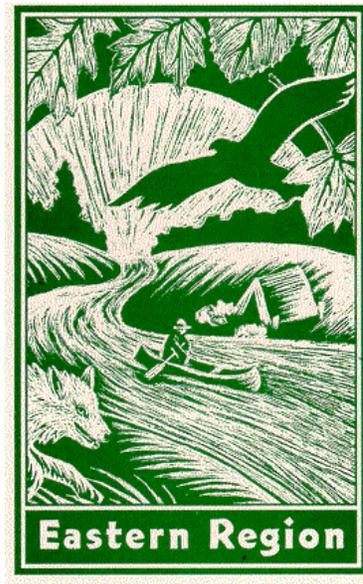


Conservation Assessment
For
Plains Leopard Frog (Rana blairi)



USDA Forest Service, Eastern Region
2003

Prepared by:



This Conservation Assessment was prepared to compile the published and unpublished information and serves as a Conservation Assessment for the Eastern Region of the Forest Service. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject community, please contact the Eastern Region of the Forest Service - Threatened and Endangered Species Program at 310 Wisconsin Avenue, Suite 580 Milwaukee, Wisconsin 53203.

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NOMENCLATURE AND TAXONOMY

Scientific Name: *Rana blairi* Mecham, Littlejohn, Oldham, Brown and Brown

Common Name: Plains Leopard Frog

Family: Ranidae

Synonyms: None

USFS Region 9 Status: Sensitive

USFWS Status: None

Illinois Status: None

Global And State Rank: G5/S4 (The Nature Conservancy 1999). This ranking indicates that *Rana blairi* is widespread, abundant, and apparently secure through the core of its range.

RANGE:

The Great Plains and the Prairie Peninsula with a few disjunct populations in Arizona. Currently known from Arizona, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Missouri, Nebraska, New Mexico, Oklahoma, South Dakota, Texas (Brown 1992; The Nature Conservancy 1999), see Figure 1. In Illinois, *Rana blairi* is historically found in a wide band across the middle of the state with a southern extension along the Mississippi River (Brown and Morris 1990). The historic range in Illinois includes the following counties: Adams, Alexander, Calhoun, Cass, Champaign, Coles, De Witt, Douglas, Edgar, Fayette, Greene, Grundy, Henderson, Iroquois, Jasper, Jersey, Kankakee, La Salle, Livingston, Logan, Madison, Marshall, Macon, Mason, McLean, McDonough, Menard, Mercer, Monroe, Morgan, Peoria, Piatt, Pike, Randolph, Sangamon, Schuyler, Tazwell, Union, Vermilion, Warren, Will, and Woodford (Phillips et. al. 1999), see Figure 2.

PHYSIOGRAPHIC DISTRIBUTION:

In Illinois *Rana blairi* is currently known from Keys et. al. (1995) ecological units: Ozark Highland, Central-Till Plains, Oak-Hickory, and Southwestern Great Lakes Sections of the Eastern Broadleaf Forest Province and the Central Dissected Till Plains and Central Till Plains Sections of the Prairie Parklands Province. *Rana blairi* historically was found within all the natural divisions of Illinois (Schwegman et. al. 1973) with the exception of the Wisconsin Driftless, Rock River Hill Country, and Wabash Border divisions (Brown and Morris 1990; Mike Redmer pers. com.).

HABITAT:

Brown and Morris (1990) recorded a number of different breeding habitats where *Rana blairi* is found in Illinois. These included roadside and drainage ditches, marshes, rain pools, flooded areas, farm ponds, and sometimes lakes. Some sites were ephemeral, and all were lentic. During the non-breeding season they found individuals near breeding areas, on bottomlands, along creeks, in old fields and in various habitats showing past disturbance. They never found *Rana blairi* far from water. They never found *Rana blairi* in upland forests or in agricultural fields. Prior to settlement the primary habitat for *Rana blairi* was probably prairie and the many associated wetlands found in the prairie. *Rana blairi* probably survived in Illinois by occupying peripheral wetlands once most of the prairie was gone.

Rana blairi does not co-exist with fish. This species requires vernal ponds or permanent ponds with winter kill (Chris Phillips pers. com.)

SPECIES DESCRIPTION:

Johnson (1987) and Brown (1992) describe *Rana blairi* as the following: *Rana blairi* is a medium-size frog with light tan ground color and numerous dark brown or greenish-brown rounded spots on the back. The vocal sacs are external and of medium size. The tympanum usually has a white spot. A dark snout spot is usually present. There is always a distinct light line along the upper jaw. The belly is white with pale yellow near the groin and lower inner thighs. The dorsolateral folds are broken near the groin and a small posterior section of it is displaced medially.

In Illinois there are three sibling *Rana* species: *Rana blairi*, the northern leopard frog (*Rana pipiens*) and the southern leopard frog (*Rana utricularia*). These three species have overlapping ranges (Brown and Morris 1990). *Rana blairi* can be distinguished from the other *Rana* species by using the following combination of morphological characteristics: one or both dorsolateral fold interrupted posteriorly and displaced medially and lack of distinct white rings around each dorsal spot (Johnson 1987; Brown 1992). The dorsolateral fold is probably the best character for differentiating *Rana blairi* from other *Rana* species.

Brown and Morris (1990) note that male *Rana blairi* has a distinctive call. The mating call has been described as a “chuck-chuck-chuck” which is relatively low in volume and resembles the pounding of a nail by a single carpenter in the distance. The mating call of *Rana pipiens* is said to be a “long deep rattling snore interspersed with clucking grunts,” and that of *Rana utricularia* a “short chuckle-like, guttural trill” (Conant and Collins 1991).

LIFE HISTORY:

Brown (1992) reviews the life history characteristics of *Rana blairi*. *Rana blairi* can breed anytime from February to October. Tadpoles can metamorphose at any time during the summer dependent upon when the eggs were laid. Tadpoles from eggs laid late in the year will overwinter and will metamorphose the next spring. Overwintering probably occurs most frequently in the southern portions of the range.

Johnson (1987) states that *Rana blairi* breeds in mid-April to early June in Missouri. Mike Redmer (pers. com.) suggests late March into May as breeding times for *Rana blairi* in northeastern Illinois.

NATURAL AND HUMAN LAND USE THREATS:

Suggested declines of local populations include: water pollution; predation by introduced game fishes; groundwater pumping; introduction of exotic fishes and amphibians; agricultural development; increased aridity/drought; habitat loss or alteration; toxicants; competition with other *Rana* species; and predation by, competition with, and/or larval inhibition by bullfrogs (The Nature Conservancy 1999). Agricultural activities and development with the subsequent draining of wetlands are probably the major cause for habitat loss and declines in *Rana blairi*.

Phillips (1996) reports on predators and detrimental management practices on the *Rana pipiens*, these may also hold true for *Rana blairi*. Possible predators include: fish, bullfrogs, snakes, herons, mink, raccoon, and snapping turtles. Tadpoles are eaten by snakes, fish, and larval salamanders. Detrimental management practices include mowing right up to the edge of wetlands, stocking fish or bullfrogs, application of herbicides, pesticides and poisons such as rotenone. A study in Wisconsin on *Rana pipiens* indicated that *Atrazene*, a common agricultural herbicide, adversely affected both larval growth and development (Hine et. al. 1981). Since *Rana blairi* is so closely related to *Rana pipiens*, it may also be adversely impacted by *Atrazene*.

VIABILITY:

To maintain a viable breeding population of the plains leopard frog in appropriate habitat,, existing breeding and feeding habitat as well as creation of restored habitat for the species should be maintained and enhanced. Soule (1980) suggested that minimum viable populations are the smallest size that can persist over a period of years (usually 100 is used) with a low extinction probability (less than 5%) and with enough genetic diversity to adapt to changing conditions in the environment. Where little good information on population size exists, estimates of a minimum viable population necessary are impossible to determine. Without population size information a goal would be to increase the habitat to a point where *Rana blairi* would be likely to have a viable population. Specific goals to ensure a viable population of this species include:

1. Maintain and increase existing local populations of *Rana blairi* by improving the current habitat. Shallow wetlands that could be used for breeding by *Rana blairi* need to be protected and enhanced.
2. Increase wetland habitat that could be utilized by *Rana blairi*. This would involve restoring drained wetland areas.
3. Reintroduce *Rana blairi* into suitable habitat areas when research shows that a) *Rana blairi* is currently nonexistent in such areas and b) immigration to such areas from current

areas does not take place within a reasonable amount of time. On the other hand, research may indicate that because of environmental or evolutionary factors, reintroductions may be unsuccessful. In areas where *Rana blairi* is near the edge of its range one cannot predict whether or not this species will be able to make a comeback at all and reintroduction may be inappropriate.

MANAGEMENT:

1. Management practices should maintain and increase the existing populations of *Rana blairi* by improving the current habitat. Management practices should also increase wetland habitat that could be utilized by *Rana blairi* through the restoration of drained wetlands. The restoration of shallow wetlands especially those that will hold water through mid-summer should be given priority. Specific management practices should include:

a) The hydrology of existing shallow wetlands should be restored through the removal of drainage ditches and farm field tiles. Work during the breeding season (mid-February to mid-July) should be avoided if it will drain the wetland or lower the water level. Large trees that are removing water and transpiring it away should be removed.

Any trees removed should have the cut surface treated by a herbicide to prevent resprouting. Roads, railroad beds and trails through existing breeding wetlands should be assessed for possible removal to help restore the function of these wetlands.

Wetlands should be protected from road or lawn chemical run-off, crop field runoff and other forms of pollutants.

b) Exotic species encroachment into the current habitat should be controlled using an integrated pest management method (including herbicides if appropriate) such as Carroll and White (1997).

c) No new development should be constructed through or impact the existing wetlands that could serve as breeding areas that would decrease the possible breeding acreage.

d) Adjoining old fields and crop fields should be restored to native vegetation (prairie and sedge meadow). The prairie and sedge meadow restoration should approximate native prairie as closely as possible and not be dense stands of prairie grasses. Wetlands adjacent to crop fields should be given priority.

2. Reintroduce *Rana blairi* into areas where they aren't located or if immigration from current areas doesn't take place. Reintroduction should be of eggs into wetlands that are free from fish, salamanders and bullfrogs and that will hold water into mid-summer. A local source of eggs should be used for any reintroduction effort. Reintroduction should only occur if it's been confirmed that there isn't a pre-existing population in the area and if research indicates that the reintroduction is likely to succeed. A monitoring system should be developed to determine the success or failure of reintroductions.

MONITORING:

Monitoring is needed to determine the status and breeding areas of *Rana blairi*. Existing wetlands and any reconstructed wetlands should be monitored for presence. It's especially important to determine if *Rana blairi* is breeding in target areas prior to any reintroduction effort into those areas. Other wetlands should also be monitored for presence of *Rana blairi*, since these may be sources for reintroductions. Once breeding areas have been found, select ones should be monitored yearly to determine the health of the population and to determine any impacts of management on the population.

RESEARCH NEEDS:

Since *Rana blairi* has only been recognized for 25 years, there is a lack of existing information describing it. Thus, practically any studies of it would be useful. The following needs would be most useful.

- 1) *Rana blairi* appears to be rare in some areas of its range. Research needs to be established to determine if this rarity is natural or due to human induced factors such as development, agriculture, etc. The rarity may be due to competition with *Rana pipiens*. If it's rarity is due to competition, then there may be nothing that can be done or should be done about its localized rarity.
- 2) Research on the habitat requirement of *Rana blairi* would be useful.
- 3) Good monitoring techniques need to be developed for *Rana blairi*. Research is needed to develop some good repeatable monitoring techniques to assess yearly populations and breeding success.

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FIGURES

- 1) North America distribution
- 2) State Distribution