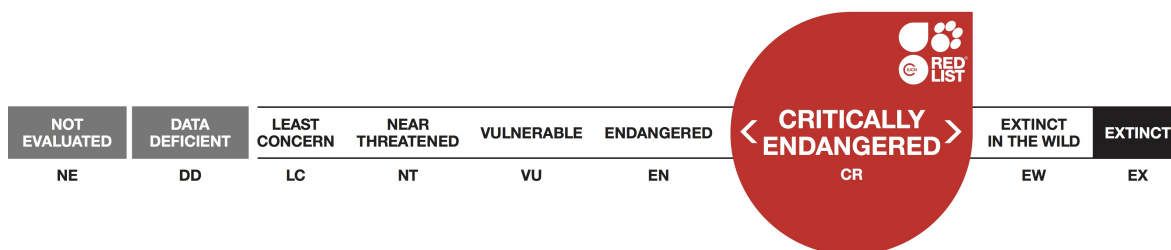


Conolophus marthae, Galápagos Pink Land Iguana

Assessment by: Gentile, G.



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Reptilia	Squamata	Iguanidae

Taxon Name: *Conolophus marthae* Gentile & Snell, 2009

Common Name(s):

- English: Galápagos Pink Land Iguana, Pink Iguana
- Spanish: Iguana Rosada

Taxonomic Source(s):

Tzika, A.C., Rosa, S.F.P., Fabiani, A., Snell, H.L., Snell, H.M., Marquez, C., Tapia, W., Rassmann, K., Gentile, G. and Milinkovitch, M.C. 2008. Population genetics of Galápagos land iguana (genus *Conolophus*) remnant populations. *Molecular Ecology* 17(23): 4943-4952.

Taxonomic Notes:

Conolophus marthae was recently described. No prior reference exists in the taxonomic literature as the species was not known before its description (Gentile and Snell 2009). The description was based on morphological, genetic, and behavioural diagnostic traits. The holotype is a free-living adult male tagged with a subcutaneous electronic marker, branded, and released. Further genetic evidence supporting separate taxonomic status of the Galápagos Pink Land Iguana prior to the species description is found in Gentile *et al.* 2009 and Tzika *et al.* 2008. Gentile *et al.* (2009) disclaims the name “rosada” for nomenclatural purposes (Articles 8.2 and 8.3, International Code of Zoological Nomenclature 1999).

Assessment Information

Red List Category & Criteria: Critically Endangered B1ab(iii,v)+2ab(iii,v); C2a(ii) [ver 3.1](#)

Year Published: 2012

Date Assessed: February 19, 2012

Justification:

A single wild population of the Galápagos Pink Land Iguana exists and is limited to a range less than 25 km² with a core area less than 10 km². The population of this iguana is very small (192 mature individuals) and prone to genetic, demographic, and environmental stochasticity. Population trends are unknown but there is genetic evidence of past reduction and current juvenile recruitment has not been observed. Black Rats and feral cats are present in the range and are likely predators, as is known for other Galápagos iguanas. The presence of ectoparasites and possible endoparasites is a potential concern and its impact on population fitness is unknown. Hybridization and introgression between *C. marthae* and *C. subcristatus* has occurred in the past on Volcán Wolf, the extent and effect of which has not been fully evaluated yet. Volcanic eruptions and periodic droughts may also impact this species.

Geographic Range

Range Description:

The Galápagos Pink Land Iguana is a recently described species endemic to Volcán Wolf, a single location on Isla Isabela. Based on direct observations (G. Gentile pers. comm. 2011) and reports of the Galápagos National Park surveys, this iguana has never been observed outside an area larger than 25 km². The maximum area surrounding the geographic capture points of all individuals observed to date is 10.9 km², with more than 95% of observations clustering in a much smaller area (G. Gentile pers. comm. 2011). The iguana occurs along the northern slopes of the volcano, in an area ranging from 600-1,700 m asl. There may be a seasonal shift in altitude with Pink Iguanas concentrating at the crater rim at 1,700 m during the months of May-July and descending down to 600 m when vegetation starts drying out. This iguana has not been seen inside the caldera.

Country Occurrence:

Native: Ecuador (Galápagos)

Distribution Map



Conolophus marthae

Range

■ Extant (resident)

Compiled by:
IUCN



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



Population

A single wild population of Galápagos Pink Land Iguana exists and it is not found *ex situ*. Recently, the effective population size (N_e) has been estimated as large as 41.21 individuals (95% CL = 30.71-67.97) by using microsatellite data (9 loci) (Fulvo 2010). Mark-recapture data, by applying the Lincoln-Petersen method from two contiguous temporal samples in 2009 and 2010 (percentage of recapture = 53%), would indicate 192 adult individuals (95% CL = 155-260). Sex ratio estimated from samples collected in May 2009 was one male to 0.59 females and one male to 0.51 females in July 2010 (Gentile and Fulvo 2011). Past and future population trends are impossible to assess due to the lack of a sufficiently long series of estimates of population size. Monomorphism for a single mitochondrial DNA haplotype in a sample of 102 iguanas strongly suggests that the Galápagos Pink Land Iguana might have suffered severe demographic contractions in the past (G. Gentile pers. comm. 2011). From 2005 to 2011, 133 adult individuals were captured and permanently marked with brands and Passive Integrated Transponders, representing nearly all observed Pink Iguanas (G. Gentile pers. comm. 2011). During these surveys, no juveniles were observed, suggesting population recruitment appears to be non-effective.

Current Population Trend: Unknown

Habitat and Ecology (see Appendix for additional information)

The Galápagos Pink Land Iguana (*Conolophus marthae*) is found coexisting with a subpopulation of Galápagos Land Iguana (*Conolophus subcristatus*) on Volcán Wolf. Altitudinal shifts along the slopes of the volcano imply different environmental conditions, which ultimately are reflected by different types of vegetation. The habitat includes tropical dry shrubland at the top of the volcano and tropical dry forest along the slopes. Vegetation at the highest altitudes may be impacted by droughts. The head nodding behaviour of *C. marthae* is very distinctive and completely different from *C. subcristatus* and may be a barrier to hybridization.

Basic reproductive biology of this iguana is unknown. In late spring 2010, a few *C. marthae* females were observed carrying 4-7 eggs in their follicles, investigated by a portable ultrasound machine (G. Gentile pers. comm. 2011). These data would indicate a much smaller clutch size than for the geographically closest population of *C. subcristatus* on Fernandina Island (7-23 eggs, Werner 1982). It is still unclear whether *C. marthae* and *C. subcristatus* have overlapping reproductive seasons and if the two species may compete for nesting sites on Volcán Wolf; the location of these nests is unknown.

Average snout-to-vent length (SVL) of animals observed is 46.8 cm, males being significantly larger than females. The SVL of the smallest male Galápagos Pink Land Iguana captured was 37.3 cm, a size that broadly corresponds to the SVL in seven-year old Galápagos Land Iguana individuals (37.5 cm \pm 6.0 SD) from Santa Cruz, and even older individuals from Plaza Sur.

Systems: Terrestrial

Use and Trade

There is no current or known historic human use or trade of this species.

Threats (see Appendix for additional information)

The population of Galápagos Pink Land Iguana is extremely small and prone to both demographic and genetic stochasticity, as well as environmental stochasticity (volcanic eruptions, droughts). Because of the overlapping range with Galápagos Land Iguana, hybridization may occur, generating introgression between *C. marthae* and *C. subcristatus* on Volcán Wolf. Although there is no evidence of living F1 hybrids at present, DNA evidence shows that rare events of hybridization have occurred, though the severity of subsequent introgression has not been fully evaluated yet (Gentile *et al.* 2009, Fulvo 2010). Because the population is so small, rare events of hybridization may have a significant effect on the species. In addition to the Galápagos Hawk (*Buteo galapagoensis*), the only native predator of Galápagos Pink Land Iguanas on Volcán Wolf, invasive alien Black Rats (*Rattus rattus*) and feral cats (*Felis catus*) are potential predators of eggs and hatchlings. It is known that feral cats prey on Galápagos Land Iguanas up to three and four years old. Animals in this age class represent a size that has not been found among Pink Iguanas. Therefore, it is suspected that feral cats pose a significant threat to population recruitment in Galápagos Pink Land Iguanas. Volcán Wolf is an active volcano, with several eruptions recorded in the last century, most recently in 1982. Most recent lava is found on the eastern and southern sides of the volcano and in the caldera (Geist *et al.* 2005). Eruptions may have caused local extinctions of populations of *C. subcristatus* in the past, for example, Volcán Chico (on the eastern side of Volcán Sierra Negra) in 1979 (Snell *et al.* 1984). Droughts may be severe on the top of Volcán Wolf. Although adults are expected to cope fairly well with drought since they obtain water from consumed plants, the resultant scarcity of food may potentially cause aborted reproduction for the year due to a combination of lack of egg laying, a higher number of infertile eggs laid, and poor juvenile survival.

Ectoparasite load is high in both Galápagos Land Iguanas and Pink Iguanas on Volcán Wolf. In fact, the location is characterized by a massive occurrence of ticks, which are much more abundant in Volcán Wolf than elsewhere in the archipelago. Both *C. marthae* and the *C. subcristatus* populations from Volcán Wolf show an unbalanced leukocyte formula compared to other populations of land iguanas from the whole archipelago. This could be related to the presence of ticks, but could also indicate a possible endoparasitic infection affecting most individuals (Fulvo 2010). This issue and how it might effect the fitness of the two populations is under investigation.

There is no current or known historic human use or trade of this species.

Conservation Actions (see Appendix for additional information)

All species of Galápagos Land Iguanas (*Conolophus* spp.) are included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The known geographic range of Galápagos Pink Land Iguana is within the Galápagos National Park, the legal authority governing and protecting biological diversity of the Galápagos Islands. The Land Iguanas are included in the Management of Native and Endemic Species Program, as part of the Management Plan of the Galápagos National Park. The Galápagos National Park undertakes major campaigns to control and eradicate invasive alien species in the Galápagos, including on Volcán Wolf. Such actions have so far successfully prevented habitat disturbance by feral goats in northern Isabela and promoted habitat restoration of southern Isabela. In the early 2000s, a three-year programme to eradicate feral cats from the island of Baltra (where *C. subcristatus* was repatriated from 1991 onwards) was effective by initially poisoning with sodium monofluoroacetate (compound 1080), then trapping or shooting the remaining cats (Phillips *et al.* 2005). However, the applicability of this protocol on Volcán Wolf is questionable due to the difficult terrain and is likely impossible for an island as large as Isla Isabela, an area of 4,588 km² (Nogales *et al.* 2004). Further evaluation of the feral cat population on Volcán Wolf is needed for the

purpose of implementing a programme for their control.

Based on successful programmes for the populations of *C. subcristatus* from Bahía Cartago (Isabela), Santa Cruz, and Baltra islands (Snell *et al.* 1984), the National Park is also considering a captive-breeding programme for *C. marthae*. The University Tor Vergata (Rome, Italy) is actively assisting the Park in this regard.

The Galápagos Pink Land Iguana is not in contact with humans in Galápagos except for the purpose of scientific investigation and management. The Galápagos National Park does not envision a plan to include Volcán Wolf in the list of touristic sites nor other possible intrusions to the population. Nevertheless, as the species is endemic and has a very limited distribution, the National Park has added a specific educational module focused on this species in the courses aimed at training and updating nature guides. This training ensures proper information is conveyed to visiting tourists.

Information on the population biology and ecology of Pink Iguanas is very limited and research has begun. Research needs include monitoring of population and habitat trends, diet analysis, and in-depth study of the reproductive biology of this species. Clarifying the frequency of hybridization and level of genetic introgression between *C. marthae* and *C. subcristatus* is urgently needed. Additionally, the health status of the population should be monitored and the possible impact of a high parasite load on the fitness of the population should be investigated.

Additionally, in the event a captive breeding programme is started, the Galápagos National Park, in collaboration with the University Tor Vergata, will develop an education programme for local people and tourists. It is extremely difficult and expensive to access the study area. The need to transport equipment to and from the site limits the duration of research trips and consequently the extent of research that can be conducted on any one trip. The construction of a small low-impact, temporary field structure near the top of volcano would greatly help by allowing longer field trips and more effective research work and monitoring.

Credits

Assessor(s): Gentile, G.

Reviewer(s): Grant, T. & Burghardt, G.M.

Contributor(s): Tapia, W. & Snell, H.

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External Resources

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Appendix

Habitats

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

Habitat	Season	Suitability	Major Importance?
1. Forest -> 1.5. Forest - Subtropical/Tropical Dry	-	Suitable	Yes
3. Shrubland -> 3.5. Shrubland - Subtropical/Tropical Dry	-	Suitable	Yes

Threats

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

Threat	Timing	Scope	Severity	Impact Score
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (<i>Rattus rattus</i>)	Ongoing	Unknown	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
8. Invasive & other problematic species & genes -> 8.1. Invasive non-native/alien species -> 8.1.2. Named species (<i>Felis catus</i>)	Ongoing	Unknown	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.1. Species mortality 2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		
10. Geological events -> 10.1. Volcanoes	Ongoing	Unknown	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	Unknown	Unknown	Unknown
	Stresses:	2. Species Stresses -> 2.3. Indirect species effects -> 2.3.7. Reduced reproductive success		

Conservation Actions in Place

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

Conservation Actions in Place
In-Place Research, Monitoring and Planning
Action Recovery plan: No
Systematic monitoring scheme: Yes
In-Place Land/Water Protection and Management
Conservation sites identified: Yes, over entire range

Conservation Actions in Place
Occur in at least one PA: Yes
Percentage of population protected by PAs (0-100): 91-100
Area based regional management plan: Yes
Invasive species control or prevention: Yes
In-Place Species Management
Successfully reintroduced or introduced benignly: No
Subject to ex-situ conservation: No
In-Place Education
Subject to recent education and awareness programmes: No
Included in international legislation: Yes
Subject to any international management/trade controls: Yes

Conservation Actions Needed

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

Conservation Actions Needed
2. Land/water management -> 2.2. Invasive/problematic species control
3. Species management -> 3.4. Ex-situ conservation -> 3.4.1. Captive breeding/artificial propagation
4. Education & awareness -> 4.3. Awareness & communications

Research Needed

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

Research Needed
1. Research -> 1.2. Population size, distribution & trends
1. Research -> 1.3. Life history & ecology
1. Research -> 1.5. Threats
2. Conservation Planning -> 2.1. Species Action/Recovery Plan
3. Monitoring -> 3.1. Population trends
3. Monitoring -> 3.4. Habitat trends
0. Root -> 4. Other

Additional Data Fields

Distribution
Estimated area of occupancy (AOO) (km ²): 9-10.9
Continuing decline in area of occupancy (AOO): Unknown
Extreme fluctuations in area of occupancy (AOO): Unknown
Estimated extent of occurrence (EOO) (km ²): 25
Continuing decline in extent of occurrence (EOO): Unknown
Extreme fluctuations in extent of occurrence (EOO): Unknown
Number of Locations: 1
Continuing decline in number of locations: No
Extreme fluctuations in the number of locations: No
Lower elevation limit (m): 600
Upper elevation limit (m): 1700
Population
Number of mature individuals: 192
Continuing decline of mature individuals: Yes
Extreme fluctuations: Unknown
Population severely fragmented: No
No. of subpopulations: 1
Continuing decline in subpopulations: No
Extreme fluctuations in subpopulations: No
All individuals in one subpopulation: Yes
Habitats and Ecology
Continuing decline in area, extent and/or quality of habitat: Yes

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