

Species in the *In Situ* Conservation Role**45 species**

Species for which mitigation of threats in the wild may still bring about their successful conservation.

Species	Threat Mitigation	Protected Habitat	Comments
<i>Eleutherodactylus blairhedgesi</i>	Threats cannot/will not be reversed in time	No	Species occurs in an area where oil mining and tourism development is increasing (A. Rodríguez pers. comm. March 2011). There is a high risk of damage to the coast from oil mining (L. Díaz, pers. comm. March 2011). This is the only frog species in Cuba that lives close to the sea, and can tolerate high levels of salt (L. Díaz, pers. comm. March 2011). Huge potential for conservation education programs, especially about habitat restoration, unique habitat etc.
<i>Eleutherodactylus emiliae</i>	Threats cannot/will not be reversed in time	No	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. During recent surveys (2009) many fewer animals were found than during previous surveys, 18 years ago, This is in a protected area (L. Díaz, A. Estrada, pers. comm. March 2011). Could be used for education purposes as a good example of how species can disappear very quickly (L. Díaz, pers. comm. March 2011).
<i>Eleutherodactylus iberia</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during 2010 Cuban Red List assessment. Is the smallest frog in the world. Habitat degradation could increase in the future from mining activities for nickel and chrome, even though the distribution of the species is within a national park. This activities could affect the watershed for many rivers in the area, so there is a high likelihood of widespread pollution (L. Díaz, A. Rodríguez pers. comm. March 2011). The species limits are also currently under review and additional studies are required (A. Rodríguez pers. comm. March 2011). Good for conservation education programs due to the clutch size and the size of the frog. Used as a flagship species in tourism, in brochures etc. (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus orientalis</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. The entire distribution of the species is in a protected area. There is occasional habitat alteration in the area, mostly associated with the management of cacao and coffee plantations (A. Rodríguez pers. comm. March 2011). This is a very small frog that lays a single egg. The species is used for educational purposes by eco-tourism guides to talk about small frog species in Cuba (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus bresslerae</i>	Threats are reversible in time	Yes	

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<i>Eleutherodactylus acmonis</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Occurs in an effectively protected area (A. Rodríguez pers. comm. March 2011). Logging and farming still continue to be a threat to the species (L. Díaz, A. Rodríguez, pers. comm. March 2011). Economically significant because the local people take tourists to the area to show them this species (A. Rodríguez pers. comm. March 2011). Is fairly abundant and widespread (A. R. Estrada, pers. comm. March 2011). Distribution is very restricted but perhaps due to poor taxonomic resolution (A. Estrada, pers. comm.). Would be a good analog for <i>E. casparii</i> and other ground-dwelling <i>Eleutherodactylus</i> species. Useful species for conservation education purposes.
<i>Eleutherodactylus cubanus</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. This is one of the smallest frogs in the world and it has a clutch size of 1. Is a good candidate for conservation education programs.
<i>Eleutherodactylus jaumei</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Is one of the few species that lays only one egg (L. Díaz, pers. comm. March 2011).
<i>Eleutherodactylus leberi</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the the 2010 Cuban Red List assessment. Lives in partly disturbed habitat, but it is unsure if this species is affected by disturbance (L. Díaz, A. Rodríguez pers. comm. March 2011). This species is recognised as a frog (rather than an insect) by the local farmers, and they show some empathy towards it, therefore there is a possibility for conservation education programs (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus melacara</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Is used for education purposes by local eco-tourism guides (A. Rodríguez pers. comm. March 2011).
<i>Peltophryne cataulaciceps</i>	Threats are reversible in time frame	No	The population on the main island is relatively unknown compared to the population on Isla de la Juventud. Good educational potential due to very fast development of tadpoles (L. Díaz, pers. comm. March 2011). Phylogenetic studies are ongoing but not yet published (Alonso, R., A. J. Crawford & E. Bermingham (submitted). Molecular phylogeny of an endemic radiation of Cuban toads (Bufonidae: <i>Peltophryne</i>) based on mitochondrial and nuclear genes. <i>Journal of Biogeography</i>).

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<i>Eleutherodactylus principalis</i>	Threats are reversible in time frame	Yes	Recent findings shows that this might be a synonym of the widespread <i>E. auriculatus</i> although the resolution of its taxonomic status is pending (Rodríguez, A., M. Vences, B. Nevado, A. Machordom y E. Verheyen. 2010. Biogeographic origin and radiation of Cuban <i>Eleutherodactylus</i> of the <i>auriculatus</i> species group, inferred from mitochondrial and nuclear gene sequences. <i>Molecular Phylogenetics and Evolution</i> 54: 179–186).
<i>Eleutherodactylus symingtoni</i>	Threats are reversible in time frame	Yes	Reassessed as Endangered during the 2010 Cuban Red List assessment. Most of the known locations for this species are in protected areas, however, the possible distribution of the species includes a great deal of unprotected area (L. Díaz, A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus limbatus</i>	Threats are reversible in time frame	No	Reassessed as Least Concern during the 2010 Cuban Red List assessment. Occurs in forests and has a wide distribution. Is mentioned in eco-tourism activities as the smallest frog in the world, even though this is not correct (A. Rodríguez pers. comm. March 2011). This species could be used as a husbandry analog for many other <i>Eleutherodactylus</i> species of the <i>limbatus</i> group.
<i>Eleutherodactylus zeus</i>	Threats are reversible in time frame	Yes	Is the largest <i>Eleutherodactylus</i> species. The distress call of this species sounds like a baby crying and the advertisement call is a low-pitched, harmonic structured single signal. Reassessed as Near Threatened during the 2010 Cuban Red List assessment. Tourist activity is the main threat to this species, but it also occurs in areas that tourists do not visit (A. Rodríguez pers. comm. March 2011). Is important for use by eco-tourism guides to talk about cave-dwelling animals (A. Rodríguez pers. comm. March 2011). Could be a good husbandry analog for <i>E. symingtoni</i> .
<i>Eleutherodactylus adelus</i>	Threats are reversible in time frame	No	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. The species is only known from pine forests and these are under increasing threat from fires (natural events that can become more frequent due to human effects) and selective logging (L. Díaz, pers. comm. March 2011). Although the species occurs close to protected areas, the pine forests themselves are not effectively protected but it is unknown if logging of the pine forests actually affects the species (A. Rodríguez pers. comm. March 2011).

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<i>Eleutherodactylus albipes</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Occurs in a very specific habitat at high altitude (L. Díaz, pers. comm. March 2011). The species occurs in protected areas and these are effectively managed (A. Rodríguez, L. Díaz, pers. comm. March 2011). The trail on Turquino Peak is used a lot by tourists and this is leading to increasing amounts of rubbish being left behind. There are no resources to remove the rubbish (L. Díaz, pers. comm.). At this stage, we do not know if this affects the species (A. R. Estrada, pers. comm. March 2011). Is also one of the highest altitude living frogs in Cuba.
<i>Eleutherodactylus bartonsmithi</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Habitat has probably not changed over the last 50 years. The biggest impact on this species is a paved road that was put through the area (A. R. Estrada, pers. comm. March 2011).
<i>Eleutherodactylus etheridgei</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during 2010 Cuban Red List assessment. This is a coastal-dwelling species, and future development may impact this species, even though it can exist with human settlement (L. Díaz, A. Rodríguez pers. comm. March 2011). It occurs in very dry and hot areas and it spends the day in rocks and limestone.
<i>Eleutherodactylus glamyrus</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Educational potential exists due to the use of the area as an eco-tourism area - information could be included in local information available for tourists (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus maestrensis</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Is known from 4 or 5 localities in a mountain range. Area of occupation estimated to be 24 sq km (A. Rodríguez pers. comm. March 2011). No evidence of decrease in habitat. Phylogeny still requires further research.
<i>Eleutherodactylus michaelschmidi</i>	Threats are reversible in time frame	No	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. The species occurs close to a protected area (L. Díaz pers. comm. March 2011), and has recently been found inside the protected area (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus pezopetrus</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Recent surveys in the original location failed to find the species, but it has subsequently been found in other areas (L. Díaz, pers. comm. March 2011). Two of the three localities where this species occurs are in protected areas (A. Rodríguez and L. Díaz, pers. comm. March 2011).
<i>Eleutherodactylus rivularis</i>	Threats are reversible in time	No	Reassessed as Vulnerable during the 2010 Cuban Red List assessment.

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<i>Eleutherodactylus tetajulia</i>	Threats are reversible in time frame	Yes	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Although the species mostly occurs in protected areas, mining activities could threaten this region in the near future (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus tonyi</i>	Threats are reversible in time frame	Unknown	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Four of the nine known localities occur in a significant national park that also covers extensive areas of suitable habitat (A. Rodríguez and L. Díaz, pers. comm. March 2011). Recent findings have identified new localities for this taxon outside of protected areas (Heinicke, M. P., L. M. Díaz y S. B. Hedges. 2011. Origin of invasive Florida frogs traced to Cuba. <i>Biology Letters</i> 7: published online 26 January 2011) and additional research is required to determine the extent of distribution (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus turquinensis</i>	Threats are reversible in time frame	Yes	The name of this species is likely to change during 2011 (L. Díaz, pers. comm. March 2011). Reassessed as Vulnerable during the 2010 Cuban Red List assessment. The main threat to this species is from tourists contaminating the water. There is potential to educate tourists in the area about protecting amphibians and not polluting the streams (L. Díaz, pers. comm. March 2011). Due to its aquatic habits this is one of the potential species to be affected by chytrid fungus (L. Díaz, pers. comm. March 2011).
<i>Eleutherodactylus eileenae</i>	Threats are reversible in time frame	No	Reassessed as Least Concern during the 2010 Cuban Red List assessment. It is one of the few species in Cuba that has a common name, which refers to its call. Husbandry analog for <i>E. leberi</i> . Populations on Guanahacabibes Peninsula and Sierra de los Organos seem to be distinct from the others on the rest of the island. (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus klinikowskii</i>	Threats are reversible in time frame	Yes	Reassessed as Least Concern during the 2010 Cuban Red List assessment although this is currently under review. This is a cave-dwelling frog, that occurs in a high tourist area but the species does not seem to be declining and the habitat is not being degraded. Tourists go on a trail through the caves where this species exists, and there are good opportunities for conservation education here (A. Rodríguez pers. comm. March 2011).

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<i>Eleutherodactylus guanahacabibes</i>	Threats are reversible in time frame	Yes	Reassessed as Near Threatened during the 2010 Cuban Red List assessment. Is now a more common species than was previously thought (L. Díaz, pers. comm. March 2011). There are plans to increase roads and tourism access in some of the areas where this species occurs. Possibly has some economic value for eco-tourism (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus casparii</i>	Threats are reversible in time frame	No	Reassessed as Least Concern during the 2010 Cuban Red List assessment. Unsure of the impact of increased tourism in the forest on this species. It is a ground-dwelling species (A. R. Estrada, pers. comm. March 2011).
<i>Eleutherodactylus dimidiatus</i>	Threats are reversible in time frame	No	Reassessed as Least Concern during 2010 Cuban Red List assessment. Is an attractive species. Could be a husbandry analog for <i>E. emiliae</i> or <i>E. maestrensis</i> .
<i>Eleutherodactylus goini</i>	Threats are reversible in time frame	No	Reassessed as Least Concern during 2010 Cuban Red List assessment.
<i>Eleutherodactylus greyi</i>	Threats are reversible in time frame	No	Reassessed as Least Concern during the 2010 Cuban Red List assessment. Unsure if this species is dependant on forest (L. Díaz, pers. comm. March 2011).
<i>Eleutherodactylus guantanamera</i>	Threats are reversible in time frame	Yes	Reassessed as Least Concern during the 2010 Cuban Red List assessment. Could be a husbandry analog for <i>E. melacara</i> . Species limits between this species and <i>E. ionthus</i> remain elusive (A. Rodríguez pers. comm. March 2011).
<i>Eleutherodactylus gundlachi</i>	Threats are reversible in time frame	Yes	Reassessed as Least Concern during the 2010 Cuban Red List assessment.
<i>Eleutherodactylus intermedius</i>	Threats are reversible in time frame	Yes	Reassessed as Least Concern during the 2010 Cuban Red List assessment. Could be used as a husbandry analog for <i>E. maestrensis</i> . Commonly heard in forests, and population size is considered to be quite high. There is no evidence of decrease in population numbers (L. Díaz, pers. comm. March 2011). Occurs in a number of large protected areas. It is a forest-restricted species, and there are risks from logging (L. Díaz, pers. comm. March 2011). Could be used as a husbandry analog for <i>E. albipes</i> and <i>E. tetajulia</i> .
<i>Eleutherodactylus ionthus</i>	Threats are reversible in time frame	No	Reassessed as Least Concern during the 2010 Cuban Red List assessment. The species inhabits uplands and lowlands and is not overly affected by habitat disturbance (L. Díaz, pers. comm. March 2011).

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<i>Eleutherodactylus pinarensis</i>	Threats are reversible in time frame	No	Reassessed as Least Concern during the 2010 Cuban Red List assessment. The species is relatively common in suitable habitats (L. Díaz, pers. comm. March 2011). Some of the caves that are used by this species have become degraded, and the local forest is also under minor threat from charcoaling (L. Díaz, pers. comm. March 2011).
<i>Eleutherodactylus ricordii</i>	Threats are reversible in time frame	Yes	Reassessed as Least Concern during the 2010 Cuban Red List assessment. This species is a forest specialist and there are still good populations of the species (L. Díaz, A. R. Estrada, A. Rodríguez pers. comm. March 2011). Could be used as a husbandry analog for other ground-dwelling species e.g. <i>E. acmonis</i> .
<i>Eleutherodactylus thomasi</i>	Threats are reversible in time frame	Yes	Reassessed as Least Concern during the 2010 Cuban Red List assessment. The species occurs mostly in protected areas (L. Díaz, A. Rodríguez pers. comm. March 2011). Locally there is mining in the area of distribution, and the species exists in caves that are also being degraded (A. Rodríguez, L. Díaz pers. comm. March 2011). Could be a husbandry analog for <i>E. pinarensis</i> and <i>E. pezopetrus</i> .
<i>Eleutherodactylus toa</i>	Threats are reversible in time frame	Yes	Reassessed as Least Concern during the 2010 Cuban Red List assessment.
<i>Eleutherodactylus varians</i>	Threats are reversible in time frame	Unknown	Reassessed as Least Concern during the 2010 Cuban Red List assessment. Is a bromeliad dweller and is sensitive to habitat destruction and requires bromeliads. Is known to re-populate areas where bromeliads have been re-established (L. Díaz, pers. comm. March 2011). Could be used as a husbandry analog for <i>E. guantanamera</i> and <i>E. melacara</i> . Could be used for education programs due to its very loud and distinctive call.
<i>Eleutherodactylus zugii</i>	Threats are reversible in time frame	Yes	Reassessed as Least Concern during the 2010 Cuban Red List assessment. According to some authors, one of the two subspecies currently recognized should be assigned a specific status (<i>E. erythroproctus</i>) (Hedges, S. B., W. E. Duellman y M. P. Heinicke. 2008. New World direct-developing frogs (Anura: Terrarana): Molecular phylogeny, classification, biogeography, and conservation. <i>Zootaxa</i> 1737: 1–182). But given that proper data were not provided, still is not recognized as such by Cuban herpetologists (Díaz, L. M. y A. Cádiz. 2008. Guía taxonómica de los anfibios de Cuba. <i>ABC Taxa</i> 4: 1-294; A. Rodríguez and L. Díaz, pers. comm. March 2011).

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<i>Eleutherodactylus mariposa</i>	Threats are reversible in time frame	No	Reassessed as Vulnerable during the 2010 Cuban Red List assessment. Some of the population occurs in a non-legally protected area, but this area is not effectively managed and other areas where the species exists are not protected (L. Díaz, A. Rodríguez pers. comm. March 2011). Has a very charismatic call (A. Rodríguez pers. comm. March 2011).

