## Inclusion of the Guatemalan Spiny-tailed Iguana *Ctenosaura palearis* in Appendix II

## Proponent: Republic of Guatemala

**Summary**: The Guatemalan Spiny-tailed Iguana *Ctenosaura palearis* is a medium-sized omnivorous arboreal iguana, endemic to the semi-arid dry forests and spiny thickets of the Rio Motagua Valley in Guatemala. It is one of around 15 species of *Ctenosaura,* a genus in the family Iguanidae native to Mexico and Central America. Two or possibly four other species of *Ctenosaura* occur in Guatemala, including *C. flavodorsalis* and *C. similis* and, debatably, *C. alfredschmidti* and *C. acanthura.*

Female *C. palearis* reproduce once a year; clutches of six to twelve eggs are deposited in holes or tunnels between March and April and the eggs hatch in May, coinciding with the start of the rainy season.

Recent field work has established that the species occurs fairly widely in the Rio Motagua Valley ecoregion, in which around 100 000 ha of potentially suitable habitat remains. However, much of this is reported to be degraded, with degradation ongoing, in particular through felling of the tree cactus *Stenocereus pruinosus*, an important component of the habitat for the iguana. A 2008 study based on sample plots estimated an overall average density of one individual per 1.7 ha (0.6 individuals per ha) in a 3000 ha area that included some of what was considered to be the best quality habitat for the species. Overall, some 20 sub-populations of the species have been identified to date. An unpublished mark-recapture study indicated that the overall population might comprise around 5000 individuals, with perhaps fewer than 2000 mature individuals. Only a very small proportion of the habitat is included within protected areas.

The species is (legally) harvested for subsistence purposes for food and in traditional medicines. In two areas where it is harvested (Los Morales and Morazán) the species is also reported to have been collected for (illegal) export in the live animal trade. Local people in these areas stated that those collecting *C. palearis* for subsistence took an average of around six specimens per month, whilst those collecting live animals for export took 50–60 per month. They also reported that populations of the iguana had declined dramatically in the past 20 years and researchers visiting these areas recently failed to find the species.

*C. palearis* is in international trade as a live animal, although seemingly on a relatively small scale. The US Fish and Wildlife Service data reporting system (LEMIS) shows the importation of 240 wild-taken *C. palearis* individuals from Guatemala in 2008 for commercial purposes; this trade was allegedly unknown to Guatemalan authorities. LEMIS data also show the importation into the USA from Guatemala of 210 wild-taken specimens of the genus *Ctenosaura* in the period 2000–2007. It is not known how many of these, if any, were *C. palearis*. There are conflicting reports on the level of international demand for the species. Advertised prices are said to be relatively low, between USD25 and EUR25, although some websites are offering specimens at considerably higher prices (up to USD149).

*C. palearis* is included in Category No. 2 of the Endangered Species List in Guatemala (CONAP, 2009) and can only be used for scientific, research and breeding purposes aimed at the conservation of the species. Individuals can only be traded if they are captive-bred to F2 generation, are bred by authorized persons and the trade has no commercial value. It appears that no captive-breeding operations have been established in Guatemala.

Three other similar species of *Ctenosaura—C. bakeri, C. melanosterma* and *C. oedirhina,* all endemic to Honduras—have also been proposed for inclusion in Appendix II at CoP15 (see CoP15 Prop. 11).

**Analysis:** *Ctenosaura palearis* is reasonably widespread, with 20 identified subpopulations (of which two may be extinct) occurring in around 100 000 ha of habitat. However, much of the habitat is fragmented and degraded, with conversion and further degradation continuing. The most recent information indicates that the overall population may be small, perhaps around 5000 individuals. The species is taken for subsistence use and in two areas has apparently been collected for export in the live animal trade; in these areas it is now reportedly either very rare or extinct. The number of individuals reported in international trade is small and, although reports conflict somewhat, demand for the species appears generally low.

The most recent information suggests that the population of *Ctenosaura palearis* may be around the guideline figure for a small population given in Annex 5 of *Resolution Conf. 9.24 (Rev. CoP14)* and the fact that collection for export has been implicated in the decline or extirpation of two sub-populations, *Ctenosaura palearis* may meet the criteria for inclusion in Appendix II in that regulation of trade may be necessary to prevent the species becoming eligible for inclusion in Appendix I in the near future.

| Supporting Statement | Additional information |
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| **Taxonomy** | |
| Synonyms: *Enyalisaurus palearis* | *Prior to 1997* C. palearis *and* C. melanosterna *were considered conspecific (Buckley and Axell, 1997).* |
| **Range** | |
| Guatemala | |
| **IUCN Global Category** | |
| Critically Endangered (criterion B1ab(iii)). | *Assessed 2004 Categories and criteria ver. 3.1* |

**Biological and trade criteria for inclusion in Appendix II *(Resolution Conf. 9.24 (Rev. CoP14)* Annex 2 a)**

**A) Trade regulation needed to prevent future inclusion in Appendix I**

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| Endemic to the semi-arid dry forests and spiny thickets of the Rio Motagua Valley, including the departments of El Progreso and Zacapa.<br><br>The supporting statement (SS) states that *C. palearis* is restricted to a few remaining wooded areas and semi-arid parts of the Motagua Vallery, over an area of 101 353 ha², citing Cotí and Ariano (2008). However, the SS also states that only 100 206 ha of the original habitat remains.<br><br>The SS also notes that much of this area has been degraded and that the species has become locally extinct.<br><br>The altitudinal range is 350–700 m asl. | *The figure given in the SS of 101 353 ha is from Ariano and Coti (2007) who estimated the potential area of distribution as 101 353 ha by investigating historical collections of* C. palearis *which was confirmed through interviews with local people regarding catches and direct observations of individuals. They found that* C. palearis *was distributed throughout more or less this entire area. They observed that populations of* C. palearis *appeared to be in good conservation condition throughout the area, particularly in Cabañas and Gualán. In the regions of Morales and El Progreso the species was doing less well, which was linked to high levels of illegal trade.*<br><br>*Cotí and Ariano (2008) give a figure for the area of the semi-arid region of the Motagua valley as around 200 000 ha, and note that there has been considerable loss* |

The SS notes that mark-and-recapture studies carried out in 2007 indicate a total population of around 5000 individuals. Elsewhere it quotes that mark-recapture studies have estimated total population size of between 2500 and 5000 individuals.

Declines in numbers have been noticed by local residents, who stated that about 20 years ago, they used to see up to five individuals in any one tree and now they only occasionally see one or two specimens.

*of habitat in the region, but do not provide a figure for the remaining habitat. In their study, they sampled a total area of 6400 m² and estimated the total population in their study area to be 99 individuals. From this they calculated the maximum population in their 3000 ha study site to be 651 (95% confidence) and the average density to be one individual per 1.69 hectares.*

*The study site was reported to be one of the areas of best remaining habitat for the species, with habitat elsewhere more fragmented and degraded, particularly through felling of the tree cactus* Stenocereus pruinosus*, an important habitat component for the iguana (Ariano, 2010). Recent studies had identified 20 sub-populations of the species, although no iguanas had been found in recent visits to two of these—Los Morales and Morazán—where the species was reported to have been collected commercially. Overall population was thought to comprise around 5000 individuals, of which mature individuals comprised fewer than 2000 (Ariano, 2010).*

*Köhler and Vesely (1996) collected just 15* C. palearis *with the help of local people over four days suggesting population numbers may be relatively low.*

**B) Regulation of trade required to ensure that harvest from the wild is not reducing population to level where survival might be threatened by continued harvest or other influences**

There is huge international demand for this species for the pet trade, particularly within Europe and America. The demand for *C. palearis* for the pet trade is now greater than for local consumption. The supporting statement details internet sales of *C. palearis* to Germany, USA and Czech Republic for USD90. However, at a different point in the supporting statement, the average price for *C. palearis* is given as USD70.00.

*The* IUCN Red List of Endangered Species *specifies that the international pet trade is a threat to* C. palearis *but states that "it is not thought to be a serious threat at present" (Köhler, 2004).*

*In a review conducted by TRAFFIC, it was observed that* C. palearis *was found in the EU (European Union) pet trade during the 1990s (Auliya, 2003).*

*Coti and Ariano (2008) found that people harvesting* C. palearis *for commercial purposes would collect 50–60 specimens per month in order to sell them to international traders, compared to around six per month when collecting for local food consumption. Ariano and Cotí (2007) and Ariano (2010) reported that commercial collection was confined to two areas (Los Morales and Morazán) and did not appear to take place elsewhere, although harvesting for subsistence use did. Ariano (2010) reported that in recent visits to these areas, no iguanas had been found.*

*A study investigating the availability of* C. palearis *for sale through the internet was conducted by Reijngoud (2009) and found that* C. palearis *was not available on a large scale. A brief internet search for the purpose of this review was also conducted; similarly this search indicated limited availability and demand for* C. palearis*. Specific observations during the internet search included: a chat room forum which implied that imported* C. palearis *are readily available in the USA, a forum which indicated that* C. palearis *is being exported from the Netherlands, though the source and country of import were not specified, and a limited number of websites advertising specimens for sale (EUR69–USD149), some of which were said to be captive-bred.*

*Coti and Ariano (2008) specified that web and market surveys have revealed that* C. palearis *is sold in countries such as Greece, Germany and the USA for approximately USD25 per specimen.*

*Binns (2009) reported that there appear to be hundreds of* C. palearis *for sale in the USA. He believes that local people are driven to supply* C. palearis *by economic incentives and that they are now targeting isolated populations of* C. palearis*, therefore devastating populations which are already threatened due to agricultural developments. Gaal (2009) also believes that* C. palearis *is being heavily traded, being smuggled into Europe and then later sent to the USA. Gaal states that this species is relatively easy to maintain in captivity, therefore making it a more popular pet than some other* Ctenosaura *species. However, Werning (2009) believes that although* C. palearis *is available in the pet trade, it fetches a relatively low price (approximately EUR25 wholesale in Germany; Hoch, 2009) and is usually only a "supplement" to imports of more popular reptile species. A reptile trader reported that there is very little specific demand for* C. palearis *and that most purchasers of this species are uninformed and inexperienced reptile keepers (Werning, 2009). A breeder*

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| | *of* C. palearis *in the USA stated that he had difficulties selling his specimens despite breeding small numbers (Werning, 2009). This suggests that* C. palearis *is unlikely to be highly sought after by smugglers or traders.*<br><br>*Data from the US Fish & Wildlife Service's data reporting system (LEMIS) show that in the period 2000–2007, 210 wild-taken specimens of the genus* Ctenosaura *have been imported by the USA from Guatemala. 193 of these specimens were live and reported to be for commercial purposes, the remainder (all imported in 2007) were for scientific purposes. However, these specimens have not been identified to species level and several species of* Ctenosaura *are known to occur in Guatemala.*<br><br>*The 240* C. palearis *imported into the USA in 2008 were from one consignment and for commercial purposes.* |
| The supporting statement states that the local residents have reported receiving requests to capture up to 200 individuals for international trade. In addition, the US Fish & Wildlife Service reported the importation of 240 *C. palearis* from Guatemala in 2008. | |

**Inclusion in Appendix II to improve control of other listed species**

**A) Specimens in trade resemble those of species listed in Appendix II under *Resolution Conf. 9.24 (Rev. CoP14)* Annex 2 a or listed in Appendix I**

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| | *No* Ctenosaura *species are currently listed in Appendix II.*<br><br>C. bakeri, C. melanosterna, *and* C. oedirhina *have been proposed for listing in Appendix II (CoP15, prop. 11).* C. melanosterna *and* C. palearis *are regarded as very similar in appearance and may be particularly hard to distinguish as hatchlings.* |

**B) Compelling other reasons to ensure that effective control of trade in currently listed species is achieved**

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**Other information**

## Threats

There are four major threats to *C. palearis*, including: increase in human population size, habitat loss (related to increased population), illegal trade and unsustainable hunting techniques.

*According to the* IUCN Red List of Threatened Species*, habitat loss is the greatest threat to* C. palearis *(Köhler, 2004).*

As the population of Guatemala has increased, so has the need for greater infrastructure and development. It has been estimated that approximately 30% or 60 000 ha of suitable *C. palearis* habitat has been lost. This is thought to be related to agricultural development, including farming of products such as corn, melons and tobacco. However, some of its habitat (3%) is protected and 56% of original habitat remains, although much of this is fragmented and degraded.

*The semi-arid region of the Motagua Valley covers approximately 200 000 ha but natural ecosystems have been fragmented and the area is now made up of a combination of crops, grasslands, thornscrubs and deciduous dry forest remnants (Cotí and Ariano, 2008).*

The supporting statement suggests that because *C. palearis* is primarily a tree-dwelling species, it is sensitive to selective felling of trees and as their habitat becomes more fragmented, individuals are becoming increasingly isolated and are forced closer to urban areas, resulting in an increased risk of poaching.

Subsistence or local hunting of *C. palearis* is common in order to obtain meat and eggs. The meat of *C. palearis* is said to be preferred to the meat of *Ctenosaura similis,* which also occurs in Guatemala. The supporting statement suggests that some hunters (17.3%) prefer to hunt *C. palearis* during the dry season which correlates with their breeding season. They do this to obtain pregnant females which they can use for both meat and eggs. Another practice is to remove the eggs of live gravid females. Unfortunately, the females often die as a result of the incision made to extract the eggs. Parts of *C. palearis* are also used as an aphrodisiac and in traditional medicines. More recently it has been used as a laboratory animal and in the exotic skin industry.

*Coti and Ariano (2008) conducted a study on hunting of* C. palearis*. They found that 88% of people asked had eaten iguanas in the past, but only 39% ate them currently. Those collecting for subsistence reportedly took around six specimens per month, whereas those hunting for trading purposes collected 50–60 per month. The authors report that local people believe soup made from the meat of* C. palearis *can heal eye problems and cancer, whilst their fat is used to reduce swellings and heal earaches.*

The flooding caused by Hurricane Mitch is known to have affected *Heloderma horridum charlesbogerti* in the same region as *C. palearis*, which implies that *C. palearis* may have also been affected.

*According to Ariano (2006), the impact of Hurricane Mitch on populations of* H. h. charlesbogerti *could not be determined due to the lack of baseline data. However, they stipulated that eggs were probably lost as a result of the sensitivity of reptile eggs to changes in humidity. It is therefore likely that* C. palearis *was also affected.*

## Similar species

*C. palearis* is included in the subgenus *Loganiosaura* which also includes: *C. melanosterna, C. bakeri* and *C. oedirhina*. These are easily differentiated from one another.

*Prior to 1997* C. palearis *and* C. melanosterna *were considered conspecific due to their closely related phylogenetics (Buckley and Axell, 1997). However,* C. palearis *is much smaller and less colourful than* C. melanosterna *(in adulthood) and possesses different behavioural traits (Malfatti, undated), although hatchlings may be more difficult to distinguish.* C. melanosterna *has also been proposed at the present CoP for inclusion in Appendix II (see analysis for Prop. 11).*

A study was carried out to find out whether the species described as *C. palearis* in Guatemala was the same as the species described in Honduras or not. Their findings led them to describe the Honduran population as an independent species—

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| *C. melanosterna*. | C. similis *is easy to distinguish from* C. palearis *due to its intercalary scale rows and green colouring when a hatchling (Echternacht, 2009; Pasachnik, 2009).* |

**Conservation, management and legislation**

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| *Ctenosaura palearis* is included in Category No. 2 of the Endangered Species List in Guatemala.<br><br>Locally, the species is one of those for which subsistence hunting is allowed, although its sale is prohibited. Hence, trade in any parts or derivatives of the species is illegal. | *According to Cotí and Ariano (2008) "the lack of a regulator entity for the international trade markets make it difficult to control illicit commerce in this species". TRAFFIC North America (2009) suggest that, given that all use of this species (other than for scientific, research and breeding purposes aimed at its conservation) is prohibited by Guatemalan legislation, the primary problem is the lack of enforcement.* |
| There are a number of laws offering protection to *C. palearis* and other protected species, including laws related to the hunting of specimens, protected areas and the List of Threatened Species of Guatemala. Most importantly, the *Protected Areas Law, Decree 4-89* specifies that endemic species of Guatemala (including *C. palearis*) can only be used for scientific, research and breeding purposes aimed at the conservation of the species. Specimens can only be traded if they are captive bred to F2 generation and are bred by authorized persons. Prison sentences of five to ten years and fines of USD1250–2 500 are applicable to those found using wild species illegally. Guatemala implements a system of permits for all wild specimens and has capacity for enforcement amongst Customs, police and quarantine personnel. | |
| A national conservation plan for *C. palearis* is currently being developed. Since 2007, an NGO (Zootropic) has been monitoring *C. palearis* populations in the wild, microchipping some specimens and recording their behaviour. They have also implemented environmental education programmes.<br><br>At this time only 3% (934 ha) of the species habitat is within Protected Areas. However, there are proposals to increase Protected Areas in the region and to encourage conservation by large land-owners. | *Zootropic is also involved in conservation of private lands and is working towards an official declaration of municipal, communal and private nature reserves as part of the Guatemalan protected areas system (Ariano, 2006). Although aimed primarily at* H. h. charlesbogerti*, it may also benefit* C. palearis*.* |

**Captive breeding/artificial propagation**

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| There is currently no captive breeding programme for *C. palearis* due to limited knowledge of the species, therefore sustainable harvesting of specimens is not considered an option at present. | *Captive populations are known to exist in three zoos, including: Rotterdam Zoo, Woodland Ark Zoo and Sacramento Zoo (Köhler, 2004).* |

**Other comments**

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| | *Coti (2009) acknowledges that illegal collection for trade is not the primary threat to the species, but believes that unless controlled it could increase pressure on the species.* |

**Reviewers:** P. Coti, TRAFFIC North America, H. Werning.

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