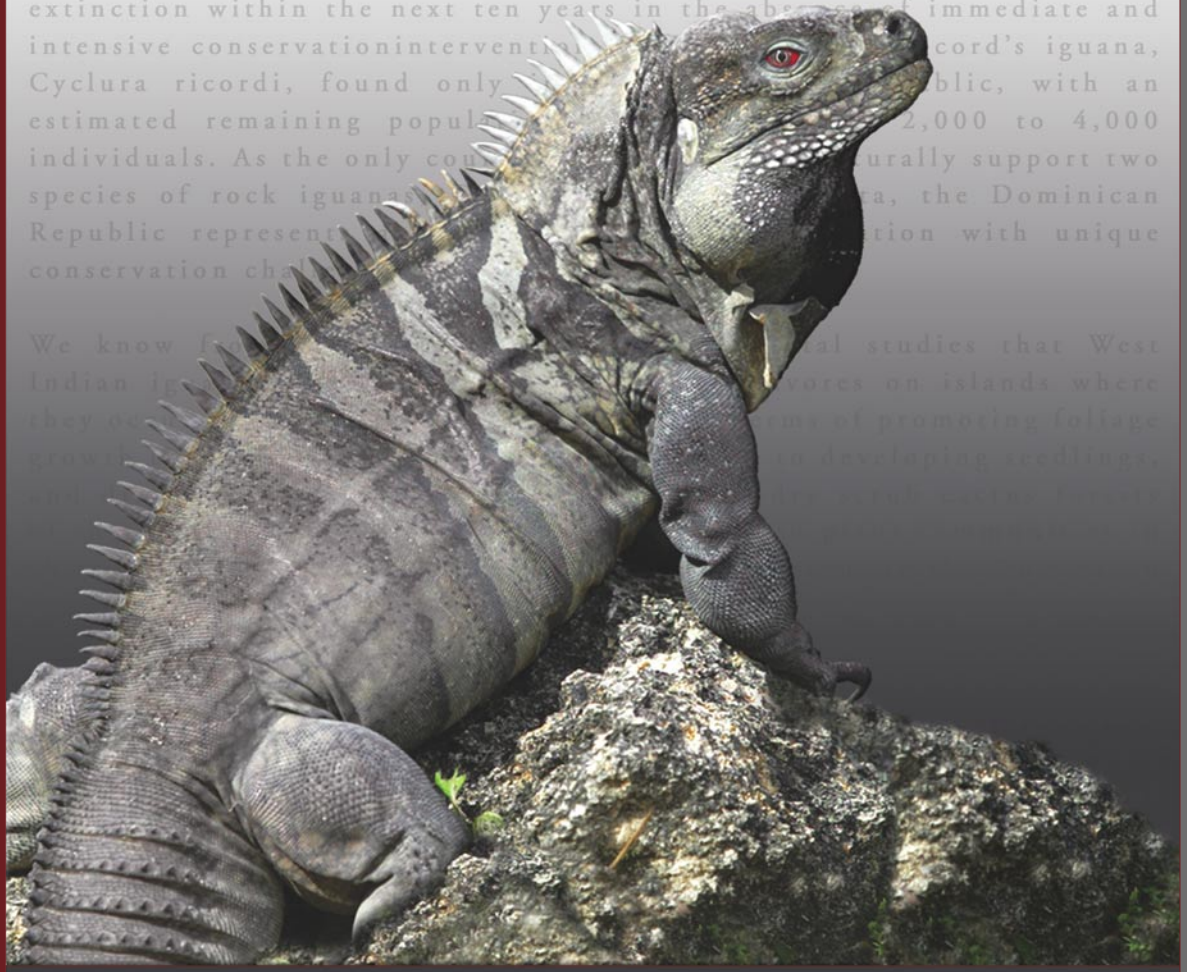
ISG

IUCN • SPECIES SURVIVAL COMMISSION
IGUANA SPECIALIST GROUP

As a group, the giant iguanas of the West Indies are the most endangered lizards in the world, primarily because much of their island habitat has been eliminated by human development or severely degraded by invasive species. Five of the eight species are ranked as Critically Endangered on the IUCN Red List, with a 50% chance of extinction within the next ten years in the absence of immediate and intensive conservationinterventi... cord's iguana, Cyclura ricordi, found only ... blic, with an estimated remaining popul... 2,000 to 4,000 individuals. As the only co... urally support two species of rock iguanas ... a, the Dominican Republic represen... tion with unique conservation ch...

We know f... al studies that West Indian ig... ores on islands where they o... mix of promoting foliage grow... to developing seedlings, ...



DEVELOPED IN A WORKSHOP HELD ON 17TH-18TH NOVEMBER 2002 IN SANTO DOMINGO, DOMINICAN REPUBLIC, IN CONJUNCTION WITH THE ANNUAL MEETING OF THE IUCN/SSC IGUANA SPECIALIST GROUP, AND HOSTED BY THE PARQUE ZOOLÓGICO NACIONAL.

Ricord's iguana
Cyclura ricordii
Species Recovery Plan
2002-2007

ERPÉTOLOGIE

GÉNÉRALE

DE

HISTOIRE NATURELLE

COMPLÈTE

DES REPTILES.

PAR A. M. C. DUMÉRIL

MEMBRE DE L'INSTITUT, PROFESSEUR A LA FACULTÉ DE MÉDECINE, PROFESSEUR ET ADMINISTRATEUR DU MUSÉUM D'HISTOIRE NATURELLE, ETC.

ET PAR G. BIBRON,

AIDE NATURALISTE AU MUSÉUM D'HISTOIRE NATURELLE.

TOME QUATRIÈME.

CONTENANT L'HISTOIRE DE QUARANTE-SIX GENRES ET DE CENT QUARANTE-SIX ESPÈCES DE LA FAMILLE DES SCINCIENS, DE L'ORDRE DES SAURIENS.

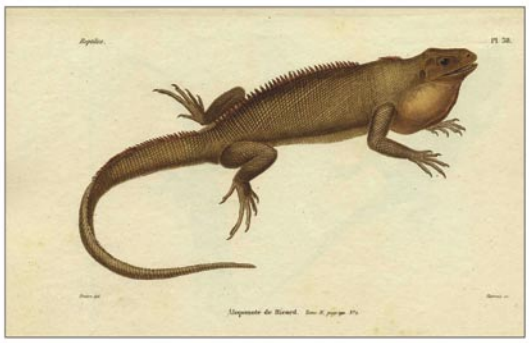
OUVRAGE ACCOMPAGNÉ DE PLANCHES.

PARIS.

LIBRAIRIE ENCYCLOPÉDIQUE DE RORET,

RUE HAUTEFEUILLE, N° 10 BIS.

1837.



1. L'ALOPONOTE DE RICORD. *Aloponotus Ricordii*. Nobis.
(*Voyez* planche 37.)

CARACTÈRES. Dessus du corps offrant, sur un fond noirâtre, un grand nombre de taches carrées de couleur fauve.

Excerpts from the original description of *Cyclura ricordii* in Dumeril and Bibron, 1837

Printing of the *Cyclura ricordii* Species Recovery Plan was made possible by funding from the The Toledo Zoo.

Spanish translation by M.A. García and H.Y. López-Department of Natural and Environmental Resources, San Juan, Puerto Rico.

We thank Roberto Maria, Senior Veterinarian ZooDom, for his assistance in review of the Spanish document.

Document design, layout and front cover by John Binns International Reptile Conservation Foundation

Ricord's iguana
Cyclura ricordii
Species Recovery Plan 2002–2007

Developed in a workshop held on 17–18 November 2002 in Santo Domingo, Dominican Republic, in conjunction with the annual meeting of the IUCN/SSC Iguana Specialist Group, and hosted by the Parque Zoológico Nacional.

Facilitators: Frederic J. Burton and Quentin M.C. Bloxam

Parque Zoológico Nacional (ZooDom)

Grupo Jaragua

IUCN-SSC Iguana Specialist Group

International Iguana Foundation

Durrell Wildlife Conservation Trust

IUCN encourages meetings, workshops and other fora for the consideration and analysis of issues related to conservation, and believes that reports of these meetings are most useful when broadly disseminated. The opinions and views expressed by the authors may not necessarily reflect the formal policies of IUCN, its Commissions, its Secretariat or its members.

Male Ricord's iguana (*Cyclura ricordii*)
Photograph by Thomas Wiewandt

Foreword

As a group, the giant iguanas of the West Indies are the most endangered lizards in the world, primarily because much of their island habitat has been eliminated by human development or severely degraded by invasive species. Five of the eight species are ranked as Critically Endangered on the IUCN Red List, with a 50% chance of extinction within the next ten years in the absence of immediate and intensive conservation intervention. One of these is Ricord's iguana, *Cyclura ricordii*, found only in the Dominican Republic, with an estimated remaining population of no more than 2,000–4,000 individuals. As the only country in the world to naturally support two species of rock iguanas, *Cyclura ricordii* and *Cyclura cornuta*, the Dominican Republic represents a special biogeographic situation with unique conservation challenges.

We know from a variety of recent studies that West Indian iguanas, as the dominant native herbivores on islands where they occur, play a crucial ecological role in terms of promoting foliage growth through cropping, providing nutrients to developing seedlings, and dispersing seeds into new habitats. The dry scrub cactus forests of the West Indies are among the most imperiled plant communities in the world. Preservation of native iguana populations in the Dominican Republic represents a significant step toward maintaining these natural habitats in a healthy and self-sustaining state.

On 17–18 November 2002, members of the IUCN SSC Iguana Specialist Group met with local experts in Santo Domingo to draft this cooperative species recovery plan for Ricord's iguana. The overall goal of the plan is to prioritize the conservation actions necessary to ensure the long-term survival of Ricord's iguana throughout its natural range. The work presented here details management of the wild population, restoration and maintenance of high quality native habitat, expansion of captive propagation efforts, implementation of education awareness programs, and mobilization of the financial, technical, and human resources. Achieving these objectives will preserve an important and unique component of Dominican natural heritage for all future generations to enjoy and appreciate. Clearly, the high quality of local expertise and strong commitment within the government, academic, and NGO communities of the Dominican Republic offer tremendous optimism for the future of this magnificent species. Our collective hope is that this comprehensive strategy will inspire funding agencies and the international conservation community to provide the ongoing attention this worthy recovery program deserves.

Dr. Allison Alberts, Co-Chair
IUCN/SSC Iguana Specialist Group

Executive Summary

The critically endangered Ricord's iguana, *Cyclura ricordii*, is unique to the island of Hispaniola. Despite its presence in protected areas, the species is rare with a very limited distribution, and there are indications that its population may be declining further.

This document presents a detailed plan for conservation measures considered essential to the long-term survival of this flagship species in the wild. It combines the knowledge and expertise of highly qualified experts from government and NGO institutions within the Dominican Republic, together with the World Conservation Union's SSC Iguana Specialist Group.

In 2003, a rapid survey to map all the areas where Ricord's iguana still occurs will be carried out simultaneously with a more detailed survey of the protected population on Isla Cabritos in Lago Enriquillo. These initial studies will provide the necessary information to propose protection for all the areas critical to the survival of this species. The assessment is expected to emphasize the need for extension of Parque Nacional Jaragua in the Cabo Rojo - Pedernales area, which is already under consideration.

Support for these measures from local communities will be sought and maintained through a major public awareness and education effort, led mainly by Grupo Jaragua throughout the areas where Ricord's iguana still occurs. In Santo Domingo, the role Parque Zoológico Nacional plays in public awareness for Ricord's iguana will be expanded.

After initial studies are complete, the results will be reviewed in a planning workshop that will provide important terms of reference for a future management plan for the protected areas supporting Ricord's iguana populations.

Threats to Ricord's iguanas such as feral predators and habitat degradation will be prioritized and then progressively managed, reduced or eliminated within protected areas of Ricord's iguana habitat. Restoration of native vegetation communities in areas that have been seriously degraded by grazing animals will be attempted. In-depth research into the distribution, abundance and ecology of Ricord's iguana will be carried out to gain an understanding of the many issues which are likely to influence effective conservation management.

The feasibility of maintaining Ricord's iguana in captivity will be investigated with two adult pairs at Parque Zoológico Nacional, with the potential of supplying offspring to display for education and awareness purposes in other locations both within Santo Domingo and the Parque Nacional Jaragua area.

Funding to implement this plan will be secured from a variety of local and international grants, supplemented with educational retail products that will be sold within the Dominican Republic and internationally. A newly formed Ricord's Iguana Recovery Group, supported by the members of the IUCN-SSC Iguana Specialist Group and the International Iguana Foundation, will implement the plan in the Dominican Republic.

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Director of the Parque Zoológico Nacional, Dr. Alfonso Ferreira, displays Ricord's iguana hatchlings, marking the resumption of successful captive breeding at ZooDom in 2002.

Photographs by John Bendon (left) and Thomas Wiewandt (right)

1. Current assessment

(Sections 1.1 and 1.2 by Sixto Incháustegui, December 2002)

1.1 Ricord's iguana

1.1.1 Taxonomy. Ricord's iguana is currently classified as *Cyclura ricordii*, recognized as a well-separated species from the other Hispaniolan Rock iguana, the Rhinoceros iguana, *Cyclura cornuta*. The taxon is endemic to Hispaniola, where it is restricted at present to a very limited range in the southwest of the Dominican Republic.

1.1.2 Status. Ricord's iguana is critically endangered according to the current IUCN Red List. The population is divided into two isolated ranges within the southwest of the Dominican Republic. One sub-population is present in the Neiba Valley, restricted to Cabritos Island in the Enriquillo Lake and some surrounding habitats on the Lake's southern shores. The other sub-population is within Pedernales Province, at the border with Haiti. The known range within this area is very limited. It is at present much impacted by agricultural development and threatened by several other development initiatives. The total population of Ricord's iguana has been roughly estimated between 2,000 and 4,000, although the real figures could be much lower.

1.1.3 Natural history. While likely the original population had a much broader range, within the southwest of the Dominican Republic and probably in adjacent suitable habitat in Haiti, at present Ricord's iguanas are restricted to xerophytic shrubland with sandy or earthen soils. They excavate their own retreats and do not seem to occupy rock hole retreats frequently. Adults are primarily terrestrial. Young individuals tend to be more arboreal and occupy arboreal retreats.

Like all *Cyclura* species, Ricord's iguana is primarily herbivorous. It also feeds opportunistically on animal food, including carrion.

Mating seems to occur between March and May. Eggs are usually laid in May or June, in nests excavated in the soil. Average clutch size is 11 eggs. Ricord's iguanas appear to develop social hierarchies more than territoriality, using relatively small patches of appropriate substrate to excavate their burrows in high densities. Neonates and young often occupy arboreal retreats, and rock holes may be used.

Hatchlings may be preyed upon by *Alsophis anomalus* in the Enriquillo Lake area (although this is also a critically endangered species with what seems to be very low populations), by some birds (great blue herons and others), mongooses and feral and domestic cats and dogs. Adults do not have natural predators.

1.1.4 Conservation issues. Habitat destruction both in the Enriquillo and Pedernales ranges is the main threat. Land is being converted from wild habitats to agriculture, pasture and other uses. New mining activities are being initiated in some of the areas and intensive tourism is expected to be developed, all these creating speculation for real estate development (including fencing and clearing of lands).

Feral and domestic cats prey on hatchlings and young animals, and feral and domestic dogs on adults and sub-adults. Trapping and shooting does not seem to be an important factor at present.

1.2 Conservation actions implemented as of 2002

Ricord's iguana has been legally protected over the last decades. Part of the range of each sub-population has been legally protected (Cabritos/Enriquillo Lake National Park since 1974, and Jaragua National Park since 1983).

ZooDom (Parque Zoológico Nacional), with assistance from Indianapolis and Toledo Zoos, recently restarted the Ricord's iguana captive breeding program.

Grupo Jaragua has promoted both *Cyclura ricordii* and *Cyclura cornuta* awareness and education activities, including the publication of a set of three books for preschoolers (5,000 copies each).

1.3 Strengths, weaknesses, opportunities and threats

These factors are assessed here for Ricord's iguana and the current conservation program as of November 2002.

1.3.1 Strengths

a) High biodiversity occurs in association with Ricord's iguana habitats
b) Established national parks exist in Ricord's iguana*'s* range

c) Effective management is in place for Isla Cabritos in the Lago Enriquillo Ramsar site (by the Secretaría de Estado de Medio Ambiente y Recursos Naturales, Subsecretaría de Áreas Protegidas y Biodiversidad).
d) Captive breeding and head-starting appear to be feasible
e) CITES controls are effective
f) Ricord's iguana is protected by local law
g) An established NGO (Grupo Jaragua) is actively involved
h) Ecotourism is occurring in Ricord's iguana habitats
i) Scientific community interest and research potential is high
j) Environmental education activities are ongoing
k) Lago Enriquillo, including parts of the lake shores and all of Isla Cabritos, is a Ramsar site and national park
l) Some private sector support is being realized
m) Multiple sub-populations are present

1.3.2 Weaknesses

a) Lack of resources (technical, financial and human) impedes conservation work
b) Quality and enforcement of environmental laws is weak in some areas
c) A lack of public awareness and involvement in conservation is an ongoing problem
d) A severe lack of information on *Cyclura ricordii* / *Cyclura cornuta* inter-relationships and the status and distribution of Ricord's iguana impedes progress
e) Survey work in the Jaragua area is difficult
f) Limestone mining concessions remain unresolved on the border of Parque Nacional Jaragua
g) The southwest of the Dominican Republic, where Ricord's iguana occurs, includes the country's most socioeconomically depressed regions

1.3.3 Opportunities

a) ZooDom has begun breeding Ricord's iguana
b) Management of Parque Nacional Jaragua is improving (Grupo Jaragua, Biosphere Reserve with flagship species potential, presence of hutia, solenodon, manatee)
c) Law enforcement is improving
d) ISG and IIF have indicated a strong commitment to support this plan
e) US zoos (e.g. Indianapolis Zoo) have committed financial support and captive management

f) Further local private sector support potential exists
g) An extension of Parque Nacional Jaragua in the Cabo Rojo – Pedernales region is proposed, which would bring protection to known Ricord's iguana habitat
h) Media, publicity and marketing opportunities are available
i) Potential exists to improve ecotourism quality
j) Existing local capacity can be built upon
k) Research opportunities abound

Critical iguana habitat where both species, *Cyclura ricordii* and *Cyclura cornuta*, flourished in 1975 (field notes from Wiewandt & Gicca). This area (east of Pedernales and north of Route 44 west of the Las Mercedes Rd. junction) lies outside national park boundaries and has been proposed for immediate protection. Most land to the west has already been cleared for cultivation.

Photograph by Thomas Wiewandt

Relatively undisturbed habitat along the Las Mercedes Road outside national park boundaries. The area's scarce soil deposits attract agriculture, soil that the iguanas need for nesting.

Photograph by Thomas Wiewandt

A male Ricord's iguana near the entrance to his burrow catches the day's last sun light before retreating for the night.

Photograph by Eladio Fernandez

1.3.4 Threats

a) Habitat loss and degradation:
- Agriculture
- Deforestation
- Charcoal collection
- Livestock grazing
- Limestone mining
- Cactus collection
- Private acquisition

Photograph by Diderot Gicca

b) Hunting (but vendors are selling mostly *C. cornuta*)
c) Non-native predators (dogs, cats, mongoose)
d) Non-native herbivores (donkeys, goats, cattle)
e) Smuggling across Haitian border has been reported, though probably not on a large scale
f) Changes in interactions with *Cyclura cornuta* may affect *Cyclura ricordii* ecology
g) Future industrial development is possible in Ricord's iguana habitat

Threats: Non-native predators, non-native herbivores, hunting and habitat loss

Photographs by Thomas Wiewandt, John Binns and Diderot Gicca

2. Overall Goal

"To ensure the long-term survival of Ricord's iguana throughout its natural range."

Male Ricord's iguana (*Cyclura ricordii*)
Photograph by John Binns

3. The Recovery Plan:

Objectives, Specific Results & Action Steps

3.1 OBJECTIVE: Establish management for wild Ricord's iguana populations sufficient for the long-term survival of the species.

3.1.1 Appoint a Dominican group to coordinate work on the wild populations of Ricord's iguana, along with cooperative partners: immediately.

> ***Agreed*** *on 18th November 2002 by consensus of the workshop participants,* Grupo de Recuperación de la Iguana Ricordii (GRIR) *was formed with the initial membership as follows:*
>
> *Alfonso Ferreira – Parque Zoológico Nacional (ZooDom)*
> *Andreas Schubert – Programa Medioambiental Transfrontierico*
> *Angélica Espinal – ZooDom*
> *Elizabeth Skeet García – ZooDom*
> *Ernst (Ernesto) Rupp – Grupo Jaragua*
> *Gloria Santana – Vida Silvestre*
> *José Ottenwalder – IUCN-SSC Iguana Specialist Group*
> *Roberto Maria – ZooDom*
> *Sixto Incháustegui – Grupo Jaragua* and *ISG*
> *Yvonne Arias – Grupo Jaragua*

3.1.2 Complete a comprehensive population analysis of Ricord's iguana on Isla Cabritos in 2003, to serve also as a baseline for future studies in the other areas of occurrence to be identified in 2003 (see 3.2.1).

a) Conduct field surveys (transects) in breeding (April–May), nesting (June–July), and hatching (September–October) seasons, covering all of Isla Cabritos
   Action: Indianapolis Zoological Society (IZS); ZooDom; Grupo Jaragua; Rangers, Subsecretaría de Áreas Protegidas y Biodiversidad; Gloria Santana
   Funding: $30,000, also covering 3.1.2 d, e, f, g (note: $10,000 from Indianapolis Zoo, $2,600 from the Miami Metrozoo Conservation & Research Fund, and $1,000 from Cleveland Metroparks Zoo is in hand as of November 2002)

b) Study nesting ecology, including marking locations of nests with GPS, setting up exclusion barriers around nests and counting and marking hatchlings
   Action: as above and concurrent
   Funding: $5,000 (for GPS and fencing materials)

c) Assess health of 10–15 animals during each study visit, including blood, fecal, morphometrics, parasites, and genetics
Action: Roberto Maria (ZooDom); Jan Ramer
Funding: Morris Animal Foundation grant in hand

d) Identify threats to Ricord's iguana during study such as predators, competition, hunting etc.
Action and Funding: as 3.1.2 a

e) Create a field reference chart of plants of the habitats of Ricord's iguana in time for the first visit
Action: Ricardo García, Jardín Botánico Nacional, bajo-El Ministerio de Áreas Protegidas y Biodiversidad y el Negociado de Parques Nacionales
Funding: as 3.1.2 a

f) Initiate an inventory of food resources and identify items consumed by Ricord's iguana (direct observation, scat collection and analysis)
Action and funding as 3.1.2 a

g) Identify the methods found to be most useful during the survey, to be used subsequently in the most critical area(s) identified by presence/absence studies being conducted in 2003 (see 3.2.1)
Action and funding as 3.1.2 a

3.1.3 Identify interactions and possible impact of *Cyclura cornuta* on *Cyclura ricordii* in all suspected *Cyclura ricordii* habitats.

a) Ensure that no *Cyclura cornuta* are released into suspected *Cyclura ricordii* habitats, and that all captive bred *C. cornuta* released into other areas are subjected to pre-release health screening according to internationally accepted standards (see West Indian Iguana Action Plan 2000 and future husbandry manual by Jeff Lemm to be adopted as ISG standard)
Action: ZooDom
Funding: $500 per year for health screening

b) Study *C. cornuta* on Isla Cabritos concurrently with 3.1.2 in 2003
Action: Nestor Pérez will design a behavioral competition study by early 2003, and implement it in mid to late 2003
Funding: $10,000

3.1.4 Develop a comprehensive management plan for the full range of Ricord's iguana in 2004.

a) Analyze results of 2003 work by early 2004
Action: IZS, ZooDom, Grupo Jaragua
Funding: none

b) Hold a two-day workshop in the Dominican Republic in mid 2004, to review the results of presence/absence studies (3.2.1) and Isla Cabritos studies (3.1.2, 3.1.3 b) and to determine terms of reference for a comprehensive management plan for Ricord's iguana and its known habitats
Action: GRIR plus IZS
Funding: $20,000

c) Publish the results of preliminary investigations and the outputs of the workshop (3.1.4.b) as 500 good quality bound copies for distribution to both local government officials, GRIR partners and the international research and conservation community
Action: investigators
Funding: $1,500

Drought-adapted vegetation on Isla Cabritos supports both *Cyclura ricordii* and *Cyclura cornuta*
Photograph by Thomas Wiewandt

3.2 OBJECTIVE: Restore and maintain a diversity of high quality native habitats sufficient to support viable sub-populations of Ricord's iguana in Isla Cabritos / Lago Enriquillo and all known and suspected localities south of the Sierra de Bahoruco.

3.2.1 Carry out a qualitative assessment of all known and suspected Ricord's iguana habitats by the end of 2003.

a) Assemble multidisciplinary team of plant and animal ecologists to carry out assessment by February 2003, led by a field coordinator
Action: GRIR
Funding: none

b) Conduct an aerial survey of the Curva del Guano - Cabo Rojo-Pedernales area to identify high probability Ricord's iguana habitats
Action: Grupo Jaragua
Funding: $11,560 sought (part of $31,000 total for broader survey work in the area funded also through Grupo Jaragua and partners)

c) Develop survey plan based on aerial survey and existing satellite imagery and known land use classifications by March 2003
Action: Field coordinator
Funding: none

d) Carry out rapid qualitative surveys to determine and map the presence of *Cyclura ricordii*, *Cyclura cornuta*, feral mammals and human impacts, together with diversity and relative abundance of plant species, during the 2003 nesting season. Document and distribute the survey results by the end of 2003
Action: Multidisciplinary team identified in (a), collaborating on Isla Cabritos with researchers implementing 3.1.2
Funding: $20,000

An adult male Ricord's iguana outside its burrow on Isla Cabritos
Photograph by John Binns

3.2.2 Acquire and incorporate all known Ricord's iguana habitat into the national system of protected areas by mid 2003, and any additional habitat identified through further surveys by mid 2004.

a) Determine land ownership in all Ricord's iguana habitats in mid 2003
Action: Ministerio de Medio Ambiente, GRIR.
Funding: none

b) Determine priorities for protection based on habitat surveys and land ownership (see above) and prepare proposal to government to establish new protected areas
Action: GRIR
Funding: none

c) Cultivate local support for habitat protection (planned in 3.4.2 b)

d) Enlist support of the international community by direct appeals through IUCN, ISG, and IIF publications and web sites on an ongoing basis
Action: GRIR
Funding: none

e) Develop economic alternatives for local people inhabiting / utilizing protected areas, in 2004
Action: Grupo Jaragua anthropologists
Funding: $8,750

3.2.3 Implement a quantitative habitat assessment program by the end of 2004 throughout the known and suspected range of Ricord's iguana.

a) Develop sampling strategies for monitoring human and feral mammal impacts and quantifying floral diversity, by mid 2004
Action: GRIR and ISG
Funding: none

b) Carry out annual habitat assessments using standard sampling strategies commencing by the end of 2004 and ongoing
Action: multidisciplinary team as in 3.2.1 a
Funding: $30,000–$50,000 over the next five years

3.2.4 Begin mitigating human impact to Ricord's iguana habitat in 2004.

a) Promote government enforcement of existing legislation prohibiting charcoal burning, wood clearing and hunting of iguanas, in 2004
Action: Ministerio de Medio Ambiente
Funding: none

b) Build local community "buy-in" (planned in 3.4.2 b)

3.2.5 Implement a feral mammal control program on Isla Cabritos by 2004.

a) Implement a feral cat eradication program on Isla Cabritos by 2004
Action: GRIR, ISG, IIF
Funding: $5,000

b) Implement a feral dog eradication program on Isla Cabritos by 2004 if needed
Action: GRIR, ISG, IIF
Funding: $3,000

c) Implement a burro (donkey) removal program on Isla Cabritos by December 2005, including a barrier to donkey (and goat) passage from the mainland during times of low water level which still allows movement of iguanas
Action: Ministerio de Medio Ambiente
Funding: to be determined

3.2.6 Implement an exotic plant control program on Isla Cabritos by 2004.

a) Explore feasibility of implementing control program for invasive exotic plant species on Isla Cabritos
Action: Consultant appointed by GRIR
Funding: $500

b) Develop removal plan for species likely to be eradicated successfully
Action and **funding** combined as above

c) Eradicate target species of exotic plants as determined in 3.2.6.b
Action: GRIR, ISG, in collaboration with Jardín Botánico Nacional, bajo- El Ministerio de Áreas Protegidas y Biodiversidad y el Negociado de Parques Nacionales
Funding: to be determined

3.2.7 Conditional on need shown by results of habitat monitoring (3.2.3) after removal of exotic herbivores (3.2.5), re-vegetate key sites with native plants to restore diversity and enhance iguana habitat beginning in January 2005.

a) Complete literature survey of historical floristics of the Cabritos, Cabo Rojo and Pedernales areas
Action: GRIR
Funding: none

b) Complete literature review of propagation techniques for target plant species
Action: GRIR
Funding: none

c) Establish seed bank for dry forest species
Action: Jardín Botánico Nacional, bajo-El Ministerio de Áreas Protegidas y Biodiversidad y el Negociado de Parques Nacionales
Funding: $20,000

d) Establish nursery for species likely to be transplantable
Action: Jardín Botánico Nacional, bajo-El Ministerio de Áreas Protegidas y Biodiversidad y el Negociado de Parques Nacionales
Funding: $20,000

e) Plant seeds and seedlings at target sites on Isla Cabritos and in the Cabo Rojo –Pedernales areas
Action: GRIR/ISG; in collaboration with Ricardo García, Jardín Botánico Nacional, bajo-El Ministerio de Áreas Protegidas y Biodiversidad y el Negociado de Parques Nacionales
Funding: to be determined

Habitat on Isla Cabritos
Photograph by John Binns

3.3 OBJECTIVE: Expand and maintain currently existing captive facilities and capacity for Ricord's iguana, and add additional facilities.

3.3.1 Expand and maintain facilities for Ricord's iguana at ZooDom starting in 2003.

a) Design eight off-exhibit, predator-proof enclosures by January 2003
Action: Alberto Álvarez, Jeff Lemm
Funding: none

b) Secure materials by October 2003
Action: Angélica Espinal (ZooDom)
Funding: $5,500

c) Construct enclosures, landscape and furnish by October 2003
Action: ZooDom staff
Funding: none

d) Purchase two new computers, and join ISIS to obtain software including ARKS, MEDArks and SPARKS by June 2003
Action: ZooDom staff
Funding: $2,200

e) Arrange a visit of a registrar from a US zoos to ZooDom by July 2003
Action: Toledo or Indianapolis Zoo (to be confirmed)
Funding: $2,000

3.3.2 Develop and refine management of breeding program for Ricord's iguana by October 2003.

a) Import one new female Ricord's iguana from an area that is not within national park boundaries, applying strict quarantine standards at ZooDom as defined by ISG veterinary advisors
Action: ZooDom
Funding: none

b) Relocate the subordinate male from existing exhibit to pair with new female in new enclosure (3.3.1 c)
Action: ZooDom
Funding: none

c) Continually reassess the breeding program with respect to existing enclosure space and results from field research
Action: ZooDom; GRIR
Funding: none

3.3.3 Define and improve husbandry protocols, commencing in 2003.

a) Review the current *Cyclura* diet in use at ZooDom and adjust to other *Cyclura* captive diets with relation to nutrition and cost
Action: ZooDom and The Toledo Zoo veterinary staff
Funding: none

b) Adopt standard quarantine procedures for all iguanas imported from the wild to ZooDom facilities (see 3.3.2 a)
Action: ZooDom veterinary department
Funding: none

c) ZooDom veterinary staff member to receive additional veterinary training to the level of a Master's Degree
Action: Sylvia Decamps, Ohio State University
Funding: already funded

d) Maintain health protocols to include visual examination and routine parasite checks every three months
Action: ZooDom veterinary staff
Funding: none

e) Apply standardized morphometric data collection, specifically snout-vent length and weight monitoring, every three months up to one year of age, and every six months thereafter
Action: ZooDom staff
Funding: none

f) Acquire and implement *Cyclura* husbandry manual currently being developed
Action: Jeff Lemm (San Diego Zoo) and ZooDom staff
Funding: none

g) Arrange Keeper exchange for *Cyclura* management experience, between ZooDom and San Diego Zoo, Indianapolis Zoo, or any other AZA institution with appropriate expertise and experience
Action: IZS, ZooDom
Funding: $2,000

h) Continual feral dog control at ZooDom, including dog-proofing the main display exhibit, to ensure survival of all captive Ricord's iguana
Action: ZooDom staff
Funding: none

i) Ensure all Ricord's iguana sub-adults are maintained separately from *C. cornuta*, and only in wire enclosures to safeguard against predators
Action: ZooDom staff
Funding: none

j) Implant PIT tags in all Ricord's iguana in ZooDom facilities
Action: Tandora Grant, ZooDom veterinary staff
Funding: nine PIT tags donated by San Diego Zoo

k) Develop a database for consistent record entry in ARKS, MedARKS and SPARKS
Action: Angélica Espinal, Elizabeth Skeet García, Sylvia Descamps
Funding: none

l) Submit ZooDom database for simultaneous entry into North American studbook
Action: Angélica Espinal, Tandora Grant
Funding: none

3.3.4 Establish high quality display facilities in locations additional to ZooDom in order to increase public awareness, and for education and fund raising potential.

a) Identify sites for additional captive display facilities for public awareness, education and fund-raising purposes, in 2005: to be stocked only with captive bred animals from ZooDom
Action: ZooDom staff, Grupo Jaragua, Acuario Nacional and any other potential participants
Funding: none

b) Ensure all receiving institutions adhere to captive management protocols developed by ZooDom staff and outlined in this plan (see relevant sections of 3.3.3)
Action: ZooDom staff and receiving institutions
Funding: none

c) ZooDom veterinary staff to regularly monitor the health of all Ricord's iguana at these sites
Action: ZooDom veterinary staff
Funding: none

3.4 OBJECTIVE: Institute long-term education and awareness programs to ensure sustained support from the local and international communities, and visitors, for the conservation of Ricord's iguana in the wild.

3.4.1 Produce educational resource materials and programs on Ricord's iguana and its habitat for local schools, tightly linked to the national curriculum, in 2003–4.

a) Create a printed module for the national curriculum focusing on Ricord's iguana, its habitat, threats, and the conservation program. Distribute 300 copies to schools in the Cabo Rojo / Enriquillo regions, and train teachers in its use
Action: Grupo Jaragua, coordinating with the Ministerio de Educación
Funding: $2,000 assuming 10 pages printed both sides, black and white with a color cover, good quality paper, print and photographs.

b) Create a video documentary on Ricord's iguana, its habitat, threats, and the conservation program, designed for school use. Supply 300 copies to schools in the Cabo Rojo / Enriquillo area, and also make it available for sale to the general public
Action: Joe Wasilewski; Grupo Jaragua
Funding: $5,000

3.4.2 Expand the Public Education Program (PEP) within the range of Ricord's iguana, with the focus on the iguanas and their habitat.

a) Design a public outreach program in the regions where Ricord's iguana occurs, modeled after the recent Tody Flagship Species Program, by April 2003. This will be designed to reach schools, churches, community groups and the general public
Action: Grupo Jaragua
Funding: none

b) Hire a coordinator to commence the program in May 2003 and continue for two years (to June 2005)
Action: Grupo Jaragua, coordinating with the Ministerio de Educación, and acting through the Ministerio de Medio Ambiente in the Lago Enriquillo area
Funding: $58,000 to include coordinator's salary, travel, and program resources such as posters, caps, stickers and T-shirts, some of which may also serve as retail products (see 3.4.6)

3.4.3 Enhance the role Parque Zoológico Nacional (ZooDom) plays in educating the general population of the Dominican Republic concerning Ricord's iguana.

a) Install a large information board on Ricord's iguana at the main exhibit, designed to reach the general public with key messages about the status and significance of Ricord's iguana and actions being taken to protect it
Action: ZooDom
Funding: $3,000

b) Retail Ricord's iguana educational products in ZooDom's gift shop
Action: ZooDom with GRIR (see 3.4.6)
Funding: see 3.4.6

c) Build Ricord's iguana conservation story into train drivers' commentary
Action: ZooDom
Funding: none

d) Show video and present conservation story for Ricord's iguana to all visiting school groups
Action: ZooDom
Funding: none (see 3.4.1 b)

e) Develop keeper talk on Ricord's iguana, to be advertised and presented to groups of zoo visitors at predetermined times
Action: ZooDom
Funding: none

3.4.4 Reach out to politicians and senior government officials to explain the national importance of Ricord's iguana, its status and actions planned for its recovery.

a) Deliver a high quality gift package containing a poster (see 3.4.2 and 3.4.5), pin, and personalized letter to each individual who may influence national or regional policy affecting Ricord's iguana
Action: Alfonso Ferreira
Funding: to be determined

b) Follow up with personal meetings with the highest priority individuals
Action: Members of GRIR (to be selected by the Group).
Funding: none

3.4.5 Develop communication tools in conjunction with the Ministerio de Turismo to realize financial support for Ricord's iguana conservation from tourists visiting the Dominican Republic.

a) Develop and implement a strategy for fund raising and ecotourism to support Ricord's iguana conservation, focusing on the airport and major hotels
Action: GRIR; Ministerio de Turismo
Funding: unknown

3.4.6 Create a range of retail items highlighting Ricord's iguana in the Dominican Republic to sell locally and internationally, both as a fund raiser and to raise awareness and support in the general public.

a) Develop posters, guide books, stickers, T-shirts, hats, pins, etc.
Action: John Binns, GRIR to identify organization(s) to run the commercial aspects of this program in the Dominican Republic (ZooDom?)
Funding: $4,000 per year over the next five years

3.4.7 Stimulate international support and funding through the Internet.

a) Create and market an official Ricord's iguana web site in 2003
Action: John Binns, Jan Ramer, Alfonso Ferreira/ZooDom
Funding: $3,000

b) Develop an e-commerce web store associated with the web site in 2003
Action: John Binns, Alfonso Ferreira/ZooDom
Funding: action should pay for itself

3.4.8 Communicate the results of completed field research as input to both education and awareness efforts and ongoing research.

a) Publish all substantial scientific results from research conducted as part of this Recovery Plan in peer-reviewed scientific journals within two years of completion
Action: researchers concerned
Funding: $1,000

b) Publish articles on Ricord's iguana and recovery actions in hobbyist and popular magazines locally and internationally, on an ongoing basis
Action: Relevant workers in communication with GRIR
Funding: none

c) Make current literature references available on the web site by the end of 2004
Action: John Binns, Jan Ramer, GRIR members
Funding: none

d) Submit research reports to pertinent local organizations within three months of completion of work
Action: researchers concerned
Funding: none

Isla Cabritos field trip participants returning by boat on Lago Enriquillo
Photograph by Thomas Wiewandt

3.5 OBJECTIVE: Identify and mobilize financial, technical and human resources needed to ensure the survival of Ricord's iguana.

Note: technical and human resource needs are planned and estimated under each applicable action step in sections 3.1 to 3.4. Financial resource acquisition is addressed alone in this section.

3.5.1 Realize national funding opportunities.

a) Apply for funding for a conservation education campaign for Ricord's iguana (see 3.4.2), estimated project cost $58,000. Includes salary, travel, and materials: position would work for Grupo Jaragua
Action: GRIR; ISG assistance in grant writing if needed.
Potential sources: Brugal Rum Funding-$50,000 - financial support of environmental/educational organization: Ford Foundation- $20–$60,000 award for conservation work: Presidente (beer)- cultural and environmental education award, $1 million –approach for private vehicles (truck or four-wheel drive SUV): private banks-interested in educational programs: Baninter Banco Intercontinental – helped fund Tody campaign: Codetel (Compañía Dominicana de Teléfono).

b) Apply for funding for rapid habitat assessment (3.2.1), estimated costs $20,000, from Shell Grant Funds by 15th December 2002
Action: Alfonso Ferreira; GRIR; ISG; Indianapolis Zoo

c) Apply for funding for Isla Cabritos study (3.1.3), estimated cost $25,000
Action: Alfonso Ferreira; GRIR; ISG; Indianapolis Zoo
Potential sources: Indianapolis Zoo ($10,000)

3.5.2 Realize external / international funding opportunities.

a) Apply for $8,000 for feral mammal control on Isla Cabritos (3.2.5 a,b)
Action: GRIR
Potential sources: International Iguana Foundation; US Fish & Wildlife Foundation (multiple grants available for habitat restoration); Shell Marine Habitat grants, matching funds required, two deadlines annually.

b) Seek funding for other major elements of this Recovery Plan from appropriate international donors
Action: GRIR; ISG; Alfonso Ferreira

Potential sources:

- Conservation International (note mid-year board meeting in Dominican Republic April 2003; biodiversity hot spot and high endemism in Dominican Republic may attract CI support; need to link ISG activities with CI's Caribbean Program and stay in contact to see how this new program is going and what direction they are going).
- MacArthur Foundation
- WWF-Europe -strong interest in Biosphere Reserves
- The Nature Conservancy - new office in Dominican Republic, interested in management of protected areas and bird surveys; potential for funding for habitat assessment
- Interamerican Development Bank
- European Union
- AECI-Agencia España Cooperation International- funding available now, office in Dominican Republic; interested in iguanas, money will be spent by July 2003, so apply by March 2003 (community development projects, ecotourism, environment)
- JICA-Japones Int'l Cooperation Agency
- GEF-Global Environmental Facility
- The Toledo Zoo-funding for captive iguana breeding program
- Morris Animal Foundation-health screening programs.

Parque Nacional Jaragua - *Cyclura ricordii* and *Cyclura c. cornuta* habitat
Photograph by Thomas Wiewandt

4. APPENDICES

4.1 Tables of costs by year

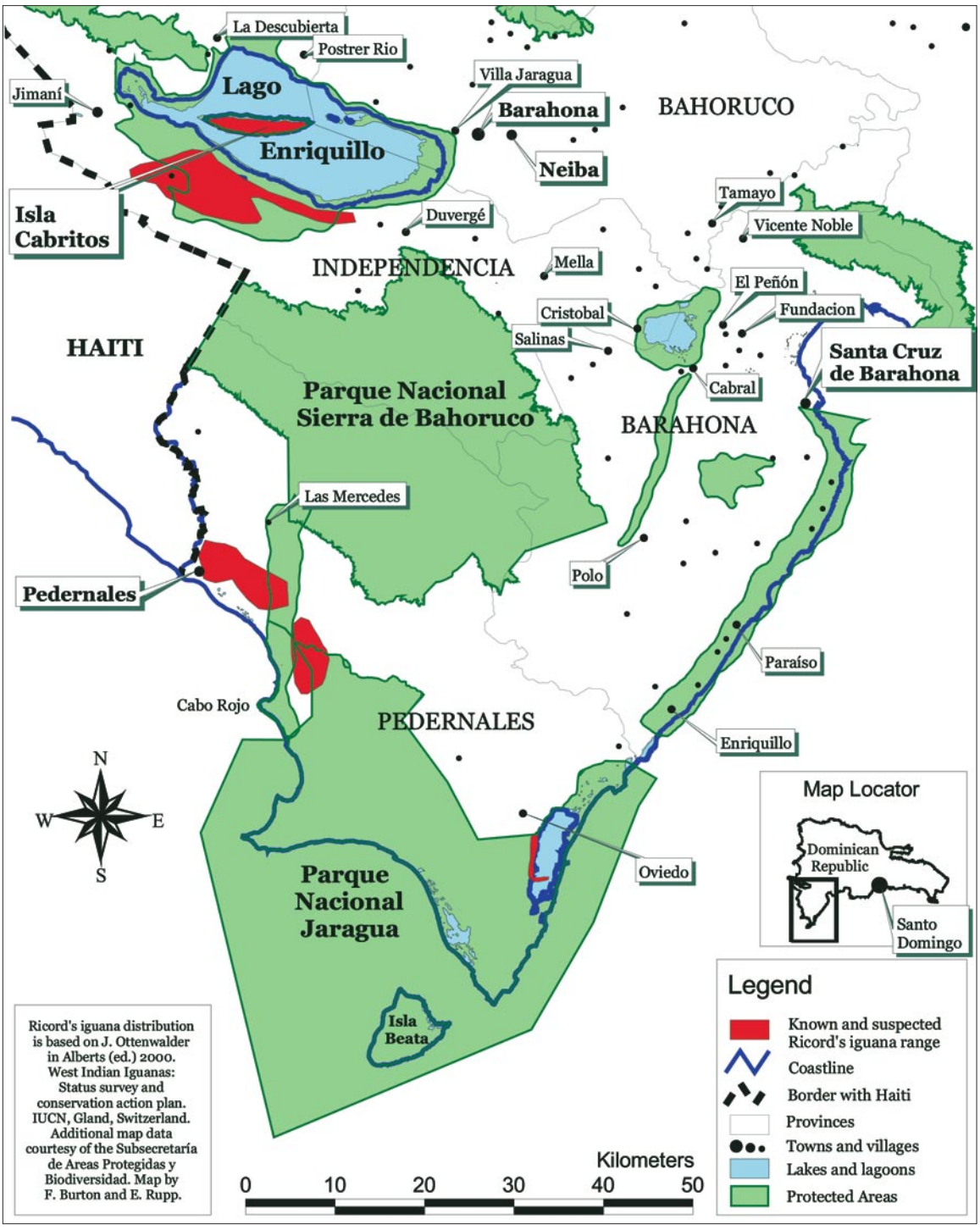
(Expressed in US dollars)

Plan reference	Item	2003	2004	2005	2006	2007
3.1.2	Isla Cabritos surveys and nesting ecology study	$35,000				
3.1.3	Isla Cabritos *cornuta/ ricordii* study	$10,500	$500	$500	$500	$500
3.1.4	Workshop and outputs		$21,500			
3.2.1	Rapid Ricord's iguana habitat survey	$31,560				
3.2.2	Economic alternatives study		$8,750			
3.2.3	Annual habitat assessments		$ 10,000	$ 10,000	$ 10,000	$10,000
3.2.5	Feral cat & dog removal from Isla Cabritos	$8,000				
3.2.6	Exotic plant removal feasibility study		$500			
3.2.7	Seed bank and nursery			$40,000		
3.3.1	ZooDom capacity enhancement	$9,700				
3.3.3	Zoo keeper exchange	$2,000				
3.4.1	Schools curriculum module & video	$2,000	$5,000			
3.4.2	Conservation Education Campaign	$58,000				
3.4.3	Educational sign at ZooDom	$3,000				
3.4.6	Retail product capital	$4,000	$4,000	$4,000	?	?
3.4.7	Web site development	$3,000				
3.4.8	Publication costs	$1,000	$1,000	$1,000		

(Note: this table excludes items for which costs have not yet been determined)

4.2 Maps

4.2.1 Known and suspected ranges of Ricord's iguana in the south-western provinces of the Dominican Republic



4.2.2 Topographic map of the main areas supporting populations of Ricord's iguana

4.3 List of Workshop Participants

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4.4 Addresses and contacts for primary implementing individuals and institutions.

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Land-clearing, lower Barahona Peninsula within Ricord's iguana range
Photograph by John Binns

4.5 Participants of the IUCN / SSC Iguana Specialist Group 2002 Annual Meeting, Dominican Republic.

Back row, left to right:
Dale McGinnity, Quentin Bloxam, José Ottenwalder, John Binns, Josepha Castro, Angélica Espinal, Gloria Santana, Bob Ehrig, Jan Ramer, Fred Burton, Deyanira Rubio, Elizabeth Skeet García and Ron Carter.

Center row, left to right:
Sixto Incháustegui, Steve Conners, Rick Hudson, Gaspar Póns, Joe Wasilewski, Nestor Pérez, Alberto Álvarez, Glenn Gerber, Jeff Lemm, Andy Verhey, Randi Meyerson, Tim Reichard.

Front row (seated), left to right:
Lee Pagni, Thomas Wiewandt, Tandora Grant, Karen Graham, Kelly Bradley, Peter Tolson, Allison Alberts, Miguel García, Rachel Goodman, Chuck Knapp, John Bendon.

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Female Ricord's iguana (*Cyclura ricordii*)
Photograph by Thomas Wiewandt