CANDIDATE AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Etheostoma cragini*

COMMON NAME: Arkansas Darter

LEAD REGION: 6

INFORMATION CURRENT AS OF: February 13, 2003

STATUS/ACTION:

___ New candidate
_X_ Continuing candidate
- _X_ Non-petitioned
- ___ Petitioned--Date petition received: ___
  - ___ 90-day positive--FR date: ___
  - ___ 12-month warranted but precluded--FR date: ___
- ___ Listing priority change
  - Former LP: __
  - New LP: ___
- Latest date species first became a Candidate: January 6, 1989 __
- Candidate removal: Former LP: ___
- ___ A Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
- ___ F - Range is no longer a U.S. territory.
- ___ M - Taxon mistakenly included in past notice of review.
- ___ N - Taxon may not meet the ESA=s definition of "species."
- ___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Fish

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Arkansas, Colorado, Kansas, Missouri, Oklahoma.

CURRENT STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Arkansas, Colorado, Kansas, Missouri, Oklahoma.

LEAD REGION CONTACT: Chuck Davis, (303) 236-7400, extension 235

LEAD FIELD OFFICE CONTACT: Manhattan, KS, Dan Mulhern, (785) 539-3474, extension 109

BIOLOGICAL INFORMATION:

The Arkansas darter is a small fish known from the Arkansas River and tributaries in Arkansas, Colorado, Kansas, Missouri, and Oklahoma (Blair 1959, Branson 1967, Cloutman 1971, 1980, Cross 1967, 1975, Matthews and McDaniel 1981, Miller 1984, Pflieger 1975). It occurs most often in sand or pebble bottomed pools of small spring-fed streams and marshes, with cool water and aquatic vegetation (Cross 1967, 1975, Distler 1972, Moss 1981, Pigg 1987, Robison et al. 1974, Taber et al. 1986). The farthest upstream collection of Arkansas darter is from a small unnamed drainage originating on the Fort Carson Military Reservation in El Paso County, Colorado (Miller 1984). The most downstream site is from Wilson Springs at the intersection of Arkansas Highway 112 and U.S. Highway 71 Bypass in Fayetteville, Washington County, Arkansas (Robison and Buchanan 1988).

In Colorado, only three records exist prior to 1980. However, extensive collections in the state from 1979 to 1982 showed the darter to occur primarily within three drainages in southeastern Colorado: Fountain Creek, Rush Creek, and Big Sandy Creek (Loeffler and Krieger 1994). The Colorado populations are disjunct geographically from the main populations in Kansas and Oklahoma, but records indicate that the distribution may have been continuous prior to European settlement (Eberle and Stark 1998). In Kansas, the Arkansas darter historically occurred in the southwestern one-third of the state and was relatively abundant (Eberle and Stark 1998). In eastern Oklahoma, there are 10 historic localities from the eastern tributaries of the Neosho River and one from the Big Cabin Creek drainage (Martinez 1996). In Missouri, the Arkansas darter was collected historically from the southwestern part of the state. It was considered to be locally abundant and occurred in 14 sites (Pflieger 1992). In Arkansas, the species was unknown from the state until 1979. Since then, it has been found at nine locations in spring runs in the Illinois River drainage in northwestern Arkansas (Hargrave 1998).Though widely distributed, the Arkansas darter has declined throughout its range. In Colorado, it is less widespread than it was historically, and is classified as a threatened species. The extant populations occur in the three aforementioned tributaries of the Arkansas River, and one of these is under threat from urban and agricultural activity (Loeffler and Krieger 1994). Surveys between 1993 and1996 in Colorado indicate that as much as 90 percent of available habitat is occupied, comprising approximately 30 populations (James Melby, Colorado Division of Wildlife, pers. comm.).In Kansas, the Arkansas darter still occurs throughout its historic range, though many populations have declined or disappeared, especially in southwestern Kansas where groundwater has previously been diminished from irrigation pressures (Eberle and Stark 1998). In northwestern Oklahoma, stable populations appear similar to those found historically. In eastern Oklahoma, although the species presently occurs at 17 localities on 11 streams, it appears to be extirpated from 9 of 11 historical localities (Martinez 1996). A survey of more than 200 historic Arkansas darter localities in Kansas and Oklahoma found the species at approximately 70 locations, representing a loss of nearly 65 percent of historic locations (Eberle and Stark 1998). The current extant locations are widely dispersed throughout the historic distribution.In Missouri, Arkansas darters occur in each of the principal drainages in the Spring River system. Based on surveys in 1991 and1992, the species occurs at most historic localities in the state, with 430 specimens collected from 32 of 61 localities sampled (Pflieger 1997). It ranked as the third most abundant of 13 darter species sampled, and there is no indication that it is declining in Missouri, which may have the largest remaining populations.Of the nine historic localities in

Arkansas, the species is currently found at only three: Healing Spring, Wilson Spring, and Gailey Hollow (Hargrave 1998). In Gailey Hollow, only a single individual was found. The other two sites had larger populations, although the species was not abundant at either site. However, these populations appear to be stable (Hargrave 1998). The Arkansas darter is found in disjunct locations throughout a broad geographical area. This may be indicative of a species that once was widely dispersed throughout its range but has since been relegated to isolated areas surrounded by unsuitable habitat that prevents dispersal, or it may indicate the species= preference for small isolated spring-fed habitats. These isolated populations are vulnerable to impacts which could result in more rapid population extirpation, since little colonization is possible in these disjunct populations. However, population dispersal may also protect against widespread extirpation from a single stochastic event.

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Water depletion in required habitats has been one of the greatest threats facing the Arkansas darter (Blair 1959, Cross et al. 1985, USFWS 1989). Drying of spring-fed marshes may cause at least localized extirpations and has forced the Arkansas darter to occupy less favorable habitats in some stream reaches (Pigg 1987). Agricultural and municipal development has contributed to habitat declines for the species, from increasing water demands to general quality degradations resulting from crop farming, livestock production, and wastewater use and discharge (Harris and Smith 1985, Moss 1981). Development of large confined animal feeding operations may also have the potential to adversely impact the groundwater upon which Arkansas darter habitat is based.

The species is considered a poor competitor (Hargrave 1998) and appears to thrive in streams with little fish diversity. This requirement limits the ability of the species to colonize other areas when threatened with habitat destruction. These overall threats could continue to cause gradual extirpations from portions of the range. However, as indicated by the best survey data currently available, the species may still persist at numerous locations. The Arkansas darter, because of its widespread distribution, may presently be relatively secure from adverse impacts resulting from all but the most widespread events, such as a catastrophic drought. Utilization of groundwater within the Arkansas River basin in Kansas has stabilized and even slightly declined in the past 14 years. During 1988 through 1994, approximately 314,000 acre-feet per year were utilized in the region, declining to approximately 288,000 acre-feet during 1995 through 2000, while the total acreage being irrigated has remained virtually unchanged (Kansas Division of Water Resources, unpublished data).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

There is no evidence at this time to suggest overutilization of the Arkansas darter for any of these purposes.

C. Disease or predation.

We are aware of no diseases that threaten the Arkansas darter. Sport fishery enhancement efforts by State agencies are designed to increase predatory sport fish numbers in impoundments and, subsequently, some may also move into streams within the range of the Arkansas darter. The effect of predation on the species is unknown at this time; however, it is reasonable to assume it is preyed upon to the same extent as other small fish, including other darters. The Arkansas darter is not known to occur in streams with predatory fish populations. This may be due to the small, isolated habitats which typically support this species, which limit the occurrence of significant numbers of larger predators, or it may indicate the species= inability to avoid predation.

D. The inadequacy of existing regulatory mechanisms.

The species is State-designated as endangered in Oklahoma, threatened in Colorado and Kansas. Arkansas classifies it as a vulnerable species, and it is unlisted in Missouri. The species is afforded some degree of protective status in several of the States in its range, limiting the extent of outright taking. The most persistent threats to this species are adverse impacts to habitat quantity and quality, and State regulations may not adequately address them. In concert with State=s authority for National Pollution Discharge Elimination System permits and water withdrawal rights, some level of protection may be afforded.

E. Other natural or manmade factors affecting its continued existence.

The specialized spring-fed habitat type typically occupied by Arkansas darters, plus the isolated nature of many populations, intensifies any impacts the species may suffer, and increases the time required for repopulation following temporary population reductions from other causes. However, the isolation of many populations also makes a wide-spread extirpation event much less likely to occur.

Results of a preliminary study to measure allozyme variability and relative genetic distances among different populations indicated differences between populations in Colorado, Kansas, and the Spring River basin of Missouri (Johnson and Philipp 1996). Though Colorado and Kansas populations exhibited differences, the greatest differences were between these populations and those in Missouri. Further analyses of a broader sample may indicate that significant differences exist between western plains and eastern Ozark populations, matching the differences observed in habitats occupied. Results of such analyses may dictate differing management schemes for each group.

LAND OWNERSHIP: With few exceptions, almost all Arkansas darter populations occur on privately owned land. Two populations in Kansas are located on State property, one population in Colorado located on United States Department of Defense property, and one population in Arkansas on municipal property.

PRELISTING: The Kansas Ecological Services Field Office has completed and signed three private landowner agreements in south central Kansas, which provide for habitat protection and enhancement for approximately 14 stream miles of Arkansas darter habitat. The Arkansas Ecological Services Field Office is currently pursuing a Candidate Conservation Agreement with

Assurances with the City of Fayetteville to protect one of the state=s three extant populations during development of a business technology park. The Colorado Fish and Wildlife Assistance Office has coordinated with Colorado Division of Wildlife to transplant the species into various sites within the historical range.

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LISTING PRIORITY

THREAT

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	*11*
		Subspecies/population	12

Rational for listing priority number:

Magnitude:

Imminence:

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, annual retentions of candidates, removal of candidates, and listing priority changes.

Approve: Ralph O. Morgenweck April 1, 2003
Regional Director, Fish and Wildlife Service Date

Concur: _____ _____
Director, Fish and Wildlife Service Date

Do not concur: _____ _____
Director, Fish and Wildlife Service Date

Director's Remarks:

-
-
-

Date of annual review:_____

Conducted by: Dan Mulhern