ORANGE LAKE CAVE CRAYFISH
Procambarus franzi

Order: Decapoda
Family: Cambaridae
FNAI Ranks: G1/S1
U.S. Status: none
FL Status: none

Description: This is a moderately sized cave crayfish (body length [cephalothorax plus abdomen] to 65 mm/2.5 in, but usually less) that is white to translucent with reduced eyes lacking pigment (no prominent eye spot) and facets. Specific identification is based on fine morphological features (described and illustrated by Hobbs and Lee 1976), including structure and ornamentation of the first pleopods of reproductive (form I) males. Characteristics include: rostrum tapering from base, areola less than 20 times as long as wide, and first pleopod of male with preapical curvature of no more than 60 degrees; females lack tubercles on the sternum immediately anterior to the annulus (Hobbs and Lee 1976, Franz and Hobbs 1983).

Similar Species: *Procambarus franzi* is one of several stygobitic (groundwater-dwelling) species in the subgenus *Ortmannicus* and is considered a member of the *P. lucifugus* complex (Franz and Lee 1982). It is distinguished from all other stygobitic *Procambarus* in Florida by the terminal structure of the first pleopod of form I males. The tapering rostrum also distinguishes it from *P. l. lucifugus*, and the unpigmented eye from *P. l. alachua* and *P. erythrops*. The areola of both *P. pallidus* and *P. l. lucifugus* is more than 20 times as long as wide (Franz and Hobbs 1983). *P. franzi* can co-occur with *Troglocambarus maclanei*, a small (to 35 mm/1.3 in., never more than 50 mm/2 in.), slender cave crayfish characterized by extremely long, spider-like legs and other unique features (see species account). Because of similarities among Florida's many species of crayfishes, identification should be confirmed by an expert.

Habitat: The species inhabits subterranean fresh waters in limestone bedrock. Two of four known sites support maternity aggregations of the southeastern bat (*Myotis austroriparius*) during the spring; a third is a small karst window that receives direct runoff during rains, and the fourth was a flooded cave in which detritus entered via a large sink prior to being filled (Deyrup and Franz 1994; Paul Moler, personal communication). At the type locality (Orange Lake Cave), crayfish have been found in a large, irregularly shaped room (15 m x 5 m) where water levels fluctuate markedly; water

temperature is typically 21–22°C. With more than 3,000 bats recorded, the bat colony provides a major source of nutrients for *P. franzi*, with nearly all crayfish observed beneath their roosts (Hobbs and Lee 1976).

Seasonal Occurrence: Crayfish are presumably present year-round. Reproductive (form I) males have been found in January, May, and June. No seasonal data are available for ovigerous (egg-bearing) females (Deyrup and Franz 1994).

Florida Distribution: *Procambarus franzi* is known from only four caves (current population statuses unknown), all in Marion County.

Range-wide Distribution: The species is endemic to Florida.

Conservation Status: *Procambarus franzi* is currently known from only four caves within a very small area; only one is on conservation land, although it receives no special protection. This makes this species one of the most vulnerable of all Florida crayfishes and in urgent need of conservation measures. In general, subterranean fresh waters, such as inhabited by this crayfish, face a variety of potential threats; these include chemical pollution and excessive water withdrawal to support human consumption, agriculture, and industry. Population data for this species are non-existent and virtually impossible to obtain given that at least some of the species' primary habitat is inaccessible. Thus, population declines, though thus far unreported, would likely go unnoticed.

Protection and Management: As for all cave-inhabiting crustaceans, protection of groundwater quality and quantity must be the primary focus of conservation, management, and monitoring. Minimally, landowners should retain natural vegetation and avoid use of chemical pesticides and herbicides within at least 50 m of all sites and any associated subterranean conduits. Because *P. franzi* populations appear to depend on accumulations of detritus, it is critical to protect bat colonies that use caves as well as sinkholes that provide detrital input. Efforts should be made to secure protection via fee-simple or less-than-fee-simple measures for all sites, particularly Orange Lake Cave itself. Whether physical barriers need to be erected to restrict human entry should be assessed on a site-specific basis. Potential state and/or federal listing as threatened merits consideration.

References: Deyrup and Franz 1994, Franz et al. 1994, Franz and Hobbs 1983, Franz and Lee 1982, Hobbs and Lee 1976.

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