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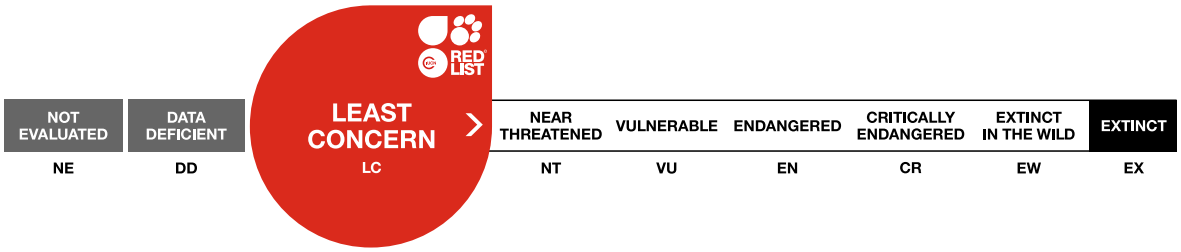
Pelophylax saharicus, North African Green Frog

Assessment by: IUCN SSC Amphibian Specialist Group



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Amphibia	Anura	Ranidae

Scientific Name: *Pelophylax saharicus* (Boulenger in Hartert, 1913)

Synonym(s):

- *Rana esculenta* var. *saharica* Boulenger in Hartert, 1913

Regional Assessments:

- Europe

Common Name(s):

- English: North African Green Frog, Sahara Frog
- French: Grenouille Verte d'Afrique du Nord, Grenouille d'Afrique du Nord, Grenouille saharienne
- Spanish; Castilian: Rana Verde Norteafricana
- Arabic: ضفدع أخضر مغربي

Taxonomic Source(s):

Frost, D.R. 2019. Amphibian Species of the World: an Online Reference. Version 6.0. American Museum of Natural History, New York, USA Available at: http://research.amnh.org/herpetology/amphibia/index.html.

Taxonomic Notes:

Prior to Uzzell (1982) (who provisionally resurrected the name), this species was considered to be a synonym of *Pelophylax perezi*, or, following Pasteur and Bons (1959), a synonym of *P. ridibundus*. Although northwest African members of the "*P. esculentus*" complex are here tentatively regarded as *P. saharicus*, Hemmer, Konrad and Bachmann (1980), suggested that two species were hybridizing in North Africa. Steinwarz and Schneider (1991), considered it probable that *P. saharicus* is a junior synonym of *P. perezi*.

Cryptic diversity possibly exists in the Libyan subpopulation (Ibrahim 2013). Nicolas et al. (2014) found their sampled populations from Morocco and Algeria to be genetically distinct, suggesting divergence along the Moulouya River valley dating back approximately 2.6 Mya. Some mitochondrial differentiation has been found between northern and southern populations in Morocco (Lansari *et al.* 2015). Arano *et al*. (1998) previously found an east-west pattern of allozyme divergence between the subspecies *P. s. saharicus* and *P. s. rioderoi*.

Assessment Information

Red List Category & Criteria: Least Concern ver 3.1

Year Published: 2021

Date Assessed: November 6, 2020

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Justification:

Listed as Least Concern in view of its wide distribution, and its presumed large and stable population.

Previously Published Red List Assessments

2009 – Least Concern (LC)
https://dx.doi.org/10.2305/IUCN.UK.2009.RLTS.T58707A11826925.en

2004 – Least Concern (LC)

Geographic Range

Range Description:

This species is widely distributed (but with fragmented subpopulations in some areas, including Tunisia [Amor *et al*. 2010], due to patchy available habitat) from northwestern Western Sahara, through Morocco, Ceuta and Melilla (Spain), Algeria (south to the Hoggar Massif), Tunisia, northern Libyan Arab Jamahiriya and northwestern Egypt (Siwa Oasis only). It was introduced in Gran Canaria, Spain, in the early 1990s, but has been extinct here since at least 2012 (Mateo 2015). The species has an altitudinal range of sea level to 2,670 m asl.

Country Occurrence:

Native, Extant (resident): Algeria; Egypt; Libya; Morocco; Spain (Spanish North African Territories); Tunisia; Western Sahara

Extinct & Introduced: Spain (Canary Is.)

Distribution Map

Legend

- EXTANT (RESIDENT)
- EXTINCT & INTRODUCED

Compiled by:

IUCN (International Union for Conservation of Nature). 2020

The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.

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Population

It is abundant where suitable wetland habitat exists, and is described by Mateo *et al*. (2013) as the most common and widely-distributed amphibian in North Africa. It is localized and uncommon in Egypt (S. Baha El Din pers. comm.). In Algeria (where up to 42% of the global population occurs - Mateo *et al.* 2013), subpopulations are abundant in the north but those in the Sahara (below 32 °N) are isolated and some are highly threatened. Surveys in the Mouloya River Basin in Morocco between 2013 and 2017 concluded that the species had been heavily impacted by habitat degradation and destruction resulting primarily from urban expansion, and associated pollution and water extraction (Mabrouki 2019). It is considered abundant and ubiquitous in suitable habitat in Tunisia and exhibits low genetic variability across the country despite the fragmentary distribution of breeding habitat (Ben Hassine and Nouira 2012, Farjallah *et al*. 2012), although Amor *et al*. (2013) report that the species is in decline in this country resulting from varied local threats. Its overall population is considered to be stable.

Current Population Trend: Stable

Habitat and Ecology **(see Appendix for additional information)**

This frog has broad habitat requirements and is common in a range of Mediterranean, dry and arid habitats as long as water is present (P-A. Crochet pers. comm. 2020). It is largely aquatic, being found in and around both natural and artificial waterbodies including streams, oasis pools, ponds, irrigation canals and lakes (Amor *et al.* 2010, Bellakhal *et al.* 2014a, Ben Hassine *et al*. 2011, Mabrouki 2019). It exhibits high ecological plasticity and diet flexibility (Ben Hassine and Nouira 2009, Sicilia *et al*. 2009, Ortega *et al.* 2016). Eggs are deposited in water. The thermal range for tadpole survival found in one North African study was 22-30 °C, with the optimal temperature for growth at 26 °C and 50% mortality recorded at 28 °C (Bellakhal *et al*. 2014b). The species can be found in cold montane areas, and so this is unlikely to be the true lower limit for the temperature tolerance of larvae (P.-A. Crochet pers. comm. 2020). Differences in climatic conditions are likely to have significant impacts on this species, based on different sizes and age distributions recorded between subpopulations in the semiarid Tiaret region and those elsewhere (Oromi *et al.* 2011).

Systems: Terrestrial, Freshwater (=Inland waters)

Use and Trade

The species is traded to be used as model animal in the educational system in Tunisia (Amor *et al*. 2013). It has been found in a pet market in the Czech Republic destined for export to other European Union states for ornamental ponds, where this adaptable species may represent a threat to the native *Pelophylax perezi* (Kopecký *et al*. 2016).

Threats **(see Appendix for additional information)**

The species is presumed to be subject to no major threats across the range as a whole, although human impacts are increasingly affecting some subpopulations (Z. Ortega Diago pers. comm. 2020) such as the Molouya River Basin in Morocco (Mabrouki 2019). These are under pressure from the over-exploitation of water resources, water pollution (both agricultural and industrial - Mabrouki 2019), fragmentation of subpopulations, urban expansion and climate change (Samraoui *et al*. 2012, Amor *et al.* 2013, Bellakhal *et al*. 2014b). High rates of morphological abnormalities (more than 35% of new metamorphs and young

juveniles) have been recorded in waterbodies in areas subject to intensive agriculture (Ben Hassine *et al*. 2011). It is likely that these malformations result in elevated mortality in affected subpopulations, and may represent a major threat in some areas (Ben Hassine *et al.* 2011). There has been some loss of habitat around Ceuta and Melilla. Subpopulations in the southern part of the distribution are most threatened by water scarcity resulting from drainage (including that of a major wetland complex in northern Algeria important for regional amphibian conservation - Samraoui *et al.* 2012) and habitat alteration, and reduction in habitat suitability (including the impacts of increased temperature on larval development) and an increase in the incidence of fire resulting from climate change (Samraoui *et al.* 2012. Mateo *et al.* 2013, Bellakbal *et al*. 2014b). Water cisterns in arid areas represent population sinks, where animals breed but the young cannot escape (L. García-Cardenete pers. comm. 2020). The species has been found to co-exist with invasive fish (Samraoui *et al.* 2012), and in desert oases the frogs have been observed to feed on exotic mosquitofish (García-Cardenete *et al.* 2011). *Batrachochytrium dendrobatidis* (*Bd*) has been found in Morocco, and this species is believed to be susceptible to the disease chytridiomycosis (El Cadi *et al*. 2019). This species may itself be a threat when locally introduced to ponds in Europe, through both competitive exclusion and hybridization, should these exotic populations become established in the wild (Kopecký *et al.* 2016).

Conservation Actions **(see Appendix for additional information)**

Conservation Actions In-Place

This species occurs in several protected areas. It is listed on Appendix III of the Bern Convention. It is not included in Algerian protected species legislation (Executive Decree 12-235) (I. Bouam pers. comm. 2020)

Conservation Actions Needed

Artificial ponds have been found to be an effective way to preserve subpopulations of this species in Tunisia (Bellakhal *et al.* 2014a), and protection is recommended for localized subpopulations in this country (Amor *et al.* 2010).

Research Needed

There is a need for taxonomic research on the Libyan subpopulations to determine whether another species exists under this current concept.

Credits

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External Resources

For Supplementary Material, and for Images and External Links to Additional Information, please see the Red List website.

Appendix

Habitats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Habitat	Season	Suitability	Major Importance?
5. Wetlands (inland) -> 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	Resident	Suitable	-
5. Wetlands (inland) -> 5.5. Wetlands (inland) - Permanent Freshwater Lakes (over 8ha)	Resident	Suitable	-
14. Artificial/Terrestrial -> 14.1. Artificial/Terrestrial - Arable Land	Resident	Suitable	-
15. Artificial/Aquatic & Marine -> 15.2. Artificial/Aquatic - Ponds (below 8ha)	Resident	Suitable	-
15. Artificial/Aquatic & Marine -> 15.7. Artificial/Aquatic - Irrigated Land (includes irrigation channels)	Resident	Suitable	-

Use and Trade

(http://www.iucnredlist.org/technical-documents/classification-schemes)

End Use	Local	National	International
13. Pets/display animals, horticulture	No	No	Yes
14. Research	No	Yes	Yes

Threats

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Threat	Timing	Scope	Severity	Impact Score
1. Residential & commercial development -> 1.1. Housing & urban areas	Ongoing	Minority (50%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.1. Fire & fire suppression -> 7.1.1. Increase in fire frequency/intensity	Ongoing	Unknown	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.1. Abstraction of surface water (domestic use)	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.3. Abstraction of surface water (agricultural use)	Ongoing	-	-	Low impact: 3
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		

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8. Invasive and other problematic species, genes & diseases -> 8.1. Invasive non-native/alien species/diseases -> 8.1.2. Named species (Batrachochytrium dendrobatidis)	Ongoing	Unknown	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
9. Pollution -> 9.2. Industrial & military effluents -> 9.2.3. Type Unknown/Unrecorded	Ongoing	Unknown	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
9. Pollution -> 9.3. Agricultural & forestry effluents -> 9.3.4. Type Unknown/Unrecorded	Ongoing	Minority (50%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		
11. Climate change & severe weather -> 11.2. Droughts	Future	Minority (50%)	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
11. Climate change & severe weather -> 11.3. Temperature extremes	Ongoing	Unknown	Unknown	Unknown
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.1. Species mortality		

Conservation Actions in Place

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Action in Place
In-place land/water protection
Occurs in at least one protected area: Yes

Conservation Actions Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Conservation Action Needed
1. Land/water protection -> 1.1. Site/area protection
2. Land/water management -> 2.3. Habitat & natural process restoration

Research Needed

(http://www.iucnredlist.org/technical-documents/classification-schemes)

Research Needed
1. Research -> 1.1. Taxonomy

Additional Data Fields

Distribution
Lower elevation limit (m): 0
Upper elevation limit (m): 2,670
Population
Population severely fragmented: No
Habitats and Ecology
Movement patterns: Not a Migrant

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