CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Typhlatya monae

COMMON NAME: troglobitic groundwater shrimp

LEAD REGION: 4

INFORMATION CURRENT AS OF: February 2003

STATUS/ACTION (Check all that apply):
___ New candidate
_X_ Continuing candidate
    _X_ Non-petitioned
    ___ Petitioned - Date petition received: ___
        ___ 90-day positive - FR date: ___
        ___ 12-month warranted but precluded - FR date: ___
        ___ Is the petition requesting a reclassification of a listed species?
    ___ Listing priority change
        Former LP: ___
        New LP: ___
Latest date species first became a Candidate: _____
___ Candidate removal: Former LP: ___ (Check only one reason)
    ___ 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 Act=s definition of Aspecies.@
    ___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Crustacea - Atyidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Puerto Rico, Barbuda, Dominican Republic

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Puerto Rico, Barbuda, Dominican Republic

LEAD REGION CONTACT (Name, phone number): Rick Gooch, 404/679-7124

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Boquerón, Puerto Rico Field Office, Jorge Saliva, 787/851-7297
BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

Typhlatya is an almost exclusively subterranean genus of small shrimps represented worldwide by eleven species. The distribution of these 11 species is disjunct and includes Mexico, the

Antilles, Bermuda, Ascension Island, and the Galápagos Islands (Hobbs 1994). Four species occur in the Antilles, including Typhlatya monae. These ground-water shrimp species are classified as troglobites, or obligatory cave organisms, of which their most extraordinary feature is the reduction or loss of vision and pigmentation. Typhlatya monae is small, reaching 4.5 millimeters (0.2 inches) in carapace length, with a translucent body and with a pigmented spot in the eye stalk. Some individuals may appear to be light yellow-orange due to the color of the internal organs.

Typhlatya monae was discovered in 1954 from Mona Island, an island located off the southwestern coast of Puerto Rico. The specimens were collected from water located in a concrete basin at the Mona airstrip. The basin contained groundwater that had been pumped into it from an adjacent well. It was later (1974) found in two caves in the Guánica Commonwealth Forest, located in the southwestern part of Puerto Rico (Peck 1981). This groundwater shrimp species has also been found in Barbuda (Chace and Hobbs 1969) and in the Dominican Republic (Hobbs et al. 1977). Little is known concerning this species= status in either Barbuda or the Dominican Republic.

Surveys conducted in 1974 (Peck and Kukalova 1974) and in 1995 (Conde-Costas and González de Segal 1996) on Mona Island did not locate any specimens of the shrimp at the historical locality or at other areas surveyed on the island. Currently, the species is known only from three caves in the Guánica Commonwealth Forest of Puerto Rico: 1) El Refugio, 2) Carmen, and 3) Los Murciélagos. The largest population was found in the lagoon located in the El Refugio cave. Individuals were distributed in a clumped or patchy pattern, caused perhaps by a patchy distribution of food. The shrimp feeds on organic waste material and debris, and a steady input of fresh organic material was available in this cave. It is believed that the shrimp is not restricted to the cave=s aquatic habitat, but may also be found within the aquifer=s conduit system that connects the cave=s groundwater environment. Estimates of 1,970 individuals in the El Refugio cave, 40 in the Carmen cave, and 2 in the Los Murciélagos cave were made in 1995. Typhlatya monae was found in varying light conditions and in moderately saline, alkaline water low in oxygen. Bat guano was the primary source of organic material (Conde-Costas and González de Segal 1996).

Both the Guánica Commonwealth Forest and Mona Island are managed by the Puerto Rico Department of Natural and Environmental Resources. Both are located within the subtropical dry forest life zone, in areas that overlie a limestone substrate. In these areas, the vegetation is typically more xerophytic than that of other soil types in this life zone. Mean annual precipitation in the life zone is approximately 66 centimeters (25.7 inches), distributed in distinct wet (August through November) and dry (January through March) seasons. Mean annual temperature in Guánica has been reported to be 25.3 C, with a mean monthly minimum of 23.5 C and a mean monthly maximum of 26.7 C.

The Guánica Commonwealth Forest is located in the municipalities of Guánica, Yauco, and Guayanilla in southwestern Puerto Rico and encompasses an area of about 4,000 hectares (9,880 acres). Twelve known caves are found in the forest, most of them formed within the Ponce limestone by solutional processes at the freshwater and saltwater mixing zone. A total of 34 invertebrate species has been reported from these caves and, of the five aquatic troglobitic species known from Puerto Rico, three are found in the ground waters of Guánica.

Mona Island is located approximately 68 kilometers (42 miles) to the southwest of Puerto Rico and is about 5,500 hectares (13,585 acres) in size. Mona is a flat limestone plateau bounded by high vertical cliffs. Twenty-five major caves, distributed along the periphery of the island, have been documented. The majority have been formed by solutional processes at the junction between Lirio limestone and the underlying Mona Dolomite. The entrances are usually found on sea cliffs where openings have formed from roof collapse. Most of the caves are dry, but two provide access to the aquifer=s water table. Forty-six invertebrate species have been documented in these caves, of which three are troglobitic.

THREATS (Describe threats in terms of the five factors in section 4 of the ESA providing specific, substantive information. If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change):

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

The largest population of the species in Guánica is found in the El Refugio cave. This is also the most accessible of the caves and is, therefore, the most vulnerable to human impact. Human impact may result from contamination of the lagoon, as well as from vandalism, including fires, and collection. These caves are visited frequently and a large amount of trash accumulates in them. An additional threat to the species may be from the development of the groundwater resources, resulting in a change in groundwater quality, as well as pumping, and the resultant removal of individuals. Contamination of recharge areas from landfills or spills from storage tanks may result in the contamination of groundwater in the Guánica caves.

While the species was not found on the island of Mona in 1995, Conde-Costas and González de Segal (1996) indicated that the species may still be found in the reef deposits aquifer on the island=s southwest coastal plain. Development of this groundwater resource may result in water quality changes or actual removal of the individuals. Although the island is designated as a Natural Reserve, managed by the Department of Natural and Environmental Resources, numerous developments, including a superport, a prison, and a hotel, have been proposed for construction there. Such facilities would require a source of freshwater.

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

While collection has not been documented to be a threat, it may become a threat in the future, because the Guánica caves are open to the public and receive frequent visitation.

C. Disease or predation.

Neither disease nor predation has been documented as a threat to the species. Nevertheless, predation by species such as the introduced toad Bufo marinus may become a threat in the future.

D. The inadequacy of existing regulatory mechanisms.

The species is not currently protected by the Commonwealth of Puerto Rico. Federal listing would result in its inclusion as an endangered species under the Commonwealth=s Regulation for the Management of Vulnerable and Endangered Species. Although Mona Island and the Guánica Forest are managed by the Commonwealth, development projects continue to be proposed in both areas.

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

Typhlatya monae is currently known only from one large population and two additional localities where very few individuals have been found. Little is known concerning its status in either Barbuda or the Dominican Republic, but the Caribbean islands, in general, are under intense development pressure. One of the most important factors affecting the continued survival of the species is its limited distribution. Any catastrophic event or impact from humans (e.g., contamination) that affects the major population may lead to the extinction of the species.

FOR RECYCLED PETITIONS:

a. Is listing still warranted? ___
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? ___
c. Is a proposal to list the species as threatened or endangered in preparation? ___
d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP (Estimate proportion Federal/state/local government/private, identify non-private owners):

All known sites in Puerto Rico are located on land owned and managed by the Commonwealth of Puerto Rico.

PRELISTING (Describe status of conservation agreements or other conservation activities):

The Puerto Rico Department of Natural and Environmental Resources is aware of the presence of the species. Surveys of the species have been conducted on both the island of Mona and in the Guánica Forest.

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

Chace, F. A. and H. H. Hobbs. 1969. The freshwater and terrestrial decapod crustaceans of the West Indies. U.S. National Museum Bulletin 292. 258 pp.

Conde-Costas, C. and C. Gonzalez de Segal. 1996. Distribution, abundance and habitat characterization of the troglobitic groundwater shrimp - Typhlatya monae in Puerto Rico. Tierra Linda Consultants. 69 pp.

Hobbs, H. H., H. H. Hobbs III, and M. A. Daniel. 1977. A review of the troglobitic decapod crustaceans of the Americas. Smithsonian Contributions to Zoology 244: 39-43.

Hobbs III, H. H. 1994. Biogeography of subterranean decapods in North and Central American and the Caribbean region. Hydrobiologea 287: 95-104.

Peck, S. B. 1981. Zoogeography of invertebrate cave faunas in southwestern Puerto Rico. National Speleological Society Bulletin 43: 70-79.

Peck, S. B. and J. Kukalova-Peck. 1974. The subterranean fauna and conservation of Mona Island: A Caribbean karst environment. National Speleological Society Bulletin 43: 59-68.

LISTING PRIORITY (place * after number)

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

Rationale for listing priority number:

Magnitude and Imminence: The Troglobitic shrimp (Typhlatya monae) is found within protected lands in Puerto Rico (Mona Island Natural Reserve and the Guánica State Forest). Threats to the species are not imminent because at least one population is found on protected lands (Mona Island Natural Reserve) with adequate regulatory mechanisms that should prevent population declines, therefore, a Listing Priority of 5 was assigned to the species.

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, removal of candidates, and listing priority changes.

Approve: Linda Kelsey March 14, 2003
Acting 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:

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Date of annual review: February 2003

Conducted by: Jorge E. Saliva - Boquerón, Puerto Rico FO

Comments:

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