Population Restoration for a Critically Endangered Reptile – the Grand Cayman Blue Iguana *(Cyclura lewisi)*

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Biogeographical context

The three Cayman Islands are the emergent peaks of a submarine ridge, originally formed by the tectonic uplift of the southern edge of the North American tectonic plate, to the south of Cuba.

Their surface terrain is formed by carbonate rocks, derived from corals and sea floor sediments, and extensively eroded into surface karst. Aeolian soils from stratospheric transport of Saharan dust, perhaps supplemented by regional volcanic ash deposited and weathered over millennia, have accumulated locally in basins in the rock (Jones, 1994). Lower-lying areas have become blanketed by mangroves growing on autochthonous peat accumulating in response to post-Holocene sea level rise (Brunt and Burton, 1994).

The three islands have never been connected to a larger land mass, and were completely submerged ~3 million years ago during the mid-Pliocene climate optimum, with modern terrestrial fauna and flora only becoming established and evolving since receding sea levels exposed the three islands ~2 million years ago (Jones, 1994).

Fred Burton

A young adult male Grand Cayman Blue Iguana (*Cyclura lewisi*).

John Binns

Trees rooting directly into bedrock karst in eastern Grand Cayman.

Before human impacts, the islands were densely vegetated throughout by semi-deciduous forests (seasonally flooded, dry, or xeromorphic depending on settings), xerophytic interior and coastal shrublands, mangrove forests and shrublands, and a handful of rarer habitat types. The ancient flora and fauna was primarily derived from the neighbouring Greater to the west. The plant and animal communities have evolved such that a significant degree of endemism is now recognized in the native flora and fauna of the Cayman Islands (Proctor, 1984; Davies, 1994; Burton, 2008).

Shortly before human settlement, Blue Iguanas were the largest fully terrestrial animal on Grand Cayman

Early observations

One of those endemics is the Grand Cayman Blue Iguana (*Cyclura lewisi*), which is a descendant of a common ancestor to the Cuban Iguana (*Cyclura nubila,* Malone et al., 2000) which apparently colonized Grand Cayman soon after the island last emerged from beneath the sea. It was originally described in 1940 by Chapman Grant, based on observations by Bernard C. Lewis in 1938 (Grant, 1940). At this time the population of this large herbivorous reptile had already been heavily impacted by humans and associated non-native predators. Lewis observed, *"the species is nearly extinct, and I doubt that more than a dozen individuals still exist on the island."* He also observed that *"East End people say that since 1925 the 'guanas' have become so scarce that it is no longer worth their while to hunt them."*

Grant published the taxon as a subspecies of the Cuban Iguana, but modern studies support designation as a full species, *Cyclura lewisi* Grant (Burton, 2004).

Historic decline

The causes of the decline of the Grand Cayman Blue Iguana prior to 1925 are not documented, other than passing references in Grant's publication, but may be inferred by reference to a more recent decline of a closely related iguana, *Cyclura nubila caymanensis* on Cayman Brac and Little Cayman.

Blue Iguanas on Grand Cayman, shortly before human settlement, were the island's largest fully terrestrial animal. They were almost certainly present in high concentrations in coastal areas, where they would have nested in sandy glades amid coastal shrubland. Inland populations were probably distributed throughout the xerophytic shrubland, nesting in local soil pockets amid the carbonate karst terrain. They were distributed throughout Grand Cayman (Morgan, 1994). Considering the original extent of suitable habitat and what is known of densities that this and other closely related species can reach, it seems probable the original population numbered in the low tens of thousands.

Human settlement became established on Grand Cayman at the beginning of the 18th Century (Craton, 2003), heralding the arrival of dogs and cats to an ecosystem naïve to large mammalian predators. Most early settlement occurred in coastal areas, where dogs would have slaughtered large numbers of adult iguanas, and cats would have severely impaired recruitment by hunting hatchlings and yearlings. From Grant's monograph and local aural history we also know that humans hunted iguanas both for sustenance and to protect crops such as yams, whose young shoots the iguanas like to consume.

As coastal settlements became linked by tracks and the human population increased, the iguanas would have been rapidly extirpated from coastal areas. Meanwhile, global demand for Mahogany and other West-Indian hardwoods was the driver for extensive inland deforestation in Grand Cayman, especially in areas on soil which could then be accessed for agriculture (Craton, 2003).

Modern observations on wild Blue Iguanas, and evidence from Little Cayman suggest that novel and human-modified habitats can be extremely attractive to iguanas if they are not already defended by dominant settled individuals, and if they provide access to sunlight, food, and suitable retreats. Traditional farms on cleared forest provide these in abundance, with fallen fruits (mangoes, papayas, etc.) richly supplementing the growth of edible weed species. Coastal gardens also offer food and thermoregulatory opportunities, and iguanas are quick to use artificial structures for retreats.

Fred Burton

An iguana that died in a farmer's trap. Grand Cayman east interior in the mid 1990's.

These human-modified habitats appear to be sufficiently attractive that they probably acted as population sinks, drawing iguanas out from the inland xerophytic shrubland into farms and dwelling areas, where they would be naïve to the dangers of hunters, dogs and cats. As new arrivals were soon killed, the sinks would remain open to new colonizers from inland, and the process would have continued to the point in 1938 when in Lewis' words, "most people in Grand Cayman were unaware that iguanas existed on the island, as the few remaining representatives of the species inhabit the most inaccessible and unfrequented part of Cayman."

Modern threats

In modern times, pressures on the iguanas have increased exponentially, as the human population has been doubling every 12 years. In 1925 there were approximately 5,500 people living on Grand Cayman. The human population has since increased tenfold to approximately 55,000 in October 2010 (Anon, 2011).

Road kill has joined the lethal threats to Blue Iguanas, especially with roads being constructed along the northeast coast (formerly a centre for the remnant wild population), and into historic nesting areas in the east interior. Traditional fruit and produce farming have been widely replaced by cattle farming and residential subdivisions, degrading even that high-risk habitat option for the iguanas. Ironically, increased access to the interior enabled discovery of more remnant Blue Iguana populations just as they were being exposed to the threats that would destroy them.

Population trends

Lewis' estimate of less than a dozen remaining in 1938 was probably an underestimate resulting from the sheer difficulty of accessing the island's interior at that time. In 1992-3 the present author and Kevin Gould (then an intern with the US National Zoo) estimated there were 100 – 200 wild Blue Iguanas, now restricted to the east interior and northeast coast of Grand Cayman.

In retrospect it seems reasonable to assume that the species had been bottlenecked at a population in the low hundreds, since before 1925.

Nine years later, a second survey found the geographic distribution occupied by wild Blue Iguanas had halved, and the population density in still-occupied areas reduced by 90%. We assessed the population to be at the point of functional extinction, with 10-25 wild individuals remaining, many too isolated to find mates, and the few progeny from small clusters failing to reach maturity due to unnaturally extreme predation pressure (Burton, 2002a).

Fred Burton

Young wild female Blue Iguana in 1993, living in a traditional farm surrounded by shrubland.

Initial conservation measures

This 2002 crisis point galvanized the rather low-key conservation efforts that were already underway, and led to the establishment of the Blue Iguana Recovery Programme (BIRP). The programme was set up and remains a partnership under the aegis of the National Trust for the Cayman Islands (NTCI), with the Cayman Islands Department of Environment, the International Reptile Conservation Foundation, the Durrell Wildlife Conservation Trust, and a host of other participating institutions.

Twelve years earlier (in 1990) the NTCI had already began some conservation work with the Blue Iguanas, beginning with small-scale captive breeding using adults sourced from illegal captivity in private hands, and the first field research. The latter was extremely difficult, because we had only one known site with wild Blue Iguanas, and those were extremely shy and elusive. However, careful compilation of scat contents and very occasional sightings gave us the first authoritative data on diet, which we began to use to inform our diet in captivity.

These same observations also pointed to the inland xerophytic shrubland and its interface with traditional farmland as an important habitat for the iguanas, and a single nest site provided data we used to optimise egg incubation temperature. There we also observed first hand the effects of conversion of the land to cattle grazing, with the subsequent loss of food diversity and disappearance of the iguanas.

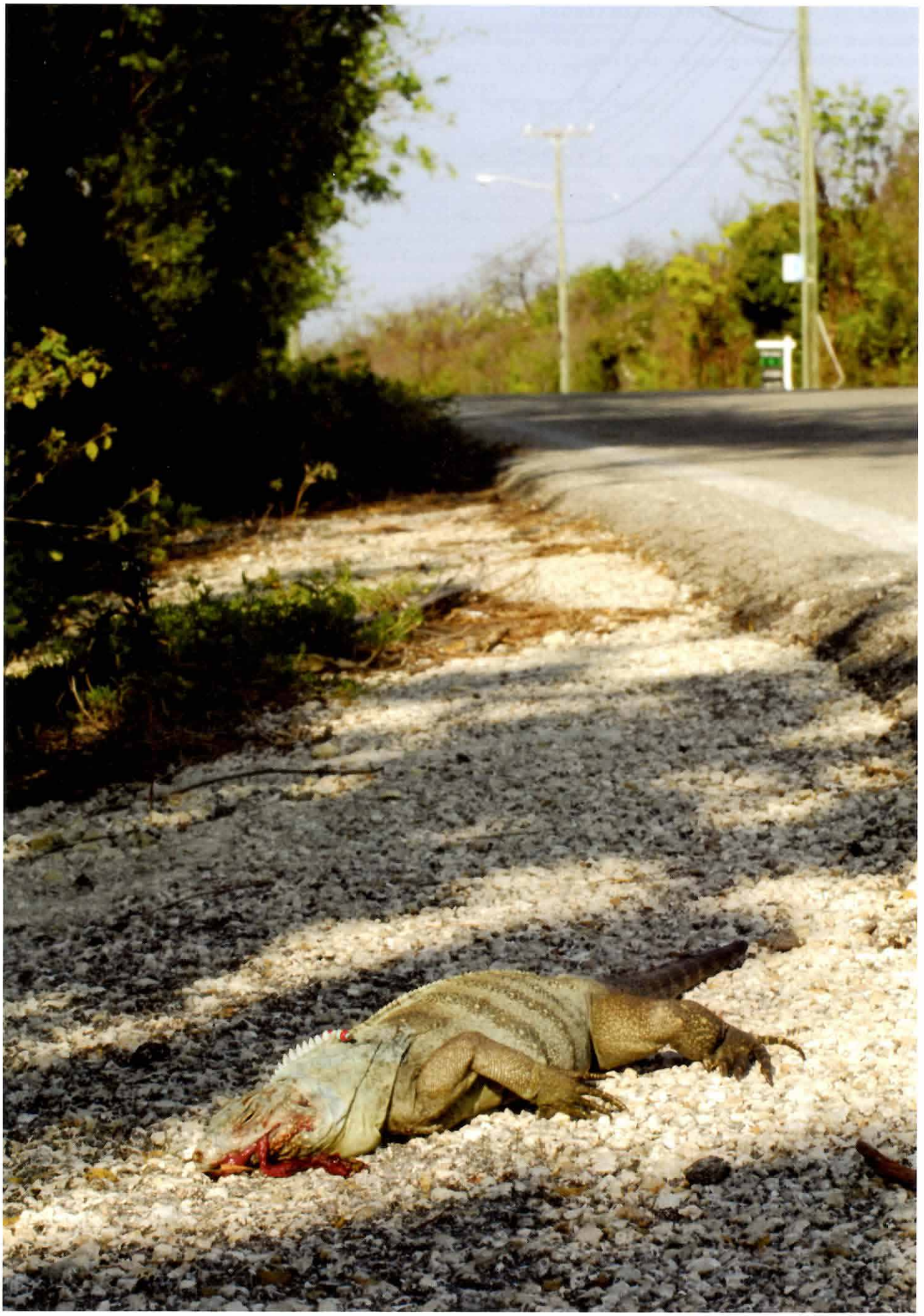
In 1996 with the captive breeding effort still in its experimental phase, we began releasing very small numbers of head-started two year olds into the QE II Botanic Park (QEIIBP) on Grand Cayman, permanently marked by implanted PIT tags. This became our restoration pilot project, following two early experimental releases in the larger Salina Reserve, which were promising but proved impractical to monitor on an ongoing basis. By 2000 a total of 26 captive bred, head-started Blue Iguanas had been released to the QEIIBP, about half of which had remained within the 26-hectare Park, and the first evidence of breeding by the released iguanas was observed. These released Park iguanas were not included in the 2002 population assessment, which focused on the remnant natural population.

With further effort to mimic the wild diet, we are now able to match or exceed growth rates in the wild, among our captive head-starters.

Learning from the iguanas

In 2001-2002 Rachel Goodman, a Master's student with the University of Tennessee, captured, tagged, and radio tracked all the iguanas then free in the QEIIBP, and studied their habitat and space use (Goodman et al., 2005a; Goodman et al., 2005b). Some of these iguanas had been living wild for six years by this time, and all aspects of their behaviour and diet matched those observed in the few truly wild iguanas we had studied, except that the released Park iguanas were easily habituated to observers. The ability to observe these released iguanas allowed us to reach a wider and more detailed understanding of diet and activity, which led to changes in our captive husbandry work, and our release strategies.

The diversity of the diet of the released iguanas was striking, (see table 1, next page). In addition to native plants, the iguanas in the QEIIBP have access to a wide range of exotic flora and were utilizing some of these novel food sources intensively. When we fed a fraction of this diversity in freshly gathered leaves, flowers, and fruits in place of pelleted formula diet, our captive breeding success increased and our growth rates improved. With further effort to mimic the wild diet, we are now able to match or exceed growth rates in the wild, among our captive head-starters.



Doug Bell

An adventurous released male that unfortunately reached the Queen's Highway.

TABLE 1: PLANTS CONSUMED BY CYCLURA LEWISI.

Species and families in square brackets are not native to the Cayman Islands, and are disproportionately represented in the QEIIBP

		PART(S) CONSUMED						
FAMILY	SPECIES	FLOWERS	FRUIT	LEAVES/ WHOLE PLANTS	SEEDLINGS	QEIIBP 2001-2003	SALINA RESERVE 1993-1994	WILD (mostly from scat)
Acanthaceae	*[Ruellia brittonia]*					2	-	-
Apocynaceae	*[Allamanda cathartica]*					1	-	-
	[Stephanotis floribunda]					2	-	-
	Sarcostemma clausum					0	1	?
Bignoniaceae	*[Tecoma stans]*					1	-	-
	[Tecomeria capensis]					3	-	-
	Tabebuia heterophylla					3	2	?
Euphorbiaceae	*[Hura crepitans]*					1	-	-
Fabaceae	*[Clitoria terneata]*					1	-	?
Sapindaceae	*Hypelate trifoliata*					1	?	?
Turneraceae	*Turnera ulmifolia*					1	-	-
Verbenaceae	*[Clerodendron thompsoniae]*					1	-	-
	[Gmelina phillipensis]					1	-	-
[Caricaceae]	*[Carica papaya]*					2	-	2
[Musaceae]	*[Musa sapientum]*					2	-	2
Anacardiaceae	*[Spondias spp.]*					2	-	2
Annonaceae	*[Annona muriatica]*					1	-	-
Arecaceae	*[Carpenteria acuminata]*					2	-	-
	[Dypsis lastelliana]					1	-	-
	Coccothrinax proctorii					2	2	?
Boraginaceae	*[Cordia boissieri]*					3	-	-
	Cordia sebestena					2	-	?
Canellaceae	*Canella winterana*					?	-	2
Erythroxylaceae	*Erythroxylum areolatum*					2	-	?
Euphorbiaceae	*Hippomane mancinella*					2	2	2
Malpighiaceae	*[Malpighia glabra]*					2	-	-
Moraceae	*Ficus aurea*					2	?	2
Myrtaceae	*Eugenia axillaris*					?	2	?
	Myrcianthes fragrans					2	2	?
Nyctaginaceae	*Guapira discolor*					?	?	2
Oleaceae	*Chionanthus caymanensis*					?	2	?
Picrodendraceae	*Picrodendron baccatum*					0	-	2
Rubiaceae	*[Morinda citrifolia]*					2	-	-
	Hamelia cuprea					2	-	?
	Psychotria nervosa					2	?	?
Vitaceae	*Cissus trifoliata*					-	-	1
[Araceae]	*[Caladium sp.]*					1	-	-
	[Colocasia esculanta]					1	-	-
[Dioscoreaceae]	*[Dioscorea sp.]*					1	-	2
Acanthaceae	*[Asystasia gangetica]*					3	-	-
	[Crossandra infundibuliformis]					1	-	-
	Blechum brownei					1	-	-
	Ruellia tuberosa					1	-	?
Amaranthaceae	*Amaranthus sp.*					4	-	-
Apocynaceae	*[Cantharanthus roseus]*					1	-	-
	[Cascabela thevetia]					4	-	-
Asteraceae	*[Pseudogynoxys confusus]*					1	-	-
	[Tagetes erecta]					2	-	-
	Bidens alba					1	-	-
	Eupatorium odoratum					3	-	?
	Spilanthes urens					1	-	?
	Tridax procumbens					1	-	?
	Vernonia divaricata					0	1	?
Brassicaceae	*Capparis ferruginea*					-	1	?
	Capparis flexuosa					1	4	4

TABLE 1, CONTINUED

FAMILY	SPECIES	PART(S) CONSUMED: FLOWERS	FRUIT	LEAVES/ WHOLE PLANTS	SEEDLINGS	QEIIBP 2001-2003	SALINA RESERVE 1993-1994	WILD (mostly from scat)
Convolvulaceae	*[Ipomoea batatas]*					3	-	3
	Ipomoea indica / I. violacea					1	-	-
	Ipomoea trilobata					1	3	?
Cucurbitaceae	*Momordica charantia*					1	-	-
Cyperaceae	*Scleria lithosperma*					0	1	?
Erythroxylaceae	*Erythroxylum rotundifolium*					0	1	?
Euphorbiaceae	*Acalypha alcopercuroidea*					3	-	?
	Chamaecyce hypericifolia					4	3	?
	Chamaecyce opthalmica					4	-	?
	Chamaesyce hirta					3	-	?
	Chamaesyce prostrata					3	-	?
Fabaceae	*[Abrus precatorius]*					1	4	3
	[Indigofera suffruticosa]					-	4	?
	[Stylosanthes hamata]					3	4	4
	Alysicarpus vaginalis					1	-	?
	Chamaecrista nictitans					0	4	?
	Desmodium incanum					1	3	3
	Rhynchosia minima					0	4	?
	Teramnus labialis					3	-	4
	Vigna luteola					1	-	-
Loganiaceae	*Spigelia anthelmia*					1	1	0
Malpighiaceae	*[Tristellateia australasiae]*					1	-	-
Malvaceae	*[Hibiscus esculentus]*					4	-	-
	Corchorus aestuans					1	-	?
	Corchorus siliquosus					1	1	?
	Sida stipularis					4	3	?
Nyctaginaceae	*[Mirabilis jalapa]*					1	-	-
	Boerhavia erecta					1	?	?
Passifloraceae	*Passiflora cuprea*					0	1	?
Phyllanthaceae	*Phyllanthus amarus*					4	-	?
Poaceae	*Lasiacis divaricata*					0	1	?
	Unidentified grasses					1	1	1
Portulacaceae	*Portulaca oleracea*					3	-	3
Rubiaceae	*[Ixora coccinea]*					1	-	-
	Chiococca alba					0	1	?
	Morinda royoc					1	4	4
	Randia aculeata					1	1	?
	Spermacoce assurgens					4	-	?
	Spermacoce confusa					3	4	?
Scrophulariaceae	*Capraria biflora*					1	-	?
Verbenaceae	*[Lantana camera]*					0	-	1
	Lantana bahamensis					1	-	?
	Lantana involucrata					0	1	?
	Phyla nodiflora					4	-	?
	Priva lappulacea					1	-	?
	Stachytarpheta jamaicensis					3	1	?
Fabaceae	*[Haematoxylum campechianum]*					3	-	-
Malvaceae	*[Hibiscus sabdariffa]*					1	-	-
	[Waltheria indica]					3	3	?
	Sida glutinosa					4	-	?
51 Families	***105 Species***							

Key:
0: Not observed consumed despite being available, **1:** Rarely consumed, **2:** Limited access, but fed on heavily when available, **3:** Commonly eaten, **4:** Staple consumed in large quantities, **- :** Species absent from area, **?:** No opportunity to observe, (e.g. seasonally unavailable fruits)

John Marotta

A released Blue Iguana vigilant by his artificial retreat.

A second key finding from the Park free roamers was that they occupied large home ranges (Goodman *et al.*, 2005b) and this led us to greatly increase our enclosure sizes for our large breeders that had ceased reproducing in our original 6 m2 cages. Breeding rapidly resumed when we introduced these adults to open pens of up to 160 m2 each.

Finally, we found most of the Park free-roamers were using artificial structures and natural rock holes for overnight retreats. We looked for common characteristics shared by these diverse retreats, and began experimenting with artificial retreat designs for releasing iguanas to the wild. By 2004 we had developed a wooden "Mark 5" artificial retreat design that has proved highly effective in anchoring released 2-3 year-old iguanas to the wild. We place the iguanas into the retreats close to dusk, so they voluntarily sleep the night inside. In the morning they begin exploring their new surroundings from the safety of their retreat, and gradually establish a core territory centred on it. By using these retreats we have cut the immediate post-release dispersal of released iguanas from 50% to almost zero.

Transition to population restoration

The formation of the BIRP, the optimisation of our release, captive breeding and head-starting techniques, and the onset of substantial breeding by the released iguanas in the QEIIBP, all coincided in the early 2000's and enabled a transition to large-scale population restoration just as the original wild population reached functional extinction. The Salina Reserve, in the east interior of Grand Cayman and within the recent historic range of Grand Cayman Blue Iguanas, was selected as the first site for re-establishment of a self-sustaining population. Protected by ownership and management by the NTCI, the Reserve is 253 hectares, of which ~30 ha is xerophytic shrubland habitat suitable for iguanas.

To increase the numbers of iguanas available for release, nests laid by free roaming iguanas in the QEIIBP were excavated, the eggs hatched in incubators, and the hatchlings head-started for 2-3 years in the same way as for the captive bred clutches. The captive effort focused on breeding founder-founder pairs as much as possible and we sought to gain representation from at least 20 founders in the restored population in order to retain a high proportion of the original genetic diversity of the wild population. The San Diego Zoo, studbook keeper for the West Indian Rock Iguanas, provided the technical guidance to help us optimise implementation of this genetic strategy (Grant, 2009).

Before release, all iguanas were health screened by a team led by Dr Paul Calle from the Wildlife Conservation Society, Bronx. The locally implemented health screening focused on white blood cell counts and differentials, red blood cell counts, and packed cell volume and total solids. Faecal samples were screened locally to check parasite loads, and also prepared for later enteric bacterial culture and quantitative parasite screening in the USA. Growth rates and an inspection of body condition completed the local screening, and iguanas were cleared for release if all locally determined parameters were within normal healthy ranges.

Eastern Grand Cayman - the Salina Reserve is in the left-central part of this image, and part of the Colliers Wilderness Reserve to the far right.

John Binns

Fred Burton

Above: Containers of Blue Iguana eggs in incubation on Grand Cayman.

Fred Burton

Below: Dr. Paul Calle and colleagues from the Wildlife Conservation Society examine a young Blue Iguana prior to release.

The iguanas released to the Salina Reserve from 2004 to 2010 are summarized in table 2. After the large 2006 release we reduced head-starting of nests from free roamers in the QEIIBP, to avoid over-representation of those genetic lineages and to increase the relative contribution of less represented founders in the captive breeding group. Known deaths among these released iguanas were due to road kills and dog attacks on individuals that had dispersed out of the protected area.

We radio tracked all 23 iguanas that we released in 2004 for a month after release. This confirmed our findings in the QEIIBP, showing that the iguanas bonded tightly to their release retreats and formed small territories centred on them. The iguanas lost weight initially as they explored their surroundings and established these territories, but then began feeding vigorously and resumed steady growth. In summer 2005 we found 21 of the 23 released iguanas in the same areas, and radio tracked them again through the breeding season.

Breeding in the Salina Reserve began in 2005, with three females of the 2004 release observed nesting, and all eggs confirmed to have hatched with 100% viability of 1-3 eggs per female.

Monitoring

After the second release, the Salina population of Blue Iguanas was too large to census by direct count. In order to monitor the population trend as we released additional numbers and the existing groups started to breed, we began a series of monitoring sessions in 2007 (table 3).

Area sampling, and direct counts within an area where 100% of iguanas were being radio tracked, both gave a similar population density value in 2007, and this was used to calibrate a less time-consuming line transect technique that was used in subsequent years.

Results indicate an increasing outward dispersal of iguanas as we sought to increase the population density, with analysis pointing to mate competition, competitive territorial behaviour and sexual aggression by males driving smaller iguanas of both sexes away from the release zones. Dispersal distances recorded are predominately local but a small proportion migrate very long distances, with some leaving the protected area and succumbing to road kill and cat predation in built up areas. In absence of reverse migration from adjacent areas, this pattern indicates an ongoing loss from the release area will continue and will have to be balanced by reproduction if the Salina Reserve population is to support itself long-term.

Under current population densities, it is clear the Salina Reserve has insufficient habitat to support 1,000 wild Blue Iguanas, which is the long-term goal set by the BIRP in its inaugural strategic plan (Burton, 2002b). Fortunately, in 2010 a second protected area with extensive historic Blue Iguana habitat was established by Crown lease to NTCI. This was the culmination of eight years of effort and was achieved primarily as a result of widespread public support for and pride in the Blue Iguanas and the work of the BIRP.

A new protected area

Tentatively named the Colliers Wilderness Reserve, the new protected area is 77 ha and is dominated by xerophytic shrubland. NTCI plans to fund the management of this area through compatible visitor activity, centred on a visitor centre in the southern end of the Reserve.

The BIRP released 135 iguanas to the Colliers Wilderness in 2010, and we plan to continue large-scale releases in coming years. The first release included three adults from the captive facility, which were preconditioned in an electric fence enclosure in the middle of the release area. A simple electric fence design proved sufficient to retain three adults for 2-3 weeks, by which time food resources in the enclosure were being depleted. On opening of the enclosure, two of the three adults remained in territories centred on their release site.

Three iguanas from the Colliers Wilderness release are already known to have dispersed beyond the boundary of the protected area, indicating that the same dispersal issues will apply as for the Salina Reserve.

If human population growth and habitat conversion trends continue on Grand Cayman,

TABLE 2

Year	Month	Number released
2004	December	23
2005	December	71
2006	December	112
2007	December	34
2008	November	26
2009	December	39
2010	August	52
Total released:		**357**
Total known mortality:		**5**

TABLE 3

Year	Month	Technique	Iguanas/ha
2007	July	area sampling	11.0
2007	November	line transects	11.6
2008	February	line transects	14.9
2010	March	line transects	13.0

The Colliers Wilderness Reserve, Grand Cayman.

Fred Burton

it is likely that both the Salina Reserve and the Colliers Wilderness will eventually become habitat islands surrounded by residential and/or commercial human activity. In that scenario the protected areas will have to be surrounded by perimeter fences capable of keeping dogs and cats out and iguanas in. Since this would have the effect of constraining outward migration, which would improve the prospect for the protected populations to sustain themselves, such fencing may be worthy of implementation before the external environment makes it an absolute necessity. However isolating the two areas from each other in this way will require periodic exchange of individuals to maintain genetic mixing between the sub-populations.

Measures of success

When the combined wild population of the Colliers Wilderness and the Salina Reserve approaches 1,000, with vigorous reproduction and recruitment confirmed in both, the need for captive breeding and head starting will fall away and we will be able to close the captive facility operation. This will involve releasing the captive founders.

Declaring success for the restoration of Grand Cayman Blue Iguanas in the long term will hinge on both subpopulations achieving self-sustainability, with recruitment equal or greater than mortality plus any other loss from the protected areas. It will also hinge on the protected areas achieving financial self-sufficiency such that the areas can be adequately staffed and managed without permanent reliance on charitable grants. These are still tough goals to meet, and for all the rather spectacular successes the BIRP and its many supporters and partners have achieved to date, it is too early to say we have saved a species.

With the iguanas' help, however, we have now tripled the area of xerophytic shrubland in the Cayman Islands' protected area system, which means we have protected an array of locally and regionally endemic plants and animals far less glamorous than, but every bit as significant as the Grand Cayman Blue Iguana, which is acting as their highly effective flagship.

Acknowledgements

The success to date of the Blue Iguana Recovery Programme has depended very heavily on the support of its institutional partners – the National Trust for the Cayman Islands, the Cayman Islands Department of Environment, the International Reptile Conservation Foundation, and the Durrell Wildlife Conservation Trust. Additional support has come through the IUCN-SSC Iguana Specialist Group network. Local and international volunteers far too numerous to list here have enabled the Programme to achieve vastly more than would have been possible with only two paid staff positions. Funding has come from local corporate and private donations, international conservation grants, tours and retail income, and very extensive in-kind goods and services contributions.

Data in table 1 is a compilation of diet observations by Kevin Gould and Rachel Goodman in addition to the author.

Blue Iguana Recovery Program

The Blue Iguana Recovery Programme remains open to contributions of funds and volunteer time, in its ongoing effort to secure the long-term future of Grand Cayman's Blue Iguanas. See www.blueiguana.ky and www.ircf.org/volunteer for online information. "*The Little Blue Book – a Short History of the Grand Cayman Blue Iguana*" by Frederic Burton is available by international mail order from www.ircf.org/lbb, and in the UK at http://www.amazon.co.uk/gp/product/0578043084. It is also available in stores throughout the Cayman Islands.

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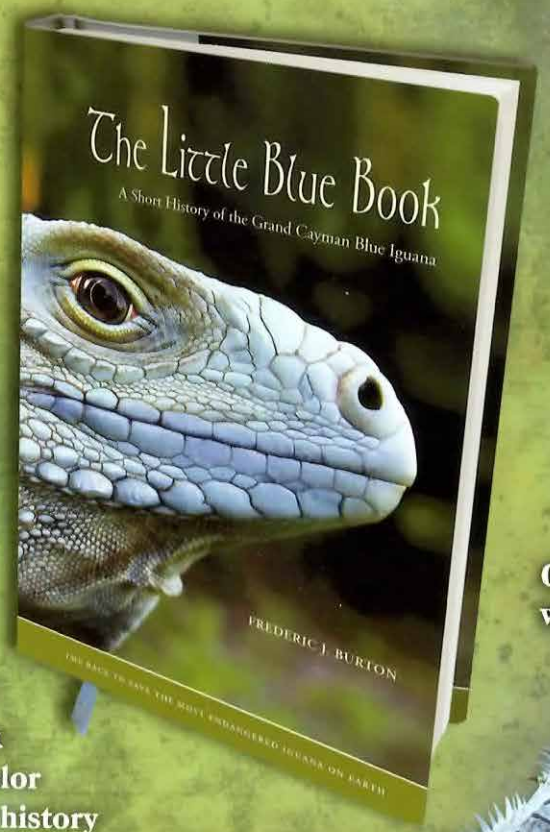

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