union Counties, Ohio

Unit RF27 includes 33.3 rkm (20.7 rmi) of Little Darby Creek from Ohio Highway 161 near Chuckery, Union County, Ohio, downstream to U.S. Highway 40 near West Jefferson, Madison County, Ohio. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above and row crop agriculture. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit RF28: North Fork Vermilion River and Middle Branch North Fork Vermilion River, respectively, Vermilion County, Illinois

Unit RF28 includes a total of 28.5 rkm (17.7 rmi). Unit RF28 includes 21.2 rkm (13.2 rmi) of the North Fork Vermilion River from the confluence of Middle Branch North Fork Vermilion River downstream to Illinois Highway 1 and U.S. Highway 136 upstream of Lake Vermilion, Vermilion County, Illinois. Unit RF28 also includes 7.2 rkm (4.5 rmi) of the Middle Branch North Fork Vermilion River from the Jordan Creek confluence northwest of Alvin, Illinois, downstream to its confluence with North Fork Vermilion River west of Alvin, Vermilion County, Illinois. The rabbitsfoot in the North Fork Vermilion River is considered a metapopulation with the Middle Branch North Fork Vermilion River population (Butler 2005, p. 47). This unit contains all or some components of all four physical or biological features, including connectivity between North Fork Vermilion River and Middle Branch North Fork Vermilion River. This unit contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above and channelization and row crop agriculture. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit RF29: Fish Creek—Williams County, Ohio

Unit RF29 includes 7.7 rkm (4.8 rmi) of Fish Creek from the Indiana and Ohio

State line northwest of Edgerton, Ohio, downstream to its confluence with the St. Joseph's River north of Edgerton, Williams County, Ohio. This unit contains all or some components of all four physical or biological features and sustains genetic diversity and historical distribution as the only remaining rabbitsfoot population in the Great Lakes sub-basin. This unit contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above as well as row crop agriculture and confined animal operations (hogs). Approximately 90 percent of the riparian lands adjacent to, but not included in, this unit are in private ownership and 10 percent are in State or local ownership (Table 3).

Unit RF30: Red River—Logan County, Kentucky; and Montgomery and Robertson Counties, Tennessee

Unit RF30 includes 50.2 rkm (31.2 rmi) of the Red River from the South Fork Red River confluence west of Adairville, Kentucky, downstream to the Sulphur Fork confluence southwest of Adams, Tennessee. This unit contains all or some components of all four physical or biological features and sustains genetic diversity and historical distribution as the largest of two remaining rabbitsfoot populations within the Cumberland River basin. This unit contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protection to address changes described above as well as row crop agriculture and channelization. All riparian lands adjacent to, but not included in, this unit are in private ownership (Table 3).

Unit RF31: Shenango River—Mercer County, Pennsylvania

Unit RF31 includes 24.8 rkm (15.4 rmi) of the Shenango River from Porter Road near Greenville, Pennsylvania, downstream to the point of inundation by Shenango River Lake near Big Bend, Mercer County, Pennsylvania. This unit contains all or some components of all four physical or biological features and contains all five primary constituent elements. The physical or biological features in this unit may require special management considerations or protections to address changes described above as well as consumptive water uses. Approximately 54 percent of the riparian lands adjacent to, but not included in, this unit are in Federal ownership and 46 percent are in private ownership (Table 3).

## Effects of Critical Habitat Designation

### Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

Decisions by the 5th and 9th Circuit Courts of Appeals have invalidated our regulatory definition of “destruction or adverse modification” (50 CFR 402.02) (see *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F. 3d 1059 (9th Cir. 2004) and *Sierra Club v. U.S. Fish and Wildlife Service*, 245 F.3d 434 (5th Cir. 2001)), and we do not rely on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Under the provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the effected critical habitat would continue to serve its intended conservation role for the species.

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Examples of actions that are subject to the section 7 consultation process are actions on State, tribal, local, or private lands that require a Federal permit (such as a permit from the ACOE under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat, and actions on State, tribal, local, or private lands that are not federally funded or authorized, do not require section 7 consultation.

As a result of section 7 consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect and are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are identifiable, that would avoid the likelihood of jeopardy and/or destruction or adverse modification of critical habitat. We define “reasonable and prudent alternatives” (at 50 CFR 402.02) as alternative actions identified during consultation that:

(1) Can be implemented in a manner consistent with the intended purpose of the action,

(2) Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,

(3) Are economically and technologically feasible, and

(4) Would, in the Director's opinion, avoid the likelihood of jeopardizing the continued existence of the listed species and/or avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where we have listed a new species or subsequently designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies sometimes may need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

### Application of the “Adverse Modification” Standard

The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical

habitat would continue to serve its intended conservation role for the species. Activities that may destroy or adversely modify critical habitat are those that alter the physical or biological features to an extent that appreciably reduces the conservation value of critical habitat for Neosho mucket and the rabbitsfoot. As discussed above, the role of critical habitat is to support life-history needs of the species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may destroy or adversely modify such habitat, or that may be affected by such designation.

Activities that may affect critical habitat, when carried out, funded, or authorized by a Federal agency, should result in consultation for the Neosho mucket and rabbitsfoot. These activities include, but are not limited to:

(1) Actions that would alter the geomorphology of their stream and river habitats. Such activities may include, but are not limited to, instream excavation or dredging, impoundment, channelization, sand and gravel mining, clearing riparian vegetation, and discharge of fill materials. These activities could cause aggradation or degradation of the channel bed elevation or significant bank erosion, result in entrainment or burial of these mollusks, and cause other direct or cumulative adverse effects to these species and their life cycles.

(2) Actions that would significantly alter the existing flow regime where these species occur. Such activities may include, but are not limited to, impoundment, channelization, urban development, water diversion, water withdrawal, and tail water releases downstream of dams. These activities could eliminate or reduce the habitat necessary for growth and reproduction of these mollusks and their life cycles including fish hosts.

(3) Actions that would significantly alter water chemistry or water quality (for example, temperature, pH, contaminants, conductivity, and excess nutrients). Such activities may include, but are not limited to, tail water releases downstream of dams, or the release of chemicals, biological pollutants, or heated effluents into surface water or connected groundwater at a point source or by dispersed release (nonpoint source). These activities could alter water conditions that are beyond the tolerances of these mussels or their fish hosts or both, and result in direct or

cumulative adverse effects to the species and their life cycles.

(4) Actions that would significantly alter stream bed material composition and quality by increasing sediment deposition or filamentous algal growth. Such activities may include, but are not limited to, construction projects, gravel and sand mining, oil and gas development, livestock grazing, timber harvest, off-road vehicle use, and other watershed and floodplain disturbances that release sediments or contaminants into the water. These activities could eliminate or reduce habitats necessary for the survival, growth, and reproduction of these mollusks or their fish hosts or both by causing excessive sedimentation and burial of Neosho mucket and rabbitsfoot or their habitats, sublethal effects from sediment exposure that are not readily apparent, acute and chronic exposure to chemical contaminants resulting in sublethal and lethal effects, and nitrification leading to excessive filamentous algal growth. Excessive filamentous algal growth can cause reduced nighttime dissolved oxygen levels and prevent mussel glochidia from settling into stream sediments.

#### **Exemptions**

##### *Application of Section 4(a)(3) of the Act*

Section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) provides that: "The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan (INRMP) prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation." There are no Department of Defense lands with a completed INRMP within the critical habitat designation.

#### **Consideration of Impacts Under Section 4(b)(2) of the Act**

Section 4(b)(2) of the Act states that the Secretary must designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if she determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless she determines, based on the best scientific

data available, that the failure to designate such area as critical habitat will result in the extinction of the species. In making that determination, the statute on its face, as well as the legislative history, are clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor.

#### *Consideration of Economic Impacts*

Under section 4(b)(2) of the Act, we consider the economic impacts of specifying any particular area as critical habitat. In order to consider economic impacts of the proposed designation, we prepared a DEA (Industrial Economics Incorporated (IEC) 2012). The DEA, dated February 6, 2013, was made available for public review from May 9, 2013, through June 10, 2013 (78 FR 27171), from August 27, 2013, through October 28, 2013 (78 FR 52894), and from May 14, 2014, to July 14, 2014 (79 FR 27547). Following the close of the last comment period, an FEA was developed, taking into consideration the public comments and any new information (IEC 2013, entire). By analyzing economic impacts of the proposed designation, which differs from the final designation, the FEA does not capture the exact incremental impacts of the final designation. Therefore, a final summary memorandum has been prepared describing our revised forecast calculations (IEC 2014a and 2014b, entire).

The intent of the FEA is to quantify the economic impacts of all potential conservation efforts for Neosho mucket and rabbitsfoot; some of these costs will likely be incurred regardless of whether we designate critical habitat (baseline). The economic impact of the proposed critical habitat designation is analyzed by comparing scenarios both "with critical habitat" and "without critical habitat." The "without critical habitat" scenario represents the baseline for the analysis, considering protections already in place for the species (for example, under the Federal listing and other Federal, State, and local regulations). The baseline, therefore, represents the costs incurred regardless of whether critical habitat is designated. The "with critical habitat" scenario describes the incremental impacts associated specifically with the proposed designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the species. In other words, the incremental costs are those attributable solely to the designation of critical

habitat above and beyond the baseline costs; these are the costs we consider in the final designation of critical habitat. The analysis looks retrospectively at baseline impacts incurred since the species was listed, and forecasts both baseline and incremental impacts likely to occur with the designation of critical habitat.

The FEA also addresses how potential economic impacts are likely to be distributed, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation activities on government agencies, private businesses, and individuals. The FEA measures lost economic efficiency associated with residential and commercial development and public projects and activities, such as economic impacts on water management and transportation projects, Federal lands, small entities, and the energy industry. Decisionmakers can use this information to assess whether the effects of the proposed designation might unduly burden a particular group or economic sector. Finally, the FEA looks retrospectively at costs that occurred between the publication of the final listing rule and the final rule designating critical habitat, and considers those costs that may occur in the 20 years following the designation of critical habitat, which was determined to be the appropriate period for analysis because limited planning information was available for most activities to forecast activity levels for projects beyond a 20-year timeframe. The FEA quantifies economic impacts of Neosho mucket and rabbitsfoot conservation efforts associated with the following categories of activity:

- (1) Water flow management;
- (2) Water quality management;
- (3) Timber, agriculture, and grazing;
- (4) Mining;
- (5) Oil and gas;
- (6) Transportation and utilities;
- (7) Development and recreation; and
- (8) Other activities (such as animal

and biological control, prescribed burns, land clearing, habitat or shoreline restoration, among others).

Baseline protections for the Neosho mucket and rabbitsfoot address a broad range of threats within a significant portion of the critical habitat area. The key conclusion for the incremental analysis is that critical habitat designation is not expected to generate additional requests for conservation efforts in any of the proposed critical habitat units. All critical habitat units are occupied by at least one of the two mussel species. In addition, incremental economic impacts of the designation

will likely be limited to additional administrative costs to the Service, Federal agencies, and third parties. This result is attributed to the following key findings: (1) Baseline protections exist for Neosho mucket and rabbitsfoot, and (2) all designated critical habitat is occupied by at least one of the two mussel species.

In total, the incremental impacts to all economic activities are estimated to be \$4,400,000 over the 20-year timeframe, or \$290,000 on an annualized basis (assuming a 7 percent discount rate) for the proposed critical habitat. Units RF2 (Verdigris River) and NM1 (Illinois River) are expected to generate the largest incremental impacts, due to section 7 consultations expected to occur in all categories within these units. The majority of incremental impacts across all units are related to transportation and utilities, followed by timber, agriculture, and grazing. Incremental costs associated with transportation are estimated to be \$1,400,000 over the 20-year timeframe; \$960,000 is associated with timber, agriculture, and grazing over the 20-year timeframe.

Incremental conservation costs of avoiding impacts to mussels and their habitat will vary depending on a variety of factors, including, but not limited to, location, size, and type of project being proposed, as well as the extent to which mussels occur in the project area. These include the costs for mussel surveys, relocation, monitoring and reporting, mussel propagation and population augmentation, best management practices for erosion and sedimentation controls, timing restrictions, and limiting project scope, or in-stream work.

#### *Exclusions Based on Economic Impacts*

Our economic analysis did not identify any disproportionate costs that are likely to result from the designation. Consequently, the Secretary is not exercising her discretion to exclude any areas from this designation of critical habitat for the Neosho mucket and rabbitsfoot based on economic impacts.

A copy of the FEA with supporting documents may be obtained by contacting the Arkansas Ecological Services Field Office (see **ADDRESSES**, above) or by downloading from the Internet at <http://www.regulations.gov>.

#### *Exclusions Based on National Security Impacts*

Under section 4(b)(2) of the Act, we consider whether there are lands owned or managed by the Department of Defense or Department of Homeland Security where a national security

impact might exist. In preparing this final rule, we have determined that no lands within the designated critical habitat for the Neosho mucket and rabbitsfoot are owned or managed by the Department of Defense or Department of Homeland Security, and, therefore, we anticipate no impact on national security or homeland security. Consequently, the Secretary is not exercising her discretion to exclude any areas from this final designation based on impacts on national security or homeland security.

#### *Exclusions Based on Other Relevant Impacts*

Under section 4(b)(2) of the Act, we consider any other relevant impacts resulting from the designation of critical habitat. We consider a number of factors, including whether the landowners have developed any HCPs or other management plans for the area, or whether there are conservation partnerships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at any tribal issues, and consider the government-to-government relationship of the United States with tribal entities. We also consider any social impacts that might occur because of the designation.

In preparing this final rule, we have determined that there are currently no permitted HCPs or other approved management plans for Neosho mucket and rabbitsfoot, and the final designation includes only tribal jurisdictional areas, not lands managed by any Tribe or trust resources. We anticipate no effect to tribal lands, partnerships, or HCPs from this critical habitat designation. Accordingly, the Secretary is not exercising her discretion to exclude any areas from this final designation based on other relevant impacts.

#### **Required Determinations**

##### *Regulatory Planning and Review (Executive Orders 12866 and 13563)*

Executive Order 12866 provides that the Office of Information and Regulatory Affairs (OIRA) will review all significant rules. The Office of Information and Regulatory Affairs has determined that this rule is not significant.

Executive Order 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that

reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this rule in a manner consistent with these requirements.

*Regulatory Flexibility Act (5 U.S.C. 601 et seq.)*

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 801 *et seq.*), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

According to the Small Business Administration, small entities include small organizations, such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than \$5 million in annual sales, general and heavy construction businesses with less than \$27.5 million in annual business, special trade contractors doing less than \$11.5 million in annual business, and agricultural businesses with annual sales less than \$750,000. To determine if potential economic impacts on these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule, as well as the types of project modifications that may result. In general, the term "significant economic impact" is meant to apply to a typical

small business firm's business operations.

The Service's current understanding of the requirements under the RFA, as amended, and following recent court decisions, is that Federal agencies are only required to evaluate the potential incremental impacts of rulemaking on those entities directly regulated by the rulemaking itself, and therefore, not required to evaluate the potential impacts to indirectly regulated entities. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to ensure that any action authorized, funded, or carried by the agency is not likely to destroy or adversely modify critical habitat. Therefore, under section 7 only Federal action agencies are directly subject to the specific regulatory requirement (avoiding destruction and adverse modification) imposed by critical habitat designation. Consequently, it is our position that only Federal action agencies will be directly regulated by this designation. There is no requirement under RFA to evaluate the potential impacts to entities not directly regulated. Moreover, Federal agencies are not small entities. Therefore, because no small entities are directly regulated by this rulemaking, the Service certifies that this final critical habitat designation will not have a significant economic impact on a substantial number of small entities.

During the development of this final rule, we reviewed and evaluated all information submitted during the comment period that may pertain to our consideration of the probable incremental economic impacts of this critical habitat designation. Based on this information, we affirm our certification that this final critical habitat designation will not have a significant economic impact on a substantial number of small entities, and a regulatory flexibility analysis is not required.

*Energy Supply, Distribution, or Use—Executive Order 13211*

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare Statements of Energy Effects when undertaking certain actions. OMB has provided guidance for implementing this Executive Order that outlines nine outcomes that may constitute "a significant adverse effect" when compared to not taking the regulatory action under consideration. Appendix A of the FEA discusses the

potential for critical habitat to affect utilities through the additional cost of considering adverse modification in section 7 consultation. Critical habitat designation for the mussels is anticipated to affect oil and gas activities. The Service does not anticipate consulting with the Federal Energy Regulatory Commission on hydropower operations as a result of the designation. Impacts to oil and gas development are limited to the administrative costs of consultation, and, therefore, reductions in oil and natural gas production are not anticipated. This analysis projects approximately 14 actions each year on oil and gas related activities, totaling approximately \$7,000 per year. The magnitude of these consultation costs is not anticipated to increase the cost of energy production or distribution in the United States in excess of one percent.

The economic analysis finds that none of the nine outcomes is relevant to this analysis. Thus, based on information in the economic analysis, energy-related impacts associated with Neosho mucket and rabbitsfoot conservation activities within critical habitat are not expected. As such, the designation of critical habitat is not expected to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required.

*Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)*

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*), we make the following findings:

(1) This rule will not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or tribal governments, or the private sector, and includes both "Federal intergovernmental mandates" and "Federal private sector mandates." These terms are defined in 2 U.S.C. 658(5)–(7). "Federal intergovernmental mandate" includes a regulation that "would impose an enforceable duty upon State, local, or tribal governments" with two exceptions. It excludes "a condition of Federal assistance." It also excludes "a duty arising from participation in a voluntary Federal program," unless the regulation "relates to a then-existing Federal program under which \$500,000,000 or more is provided annually to State, local, and tribal governments under entitlement authority," if the provision would "increase the stringency of conditions of assistance" or "place caps upon, or

otherwise decrease, the Federal Government's responsibility to provide funding," and the State, local, or tribal governments "lack authority" to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. "Federal private sector mandate" includes a regulation that "would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program."

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule will significantly or uniquely affect small governments because it would not produce a Federal mandate of \$100 million or greater in any year; that is, it is not a "significant regulatory action" under the Unfunded Mandates Reform Act. Small governments will be affected only to the extent that any programs having Federal funds, permits, or other authorized activities must ensure that their actions will not adversely affect the critical habitat. The FEA concludes incremental impacts may occur due to administrative costs of section 7 consultations for activities related to water flow management; water quality; timber, agriculture, and grazing; mining; oil and gas; transportation and utilities; development and recreation; and other activities; however, these are not

expected to significantly affect small government entities. Consequently, we do not believe that the critical habitat designation will significantly or uniquely affect small government entities. As such, a Small Government Agency Plan is not required.

#### *Takings—Executive Order 12630*

In accordance with Executive Order 12630 ("Government Actions and Interference with Constitutionally Protected Private Property Rights"), we have analyzed the potential takings implications of designating critical habitat for Neosho mucket and rabbitsfoot in a takings implications assessment. As discussed above, the designation of critical habitat affects only Federal actions. Although private parties that receive Federal funding, assistance, or require approval or authorization from a Federal agency for an action may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

The majority of the designation occurs in navigable waterways whose stream bottoms are owned by the States. Impacts of this designation could occur on non-Federal riparian lands adjacent to, but not included in, the critical habitat designation where there is Federal involvement (such as Federal funding or permitting) subject to section 7 of the Act, or where a decision on a proposed action on federally owned land could affect economic activity on adjoining non-Federal land. However, in general, we believe that the takings implications associated with this critical habitat designation will be insignificant. Based on the best available information, the takings implications assessment concludes that this designation of critical habitat for the Neosho mucket and rabbitsfoot does not pose significant takings implications.

#### *Federalism—Executive Order 13132*

In accordance with Executive Order 13132 (Federalism), this rule does not have significant Federalism effects. A Federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of, this critical habitat designation with appropriate State resource agencies in Alabama, Arkansas, Illinois, Indiana, Kansas, Kentucky, Mississippi, Missouri, Ohio, Oklahoma, Pennsylvania, and Tennessee. We received comments from Kansas,

Illinois, Ohio, Oklahoma, and Pennsylvania and have addressed them in the Summary of Comments and Recommendations and Summary of Changes from Proposed Rule sections of this rule. From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, this rule does not have substantial direct effects either on the States, or on the relationship between the national government and the States, or on the distribution of powers and responsibilities among the various levels of government. The designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical or biological features of the habitat necessary to the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist local governments in long-range planning (because these local governments no longer have to wait for case-by-case section 7 consultations to occur).

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

#### *Civil Justice Reform—Executive Order 12988*

In accordance with Executive Order 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and that it meets the applicable standards set forth in sections 3(a) and 3(b)(2) of the Order. We are designating critical habitat in accordance with the provisions of the Act. To assist the public in understanding the habitat needs of the species, the rule identifies the elements of physical or biological features essential to the conservation of the Neosho mucket and rabbitsfoot. The designated areas of critical habitat are presented on maps, and the rule provides several options for the

interested public to obtain more detailed location information, if desired.

*Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)*

This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

*National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.)*

It is our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to NEPA in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)). However, when the range of the species includes States within the Tenth Circuit, such as that of Neosho mucket and rabbitsfoot, under the Tenth Circuit ruling in *Catron County Board of Commissioners v. U.S. Fish and Wildlife Service*, 75 F.3d 1429 (10th Cir. 1996), we undertake a NEPA analysis for critical habitat designation and notify the public of the availability of the draft environmental assessment for a proposal when it is finished.

We performed this NEPA analysis and made the draft environmental assessment available for public comment on May 9, 2013 (78 FR 27171), August 27, 2013 (78 FR 52894), and May 14, 2014 (79 FR 27547). The final environmental assessment has been completed and is available with the publication of this final rule. You may obtain a copy of the final environmental assessment online at <http://www.regulations.gov>, by mail from the Arkansas Ecological Services Field Office (see **ADDRESSES**, above), or by

visiting the office Web site at <http://www.fws.gov/arkansas-es/>.

The final environmental assessment included a detailed analysis of the potential effects of the proposed critical habitat designation on resource categories, including:

- (1) Water flow management;
- (2) Water quality management;
- (3) Timber, agriculture, and grazing;
- (4) Mining;
- (5) Oil and gas;
- (6) Transportation and utilities;
- (7) Development and recreation; and
- (8) Other activities (such as animal

and biological control, prescribed burns, land clearing, habitat or shoreline restoration, among others, environmental justice, and cumulative effects).

The scope of the effects were primarily limited to those activities involving Federal actions, because critical habitat designation does not have any impact on the environment other than through the Act's section 7 consultation process conducted for Federal actions. Private actions that have no Federal involvement are not affected by critical habitat designation.

Based on the review and evaluation of the information contained in the environmental assessment, we determined that the designation of critical habitat for the Neosho mucket and rabbitsfoot does not constitute a major Federal action having a significant impact on the human environment under the meaning of section 102(2)(c) of NEPA, and so an environmental impact statement is not required.

*Government-to-Government Relationship With Tribes*

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge

our responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes.

We determined that there are no tribal lands occupied by the Neosho mucket and rabbitsfoot at the time of listing that contain the physical or biological features essential to conservation of the species, and no tribal lands unoccupied by the Neosho mucket and rabbitsfoot that are essential for the conservation of the species. Therefore, we are not designating critical habitat for the Neosho mucket and rabbitsfoot on tribal lands.

**References Cited**

A complete list of all references cited is available on the Internet at <http://www.regulations.gov> and upon request from the Arkansas Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

**Authors**

The primary authors of this rulemaking are the staff members of the Arkansas Ecological Services Field Office.

**List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

**Regulation Promulgation**

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

**PART 17—[AMENDED]**

- 1. The authority citation for part 17 continues to read as follows:

**Authority:** 16 U.S.C. 1361–1407; 1531–1544; 4201–4245, unless otherwise noted.

- 2. Amend § 17.11(h) by revising the entries for “Mucket, Neosho” and “Rabbitsfoot” under CLAMS in the List of Endangered and Threatened Wildlife to read as follows:

**§ 17.11 Endangered and threatened wildlife.**

\* \* \* \* \*

(h) \* \* \*

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*	*	*
CLAMS							
*	*	*	*	*	*	*	*
Mucket, Neosho .....	<i>Lampsilis rafinesqueana</i> .	U.S.A. (AR, KS, MO, OK).	NA .....	E	816	17.95(f)	NA
*	*	*	*	*	*	*	*
Rabbitsfoot .....	<i>Quadrula cylindrica cylindrica</i> .	U.S.A. (AL, AR, GA, IN, IL, KS, KY, LA, MO, MS, OH, OK, PA, TN, WV).	NA .....	T	816	17.95(f)	NA
*	*	*	*	*	*	*	*

\* \* \* \* \*

■ 3. In § 17.95, amend paragraph (f) by adding entries for “Neosho Mucket (*Lampsilis rafinesqueana*)” and “Rabbitsfoot (*Quadrula cylindrica cylindrica*)”, immediately following the entry for “Slabside Pearlymussel (*Pleuronaia dolabelloides*),” to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

\* \* \* \* \*

(f) *Clams and Snails*.

\* \* \* \* \*

Neosho Mucket (*Lampsilis rafinesqueana*)

(1) Critical habitat units are depicted for the Neosho mucket on the maps below in the following Counties:

- (i) Benton and Washington Counties, Arkansas;
- (ii) Allen, Cherokee, Coffey, Elk, Greenwood, Labette, Montgomery, Neosho, Wilson, and Woodson Counties, Kansas;
- (iii) Jasper, Lawrence, McDonald, and Newton Counties, Missouri; and
- (iv) Adair, Cherokee, and Delaware Counties, Oklahoma.

(2) Within these areas, the primary constituent elements of the physical or biological features essential to the conservation of the Neosho mucket consist of five components:

- (i) Geomorphically stable river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) with habitats that support a diversity of freshwater mussel and native fish (such as stable riffles, sometimes with runs,

and mid-channel island habitats that provide flow refuges consisting of gravel and sand substrates with low to moderate amounts of fine sediment and attached filamentous algae).

(ii) A hydrologic flow regime (the severity, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found and to maintain connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the mussel’s and fish host’s habitat, food availability, spawning habitat for native fishes, and the ability for newly transformed juveniles to settle and become established in their habitats.

(iii) Water and sediment quality (including, but not limited to, conductivity, hardness, turbidity, temperature, pH, ammonia, heavy metals, and chemical constituents) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.

(iv) The occurrence of natural fish assemblages, reflected by fish species richness, relative abundance, and community composition, for each inhabited river or creek that will serve as an indication of appropriate presence and abundance of fish hosts necessary for recruitment of the Neosho mucket. Suitable fish hosts for Neosho mucket glochidia include smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), and spotted bass (*Micropterus punctulatus*).

(v) Competitive or predaceous invasive (nonnative) species in quantities low enough to have minimal effect on survival of freshwater mussels.

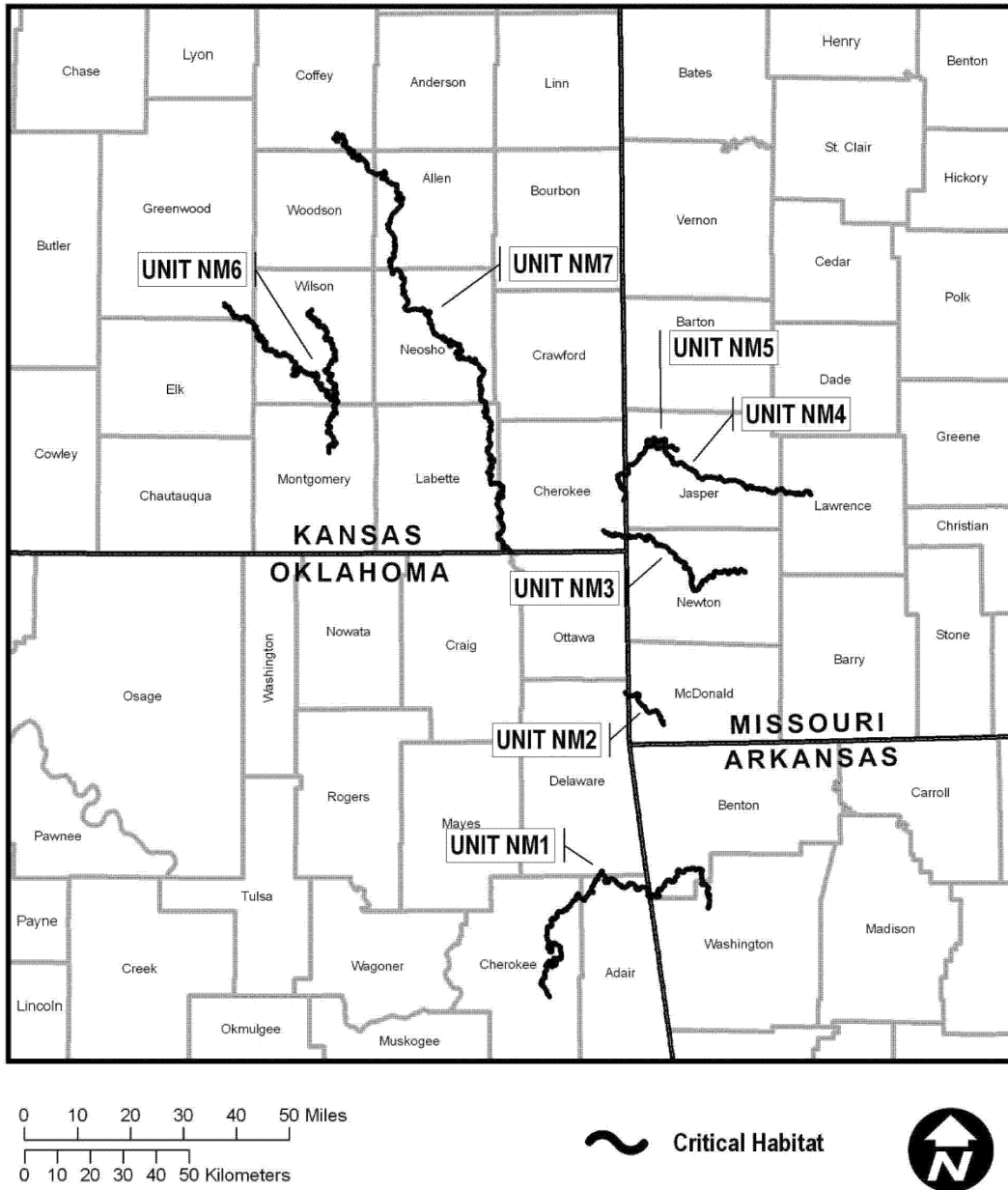
(3) Critical habitat does not include manmade structures (such as dams, piers and docks, bridges, or other similar structures) within the legal boundaries on June 1, 2015.

(4) *Critical habitat map units*. Data layers defining map units were developed using ESRI ArcGIS mapping software along with various spatial data layers. Critical habitat unit upstream and downstream limits were delineated at the nearest road crossing or stream confluence of each occupied reach. Data layers defining map units were created with U.S. Geological Survey National Hydrography Dataset (NHD) Medium Flowline data. ArcGIS was also used to calculate river kilometers (rkm) and river miles (rmi) from the NHD dataset, and it was used to determine longitude and latitude coordinates in decimal degrees. The projection used in mapping and calculating distances and locations within the units was North American Albers Equal Area Conic, NAD 83. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates, plot points, or both on which each map is based are available to the public at the Service’s Internet site ([http://www.fws.gov/arkansas-es/te\\_listing.html](http://www.fws.gov/arkansas-es/te_listing.html)), the Federal eRulemaking Portal (<http://www.regulations.gov> at Docket No. FWS–R4–ES–2013–0007), and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.



(5) Note: Index map of all critical habitat units for the Neosho mucket follows:

### Index map of critical habitat units for Neosho mucket



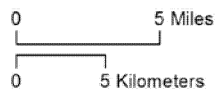
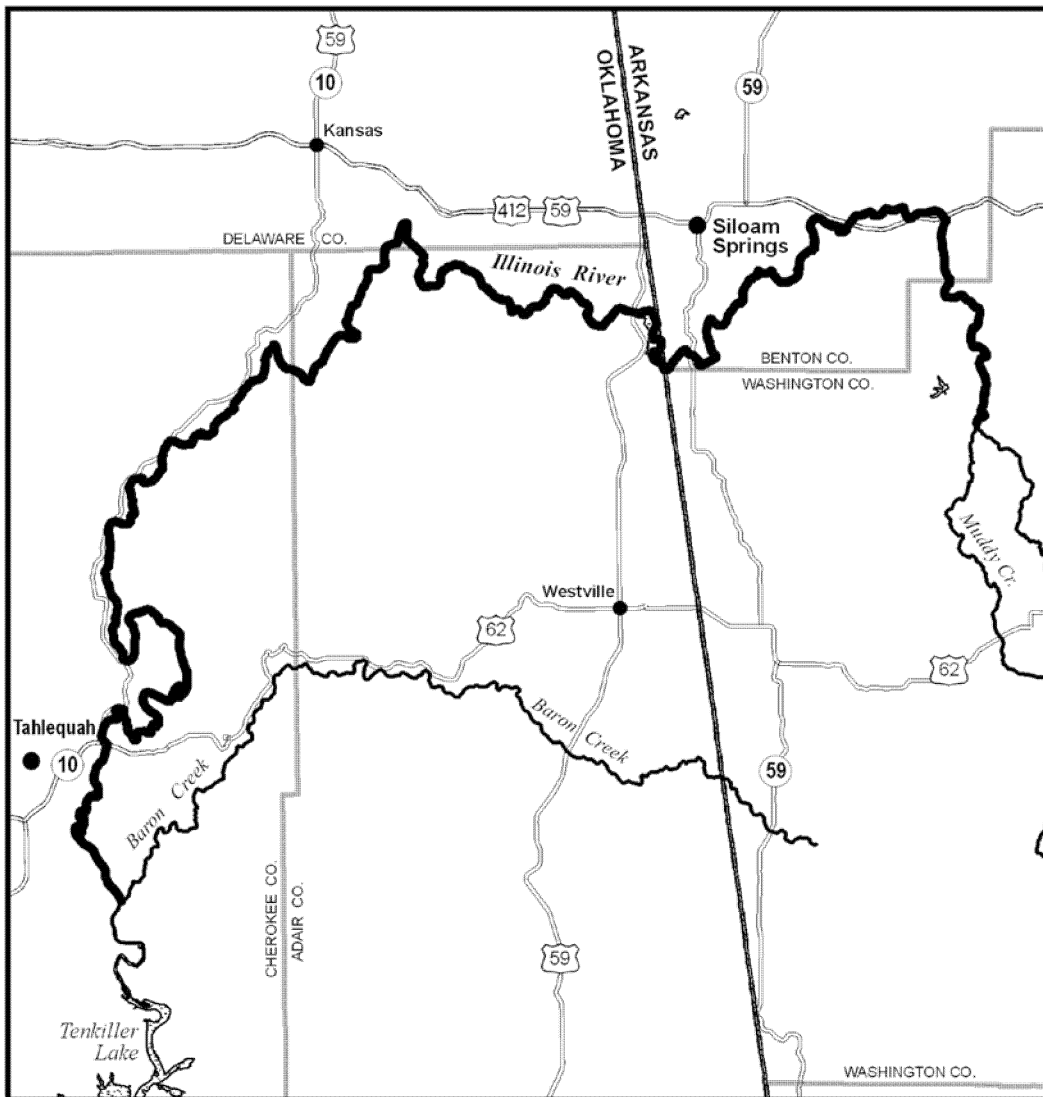
(6) Unit NM1: Illinois River—Benton and Washington Counties, Arkansas; and Adair, Cherokee, and Delaware Counties, Oklahoma.

(i) *General Description:* Unit NM1 includes 146.1 rkm (90.8 rmi) of the Illinois River from the Muddy Fork Illinois River confluence south of Savoy,

Washington County, Arkansas, downstream to the Baron Creek confluence southeast of Tahlequah, Cherokee County, Oklahoma.

(ii) Map of Unit NM1 follows:

Map of Unit NM1 (Illinois River) of critical habitat for Neosho mucket



 Critical Habitat



(7) Unit NM2: Elk River—McDonald County, Missouri; and Delaware County, Oklahoma.

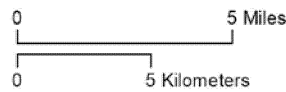
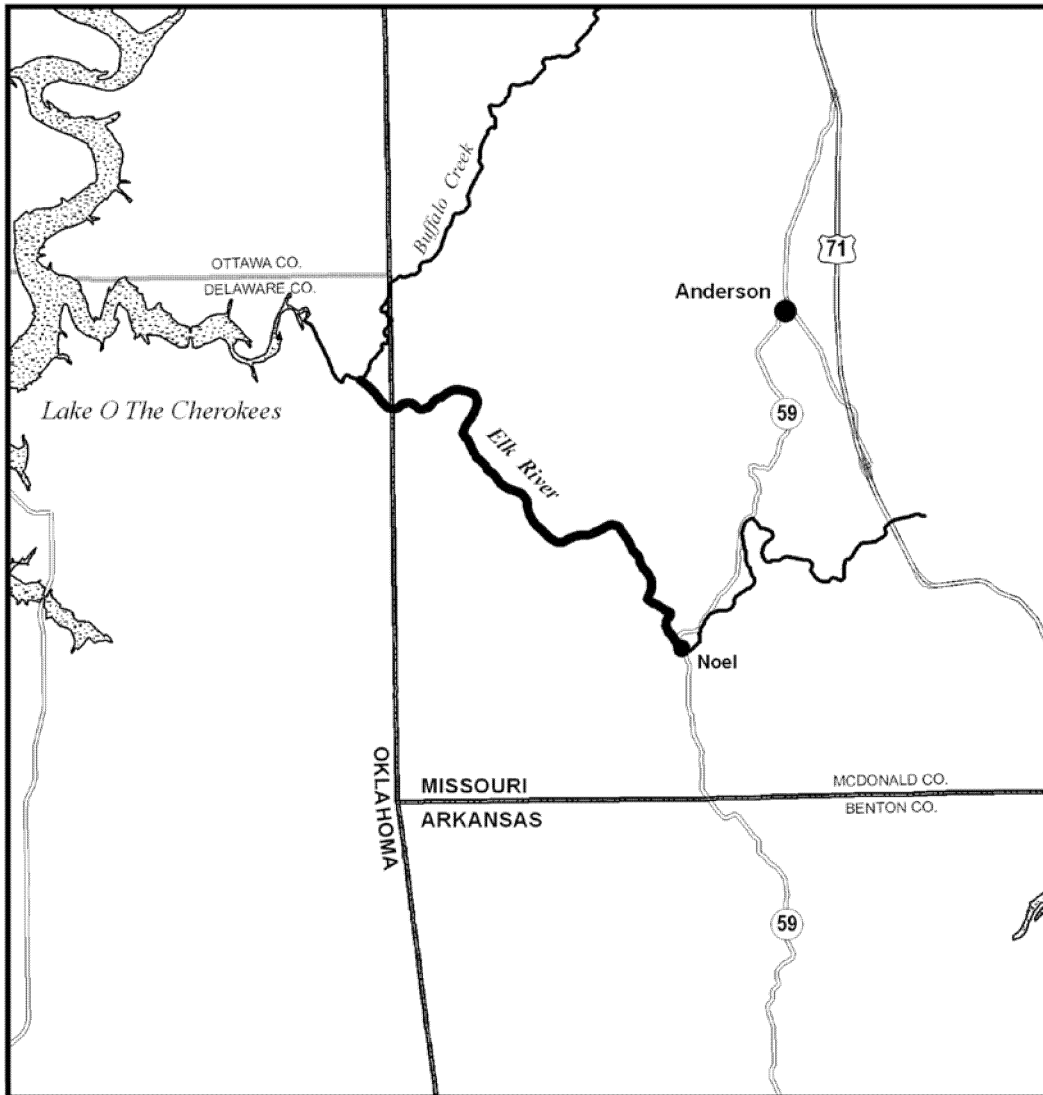
(i) *General Description:* Unit NM2 includes 20.3 rkm (12.6 rmi) of the Elk

River from Missouri Highway 59 at Noel, McDonald County, Missouri, to the confluence of Buffalo Creek immediately downstream of the

Oklahoma and Missouri State line, Delaware County, Oklahoma.

(ii) Map of Unit NM2 follows:

Map of Unit NM2 (Elk River) of critical habitat for Neosho mucket



 Critical Habitat



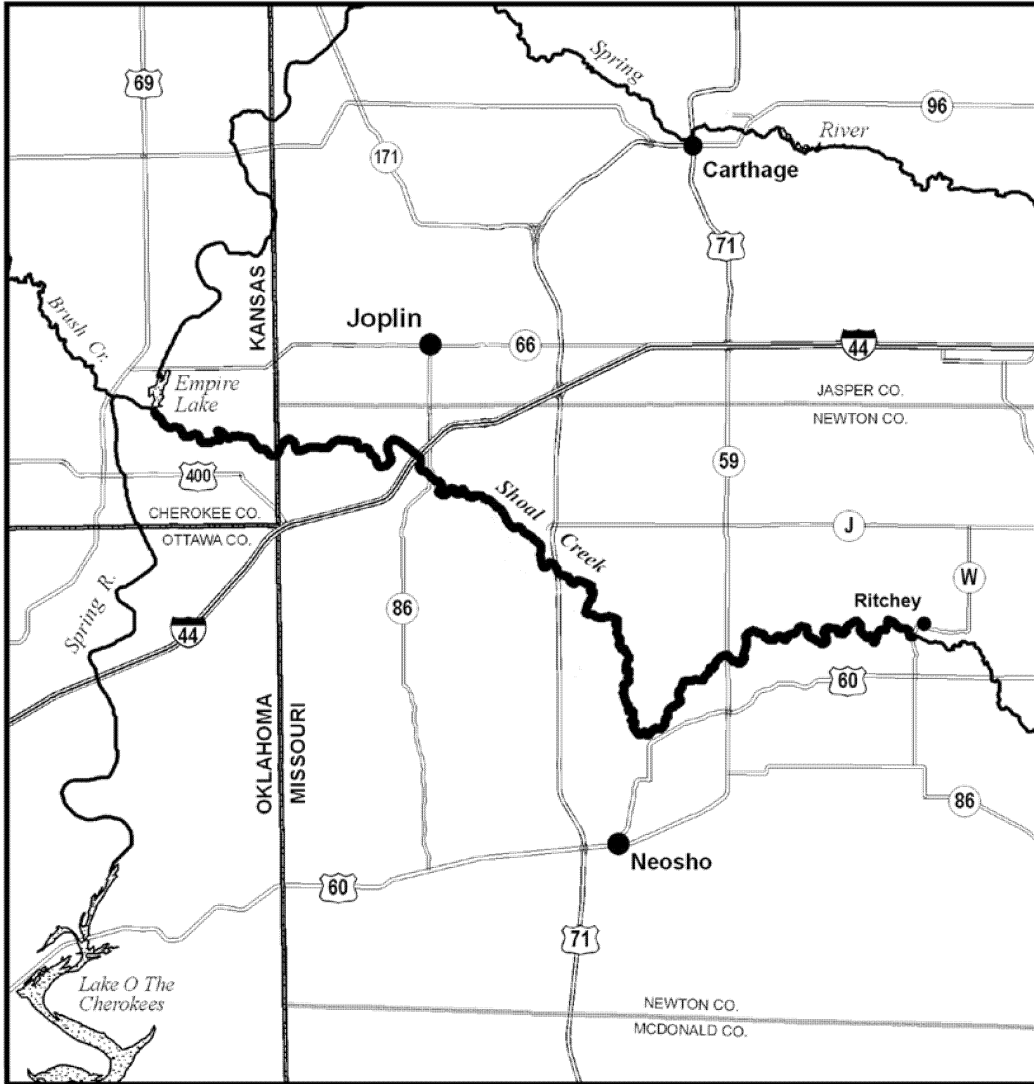
(8) Unit NM3: Shoal Creek—Cherokee County, Kansas; and Newton County, Missouri.

(i) *General Description:* Unit NM3 includes 75.8 rkm (47.1 rmi) of Shoal Creek from Missouri Highway W near Ritchey, Newton County, Missouri, to

Empire Lake where inundation begins in Cherokee County, Kansas.

(ii) Map of Unit NM3 follows:

Map of Unit NM3 (Shoal Creek) of critical habitat for Neosho mucket



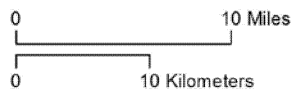
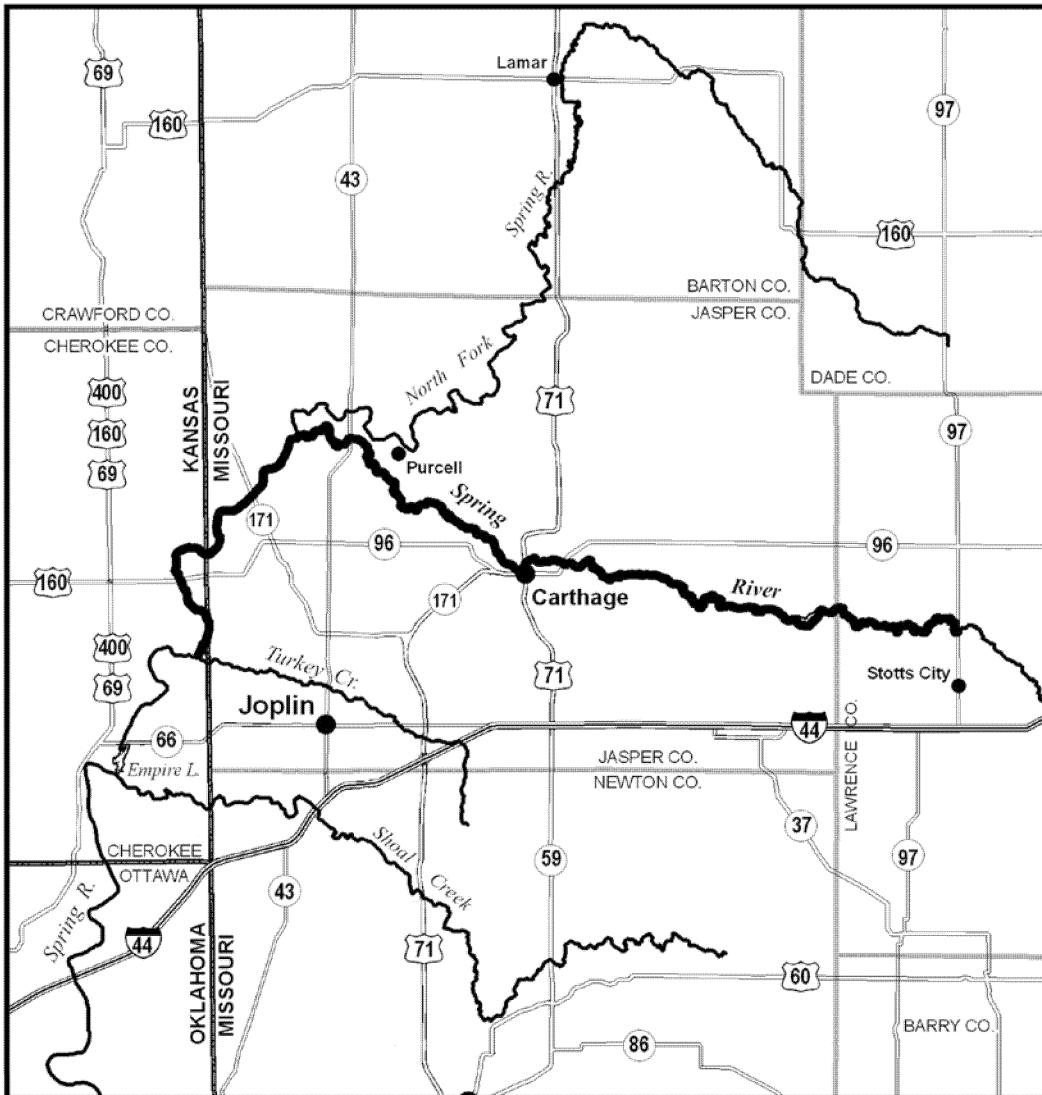
(9) Unit NM4: Spring River—Jasper and Lawrence Counties, Missouri; and Cherokee County, Kansas.

(i) *General Description:* Unit NM4 includes 102.3 rkm (63.6 rmi) of the Spring River from Missouri Highway 97 north of Stotts City, Lawrence County,

Missouri, downstream to the confluence of Turkey Creek north of Empire, Cherokee County, Kansas.

(ii) Map of Unit NM4 follows:

Map of Unit NM4 (Spring River) of critical habitat for Neosho mucket



(10) Unit NM5: North Fork Spring River—Jasper County, Missouri.

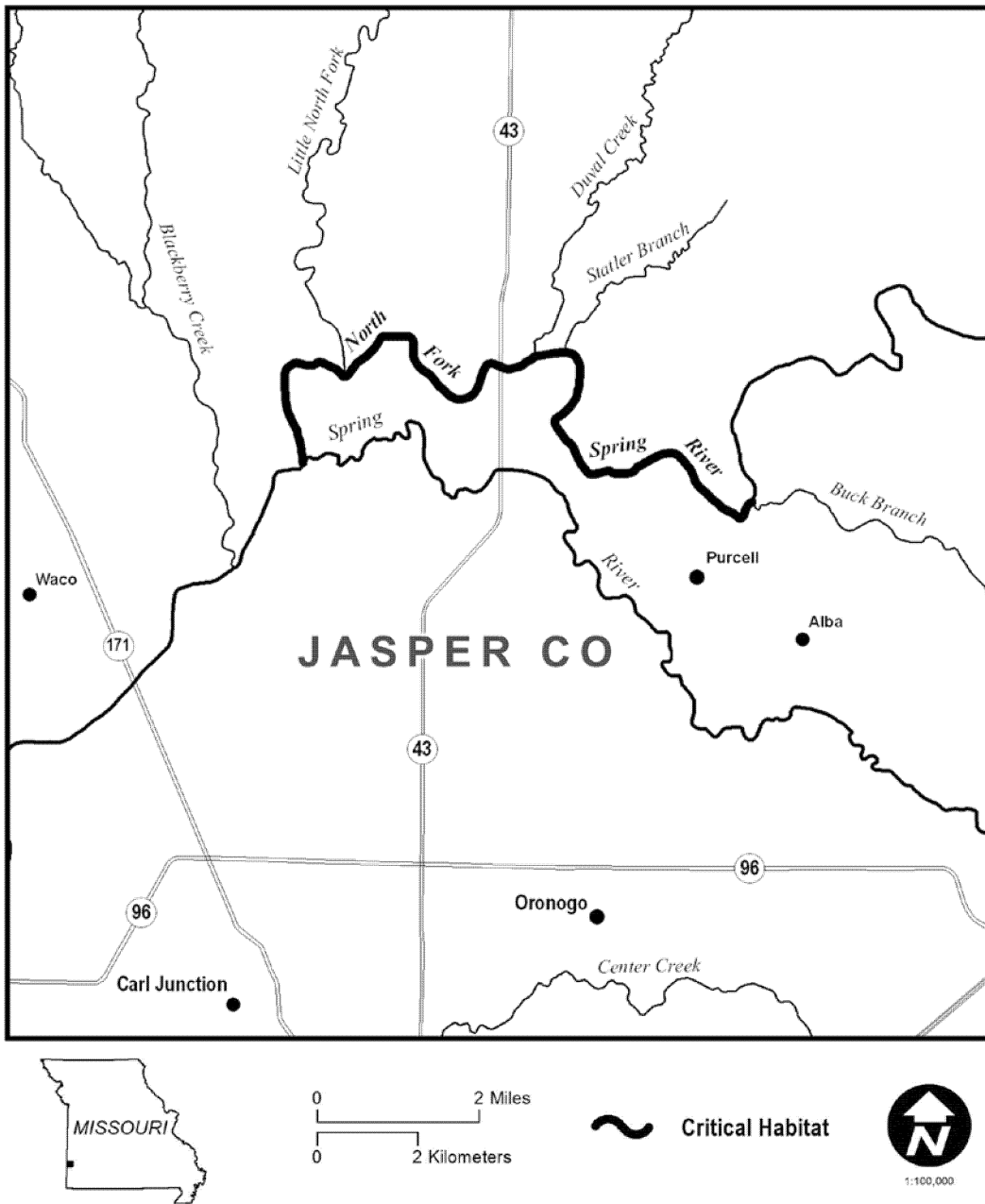
(i) *General Description:* Unit NM5 includes 16.4 rkm (10.2 rmi) of the

North Fork Spring River from the confluence of Buck Branch southwest of Jasper, Missouri, downstream to its

confluence with the Spring River near Purcell, Jasper County, Missouri.

(ii) Map of Unit NM5 follows:

Map of Unit NM5 (North Fork Spring River) of critical habitat for Neosho mucket



(11) Unit NM6: Fall River—Elk, Greenwood, and Wilson Counties, Kansas; Verdigris River—Montgomery and Wilson Counties, Kansas.

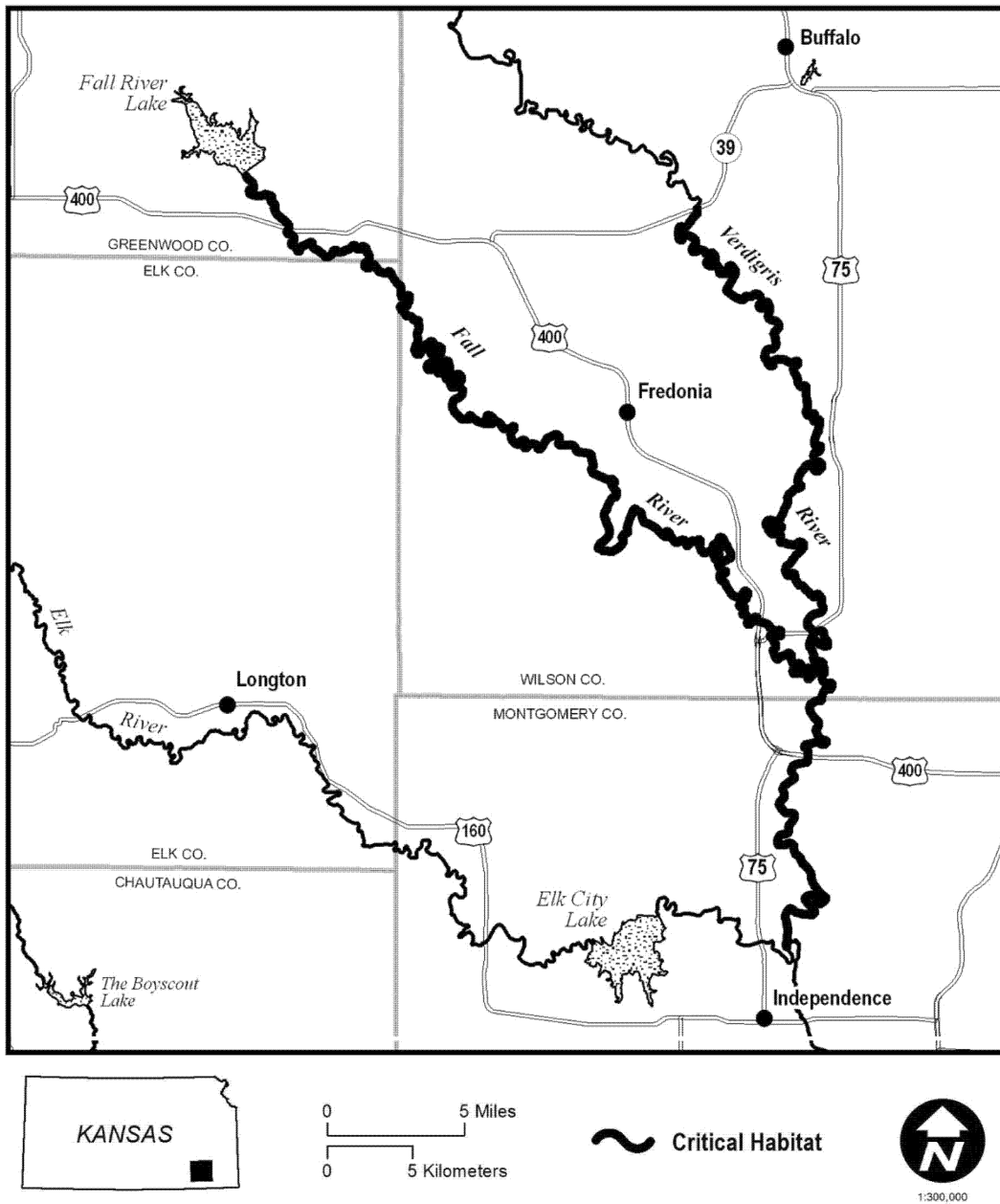
(i) *General Description:* Unit NM6 includes a total of 171.1 rkm (106.3 rmi) including 90.4 rkm (56.2 rmi) of the Fall

River from Fall River Lake dam northwest of Fall River, Greenwood County, Kansas, downstream to its confluence with the Verdigris River near Neodesha, Wilson County, Kansas. Unit NM6 also includes 80.6 rkm (50.1 rmi) of the Verdigris River from Kansas

Highway 39 near Benedict, Wilson County, Kansas, downstream to the Elk River confluence near Independence, Montgomery County, Kansas.

(ii) Map of Unit NM6 follows:

Map of Unit NM6 (Fall & Verdigris Rivers) of critical habitat for Neosho mucket



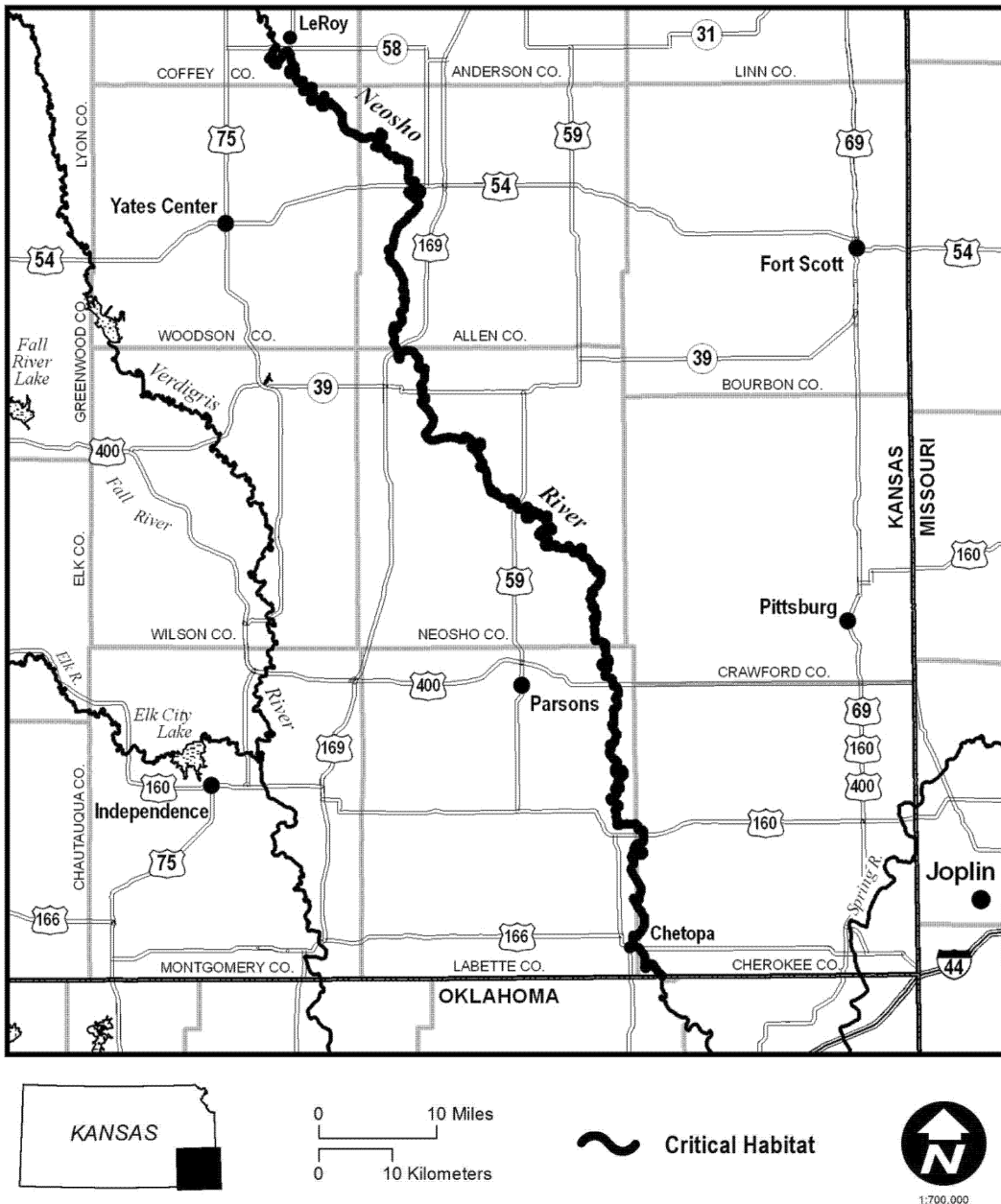
(12) Unit NM7: Neosho River—Allen, Cherokee, Coffey, Labette, Neosho, and Woodson Counties, Kansas.

(i) *General Description:* Unit NM7 includes 244.5 rkm (151.9 rmi) of the Neosho River from Kansas Highway 58 west of LeRoy, Coffey County, Kansas,

downstream to the Kansas and Oklahoma State line, Cherokee County, Kansas.

(ii) Map of Unit NM7 follows:

### Map of Unit NM7 (Neosho River) of critical habitat for Neosho mucket



#### Rabbitsfoot (*Quadrula cylindrica cylindrica*)

(1) Critical habitat units are depicted for rabbitsfoot on the maps below in the following Counties:

(i) Colbert, Jackson, Madison, and Marshall Counties, Alabama;

(ii) Arkansas, Ashley, Bradley, Clark, Cleburne, Cleveland, Drew, Hot Spring, Independence, IZARD, Jackson, Lawrence, Little River, Marion, Monroe, Newton, Ouachita, Randolph, Searcy,

Sevier, Sharp, Van Buren, White, and Woodruff Counties, Arkansas;

(iii) Massac, Pulaski, and Vermilion Counties, Illinois;

(iv) Carroll, Pulaski, Tippecanoe, and White Counties, Indiana;

(v) Allen and Cherokee Counties, Kansas;

(vi) Ballard, Edmonson, Green, Hart, Livingston, Logan, Marshall, McCracken, and Taylor Counties, Kentucky;

(vii) Hinds, Sunflower, Tishomingo, and Warren Counties, Mississippi;

(viii) Jasper, Madison, and Wayne Counties, Missouri;

(ix) Coshocton, Madison, Union, and Williams Counties, Ohio;

(x) McCurtain and Rogers Counties, Oklahoma;

(xi) Crawford, Erie, Mercer, and Venango Counties, Pennsylvania; and

(xii) Hardin, Hickman, Humphreys, Marshall, Maury, Montgomery, Perry, and Robertson Counties, Tennessee.

(2) Within these areas, the primary constituent elements of the physical or biological features essential to the



conservation of the rabbitsfoot consist of five components:

(i) Geomorphically stable river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) with habitats that support a diversity of freshwater mussel and native fish (such as stable riffles, sometimes with runs, and mid-channel island habitats that provide flow refuges consisting of gravel and sand substrates with low to moderate amounts of fine sediment and attached filamentous algae).

(ii) A hydrologic flow regime (the severity, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found and to maintain connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the mussel's and fish host's habitat, food availability, spawning habitat for native fishes, and the ability for newly transformed juveniles to settle and become established in their habitats.

(iii) Water and sediment quality (including, but not limited to, conductivity, hardness, turbidity, temperature, pH, ammonia, heavy metals, and chemical constituents) necessary to sustain natural

physiological processes for normal behavior, growth, and viability of all life stages.

(iv) The occurrence of natural fish assemblages, reflected by fish species richness, relative abundance, and community composition, for each inhabited river or creek that will serve as an indication of appropriate presence and abundance of fish hosts necessary for recruitment of the rabbitsfoot. Suitable fish hosts for rabbitsfoot may include, but are not limited to, blacktail shiner (*Cyprinella venusta*) from the Black and Little River and cardinal shiner (*Luxilus cardinalis*), red shiner (*C. lutrensis*), spotfin shiner (*C. spiloptera*), bluntface shiner (*C. camura*), rainbow darter (*Etheostoma caeruleum*), rosyface shiner (*Notropis rubellus*), striped shiner (*L. chrysocephalus*), and emerald shiner (*N. atherinoides*).

(v) Competitive or predaceous invasive (nonnative) species in quantities low enough to have minimal effect on survival of freshwater mussels.

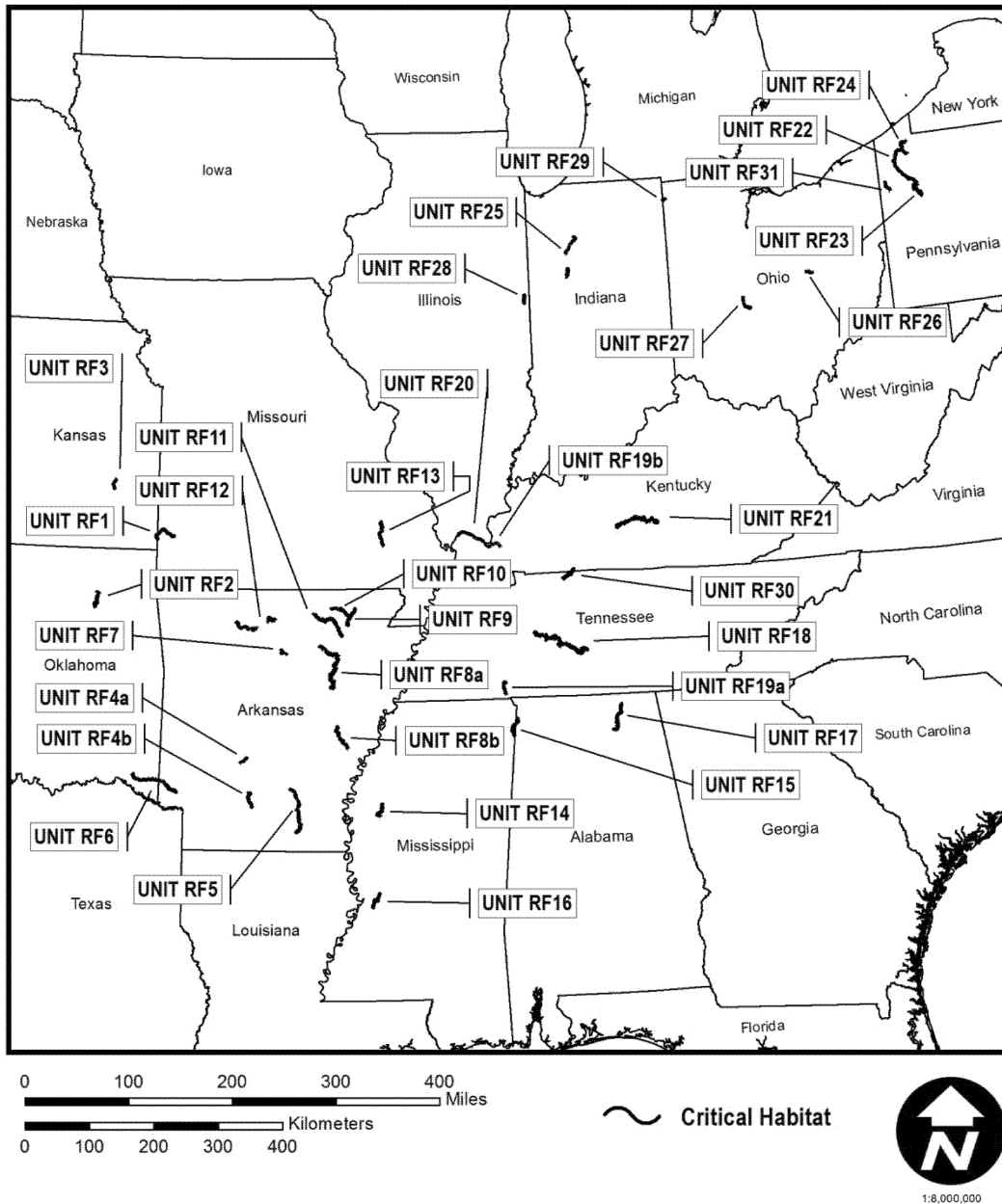
(3) Critical habitat does not include manmade structures (such as dams, piers and docks, bridges, or other similar structures) within the legal boundaries on June 1, 2015.

(4) *Critical habitat map units.* Data layers defining map units were developed using ESRI ArcGIS mapping

software along with various spatial data layers. Critical habitat unit upstream and downstream limits were delineated at the nearest road crossing or stream confluence of each occupied reach. Data layers defining map units were created with U.S. Geological Survey National Hydrography Dataset (NHD) Medium Flowline data. ArcGIS was also used to calculate river kilometers (rkm) and river miles (rmi) from the NHD dataset, and it was used to determine longitude and latitude coordinates in decimal degrees. The projection used in mapping and calculating distances and locations within the units was North American Albers Equal Area Conic, NAD 83. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates, plot points, or both on which each map is based are available to the public at the Service's Internet site ([http://www.fws.gov/arkansas-es/te\\_listing.html](http://www.fws.gov/arkansas-es/te_listing.html)), the Federal eRulemaking Portal (<http://www.regulations.gov> at Docket No. FWS-R4-ES-2013-0007), and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Note: Index map of all critical habitat units for the rabbitsfoot follows:

### Index map of critical habitat units for Rabbitsfoot



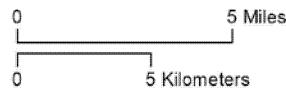
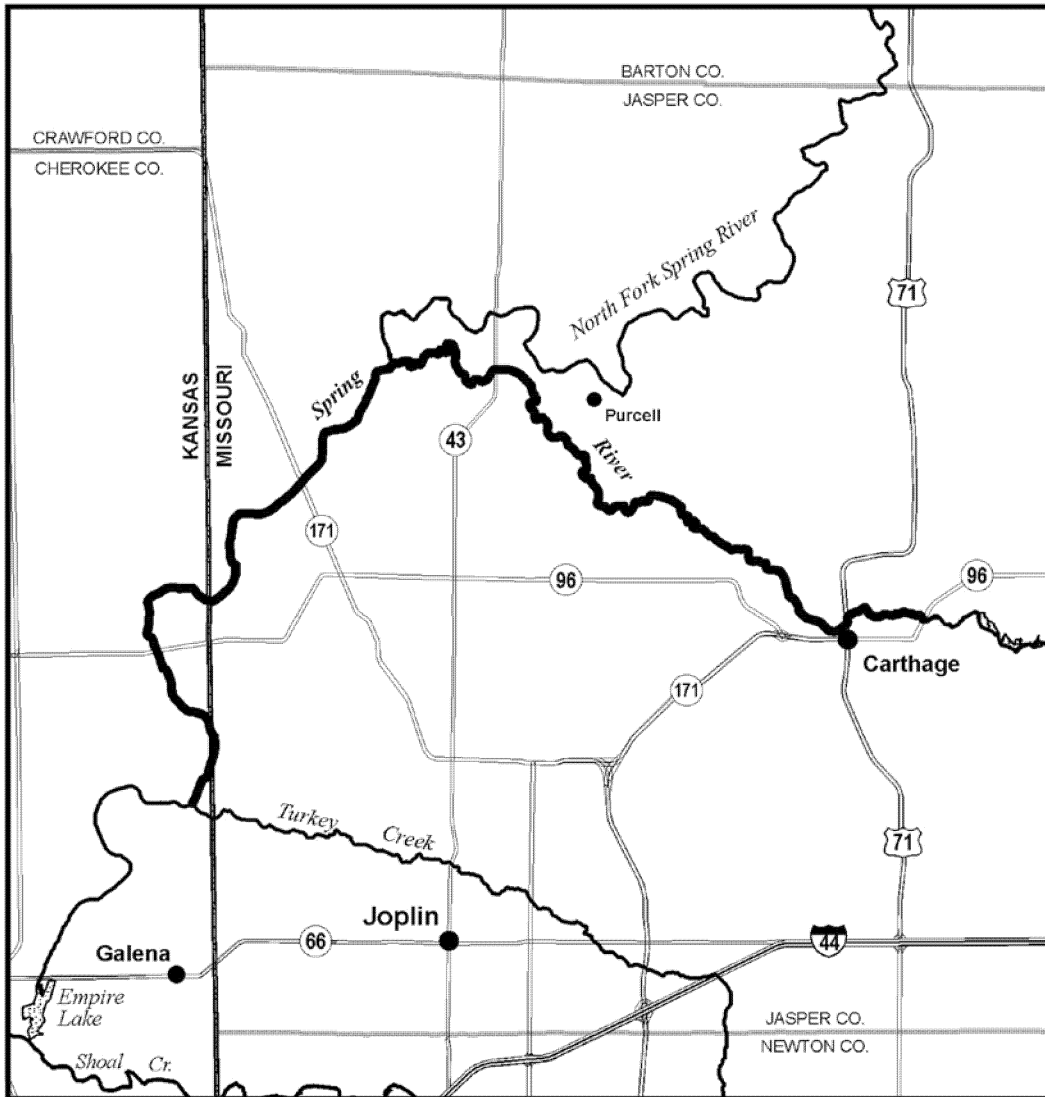
(6) Unit RF1: Spring River—Jasper County, Missouri; and Cherokee County, Kansas.

(i) *General Description:* Unit RF1 includes 56.5 rkm (35.1 rmi) of the Spring River from Missouri Highway 96 at Carthage, Jasper County, Missouri,

downstream to the confluence of Turkey Creek north of Empire, Cherokee County, Kansas.

(ii) Map of Unit RF1 follows:

Map of Unit RF1 (Spring River) of critical habitat for Rabbitsfoot



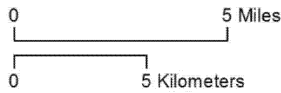
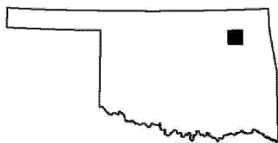
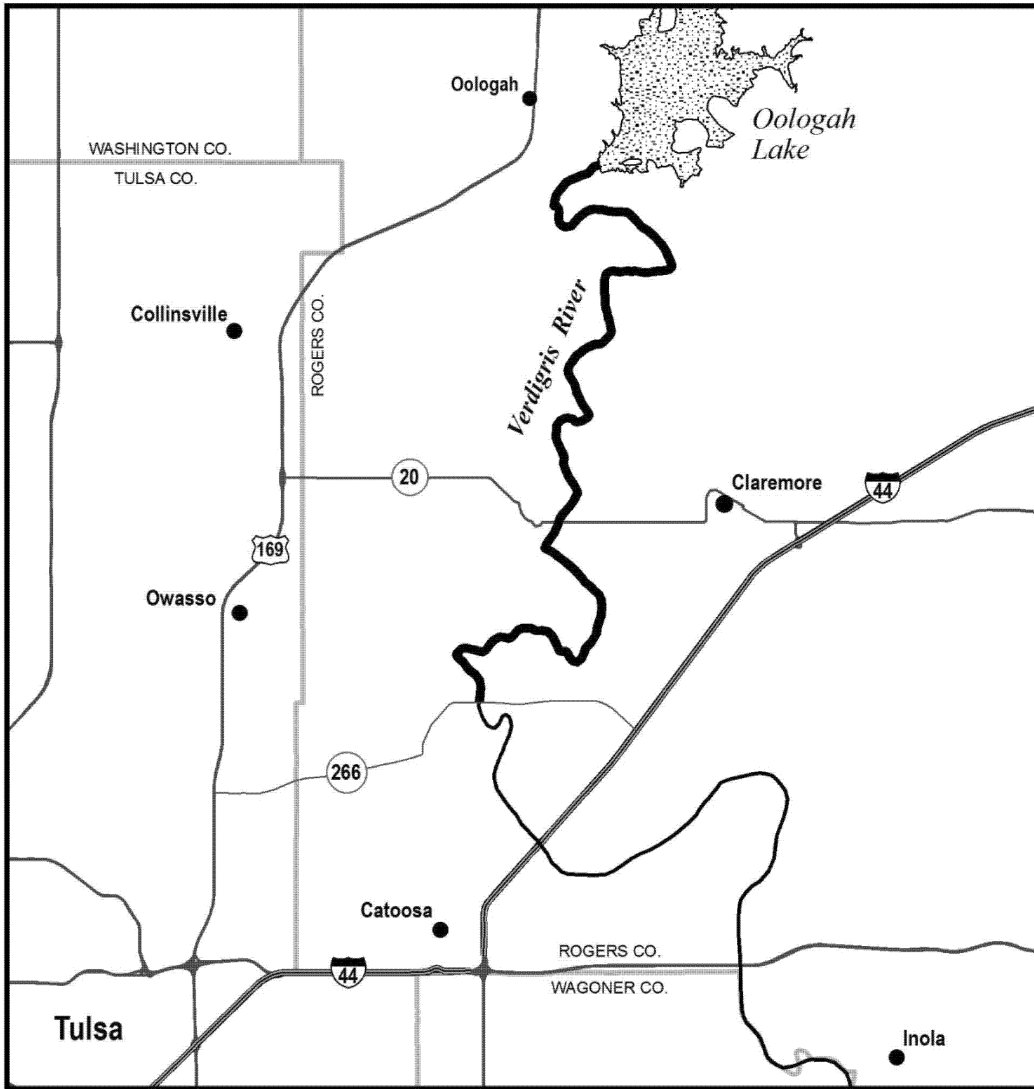
(7) Unit RF2: Verdigris River—Rogers County, Oklahoma.  
 (i) *General Description:* Unit RF2 includes 38.0 rkm (23.6 rmi) of the

Verdigris River from Oologah Lake dam north of Claremore, Oklahoma, downstream to Oklahoma Highway 266

northwest of Catoosa, Rogers County, Oklahoma.

(ii) Map of Unit RF2 follows:

### Map of Unit RF2 (Verdigris River) of critical habitat for Rabbitsfoot



 Critical Habitat



1:200,000

(8) Unit RF3: Neosho River—Allen County, Kansas.

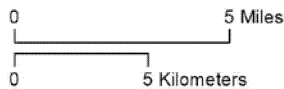
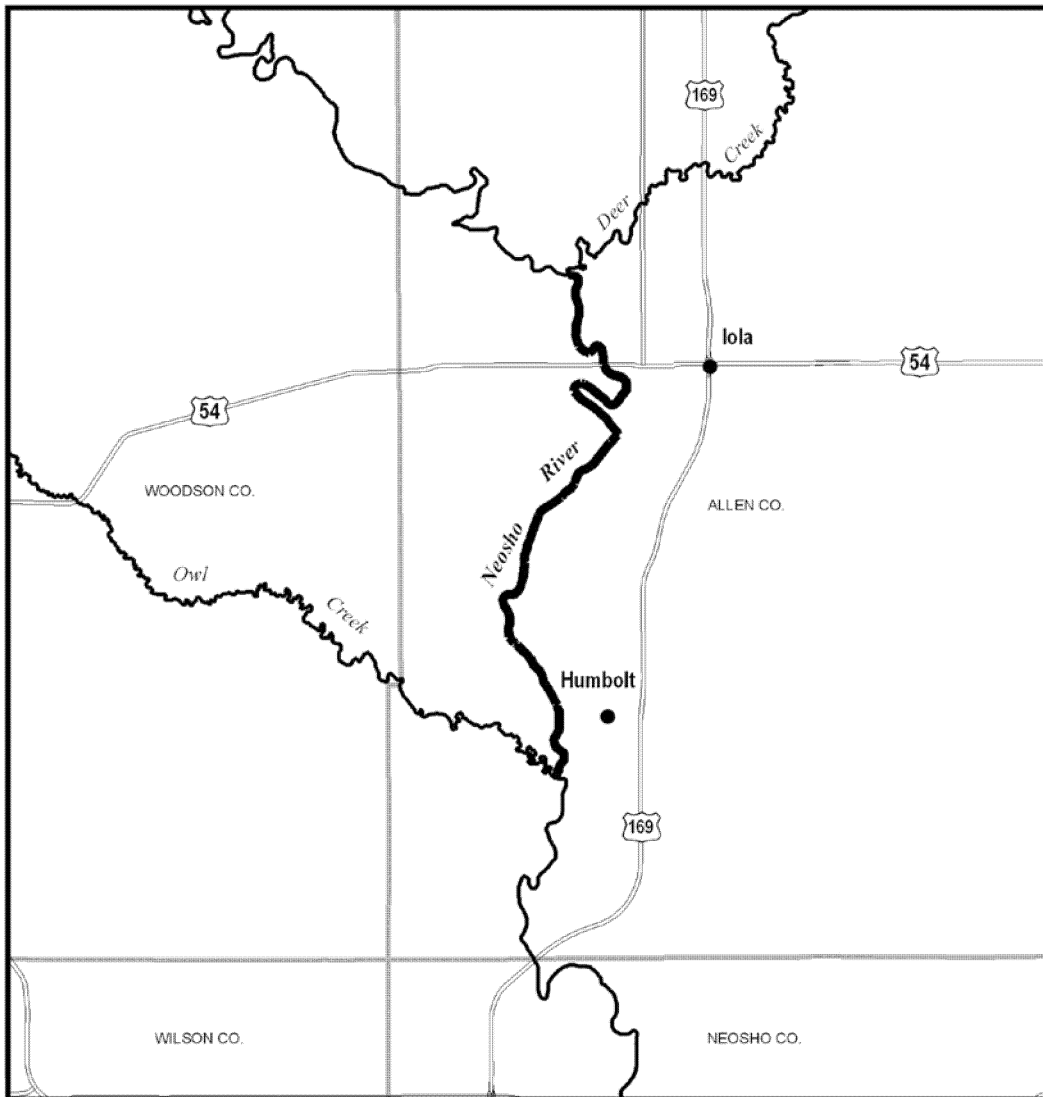
(i) *General Description:* Unit RF3 includes 26.6 rkm (16.5 rmi) of the

Neosho River from the Deer Creek confluence northwest of Iola, Kansas, downstream to the confluence of Owl

Creek southwest of Humboldt, Allen County, Kansas.

(ii) Map of Unit RF3 follows:

Map of Unit RF3 (Neosho River) of critical habitat for Rabbitsfoot



Critical Habitat



1:200,000

(9) Unit RF4a: Ouachita River—Clark and Hot Spring Counties, Arkansas.

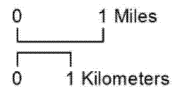
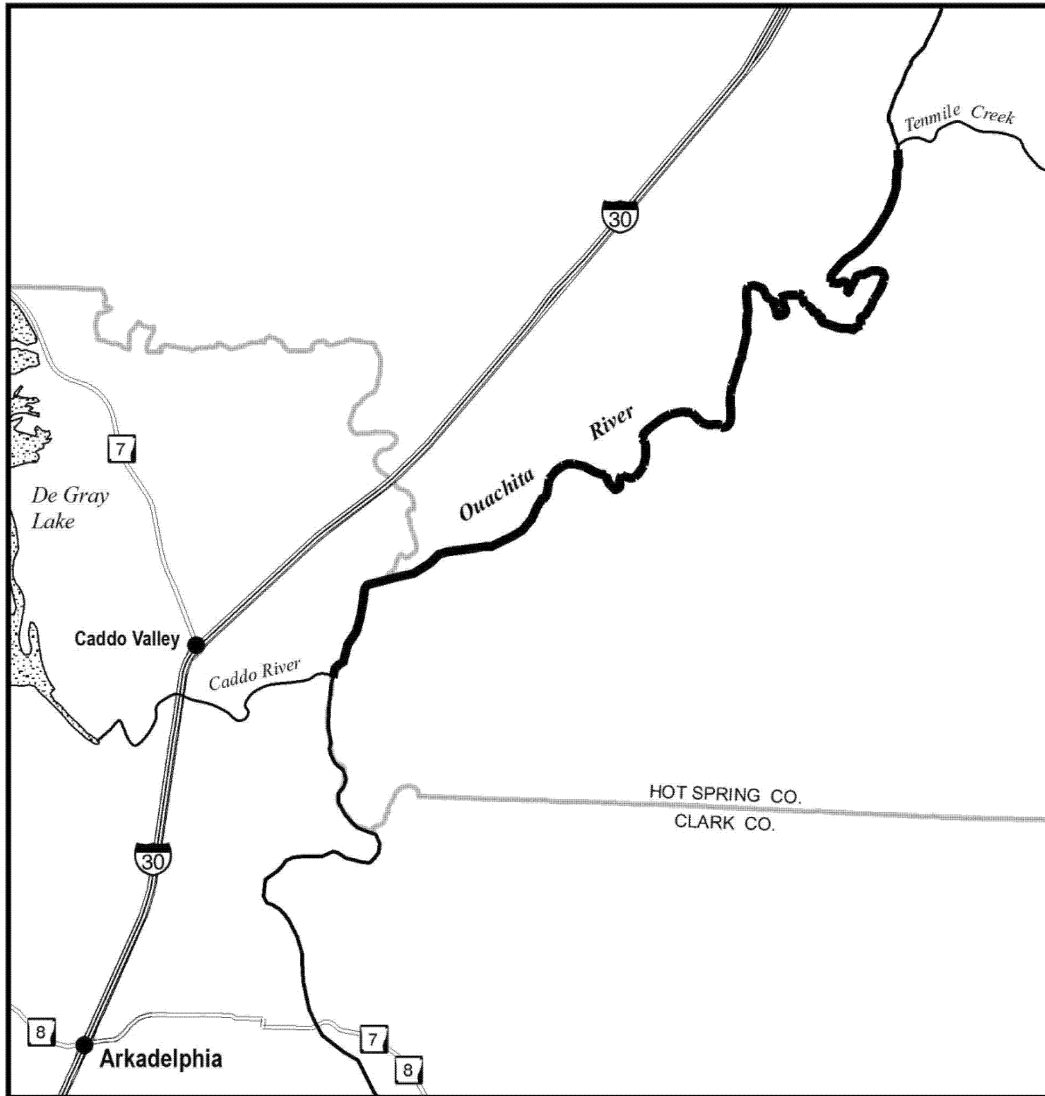
(i) *General Description:* Unit RF4a includes 22.7 rkm (14.1 rmi) of the

Ouachita River from the Tenmile Creek confluence north of Donaldson downstream to the Caddo River

confluence near Caddo Valley, Hot Spring and Clark Counties, Arkansas.

(ii) Map of Unit RF4a follows:

Map of Unit RF4a (Ouachita River) of critical habitat for Rabbitsfoot



~ Critical Habitat



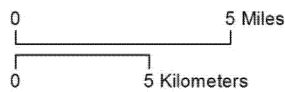
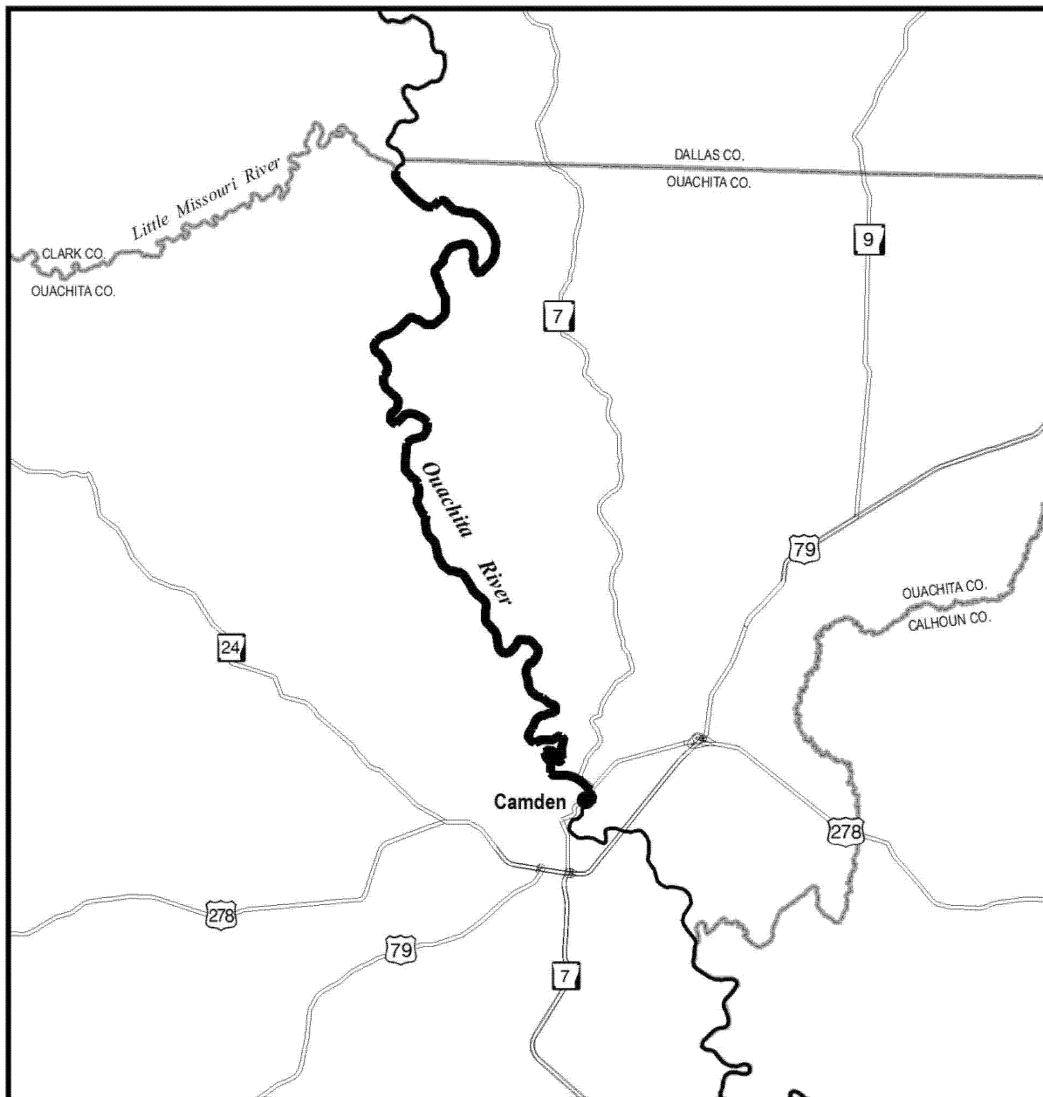
(10) Unit RF4b: Ouachita River—Ouachita County, Arkansas.

(i) *General Description:* Unit RF4b includes 43.0 rkm (26.7 rmi) of the

Ouachita River from the Little Missouri River confluence downstream to U.S. Highway 79 at Camden, Ouachita County, Arkansas.

(ii) Map of Unit RF4b follows:

Map of Unit RF4b (Ouachita River) of critical habitat for Rabbitsfoot



 Critical Habitat



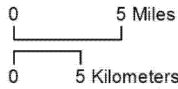
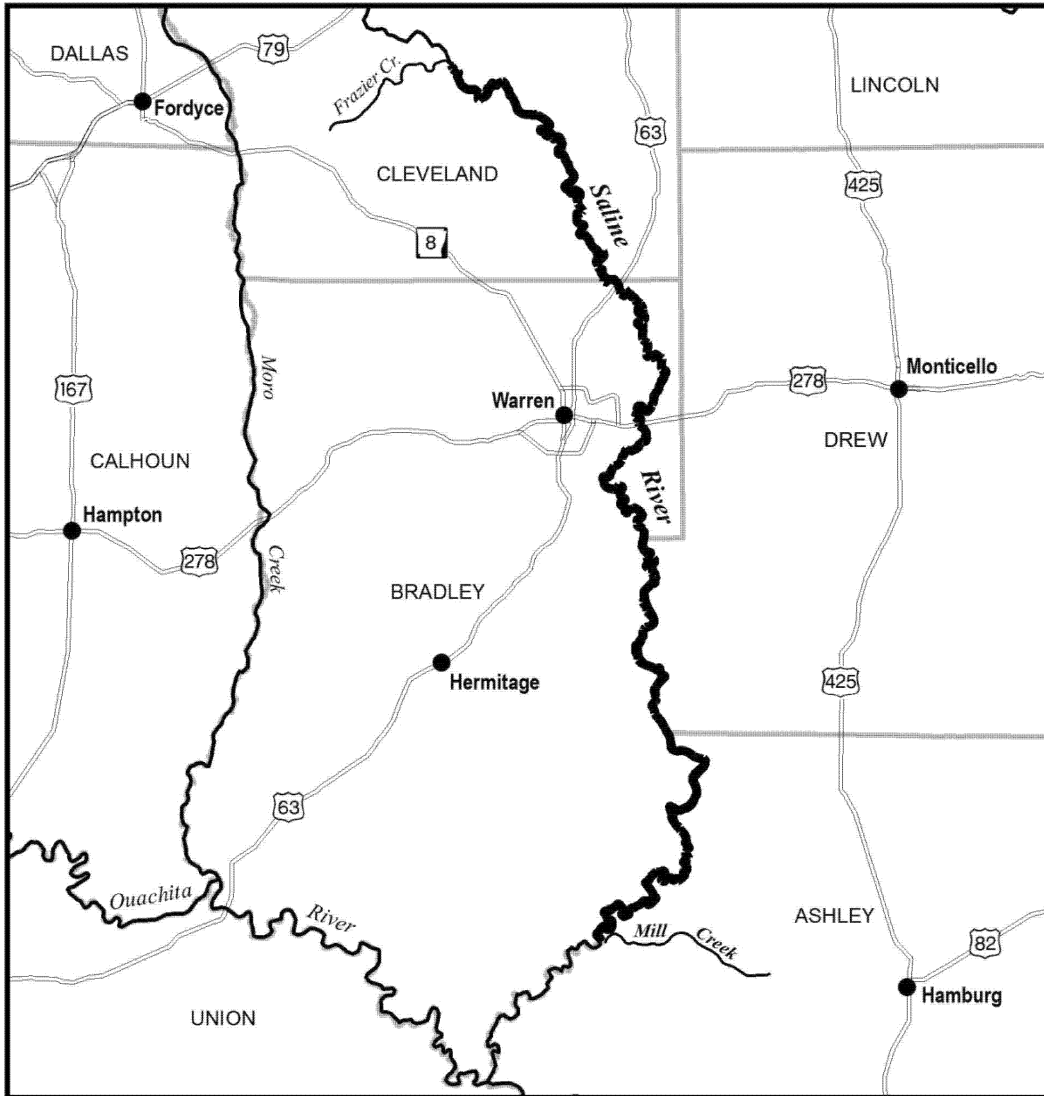
(11) Unit RF5: Saline River—Ashley, Bradley, Cleveland, and Drew Counties, Arkansas.

(i) *General Description:* Unit RF5 includes 119.4 rkm (74.2 rmi) of the Saline River from the Frazier Creek confluence near Mount Elba, Cleveland

County, Arkansas, to the Mill Creek confluence near Stillions, Ashley and Bradley Counties, Arkansas.

(ii) Map of Unit RF5 follows:

### Map of Unit RF5 (Saline River) of critical habitat for Rabbitsfoot



(12) Unit RF6: Little River—  
 McCurtain County, Oklahoma; and  
 Little River and Sevier Counties,  
 Arkansas.

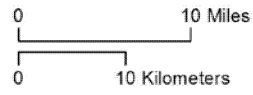
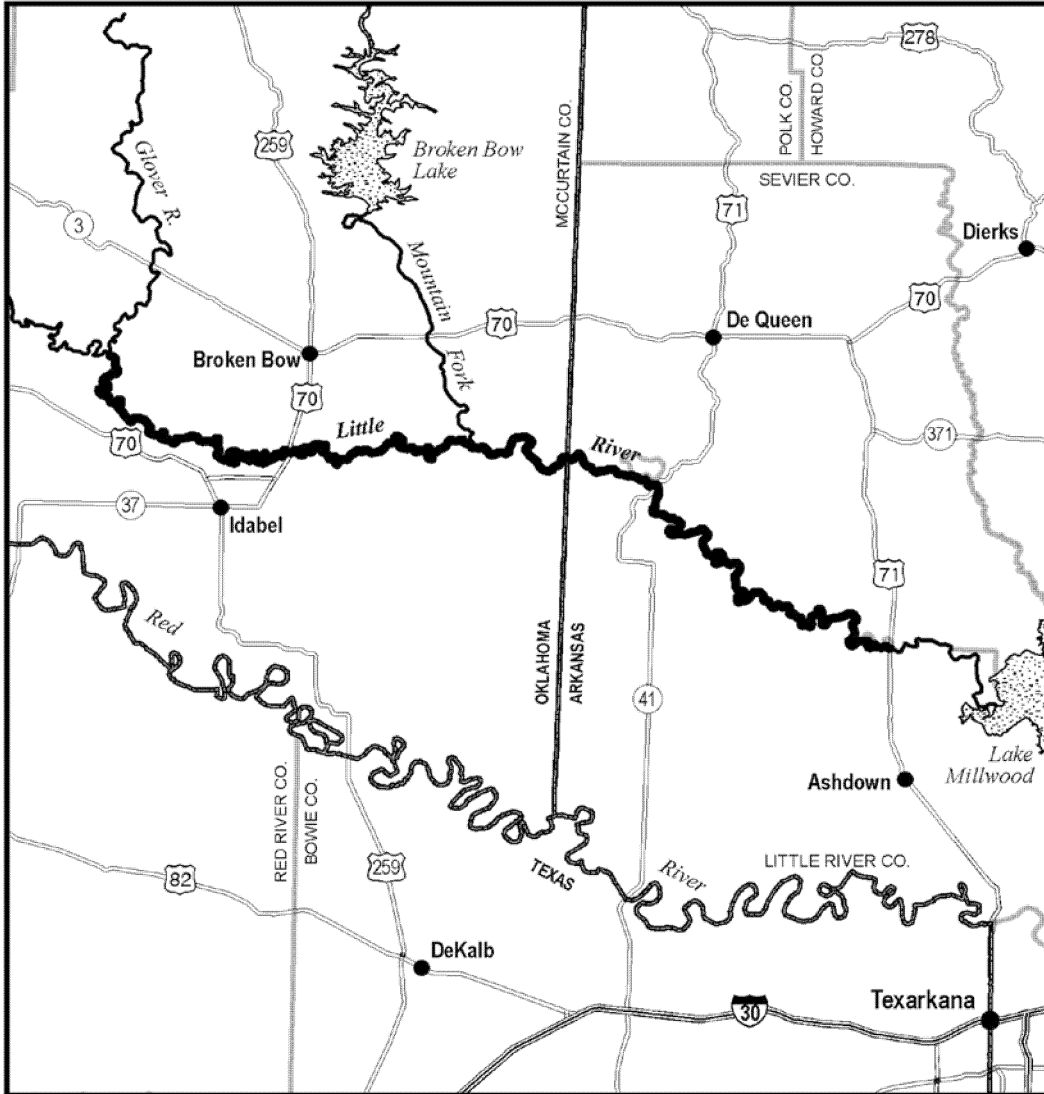
(i) *General Description:* Unit RF6  
 includes 139.7 rkm (86.8 rmi) of the  
 Little River from the Glover River  
 confluence northwest of Idabel,  
 McCurtain County, Oklahoma,

downstream to U.S. Highway 71 north  
 of Wilton, Little River and Sevier  
 Counties, Arkansas.



(ii) Map of Unit RF6 follows:

Map of Unit RF6 (Little River) of critical habitat for Rabbitsfoot



~ Critical Habitat



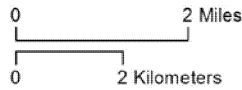
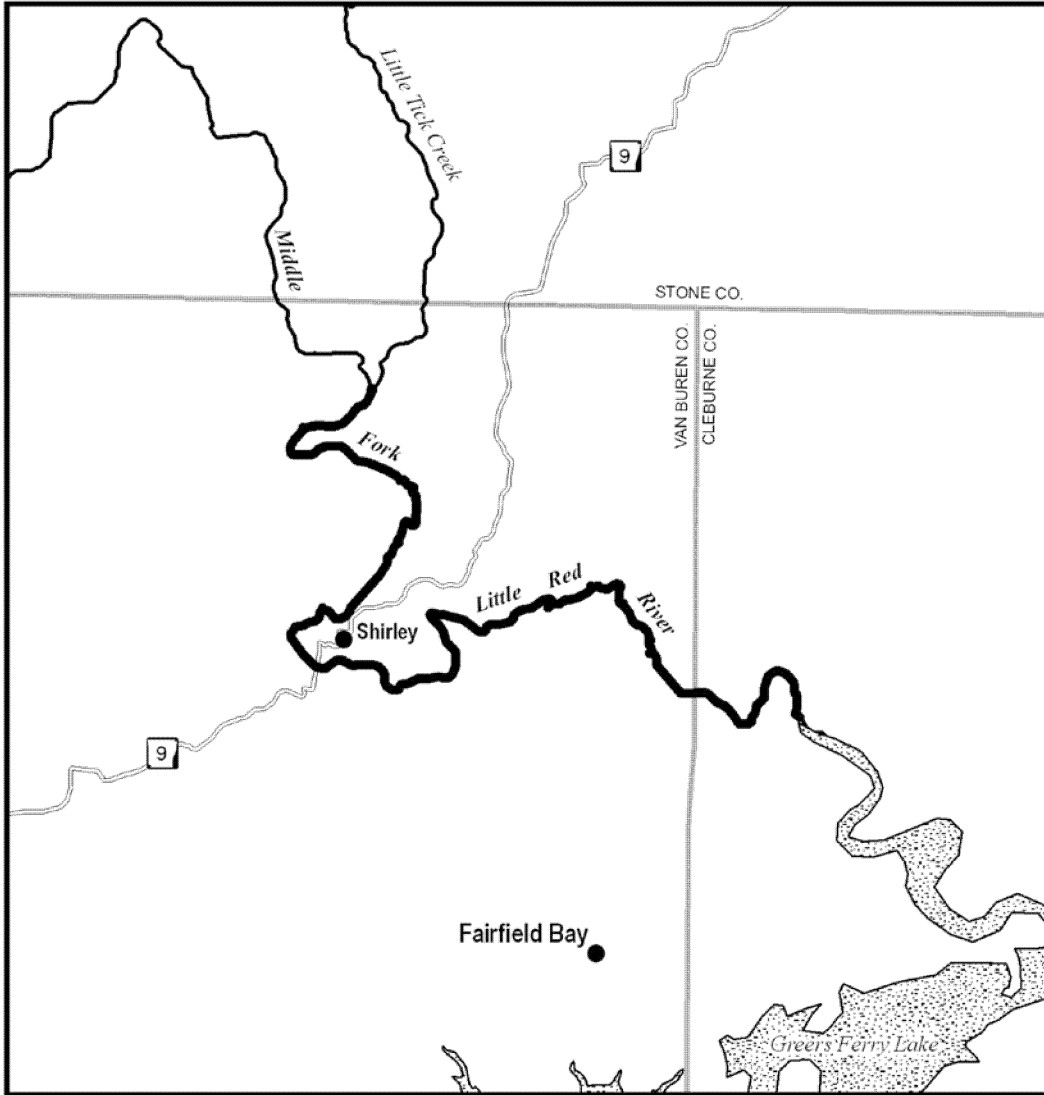
(13) Unit RF7: Middle Fork Little Red River—Cleburne and Van Buren Counties, Arkansas.  
 (i) *General Description:* Unit RF7 includes 24.8 rkm (15.4 rmi) of the

Middle Fork Little Red River from the confluence of Little Tick Creek north of Shirley, Arkansas, downstream to Greers Ferry Reservoir (where

inundation begins), Van Buren County, Arkansas.

(ii) Map of Unit RF7 follows:

Map of Unit RF7 (Middle Fork Little Red River) of critical habitat for Rabbitsfoot



(14) Unit RF8a: White River— Independence, Jackson, White, and Woodruff Counties, Arkansas.

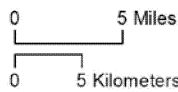
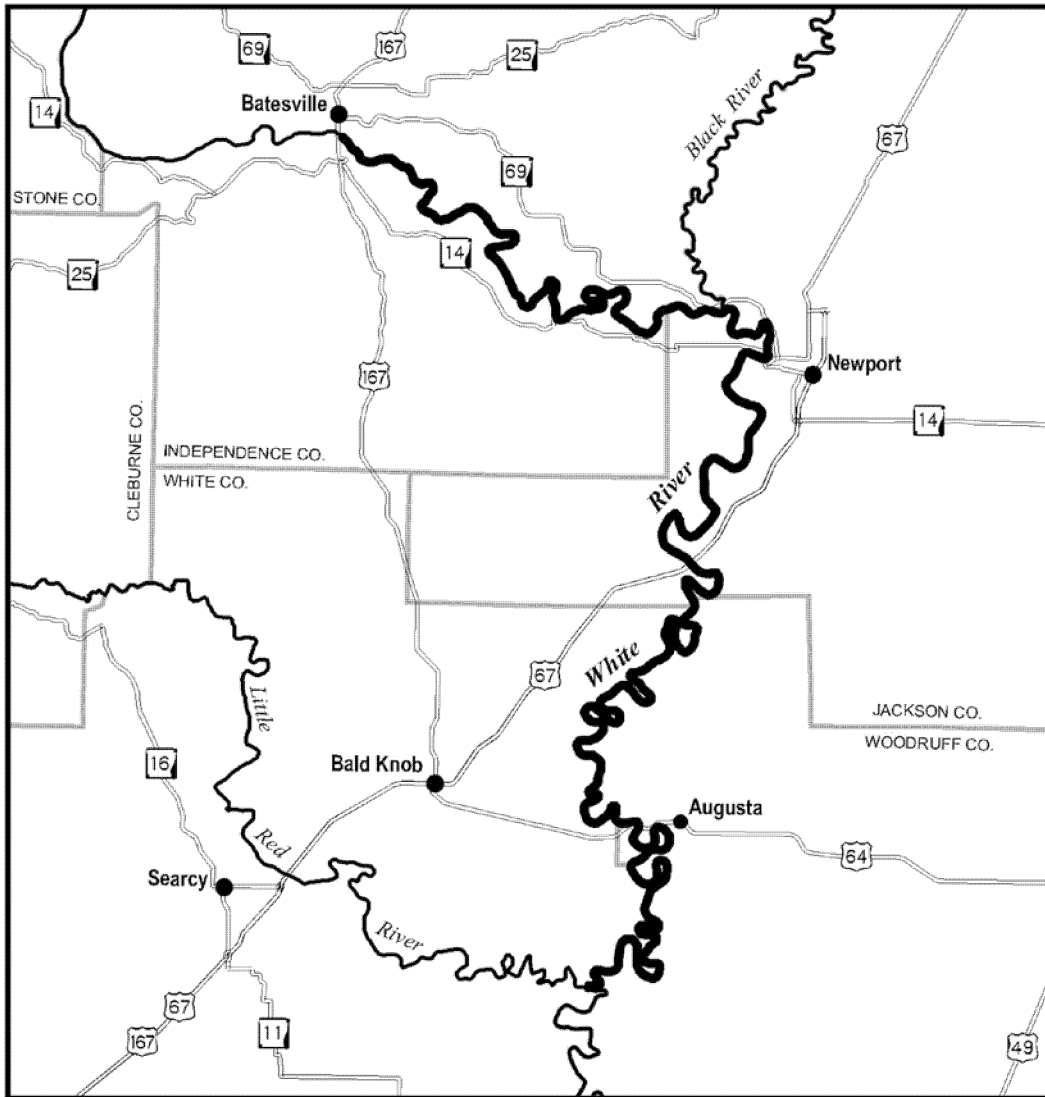
(i) *General Description:* Unit RF8a includes 188.3 rkm (117.0 rmi) of the

White River from the Batesville Dam at Batesville, Independence County, Arkansas, downstream to the Little Red River confluence north of Georgetown,

White, and Woodruff Counties, Arkansas.

(ii) Map of Unit RF8a follows:

Map of Unit RF8a (White River) of critical habitat for Rabbitsfoot



~ Critical Habitat



1:400,000

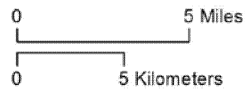
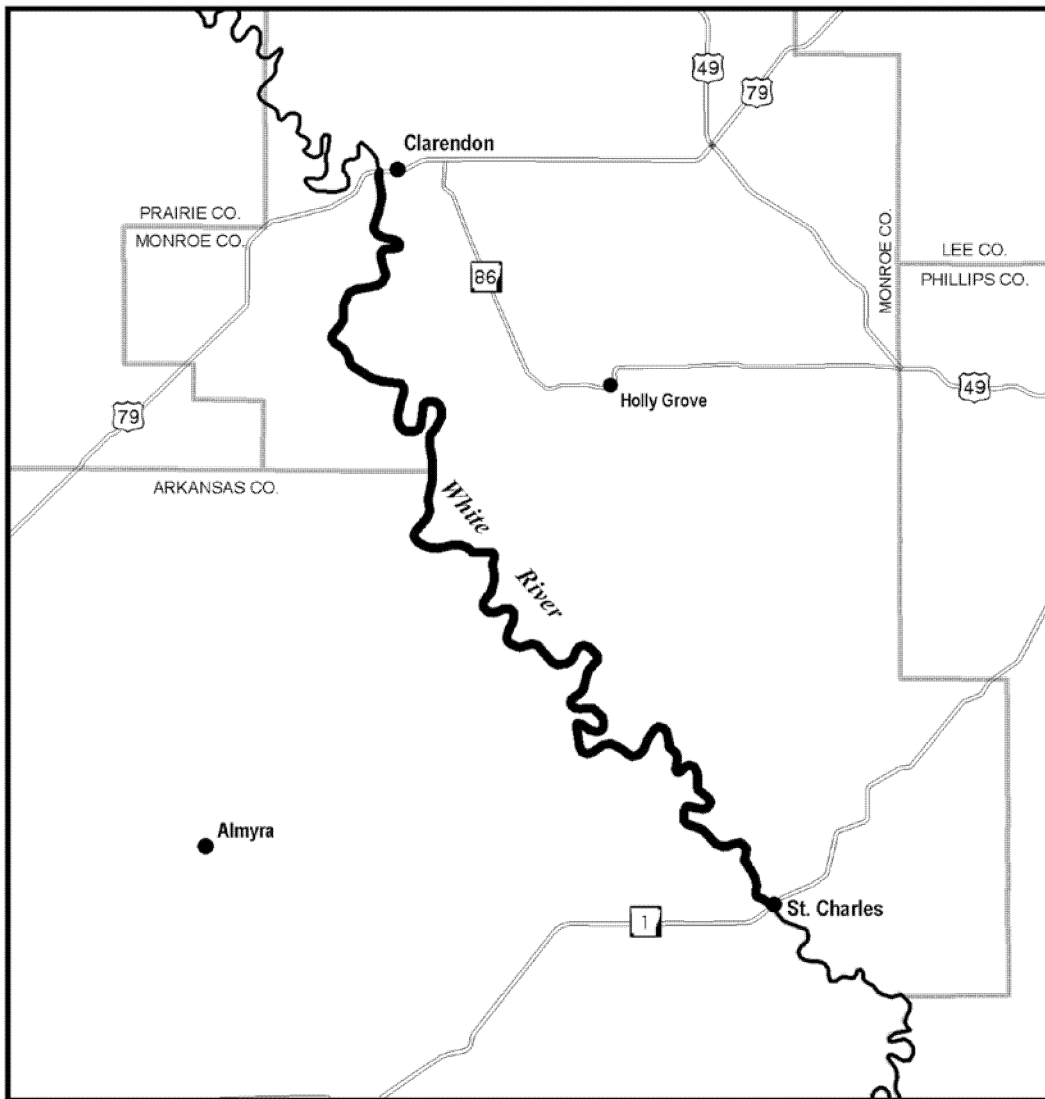
(15) Unit RF8b: White River—Arkansas and Monroe Counties, Arkansas.

(i) *General Description:* Unit RF8b includes 68.9 rkm (42.8 rmi) of the White River from U.S. Highway 79 at Clarendon, Monroe County, Arkansas,

downstream to Arkansas Highway 1 near St. Charles, Arkansas County, Arkansas.

(ii) Map of Unit RF8b follows:

Map of Unit RF8b (White River) of critical habitat for Rabbitsfoot



~ Critical Habitat



1:250,000

(16) Unit RF9: Black River—Lawrence and Randolph Counties, Arkansas.

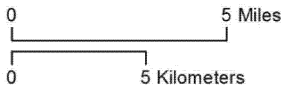
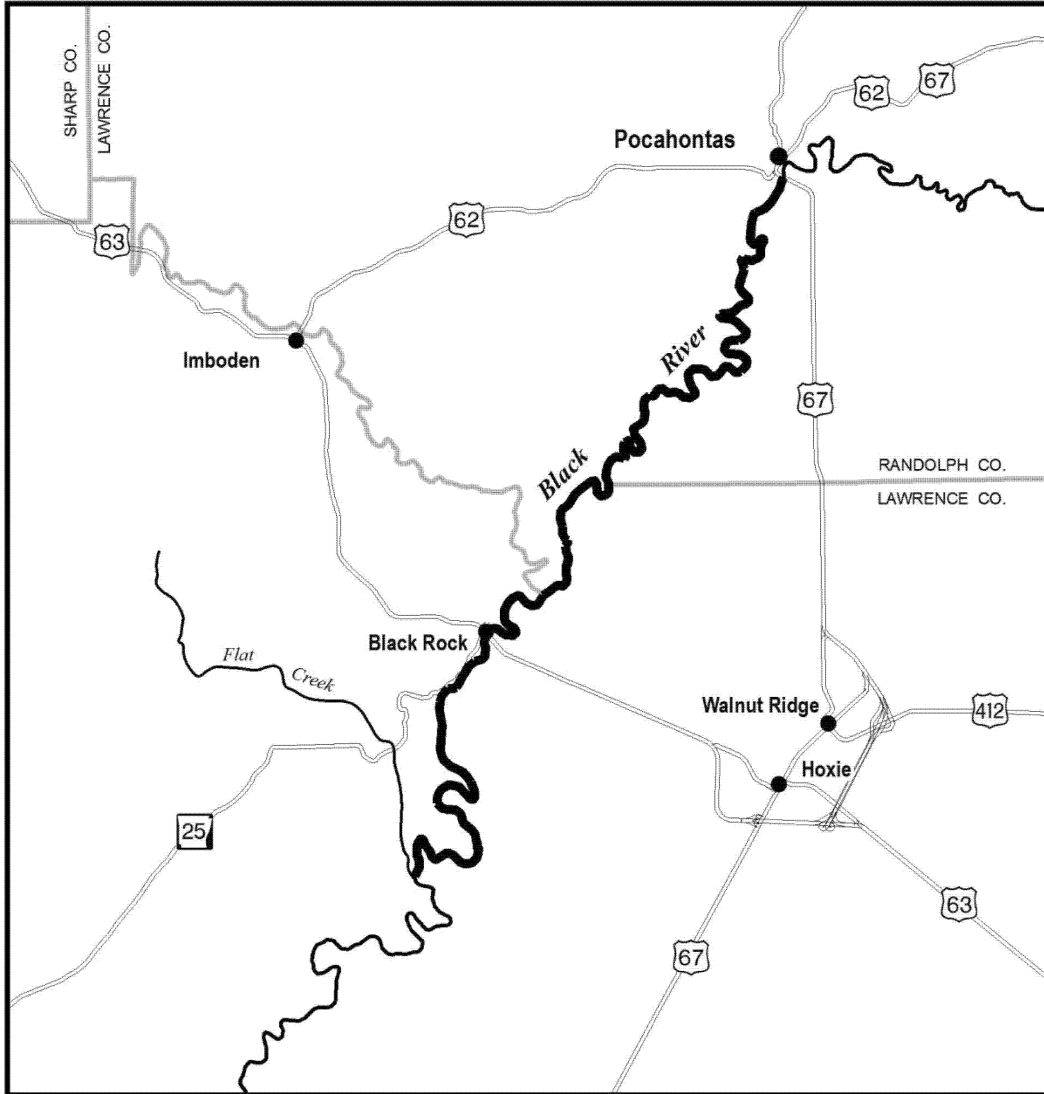
(i) *General Description:* Unit RF9 includes 51.2 rkm (31.8 rmi) of the

Black River from U.S. Highway 67 at Pocahontas, Randolph County, Arkansas, downstream to the Flat Creek

confluence southeast of Powhatan, Lawrence County, Arkansas.

(ii) Map of Unit RF9 follows:

Map of Unit RF9 (Black River) of critical habitat for Rabbitsfoot



 Critical Habitat



1:200,000

(17) Unit RF10: Spring River—Lawrence, Randolph, and Sharp Counties, Arkansas.

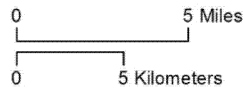
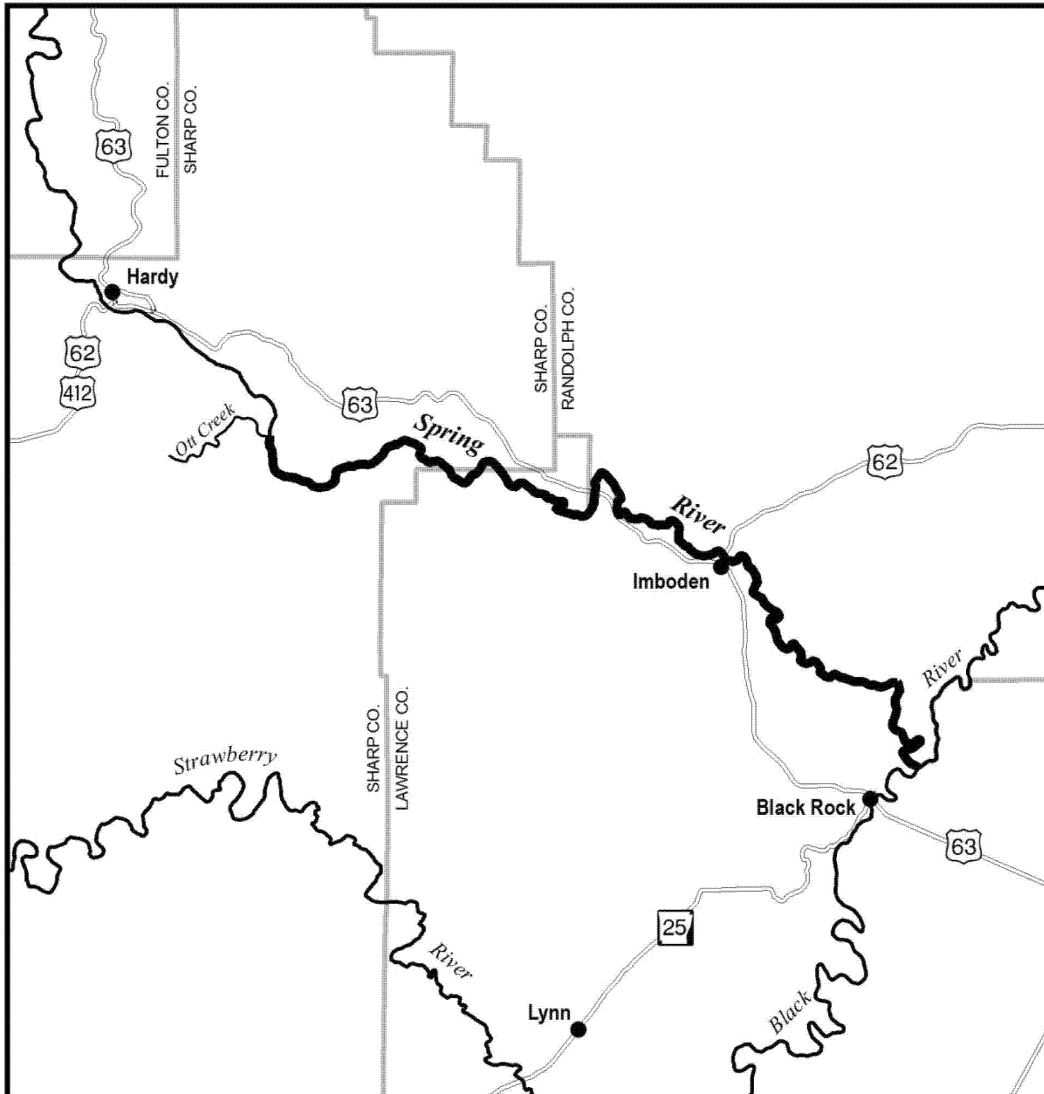
(i) *General Description:* Unit RF10 includes 51.5 rkm (32.0 rmi) of the

Spring River from the Ott Creek confluence southwest of Hardy in Sharp County, Arkansas, downstream to its confluence with the Black River east of

Black Rock, Lawrence and Randolph Counties, Arkansas.

(ii) Map of Unit RF10 follows:

Map of Unit RF10 (Spring River) of critical habitat for Rabbitsfoot



 Critical Habitat



1:250,000

(18) Unit RF11: Strawberry River—Independence, Izard, Lawrence, and Sharp Counties, Arkansas.

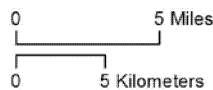
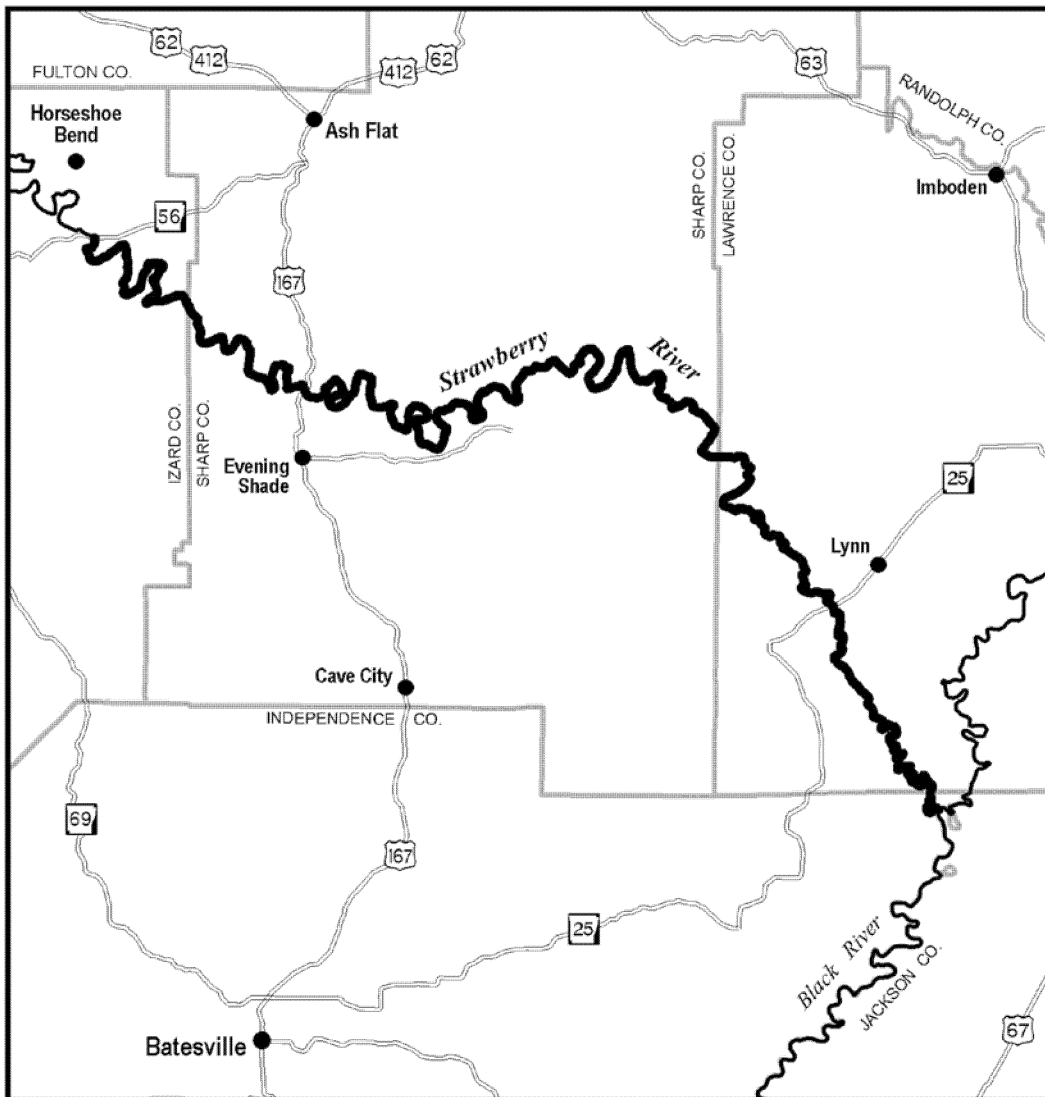
(i) *General Description:* Unit RF11 includes 123.8 rkm (76.9 rmi) of the

Strawberry River from Arkansas Highway 56 south of Horseshoe Bend, Izard County, Arkansas, downstream to its confluence with the Black River

southeast of Strawberry, Lawrence County, Arkansas.

(ii) Map of Unit RF11 follows:

Map of Unit RF11 (Strawberry River) of critical habitat for Rabbitsfoot



 Critical Habitat



(19) Unit RF12: Buffalo River—Marion, Newton, and Searcy Counties, Arkansas.

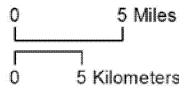
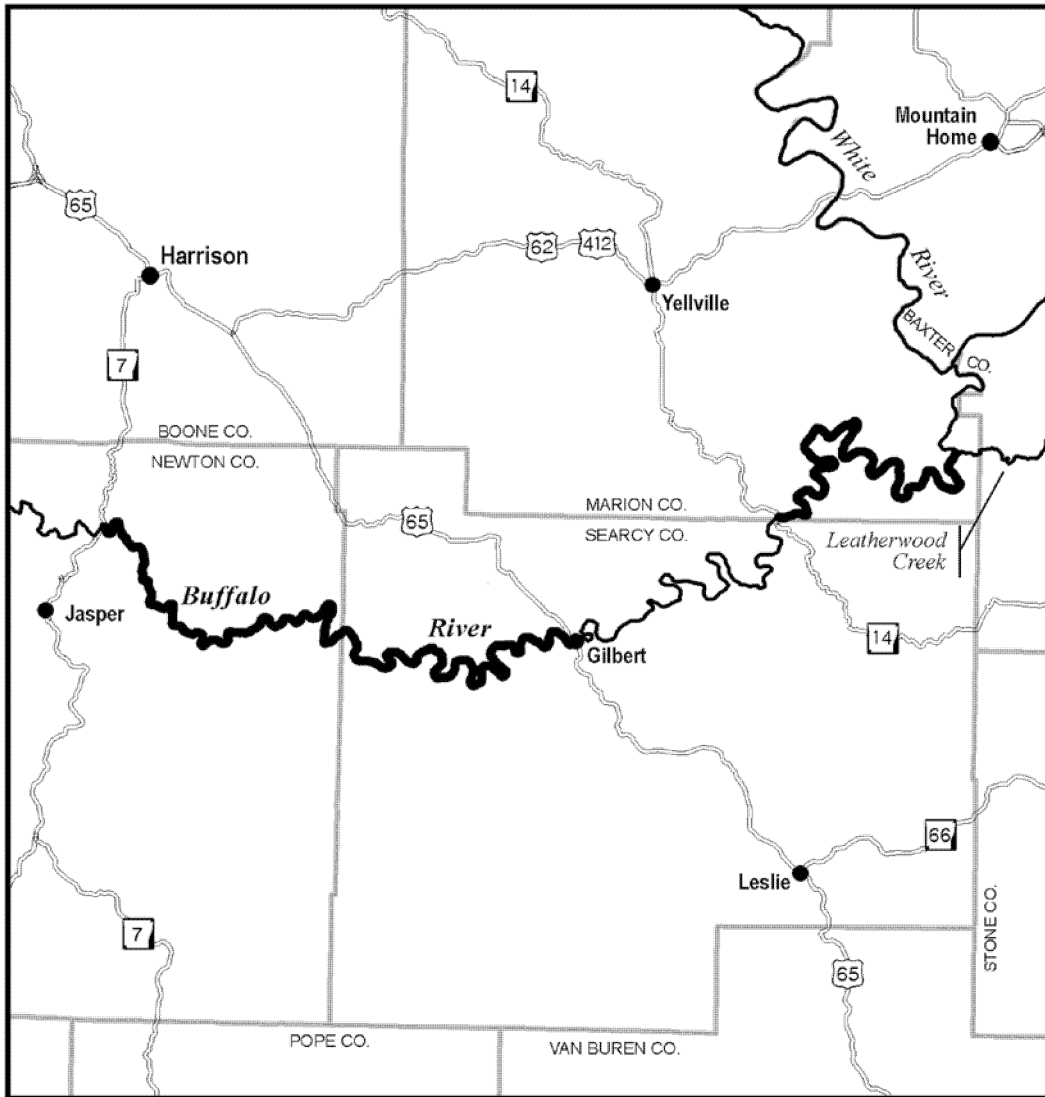
(i) *General Description:* Unit RF12 includes 113.6 rkm (70.6 rmi) of the Buffalo River from the Cove Creek

confluence southeast of Erbie, Newton County, Arkansas, downstream to U.S. Highway 65 west of Gilbert, Searcy County, Arkansas, and Arkansas Highway 14 southeast of Mull, Arkansas, downstream to the

Leatherwood Creek confluence in the Lower Buffalo Wilderness Area, Arkansas.

(ii) Map of Unit RF12 follows:

Map of Unit RF12 (Buffalo River) of critical habitat for Rabbitsfoot



 Critical Habitat



(20) Unit RF13: St. Francis River—  
Madison and Wayne Counties, Missouri.

(i) *General Description:* Unit RF13 includes 64.3 rkm (40.0 rmi) of the St.

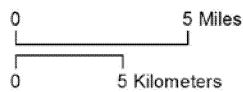
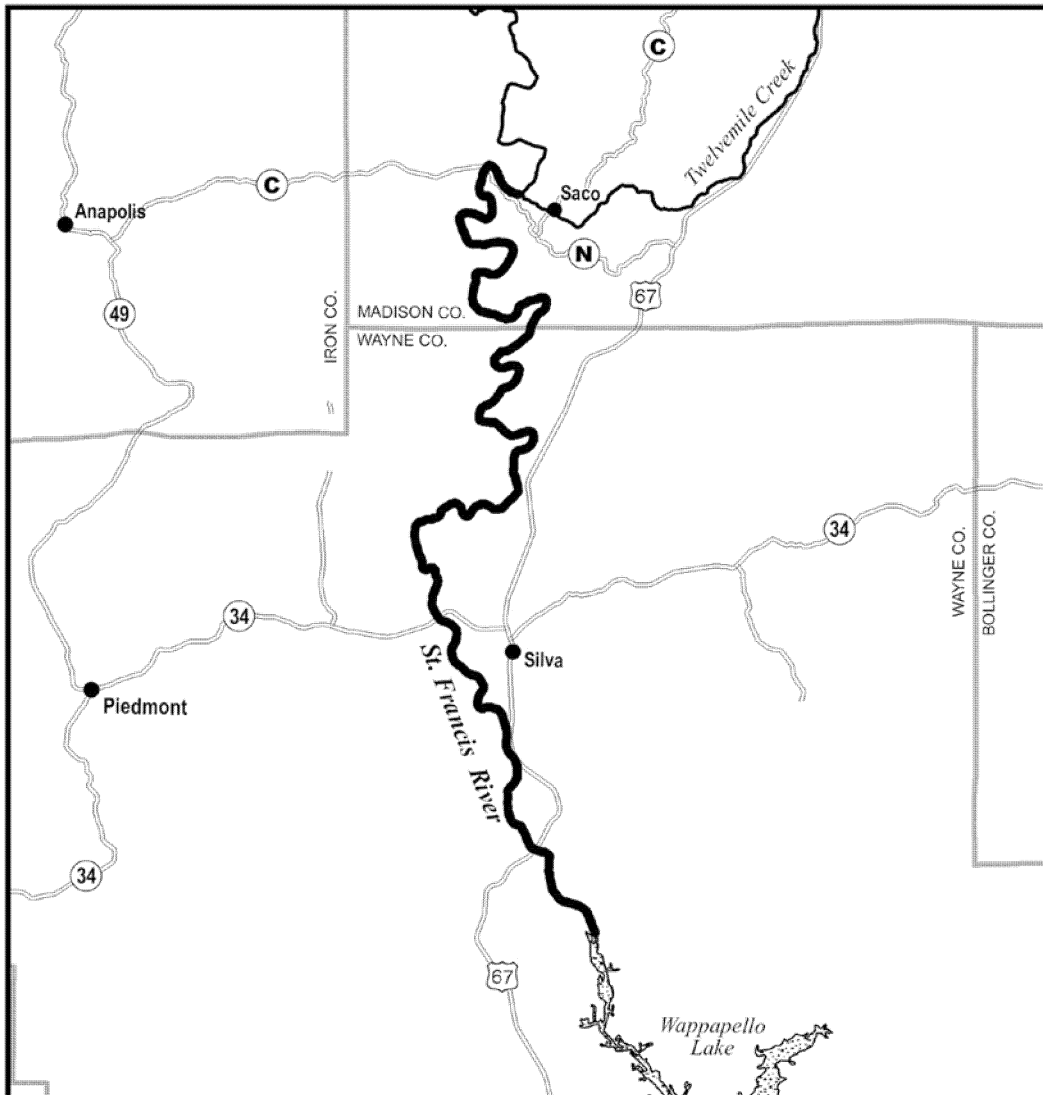
Francis River from the Twelvemile Creek confluence west of Saco, Madison County, Missouri, downstream to Lake

Wappello (where inundation begins), Wayne County, Missouri.



(ii) Map of Unit RF13 follows:

Map of Unit RF13 (St. Francis River) of critical habitat for Rabbitsfoot



 Critical Habitat



(21) Unit RF14: Big Sunflower River—  
Sunflower County, Mississippi.

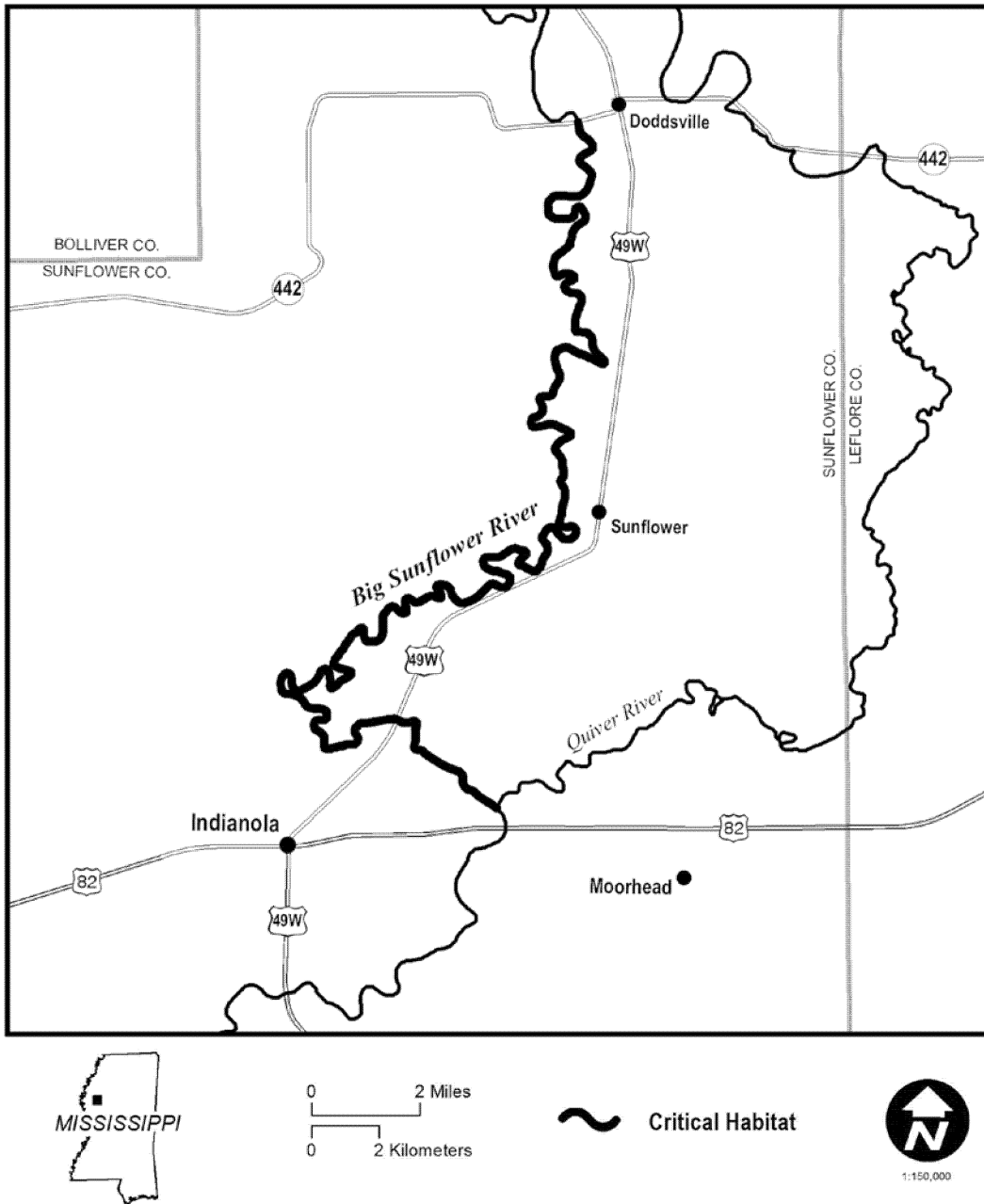
(i) *General Description:* Unit RF14  
includes 51.5 rkm (32.0 rmi) of the Big

Sunflower River from Mississippi  
Highway 442 west of Doddsville,  
Mississippi, downstream to the Quiver

River confluence east of Indianola,  
Sunflower County, Mississippi.

(ii) Map of Unit RF14 follows:

Map of Unit RF14 (Big Sunflower River) of critical habitat for Rabbitsfoot



(22) Unit RF15: Bear Creek—Tishomingo County, Mississippi; and Colbert County, Alabama.

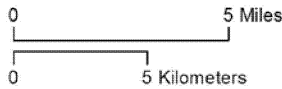
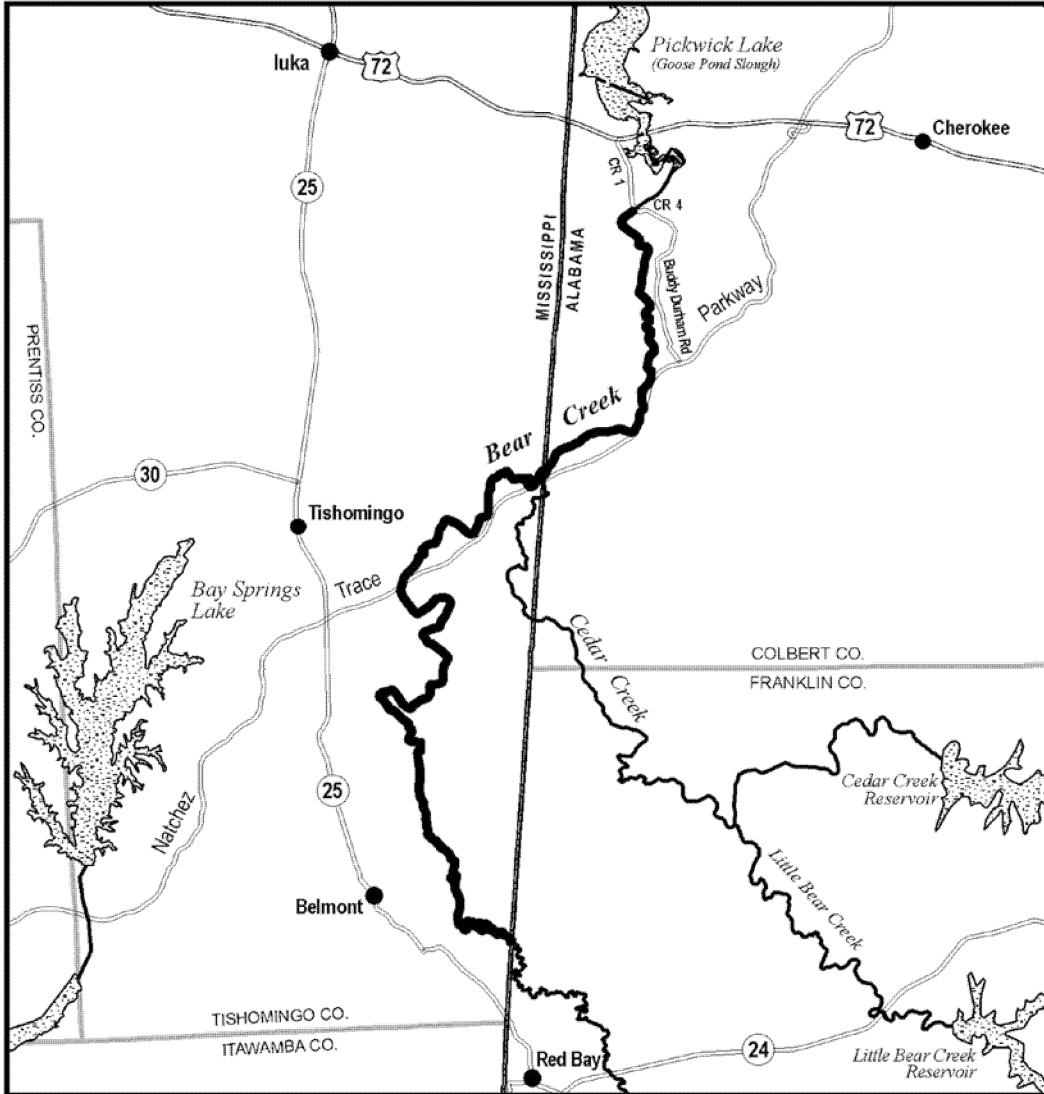
(i) *General Description:* Unit RF15 includes 49.7 rkm (30.9 rmi) of Bear


Creek from the Alabama and Mississippi State line east of Golden, Tishomingo County, Mississippi, downstream to Alabama County Road 4 southwest of

Sutton Hill, Colbert County, Alabama (just upstream of Pickwick Lake).

(ii) Map of Unit RF15 follows:

Map of Unit RF15 (Bear Creek) of critical habitat for Rabbitsfoot



 Critical Habitat



1:200,000

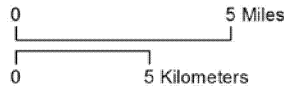
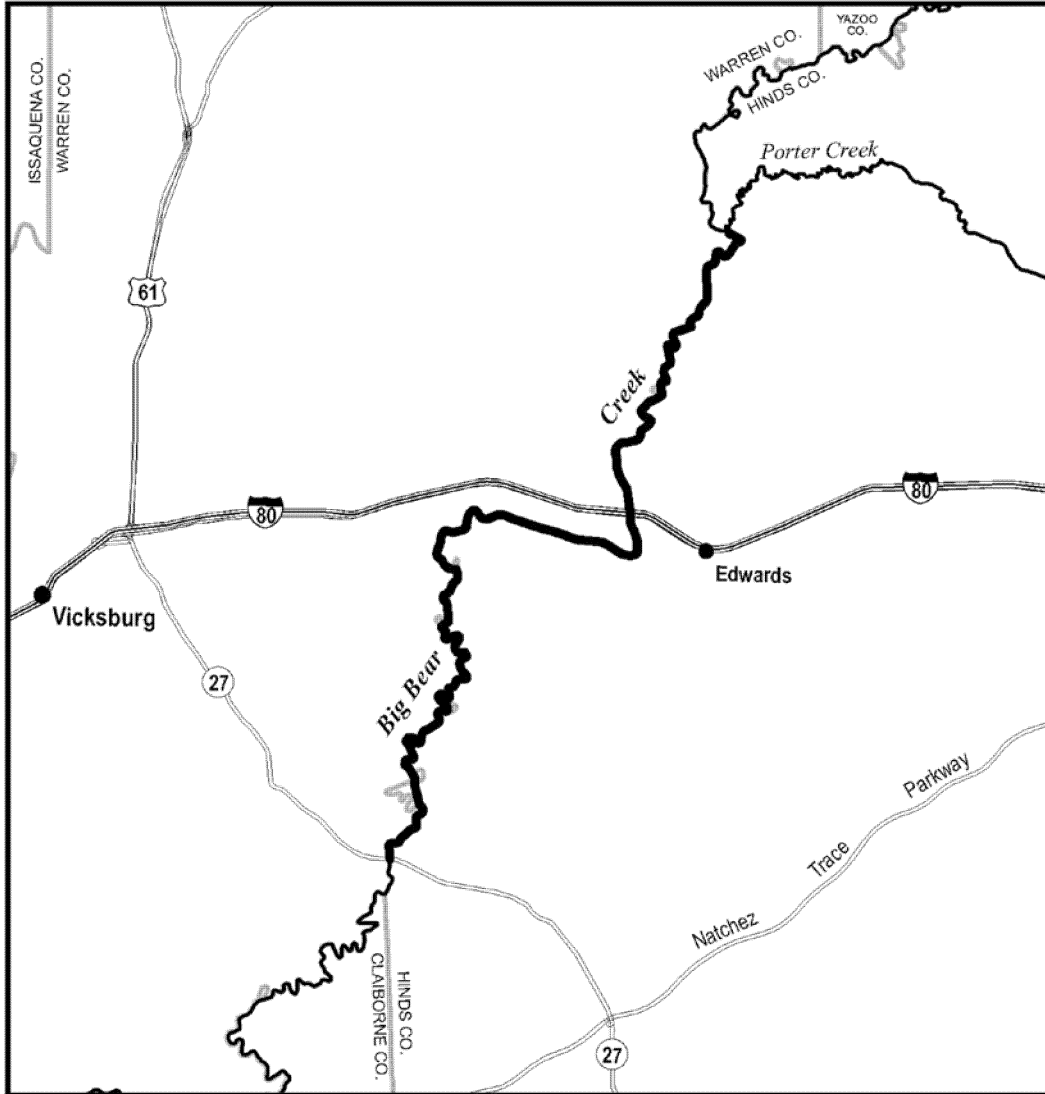
(23) Unit RF16: Big Black River—Hinds and Warren Counties, Mississippi.

(i) *General Description:* Unit RF16 includes 43.3 rkm (26.9 rmi) of the Big Black River from Porter Creek confluence west of Lynchburg, Hinds

County, Mississippi, downstream to Mississippi Highway 27 west of Newman, Warren County, Mississippi.

(ii) Map of Unit RF16 follows:

Map of Unit RF16 (Big Black River) of critical habitat for Rabbitsfoot



~ Critical Habitat



1:200,000

(24) Unit RF17: Paint Rock River— Jackson, Madison, and Marshall Counties, Alabama.

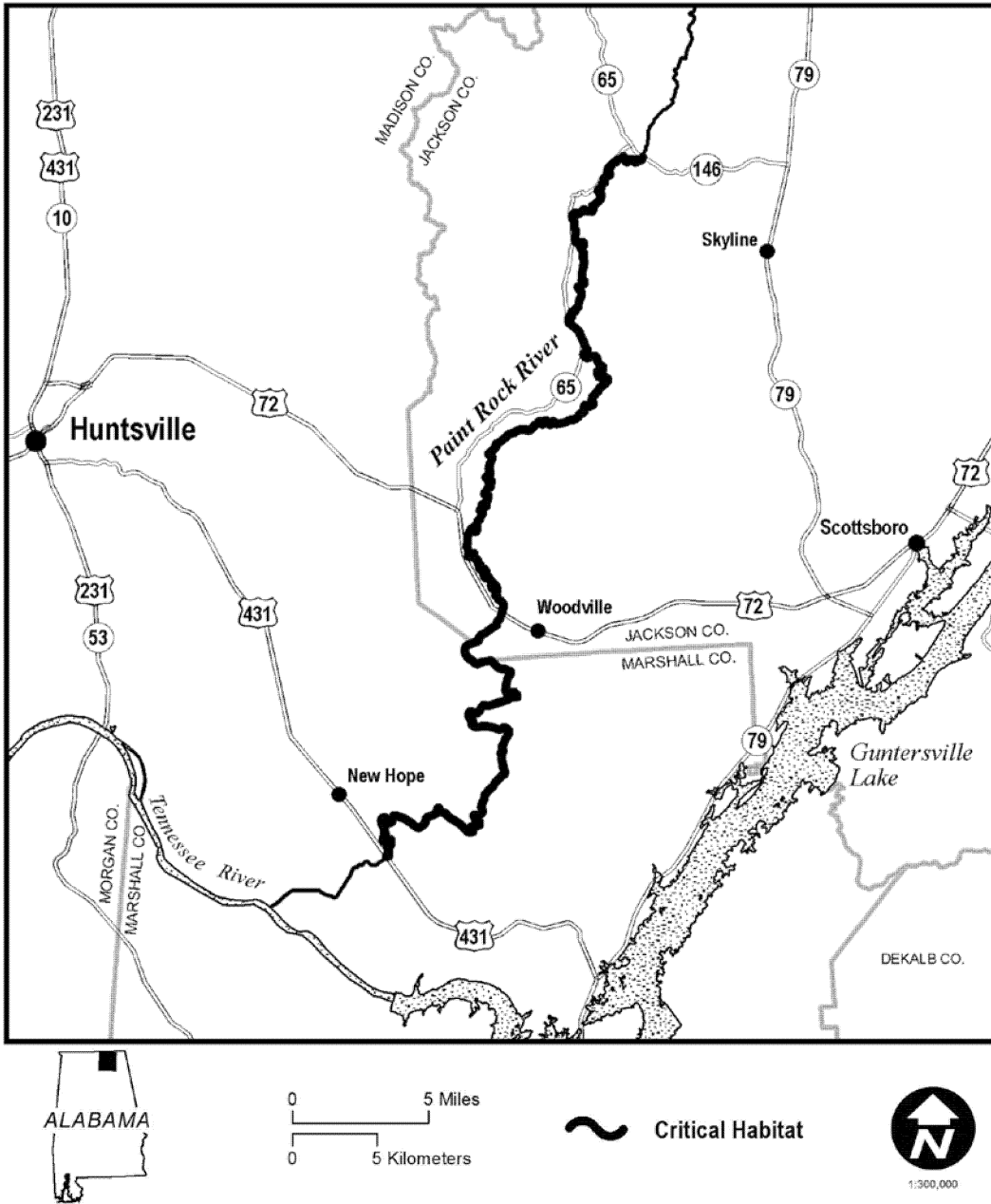
(i) *General Description:* Unit RF17 includes 81.0 rkm (50.3 rmi) of the Paint

Rock River from the convergence of Estill Fork and Hurricane Creek north of Skyline, Jackson County, Alabama, downstream to U.S. Highway 431 south

of New Hope, Madison and Marshall Counties, Alabama.

(ii) Map of Unit RF17 follows:

Map of Unit RF17 (Paint Rock River) of critical habitat for Rabbitsfoot



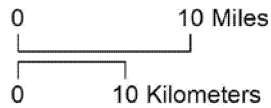
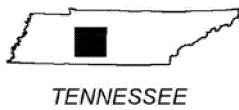
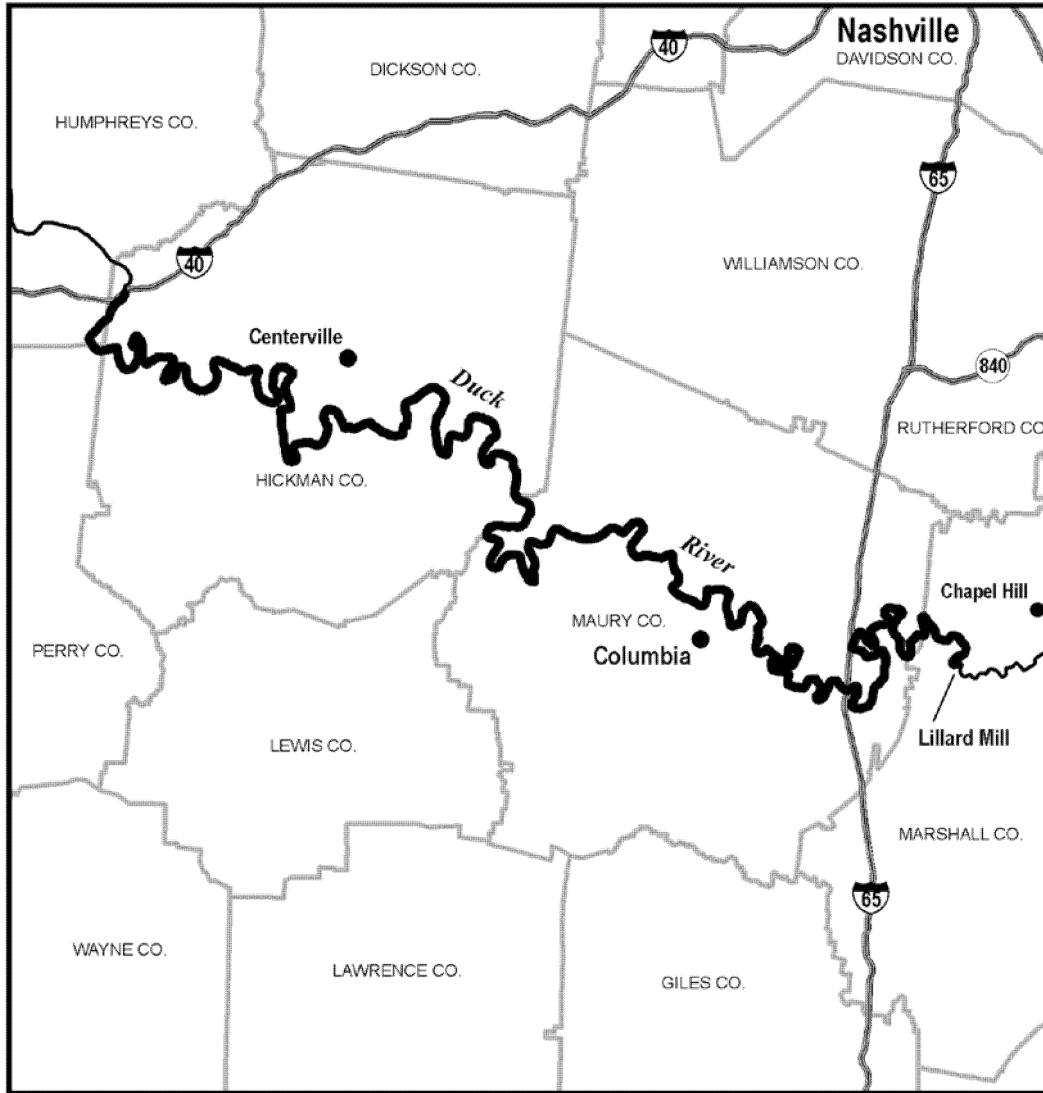
(25) Unit RF18: Duck River—Hickman, Humphreys, Marshall, Maury, and Perry Counties, Tennessee.

(i) *General Description:* Unit RF18 includes 235.3 rkm (146.2 rmi) of the Duck River from Lillard Mill (rkm 288.1; rmi 179) west of Tennessee Highway

272, Marshall County, Tennessee, downstream to Interstate 40 near Bucksport, Hickman County, Tennessee.

(ii) Map of Unit RF18 follows:

Map for Unit RF18 (Duck River) of critical habitat for Rabbitsfoot



Critical Habitat



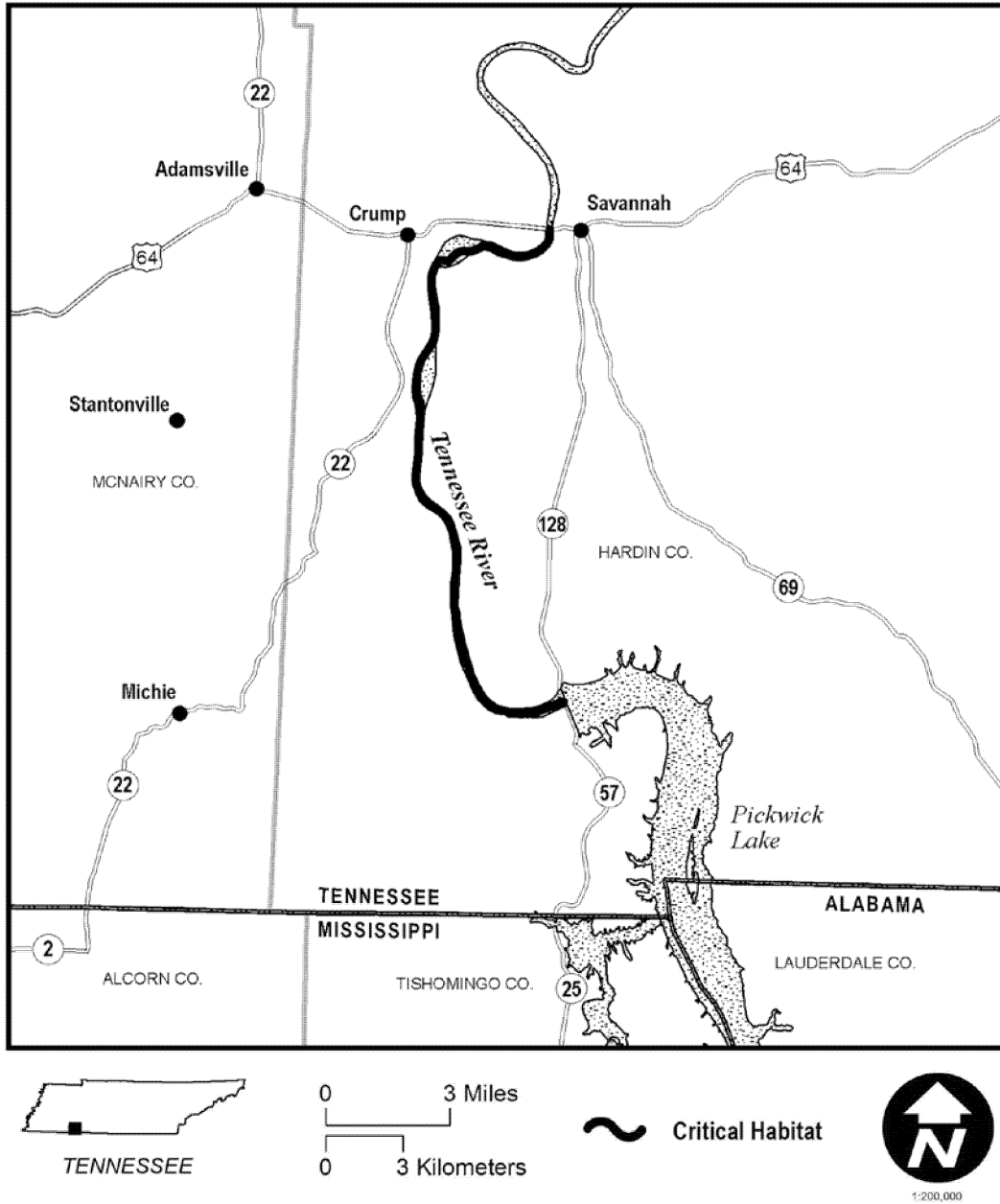
(26) Unit RF19a: Tennessee River—Hardin County, Tennessee.

(i) *General Description:* Unit RF19a includes 26.7 rkm (16.6 rmi) of the

Tennessee River from Pickwick Lake Dam downstream to U.S. Highway 64 near Adamsville, Hardin County, Tennessee.

(ii) Map of Unit RF19a follows:

Map for Unit RF19a (Tennessee River) of critical habitat for Rabbitsfoot



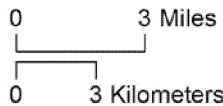
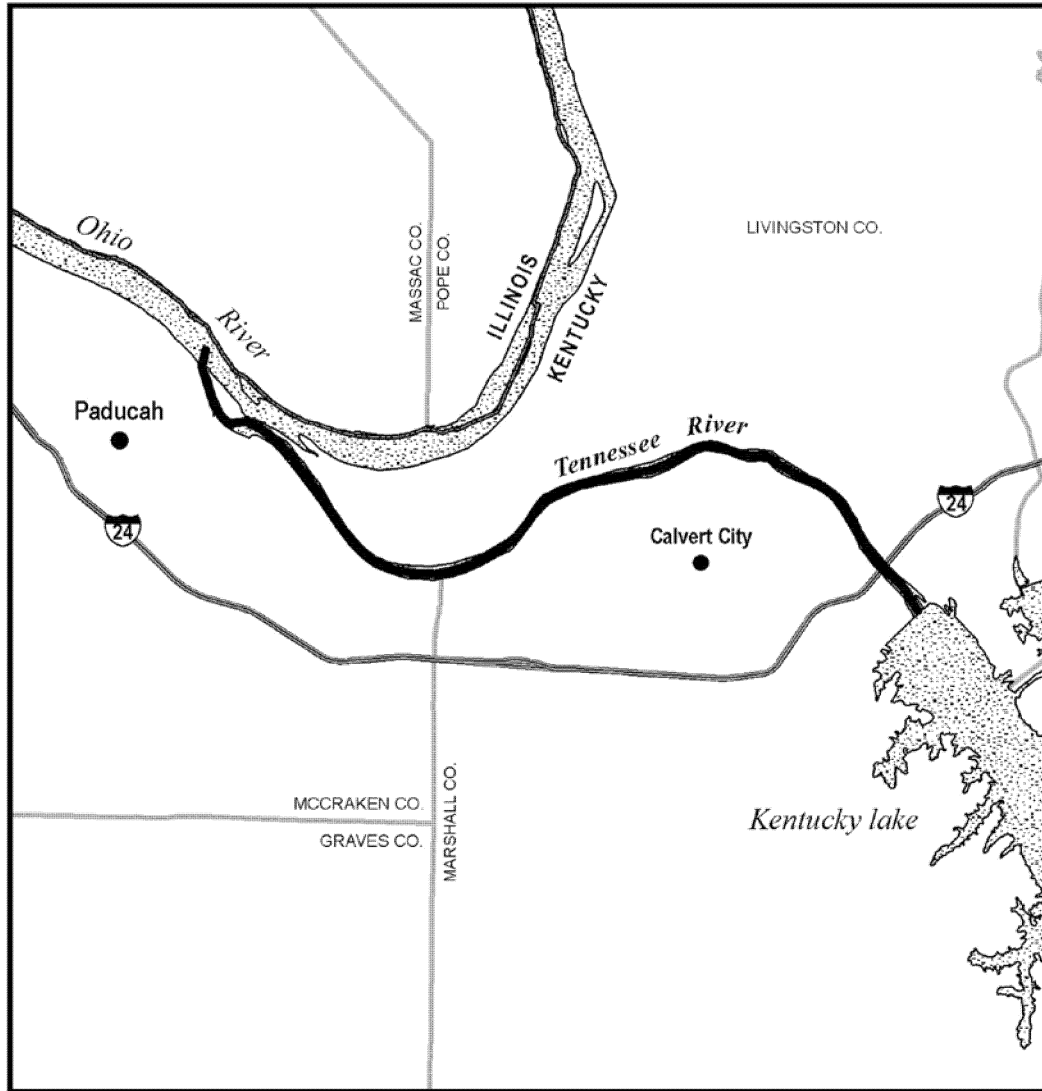
(27) Unit RF19b: Tennessee River—Livingston, Marshall, and McCracken Counties, Kentucky.

(i) *General Description:* Unit RF19b includes 35.6 rkm (22.1 rmi) of the Tennessee River from Kentucky Lake Dam, downstream to its confluence with

the Ohio River, McCracken and Livingston Counties, Kentucky.

(ii) Map of Unit RF19b follows:

Map for Unit RF19b (Tennessee River) of critical habitat for Rabbitsfoot



 Critical Habitat



1:200,000

(28) Unit RF20: Ohio River—Ballard, and McCracken Counties, Kentucky; Massac and Pulaski Counties, Illinois.

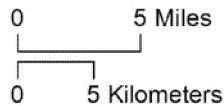
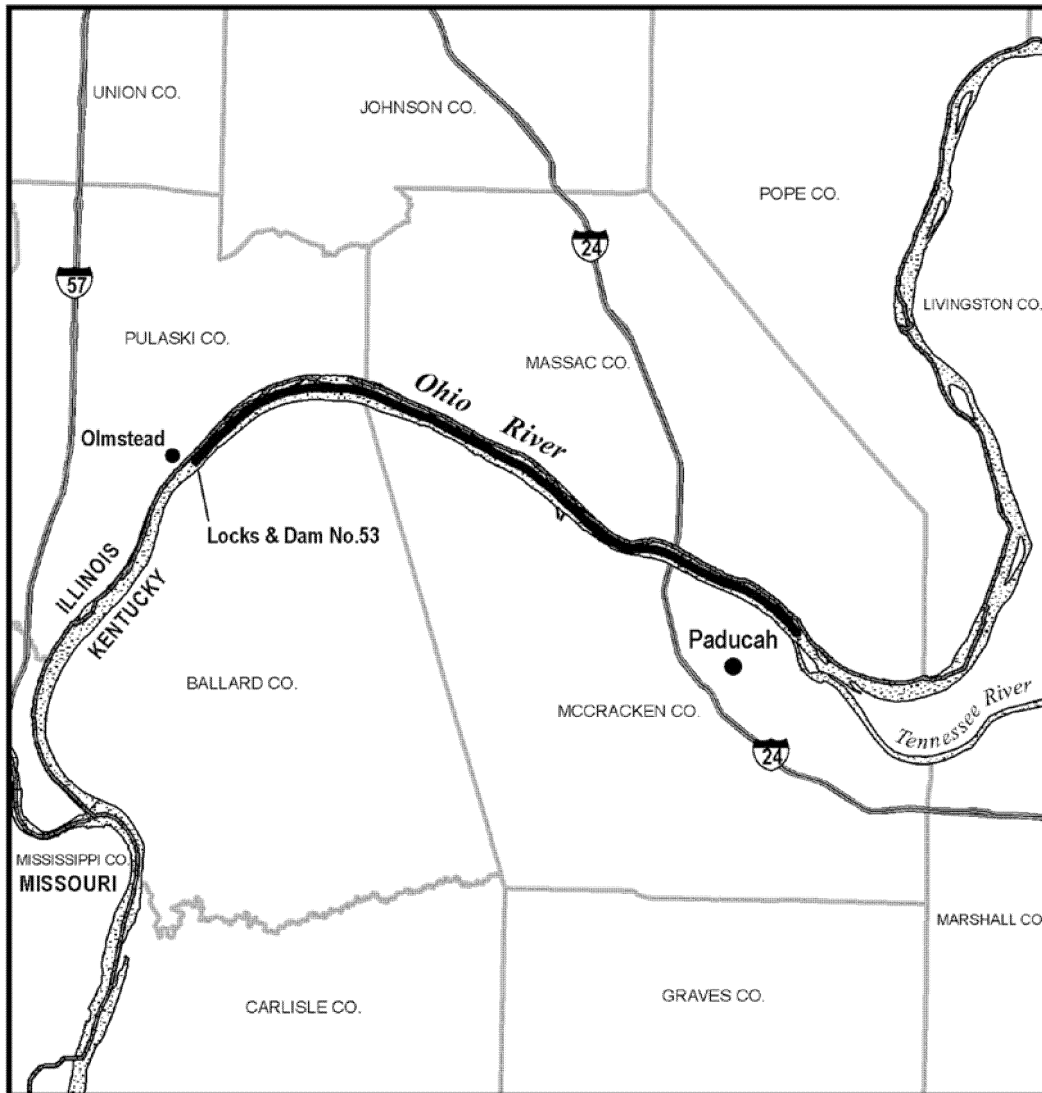
(i) *General Description:* Unit RF20 includes 45.9 rkm (28.5 rmi) of the Ohio River from the Tennessee River confluence at the downstream extent of

Owens Island downstream to Lock and Dam 53 near Olmstead, Illinois.



(ii) Map of Unit RF20 follows:

Map for Unit RF20 (Ohio River) of critical habitat for Rabbitsfoot



 Critical Habitat



1:350,000

(29) Unit RF21: Green River—Edmonson, Green, Hart, and Taylor Counties, Kentucky.

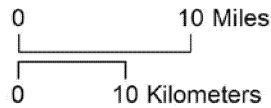
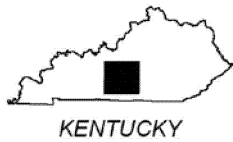
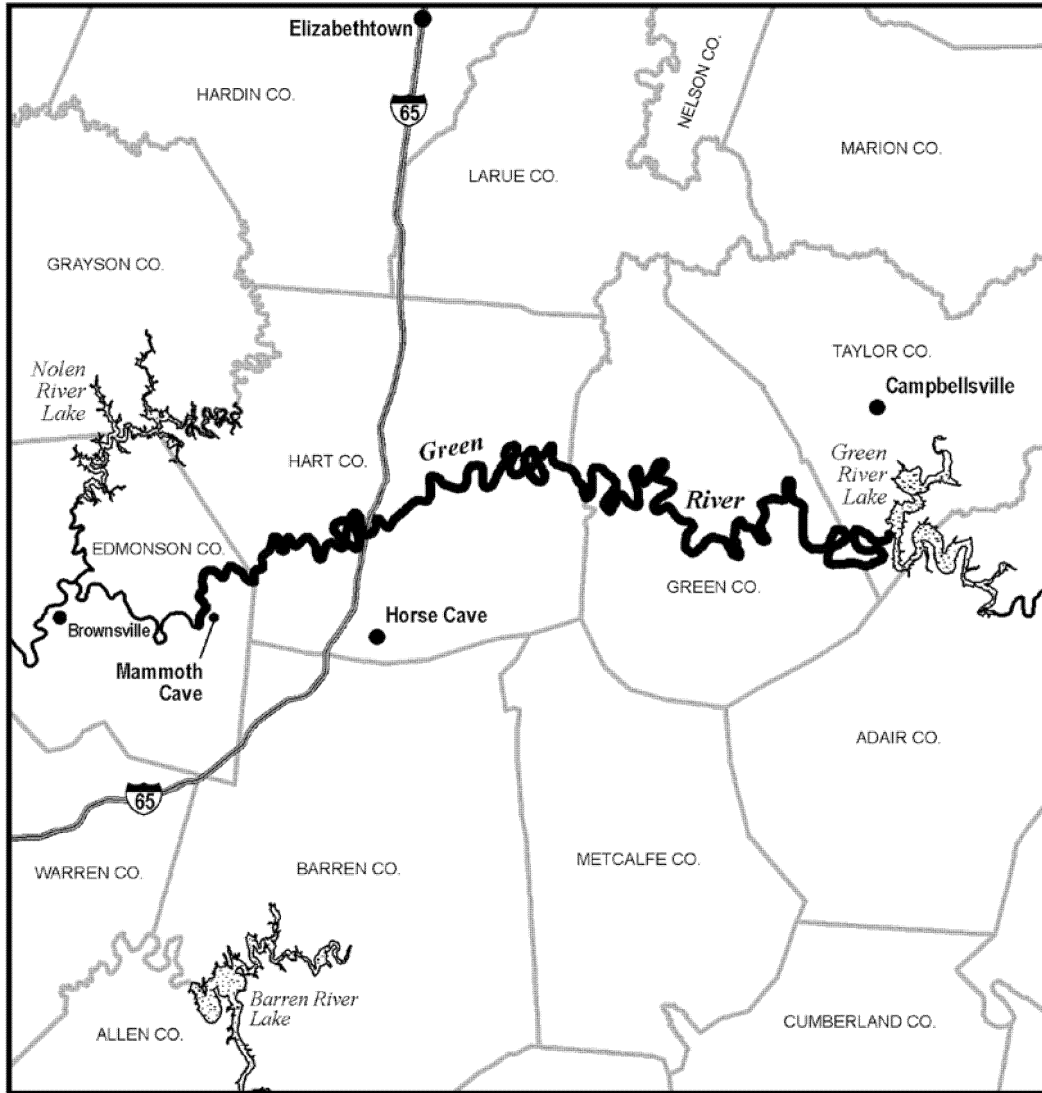
(i) *General Description:* Unit RF21 includes 175.6 rkm (109.1 rmi) of the

Green River from Green River Lake Dam south of Campbellsville, Taylor County, Kentucky, downstream to Mammoth Cave National Park North Entrance Road

in Mammoth Cave National Park, Kentucky.

(ii) Map of Unit RF21 follows:

Map for Unit RF21 (Green River) of critical habitat for Rabbitsfoot



(30) Unit RF22: French Creek—Crawford, Erie, Mercer, and Venango Counties, Pennsylvania.

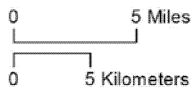
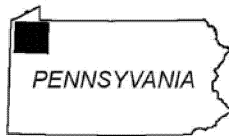
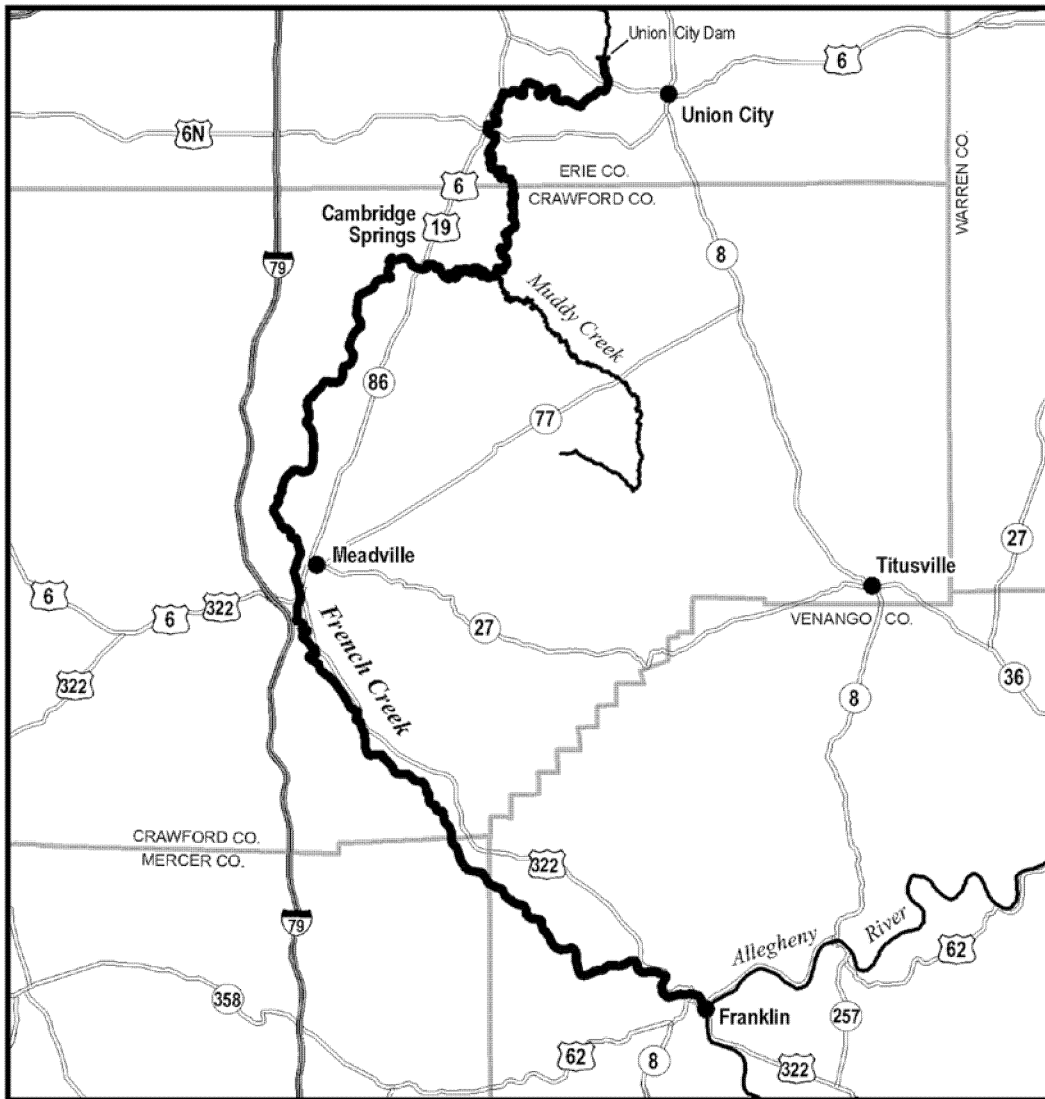
(i) *General Description:* Unit RF22 includes 120.4 rkm (74.8 rmi) of French

Creek from Union City Reservoir Dam northeast of Union City, Erie County, Pennsylvania, downstream to its confluence with the Allegheny River

near Franklin, Venango County, Pennsylvania.

(ii) Map of Unit RF22 follows:

Map for Unit RF22 (French Creek) of critical habitat for Rabbitsfoot



 Critical Habitat



1:350,000

(31) Unit RF23: Allegheny River—Venango County, Pennsylvania.

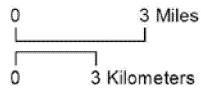
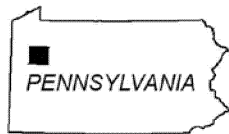
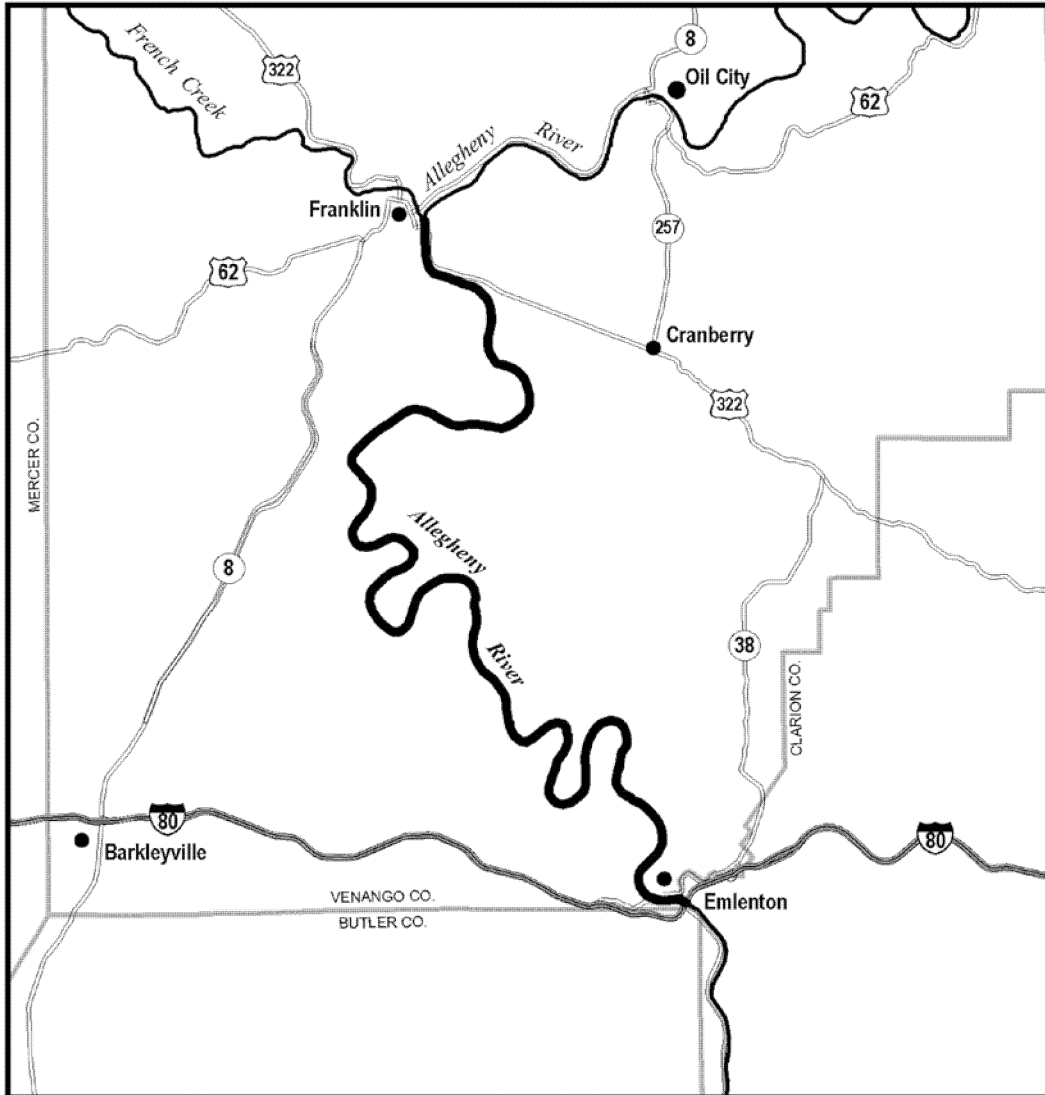
(i) *General Description:* Unit RF23 includes 57.3 rkm (35.6 rmi) of the

Allegheny River from the French Creek confluence near Franklin, Venango County, Pennsylvania, downstream to

Interstate 80 near Emlenton, Venango County, Pennsylvania.

(ii) Map of Unit RF23 follows:

Map of Unit RF23 (Allegheny River) of critical habitat for Rabbitsfoot



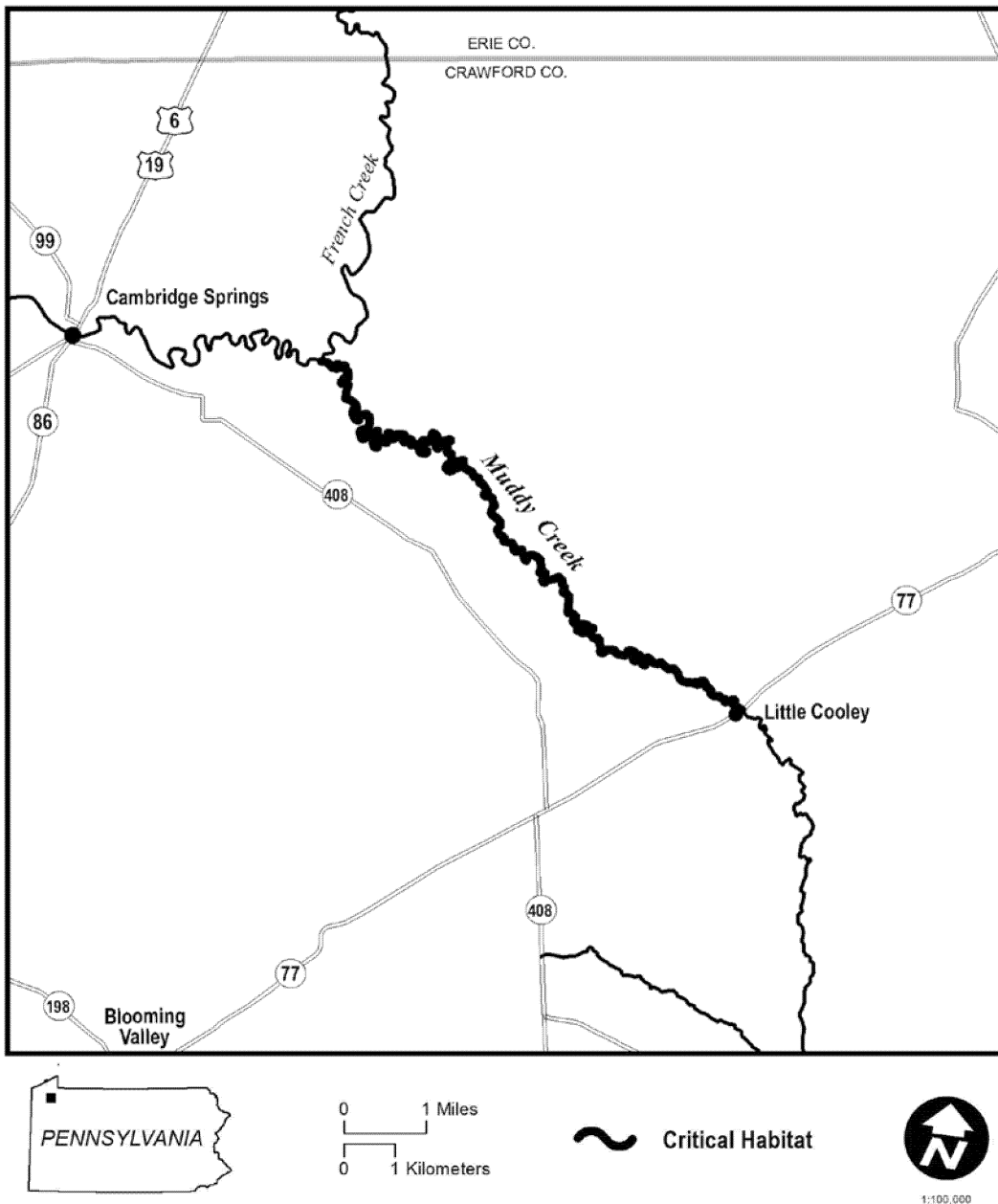
(32) Unit RF24: Muddy Creek—  
Crawford County, Pennsylvania.  
(i) *General Description:* Unit RF24  
includes 20.1 rkm (12.5 rmi) of Muddy

Creek from Pennsylvania Highway 77  
near Little Cooley, Crawford County,  
Pennsylvania, downstream to its  
confluence with French Creek east of

Cambridge Springs, Crawford County,  
Pennsylvania.

(ii) Map of Unit RF24 follows:

Map of Unit RF24 (Muddy Creek) of critical habitat for Rabbitsfoot



(33) Unit RF25: Tippecanoe River—Carroll, Pulaski, Tippecanoe, and White Counties, Indiana.

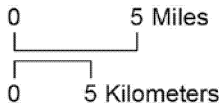
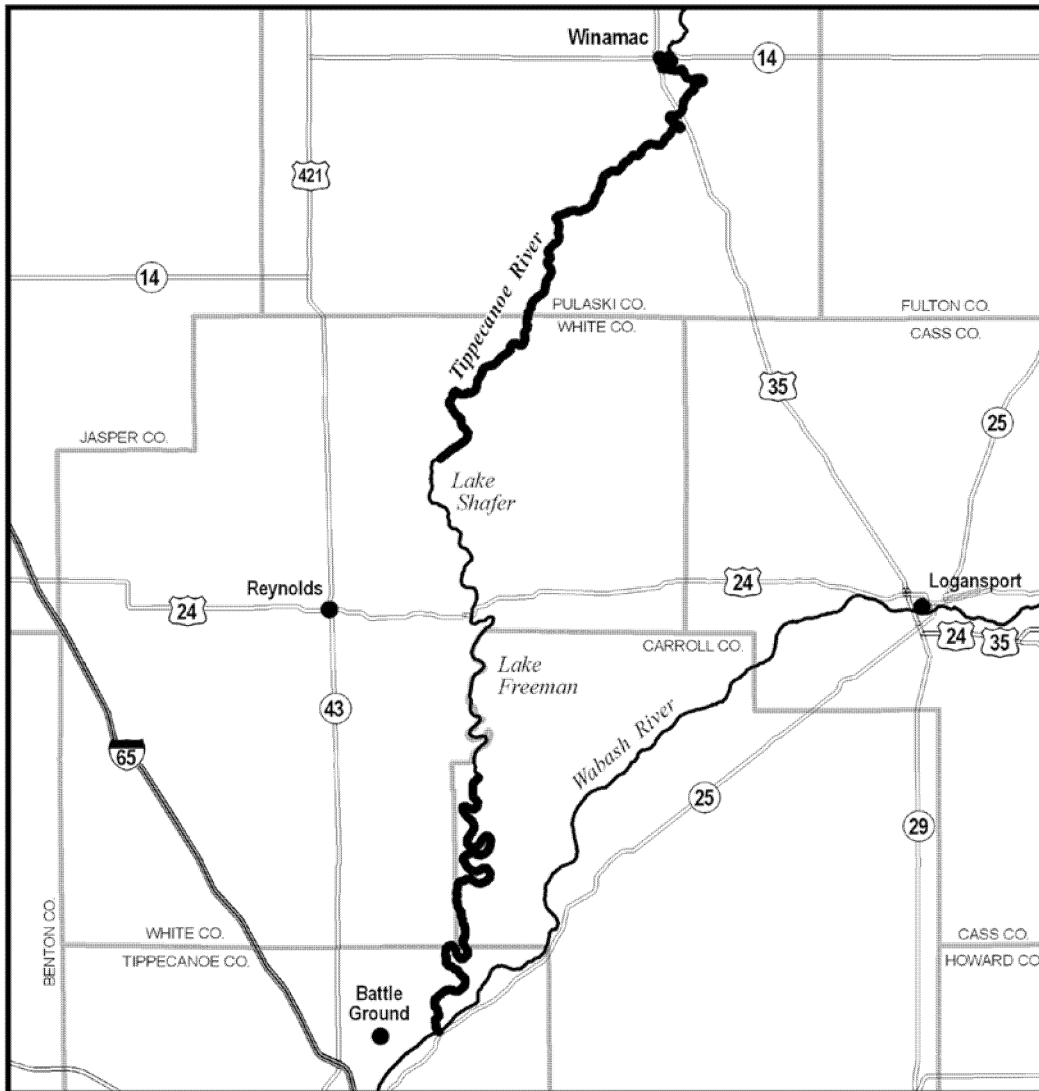
(i) *General Description:* Unit RF25 includes 75.6 rkm (47.0 rmi) of the

Tippecanoe River from Indiana Highway 14 near Winamac, Pulaski County, Indiana, downstream to its confluence with the Wabash River northeast of Battle Ground, Tippecanoe

County, Indiana, excluding Lakes Shafer and Freeman and the stream reach between the two lakes.

(ii) Map of Unit RF25 follows:

Map of Unit RF25 (Tippecanoe River) of critical habitat for Rabbitsfoot



 Critical Habitat



1:350,000

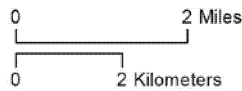
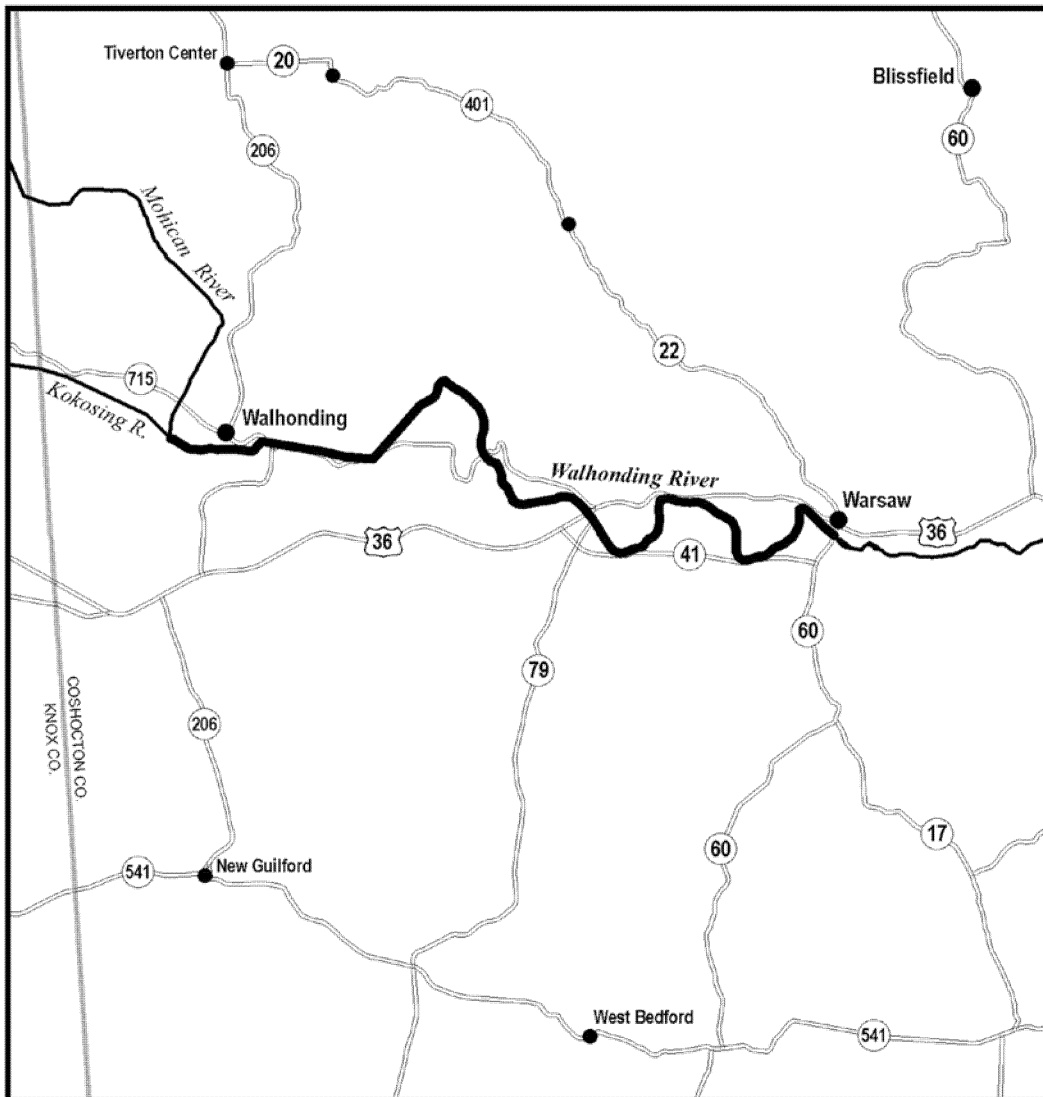
(34) Unit RF26: Walhonding River—Coshocton County, Ohio.

(i) *General Description:* Unit RF26 includes 17.5 rkm (10.9 rmi) of the

Walhonding River from the convergence of the Kokosing and Mohican Rivers downstream to Ohio Highway 60 near Warsaw, Coshocton County, Ohio.

(ii) Map of Unit RF26 follows:

Map of Unit RF26 (Walhonding River) of critical habitat for Rabbitsfoot



 Critical Habitat



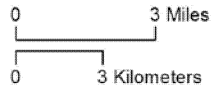
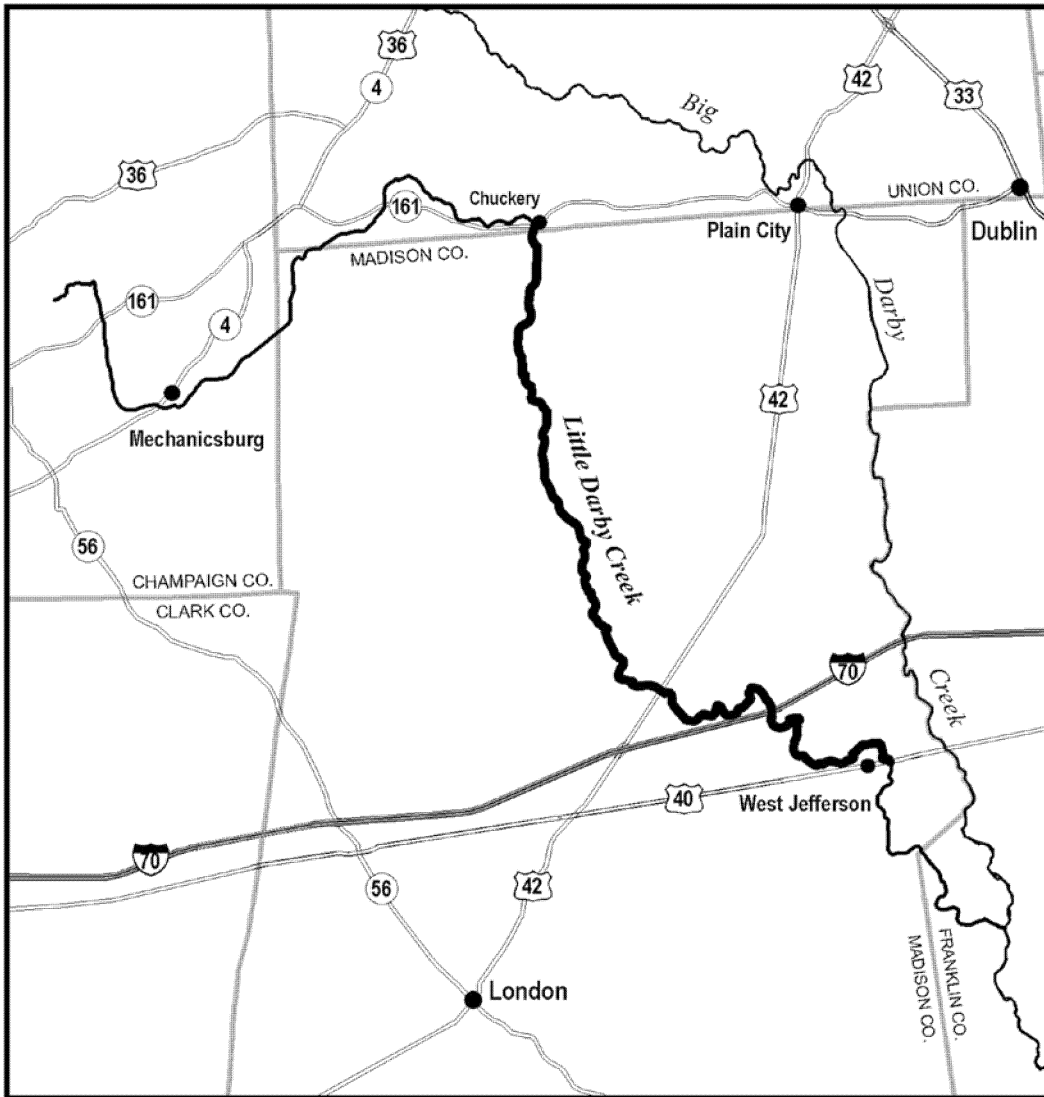
(35) Unit RF27: Little Darby Creek—Madison and Union Counties, Ohio.

(i) *General Description:* Unit RF27 includes 33.3 rkm (20.7 rmi) of Little

Darby Creek from Ohio Highway 161 near Chuckery, Union County, Ohio, downstream to U.S. Highway 40 near West Jefferson, Madison County, Ohio.

(ii) Map of Unit RF27 follows:

Map of Unit RF27 (Little Darby Creek) of critical habitat for Rabbitsfoot



 Critical Habitat



1:200,000

(36) Unit RF28: North Fork Vermilion River and Middle Branch North Fork Vermilion River, respectively—Vermilion County, Illinois.

(i) *General Description:* Unit RF28 includes a total of 28.5 rkm (17.7 rmi). Unit RF28 includes 21.2 rkm (13.2 rmi)

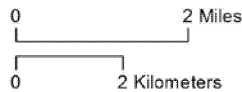
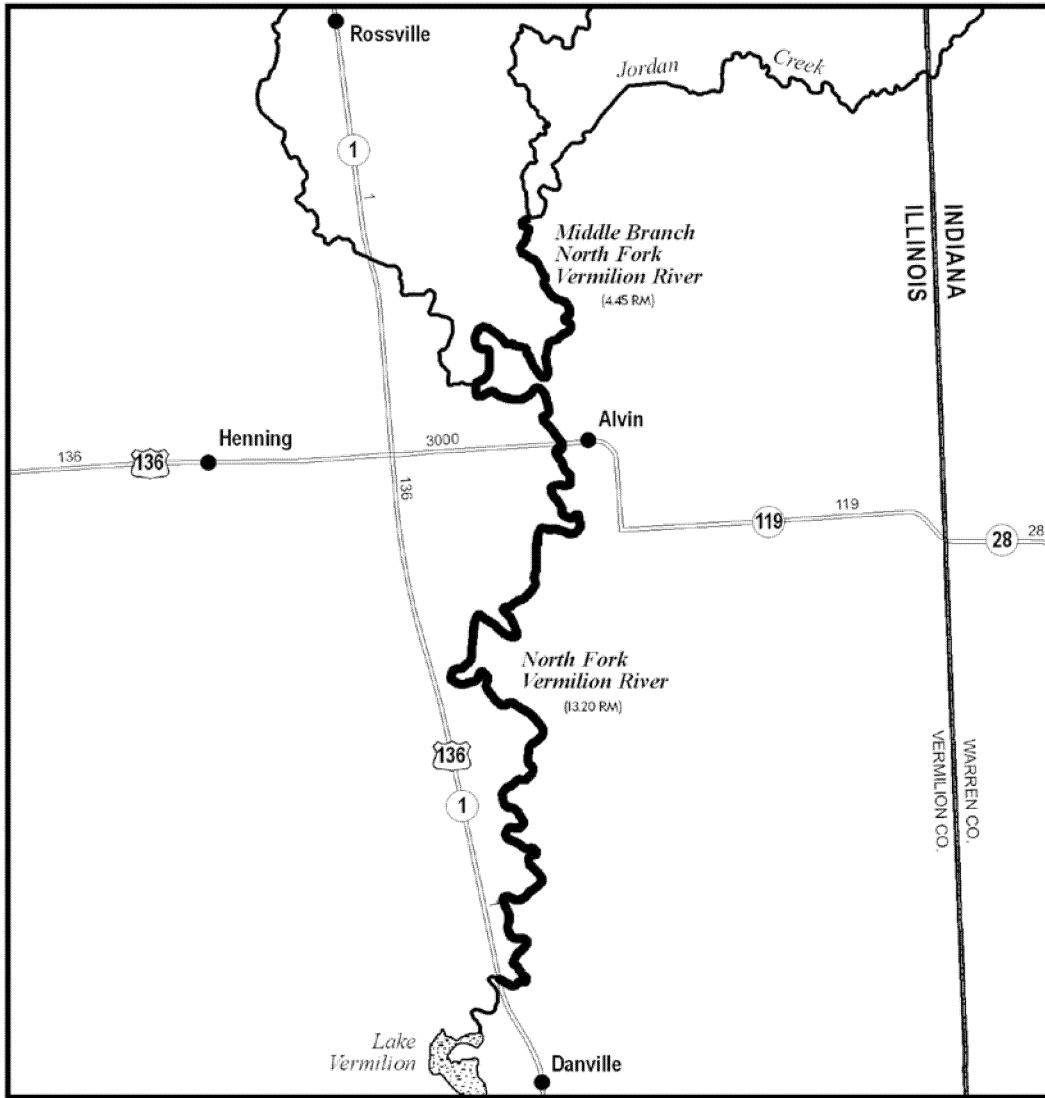
of the North Fork Vermilion River from the confluence of Middle Branch North Fork Vermilion River downstream to Illinois Highway 1 and U.S. Highway 136 upstream of Lake Vermilion, Vermilion County, Illinois. Unit RF28 also includes 7.2 rkm (4.5 rmi) of the

Middle Branch North Fork Vermilion River from the Jordan Creek confluence northwest of Alvin, Illinois, downstream to its confluence with North Fork Vermilion River west of Alvin, Vermilion County, Illinois.



(ii) Map of Unit RF28 follows:

Map for Unit RF28 (North Fork Vermilion River and Middle Branch North Fork Vermilion River) of critical habitat for Rabbitsfoot



 Critical Habitat



(37) Unit RF29: Fish Creek—Williams County, Ohio.

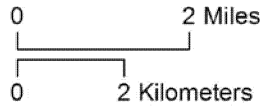
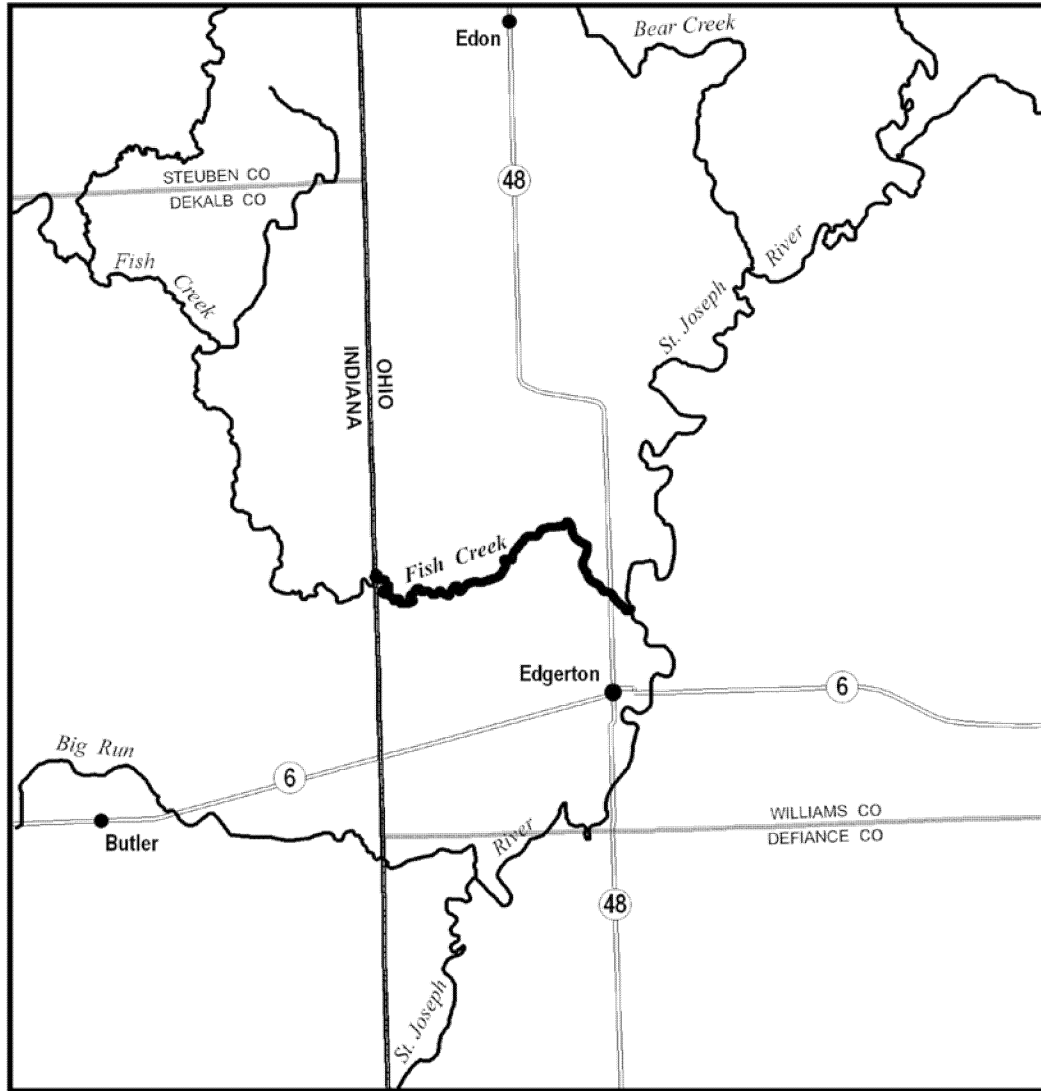
(i) *General Description:* Unit RF29 includes 7.7 rkm (4.8 rmi) of Fish Creek

from Indiana and Ohio State line northwest of Edgerton, Ohio, downstream to its confluence with the

St. Joseph's River north of Edgerton, Williams County, Ohio.

(ii) Map of Unit RF29 follows:

Map of Unit RF29 (Fish Creek) of critical habitat for Rabbitsfoot



~ Critical Habitat



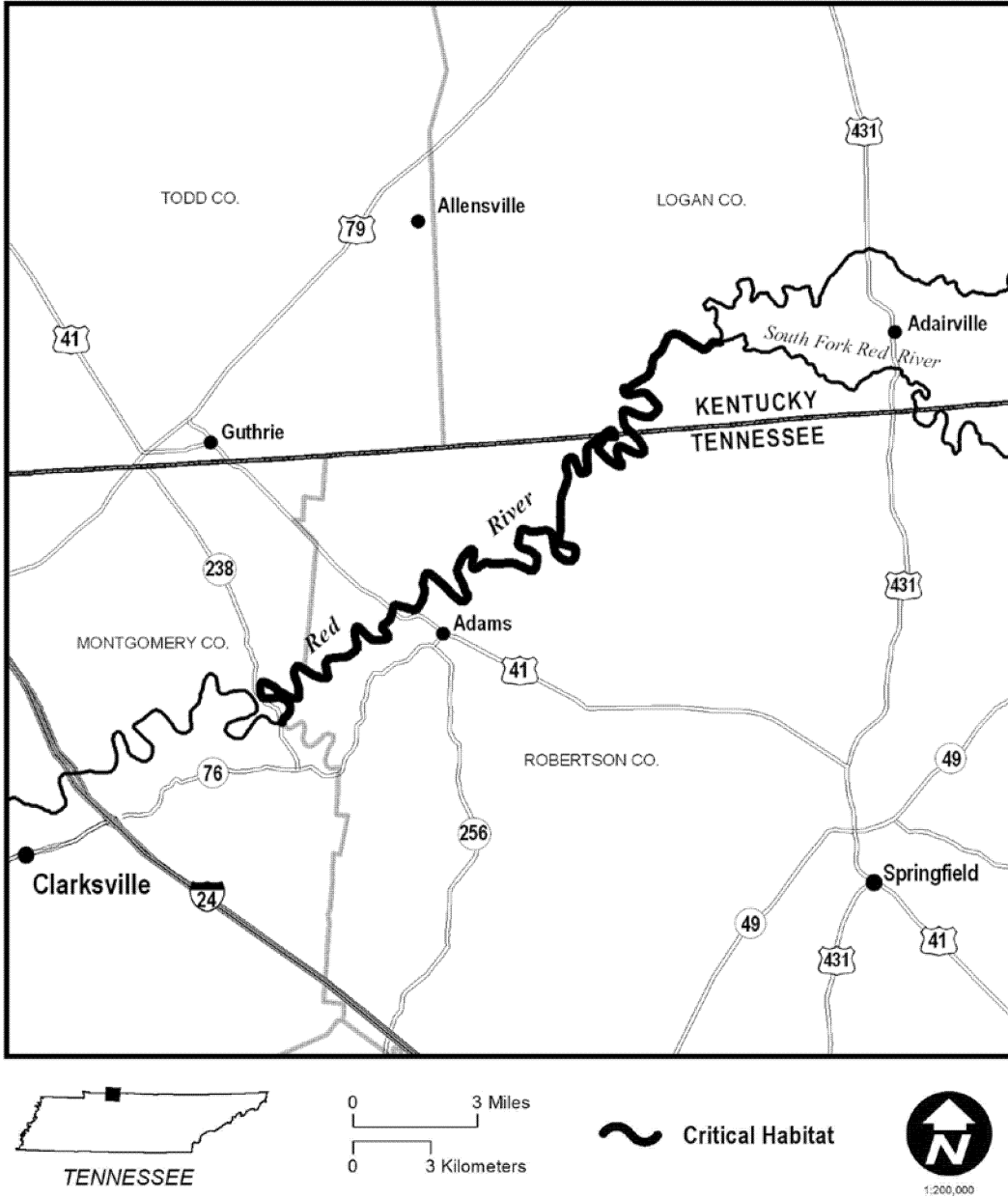
(38) Unit RF30: Red River—Logan County, Kentucky; and Montgomery and Robertson Counties, Tennessee.

(i) *General Description:* Unit RF30 includes 50.2 rkm (31.2 rmi) of the Red River from the South Fork Red River confluence west of Adairville,

Kentucky, downstream to the Sulphur Fork confluence southwest of Adams, Tennessee.

(ii) Map of Unit RF30 follows:

Map of Unit RF30 (Red River) of critical habitat for Rabbitsfoot



(39) Unit RF31: Shenango River—Mercer County, Pennsylvania.

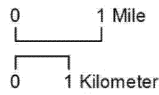
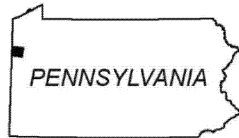
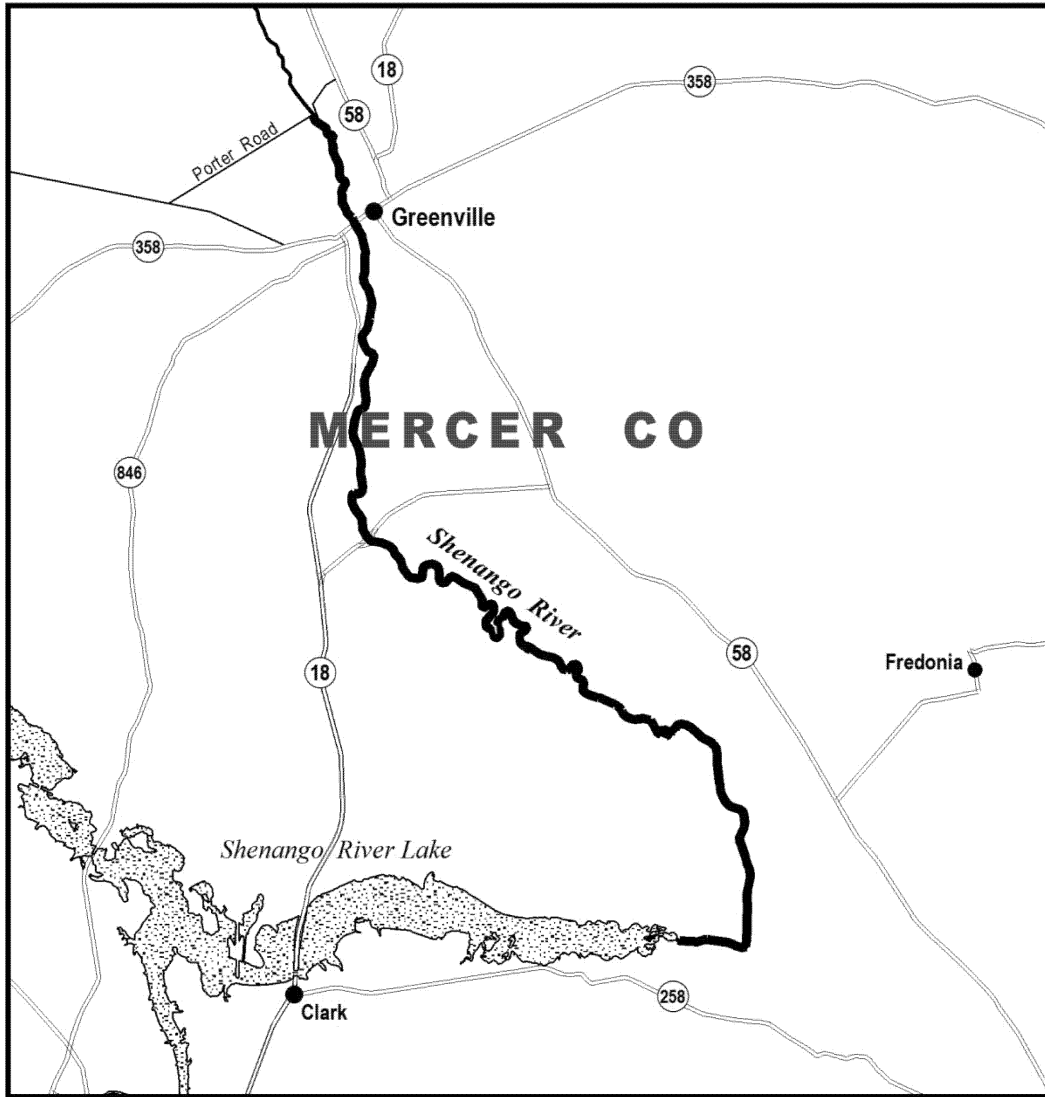
(i) *General Description:* Unit RF31 includes 24.8 rkm (15.4 rmi) of the


Shenango River from Porter Road near Greenville, Pennsylvania, downstream to the point of inundation by Shenango

River Lake near Big Bend, Mercer County, Pennsylvania.

(ii) Map of Unit RF31 follows:

### Map of Unit RF31 (Shenango River) of critical habitat for Rabbitsfoot



 Critical Habitat



\* \* \* \* \*

Dated: February 25, 2015.  
**Michael J. Bean,**  
*Principal Deputy Assistant Secretary for Fish and Wildlife and Parks.*  
 [FR Doc. 2015-09200 Filed 4-29-15; 8:45 am]  
**BILLING CODE 4310-55-P**