

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

[Docket No. FWS-R4-ES-2015-0133;  
4500030113]

RIN 1018-BB05

**Endangered and Threatened Wildlife  
and Plants; Designation of Critical  
Habitat for Kentucky Arrow Darter**

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

**ACTION:** Proposed rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), propose to designate critical habitat for the Kentucky arrow darter (*Etheostoma spilotum*) under the Endangered Species Act (Act). In total, approximately 395 stream kilometers (skm) (246 stream miles (smi)) are being proposed for designation of critical habitat for the Kentucky arrow darter in Breathitt, Clay, Harlan, Jackson, Knott, Lee, Leslie, Owsley, Perry, and Wolfe Counties, Kentucky. If we finalize this rule as proposed, it would extend the Act's protections to this species' critical habitat. We also announce the availability of our draft economic analysis of the proposed designation.

**DATES:** We will accept comments on the proposed rule or draft economic analysis that are received or postmarked on or before December 7, 2015. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for public hearings, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by November 23, 2015.

**ADDRESSES:** *Written comments:* You may submit comments on the proposed rule or draft economic analysis by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: <http://www.regulations.gov>. In the Search box, enter Docket No. FWS-R4-ES-2015-0133, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on "Comment Now!"

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS-R4-ES-2015-0133; U.S. Fish and Wildlife Service,

MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041-3803.

We request that you send comments only by the methods described above. We will post all comments on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see Information Requested, below, for more information).

*Document availability:* The draft economic analysis is available at <http://www.fws.gov/frankfort/>, at <http://www.regulations.gov> at Docket No. FWS-R4-ES-2015-0133, and at the Kentucky Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

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/frankfort/>, at <http://www.regulations.gov> at Docket No. FWS-R4-ES-2015-0133, and at the Kentucky Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**). Any additional tools or supporting information that we may develop for this critical habitat designation will also be available at the Fish and Wildlife Service Web site and Field Office set out above, and may also be included in this rule or at <http://www.regulations.gov>.

**FOR FURTHER INFORMATION CONTACT:**

Virgil Lee Andrews, Jr., 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, x108; facsimile 502-695-1024. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339.

**SUPPLEMENTARY INFORMATION:**

**Executive Summary**

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

*This document consists of a proposed rule to designate critical habitat for the Kentucky arrow darter.* Elsewhere in today's **Federal Register**, we propose to list the Kentucky arrow darter as a threatened species under the Act.

*The basis for our action.* Section 4(a)(3) of the Act requires the Secretary to designate critical habitat, to the maximum extent prudent and determinable, for an endangered or

threatened species at the time it is listed. Section 4(b)(2) of the Act states that the Secretary shall 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. We have determined that designating critical habitat is both prudent and determinable, and we propose a total of approximately 395 skm (246 smi) of critical habitat in eastern Kentucky.

*We prepared a draft economic analysis of the proposed designation of critical habitat.* In order to consider economic impacts, we have prepared a draft economic analysis of the proposed critical habitat designation and related factors.

*We will seek peer review.* We are seeking comments from independent specialists to ensure that this critical habitat proposal is based on scientifically sound data and analyses. We have invited these peer reviewers to comment on our specific assumptions and conclusions in this proposal to designate critical habitat. Because we will consider all comments and information we receive during the comment period, our final designation may differ from this proposal.

**Information Requested**

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and effective as possible. Therefore, we request comments or information from other concerned government agencies, Native American tribes, the scientific community, industry, or any other interested party concerning this proposed rule. We particularly seek comments concerning:

(1) The reasons why we should or should not designate habitat as "critical habitat" under section 4 of the Act (16 U.S.C. 1531 *et seq.*) including whether there are threats to the species from human activity, the degree of which can be expected to increase due to the designation, and whether that increase in threat outweighs the benefit of designation such that the designation of critical habitat may not be prudent.

(2) Specific information on:

(a) The amount and distribution of Kentucky arrow darter habitat;

(b) What areas, that were occupied at the time of listing (*i.e.*, are currently occupied) and that contain features essential to the conservation of the species, should be included in the designation and why;

(c) Special management considerations or protection that may be needed in critical habitat areas we are proposing, including managing for the potential effects of climate change; and

(d) What areas not occupied at the time of listing are essential for the conservation of the species and why.

(3) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat.

(4) Information on the projected and reasonably likely impacts of climate change on the Kentucky arrow darter and proposed critical habitat.

(5) Any probable economic, national security, or other relevant impacts of designating any area that may be included in the final designation, and the benefits of including or excluding areas that exhibit these impacts.

(6) Information on the extent to which the description of economic impacts in the draft economic analysis (DEA) is a reasonable estimate of the likely economic impacts.

(7) The likelihood of adverse social reactions to the designation of critical habitat, as discussed in the associated documents of the draft economic analysis, and how the consequences of such reactions, if likely to occur, would relate to the conservation and regulatory benefits of the proposed critical habitat designation.

(8) Whether any specific areas we are proposing for critical habitat designation should be considered for exclusion under section 4(b)(2) of the Act, and whether the benefits of potentially excluding any specific area outweigh the benefits of including that area under section 4(b)(2) of the Act.

(9) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

All comments submitted electronically via <http://www.regulations.gov> will be presented

on the Web site in their entirety as submitted. For comments submitted via hard copy, we will post your entire comment—including your personal identifying information—on <http://www.regulations.gov>. You may request at the top of your document that we withhold personal information such as your street address, phone number, or email address from public review; however, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <http://www.regulations.gov>, or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Kentucky Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

### Previous Federal Actions

All previous Federal actions are described in the proposal to list the Kentucky arrow darter as a threatened species under the Act, which is published elsewhere in today's **Federal Register**.

### 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 and 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 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 listed 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 ensure 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. If we list the Kentucky arrow darter, these protections and conservation tools would 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.

#### Prudency Determination

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12), require that, to the maximum extent prudent and determinable, the Secretary shall designate critical habitat at the time the species is determined to be an endangered or threatened species. Our regulations (50 CFR 424.12(a)(1)) state that the 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.

As discussed in the proposed listing rule, there is currently no imminent threat of take attributed to collection or vandalism (listing factor B) for this species, and identification and mapping of critical habitat is not expected to initiate any such threat. In the absence of finding that the designation of critical habitat would increase threats to a species, if there are any benefits to a critical habitat designation, then a prudent finding is warranted. Here, the potential benefits of designation include: (1) Triggering consultation under section 7 of the Act, in 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) reducing the potential for people to cause inadvertent harm to the species. Because we have determined that the designation of critical habitat will not likely increase the degree of threat to the species and may provide some measure of benefit, we find that designation of critical habitat is prudent for the Kentucky arrow darter.

#### Critical Habitat Determinability

Having determined that designation is prudent under section 4(a)(3) of the Act, we must find whether critical habitat for the Kentucky arrow darter is determinable. Our regulations at 50 CFR 424.12(a)(2) state that critical habitat is not determinable when one or both of the following situations exist:

(i) Information sufficient to perform required analyses of the impacts of the designation is lacking, or

(ii) The biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat.

When critical habitat is not determinable, the Act allows the Service an additional year to publish a critical habitat designation (16 U.S.C. 1533(b)(6)(C)(ii)).

We have reviewed the available information pertaining to the biological needs of the species and characteristics of the species' habitat. This and other information represent the best scientific data available and led us to conclude that the designation of critical habitat is determinable for the Kentucky arrow darter.

#### Physical or Biological Features

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), 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 that are 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 historic, geographical, and ecological distributions of a species.

We derive the specific physical or biological features essential for the Kentucky arrow darter from studies of its habitat, ecology, and life history as described below. Additional information can be found in the proposed listing rule published elsewhere in today's **Federal Register**. To identify the physical or biological features essential to the conservation of the species, we have relied on current conditions at locations where the species survives, the limited information available on the species and its closest relatives, and factors associated with the decline of other fishes that occupy similar habitats in the Southeast. We have determined that the following physical or biological features are essential to the Kentucky arrow darter.

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

Little is known about the specific space requirements of the Kentucky arrow darter; however, the species is typically observed in moderate- to high-gradient, first- to third-order, geomorphically stable streams (Lotrich 1973, p. 382; Thomas 2008, p. 6). Geomorphically stable streams transport sediment while maintaining their horizontal and vertical dimensions (width to depth ratio and cross-sectional area), pattern (sinuosity), and longitudinal profile (riffles, runs, and pools), thereby conserving the physical characteristics of the stream, including bottom features such as riffles, runs, and pools and the transition zones between these features (Rosgen 1996, p. 1–3). The protection and maintenance of these habitat features accommodate spawning, rearing, growth, migration, and other normal behaviors of the species.

During most of the year (late spring through winter), Kentucky arrow darters occupy shallow pools between 10–45 centimeters (cm) (4–18 inches (in)) or transitional areas between riffles and pools (runs and glides) with cobble and boulder substrates that are interspersed with clean (relatively silt free) sand and gravel (Lotrich 1973, p. 382; Thomas 2008, p. 6). Most individuals are encountered near some type of instream cover: Large cobble, boulders, bedrock ledges, or woody debris piles (Thomas 2008, p. 6). During the spawning period (April through June), Kentucky arrow darters utilize riffle habitats with relatively silt free, gravel, cobble, and sand substrates (Kuehne and Barbour

1983, p. 71). Streams inhabited by Kentucky arrow darters tend to be clear and cool (generally less than or equal to 24 degrees Celsius (°C) (72 degrees Fahrenheit (°F))), with shaded corridors and naturally vegetated, intact riparian zones (Lotrich 1973, p. 378; Thomas 2008, pp. 7, 23).

Limited information exists about upstream or downstream movements of Kentucky arrow darters; however, there is evidence that the species can utilize relatively long stream reaches. Observations by Lowe (1979, pp. 26–27) of potential dispersal behavior for a related species (the Cumberland arrow darter (*Etheostoma sagitta*)) in Tennessee, preliminary findings from a movement study at Eastern Kentucky University (EKU), and recent survey results by Kentucky Department of Fish and Wildlife Resources (KDFWR) suggest that Kentucky arrow darters can utilize stream reaches of over 4 skm (2.5 smi) and disperse to other tributaries (Baxter 2014, pers. comm.; Thomas 2015, pers. comm.) (see “Habitat and Life History” section of our proposed listing rule published elsewhere in today's **Federal Register**).

The current range of the Kentucky arrow darter has been reduced from 74 historically occupied streams to 47 currently occupied streams due to destruction, modification, and fragmentation of habitat. Fragmentation of the species' habitat has subjected these small populations to genetic isolation, reduced space for rearing and reproduction, reduced adaptive capabilities, and an increased likelihood of local extinctions (Burkhead *et al.* 1997, pp. 397–399; Hallerman 2003, pp. 363–364). Genetic variation and diversity within a species are essential to recovery, adaptation to environmental change, and long-term viability (capability to live, reproduce, and develop) (Noss and Cooperider 1994, pp. 282–297; Harris 1984, pp. 93–107; Fluker *et al.* 2007, p. 2). The long-term viability of a species is founded on the conservation of numerous local populations throughout its geographic range (Harris 1984, pp. 93–104). Connectivity of these habitats is essential in preventing further fragmentation and isolation of Kentucky arrow darter populations and promoting species movement and genetic flow between populations.

Therefore, based on the information above, we identify shallow pools, runs, glides, and riffles and associated stream segments of geomorphically stable, first- to third-order streams to be physical or biological features essential to the conservation of the Kentucky arrow darter. The maintenance of these

habitats is essential in accommodating feeding, breeding, growth, and other normal behaviors of the Kentucky arrow darter and in promoting gene flow within the species.

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

Feeding habits of the Kentucky arrow darter were documented by Lotrich (1973, pp. 380–382) in the Clemons Fork system, Breathitt County, Kentucky. The primary prey item was mayflies (Order Ephemeroptera), which comprised 77 percent of identifiable food items (420 of 542 items) in 57 Kentucky arrow darter stomachs (Lotrich 1973, p. 381). Large Kentucky arrow darters (greater than 70 millimeters (mm) (2.8 in) total length (TL)) utilized small crayfishes, as 7 of 8 stomachs examined by Lotrich (1973, p. 381) contained crayfishes ranging in size from 11 to 24 mm (0.4 to 0.9 in). Lotrich (1973, p. 381) considered this to be noteworthy because stomachs of small Kentucky arrow darters (less than 70 mm (2.8 in) TL) and stomachs of other darter species did not contain crayfishes. Other food items reported by Lotrich (1973, p. 381) and Etnier and Starnes (1993, p. 523) included larval blackflies (family Simuliidae) and midges (Chironomidae), with lesser amounts of caddisfly larvae, stonefly nymphs, and beetle larvae. Etnier and Starnes (1993, p. 523) reported that juvenile arrow darters feed on microcrustaceans and dipteran larvae.

Like most other darters, the Kentucky arrow darter depends on perennial stream flows that create suitable habitat conditions needed for successful completion of its life cycle. An ample supply of flowing water provides a means of transporting nutrients and food items, moderating water temperatures and dissolved oxygen levels, removing fine sediments that could damage spawning or foraging habitats, and diluting nonpoint-source pollutants. Water withdrawals do not represent a significant threat to the species, but the species is faced with occasional low-flow conditions that occur during periods of drought.

Water quality is also important to the persistence of the Kentucky arrow darter. The species requires relatively clean, cool, flowing water to successfully complete its life cycle. Specific water quality requirements, such as temperature, dissolved oxygen, pH (a measure of the acidity or alkalinity of water), and conductivity (a measure of electrical conductance in the water column that increases as the concentration of dissolved solids

increases), that define suitable habitat conditions for the Kentucky arrow darter have not been determined; however, the species appears to be sensitive to elevated conductivity and is generally absent when levels exceed 350 microsiemens ( $\mu\text{S}$ )/cm. In general, optimal water quality conditions for fishes and other aquatic organisms are characterized by (1) moderate stream temperatures (generally less than or equal to 24 °C (72 °F) for the Kentucky arrow darter); (2) acceptable dissolved oxygen concentrations; and (3) the lack of harmful levels of pollutants, such as inorganic contaminants like iron, manganese, selenium, and cadmium; organic contaminants such as human and animal waste products; pesticides and herbicides; nitrogen, potassium, and phosphorus fertilizers; and petroleum distillates.

Therefore, based on the information above, we identify aquatic macroinvertebrate prey items, which are typically dominated by mayflies; permanent surface flows, as measured during average rainfall years; and adequate water quality to be physical or biological features essential to the conservation of the Kentucky arrow darter.

#### Cover or Shelter

Kentucky arrow darters depend on specific habitats and bottom substrates for normal life processes such as spawning, rearing, resting, and foraging. As described above, the species typically inhabits shallow pools, riffles, runs, and glides dominated by cobble and boulder substrates and interspersed with clean sand and gravel and low levels of siltation (Thomas 2008, p. 6; Service unpublished data). Kentucky arrow darters are typically observed near some type of cover (boulders, rock ledges, large cobble, or woody debris piles) and at depths ranging from 10 to 91 cm (4 to 36 in) (Thomas 2008, p. 6; Service unpublished data). Sedimentation (siltation) has been listed repeatedly as a threat to the Kentucky arrow darter (Kuehne and Barbour 1983, p. 71; Etnier and Starnes 1993, p. 523; Thomas 2008, pp. 3–7), and the species has suffered population declines and extirpations where sedimentation has been severe (Etnier and Starnes 1993, p. 524; Thomas 2008, p. 7; Service 2012, p. 1). Substrates with low levels of siltation are essential in accommodating the species' feeding, breeding, growth, and other normal behaviors. The term "low levels of siltation" is defined for the purpose of this rule as silt or fine sand within interstitial spaces of substrates in amounts low enough to have minimal impact (*i.e.*, that would

have no appreciable reduction in spawning, breeding, growth, and feeding) to the species.

Therefore, based on the information above, we identify stable, shallow pools, runs, and glides with boulder and cobble substrates, ample cover (*e.g.*, slab rocks, bedrock ledges, woody debris piles), to be physical or biological features essential to the conservation of the Kentucky arrow darter.

#### Sites for Breeding, Reproduction, or Rearing (or Development) of Offspring

Prior to spawning, male Kentucky arrow darters establish territories over riffles from March to May, when they are quite conspicuous in water 5 to 15 cm (2 to 6 in) deep (Kuehne and Barbour 1983, p. 71). Males fan out a depression in the substrate (typically a mixture of cobble, gravel, and sand) and defend these sites vigorously. Initial courtship behavior involves rapid dashes, fin-flaring, nudging, and quivering motions by the male followed by similar quivering responses of the female, who then precedes the male to the nest. The female partially buries herself in the gravel substrate, is mounted by the male, and spawning occurs (Etnier and Starnes 1993, p. 523). It is assumed that the male continues to defend the nest until the eggs have hatched. The spawning period extends from April to June, but peak activity occurs when water temperatures reach 13 °C (55 °F), typically in mid-April (Bailey 1948, pp. 82–84; Lowe 1979, p. 44). Females produce between 200 and 600 eggs per season, with tremendous variation resulting from size, age, condition of females, and stream temperature (Rakes 2014, pers. comm.). As mentioned above, substrates with low levels of siltation are essential in accommodating the species' normal behaviors, including breeding, reproduction, and rearing. The species has suffered population declines and extirpations where sedimentation has been severe (Etnier and Starnes 1993, p. 524; Thomas 2008, p. 7; Service 2012, p. 1).

Juvenile arrow darters can exceed 25 mm (1 in) TL by mid-June and grow up to 50 mm (2 in) TL during the first year (Kuehne and Barbour 1983, p. 71; Etnier and Starnes 1993, p. 523). Juvenile arrow darters can be found throughout the channel but are often observed in shallow water along stream margins near roots mats, rock ledges, or some other cover. One-year olds are generally sexually mature and participate in spawning along with older classes (Etnier and Starnes 1993, p. 523). As stream flow lessens and riffles begin to shrink, most arrow darters move into

pools and tend to remain there even when summer and autumn rains restore stream flow (Kuehne and Barbour 1983, p. 71).

Therefore, based on the information above, we identify first- to third-order streams containing moderately flowing riffle, pool, run, and glide habitats with gravel and cobble substrates, root mats along the bank, undercut banks, and low levels of siltation to be physical or biological features essential to the conservation of the Kentucky arrow darter.

#### *Habitats Protected From Disturbance or Representative of the Historic, Geographical, and Ecological Distributions of the Species*

As described above, stable substrates with low levels of siltation, adequate water quality, and healthy aquatic insect populations are habitat features essential to the Kentucky arrow darter. Historically, first- to third-order streams across the species' range would have contained these habitat features.

All current and historical capture locations of the Kentucky arrow darter are from first- to third-order order, warmwater streams within the upper Kentucky River drainage (Gilbert 1887, pp. 53–54; Woolman 1892, pp. 275–281; Kuehne and Bailey 1961, pp. 3–4; Kuehne 1962, pp. 608–609; Thomas 2008, entire; Service 2012, entire). The species was historically distributed in at least six sub-basins of the Kentucky River, but it is now extirpated from at least 36 historical streams within those sub-basins. Forty-four percent of the species' extirpations (16 streams) have occurred since the mid-1990s, and the species appears to have disappeared completely from several minor watersheds (*e.g.*, Sexton Creek, South Fork Quicksand Creek, Troublesome Creek headwaters). Most remaining populations are highly fragmented and restricted to short stream reaches. Given the species' reduced range and fragmented distribution, it is vulnerable to extirpation from intentional or accidental toxic chemical spills, habitat modification, progressive degradation from runoff (nonpoint-source pollutants), natural catastrophic changes to their habitat (*e.g.*, flood scour, drought), and other stochastic disturbances, such as loss of genetic variation and inbreeding (Soulé 1980, pp. 157–158; Hunter 2002, pp. 97–101; Allendorf and Luikart 2007, pp. 117–146). In addition, the level of isolation seen in this species makes natural repopulation following localized extirpations virtually impossible without human intervention. Greater connectivity within extant populations

is needed to provide some protection against these threats and would be more representative of the historic, geographical distribution of the species.

Based on the biological information and needs discussed above, we identify stable, undisturbed stream beds and banks, and ability for populations to be distributed in multiple first- to third-order streams throughout the upper Kentucky River drainage that are protected from disturbance or are representative of the historic, geographical, and ecological distributions of the species to be physical or biological features essential to the conservation of the Kentucky arrow darter.

#### Primary Constituent Elements for the Kentucky Arrow Darter

According to 50 CFR 424.12(b), we are required to identify the physical or biological features essential to the conservation of the Kentucky arrow darter in areas occupied at the time of listing, focusing on the features' primary constituent elements. We consider primary constituent elements to be 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 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 Kentucky arrow darter are:

(1) Primary Constituent Element 1—Riffle-pool complexes and transitional areas (glides and runs) of geomorphically stable, first- to third-order streams with connectivity between spawning, foraging, and resting sites to promote gene flow throughout the species' range.

(2) Primary Constituent Element 2—Stable bottom substrates composed of gravel, cobble, boulders, bedrock ledges, and woody debris piles with low levels of siltation.

(3) Primary Constituent Element 3—An instream flow regime (magnitude, frequency, duration, and seasonality of discharge over time) sufficient to provide permanent surface flows, as measured during years with average rainfall, and to maintain benthic habitats utilized by the species.

(4) Primary Constituent Element 4—Adequate water quality characterized by moderate stream temperatures, acceptable dissolved oxygen concentrations, moderate pH, and low levels of pollutants. Adequate water quality is defined for the purpose of this

rule as the quality necessary for normal behavior, growth, and viability of all life stages of the Kentucky arrow darter.

(5) Primary Constituent Element 5—A prey base of aquatic macroinvertebrates, including mayfly nymphs, midge larvae, caddisfly larvae, stonefly nymphs, and small crayfishes.

#### Special Management Considerations or Protection

When designating critical habitat, we assess whether the specific areas within the geographical 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. The 38 units we are proposing to designate as critical habitat for the Kentucky arrow darter will require some level of management to address the current and future threats to the physical or biological features of the species. Due to their location on the Daniel Boone National Forest (DBNF), at least a portion of 20 proposed critical habitat units (Units 15–16, 18–32, and 36–38) are being managed and protected under DBNF's land and resource management plan (LRMP) (United States Forest Service (USFS) 2004, pp. 1–14), and additional conservation measures will be provided upon completion of a candidate conservation agreement between DBNF and the Service (see Available Conservation Measures section of the proposed listing rule published elsewhere in today's **Federal Register**).

Two of the 38 proposed critical habitat units (Units 3 and 4) are located wholly (Unit 3) or partially (Unit 4) on State property, specifically Robinson Forest, a 4,047-hectare (10,000-acre) research, education, and extension forest in Breathitt and Knott Counties owned by the University of Kentucky (UK) and managed by the Department of Forestry in the College of Agriculture, Food, and Environment. Management guidelines approved by the University of Kentucky's Board of Trustees in 2004 provide general land use allocations, sustainable allowances for active research and demonstration projects involving overstory manipulation, allocations of net revenues from research and demonstration activities, and management and oversight responsibilities (Stringer 2015, pers. comm.). Activities within Robinson Forest may require special management considerations or protection to address minor siltation associated with timber management research, stormwater runoff from unpaved roads, and limited off-road vehicle use. These threats are in

addition to random effects of drought, floods, or other natural phenomena.

At least portions of 32 proposed critical habitat units are located on private property (16 are located entirely on private property) and are not presently under the protection provided by the management plan or candidate conservation agreement for the species. Activities in or adjacent to these areas of proposed critical habitat may affect one or more of the physical or biological features essential to the Kentucky arrow darter. For example, features in this proposed critical habitat designation may require special management due to threats associated with resource extraction (coal surface mining, logging, natural gas and oil exploration), agricultural runoff (livestock, row crops), lack of adequate riparian buffers, construction and maintenance of State and county roads, land development, off-road vehicle use, and other nonpoint-source pollution. These threats are in addition to adverse effects of drought, floods, or other natural phenomena. Other activities that may affect physical and biological features in the proposed critical habitat units include those listed in the Effects of Critical Habitat Designation section, below.

Management activities that could ameliorate these threats include, but are not limited to, the use of best management practices (BMPs) designed to reduce sedimentation, erosion, and stream bank destruction; development of alternatives that avoid and minimize stream bed disturbances; an increase of stormwater management and reduction of stormwater flows into stream systems; preservation of headwater springs and streams; regulation of off-road vehicle use; and reduction of other watershed and floodplain disturbances that release sediments, pollutants, or nutrients into the water.

In summary, we find that the areas we are proposing as critical habitat for the Kentucky arrow darter that are occupied at the time of listing contain the physical or biological features for the species, and that these features may require special management considerations or protection. Special management consideration or protection may be required to eliminate, or to reduce to negligible levels, the threats affecting the physical or biological features of each unit. Additional discussion of threats facing individual units is provided in the individual unit descriptions below.

### 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. If after identifying occupied areas, a determination is made 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. We are not currently proposing to designate any areas outside the geographical area occupied by the species because we believe that occupied areas (a total of 47 streams) are adequate to ensure the conservation of the species. The following discussion describes how we identified and delineated those occupied areas.

We began our analysis by considering the historical and current ranges of the Kentucky arrow darter. We used various sources including published literature, museum collection databases, surveys, reports, and collection records obtained from the KDFWR, Kentucky State Nature Preserves Commission, Kentucky Division of Water, and our own files (see “Historical Range and Distribution” and “Current Range and Distribution” sections of our proposed listing rule published elsewhere in today’s **Federal Register**). We then identified the specific areas that are occupied by the species and that contain one or more of the physical or biological features essential to the species’ conservation. We defined occupied habitat as those stream reaches known to be currently occupied by the species. To identify the currently occupied stream reaches, we used post-2006 survey data that provided information on distribution and habitat condition (Thomas 2008, entire; Service 2012, entire; Service unpublished data). Generally, if the species was collected or observed in a particular stream during our recent rangewide surveys (2007–2014), the stream reach was considered to be occupied. A few transient individuals were observed in streams with unsuitable habitat conditions (*e.g.*, elevated conductivity), but these streams were not considered to be

occupied due to the poor habitat conditions and the high likelihood that these individuals had simply migrated from a nearby source stream. To identify the unoccupied stream reaches, we evaluated historical data (late 1880s–2006) and the results of our recent surveys (2007–2014) (Thomas 2008, entire; Service 2012, entire; Service unpublished data). If the species was known to occur in a stream prior to 2007, but was not observed during our recent rangewide survey, the stream reach was considered to be unoccupied.

Based on our review, we made a determination to not propose to designate as critical habitat any unoccupied stream reaches. We concluded that the proposed units occupied by the species at the time of listing are representative of the species’ historical range and include both the core population areas of Kentucky arrow darters, as well as remaining peripheral population areas. We determined that there was sufficient area for the conservation of the species within the occupied areas.

Following the identification of occupied stream reaches, the next step was to delineate the probable upstream and downstream extent of the species’ distribution. We used U.S. Geological Survey (USGS) 1:100,000 digital stream maps to delineate these boundaries of proposed critical habitat units according to the criteria explained below. We set the upstream and downstream limits of each critical habitat unit by identifying landmarks (bridges, confluences, and road crossings), and in some instances latitude and longitude coordinates and section lines, above and below the upper and lowermost reported locations of the Kentucky arrow darter in each stream reach to ensure incorporation of all potential sites of occurrence. We considered stream order and watershed size to select the upstream terminus. The species can occur in small, first-order reaches (Thomas 2008, entire; Service 2012, entire), but recent surveys have also demonstrated that the species is typically absent in these reaches once the watershed size (the upstream basin or catchment) falls below 1.3 square kilometers (km<sup>2</sup>) (0.5 square miles (mi<sup>2</sup>)). Consequently, we searched for this point within the watershed and selected the nearest tributary confluence as the upstream terminus. When a tributary was not available, a road-crossing (bridge or ford) or dam was used to mark the boundary. For the downstream boundary of a unit, we typically selected a stream confluence of a named tributary below the downstream-most occurrence record and within a third-order or smaller

stream reach. In the unit descriptions, distances between landmarks used to identify the upstream or downstream extent of a stream segment are given in stream kilometers and equivalent miles, as measured tracing the course of the stream, not straight-line distance. The proposed critical habitat areas were then mapped using ArcGIS software to produce the critical habitat unit maps.

Because fishes are naturally restricted by certain physical conditions within a stream reach (*i.e.*, flow, substrate, cover), they may be unevenly distributed within these habitat units. Uncertainty on some downstream distributional limits for some populations (*e.g.*, Frozen Creek) may have resulted in small areas of occupied habitat not being included in, or areas of unoccupied habitat included in, the designation. We recognize that both historical and recent collection records upon which we relied are incomplete, and that there may be stream segments or small tributaries not included in this proposed designation that harbor small, limited populations of the species considered in this proposed designation, or that others may become suitable in the future. The omission of such areas does not diminish their potential individual or cumulative importance to the conservation of the Kentucky arrow darter. The habitat areas contained within the proposed units described below constitute our best evaluation of areas needed for the conservation of this species at this time.

The areas proposed for critical habitat below include only stream channels within the ordinary high-water line and do not contain any developed areas or structures. When determining proposed critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such areas usually lack physical and biological features essential to the conservation of the species. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed areas. Any such areas inadvertently left inside critical habitat boundaries shown on the maps of this proposed rule have been excluded by text in the proposed rule and are not proposed for designation as critical habitat. Therefore, if the critical habitat is finalized as proposed, 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 designation of critical habitat does not imply that lands outside of critical habitat do not play an important role in the conservation of the species.

The proposed 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 Proposed Regulation Promulgation section. We include more detailed information on the boundaries of the proposed critical habitat designation in the individual unit descriptions below. 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-2015-0133, on our Internet site at <http://www.fws.gov/frankfort/>, and at the field office responsible for the designation (see **FOR FURTHER INFORMATION CONTACT**, above).

#### Proposed Critical Habitat Designation

We are proposing to designate approximately 395 skm (246 smi) in 38 units as critical habitat in Kentucky for the Kentucky arrow darter. These stream reaches comprise the entire currently known range of the species (and all extant populations). All proposed units are considered to be occupied at the time of listing and contain the physical or biological features in the appropriate quantity and spatial arrangement essential to the conservation of this species and support multiple life-

history processes for the Kentucky arrow darter. The 38 areas we propose as critical habitat are listed in Table 1 below.

Critical habitat units are either in private, Federal (DBNF), or State (UK) ownership. In Kentucky, adjacent landowners also own the land under streams (e.g., the stream channel or bottom), but the water is under State jurisdiction. Portions of the public-to-private boundary for Units 16, 18, 19, 21, 22, 24, 32, and 36 were located along the mid-line of the stream channel; lengths for these segments were divided equally between public and private ownership. Ownership and lengths of proposed Kentucky arrow darter critical habitat units are provided in Table 1.

TABLE 1—LOCATION, OWNERSHIP, AND LENGTHS FOR PROPOSED KENTUCKY ARROW DARTER CRITICAL HABITAT UNITS

Unit	Stream	County	Ownership—skm (smi)			Total length skm (smi)
			Private	Federal	State	
1 .....	Buckhorn Creek and Prince Fork .....	Knott .....	1.1 (0.7)	0	0	1.1 (0.7)
2 .....	Eli Fork .....	Knott .....	1.0 (0.6)	0	0	1.0 (0.6)
3 .....	Coles Fork and Snag Ridge Fork .....	Breathitt, Knott .....	0	0	11.0 (6.8)	11.0 (6.8)
4 .....	Clemons Fork .....	Breathitt .....	0.1 (0.1)	0	6.9 (4.3)	7.0 (4.4)
5 .....	Laurel Fork Quicksand Creek and Tributaries.	Knott .....	19.8 (12.4)	0	0	19.8 (12.4)
6 .....	Middle Fork Quicksand Creek and Tributaries.	Knott .....	22.5 (13.9)	0	0	22.5 (13.9)
7 .....	Spring Fork Quicksand Creek .....	Breathitt .....	2.2 (1.4)	0	0	2.2 (1.4)
8 .....	Hunting Creek and Tributaries .....	Breathitt .....	15.6 (9.7)	0	0	15.6 (9.7)
9 .....	Frozen Creek and Tributaries .....	Breathitt .....	26.4 (16.4)	0	0	26.4 (16.4)
10 .....	Holly Creek and Tributaries .....	Wolfe .....	18.3 (11.5)	0	0	18.3 (11.5)
11 .....	Little Fork .....	Lee, Wolfe .....	3.8 (2.3)	0	0	3.8 (2.3)
12 .....	Walker Creek and Tributaries .....	Lee, Wolfe .....	25.0 (15.5)	0	0	25.0 (15.5)
13 .....	Hell Creek and Tributaries .....	Lee .....	12.0 (7.4)	0	0	12.0 (7.4)
14 .....	Big Laurel Creek .....	Harlan .....	9.1 (5.7)	0	0	9.1 (5.7)
15 .....	Laurel Creek .....	Leslie .....	0.7 (0.5)	3.4 (2.1)	0	4.1 (2.6)
16 .....	Hell For Certain Creek and Tributaries.	Leslie .....	11.4 (7.0)	4.4 (2.8)	0	15.8 (9.8)
17 .....	Squabble Creek .....	Perry .....	12.0 (7.5)	0	0	12.0 (7.5)
18 .....	Blue Hole Creek and Left Fork Blue Hole Creek.	Clay .....	0	5.7 (3.5)	0	5.7 (3.5)
19 .....	Upper Bear Creek and Tributaries ....	Clay .....	0.2 (0.1)	6.6 (4.2)	0	6.8 (4.3)
20 .....	Katies Creek .....	Clay .....	1.7 (1.0)	4.0 (2.5)	0	5.7 (3.5)
21 .....	Spring Creek and Little Spring Creek	Clay .....	3.6 (2.2)	5.6 (3.5)	0	9.2 (5.7)
22 .....	Bowen Creek and Tributaries .....	Leslie .....	2.0 (1.2)	11.6 (7.3)	0	13.6 (8.5)
23 .....	Elisha Creek and Tributaries .....	Leslie .....	3.0 (1.9)	6.6 (4.0)	0	9.6 (5.9)
24 .....	Gilberts Big Creek .....	Clay, Leslie .....	2.0 (1.2)	5.2 (3.3)	0	7.2 (4.5)
25 .....	Sugar Creek .....	Clay, Leslie .....	1.1 (0.7)	6.1 (3.8)	0	7.2 (4.5)
26 .....	Big Double Creek and Tributaries ....	Clay .....	0	10.3 (6.4)	0	10.3 (6.4)
27 .....	Little Double Creek .....	Clay .....	0	3.4 (2.1)	0	3.4 (2.1)
28 .....	Jacks Creek .....	Clay .....	5.4 (3.4)	0.5 (0.3)	0	5.9 (3.7)
29 .....	Long Fork .....	Clay .....	0	2.2 (1.4)	0	2.2 (1.4)
30 .....	Horse Creek .....	Clay .....	3.0 (1.9)	2.0 (1.2)	0	5.0 (3.1)
31 .....	Bullskin Creek .....	Clay, Leslie .....	21.3 (13.3)	0.4 (0.2)	0	21.7 (13.5)
32 .....	Buffalo Creek and Tributaries .....	Owsley .....	23.2 (14.5)	14.9 (9.3)	0	38.1 (23.8)
33 .....	Lower Buffalo Creek .....	Lee, Owsley .....	7.3 (4.6)	0	0	7.3 (4.6)
34 .....	Silver Creek .....	Lee .....	6.2 (3.9)	0	0	6.2 (3.9)
35 .....	Travis Creek .....	Jackson .....	4.1 (2.5)	0	0	4.1 (2.5)
36 .....	Wild Dog Creek .....	Jackson, Owsley ..	4.3 (2.7)	3.8 (2.4)	0	8.1 (5.1)
37 .....	Granny Dismal Creek .....	Lee, Owsley .....	4.4 (2.7)	2.5 (1.6)	0	6.9 (4.3)
38 .....	Rockbridge Fork .....	Wolfe .....	0	4.5 (2.8)	0	4.5 (2.8)
Total .....	.....	.....	273.8 (170.3)	103.7 (64.7)	17.9 (11.1)	395.4 (246.1)



We present brief descriptions of all units below. We consider each proposed unit to contain all the physical or biological features and primary constituent elements (PCEs) identified above that are essential to the conservation of the species. In general, stream channels within these units are stable, with ample pool, glide, riffle, and run habitats (PCE 1) that maintain surface flows year round (PCE 3) and contain gravel, cobble, and boulder substrates with low levels of siltation (PCE 2). Such characteristics are necessary for reproductive, foraging, and sheltering requirements of Kentucky arrow darters. We consider water quality in each of these units to be characterized by moderate temperatures, relatively high dissolved oxygen concentrations, moderate pH, and low levels of pollutants (PCE 4). These conditions support abundant populations of aquatic macroinvertebrates that serve as prey items for Kentucky arrow darters (PCE 5).

The proposed critical habitat units include the stream channels of the creek 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. For each stream reach proposed as a critical habitat unit, the upstream and downstream boundaries are described generally below. More precise definitions are provided in the Proposed Regulation Promulgation at the end of this proposed rule.

*Unit 1: Buckhorn Creek and Prince Fork, Knott County, Kentucky*

Proposed Unit 1 is located off Buckhorn Road in the headwaters of the Buckhorn Creek drainage and between Kentucky Highway 1098 (KY 1098) and KY 1087. It includes 0.7 skm (0.4 smi) of Prince Fork from its confluence with Mart Branch downstream to its confluence with Buckhorn Creek and 0.4 skm (0.3 smi) of Buckhorn Creek from its confluence with Prince Fork downstream to its confluence with Emory Branch. Live Kentucky arrow darters have been collected from proposed Unit 1 in Prince Fork and just upstream of the confluence of Buckhorn Creek and Emory Branch (ATS 2011, p. 6; Service 2012, pp. 1–4). This unit is located almost entirely on private land,

except for any small amount that is publicly owned in the form of bridge crossings and road easements. The watershed surrounding proposed Unit 1 is dominated by forest and remains relatively undisturbed; however, downstream reaches of Buckhorn Creek have been degraded by siltation and nonpoint-source pollutants associated with surface coal mining, oil and gas exploration, logging, and runoff from unpaved roads (Service 2012, pp. 1–4). This unit helps to maintain the geographical range of the species (adds population redundancy) and provides opportunity for population growth.

Within proposed Unit 1, the Kentucky arrow darter and its habitat may require special management considerations or protection to address potential adverse effects (e.g., water pollution, siltation) associated with surface coal mining, logging (timber harvests on private land), natural gas and oil exploration, construction and maintenance of county roads (Buckhorn Road), the lack of adequate riparian buffers (near the confluence with Emory Branch), and off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 2: Eli Fork, Knott County, Kentucky*

This proposed unit is located in the headwaters of the Buckhorn Creek drainage between KY 1098 and KY 1087. It includes 1.0 skm (0.6 smi) of Eli Fork from its confluence with Stonecoal Branch downstream to its confluence with Boughcamp Branch (of Buckhorn Creek). Live Kentucky arrow darters have been collected from proposed Unit 2 near the confluence of Eli Fork and Boughcamp Branch (ATS 2011, p. 6). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. The watershed surrounding proposed Unit 2 is dominated by forest and remains relatively undisturbed; however, its receiving stream, Boughcamp Branch, and adjacent watersheds have been degraded by siltation and nonpoint-source pollutants associated with surface coal mining and logging (Service 2012, pp. 1–4). This unit helps to maintain the geographical range of the species (adds population redundancy) and provides opportunity for population growth.

Within proposed Unit 2, the Kentucky arrow darter and its habitat may require special management considerations or protection to address potential adverse effects (e.g., water pollution, siltation) associated with surface coal mining, logging, natural gas and oil exploration, off-road vehicle use, and construction

and maintenance of county roads. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 3: Coles Fork and Snag Ridge Fork, Breathitt and Knott Counties, Kentucky*

This proposed unit is located entirely within Robinson Forest, a 4,047-hectare (10,000-acre) research, education, and extension forest in Breathitt and Knott Counties owned by UK and managed by the Department of Forestry in the College of Agriculture, Food, and Environment. Unit 3 includes 2.1 skm (1.3 smi) of Snag Ridge Fork from its headwaters downstream to its confluence with Coles Fork and 8.9 skm (5.5 smi) of Coles Fork from its confluence with Saddle Branch downstream to its confluence with Buckhorn Creek. Live Kentucky arrow darters have been observed throughout proposed Unit 3 (Thomas 2008, p. 5; Service 2012, pp. 1–4), and Coles Fork continues to be one of the species' best remaining habitats. This unit is located entirely on lands owned by UK. The watershed surrounding proposed Unit 3 is intact and densely forested, water quality conditions are excellent (very close to baseline levels), and instream habitats are ideal for the species. This unit represents a stronghold for the species (core population) and likely contributes to range expansion (source population).

Within proposed Unit 3, the Kentucky arrow darter and its habitat may require special management considerations or protection to address siltation associated with timber management (on Robinson Forest), stormwater runoff from unpaved roads, and limited off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 4: Clemons Fork, Breathitt County, Kentucky*

Proposed Unit 4 is located along Clemons Fork Road in southeastern Breathitt County. This unit includes 7.0 skm (4.4 smi) of Clemons Fork from its confluence with Maple Hollow downstream to its confluence with Buckhorn Creek. Live Kentucky arrow darters have been observed throughout proposed Unit 4 (Lotrich 1973, p. 380; Thomas 2008, p. 5; Service 2012, pp. 1–4). A portion of this unit near the mouth of Clemons Fork is privately owned (0.1 skm (0.1 smi)), but the majority is located on lands owned by UK (see description for Unit 3). The watershed surrounding proposed Unit 4 is intact and densely forested, water quality conditions are excellent (very close to baseline levels), and instream habitats

are ideal for the species. Clemons Fork continues to be one of the species' best remaining habitats. This unit represents a stronghold for the species (core population) and likely contributes to range expansion (source population).

Within proposed Unit 4, the Kentucky arrow darter and its habitat may require special management considerations or protection to address siltation associated with timber management (on Robinson Forest), stormwater runoff from unpaved roads, and limited off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 5: Laurel Fork Quicksand Creek and Tributaries, Knott County, Kentucky*

Proposed Unit 5 generally runs parallel to KY 1098 and Laurel Fork Road in northern Knott County. This unit includes 1.2 skm (0.8 smi) of Fitch Branch from its headwaters downstream to its confluence with Laurel Fork Quicksand Creek, 2.7 skm (1.7 smi) of Newman Branch from its headwaters downstream to its confluence with Laurel Fork Quicksand Creek, 2.1 skm (1.3 smi) of Combs Branch from its headwaters downstream to its confluence with Laurel Fork Quicksand Creek, and 13.8 skm (8.6 smi) of Laurel Fork Quicksand Creek from KY 80 downstream to its confluence with Patten Fork. Live Kentucky arrow darters have been captured within proposed Unit 5 just upstream of the Laurel Fork and Patten Fork confluence and farther upstream at the first Laurel Fork Road crossing (Thomas 2008, p. 5; Service 2012, pp. 1–4). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. Hillsides and ridgetops above proposed Unit 5 are forested, but the valley is more developed with scattered residences along Laurel Fork Road. This unit helps to maintain the geographical range of the species (adds population redundancy) and likely serves as a source population within the Quicksand Creek watershed.

Within proposed Unit 5, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with logging, inadequate sewage treatment, surface coal mining, natural gas and oil exploration activities, inadequate riparian buffers, construction and maintenance of county roads, and off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 6: Middle Fork Quicksand Creek and Tributaries, Knott County, Kentucky*

Proposed Unit 6 is located along Middle Fork of Quicksand Creek Road in northeastern Knott County. This unit includes 0.8 skm (0.5 smi) of Big Firecoal Branch from its headwaters downstream to its confluence with Middle Fork Quicksand Creek, 2.1 skm (1.3 smi) of Bradley Branch from its headwaters downstream to its confluence with Middle Fork Quicksand Creek, 2.0 skm (1.2 smi) of Lynn Log Branch from its headwaters downstream to its confluence with Middle Fork Quicksand Creek, and 17.6 skm (10.9 smi) of Middle Fork Quicksand Creek from its headwaters downstream to its confluence with Big Branch. Live Kentucky arrow darters have been captured within proposed Unit 6 near the confluence of Middle Fork and Jack Branch and the confluence of Middle Fork and Upper Bear Pen Branch (Thomas 2008, p. 5; Service 2012, pp. 1–4). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. The watershed surrounding proposed Unit 6 is dominated by forest and continues to be relatively undisturbed. An unpaved, road traverses the length of the unit, but the rough condition of the road limits its use to off-road vehicles. This unit helps to maintain the geographical range of the species (adds population redundancy) and likely serves as a source population within the Quicksand Creek watershed.

Within proposed Unit 6, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with natural gas and oil exploration activities, logging, surface coal mining, inadequate riparian buffers, construction and maintenance of county roads, and off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 7: Spring Fork Quicksand Creek, Breathitt County, Kentucky*

Proposed Unit 7 is located of KY 2465 in southeastern Breathitt County and includes 2.2 skm (1.4 smi) of Spring Fork Quicksand Creek from its headwaters downstream to its confluence with an unnamed tributary. Live Kentucky arrow darters have been captured within proposed Unit 7 (Service unpublished data). This unit is located almost entirely on private land, except for any small amount that is

publicly owned in the form of bridge crossings and road easements. Most of the watershed surrounding proposed Unit 7 is forested, but mine reclamation activities have created open, pasture-like habitats along ridgetops and slopes to the north. This unit helps to maintain the geographical range of the species within the Quicksand Creek watershed (adds population redundancy) and provides opportunity for population growth.

Within proposed Unit 7, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with surface coal mining, natural gas and oil exploration activities, logging, and off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 8: Hunting Creek and Tributaries, Breathitt County, Kentucky*

Proposed Unit 8 is located along KY 1094 in eastern Breathitt County and includes 0.9 skm (0.5 smi) of Wolf Pen Branch from its headwaters downstream to its confluence with Hunting Creek, 2.3 skm (1.4 smi) of Fletcher Fork from its headwaters downstream to its confluence with Hunting Creek, 1.6 skm (1.0 smi) of Negro Fork from its headwaters downstream to its confluence with Hunting Creek, 3.1 skm (1.9 smi) of Licking Fork from its headwaters downstream to its confluence with Hunting Creek, and 7.7 skm (4.8 smi) of Hunting Creek from its confluence with Wells Fork downstream to its confluence with Quicksand Creek. Live Kentucky arrow darters have been captured within proposed Unit 8 near the confluence with Winnie Branch (Service unpublished data). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. The narrow valley surrounding proposed Unit 8 contains a few scattered residences and fields along Hunting Creek Road, but the majority of the watershed is relatively intact and dominated by forest. This unit helps to maintain the geographical range of the species within the Quicksand Creek watershed (adds population redundancy) and provides opportunity for population growth.

Within proposed Unit 8, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with natural gas and oil exploration activities, logging, surface

coal mining, inadequate sewage treatment, inadequate riparian buffers, construction and maintenance of county roads, and off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 9: Frozen Creek and Tributaries, Breathitt County, Kentucky*

Proposed Unit 9 is located along KY 378 in northern Breathitt County. This unit includes 4.7 skm (2.9 smi) of Clear Fork from its headwaters downstream to its confluence with Frozen Creek, 3.6 skm (2.3 smi) of Negro Branch from its headwaters downstream to its confluence with Frozen Creek, 4.2 skm (2.6 smi) of Davis Creek from its headwaters downstream to its confluence with Frozen Creek, and 13.9 skm (8.6 smi) of Frozen Creek from its headwaters downstream to its confluence with Morgue Fork. Live Kentucky arrow darters have been captured within proposed Unit 9 upstream of Rock Lick in the headwaters of Frozen Creek (Thomas 2008, p. 5; Service unpublished data). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. The individual valleys surrounding proposed Unit 9 are relatively narrow (approximately 100–160 meters (m) (328–525 feet (ft)) at their widest) and comprised of small farms and scattered residences. The ridgetops and hillsides are relatively undisturbed and dominated by forest. This unit helps to maintain the geographical range of the species (adds population redundancy), contributes to genetic exchange between several streams in the Frozen Creek watershed, and likely serves as an important source population in the northern limits of the species' range.

Within proposed Unit 9, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with inadequate sewage treatment, canopy loss, agricultural runoff, inadequate riparian buffers, construction and maintenance of county roads, logging, natural gas and oil exploration activities, surface coal mining (legacy effects), and off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 10: Holly Creek and Tributaries, Wolfe County, Kentucky*

Proposed Unit 10 is located along KY 1261 in southern Wolfe County and

includes 2.8 skm (1.8 smi) of Spring Branch from its headwaters downstream to its confluence with Holly Creek, 2.0 skm (1.3 smi) of Pence Branch from its headwaters downstream to its confluence with Holly Creek, 4.0 skm (2.5 smi) of Cave Branch from its headwaters downstream to its confluence with Holly Creek, and 9.5 skm (5.9 smi) of Holly Creek from KY 1261 (first bridge crossing north of KY 15) downstream to its confluence with the North Fork Kentucky River. Live Kentucky arrow darters have been captured within proposed Unit 10 near the confluence of Holly Creek and Spring Branch (Thomas 2008, p. 5). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. This unit helps to maintain the geographical range of the species and provides opportunity for population growth.

The valley bottom surrounding proposed Unit 10 is consistently wider (approximately 320 m (1050 ft) at its widest) than other occupied stream valleys (e.g., Frozen Creek), and agricultural land use is more extensive. Multiple small farms (e.g., pasture, row crops, hayfields) and residences are scattered along KY 1261, while the ridgetops and hillsides are dominated by forest. We are not designating critical habitat in upstream reaches of the drainage (e.g., Kelse Holland Fork, Mandy Holland Fork, Terrell Fork) because these streams do not contain the PCEs essential to the species' conservation. Habitat conditions in these upstream reaches are poor, as characterized by straightened, incised channels; a lack of canopy cover; and unstable substrates.

Within proposed Unit 10, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with agricultural runoff, canopy loss, inadequate riparian buffers, construction and maintenance of county roads, inadequate sewage treatment, logging, surface coal mining (legacy effects), and off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 11: Little Fork, Lee and Wolfe County, Kentucky*

This proposed unit is located between KY 2016 and Booth Ridge Road in southern Wolfe County and includes 3.8 skm (2.3 smi) of Little Fork from its headwaters downstream to its confluence with Lower Devil Creek. Live Kentucky arrow darters have been

captured within proposed Unit 11 just upstream of the confluence of Little Fork and Lower Devil Creek (Thomas 2008, p. 5; Service 2012, pp. 1–4). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. This unit helps to maintain the geographical range of the species (population redundancy) and provides opportunity for population growth.

The valley bottom surrounding this proposed unit is densely forested, but a network of unpaved roads and oil and gas well sites are located along the ridgetops to the east and west of the stream. Within proposed Unit 11, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with oil and gas exploration activities, off-road vehicle use, road runoff, canopy loss, logging, and surface coal mining (legacy effects). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 12: Walker Creek and Tributaries, Lee and Wolfe Counties, Kentucky*

Proposed Unit 12 is located between KY 11 and Shumaker Road to the west and KY 2016 to the east in northern Lee County and southwestern Wolfe County. This unit includes 3.9 skm (2.4 smi) of an unnamed tributary of Walker Creek from its headwaters downstream to its confluence with Walker Creek, 2.4 skm (1.5 smi) of Cowan Fork from its headwaters downstream to its confluence with Hell for Certain Creek, 2.0 skm (1.2 smi) of Hell for Certain Creek from the outflow of an unnamed reservoir downstream to its confluence with Walker Creek, 0.8 skm (0.5 smi) of Boonesboro Fork from its headwaters downstream to its confluence with Walker Creek, 2.2 skm (1.4 smi) of Peddler Creek from its headwaters downstream to its confluence with Walker Creek, 1.1 skm (0.7 smi) of Huff Cave Branch from its headwaters downstream to its confluence with Walker Creek, and 12.6 skm (7.8 smi) of Walker Creek from its headwaters (reservoir) downstream to its confluence with North Fork Kentucky River. Live Kentucky arrow darters have been captured at several locations within proposed Unit 12 (Thomas 2008, p. 5; Service 2012, pp. 1–4), including the Old Fincastle Road low-water crossing, a site upstream near the confluence with Boonesboro Fork, and in the headwaters just upstream of the confluence of Walker Creek with Hell For Certain Creek. This unit is located almost

entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements.

Land use surrounding this proposed unit is similar to that of Little Fork (proposed Unit 11) and Hell Creek (proposed Unit 13). The valley bottom is densely forested, but numerous unpaved roads, oil and gas well sites, and scattered residences occur along the ridgetops to the east and west of the stream. A narrow, unmaintained dirt road (Walker Creek Road) runs parallel to and east of this unit for its entire length; off-road vehicle use is common. This unit helps to maintain the geographical range of the species (adds population redundancy), contributes to genetic exchange between several streams in the Walker Creek watershed, and likely serves as an important source population in the northern limits of the species' range.

Within proposed Unit 12, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with oil and gas exploration activities, off-road vehicle use, road runoff, canopy loss, and legacy effects of previous oil and gas well development. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 13: Hell Creek and Tributaries, Lee County, Kentucky*

Proposed Unit 13 is located between KY 11 and Shumaker Road in northern Lee County. This unit includes 2.3 skm (1.4 smi) of Miller Fork from its headwaters downstream to its confluence with Hell Creek, 0.7 skm (0.4 smi) of Bowman Fork from its headwaters downstream to its confluence with Hell Creek, 1.9 skm (1.2 smi) of an unnamed tributary of Hell Creek from its headwaters downstream to its confluence with Hell Creek, and 7.1 skm (4.4 smi) of Hell Creek from the outflow of an unnamed reservoir downstream to its confluence with North Fork Kentucky River. Live Kentucky arrow darters have been captured within proposed Unit 13 from the Hell Creek mainstem near the Hell Creek Road low-water crossing and from an unnamed tributary of Hell Creek near the Hell Creek Road low-water crossing (Thomas 2008, p. 5; Service 2012, pp. 1–4). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements.

Land use surrounding this proposed unit is similar to that of Little Fork

(proposed Unit 11) and Walker Creek (proposed Unit 12). The valley bottom surrounding this proposed unit is forested, but numerous unpaved roads, oil and gas well sites, and scattered residences occur along the ridgetops to the east and west of the stream. A narrow, unmaintained dirt road runs parallel to and east of proposed Unit 13 upstream of the Hell Creek Road crossing; off-road vehicle use is common. This unit helps to maintain the geographical range of the species (population redundancy) and provides opportunity for population growth.

Within proposed Unit 13, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with oil and gas exploration activities, off-road vehicle use, road runoff, canopy loss, and legacy effects of previous oil and gas well development. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 14: Big Laurel Creek, Harlan County, Kentucky*

Proposed Unit 14 is located off KY 221 and Big Laurel Creek Road in northern Harlan County and includes 9.1 skm (5.7 smi) of Big Laurel Creek from its confluence with Combs Fork downstream to its confluence with Greasy Creek. Live Kentucky arrow darters have been captured from this unit near its confluence with White Oak Branch (Thomas 2008, p. 5; Service 2012, pp. 1–4). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. This unit adds population redundancy at the southeastern edge of the species' range.

The valley bottom and hillsides surrounding proposed Unit 14 are densely forested, but extensive surface coal mining within the watershed has created clearings along the ridgetops and has resulted in five valley (hollow) fills that are located within tributaries of Big Laurel Creek. Within proposed Unit 14, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with historical surface coal mining, off-road vehicle use, road runoff, logging, and canopy loss. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 15: Laurel Creek, Leslie County, Kentucky*

Proposed Unit 15 is located south of US 421/KY 80 in western Leslie County and includes 4.1 skm (2.6 smi) of Laurel Creek from its confluence with Sandlick Branch downstream to its confluence with Left Fork Rockhouse Creek. A single live Kentucky arrow darter has been captured from this unit, approximately 0.48 skm (0.3 smi) from the confluence with Left Fork Rockhouse Creek (Thomas 2013, pers. comm.). A small portion of this proposed unit is privately owned (0.7 skm (0.5 smi)), but the remainder of the unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit adds population redundancy and provides opportunity for population growth.

The watershed surrounding proposed Unit 15 is entirely forested, with no private residences or other structures. Within proposed Unit 15, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with illegal off-road vehicle use, road runoff, and timber management. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 16: Hell For Certain Creek and Tributaries, Leslie County, Kentucky*

Proposed Unit 16 is located off Hell For Certain Road between KY 1482 and KY 257 in northern Leslie County. This unit includes 1.3 skm (0.8 smi) of Cucumber Branch from its headwaters downstream to its confluence with Hell For Certain Creek, 3.1 skm (1.9 smi) of Big Fork from its headwaters downstream to its confluence with Hell For Certain Creek, and 11.4 skm (7.1 smi) of Hell For Certain Creek from its headwaters downstream to its confluence with Middle Fork Kentucky River. Live Kentucky arrow darters have been captured from proposed Unit 16 at multiple locations upstream of its confluence with Big Fork (Thomas 2008, p. 4; Service unpublished data). A portion of this proposed unit is in Federal ownership (administered by DBNF) (4.4 skm (2.8 smi)), but the majority of the unit is in private ownership. For the portion of the unit in Federal ownership, land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit represents a stronghold for the species

within the Middle Fork Kentucky River sub-basin and likely acts a source population. This unit is also important for maintaining the distribution and genetic diversity of the species within the Middle Fork sub-basin.

The valley bottom surrounding proposed Unit 16 is narrow (approximately 100 m (328 ft) at its widest) and comprised of a mixture of small farms (e.g., pasture, hayfields) and scattered residences along Hell For Certain Road. The ridgetops and hillsides are relatively undisturbed and dominated by forest. Within proposed Unit 16, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, inadequate sewage treatment, inadequate riparian buffers, construction and maintenance of county roads, agricultural runoff, illegal off-road vehicle use, logging, and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 17: Squabble Creek, Perry County, Kentucky*

This proposed unit is located south of KY 28, just downstream of Buckhorn Lake Dam and near the community of Buckhorn in northwestern Perry County. Proposed Unit 17 includes 12.0 skm (7.5 smi) of Squabble Creek from its confluence with Long Fork downstream to its confluence with Middle Fork Kentucky River. Live Kentucky arrow darters have been captured from this unit near its confluence with Big Branch (Service unpublished data). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. This unit helps to maintain the geographical range of the species and provides opportunity for population growth.

The valley surrounding proposed Unit 17 is narrow (approximately 113 m (370 ft) at its widest) and comprised of a mixture of residences (many in clusters) and small farms (e.g., pasture, hayfields) scattered along KY 222, which parallels Squabble Creek for much of its length. Ridgetops and hillsides in most of the Squabble Creek valley are relatively undisturbed and dominated by forest; however, surface coal mining has occurred along ridgetops (to the north and south of Squabble Creek) in the downstream half of the drainage.

Within proposed Unit 17, the Kentucky arrow darter and its habitat may require special management considerations or protection to address

adverse effects (e.g., siltation, water pollution) associated with road runoff, inadequate sewage treatment, agricultural runoff, inadequate riparian buffers, construction and maintenance of county roads, illegal off-road vehicle use, logging, and historical surface coal mining. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 18: Blue Hole Creek and Left Fork Blue Hole Creek, Clay County, Kentucky*

Proposed Unit 18 is located along KY 1524 in southeastern Clay County. This unit includes 1.8 skm (1.1 smi) of Left Fork from its headwaters downstream to its confluence with Blue Hole Creek and 3.9 skm (2.4 smi) of Blue Hole Creek from its confluence with Dry Branch downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured from Unit 18 near the mouth of Cow Hollow (Thomas 2008, p. 4). This unit is entirely in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 18 is entirely forested, with no private residences or other structures. The only interruption in the canopy is the KY 1525 corridor, which traverses most of the valley. One additional road, Blue Hole School Road, is located at the headwaters of Blue Hole Creek, leading to a small cemetery site. Blue Hole Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). Collectively, these streams represent the largest, most significant cluster of occupied streams and are characterized by intact riparian zones with negligible residential development, high gradients with abundant riffles, cool temperatures, low conductivities (less than 100  $\mu$ S/cm), and stable channels with clean cobble and boulder substrates (Thomas 2008, p. 4; Service 2014, p. 6).

Within proposed Unit 18, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, illegal off-road vehicle use, and timber management (on DBNF). These threats are in addition to random effects of

drought, floods, or other natural phenomena.

*Unit 19: Upper Bear Creek and Tributaries, Clay County, Kentucky*

Proposed Unit 19 is located along KY 1524 and Upper Bear Creek Road in southeastern Clay County. This unit includes 1.5 skm (1.0 smi) of Left Fork Upper Bear Creek from its headwaters downstream to its confluence with Upper Bear Creek, 0.8 skm (0.5 smi) of Right Fork Upper Bear Creek from its headwaters downstream to its confluence with Upper Bear Creek, and 4.5 skm (2.8 smi) of Upper Bear Creek from its confluence with Left Fork and Right Fork Upper Bear Creek downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured from proposed Unit 19 in two locations downstream of the Left and Right Forks (Thomas 2008, p. 4). A small portion of this unit is privately owned (0.2 skm (0.1 smi)), but the majority of the unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 19 is primarily forested, but a few scattered residences and small farms are located along KY 1524 in the upstream (western) half of the watershed. Upper Bear Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 19, the Kentucky arrow darter and its habitats may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, illegal off-road vehicle use, agricultural runoff, and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 20: Katies Creek, Clay County, Kentucky*

Proposed Unit 20 is located along Katies Creek Road in southeastern Clay County and includes 5.7 skm (3.5 smi) of Katies Creek from its confluence with Cave Branch downstream to its confluence with the Red Bird River.

Live Kentucky arrow darters have been captured from this unit approximately 0.2 skm (0.12 smi) upstream of the mouth of Kates Creek (Thomas 2008, p. 4). A small portion of this unit is privately owned (1.7 skm (1 smi)), but the majority of the unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 20 is entirely forested, with no private residences or other structures. The only interruption in the canopy is the Kates Creek Road corridor, which traverses the valley. Kates Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 20, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, illegal off-road vehicle use, logging (on private land), and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 21: Spring Creek and Little Spring Creek, Clay County, Kentucky*

Proposed Unit 21 is located west of KY 66 in southeastern Clay County. This unit includes 1.0 skm (0.6 smi) of Little Spring Creek from its headwaters downstream to its confluence with Spring Creek and 8.2 skm (5.1 smi) of Spring Creek from its headwaters downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured within proposed Unit 21 approximately 0.2 skm (0.1 smi) upstream of the mouth of Spring Creek (Thomas 2008, p. 4). A portion of this unit is privately owned (3.6 skm (2.2 smi)), but the majority of the unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to

connectivity of streams within the watershed.

The watershed surrounding proposed Unit 21 is relatively undisturbed and dominated by forest; however, a few scattered residences are located along a short segment (approximately 0.8 skm (0.5 smi)) of Lower Spring Creek Road near its junction with KY 66 and along Sand Hill Road and Spring Creek Road at the western (upstream) end of the drainage. The stream corridor between these two areas, an approximate 6.4-skm (4-smi) segment, is inaccessible except by off-road vehicle. About 10 oil wells are located along ridgetops and hillsides near the mouth of Spring Creek, and these sites are connected by a network of unpaved roads. Spring Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 21, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, off-road vehicle use, inadequate sewage treatment, logging (on private land), timber management (on DBNF), and oil and gas exploration activities. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 22: Bowen Creek and Tributaries, Leslie County, Kentucky*

Proposed Unit 22 is located east of KY 66 and adjacent to Bowen Creek Road in western Leslie County. This unit includes 2.2 skm (1.4 smi) of Laurel Fork from its headwaters downstream to its confluence with Bowen Creek, 1.8 skm (1.1 smi) of Amy Branch from its headwaters downstream to its confluence with Bowen Creek, and 9.6 skm (6.0 smi) of Bowen Creek from its headwaters downstream to the Red Bird River. Live Kentucky arrow darters have been captured from proposed Unit 22 near its confluence with Blevins Branch and Hurricane Branch (Service unpublished data). A portion of this unit is privately owned (2.0 skm (1.2 smi)), but the majority of the unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to

connectivity of streams within the watershed.

The watershed surrounding this unit is relatively undisturbed and dominated by forest. A few scattered residences are located along Bowen Creek Road near the mid-point of the valley, and others are located further upstream along KY 406. Bowen Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within Unit 22, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, illegal off-road vehicle use, inadequate sewage treatment, logging (on private land), and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 23: Elisha Creek and Tributaries, Leslie County, Kentucky*

Proposed Unit 23 is located east of KY 66 and adjacent to Elisha Creek Road in western Leslie County. This unit includes 4.4 skm (2.7 smi) of Right Fork Elisha Creek from its headwaters downstream to its confluence with Elisha Creek, 2.3 skm (1.4 smi) of Left Fork Elisha Creek from its headwaters downstream to its confluence with Elisha Creek, and 2.9 skm (1.8 smi) of Elisha Creek from its confluence with Right Fork Elisha Creek downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured throughout proposed Unit 23 (Service unpublished data). A portion of this proposed unit is privately owned (3.0 skm (1.9 smi)), but the majority of the unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 23 is relatively undisturbed and dominated by forest. A few scattered residences are located along Elisha Creek Road at the downstream end of the Elisha Creek valley (near the mouth of Elisha Creek). A few oil and gas wells are scattered throughout the drainage. Elisha Creek is 1 of 11 Red Bird River

tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 23, the Kentucky arrow darter and its habitats may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, illegal off-road vehicle use, logging (on private land), timber management (on DBNF), inadequate sewage treatment, and natural gas and oil exploration activities. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 24: Gilberts Big Creek, Clay and Leslie Counties, Kentucky*

Proposed Unit 24 is located east of KY 66 and generally parallel to Gilberts Creek Road in southeastern Clay County and western Leslie County. This proposed unit includes 7.2 skm (4.5 smi) of Gilberts Big Creek from its headwaters downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured throughout this unit. A portion of this unit is privately owned (2.0 skm (1.2 smi)), but the majority of the unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 24 is relatively undisturbed and dominated by forest. A few scattered residences and small farms are located along Gilberts Creek Road at the downstream end of the valley near the mouth of Gilberts Big Creek. Several gas and oil wells are also scattered throughout the valley. Gilberts Big Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 24, the Kentucky arrow darter and its habitats may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, off-road vehicle use, logging (on private

land), timber management (on DBNF), inadequate sewage treatment, agricultural runoff, and natural gas and oil exploration activities. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 25: Sugar Creek, Clay and Leslie Counties, Kentucky*

Proposed Unit 25 is located off Sugar Creek Road in southeastern Clay County and western Leslie County and includes 7.2 skm (4.5 smi) of Sugar Creek from its headwaters downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured throughout this unit (Thomas 2008, p. 4; Thomas *et al.* 2014, p. 23). A portion of this unit is privately owned (1.1 skm (0.7 smi)), but the majority of the unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 25 is relatively undisturbed and dominated by forest. A few scattered residences and small farms are located along Sugar Creek Road at the downstream end of the valley near the mouth of Sugar Creek. Several gas and oil wells are also scattered throughout the valley. Sugar Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 25, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, off-road vehicle use, logging (on private land), timber management (on DBNF), inadequate sewage treatment, agricultural runoff, and natural gas and oil exploration activities. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 26: Big Double Creek and Tributaries, Clay County, Kentucky*

Proposed Unit 26 is located adjacent to Big Double Creek Road in southeastern Clay County. This unit includes 1.4 skm (0.9 smi) of Left Fork

Big Double Creek from its headwaters downstream to its confluence with Big Double Creek, 1.8 skm (1.1 smi) of Right Fork Big Double Creek from its headwaters downstream to its confluence with Big Double Creek, and 7.1 skm (4.4 smi) of Big Double Creek from its headwaters downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured from numerous localities in proposed Unit 26, which has been surveyed regularly by KDFWR and Service personnel (Thomas 2008, p. 4; Thomas *et al.* 2014, p. 23; Service unpublished data). This unit is entirely in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 26 is relatively undisturbed and dominated by forest, with about 90 percent in Federal ownership (administered by DBNF). The only residential development is concentrated along Arnett Fork Road, which parallels Arnett Fork, a first order tributary of Big Double Creek. A USFS public use area (Big Double Creek Recreational Area) is located adjacent to Unit 26, approximately 1.6 skm (1.0 smi) upstream of Arnett Fork. This area consists of a gravel road and parking lot, a bathroom facility, several picnic tables, and two maintained fields connected by a pedestrian bridge over Big Double Creek. Upstream of the public use area, Big Double Creek can be accessed via USFS Road 1501, which extends upstream to the confluence of the Left and Right Forks. Big Double Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 26, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation) associated with road runoff, off-road vehicle use, and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.



*Unit 27: Little Double Creek, Clay County, Kentucky*

Proposed Unit 27 is located adjacent to Little Double Creek Road in southeastern Clay County. This unit includes 3.4 skm (2.1 smi) of Little Double Creek from its headwaters downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured from two localities in proposed Unit 27 (Thomas 2008, p. 4; Service unpublished data). One hundred percent of this unit is in Federal ownership (administered by DBNF), and the DBNF's Redbird Ranger District headquarters is located off KY 66 at the mouth of Little Double Creek. Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 27 is entirely forested, with no private residences or other structures. The only interruption in the canopy of the watershed is the Little Double Creek Road corridor, which traverses the length of the valley. Little Double Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 27, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation) associated with road runoff, illegal off-road vehicle use, and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 28: Jacks Creek, Clay County, Kentucky*

This proposed unit is located along Jacks Creek Road, north of Hal Rogers Parkway and east of KY 66 in eastern Clay County. Unit 28 includes 5.9 skm (3.7 smi) of Jacks Creek from its headwaters downstream to its confluence with the Red Bird River. Live Kentucky arrow darters have been captured from proposed Unit 28 just downstream of the Crib Branch confluence (Service 2012, entire). A small portion of this unit is in Federal ownership (0.5 skm (0.3 smi)), but the majority of the unit is privately owned.

For the portion of the unit in Federal ownership (administered by DBNF), land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The valley bottom surrounding proposed Unit 28 is comprised of a mixture of residences (many in clusters) and small farms (e.g., pasture, hayfields) scattered along Jacks Creek Road, which parallels Jacks Creek for most of its length. Ridgetops and hillsides in most of the valley are relatively undisturbed and dominated by forest. Jacks Creek is 1 of 11 Red Bird River tributaries (proposed Units 18–28) that support Kentucky arrow populations (Thomas 2008, entire; Service 2012, entire). See the description of proposed Unit 18 for more information regarding the characterization of the streams within this drainage.

Within proposed Unit 28, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, inadequate sewage treatment, agricultural runoff, inadequate riparian buffers, construction and maintenance of county roads, illegal off-road vehicle use, logging (on private land), and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 29: Long Fork, Clay County, Kentucky*

Proposed Unit 29 is located along USFS Road 1633, which is west of KY 149 and the Hal Rogers Parkway in eastern Clay County. Unit 29 includes 2.2 skm (1.4 smi) of Long Fork from its headwaters downstream to its confluence with Hector Branch. Live Kentucky arrow darters have been captured throughout proposed Unit 29 as a result of a reintroduction effort by KDFWR and Conservation Fisheries, Inc. (CFI) of Knoxville, Tennessee (Thomas et al. 2014, p. 23) (see Available Conservation Measures section of our proposed listing rule published elsewhere in today's **Federal Register**). One hundred percent of this unit is in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit comprises a portion of the

species' core population within the Red Bird River watershed and contributes to connectivity of streams within the watershed.

The watershed surrounding proposed Unit 29 is entirely forested, with no private residences or other structures. The only minor interruption in the canopy of the watershed is the USFS Road 1633 corridor, which parallels Long Fork for part of its length. Habitats in Long Fork are similar to other occupied streams (proposed Units 18–28) in the Red Bird River drainage. See the description of proposed Unit 18 for more information regarding the characterization of the streams within the Red Bird drainage.

Within proposed Unit 29, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation) associated with road runoff, illegal off-road vehicle use, and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 30: Horse Creek, Clay County, Kentucky*

Proposed Unit 30 is located adjacent to Reynolds Road and Elijah Feltner Road in southwestern Clay County. It includes 5.0 skm (3.1 smi) of Horse Creek from its headwaters downstream to its confluence with Pigeon Roost Branch. Live Kentucky arrow darters have been captured within this unit approximately 1.9 skm (1.2 smi) downstream of the confluence of Horse Creek and Tuttle Branch (Service unpublished data). A portion of proposed Unit 30 is in Federal ownership (2.0 skm (1.2 smi)), but the majority of the unit is privately owned. For the portion of the basin in Federal ownership (administered by DBNF), land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit helps to maintain the geographical range of the species and represents the only occupied habitat within the Goose Creek watershed.

The valley bottom surrounding proposed Unit 30 is comprised of a mixture of forest, small farms, and residences. Ridgetops and hillsides in most of the valley are relatively undisturbed and dominated by forest. Within proposed Unit 30, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, agricultural runoff, inadequate sewage treatment,

lack of riparian buffers, construction and maintenance of county roads, illegal off-road vehicle use, and logging on private land and timber management on DBNF. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 31: Bullskin Creek, Clay and Leslie Counties, Kentucky*

Proposed Unit 31 is located along KY 1482, east of the town of Oneida, Kentucky, in eastern Clay County and northwestern Leslie County. It includes 21.7 skm (13.5 smi) of Bullskin Creek from its confluence with Old House Branch downstream to its confluence with the South Fork Kentucky River. Live Kentucky arrow darters have been captured from Unit 31 at the confluence of Long Branch and just upstream of the confluence of Barger Branch (Thomas 2008, p. 4; Service 2012, entire). A small portion of this unit is in Federal ownership (0.4 skm (0.2 smi)), but the majority of the unit is privately owned. For the portion of the basin in Federal ownership (administered by DBNF), land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit helps to maintain the geographical range of the species and provides opportunity for population growth.

The valley bottom surrounding proposed Unit 31 is comprised of a mixture of residences (many in clusters) and small farms (e.g., pasture, hayfields) scattered along KY 1482, which parallels Bullskin Creek for its entire length. Ridgetops and hillsides in most of the valley are relatively undisturbed and dominated by forest, but a few watersheds show signs of active or recent disturbance. Surface coal mining is currently ongoing in the watersheds of Wiles Branch (Permit #826–0649), Barger Branch (Permit #826–0664), and a few unnamed tributaries of Bullskin Creek (Permit #826–0664). Recent logging activities have occurred in the watershed of Panco Branch.

Within proposed Unit 31, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, surface coal mining, inadequate sewage treatment, agricultural runoff, lack of riparian buffers, construction and maintenance of county roads, illegal off-road vehicle use, and logging. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 32: Buffalo Creek and Tributaries, Owsley County, Kentucky*

Proposed Unit 32 is located north of Oneida, Kentucky, and east of KY 11 in southeastern Owsley County. This unit includes 2.0 skm (1.2 smi) of Cortland Fork from its headwaters downstream to its confluence with Laurel Fork, 6.4 skm (4.0 smi) of Laurel Fork from its headwaters downstream to its confluence with Left Fork Buffalo Creek, 4.6 skm (2.9 smi) of Lucky Fork from its headwaters downstream to its confluence with Left Fork Buffalo Creek, 5.1 skm (3.2 smi) of Left Fork Buffalo Creek from its headwaters downstream to its confluence with Buffalo Creek, 17.3 skm (10.8 smi) of Right Fork Buffalo Creek from its headwaters downstream to its confluence with Buffalo Creek, and 2.7 skm (1.7 smi) of Buffalo Creek from its confluence with Left Fork Buffalo Creek and Right Fork Buffalo Creek downstream to its confluence with the South Fork Kentucky River. Live Kentucky arrow darters have been captured from multiple locations throughout proposed Unit 32 (Thomas 2008, p. 4; Service 2012, entire). A portion of this unit is in Federal ownership (administered by DBNF) (14.9 skm (9.3 smi)), but the majority of the unit is in private ownership. For the portion in Federal ownership, land and resource management decisions and activities are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit represents a stronghold for the species within the lower half of the South Fork Kentucky River sub-basin and likely acts a source population.

Ridgetops and hillsides in most of the valley surrounding proposed Unit 32 are relatively undisturbed and dominated by forest, but portions of the valley bottom surrounding Unit 32 have been cleared and consist of a mixture of residences (many in clusters) and small farms (e.g., pasture, hayfields, row crops) scattered along roadways. Surface coal mining has been conducted recently or is currently ongoing in the headwaters of Left Fork Buffalo Creek, specifically Stamper Branch of Lucky Fork (Permit #895–0175), Cortland Fork of Laurel Fork (Permit #813–0271), and Joyce Fork of Laurel Fork (Permit #895–0175).

Within proposed Unit 32, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, surface coal mining, inadequate sewage treatment, inadequate riparian buffers, agricultural runoff, construction and

maintenance of roads, illegal off-road vehicle use, logging (on private land), and timber management (on DBNF). These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 33: Lower Buffalo Creek, Lee and Owsley Counties, Kentucky*

Proposed Unit 33 is located along KY 1411 and Straight Fork-Zeke Branch Road in southern Lee and northern Owsley Counties. This unit includes 2.2 skm (1.4 smi) of Straight Fork from its headwaters downstream to its confluence with Lower Buffalo Creek and 5.1 skm (3.2 smi) of Lower Buffalo Creek from its confluence with Straight Fork downstream to its confluence with the South Fork Kentucky River. Live Kentucky arrow darters have been captured within proposed Unit 33 at the confluence of Lower Buffalo Creek and Straight Fork (Thomas 2008, p. 4). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. This unit helps to maintain the geographical range of the species and provides opportunity for population growth.

Ridgetops and hillsides in most of the valley surrounding proposed Unit 33 are relatively undisturbed and dominated by forest, but large portions of the valley bottom surrounding proposed Unit 33 have been cleared and consist of a mixture of residences (many in clusters) and small farms (e.g., pasture, hayfields, row crops). Extensive logging has occurred recently (within the last 7 years) within Jerushia Branch, a first order tributary of Lower Buffalo Creek.

Within this unit, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, construction and maintenance of roads, inadequate sewage treatment, inadequate riparian buffers, agricultural runoff, illegal off-road vehicle use, and logging. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 34: Silver Creek, Lee County, Kentucky*

Proposed Unit 34 is located along Silver Creek Road, partially within the city limits of Beattyville in central Lee County. This unit includes 6.2 skm (3.9 smi) of Silver Creek from its headwaters downstream to its confluence with the Kentucky River. Live Kentucky arrow darters have been captured within proposed Unit 34 approximately 1.4 skm (0.9 smi)

upstream of the mouth of Silver Creek (Thomas 2008, p. 5). This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. This unit helps to maintain the geographical range of the species and provides opportunity for population growth.

The valley surrounding proposed Unit 34 is unusual among occupied watersheds because it is not located in a rural area. The mouth of Silver Creek (downstream terminus of Unit 34) is located within the city limits of Beattyville, and the downstream half of the watershed is moderately developed, with numerous residences along Silver Creek Road. The upstream half of the watershed is less developed and dominated by forest. Within this unit, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, construction and maintenance of roads, inadequate sewage treatment, inadequate riparian buffers, and illegal off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 35: Travis Creek, Jackson County, Kentucky*

Proposed Unit 35 is located along Travis Creek Road in eastern Jackson County. This unit includes 4.1 skm (2.5 smi) of Travis Creek from its headwaters downstream to its confluence with Hector Branch. Live Kentucky arrow darters have been captured within proposed Unit 35 approximately 1.8 skm (1.1 smi) upstream of the mouth of Travis Creek. This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. This unit represents the western extent of the species' range and increases population redundancy within the species' range.

A few agricultural fields are located near the mouth of Travis Creek, but most of the watershed surrounding proposed Unit 35 is forested, with no private residences or other structures. Some of the forest is early successional due to recent logging in the watershed. Within proposed Unit 35, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, off-road vehicle use, inadequate riparian buffers, construction and maintenance of county roads, agricultural runoff, and logging. These threats are in addition to random

effects of drought, floods, or other natural phenomena.

*Unit 36: Wild Dog Creek, Jackson and Owsley Counties, Kentucky*

Proposed Unit 36 is located west of Sturgeon Creek in eastern Jackson and northwestern Owsley Counties. This unit includes 8.1 skm (5.1 smi) of Wild Dog Creek from its headwaters downstream to its confluence with Sturgeon Creek. Live Kentucky arrow darters have been captured within proposed Unit 36 just upstream of the mouth of Wild Dog Creek. A portion of this unit is in Federal ownership (3.8 skm (2.4 smi)), but the majority of the unit is in private ownership. For the portion of the unit in Federal ownership (administered by DBNF), land and resource management decisions and activities are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit represents the western extent of the species' range and increases population redundancy within the species' range.

The watershed surrounding proposed Unit 36 is relatively undisturbed and dominated by forest, but a few scattered residences and small farms occur in the headwaters just east of KY 587. Within proposed Unit 36, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, construction and maintenance of roads, illegal off-road vehicle use, inadequate riparian buffers, agricultural runoff, logging (on private land), timber management (on DBNF), and inadequate sewage treatment. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 37: Granny Dismal Creek, Lee and Owsley Counties, Kentucky*

Proposed Unit 37 is located west of Sturgeon Creek in western Lee and eastern Owsley Counties. This unit includes 6.9 skm (4.3 smi) of Granny Dismal Creek from its confluence with Harris Branch downstream to its confluence with Sturgeon Creek. Live Kentucky arrow darters have been captured within proposed Unit 37 approximately 1.1 skm (0.7 smi) upstream of the mouth of Granny Dismal Creek. A portion (2.5 skm (1.6 smi)) of this unit is in Federal ownership (administered by DBNF), but the majority of the unit is privately owned. Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit represents the western extent of the

species' range and increases population redundancy within the species' range.

The watershed surrounding proposed Unit 37 is relatively undisturbed and dominated by forest, but a few scattered residences and small farms occur in the headwaters just east of KY 587. Within proposed Unit 37, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, construction and maintenance of roads, illegal off-road vehicle use, inadequate riparian buffers, agricultural runoff, logging (on private land), timber management (on DBNF), and inadequate sewage treatment. These threats are in addition to random effects of drought, floods, or other natural phenomena.

*Unit 38: Rockbridge Fork, Wolfe County, Kentucky*

Proposed Unit 38 is located within the Red River Gorge region in northwestern Wolfe County and represents the only occupied habitat within the Red River drainage. This unit includes 4.5 skm (2.8 smi) of Rockbridge Fork from its confluence with Harris Branch downstream to its confluence with Sturgeon Creek. Live Kentucky arrow darters have been captured within proposed Unit 38 approximately 0.2 skm (0.1 smi) upstream of the mouth of Rockbridge Fork. This unit is entirely in Federal ownership (administered by DBNF). Land and resource management decisions and activities within the DBNF are guided by DBNF's LRMP (USFS 2004, pp. 1–14). This unit represents the northern extent of the species' range and increases population redundancy within the species' range.

The watershed surrounding proposed Unit 38 is relatively undisturbed and dominated by forest, but a few scattered residences and small farms occur in the headwaters of Rockbridge Fork near the Mountain Parkway (KY 402). Within proposed Unit 38, the Kentucky arrow darter and its habitat may require special management considerations or protection to address adverse effects (e.g., siltation, water pollution) associated with road runoff, illegal off-road vehicle use, agricultural runoff, timber management (on DBNF), and inadequate sewage treatment. These threats are in addition to random effects of drought, floods, or other natural phenomena.

## 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 statutory provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected 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 U.S. Army Corps of Engineers 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 the Kentucky arrow darter. 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 Kentucky arrow darter. These activities include, but are not limited to:

(1) Actions that would alter the geomorphology of stream habitats. Such activities could include, but are not limited to, instream excavation or dredging, impoundment, channelization, road and bridge construction, surface coal mining, and discharge of fill materials. These activities could cause aggradation or degradation of the channel bed elevation or significant bank erosion that would degrade or eliminate habitats necessary for growth and reproduction of the Kentucky arrow darter.

(2) Actions that would significantly alter the existing flow regime or water quantity. Such activities could include, but are not limited to, impoundment, water diversion, water withdrawal, and hydropower generation. These activities could eliminate or reduce the habitat necessary for growth and reproduction of this species.

(3) Actions that would significantly alter water quality (for example, temperature, pH, contaminants, and excess nutrients). Such activities could include, but are not limited to, the release of chemicals, biological pollutants, or heated effluents into surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities could alter water conditions to levels that are beyond the tolerances of the Kentucky arrow darter (*e.g.*, elevated conductivity) and result in direct or cumulative adverse effects to the species and its life cycle.

(4) Actions that would significantly alter stream bed material composition and quality by increasing sediment deposition or filamentous algal growth. Such activities could include, but are not limited to, construction projects, channel alteration, livestock grazing, timber harvests, off-road vehicle use, and other watershed and floodplain disturbances that release sediments or

nutrients into the water. These activities could eliminate or degrade habitats necessary for the growth and reproduction of the Kentucky arrow darter by increasing the sediment deposition to levels that would adversely affect its ability to complete its life cycle.

### Exemptions

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

Section 4(a)(3)(B)(i) of the Act 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 proposed 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 shall 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.

When considering the benefits of exclusion, we consider, among other things, whether exclusion of a specific area is likely to result in conservation; the continuation, strengthening, or encouragement of partnerships; or implementation of a management plan. In the case of the Kentucky arrow darter, the benefits of critical habitat include public awareness of the presence of the Kentucky arrow darter and the importance of habitat protection, and, where a Federal nexus exists, increased habitat protection for the Kentucky

arrow darter due to protection from adverse modification or destruction of critical habitat. In practice, situations with a Federal nexus exist primarily on Federal lands or for projects undertaken by Federal agencies.

After identifying the benefits of inclusion and the benefits of exclusion, we carefully weigh the two sides to evaluate whether the benefits of exclusion outweigh those of inclusion. If our analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, we then determine whether exclusion would result in extinction. If exclusion of an area from critical habitat will result in extinction, we will not exclude it from the designation.

The final decision on whether to exclude any areas will be based on the best scientific data available at the time of the final designation, including information obtained during the comment period.

#### *Consideration of Economic Impacts*

Section 4(b)(2) of the Act and its implementing regulations require that we consider the economic impact that may result from a designation of critical habitat. To assess the probable economic impacts of a designation, we must first evaluate specific land uses or activities and projects that may occur in the area of the critical habitat. We then must evaluate the impacts that a specific critical habitat designation may have on restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas proposed. We then identify which conservation efforts may be the result of the species being listed under the Act versus those attributed solely to the designation of critical habitat for this particular species. The probable economic impact of a 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, which includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat (e.g., under the Federal listing as well as other Federal, State, and local regulations). The baseline, therefore, represents the costs of all efforts attributable to the listing of the species under the Act (i.e., conservation of the species and its habitat incurred regardless of whether critical habitat is designated). The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the

species. The incremental conservation efforts and associated impacts would not be expected without 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 use when evaluating the benefits of inclusion and exclusion of particular areas from the final designation of critical habitat should we choose to conduct an optional 4(b)(2) exclusion analysis.

For this proposed designation, we developed an incremental effects memorandum (IEM) considering the probable incremental economic impacts that may result from this proposed designation of critical habitat. The information contained in our IEM was then used to develop a screening analysis of the probable effects of the designation of critical habitat for the Kentucky arrow darter (Abt Associates 2015, p. 1). The purpose of the screening analysis is to filter out the geographic areas in which the critical habitat designation is unlikely to result in probable incremental economic impacts. In particular, the screening analysis considers baseline costs (i.e., absent critical habitat designation) and includes probable economic impacts where land and water use may be subject to conservation plans, land management plans, best management practices, or regulations that protect the habitat area as a result of the Federal listing status of the species. The screening analysis filters out particular areas of critical habitat that are already subject to such protections and are therefore unlikely to incur incremental economic impacts. Ultimately, the screening analysis allows us to focus our analysis on evaluating the specific areas or sectors that may incur probable incremental economic impacts as a result of the designation. This screening analysis combined with the information contained in our IEM are what we consider our draft economic analysis (DEA) of the proposed critical habitat designation for the Kentucky arrow darter and is summarized in the narrative below.

Executive Orders (E.O.) 12866 and 13563 direct Federal agencies to assess the costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consistent with the E.O. regulatory analysis requirements, our effects analysis under the Act may take into consideration impacts to both directly and indirectly impacted entities, where practicable and reasonable. We assess to the extent

practicable, the probable impacts, if sufficient data are available, to both directly and indirectly impacted entities. As part of our screening analysis, we considered the types of economic activities that are likely to occur within the areas likely affected by the critical habitat designation. In our evaluation of the probable incremental economic impacts that may result from the proposed designation of critical habitat for the Kentucky arrow darter, first we identified, in the IEM dated July 23, 2015, probable projects associated with the following land use sectors: (1) Agriculture; (2) conservation/restoration; (3) development; (4) forest management; (5) grazing; (6) mining; (7) oil and gas; (8) recreation; (9) silviculture/timber; (10) transportation; and (11) water quality. We considered each industry or category individually. Additionally, we considered whether their activities have any Federal involvement. Critical habitat designation will not affect activities that do not have any Federal involvement, but rather only activities conducted, funded, permitted, or authorized by Federal agencies. In areas where the Kentucky arrow darter is present, Federal agencies already are required to consult with the Service under section 7 of the Act on activities they fund, permit, or implement that may affect the species. If we finalize this proposed critical habitat designation, consultations to avoid the destruction or adverse modification of critical habitat would be incorporated into the existing consultation process.

In our IEM, we attempted to clarify the distinction between the effects that will result from the species being listed and those attributable to the critical habitat designation (*i.e.*, difference between the jeopardy and adverse modification standards) for the Kentucky arrow darter's critical habitat. Because the designation of critical habitat for the Kentucky arrow darter is proposed concurrently with the listing, it has been our experience that it is more difficult to discern which conservation efforts are attributable to the species being listed and those which will result solely from the designation of critical habitat. However, the following specific circumstances in this case help to inform our evaluation: (1) The essential physical or biological features identified for critical habitat are the same features essential for the life requisites of the species, and (2) any actions that would result in sufficient harm or harassment to constitute jeopardy to the Kentucky arrow darter would also likely adversely affect the

essential physical or biological features of critical habitat. The IEM outlines our rationale concerning this limited distinction between baseline conservation efforts and incremental impacts of the designation of critical habitat for this species. This evaluation of the incremental effects has been used as the basis to evaluate the probable incremental economic impacts of this proposed designation of critical habitat.

The proposed critical habitat designation for the Kentucky arrow consists of 38 units, encompassing approximately 395 skm (246 smi) in eastern Kentucky. Included lands (*i.e.*, stream bottoms; as noted previously, waters are owned by the State) are under Federal, State, and private ownership, and all are within the area occupied by the Kentucky arrow darter at the time of listing. Federal land is predominant in Units 15, 19–27, and 38. In these units, Federal lands make up over 50 percent of the acreage, which accounts for 26.3 percent of the total proposed critical habitat acreage. State-owned lands are located in two units (proposed Units 3 and 4) and make up 4.5 percent of the total proposed critical habitat acreage. Privately owned land is present in all but six units, ranging from 0 to 100 percent. Private lands account for 69.2 percent of the total proposed critical habitat acreage.

Because all of the units proposed as critical habitat for the Kentucky arrow darter are currently occupied by the species, any actions that may affect the species or its habitat would also affect critical habitat and it is unlikely that any additional conservation efforts would be recommended to address the adverse modification standard over and above those recommended as necessary to avoid jeopardizing the continued existence of the Kentucky arrow darter. Any anticipated incremental costs of the critical habitat designation will predominantly be administrative in nature and would not be significant. Critical habitat may impact property values indirectly if developers assume the designation will limit the potential use of that land. However, the designation of critical habitat is not likely to result in an increase of consultations, but rather only the additional administrative effort within each consultation to address the effects of each proposed agency action on critical habitat.

As we stated earlier, we are soliciting data and comments from the public on the DEA, as well as all aspects of the proposed rule and required determinations. We may revise the proposed rule or supporting documents to incorporate or address information

we receive during the public comment period. In particular, we may exclude an area from critical habitat if we determine that the benefits of excluding the area outweigh the benefits of including the area, provided the exclusion will not result in the extinction of this species.

#### *Exclusion Based on Economic Impacts*

Our DEA 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 proposed designation of critical habitat for the Kentucky arrow darter based on economic impacts.

During the development of a final designation, we will consider any additional economic impact information received through the public comment period, and as such areas may be excluded from the final critical habitat designation under section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19.

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

Under section 4(b)(2) of the Act, we must consider whether there are areas where designation of critical habitat might have an impact on national security. In preparing this proposal, we have determined that the areas within the proposed designation of critical habitat for the Kentucky arrow darter are not owned or managed by the Department of Defense or Department of Homeland Security, and, therefore, we anticipate no impact on national security. Consequently, the Secretary is not intending to exercise her discretion to exclude any areas from the final designation based on impacts on national security.

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

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security. 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 proposal, we have determined that there are currently no

HCPs or other management plans for the Kentucky arrow darter, and the proposed designation does not include any tribal lands or trust resources. We anticipate no impact on tribal lands, partnerships, or HCPs from this proposed critical habitat designation. Accordingly, the Secretary does not intend to exercise her discretion to exclude any areas from the final designation based on other relevant impacts.

#### Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of peer review is to ensure that our critical habitat designation is based on scientifically sound data and analyses. We have invited these peer reviewers to comment during this public comment period.

We will consider all comments and information we receive during this comment period on this proposed rule during our preparation of a final determination. Accordingly, the final decision may differ from this proposal.

#### Public Hearings

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposed rule in the **Federal Register**. Such requests must be sent to the address shown in the **FOR FURTHER INFORMATION CONTACT** section. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

#### 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. Executive Order 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 of 1996 (SBREFA; 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 (i.e., small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the 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; and small businesses (13 CFR 121.201). 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 to these small entities are significant, we considered the types of activities that might trigger regulatory impacts under this designation as well as 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 out 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. Moreover, Federal agencies are not small entities. Therefore, because no small entities are directly regulated by this rulemaking, the Service certifies that, if promulgated, the proposed critical habitat designation will not have a significant economic impact on a substantial number of small entities.

In summary, we have considered whether the proposed designation would result in a significant economic impact on a substantial number of small entities. For the above reasons and based on currently available information, we certify that, if promulgated, the proposed critical habitat designation would not have a significant economic impact on a substantial number of small business entities. Therefore, an initial 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. In our economic analysis, we did not find that the designation of this proposed critical habitat will significantly affect energy supplies, distribution, or use. Natural gas and oil exploration and development activities occur or could potentially occur in all proposed units for the Kentucky arrow darter; however, compliance with State regulatory requirements or voluntary BMPs would



be expected to minimize impacts of natural gas and oil exploration and development in the areas of proposed critical habitat for the species. The measures for natural gas and oil exploration and development are generally not considered a substantial cost compared with overall project costs and are already being implemented by oil and gas companies.

Surface coal mining occurs or could potentially occur in all proposed critical habitat units for the Kentucky arrow darter. Incidental take for listed species associated with surface coal mining activities is currently covered under a programmatic, non-jeopardy biological opinion between the Office of Surface Mining Reclamation and Enforcement and the Service completed in 1996 (Service 1996, entire). The biological opinion covers existing, proposed, and future endangered and threatened species that may be affected by the implementation and administration of surface coal mining programs under the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 *et seq.*). Through its analysis, the Service concluded that the proposed action (surface coal mining and reclamation activities) was not likely to jeopardize the continued existence of any endangered or threatened species, or any species proposed for listing as an endangered or threatened species, or result in adverse modification of designated or proposed critical habitat. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required. However, we will further evaluate this issue and review and revise this assessment as warranted.

#### *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 would 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 would significantly or uniquely affect small governments because this species occurs primarily in Federally-owned river channels or in remote privately owned stream channels. Also, this rule 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. The designation of critical habitat imposes no obligations on State or local governments and, as such, a Small Government Agency Plan is not

required. We will, however, further evaluate this issue through the public review and comment period and revise this assessment if appropriate.

#### *Takings—Executive Order 12630*

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for Kentucky arrow darter in a takings implications assessment. The Act does not authorize the Service to regulate private actions on private lands or confiscate private property as a result of critical habitat designation. Designation of critical habitat does not affect land ownership, or establish any closures, or restrictions on use of or access to the designated areas. Furthermore, the designation of critical habitat does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. However, Federal agencies are prohibited from carrying out, funding, or authorizing actions that would destroy or adversely modify critical habitat. A takings implications assessment has been completed and concludes that this designation of critical habitat for Kentucky arrow darter does not pose significant takings implications for lands within or affected by the designation.

#### *Federalism—Executive Order 13132*

In accordance with E.O. 13132 (Federalism), this proposed 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 request information from, and coordinated development of this proposed critical habitat designation with, appropriate State resource agencies in Kentucky. 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, the 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 these 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 E.O. 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 requirements of sections 3(a) and 3(b)(2) of the Order. We have proposed 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 species. 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 the Office of Management and Budget (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 (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 the National Environmental Policy Act 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)).

#### *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 are not proposing to designate critical habitat for the Kentucky arrow darter on tribal lands.

#### *Clarity of the Rule*

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (1) Be logically organized;
- (2) Use the active voice to address readers directly;
- (3) Use clear language rather than jargon;
- (4) Be divided into short sections and sentences; and
- (5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES**

section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

#### **References Cited**

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

#### **Authors**

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

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

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

#### **Proposed Regulation Promulgation**

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

#### **PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS**

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

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

- 2. In § 17.95, amend paragraph (e) by adding an entry for “Kentucky Arrow Darter (*Etheostoma spilotum*)” in the same alphabetical order that the species appears in the table at § 17.11(h), to read as follows:

#### **§ 17.95 Critical habitat—fish and wildlife.**

*	*	*	*	*
(e) <i>Fishes</i> .				
*	*	*	*	*

#### **Kentucky Arrow Darter (*Etheostoma spilotum*)**

(1) Critical habitat units are depicted on the maps below for Breathitt, Clay, Harlan, Jackson, Knott, Lee, Leslie, Owsley, Perry, and Wolfe Counties, Kentucky.

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

- (i) Riffle-pool complexes and transitional areas (glides and runs) of

geomorphically stable, first- to third-order streams with connectivity between spawning, foraging, and resting sites to promote gene flow throughout the species' range.

(ii) Stable bottom substrates composed of gravel, cobble, boulders, bedrock ledges, and woody debris piles with low levels of siltation.

(iii) An instream flow regime (magnitude, frequency, duration, and seasonality of discharge over time) sufficient to provide permanent surface flows, as measured during years with average rainfall, and to maintain benthic habitats utilized by the species.

(iv) Adequate water quality characterized by moderate stream temperatures, acceptable dissolved oxygen concentrations, moderate pH, and low levels of pollutants. Adequate water quality is defined for the purpose of this entry as the quality necessary for normal behavior, growth, and viability of all life stages of the Kentucky arrow darter.

(v) A prey base of aquatic macroinvertebrates, including mayfly nymphs, midge larvae, caddisfly larvae, stonefly nymphs, and small crayfishes.

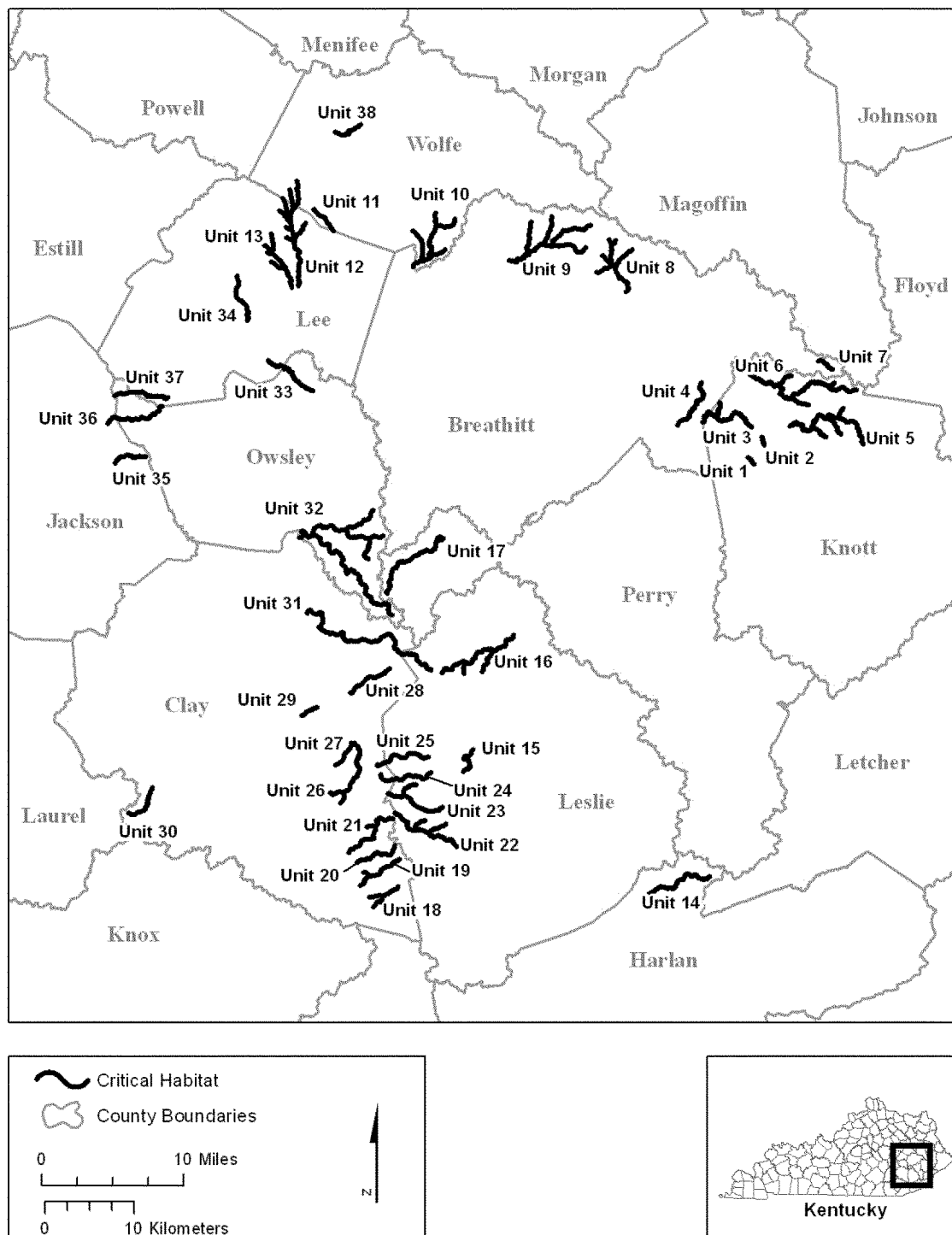
(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on [INSERT EFFECTIVE DATE OF FINAL RULE].

(4) *Critical habitat map units.* Data layers defining map units were created on a base of U.S. Geological Survey (USGS) National Hydrography Dataset (NHD+) GIS data. The 1:100,000 river reach (route) files were used to calculate river kilometers and miles. ESRI's ArcGIS 10.0 software was used to determine longitude and latitude coordinates using decimal degrees. The projection used in mapping all units was USA Contiguous Albers Equal Area Conic USGS version, NAD 83, meters. The following data sources were referenced to identify features (like

roads and streams) used to delineate the upstream and downstream extents of critical habitat units: NHD+ flowline and waterbody data, 2011 Navteq roads data, USA Topo ESRI online basemap service, DeLorme Atlas and Gazetteers, and USGS 7.5 minute topographic maps. 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://fws.gov/frankfort/www.regulations.gov>) at Docket No. FWS-R4-ES-2015-0133, 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 follows:

**Index Map: Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)**



(6) Unit 1: Buckhorn Creek and Prince Fork, and Unit 2: Eli Fork, Knott County, Kentucky.

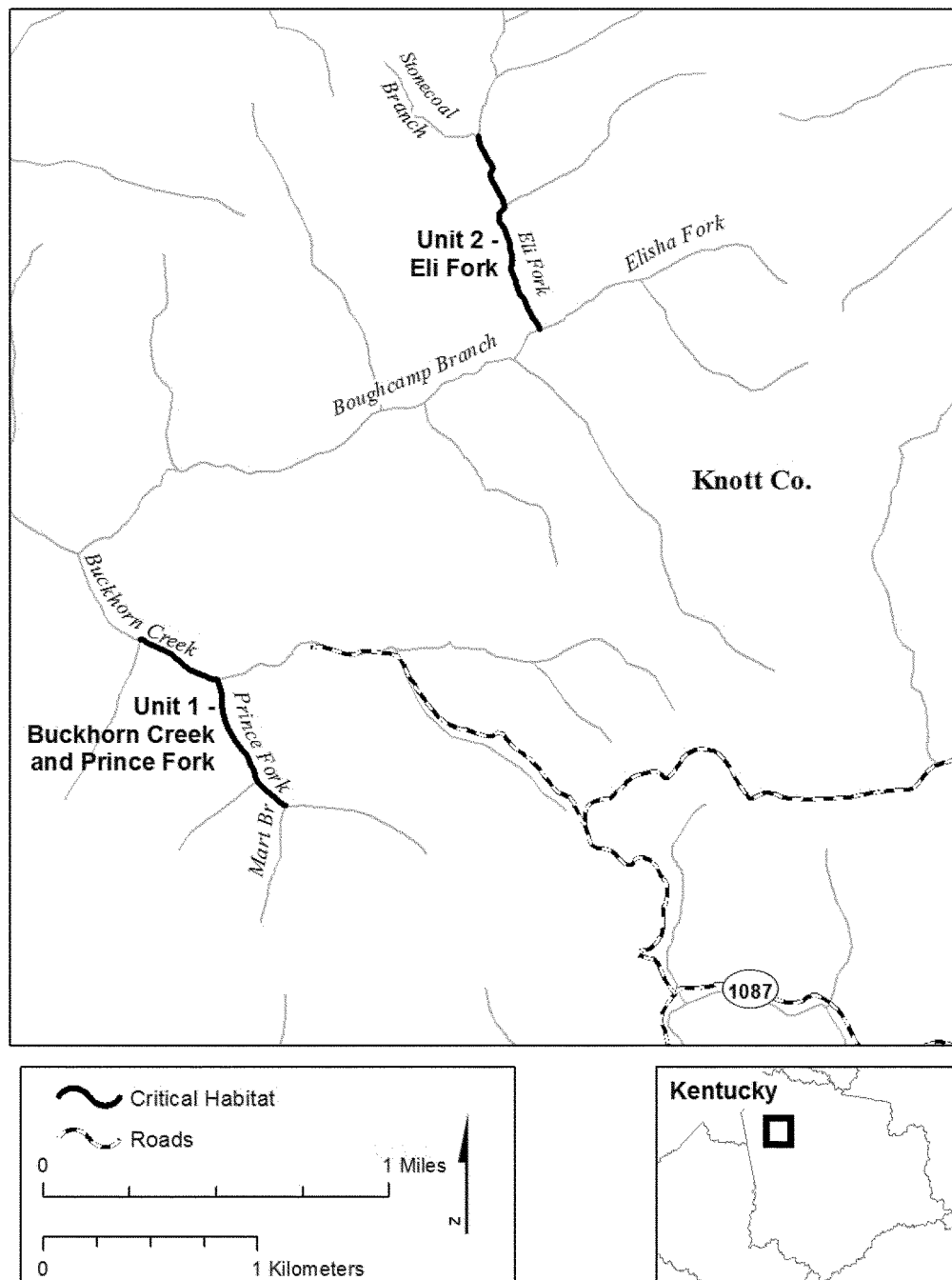
(i) Unit 1 includes 0.7 skm (0.4 smi) of Prince Fork from Mart Branch (37.41291, -83.07000) downstream to its confluence with Buckhorn Creek

(37.41825, -83.07341), and 0.4 skm (0.3 smi) of Buckhorn Creek from its headwaters at (37.41825, -83.07341) downstream to its confluence with Emory Branch (37.42006, -83.07738) in Knott County, Kentucky.

(ii) Unit 2 includes 1.0 skm (0.6 smi) of Eli Fork from its headwaters at (37.44078, -83.05884), downstream to its confluence with Boughcamp Branch (37.43259, -83.05591) in Knott County, Kentucky.

(iii) Map of Units 1 and 2 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)**  
**Unit 1 - Buckhorn Creek and Prince Fork: Knott County, Kentucky**  
**Unit 2 - Eli Fork: Knott County, Kentucky**



(7) Unit 3: Coles Fork and Snag Ridge Fork, Breathitt and Knott Counties, Kentucky.

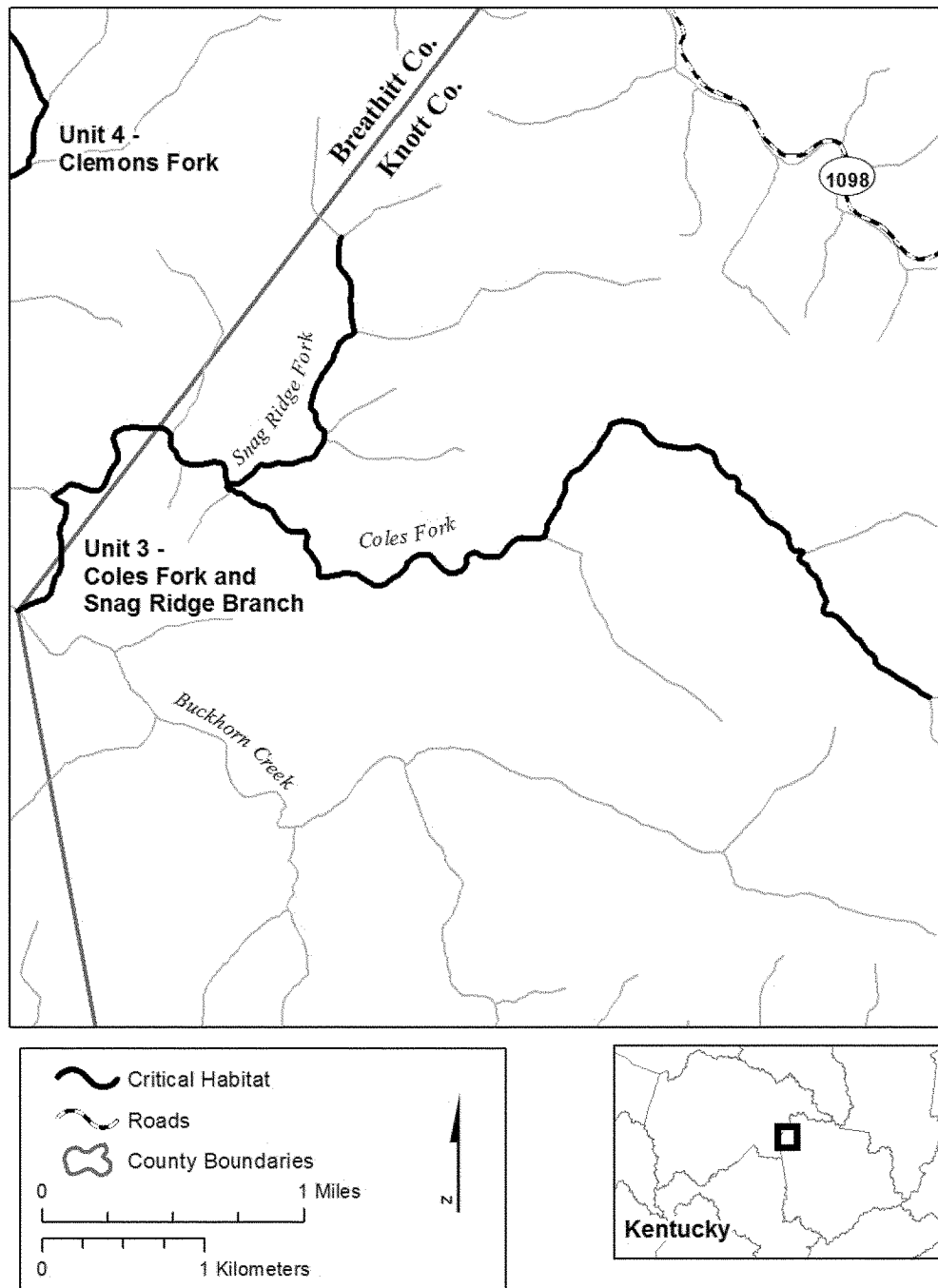
(i) Unit 3 includes 2.1 skm (1.3 smi) of Snag Ridge Fork from its headwaters

at (37.47746, -83.11139), downstream to its confluence with Coles Fork (37.46391, -83.13468) in Knott County; and 8.9 skm (5.5 smi) of Coles Fork from its headwaters at (37.45096,

-83.07124), downstream to its confluence with Buckhorn Creek (37.45720, -83.13468) in Knott County, Kentucky.

(ii) Map of Unit 3 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 3 - Coles Fork and Snag Ridge Branch: Knott and Breathitt Counties,  
Kentucky**



(8) Unit 4: Clemons Fork, Breathitt County, Kentucky.

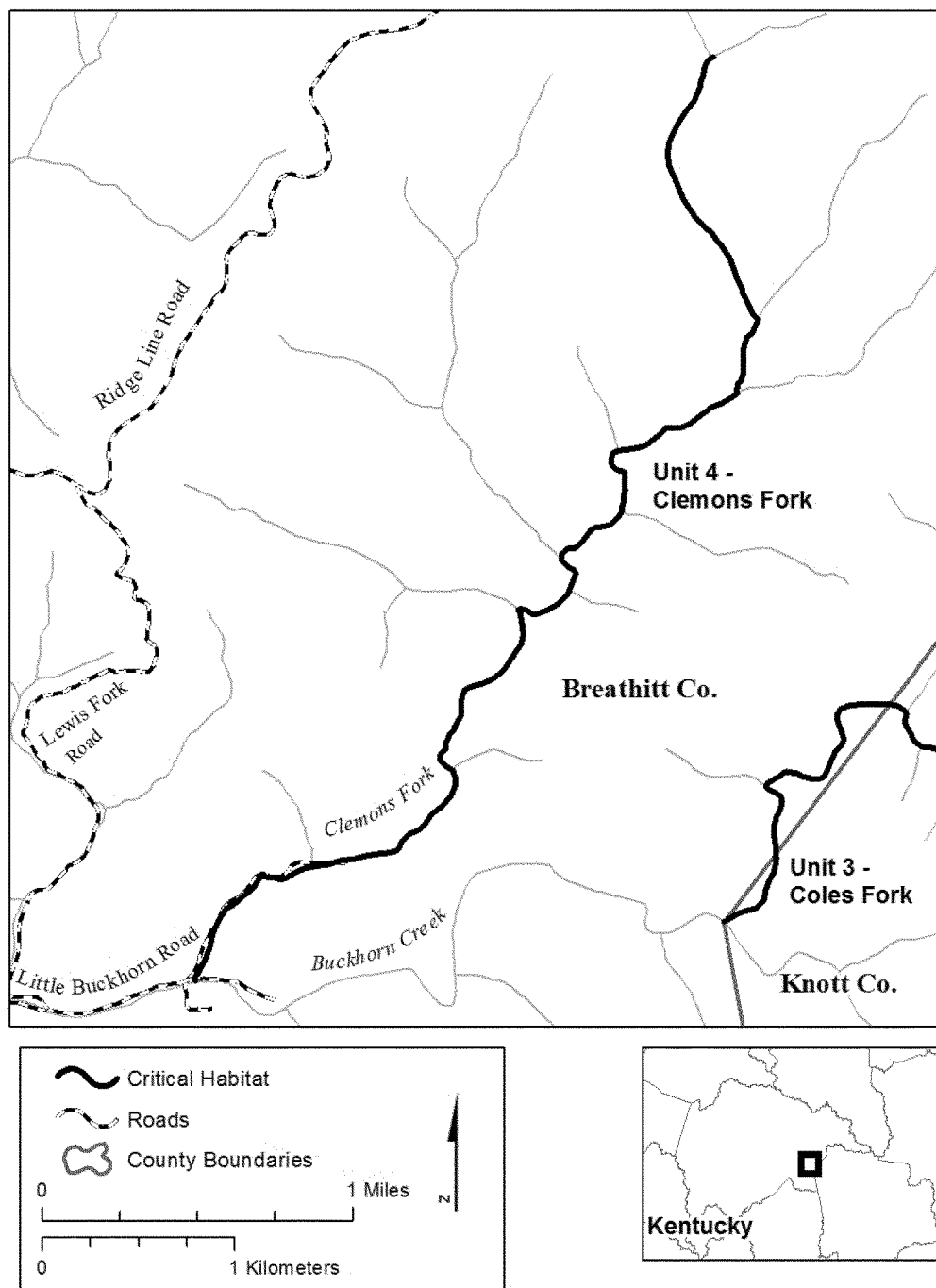
(i) Unit 4 includes 7.0 skm (4.4 smi) of Clemons Fork from its headwaters at

(37.49772, -83.13390), downstream to its confluence with Buckhorn Creek

(37.45511, -83.16582) in Breathitt County, Kentucky.

(ii) Map of Unit 4 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 4 - Clemons Fork: Breathitt County, Kentucky**



(9) Unit 5: Laurel Fork Quicksand Creek and Tributaries, Knott County, Kentucky.

(i) Unit 5 includes 1.2 skm (0.8 smi) of Fitch Branch from its headwaters at (37.46745, -82.95373), downstream to its confluence with Laurel Fork Quicksand Creek (37.45855, -82.96089); 2.7 skm (1.7 smi) of

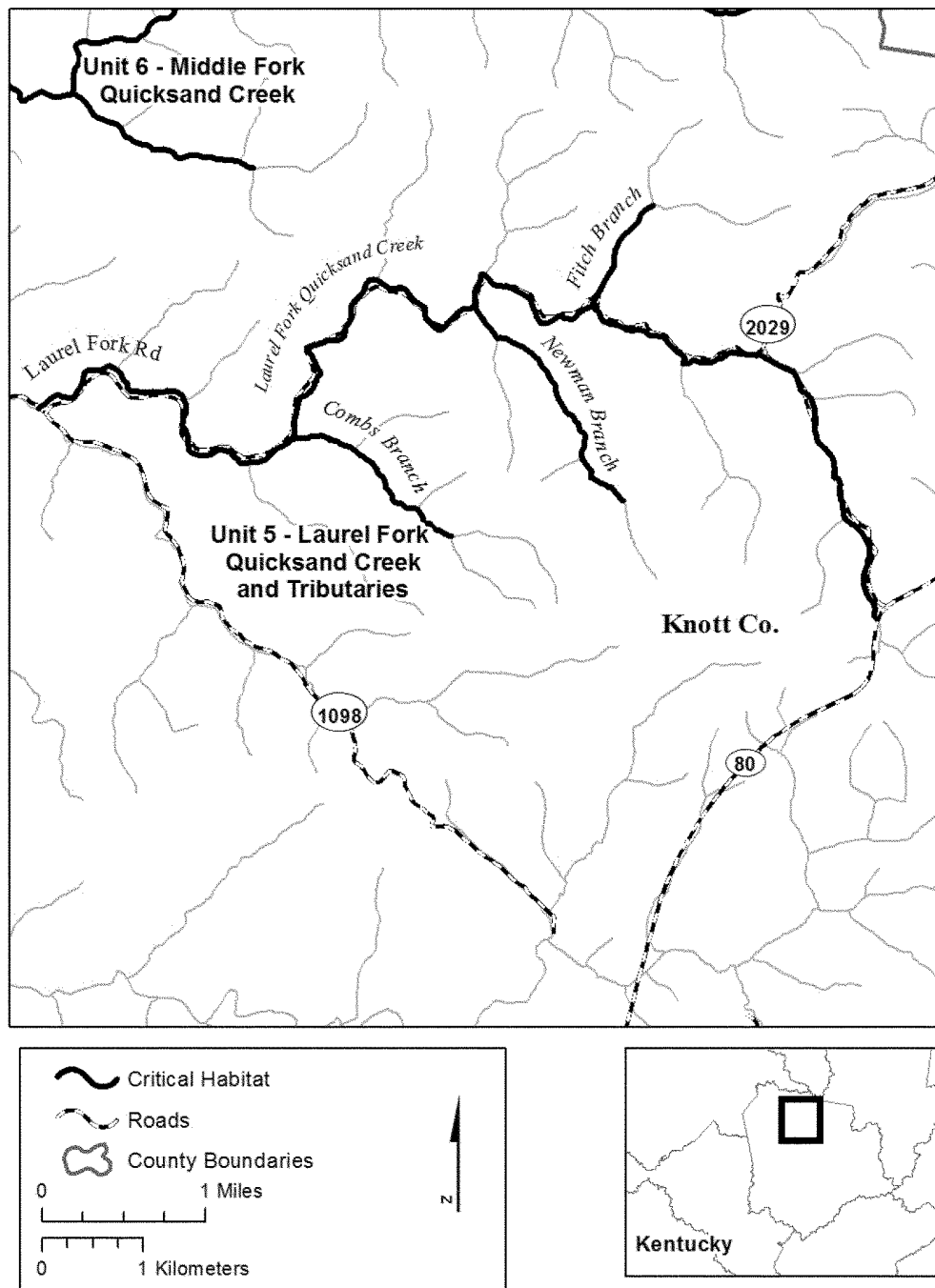
Newman Branch from its headwaters at (37.44120, -82.95810), downstream to its confluence with Laurel Fork Quicksand Creek (37.45893, -82.97417); 2.1 skm (1.3 smi) of Combs Branch from its headwaters at (37.43848, -82.97731), downstream to its confluence with Laurel Fork

Quicksand Creek (37.44758, -82.99476); and 13.8 skm (8.6 smi) of Laurel Fork Quicksand Creek from its headwaters at (37.43001, -82.93016), downstream to its confluence with Quicksand Creek (37.45100, -83.02303) in Knott County, Kentucky.



(ii) Map of Unit 5 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 5 - Laurel Fork Quicksand Creek and Tributaries: Knott County,  
Kentucky**



(10) Unit 6: Middle Fork Quicksand Creek and Tributaries, Knott County, and Unit 7: Spring Fork Quicksand Creek, Breathitt County, Kentucky.

(i) Unit 6 includes 0.8 skm (0.5 smi) of Big Firecoal Branch from its headwaters at (37.49363, -82.96426), downstream to its confluence with

Middle Fork Quicksand Creek (37.48990, -82.97148); 2.1 skm (1.3 smi) of Bradley Branch from its headwaters at (37.47180, -82.99819), downstream to its confluence with Middle Fork Quicksand Creek (37.47899, -83.01823); 2.0 skm (1.2 smi) of Lynn Log Branch from its

headwaters at (37.50190, -83.01921), downstream to its confluence with Middle Fork Quicksand Creek (37.49286, -83.03524); and 17.6 skm (10.9 smi) of Middle Fork Quicksand Creek from its headwaters at (37.48562, -82.93667), downstream to its confluence with Quicksand Creek

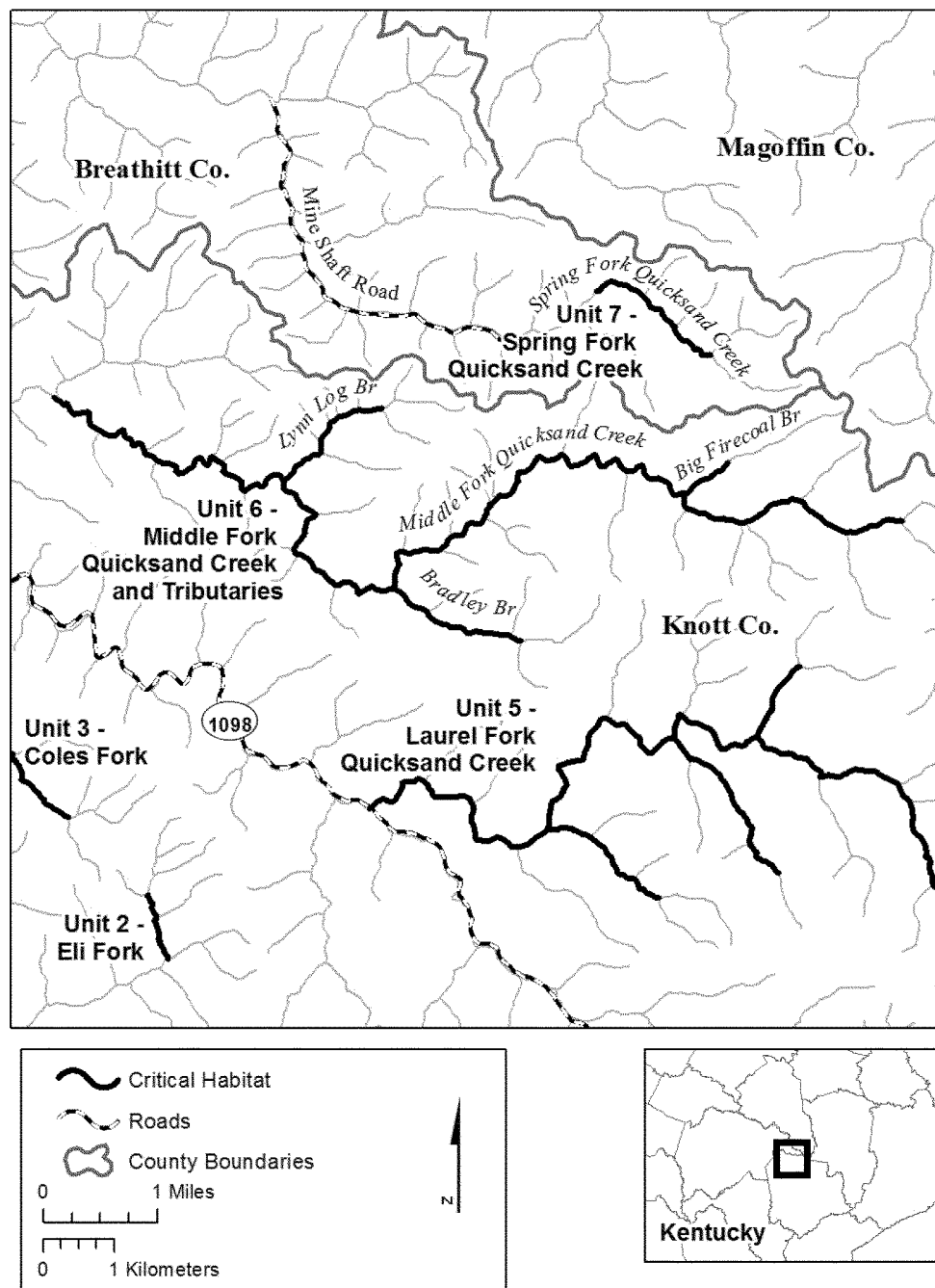
(37.504451, -83.07150) in Knott County, Kentucky.  
 (ii) Unit 7 includes 2.2 skm (1.4 smi) of Spring Fork Quicksand Creek from its

headwaters at (37.50746, -82.96647), downstream to its confluence with

Laurel Fork (37.51597, -82.98436) in Breathitt County, Kentucky.

(iii) Map of Units 6 and 7 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)**  
**Unit 6 - Middle Fork Quicksand Creek and Tributaries: Knott County, Kentucky**  
**Unit 7 - Spring Fork Quicksand Creek: Breathitt County, Kentucky**



(11) Unit 8: Hunting Creek and Tributaries, Breathitt County, Kentucky.

(i) Unit 8 includes 0.9 skm (0.5 smi) of Wolf Pen Branch from its headwaters at (37.64580, -83.23885), downstream to its confluence with Hunting Creek

(37.64023, -83.24424); 1.6 skm (1.0 smi) of Negro Fork from its headwaters at (37.62992, -83.25760), downstream to its confluence with Hunting Creek (37.62121, -83.24433); 2.3 skm (1.4 smi) of Fletcher Fork from its

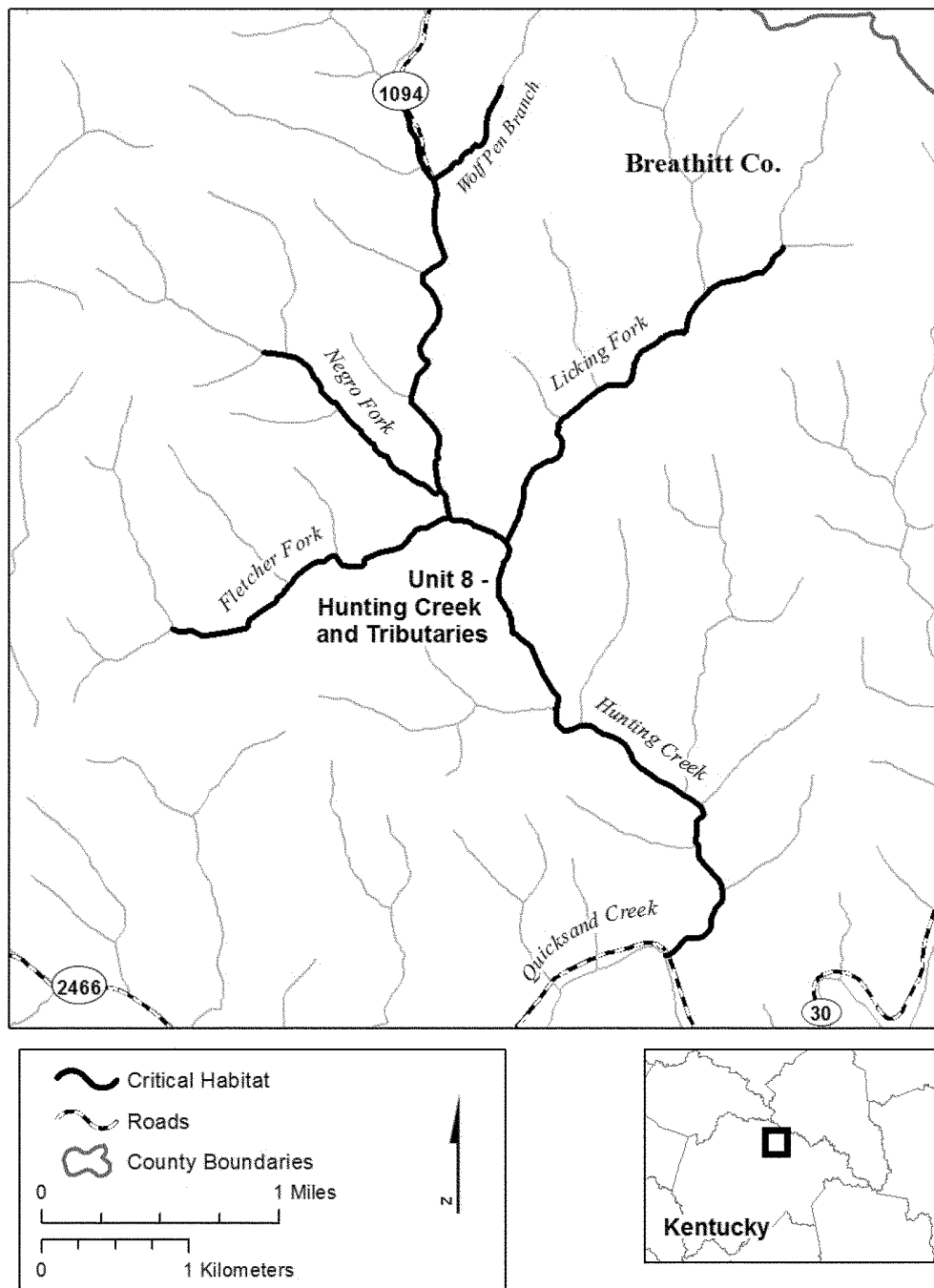
headwaters at (37.61315, -83.26521), downstream to its confluence with Hunting Creek (37.61956, -83.24370); 3.1 skm (1.9 smi) of Licking Fork from its headwaters at (37.63553, -83.21754, -83.21754), downstream to its

confluence with Hunting Creek (37.61794, -83.23938); and 7.7 skm (4.8 smi) of Hunting Creek from its

confluence with Wells Fork (37.64629, -83.24708), downstream to its confluence with Quicksand Creek

(37.59235, -83.22803) in Breathitt County, Kentucky.  
(ii) Map of Unit 8 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 8 - Hunting Creek and Tributaries: Breathitt County, Kentucky**



(12) Unit 9: Frozen Creek and Tributaries, Breathitt County, Kentucky.

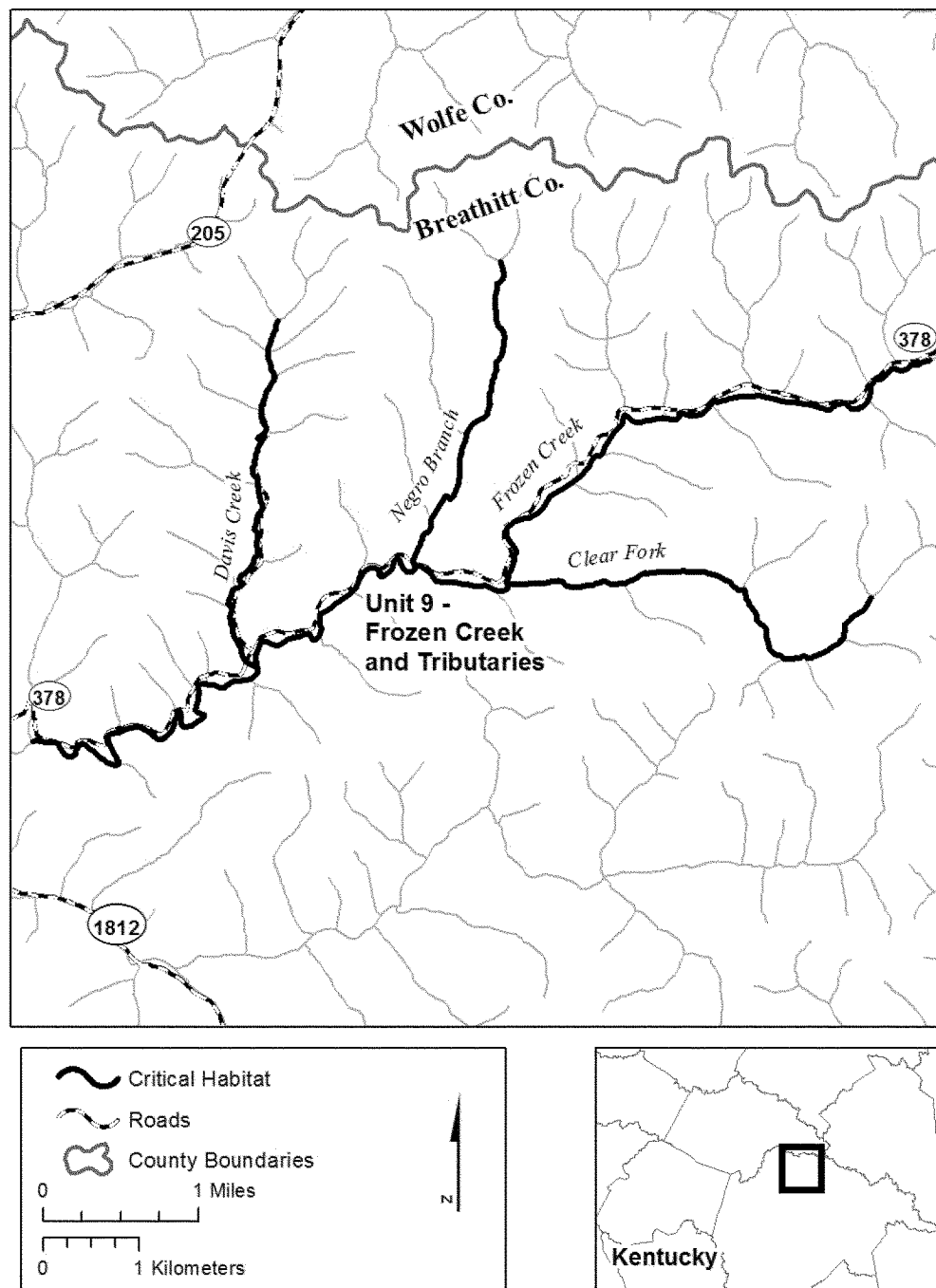
(i) Unit 9 includes 4.7 skm (2.9 smi) of Clear Fork from its headwaters at (37.63899, -83.27706), downstream to its confluence with Frozen Creek (37.64109, -83.31969); 3.6 skm (2.3

smi) of Negro Branch from its headwaters at (37.67146, -83.31971), downstream to its confluence with Frozen Creek (37.64319, -83.33068); 4.2 skm (2.6 smi) of Davis Creek from its headwaters at (37.66644, -83.34599), downstream to its

confluence with Frozen Creek (37.63402, -83.34953); and 13.9 skm (8.6 smi) of Frozen Creek from its headwaters at (37.66115, -83.26945), downstream to its confluence with Morgue Fork (37.62761, -83.37622) in Breathitt County, Kentucky.

(ii) Map of Unit 9 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 9 - Frozen Creek and Tributaries: Breathitt County, Kentucky**



(13) Unit 10: Holly Creek and Tributaries, Wolfe County, Kentucky.

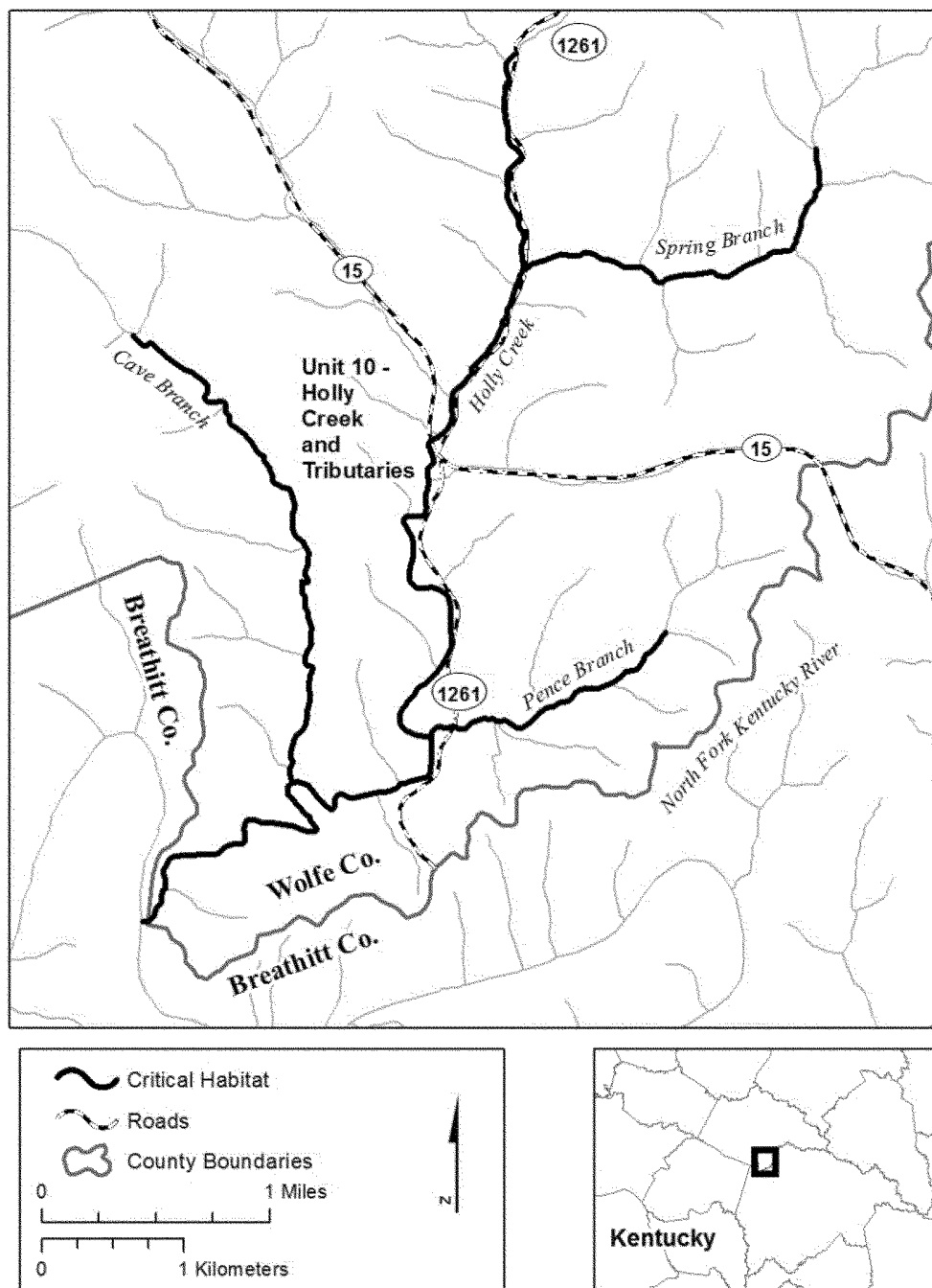
(i) Unit 10 includes 2.8 skm (1.8 smi) of Spring Branch from its headwaters at (37.67110, -83.44406), downstream to its confluence with Holly Creek (37.66384, -83.46780) in Wolfe County; 2.0 skm (1.3 smi) of Pence Branch from

its headwaters at (37.64048, -83.45703), downstream to its confluence with Holly Creek (37.63413, -83.47608) in Wolfe County; 4.0 skm (2.5 mi) of Cave Branch from its headwaters at (37.66023, -83.49916), downstream to its confluence with Holly Creek (37.63149, -83.48725) in

Wolfe County; 9.5 skm (5.9 smi) of Holly Creek from KY 1261 (37.67758, -83.46792) in Wolfe County, downstream to its confluence with the North Fork Kentucky River (37.62289, -83.49948) in Wolfe County, Kentucky.

(ii) Map of Unit 10 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 10 - Holly Creek and Tributaries: Wolfe County, Kentucky**



(14) Unit 11: Little Fork, Lee and Wolfe Counties; Unit 12: Walker Creek and Tributaries, Lee and Wolfe Counties; and Unit 13: Hell Creek and Tributaries, Lee County, Kentucky.

(i) Unit 11 includes 3.8 skm (2.3 smi) of Little Fork from its headwaters at (37.68456, -83.62465) in Wolfe County, downstream to its confluence with

Lower Devil Creek (37.66148, -83.59961) in Lee County, Kentucky.

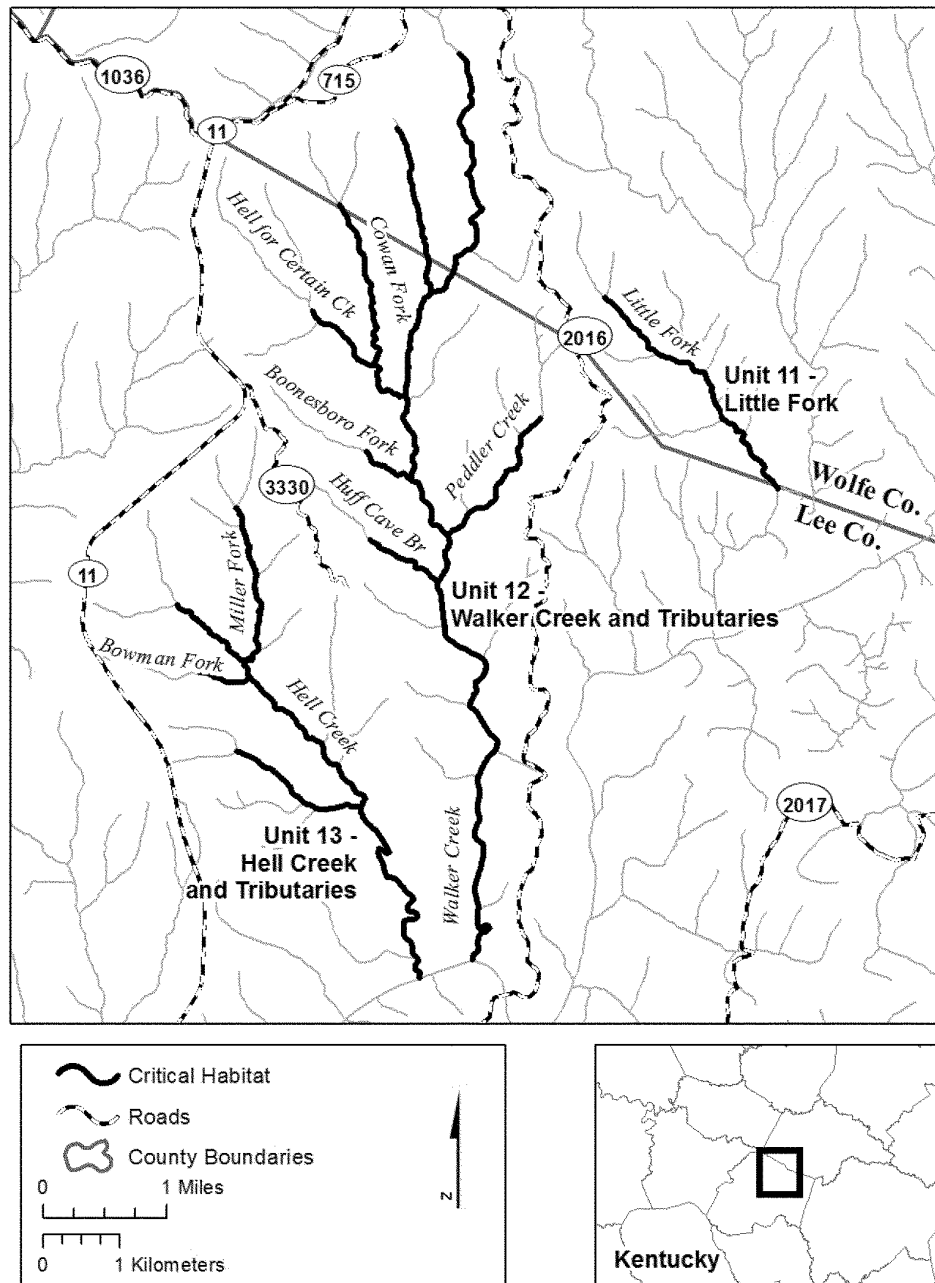
(ii) Unit 12 includes 3.9 skm (2.4 smi) of an unnamed tributary of Walker Creek from its headwaters at (37.71373, -83.64553) in Wolfe County, downstream to its confluence with Walker Creek (37.68567, -83.65045) in Lee County; 2.4 skm (1.5 smi) of Cowan

Fork from its headwaters at (37.69624, -83.66366) in Wolfe County, downstream to its confluence with Hell for Certain Creek (37.67718, -83.65931) in Lee County; 2.0 skm (1.2 smi) of Hell for Certain Creek from an unnamed reservoir at (37.68377, -83.66804), downstream to its confluence with Walker Creek (37.67340, -83.65449) in

Lee County; 0.8 skm (0.5 smi) of Boonesboro Fork from its headwaters at (37.66706, – 83.66053), downstream to its confluence with Walker Creek (37.66377, – 83.65408) in Lee County; 2.2 skm (1.4 smi) of Peddler Creek from its headwaters at (37.67054, – 83.63456), downstream to its confluence with Walker Creek (37.65696, – 83.64879) in Lee County; 1.1 skm (0.7 smi) of Huff Cave Branch from its headwaters at (37.65664, – 83.66033), downstream to its confluence with Walker Creek

(37.65138, – 83.65034) in Lee County; and 12.6 skm (7.8 smi) of Walker Creek from an unnamed reservoir (37.70502, – 83.65490) in Wolfe County, downstream to its confluence with North Fork Kentucky River (37.60678, – 83.64652) in Lee County, Kentucky. (iii) Unit 13 includes 2.3 skm (1.4 smi) of Miller Fork from its headwaters at (37.66074, – 83.68005), downstream to its confluence with Hell Creek (37.64261, – 83.67912); 0.7 skm (0.4 smi) of Bowman Fork from its headwaters at (37.64142, – 83.68594),

downstream to its confluence with Hell Creek (37.64070, – 83.67848); 1.9 skm (1.2 smi) of an unnamed tributary of Hell Creek from its headwaters at (37.63199, – 83.83.68064), downstream to its confluence with Hell Creek (37.62516, – 83.66246); and 7.1 skm (4.4 smi) of Hell Creek from an unnamed reservoir (37.64941, – 83.68907), downstream to its confluence with North Fork Kentucky River (37.60480, – 83.65440) in Lee County, Kentucky. (iv) Map of Units 11, 12, and 13 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)****Unit 11 - Little Fork: Lee and Wolfe Counties, Kentucky****Unit 12 - Walker Creek and Tributaries: Wolfe and Lee Counties, Kentucky****Unit 13 - Hell Creek and Tributaries: Lee County, Kentucky**

(15) Unit 14: Big Laurel Creek, Harlan County, Kentucky.

(i) Unit 14 includes 9.1 skm (5.7 smi) of Big Laurel Creek from its confluence

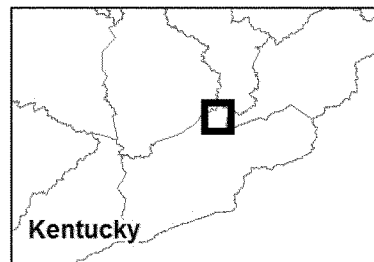
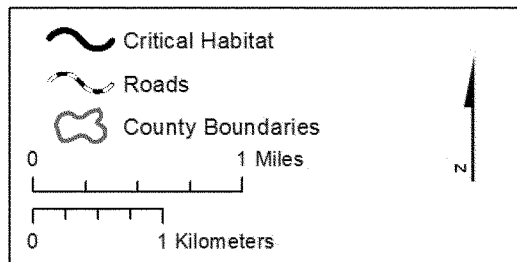
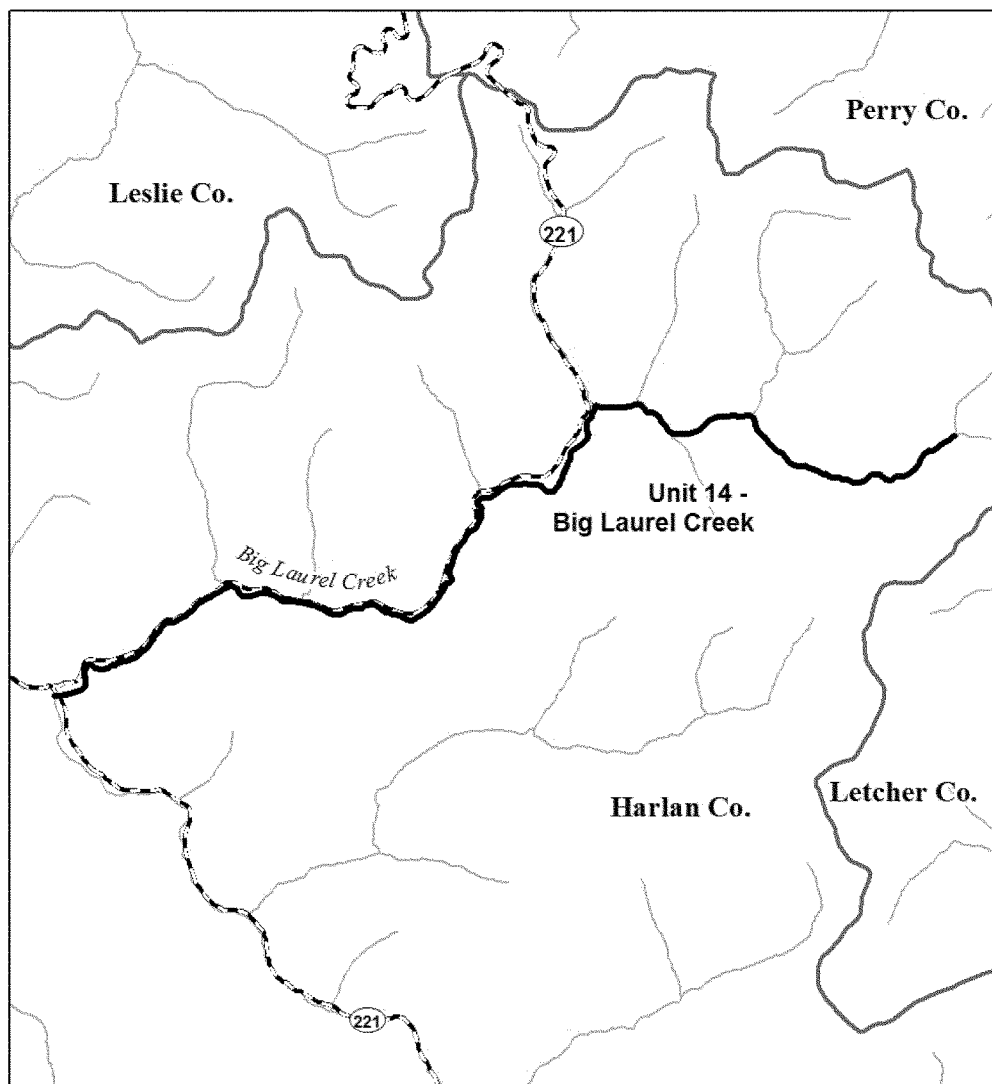
with Combs Fork (36.99520, -83.14086), downstream to its confluence with Greasy Creek

(36.97893, -83.21907) in Harlan County, Kentucky.



(ii) Map of Unit 14 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 14 - Big Laurel Creek: Harlan County, Kentucky**



(16) Unit 15: Laurel Creek, Leslie County, Kentucky.

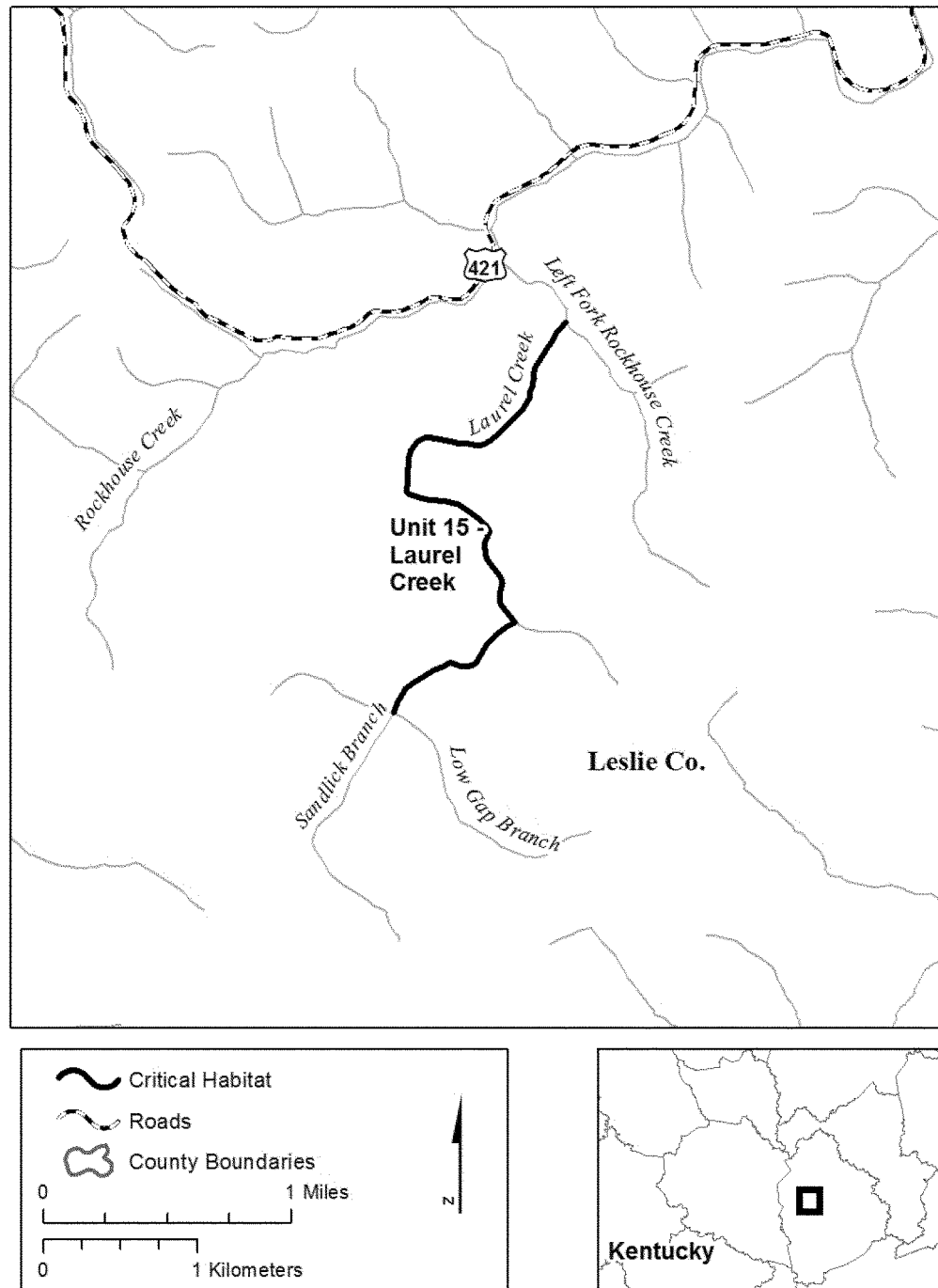
(i) Unit 15 includes 4.1 skm (2.6 smi) of Laurel Creek from its confluence with

Sandlick Branch (37.10825, -83.45036), downstream to its confluence with Left Fork Rockhouse

Creek (37.13085, -83.43699) in Leslie County, Kentucky.

(ii) Map of Unit 15 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 15 - Laurel Creek: Leslie County, Kentucky**



(17) Unit 16: Hell For Certain Creek and Tributaries, Leslie County, Kentucky.

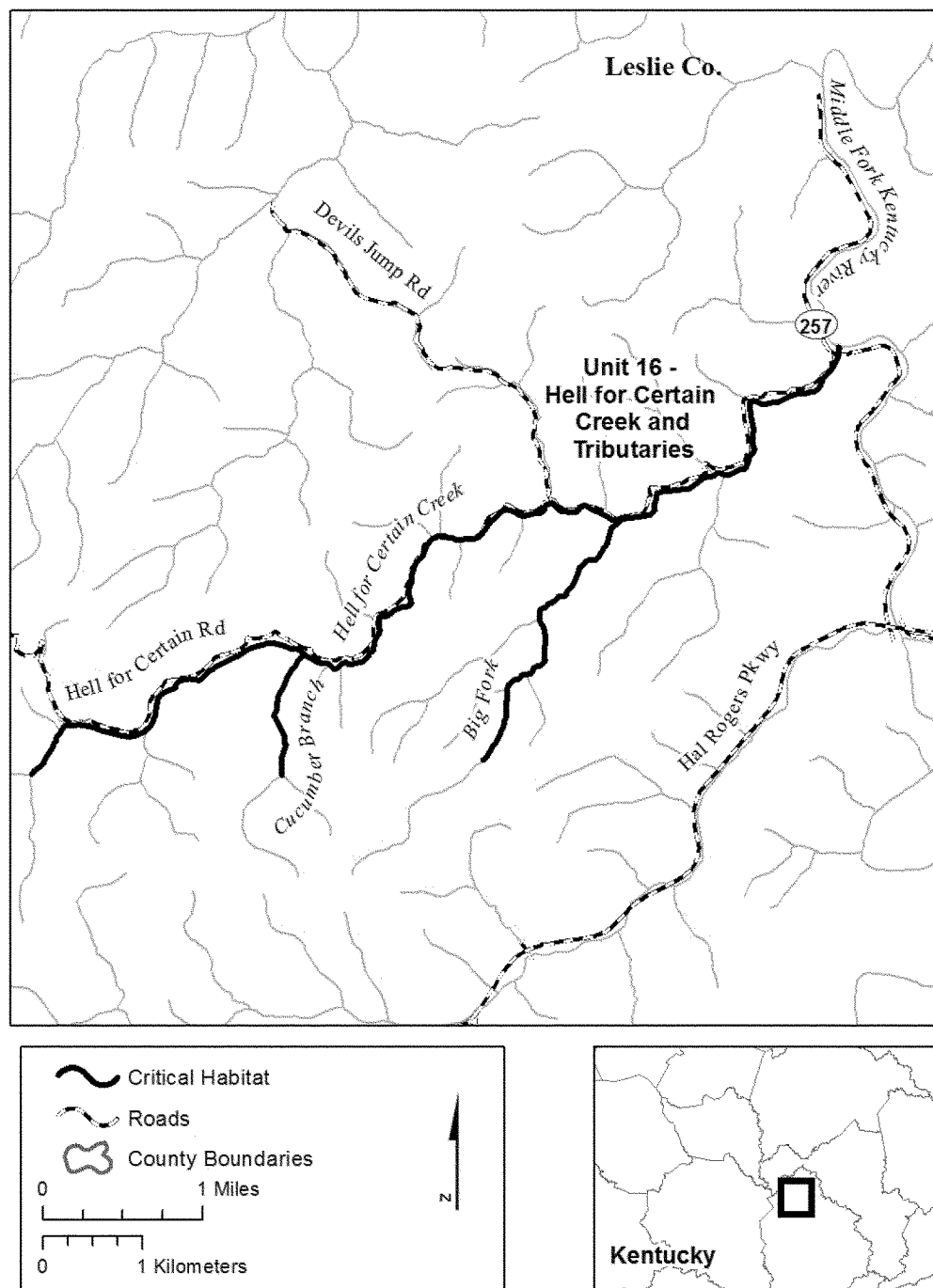
(i) Unit 16 includes 1.3 skm (0.8 smi) of Cucumber Branch from its headwaters at (37.20839, -83.44644), downstream to its confluence with Hell

For Certain Creek (37.21929, -83.44355); 3.1 skm (1.9 smi) of Big Fork from its headwaters at (37.20930, -83.42356), downstream to its confluence with Hell For Certain Creek (37.23082, -83.40720); and 11.4 skm (7.1 smi) of Hell For Certain Creek from

its headwaters at (37.20904, -83.47489), downstream to its confluence with the Middle Fork Kentucky River (37.24611, -83.38192) in Leslie County, Kentucky.

(ii) Map of Unit 16 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 16 - Hell for Certain Creek and Tributaries: Leslie County, Kentucky**



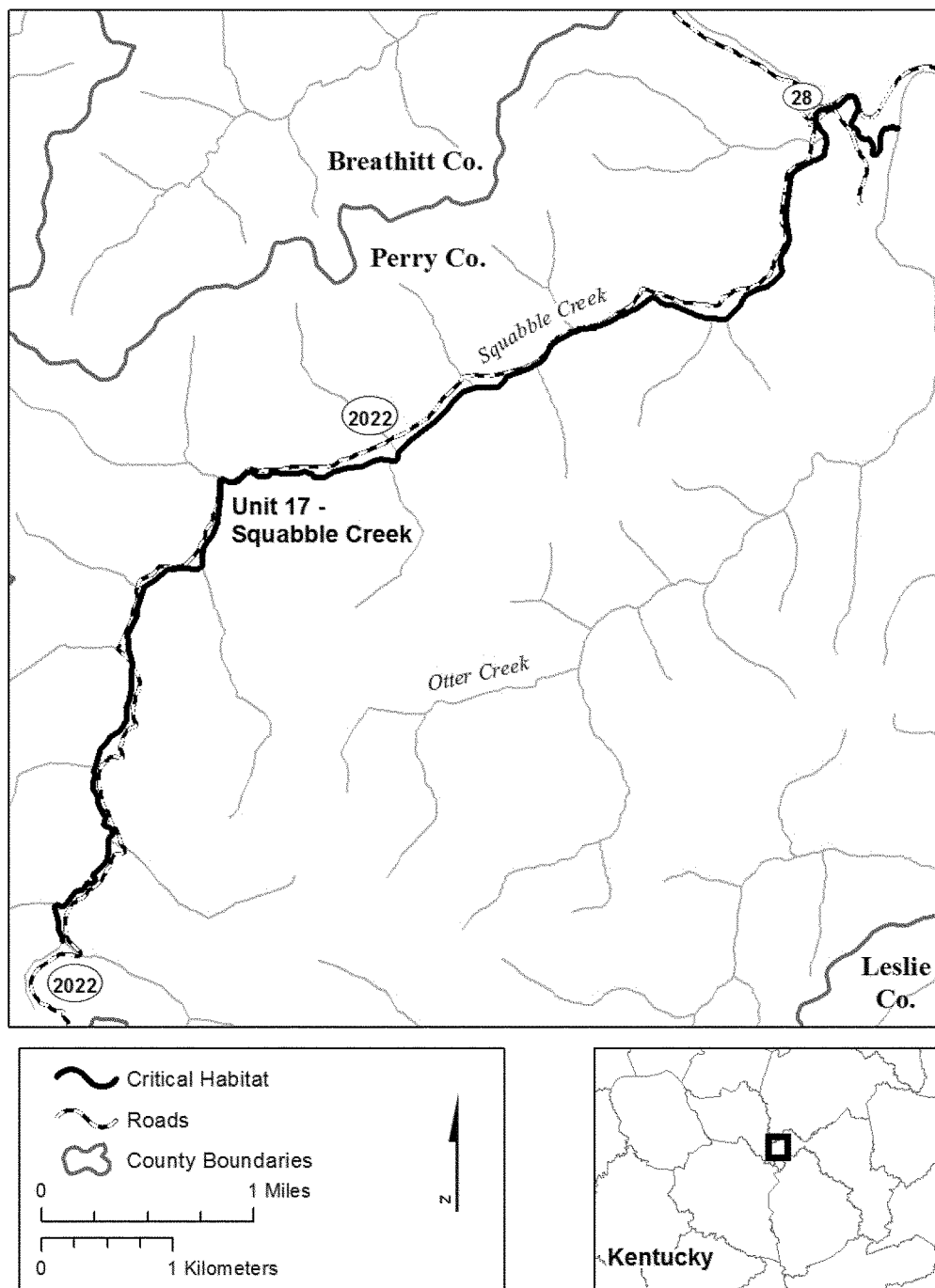
(18) Unit 17: Squabble Creek, Perry County, Kentucky.

(i) Unit 17 includes 12.0 skm (7.5 smi) of Squabble Creek from its confluence

with Long Fork (37.29162, -83.54202), downstream to its confluence with the Middle Fork Kentucky River (37.34597, -83.46883) in Perry County, Kentucky.

(ii) Map of Unit 17 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 17 - Squabble Creek: Perry County, Kentucky**



(19) Unit 18: Blue Hole Creek and Left Fork Blue Hole Creek, Unit 19: Upper Bear Creek and Tributaries, Unit 20: Katies Creek, and Unit 21: Spring Creek and Little Spring Creek, Clay County; and Unit 22: Bowen Creek and Tributaries, Leslie County, Kentucky.

(i) Unit 18 includes 1.8 skm (1.1 smi) of Left Fork from its headwaters at (36.97278, -83.56898), downstream to its confluence with Blue Hole Creek (36.98297, -83.55687); and 3.9 skm (2.4 smi) of Blue Hole Creek from its headwaters at (36.98254, -83.57376), downstream to its confluence with the

Red Bird River (36.99288, -83.53672) in Clay County, Kentucky.

(ii) Unit 19 includes 1.5 skm (1.0 smi) of Left Fork Upper Bear Creek from its headwaters at (36.99519, -83.58446), downstream to its confluence with Upper Bear Creek (37.00448, -83.57354); 0.8 skm (0.5 smi) of Right

Fork Upper Bear Creek from its headwaters at (37.00858, –83.58013), downstream to its confluence with Upper Bear Creek (37.00448, –83.57354); and 4.5 skm (2.8 smi) of Upper Bear Creek from its confluence with Left Fork and Right Fork Upper Bear Creek (37.02109, –83.53423), downstream to its confluence with the Red Bird River (37.00448, –83.57354) in Clay County, Kentucky.

(iii) Unit 20 includes 5.7 skm (3.5 smi) of Katies Creek from its confluence with Cave Branch (37.01837, –83.58848), downstream to its

confluence with the Red Bird River (37.03527, –83.53999) in Clay County, Kentucky.

(iv) Unit 21 includes 1.0 skm (0.6 smi) of Little Spring Creek from its headwaters at (37.05452, –83.57483), downstream to its confluence with Spring Creek (37.05555, –83.56339); and 8.2 skm (5.1 smi) of Spring Creek from its headwaters at (37.02874, –83.59815), downstream to its confluence with the Red Bird River (37.06189, –83.54134) in Clay County, Kentucky.

(v) Unit 22 includes 2.2 skm (1.4 smi) of Laurel Fork from its headwaters at (37.05536, –83.47452), downstream to its confluence with Bowen Creek (37.04702, –83.49641); 1.8 skm (1.1 smi) of Amy Branch from its headwaters at (37.05979, –83.50083), downstream to its confluence with Bowen Creek (37.05031, –83.51498); and 9.6 skm (6.0 smi) of Bowen Creek from its headwaters at (37.03183, –83.46124), downstream to its confluence with the Red Bird River (37.06777, –83.53840) in Leslie County, Kentucky.

(vi) Map of Units 18, 19, 20, 21, and 22 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)**

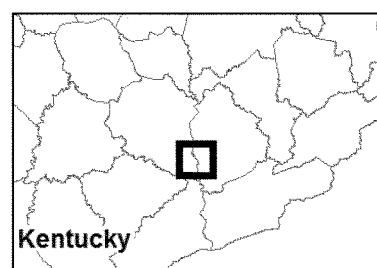
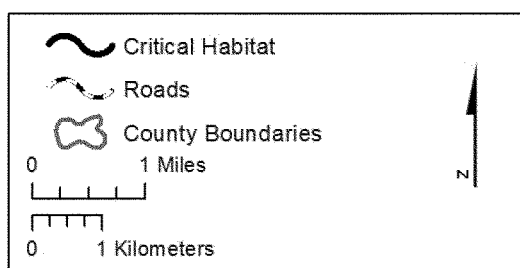
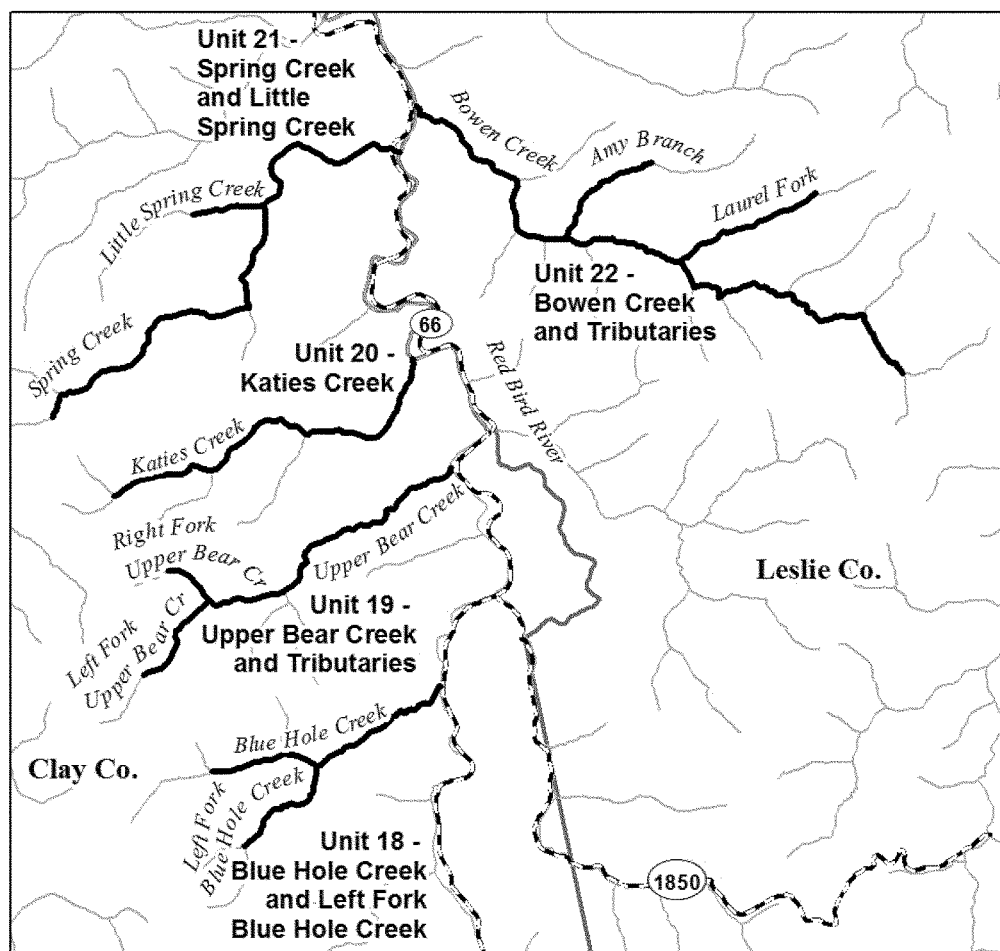
**Unit 18 - Blue Hole Creek and Left Fork Blue Hole Creek: Clay County, Kentucky**

**Unit 19 - Upper Bear Creek and Tributaries: Clay County, Kentucky**

**Unit 20 - Katies Creek: Clay County, Kentucky**

**Unit 21 - Spring Creek and Little Spring Creek: Clay County, Kentucky**

**Unit 22 - Bowen Creek and Tributaries: Leslie County, Kentucky**



(20) Unit 23: Elisha Creek and Tributaries, Leslie County; and Unit 24: Gilberts Big Creek, and Unit 25: Sugar

Creek, Clay and Leslie Counties, Kentucky.

(i) Unit 23 includes 4.4 skm (2.7 smi) of Right Fork Elisha Creek from its

headwaters at (37.07255, -83.47839), downstream to its confluence with Elisha Creek (37.08165, -83.51802); 2.3 skm (1.4 smi) of Left Fork Elisha Creek

from its headwaters at (37.09632, -83.51108), downstream to its confluence with Elisha Creek (37.08528, -83.52645); and 2.9 skm (1.8 smi) of Elisha Creek from its confluence with Right Fork Elisha Creek (37.08165, -83.51802), downstream to its confluence with the Red Bird River

(37.08794, -83.54676) in Leslie County, Kentucky.

(ii) Unit 24 includes 7.2 skm (4.5 smi) of Gilberts Big Creek from its headwaters at (37.10825, -83.49164) in Leslie County, downstream to its confluence with the Red Bird River (37.10784, -83.55590) in Clay County, Kentucky.

(iii) Unit 25 includes 7.2 skm (4.5 smi) of Sugar Creek from its headwaters at (37.12446, -83.49420) in Leslie County, downstream to its confluence with the Red Bird River (37.11804, -83.55952) in Clay County, Kentucky.

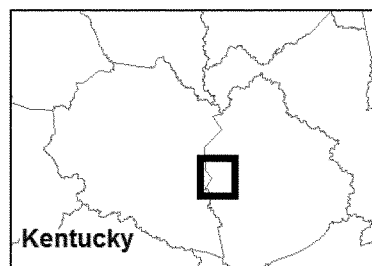
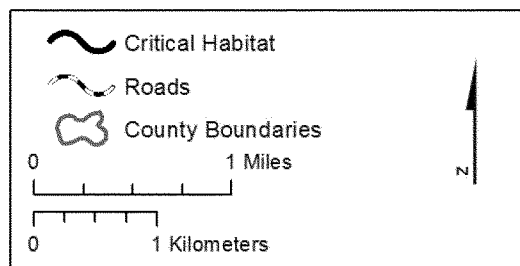
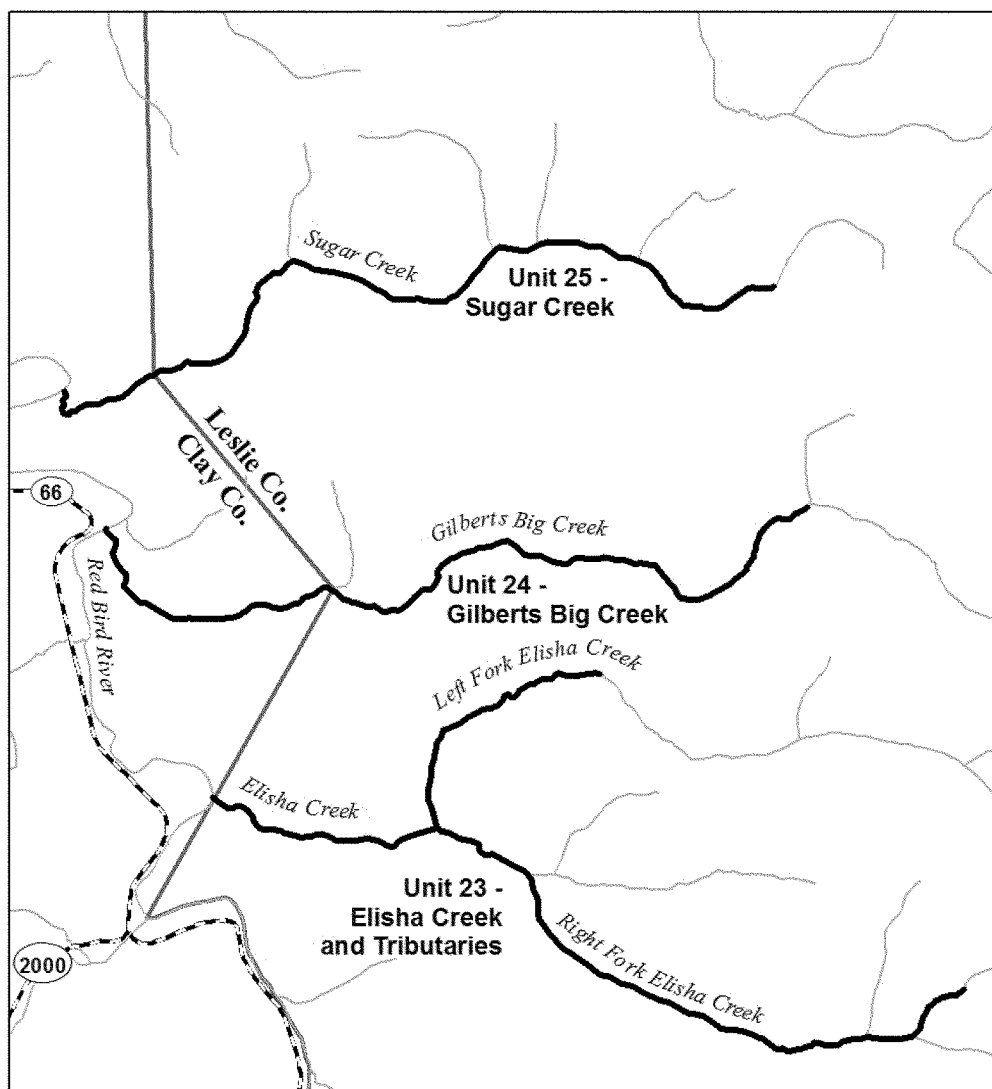
(iv) Map of Units 23, 24, and 25 follows:

### Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)

**Unit 23 - Elisha Creek and Tributaries: Leslie County, Kentucky**

**Unit 24 - Gilberts Big Creek: Clay and Leslie Counties, Kentucky**

**Unit 25 - Sugar Creek: Clay and Leslie Counties, Kentucky**



(21) Unit 26: Big Double Creek and Tributaries, and Unit 27: Little Double Creek, Clay County, Kentucky.

(i) Unit 26 includes 1.4 skm (0.9 smi) of Left Fork Big Double Creek from its headwaters at (37.07967, -83.60719), downstream to its confluence with Big Double Creek (37.09053, -83.60245); 1.8 skm (1.1 smi) of Right Fork Big

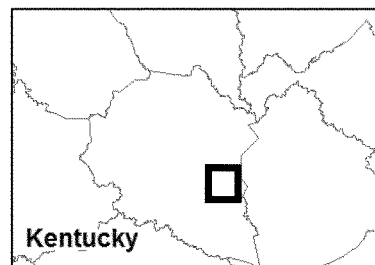
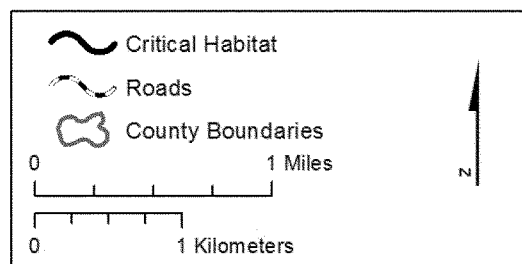
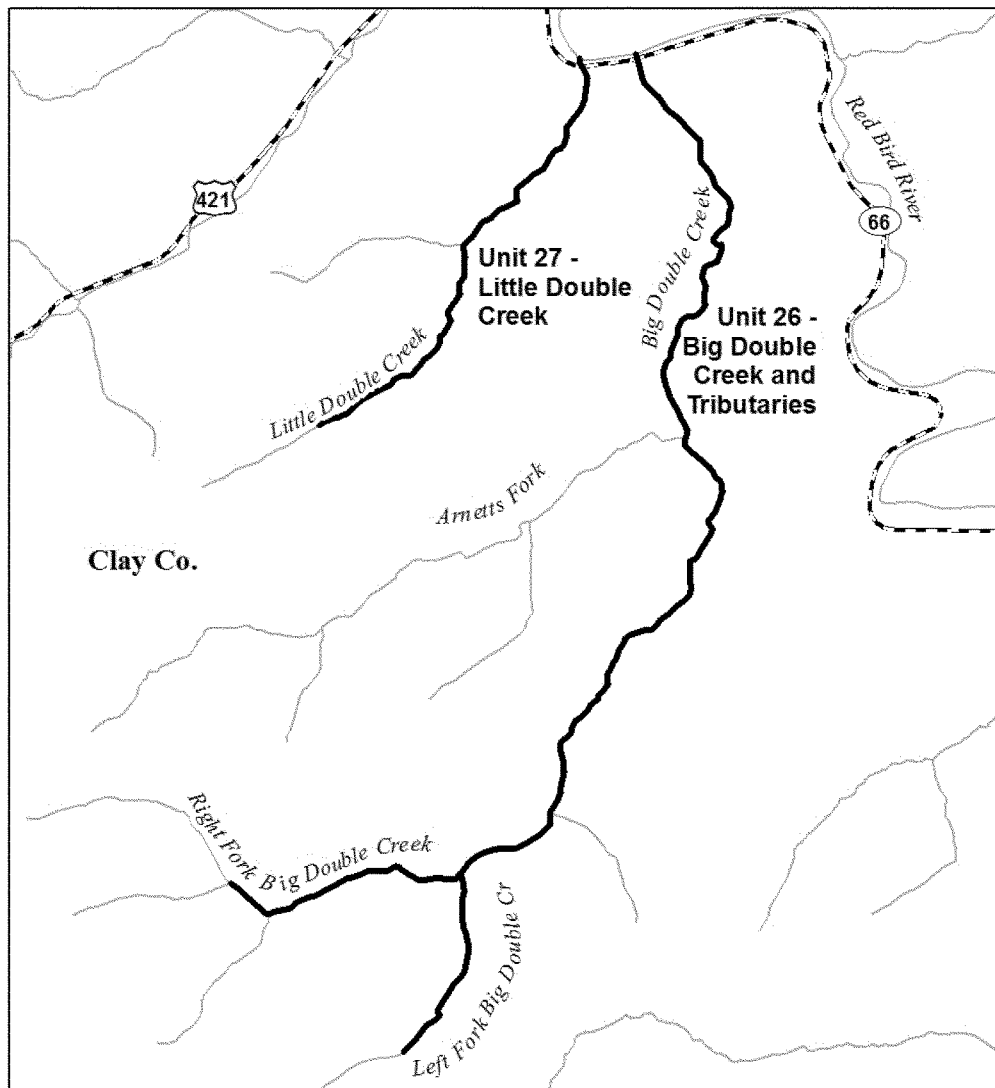
Double Creek from its headwaters at (37.09021, -83.62010), downstream to its confluence with Big Double Creek (37.09053, -83.60245); and 7.1 skm (4.4 smi) of Big Double Creek from its confluence with the Left and Right Forks (37.09053, -83.60245), downstream to its confluence with the

Red Bird River (37.14045, -83.58768) in Clay County, Kentucky.

(ii) Unit 27 includes 3.4 skm (2.1 smi) of Little Double Creek from its headwaters at (37.11816, -83.61251), downstream to its confluence with the Red Bird River (37.14025, -83.59197) in Clay County, Kentucky.

(iii) Map of Units 26 and 27 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)**  
**Unit 26 - Big Double Creek and Tributaries: Clay County, Kentucky**  
**Unit 27 - Little Double Creek: Clay County, Kentucky**





(22) Unit 28: Jacks Creek, and Unit 29: Long Fork, Clay County, Kentucky.

(i) Unit 28 includes 5.9 skm (3.7 smi) of Jacks Creek from its headwaters at (37.21472, -83.54108), downstream to

its confluence with the Red Bird River (37.19113, -83.59185) in Clay County, Kentucky.

(ii) Unit 29 includes 2.2 skm (1.4 smi) of Long Fork from its headwaters at

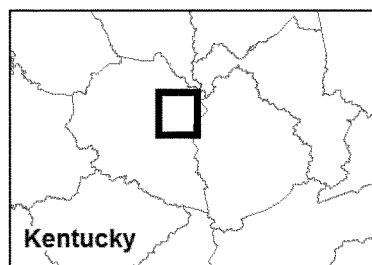
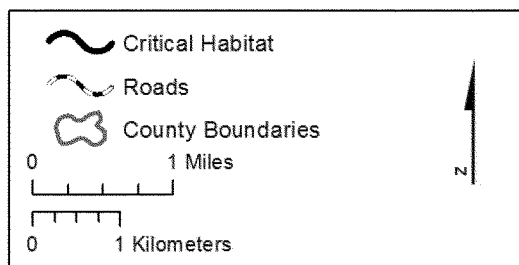
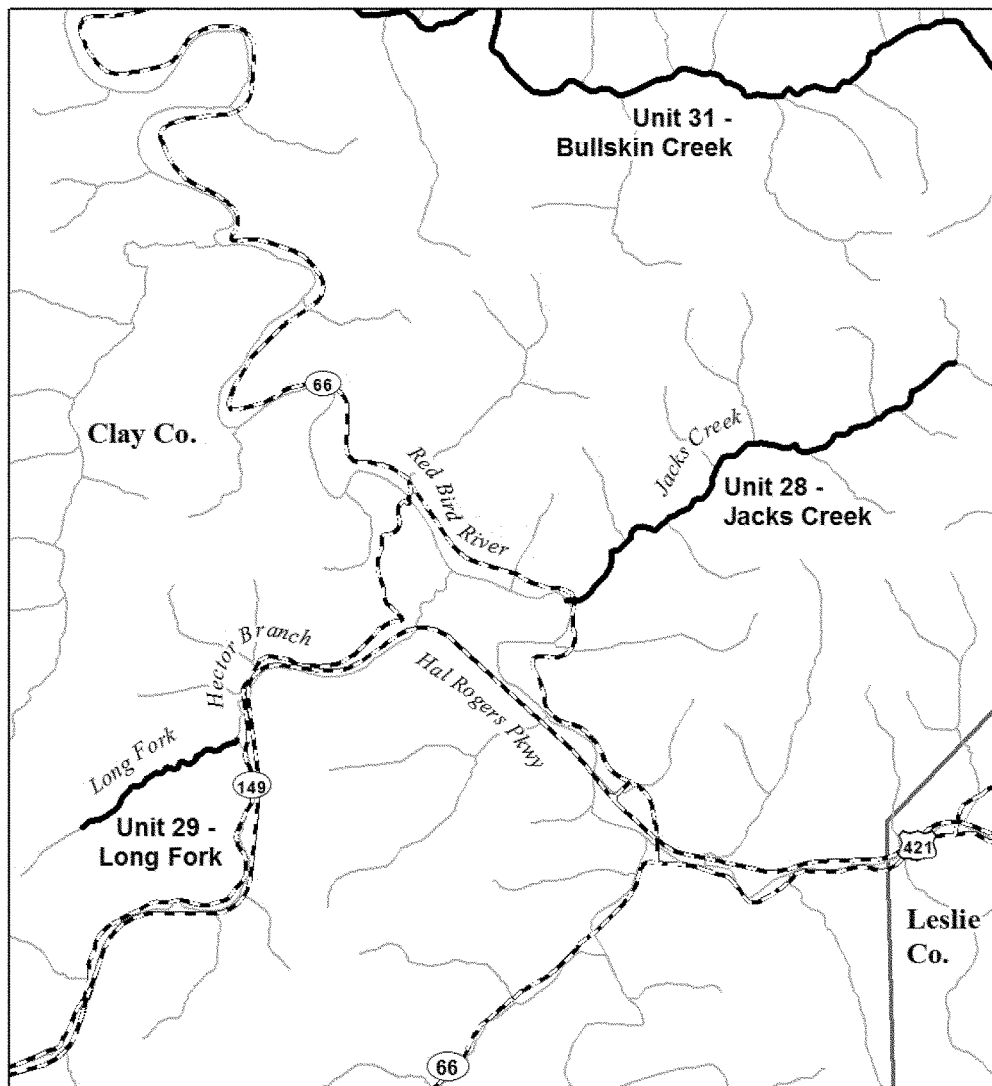
(37.16889, -83.65490), downstream to its confluence with Hector Branch (37.17752, -83.63464) in Clay County, Kentucky.

(iii) Map of Units 28 and 29 follows:

### Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)

#### Unit 28 - Jacks Creek: Clay County, Kentucky

#### Unit 29 - Long Fork: Clay County, Kentucky



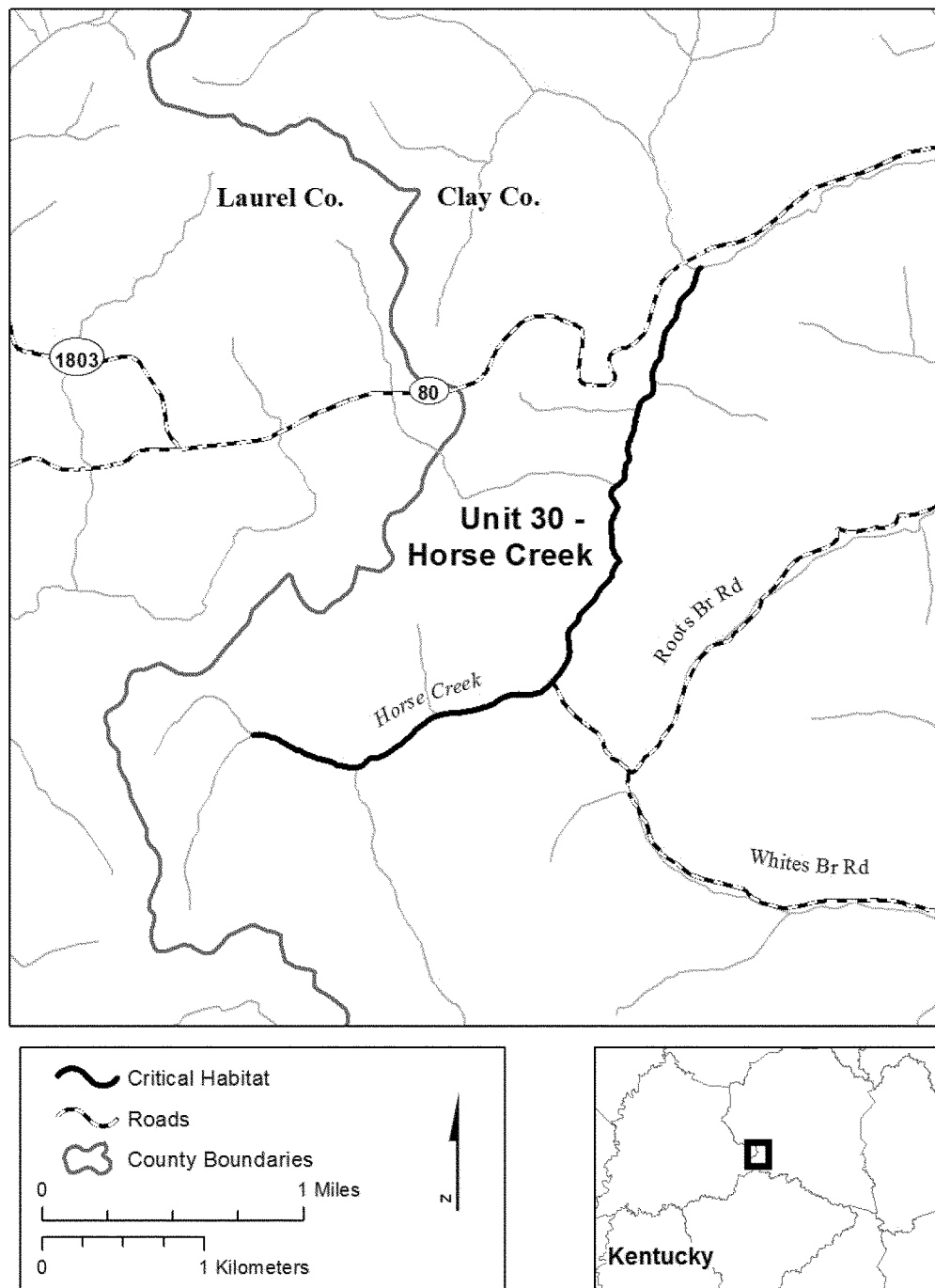
(23) Unit 30: Horse Creek, Clay County, Kentucky.

(i) Unit 30 includes 5.0 skm (3.1 smi) of Horse Creek from its headwaters at

(37.07370, -83.87756), downstream to its confluence with Pigeon Roost Branch (37.09926, -83.84582) in Clay County, Kentucky.

(ii) Map of Unit 30 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 30 - Horse Creek: Clay County, Kentucky**



(24) Unit 31: Bullskin Creek, Clay and Leslie Counties, Kentucky.

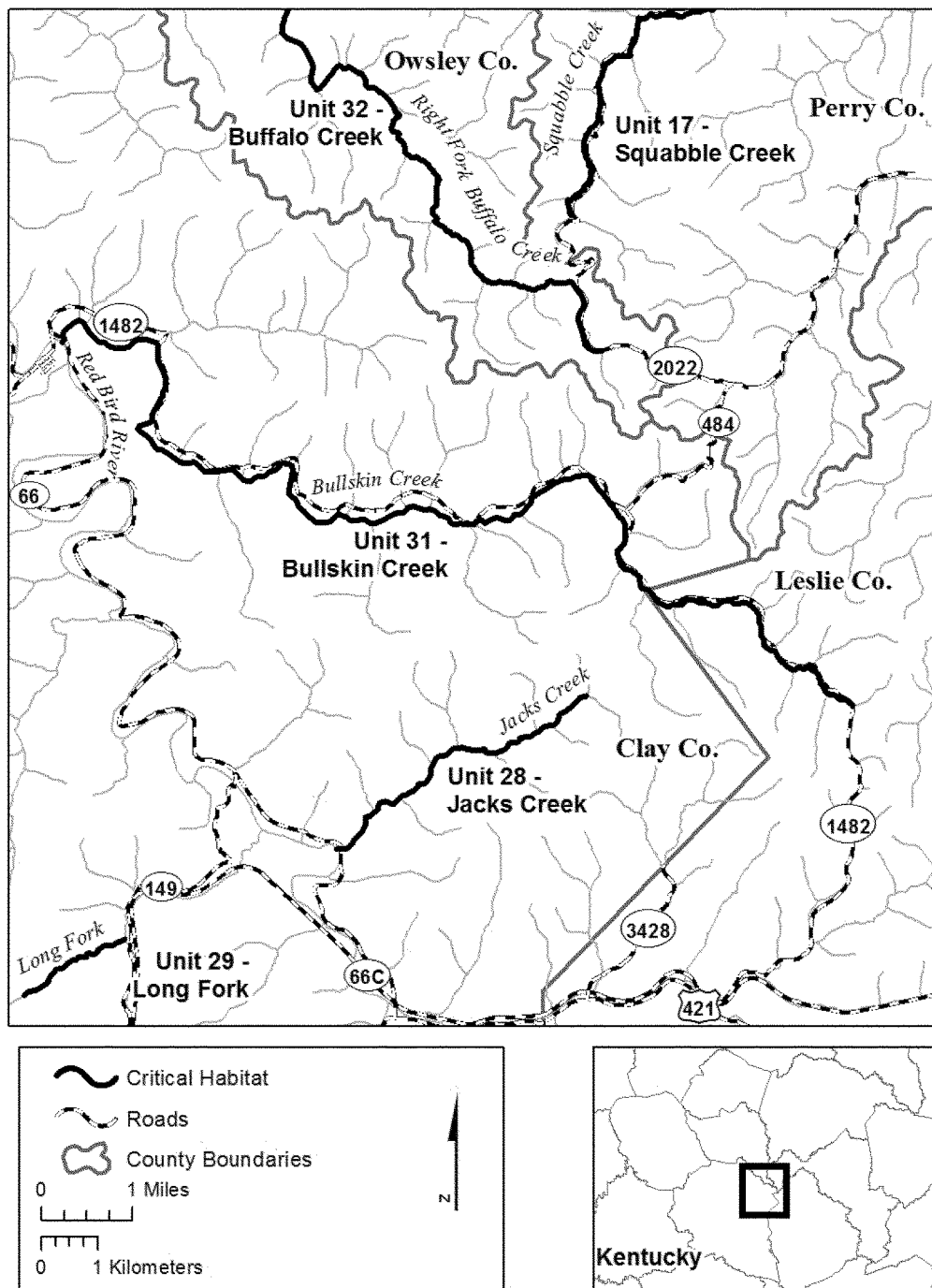
(i) Unit 31 includes 21.7 skm (13.5 smi) of Bullskin Creek from its

confluence with Old House Branch (37.21218, -83.48798) in Leslie County, downstream to its confluence with the

South Fork Kentucky River (37.27322, -83.64441) in Clay County, Kentucky.

(ii) Map of Unit 31 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 31 - Bullskin Creek: Clay and Leslie Counties, Kentucky**



(25) Unit 32: Buffalo Creek and Tributaries, Owsley County, Kentucky.

(i) Unit 32 includes 2.0 skm (1.2 smi) of Cortland Fork from its headwaters at (37.35052, -83.54570), downstream to its confluence with Laurel Fork (37.34758, -83.56466); 6.4 skm (4.0 smi) of Laurel Fork from its headwaters at (37.32708, -83.56450), downstream

to its confluence with Left Fork Buffalo Creek (37.347758, -83.56466); 4.6 skm (2.9 smi) of Lucky Fork from its headwaters at (37.37682, -83.55711), downstream to its confluence with Left Fork Buffalo Creek (37.35713, -83.59367); 5.1 skm (3.2 smi) of Left Fork Buffalo Creek from its confluence with Lucky Fork and Left Fork

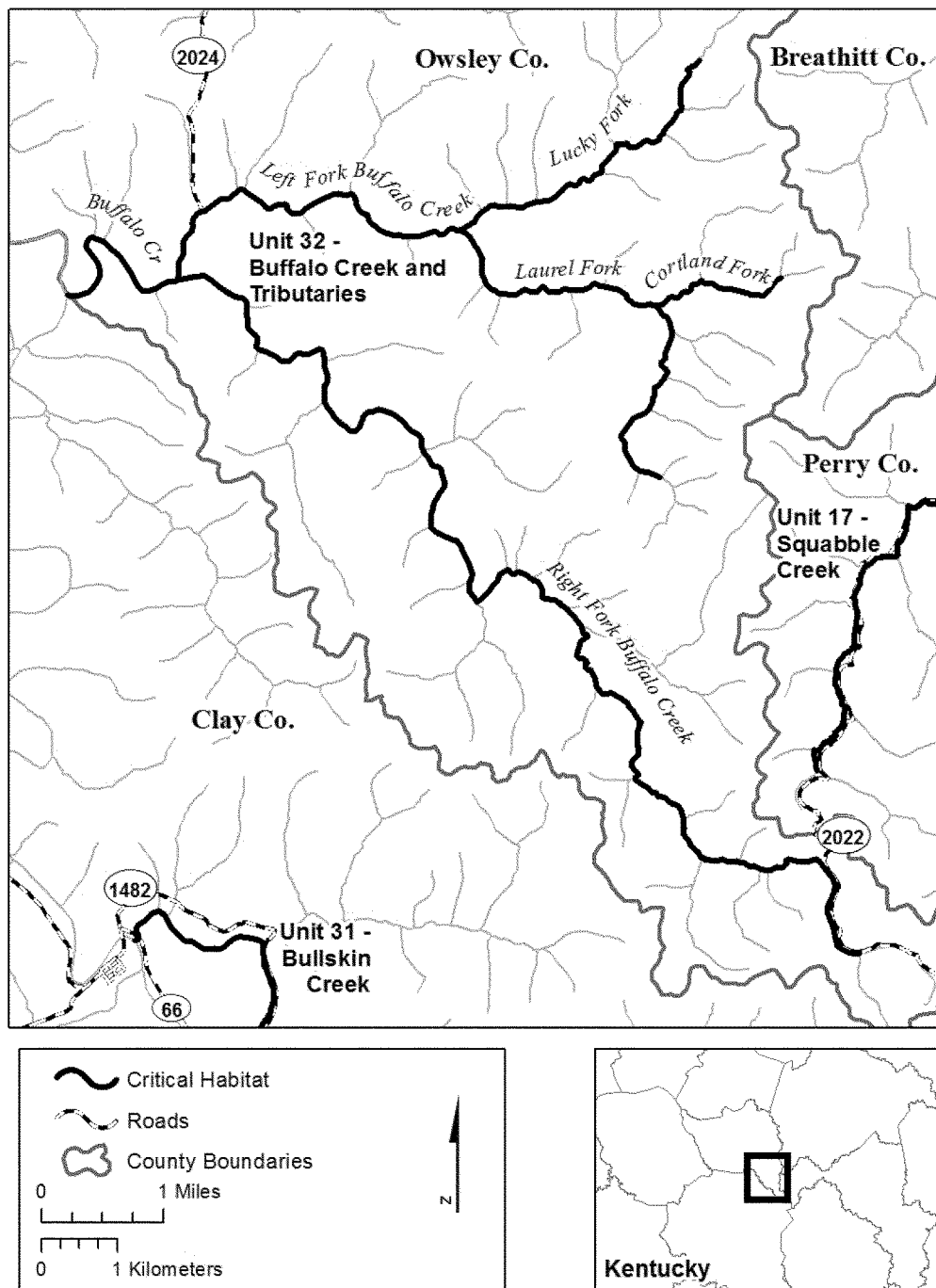
(37.35713, -83.59367), downstream to its confluence with Buffalo Creek (37.35197, -83.63583); 17.3 skm (10.8 smi) of Right Fork Buffalo Creek from its headwaters at (37.26972, -83.53646), downstream to its confluence with Buffalo Creek (37.35197, -83.63583); and 2.7 skm (1.7 smi) of Buffalo Creek from its confluence with the Left and

Right Forks (37.35197, -83.63583),  
downstream to its confluence with the  
South Fork Kentucky River (37.35051,

-83.65233) in Owsley County,  
Kentucky.

(ii) Map of Unit 32 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 32 - Buffalo Creek and Tributaries: Owsley County, Kentucky**



(26) Unit 33: Lower Buffalo Creek, Lee and Owsley Counties, Kentucky.

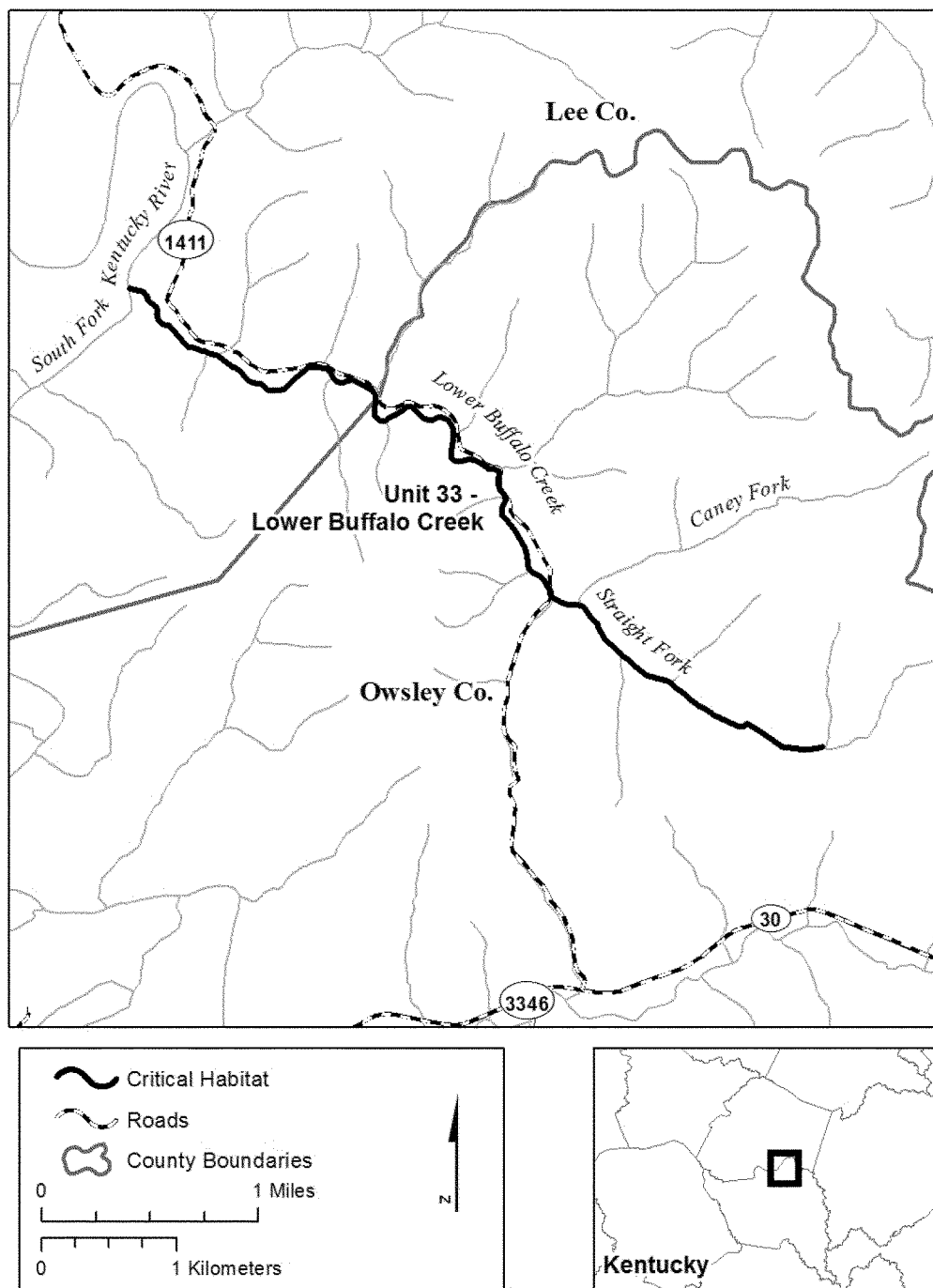
(i) Unit 33 includes 2.2 skm (1.4 smi) of Straight Fork from its headwaters at (37.49993, -83.62996), downstream to

its confluence with Lower Buffalo Creek (37.50980, -83.65015) in Owsley County; and 5.1 skm (3.2 smi) of Lower Buffalo Creek from its confluence with Straight Fork (37.50980, -83.65015) in

Owsley County, downstream to its confluence with the South Fork Kentucky River (37.53164, -83.68732) in Lee County, Kentucky.

(ii) Map of Unit 33 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 33 - Lower Buffalo Creek: Owsley and Lee Counties, Kentucky**



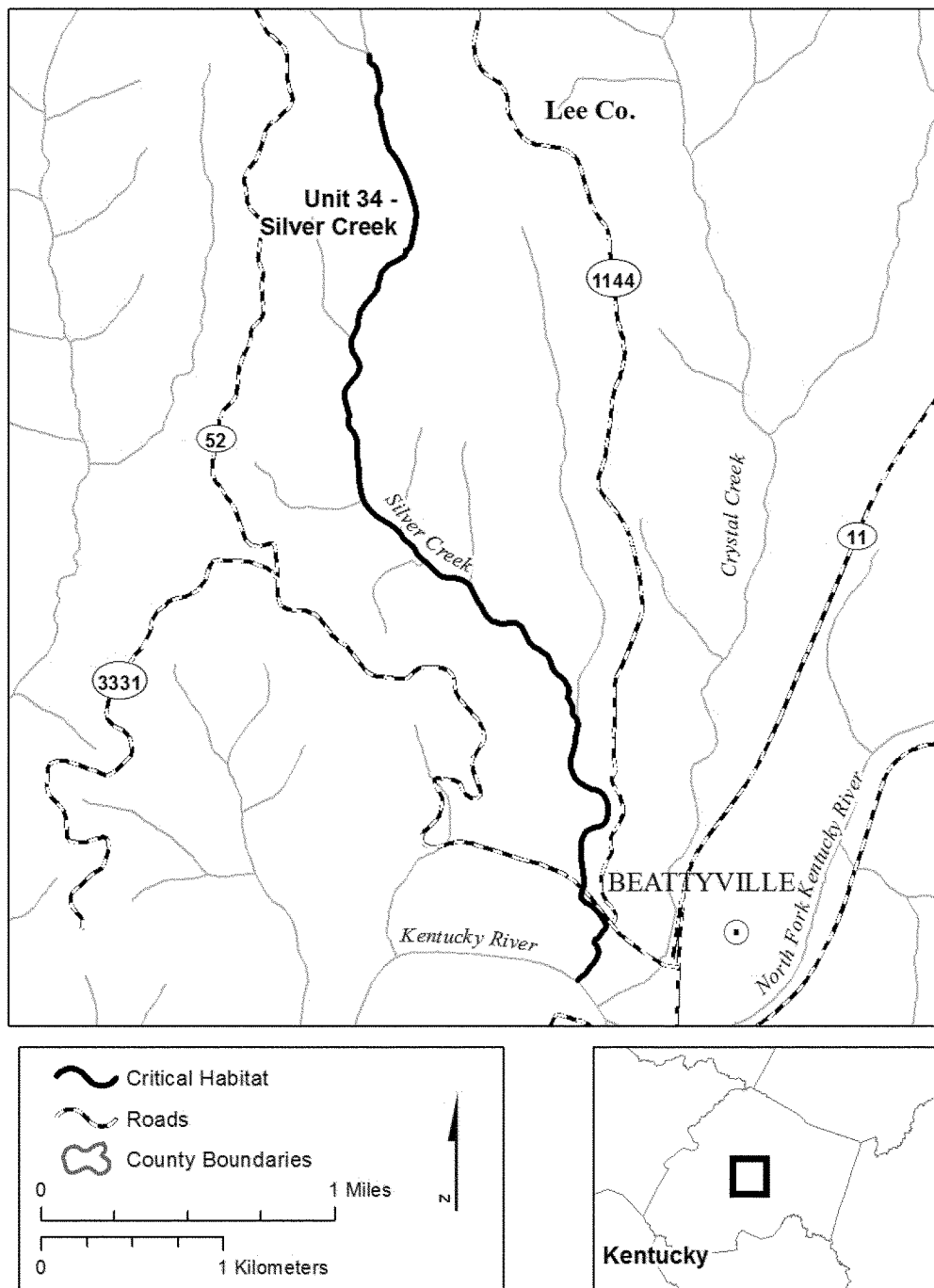
(27) Unit 34: Silver Creek, Lee County, Kentucky.

(i) Unit 34 includes 6.2 skm (3.9 smi) of Silver Creek from its headwaters at

(37.61857, -83.72442), downstream to its confluence with the Kentucky River (37.57251, -83.71264) in Lee County, Kentucky.

(ii) Map of Unit 34 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 34 - Silver Creek: Lee County, Kentucky**



(28) Unit 35: Travis Creek, Jackson County; Unit 36: Wild Dog Creek, Jackson and Owsley Counties; and Unit 37: Granny Dismal Creek, Owsley and Lee Counties, Kentucky.

(i) Unit 35 includes 4.1 skm (2.5 smi) of Travis Creek from its headwaters at (37.43039, -83.88516), downstream to its confluence with Sturgeon Creek

(37.43600, -83.84609) in Jackson County, Kentucky.

(ii) Unit 36 includes 8.1 skm (5.1 smi) of Wild Dog Creek from its headwaters at (37.47081, -83.89329) in Jackson County, downstream to its confluence with Sturgeon Creek (37.48730, -83.82319) in Owsley County, Kentucky.

(iii) Unit 37 includes 6.9 skm (4.3 smi) of Granny Dismal Creek from its headwaters at (37.49862, -83.88435) in Owsley County, downstream to its confluence with Sturgeon Creek (37.49586, -83.81629) in Lee County, Kentucky.

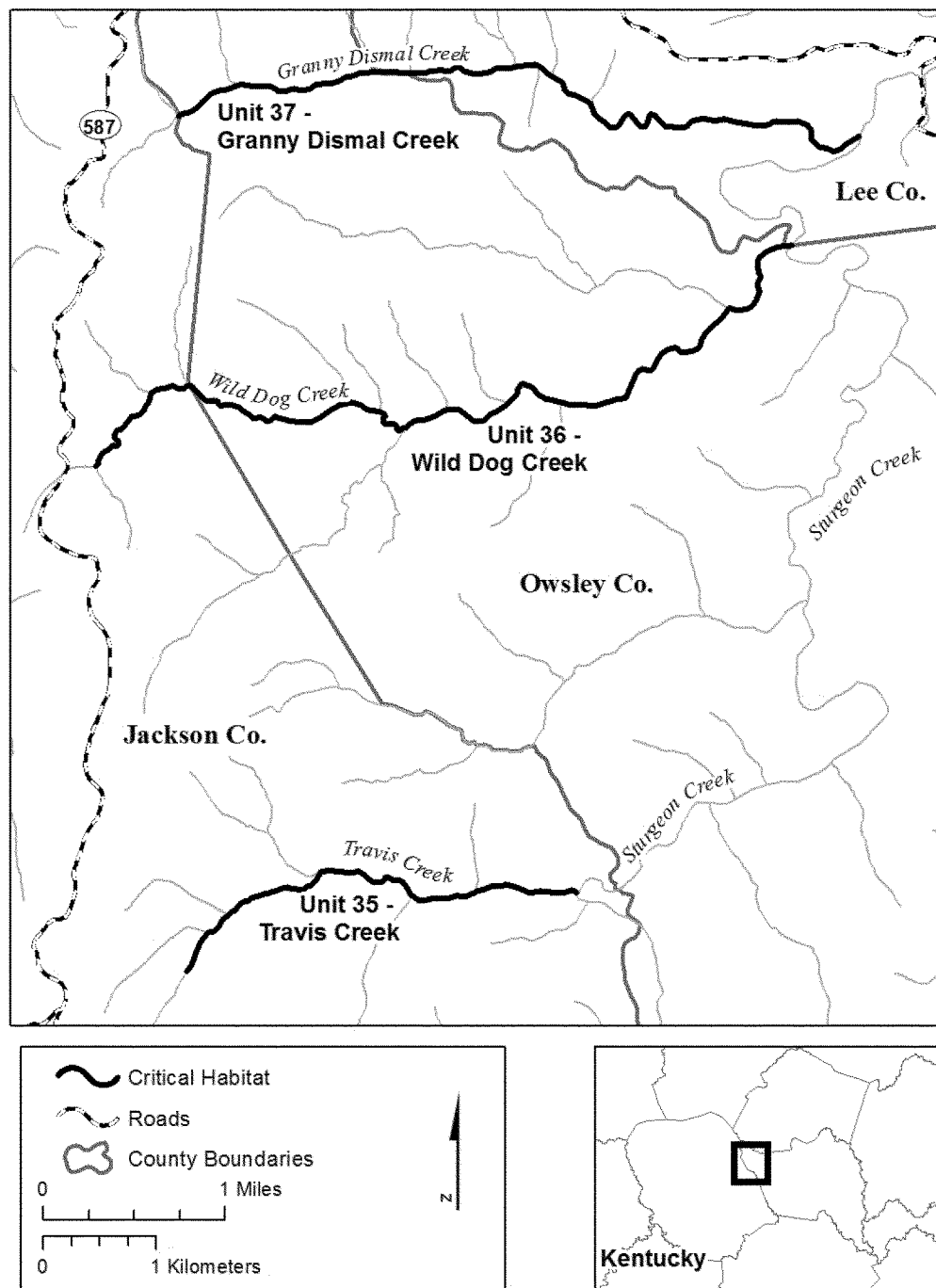
(iv) Map of Units 35, 36, and 37 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)**

**Unit 35 - Travis Creek: Jackson County, Kentucky**

**Unit 36 - Wild Dog Creek: Jackson and Owsley Counties, Kentucky**

**Unit 37 - Granny Dismal Creek: Owsley and Lee Counties, Kentucky**



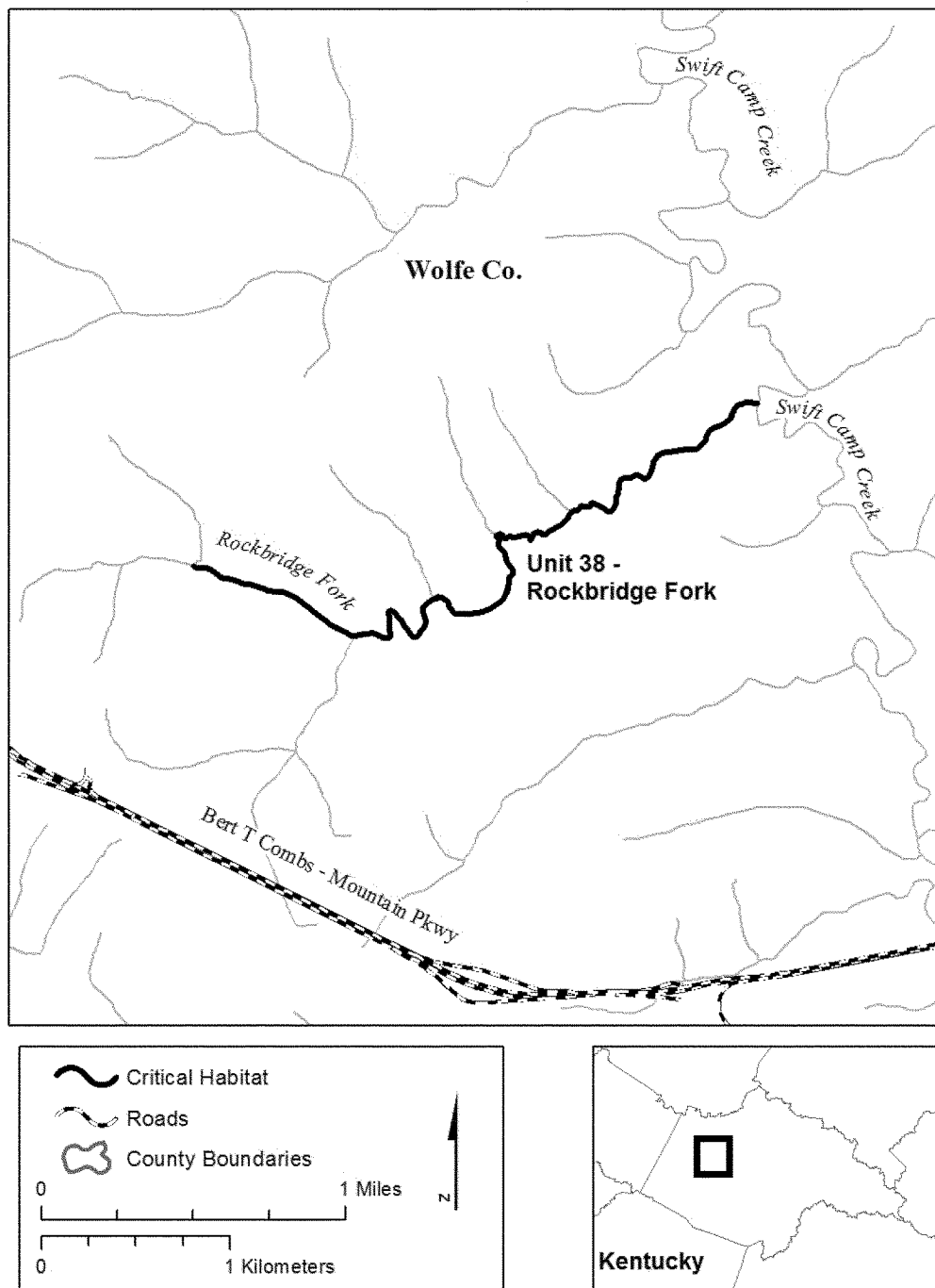
(29) Unit 38: Rockbridge Fork, Wolfe County, Kentucky.

(i) Unit 38 includes 4.5 skm (2.8 smi) of Rockbridge Fork from its headwaters

at (37.76228, -83.59553), downstream to its confluence with Swift Camp Creek (37.76941, -83.56134) in Wolfe County, Kentucky.

(ii) Map of Unit 38 follows:

**Critical Habitat for Kentucky Arrow Darter (*Etheostoma spilotum*)  
Unit 38 - Rockbridge Fork: Wolfe County, Kentucky**



\* \* \* \* \*

Dated: September 22, 2015.

**Karen Hyun,**  
*Acting Principal Deputy Assistant Secretary  
for Fish and Wildlife and Parks.*

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