Project Abronia: Protecting the Secretive Alligator Lizards of Guatemala

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Arboreal Alligator Lizards of the genus *Abronia* are among the most endangered species of lizards in the world (Campbell and Frost 1993). Of the 19 species included on the IUCN Red List (2010), one is critically endangered, six are endangered, three are vulnerable, two are of least concern, and the other seven could not be assessed because data are deficient. In Guatemala, the genus *Abronia* is comprised of ten species, eight of which are endemic (Ariano-Sánchez and Meléndez 2009). Project Abronia was initiated by the Guatemalan NGO Zootropic in late 2009, with the objective of protecting these cloud-forest-dwelling reptiles and their habitat. None of Guatemala's eight endemic *Abronia* species have been assessed using the IUCN Red List criteria; until recently, two species (*A. campbelli* and *A. frosti*) were thought to be extinct.

At Zootropic, we believe that research and environmental education are essential for effective conservation. Protecting nature requires more than science; people within the affected areas must be involved in order to ensure long-term success of our projects. So, along with the research field trips, workshops and environmental talks were held in the areas where the various species are located. This combination has produced some interesting results, and these secretive lizards have proven to be one of the best-kept "Jewels of Guatemala."

Abronia campbelli was first discovered in 1993 and thought to have become extinct shortly thereafter (Brodie and Savage 1993). In 2009, Zootropic researchers rediscovered individuals of this species in a highly disturbed oak forest (Ariano and Torres 2010). The remaining habitat consists of only 406 standing trees, leaving this highly vulnerable population subject to genetic isolation. Interviews with local villagers have revealed that the precarious state of the area is due to the felling of trees to facilitate cattle ranching. Management of this area for conservation purposes is extremely urgent.

Local inhabitants call *A. campbelli* "escorpión," which means scorpion. They believed it to be highly poisonous, and would usually kill any

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The future of conservation is the next generation. Children participating in this educational program at a school in Jalapa received t-shirts to facilitate the dissemination of the conservation message.

DANIEL ARIANO

Abronia campbelli was thought to have been extinct until its recent rediscovery. This adult is equipped with a small radio transmitter to track movements.

THOMAS SCHREI

Hatchling *Abronia campbelli* from the captive-breeding program at the Zootropic Herpetarium in Guatemala City.

lizard they encountered. Many myths existed about *A. campbelli*. They kill the trees, lightning will strike any tree with many lizards on it, any person who passes across the shadow of a lizard will die with 24 hours, and the lizard uses its tail to inject venom. Faced with such attitudes, environmental education capable of demystifying the species has been a priority. Once informed that their beliefs had no scientific basis, the local people reacted very well, showing great sympathy for these lizards

Along with habitat loss, another alarming threat is illegal trafficking. During our first field trip to the type locality, we encountered foreigners who were looking for these lizards. Unfortunately, at that time, we did not have enough information to realize what these people were doing at the site. Additional information has led us to believe that these people were smugglers who were looking for *A. campbelli* for commercial trade in Europe. Interviews with local villagers have revealed that smugglers took at least five *A. campbelli*.

We also have secured five pairs of this species for a captive-breeding program operated at the Zootropic Herpetarium located in Guatemala City. Between March and April 2010, four females gave birth to an average of 10.5 offspring. The release of the neonates into their natural habitat was organized with the assistance of local people. We chose trees that were not too isolated from other oaks and that were within areas where trees are less likely to be disturbed by humans. Some of our females seem to be pregnant again this year, so we hope the breeding program will continue to be a success.

One of the greatest achievements of the project is the realization of conservation agreements with owners of the properties that are within the habitat of *A. campbelli.* This year, we plan to start a breeding program *in situ*. Also, specific areas will be strictly protected for the species, while other areas will be slated for restoration and reforestation. Because the isolation of suitable trees is of concern for the genetic variability of the species, we plan to increase connectivity by planting native fast-growing trees between the existing oaks. We also plan to create artificial corridors by joining the tops of the remaining oaks with ropes that can be covered with thick masses of Spanish Moss (*Tillandsia usneoides*). Telemetry research that we are initiating in the area should help us identify patterns of behavior in the wild and provide means by which we can judge the utility of our proposed measures.

Abronia meledona is another species of concern to the project. People living within the range of this animal also call it "escorpión," believe it is

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A local villager learns that *Abronia meledona* is anything but dangerous.

LESTER MELÉNDEZ

Some populations of *Abronia fimbriata* appear to be healthy — thanks to the private preservation of suitable habitat.

very poisonous, and hold many of the same erroneous beliefs that are held for *A. campbelli*. Environmental education talks also have been an important component of our conservation strategy in this area. During these workshops, deforestation was identified as the main threat. The people of the community mentioned that most deforestation is a result of logging to open pastures for raising cattle, but they also recognize that their intensive use of firewood has increased degradation of the area. Fortunately, however, this species does not seem to be as threatened as some congeners since local private nature reserves have enabled the preservation of sufficient forest cover in the area.

Abronia fimbriata is yet another species on which the project has focused. As a result of workshops, we have received information about the presence of these lizards in four different private reserves. Some of the individuals we have observed are juveniles, indicating that these populations are reproducing and likely to be in good condition — thanks to the private preservation of suitable habitat.

The main threat affecting *A. fimbriata* is habitat loss due to the rapid advance of the agricultural frontier (mainly Leatherleaf [*Chamaedaphne calyculata*] cultivation). The owners of the natural reserves perceived themselves as part of the solution to this problem because the area's natural reserves help mitigate these types of changes in land use through conservation of large areas of forest. Illegal traffic of the species also has been identified as a potential threat; witnesses report that animals have been taken in the past.

Abronia frosti is another species thought to have become extinct soon after its discovery (Campbell et al. 1998, Campbell and Mendelson 1998). Fortunately, a subadult was found in October 2010 on a recently cut oak within a cloud forest remnant near the original type locality (Ariano et al., in press). This individual was captured for the initiation of a captive-breeding survival assurance colony — part of a short-term conservation program for this species. In this case, local people feared these lizards and used to kill them on sight, believing them to be indicators of bad luck. Many also thought that they were poisonous.

Abronia frosti is threatened mainly by habitat loss due to selective cutting of various species of oaks, compounded by reforestation efforts using non-native trees. Local people acknowledge that they are the cause of deforestation. They need the firewood to survive, but quickly recognized that the best strategy to reduce this threat is reforestation. The community leader informed us that they were struggling to reforest the area. Because it is a community forest, all communities must agree on reforestation before it can be implemented. *Abronia frosti* is not extinct, but strong conservation measures are urgent.

Within a short period of time Project Abronia has already provided hope for the survival of seriously endangered species of *Abronia* in Guatemala. With diligence, luck, and help from local and international partners, we may yet recover further species that are thought to be extinct, and, given the secretive nature of these animals, discover other species that are as yet unknown to science.

THOMAS SCHREI

Abronia frosti is threatened mainly by habitat loss due to selective cutting of oak trees for firewood.

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Environmental education is essential for effective conservation. Protecting nature requires more than science; people within the affected areas must be involved in order to ensure long-term success of our projects. This workshop with local villagers addressed the conservation concerns for *Abronia frosti*.

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