

(DRAFT) - Taxonomy
Species TOAD, CRESTED, PUERTO RICAN
 Species Id ESIS204003
 Date 14 MAR 96

TAXONOMY

NAME - TOAD, CRESTED, PUERTO RICAN

OTHER COMMON NAMES - TOAD, CRESTED and PUERTO RICAN;SAPO CONCHO DE PUERTO RICO

ELEMENT CODE -

CATEGORY - Amphibians

PHYLUM AND SUBPHYLUM - CHORDATA,

CLASS AND SUBCLASS - AMPHIBIA,

ORDER AND SUBORDER - ANURA,

FAMILY AND SUBFAMILY - BUFONIDAE,

GENUS AND SUBGENUS - PELTOPHRYNE,

SPECIES AND SSP - LEMUR,

SCIENTIFIC NAME - PELTOPHRYNE LEMUR

AUTHORITY -

TAXONOMY REFERENCES -

COMMENTS ON TAXONOMY -

Puerto Rican Crested Toad

Peltophryne lemur Cope, 1868

KINGDOM:	Animal	GROUP:	Amphibian
PHYLUM:	Chordata	CLASS:	Amphibia
ORDER:	Anura	FAMILY:	Bufonidae

Peltophryne lemur is a medium-sized toad, 64 to 120 mm (2.5 to 4.5 inches) in snout-vent length. It is yellowish- olive to blackish-brown and has prominent supraorbital crests and a distinctive long, upturned snout. Males (64-87 mm snout vent length) are considerably smaller than females (93-120 SVL) and exhibit less prominent crests (01,06,07).

P. lemur is the only native bufonis of the Puerto Rican Island Shelf. The crested toad was first named and described by Cope in 1868 and has been referred to and described in Garcia-Diaz (04), Grant (05), Rivero (09), Rivero et al (10), Schmidt (11) and Schwartz and Thomas (12). It was placed in the genus Bufo by Stejneger (13) but recently the native bufonids have been regrouped by Pregill under the genus Peltophryne, in recognition of their presumed monophyletic origin (08).

Taxonomy - 1□
 (DRAFT) - Status
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STATUS

Coded Status

Puerto Rico; Federal Endangered
 Puerto Rico; State Listed

T: Federal Threatened

COMMENTS ON STATUS -

U.S. STATUSES AND LAWS:

The Puerto Rican crested toad (Peltophryne lemur) has been designated a Threatened species pursuant to the Endangered Species Act of 1973 (50 CFR 17.11;P.L. 93-205, 87 Stat. 884; 16 U.S.C. 1531-1540), as amended. The species has this status wherever found including the Commonwealth of Puerto Rico.

This species is protected by the Lacey Act (P.L. 97-79, as amended; 16 U.S.C. 3371 et seq.) which makes it unlawful to import, export, transport, sell, receive, acquire, or purchase any wild animal (alive or dead including parts, products, eggs, or offspring):

- (1) in interstate or foreign commerce if taken, possessed, transported or sold in violation of any State law or regulation; or

(2) if taken or possessed in violation of any U.S. law, treaty, or regulation or in violation of Indian tribal law. It is also unlawful to possess any wild animal (alive or dead including parts, products, eggs, and offspring) within the U.S. territorial or special maritime jurisdiction (as defined in 18 U.S.C. 7) that is taken, possessed, transported, or sold in violation of any State law or regulation, foreign law, or Indian tribal law.

RESPONSIBLE FEDERAL AGENCIES:

USFWS -Responsible for the management/recovery, listing, and law enforcement/protection of this species.

All Federal agencies have responsibility to ensure that any action authorized, funded, or carried out by that agency is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of Critical Habitat (50 CFR 402), and to utilize their authorities to carry out programs for the conservation of the species.

STATE STATUSES AND LAWS:

STATE: Puerto Rico
 DESIGNATED STATUS: Threatened
 ADMINISTRATIVE AGENCY: Puerto Rico Department of Natural Resources
 STATE STATUTE: Regulation to Govern the Management of Threatened and Endangered Species in the Commonwealth of Puerto Rico. 1985.

Status - 1

(DRAFT) - Status

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INTERNATIONAL STATUSES, TREATIES, AND AGREEMENTS:
 None.

ECONOMIC STATUSES:
 This species does not have known commercial value.

86/12/23:51 FR 45923/45926 - Proposed rule
 87/08/04:52 FR 28828/28831 - Final rule; listing as Threatened

Status - 2

HABITAT ASSOCIATIONS

HABITAT - AQUATIC
 TERRESTRIAL
 TERRESTRIAL
 INLAND AQUATIC

LAND USE -
 Cropland and Pasture
 Herbaceous Rangeland
 Shrub and Brush Rangeland
 Deciduous Forest Land
 Nonforested Wetland

NATIONAL WETLAND INVENTORY CODES

<u>NWI</u>	<u>NWICLS</u>	<u>NWIMOD</u>	<u>NWISPEC</u>
Palustrine	UB		
Palustrine	SS		
Palustrine	OWO		
Palustrine	EM		

COMMENTS ON HABITAT ASSOCIATIONS -

Peltophryne lemur is found in semi-arid, rocky areas of Puerto Rico. Records from areas of high rainfall such as Bayamon, Vega Baja, Arecibo, Isabela, and Barceloneta exist, however, these are within the karst region where soils are porous and well-drained and calcareous rocks and fissures are abundant. This north coast area has been identified as the subtropical moist forest life zone by Ewel and Whitmore (03). Populations on the south coast near Guanica are found in what has been classified by these same authors as the subtropical dry forest life zone. Soils here are also limestone derived and outcroppings and fissures are abundant.

Three major life stages have been identified for the Puerto Rican crested toad: tadpole; toadlet; and adult. Quite different environmental conditions are required for each. Adult toads are semifossorial and are widely dispersed when not breeding. Adults may be found in limestone fissures, under limestone boulders, and in cavities. Although not completely understood, breeding in Guanica is sporadic and dependent upon occasional heavy rains. Breeding is known to occur at two coastal sites which flood when sufficient rainfall is received.

In the Quebradillas area Peltophryne lemur has been observed breeding in permanent cattle watering troughs. A disadvantage is the tendency for Bufo marinus to congregate there (06,07).

Guanica Forest is a coastal forest in the southwestern part of Puerto Rico. Seven vegetation associations have been identified, containing a total of more than 700 species of plants. The Forest is underlain by limestone sedimentary rocks, Tertiary in origin. Marine fossils are abundant. Soils are derived from limestone and are shallow, well-drained and alkaline. Limestone outcrops cover much of the area in Guanica and only interspersed patches of shallow soil are present (03,06,10).

Mean annual precipitation in Guanica is approximately 79 cm, distributed in distinct wet and dry seasons. Over 55 percent of the precipitation falls during the wet season, August through November. The dry season extends from January through March. Mean annual temperature has been reported to be 25.3 degrees C with a mean monthly minimum of 23.5 degrees C and a mean monthly maximum of

Habitat Associations - □ 26.7 degrees C. Short-term studies have reported an absolute minimum of 15.0 degrees C and an absolute maximum of 36.1 degrees C (06). A water deficit has been reported to occur throughout the year with an estimated potential evapotranspiration of 125 cm per year (07,01).

Mean annual precipitation in the Quebradillas area has been reported to be 90 cm (07).

Habitat Associations - 2□
 (DRAFT) - Food Habits
Species TOAD, CRESTED, PUERTO RICAN
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FOOD HABITS

TROPHIC LEVEL -
 OMNIVORE

<u>LIFESTAGE</u>	<u>FOOD</u>	<u>FOOD PART</u>
General	Arthropods	
General	Worms	

Food Habits - 1□
 (DRAFT) - Environment Associations
Species TOAD, CRESTED, PUERTO RICAN
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ENVIRONMENTAL ASSOCIATIONS

G = General	A = Adult
LIM = Limiting	RA = Resting Adult
J = Juvenile	FA = Feeding Adult
RJ = Resting Juvenile	BA = Breeding Adult
FJ = Feeding Juvenile	P = Pupae
L = Larvae	E = Egg
RL = Resting Larvae	
FL = Feeding Larvae	

LIFESTAGE ENVIRONMENTAL ASSOCIATIONS

G
G Aquatic Features: Pool areas
G Coastal Features: Vegetated offshore islands
G Terrestrial Features: Cliffs/ledges
G Terrestrial Features: Rock outcrops
G Human Association: Farm ponds

Environment Associations - 1□
(DRAFT) - Life History
Species TOAD, CRESTED, PUERTO RICAN
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LIFE HISTORY**FOOD HABITS:**

Little is known about the food habits of the Puerto Rican crested toad in its natural environment. The species has, however, been propagated in captivity and an adequate diet has been established (07). During the first 36 to 48 hours newly hatched tadpoles are left with the gelatinous masses of the egg strings as they appear to feed on the gelatin. After the first 48 hours they are offered a combination of flake fish foods which are supplemented with Vionate powder and bonemeal. The feeding response is drastically reduced as tadpoles begin to absorb their tail at metamorphosis.

Toadlets are fed one-week old crickets dusted with Vionate and bonemeal. As they begin to display search/stalk behavior other feed animals are offered. These include small mealworms, ants, drosophila, earthworms, waxworms, flour beetles and their larvae (07). Adult toads are fed "dusted" crickets twice weekly and baby mice once a week (07).

HOME RANGE/TERRITORY:

Adult toads disperse widely when not breeding, however, it has been reported that fidelity to breeding sites is strong. Marked toads have been found 4 km from the breeding sites in Guanica Forest (01,06).

PERIODICITY:

Little is known about the periodicity of the crested toad.

MIGRATION PATTERNS:

The Puerto Rican crested toad moves to and from the breeding sites. Individuals have been reported as far away as 4 km from the two breeding sites in Guanica Forest (01,06).

COVER/SHELTER REQUIREMENTS:

Little is known about the cover and shelter needed for this species survival. When not breeding mature individuals have been observed in limestone fissures and cavities and beneath limestone boulders throughout Guanica Forest.

REPRODUCTIVE SITE REQUIREMENTS:

Breeding occurs when sufficient surface water is available at the breeding site. Little is known about the required depth of the water or the time the standing water must remain in order for the reproductive cycle to be completed. At the Quebradillas site breeding occurs in permanent cattle watering troughs (07).

REPRODUCTIVE CHARACTERISTICS:

Current knowledge of non-captive reproductive habits for the crested toad is limited. Breeding occurs in temporary pools formed during the rainy season and as water evaporates or percolates down through the soil, water temperatures rise and metamorphosis occurs. A breeding episode in Guanica Forest in July, 1984 was reported to have lasted more than two weeks (from emergence of adults through

Life History - 1□

(DRAFT) - Life History

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metamorphosis). Males outnumbered females with an estimated sex ratio of 4:1. Males emerge first and females follow, breed, and leave the ponds during or after the first night. Eggs hatch within 24 hours and tadpoles metamorphose within 25 days. Tadpole mortality to predators is low and density-independent factors such as the drying out of the temporary ponds may be a more important limiting factor (01,06). Length of time for maturation in the wild is not known, but probably does not occur before at least the second year (07).

PARENTAL CARE:

Males emerge first, females follow, breed, and leave the pond within the first 24 hours (01,06,07).

POPULATION BIOLOGY:

Current limiting factors include the availability of suitable breeding sites, interspecific competition with *Bufo marinus* and predation by species such as mongoose, feral dogs and cats. It has been mentioned that predation by *B. marinus* may occur. Development on the northern coast probably reduced the once more numerous populations. Reproduction appears to rely on climatic events which may occur at irregular intervals. Extremes in sex ratios have been reported (01,06,07).

SPECIES INTERRELATIONSHIPS:

Both competition with and predation by the introduced *Bufo marinus* have been reported. Predation by wading birds on dispersing toadlets has been reported to be heavy (01,06,07).

OTHER LIFE HISTORY DESCRIPTORS:

None.

Life History - 2□

(DRAFT) - Management Practices

Species TOAD, CRESTED, PUERTO RICAN

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Date 14 MAR 96

MANAGEMENT PRACTICES

RESULT	MANAGEMENT PRACTICE
Beneficial	Controlling/Restricting Off-Road Vehicles
Beneficial	Restricting/regulating human disturbance of populations
Beneficial	Developing/maintaining/protecting wetlands
Beneficial	Controlling/Restricting Road Maintenance Actions
Beneficial	Maintaining undisturbed/undeveloped areas
Beneficial	Restricting/regulating human use of habitats
Beneficial	Land Acquisition
Beneficial	Stocking captive-reared wild-strain animals
Beneficial	Transplanting wild animals
Beneficial	Transplanting Wild Eggs/Wild Seeds
Adverse	Off Road Vehicles
Existing	Off Road Vehicles
Adverse	Inherent Reproductive Characteristics
Existing	Inherent Reproductive Characteristics
Adverse	Low Gene Pool
Existing	Low Gene Pool
Adverse	Predation
Existing	Predation
Adverse	Rural Residential/Industrial Areas
Existing	Rural Residential/Industrial Areas
Adverse	Recreational development
Existing	Recreational development
Adverse	Highway/Railroads
Existing	Highway/Railroads
Adverse	Draining wetlands, marshes, ponds, lakes
Existing	Draining wetlands, marshes, ponds, lakes
Adverse	Strip mining
Existing	Strip mining
Adverse	Competition
Existing	Competition
Adverse	Exotic/Feral/Introduced Species
Existing	Exotic/Feral/Introduced Species
Adverse	Grazing
Existing	Grazing
Adverse	
Existing	

COMMENTS ON MANAGEMENT PRACTICES -

Adult toads are semifossorial and widely dispersed when not breeding. Breeding appears to be sporadic and dependent on occasional heavy rains. There is high fidelity to breeding sites which offer the right combination of elevation, topography, and ponded fresh water. The crested toad is susceptible to a variety of threats at various stages of its life cycle. Adult toads are cryptic and their presence is difficult to ascertain in advance. On both the northern and southern coasts of Puerto Rico breeding sites are known to have been destroyed by filling or alteration of drainage patterns. The main breeding sites in the area of Guanica Forest are being

Management Practices - 1□

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threatened by resort development and road construction (01,06,07,14).

Toads have been taken for the purposes of captive breeding and overcollecting may possible occur in the future.

Reproduction is dependent on climatic events that occur at irregular intervals. Compounded by the reduced availability of breeding sites this may create natural fluctuations in the population size which may result in the elimination of entire subpopulations (14).

UNAPPROVED PLAN:

No Recovery Plan has been approved. It is anticipated that this will be completed in FY 89.

Some recommendations for recovery include:

- Transplanting wild eggs
- Transplanting wild individuals
- Captive breeding (ongoing)
- Land acquisition
- Wetland management
- Limiting human access
- Controlling off-road vehicles

Captive breeding is presently ongoing at the Buffalo Zoo. Toadlet release in Cambalache Commonwealth Forest and at Guanica Forest has taken place. Follow-up should occur on the success of these releases. The captive breeding program has been successful and should continue to be supported.

Management Practices - 2□
 (DRAFT) - References
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References

***** REFERENCES FOR ALL NARRATIVES EXCEPT N-OCCURRENCE *****

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***** REFERENCES FOR N-OCCURRENCE NARRATIVE ONLY *****

- 01 Moreno, J. A. 1985. Notes on Peltophryne lemur. Unpublished report. 6 pp.
- 02 U.S. Fish and Wildlife Service, Final Rule for Peltophryne lemur, threatened. Federal Register 52:28828/28831. August 4, 1987.

References - 1□