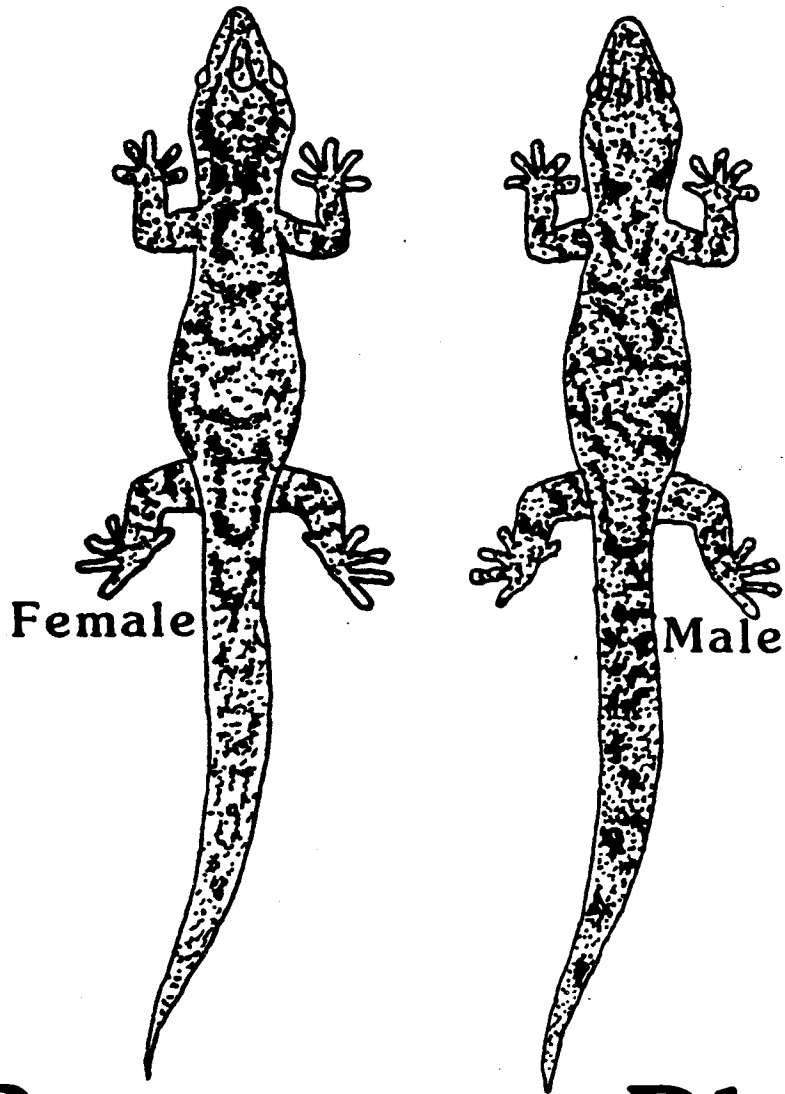


Monito Gecko




Recovery Plan

RECOVERY PLAN FOR THE
MONITO GECKO
(SPHAERODACTYLUS MICROPITHECUS)

by
Jorge A. Moreno

Prepared by the Department of Natural Resources under Order Number
40181-0495 for the U.S. Fish & Wildlife Service.

Approved: 
Acting Regional Director, Southeast Region

Date: March 27, 1986

DISCLAIMER

THIS IS THE COMPLETED MONITO GECKO RECOVERY PLAN. IT HAS BEEN APPROVED BY THE U.S. FISH AND WILDLIFE SERVICE. IT DOES NOT NECESSARILY REPRESENT OFFICIAL POSITIONS OR APPROVALS OF COOPERATING AGENCIES, AND IT DOES NOT NECESSARILY REPRESENT THE VIEWS OF ALL INDIVIDUALS WHO PLAYED A ROLE IN PREPARING THIS PLAN. THIS PLAN IS SUBJECT TO MODIFICATION AS DICTATED BY NEW FINDINGS, CHANGES IN SPECIES STATUS, AND COMPLETION OF TASKS DESCRIBED IN THE PLAN. GOALS AND OBJECTIVES WILL BE ATTAINED AND FUNDS EXPENDED CONTINGENT UPON APPROPRIATIONS, PRIORITIES, AND OTHER CONSTRAINTS.

LITERATURE CITATIONS SHOULD READ AS FOLLOWS:

U.S. Fish and Wildlife Service. 1986. Monito Gecko Recovery Plan.
U.S. Fish and Wildlife Service, Atlanta, Georgia. 18 pp.

ADDITIONAL COPIES ARE FOR SALE FROM:

Fish and Wildlife Reference Service
6011 Executive Boulevard
Rockville, Maryland 20852

301/770-3000 or
1-800-582-3421

TABLE OF CONTENTS

INTRODUCTION.....	1
Description.....	1
Distribution and Habitat.....	2
Feeding Biology.....	3
Reproductive Biology.....	3
Status of the Species.....	4
History of Research.....	5
Causes of Decline.....	5
Conservation Efforts.....	6
RECOVERY.....	7
Recovery Objective.....	7
Step Down Outline.....	7
Narrative.....	10
LITERATURE CITED.....	13
IMPLEMENTATION SCHEDULE.....	15
APPENDIX - List of Reviewers.....	18

I. INTRODUCTION

Description

The Monito gecko, Sphaerodactylus micropithecus, is a small (17-36 mm SVL) gekkonid lizard related to S. macrolepis of Puerto Rico. Schwartz (1977) and Dodd (1985) suggest that S. micropithecus is a remnant of the pre-Eocene fauna of the eastern Greater Antilles and is closely allied to S. macrolepis, which presumably gave rise to Puerto Rico's present sphaerodactilids.

Dodd & Ortiz (1983) describe the dorsal and ventral ground color as light to dark gray, with juveniles darker than the adults. Scapular patches are present, sometimes with nearly white ocelli. The tan to dark brown tail coloration contrasts with the gray dorsum. Preserved individuals lose their gray hue and appear tan.

The following scale characters were measured by Schwartz (1977) and Dodd & Ortiz (1983): keeled, imbricate, dorsal scales from axilla to groin 33-36; mid-body scales 51-56; supralabial scales to mid-eye 3; intranasal scales 1; escutcheon scales 7 x 14, 6 x 14; ventral scales from axilla to groin 32-33.

Distribution and Habitat

The Monito gecko is endemic to Isla Monito, a 0.15 sq km limestone islet lying 5 km northwest of Mona Island, halfway between Puerto Rico and the Dominican Republic (lat. 18° 10', long. 67° 57'). Ewel & Whitmore (1973) classified Monito's vegetation within Holdridge's sub-tropical dry forest life zone. Mean annual precipitation is 79 cm. February is the driest month and October the wettest, with 2.8 and 10.9 cm of rainfall, respectively. The dry season extends from January through April. The mean annual temperature is 78.8°F, the highest mean daily maximum temperature occurs in August with 90.2°F and the lowest mean daily minimum occurs in January with 68.9°F. Daily range varies from 14.4°F in June to 16.8°F in March. Dominant plant species include such xeric adapted species as Pithecellobium unguis-cati and Capparis flexuosa.

Topographically, the island is a relatively flat plateau surrounded by vertical cliffs, many with bases undercut by wave action. The highest point on the island rises 66 m above sea level.

Other vertebrate fauna on Monito include several species of marine birds, the lizards Anolis monensis and Mabuya mabouia, and black rat (Rattus rattus).

Little is known regarding habitat preferences of this gecko species. Ortiz (1982) describes the collecting sites as "...several loose rock

sheets or small piles of rock opened to the sun, with little or no cover. Some sites had a few small cacti growing on them or had a few bushes nearby." Like other Sphaerodactylus, it appears to prefer scurrying about under rocks and vegetation.

Dodd & Ortiz (1983) reported that the gecko is restricted to the margins of Monito, but Hammerson (1984) found individuals in the interior portion of the southeastern quarter of the island. Habitat at all sites is similar.

Feeding Biology

There is no information on diet and feeding biology of the Monito gecko.

Reproductive Biology

Seasonality in the reproductive activity of other species of tropical lizards has been reported but there is little information available on sphaerodactyls (Gaa, 1981, 1983). Reproductive patterns among tropical lizards seem to differ between different populations of the same species and among different species that occur in the same area. Data collected on two species of Sphaerodactylus from Puerto Rico suggest that reproductive activity is synchronized with short-term climatological factors (Gaa, 1983).

Campbell (in Schwartz, 1977) collected an egg on May 20, 1974. Dodd & Ortiz (1983) found gravid females and juveniles on August 24 and 25, 1983. Based on these observations and known gestation times of other species of Sphaerodactylus, Dodd & Ortiz estimated that reproduction occurs at least between March and November. No additional information on breeding biology is available.

Status of the Species

Nothing is known about population levels of the Monito gecko. Since its discovery, two surveys have been conducted. A total of twenty-four individuals were reported and six are preserved in museums (Smithsonian Institution: USNM 229891-2; Florida State Museum: UF/FSLM 21570-1; Puerto Rico Department of Natural Resources: sn [without catalog number]). Surveys were conducted only at one time of the year and during the day. Censusing techniques consisted of careful searches under debris spread across the island. Numerous small crevices provide potential shelters inaccessible to human observers. These past censusing techniques do not allow for an accurate estimate of population abundance.

History of Research

Since the description of the species by Schwartz (1977), two field surveys (Ortiz, 1982; Hammerson, 1984) were carried out to obtain information on the status and ecology of the Monito gecko. No other known research has been conducted on this species.

Causes of Decline

A lack of knowledge about historical population trends and basic ecological requirements precludes a cogent discussion of causes of decline. The possibility of predation and habitat destruction and modification being agents which cause population declines is considered here. Dodd & Ortiz (1983) suggested predation by Rattus rattus as a possible cause of decline but no actual observations or evidence of predation on the Monito gecko have been reported.

Although the island is now protected, just after World War II Monito was used as a bombing range by U.S. military forces. The large amounts of scattered debris on Monito suggest significant habitat destruction and modification.

Conservation Efforts

Following Dodd's (1980) suggestion, the U.S. Fish and Wildlife Service (Federal Register 10/15/82) listed the Monito gecko as endangered under the provisions of the Endangered Species Act of 1973, as amended, and designated Monito Island as its critical habitat.

In 1985, the Monito gecko was listed as endangered under Puerto Rico's Regulation to Govern the Management of Threatened and Endangered Species in the Commonwealth of Puerto Rico.

Monito's inaccessibility, its designation as critical habitat, and its management and protection by the Puerto Rico Department of Natural Resources (DNR), reduce the threat of human interference. Visits to Monito are not permitted. A DNR Ranger detachment and a resident biologist are stationed on nearby Mona Island.

II. RECOVERY

A. Recovery Objective

The recovery objective is to bring the Monito Gecko population to a level where it can be delisted as an Endangered Species. Lack of data on historic population levels, population trends, and present population size precludes the formulation of a quantitative recovery level for delisting. A comprehensive status survey and ecological study of the species are needed before specific recovery actions can be initiated. Therefore, the objective of the present plan is to gather such information, re-evaluate the species' status using the information and formulate a quantitative recovery level and specific recovery actions.

B. Step-down Outline

1. Determine the status of the present population
 - 1.1. Survey the existing population to estimate population density and distribution and develop a population model
 - 1.2. Perform periodic surveys to determine population trends
2. Conduct basic ecological studies

- 2.1. Determine habitat preferences
- 2.2. Determine seasonal fluctuations in reproductive biology and environmental correlates
- 2.3. Determine seasonal fluctuations in activity patterns and environmental correlates
3. Determine extent, if any, of predation and competition by three species
 - 3.1. Predation by rats
 - 3.11. Determine if rats predate upon the gecko
 - 3.12. Initiate control or eradication program, as necessary
 - 3.2. Determine extent, if any, of predation and/or competition by Anolis and Mabuya
4. Update Recovery Plan
 - 4.1. Review resulting data from objectives 1, 2, and 3
 - 4.2. Include data in updated Recovery Plan

- 4.3. Determine quantified recovery level
- 4.4. Determine activities required for recovery and include in step-down outline
- 5. Continue protection of the present population
 - 5.1. Discourage human visitation to the island
 - 5.2. Maintain the DNR Ranger Detachment and Resident Biologist on nearby Mona Island

C. Narrative

1. No accurate data on present population size or historical trends are available for the Monito gecko. The difficulty in obtaining an accurate population estimate precludes the use of a quantitative recovery level. A pilot study is needed to solve this problem. Periodic surveys (every month) stretching over at least two years would give information on population density and composition and their fluctuations over time. These data will aid in developing a population model that could be used as a standard to assess trends over an additional three to five year period. An indication of a stable or growing population can then be used as one of the criteria of recovery leading to delisting.

2. An ecological study to determine habitat preferences, breeding biology, and seasonal fluctuations in density of S. micropithecus is needed as an aid in formulating management decisions. Habitat preferences can be recorded as density estimates are obtained. Such factors as surface moisture, extent of vegetation, and time of day and month will play an important role in determining gecko activity patterns.

2.1. Knowledge of habitat preferences of the species is marginal. A detailed long-term analysis of microhabitats is needed.

2.2., 2.3. Information on seasonal fluctuations in numbers and breeding activity and their correlation with environmental factors (e.g., rainfall, temperature, and food availability) will aid in developing a population model.

3. A detailed study of the feeding habits and habitat of Rattus, Anolis, and Mabuya should be initiated to determine to what extent, if any, these species are interacting with the Monito gecko. Periodic trapping and subsequent stomach analyses coupled with observations should determine if a predation/competition problem exists. If Rattus is a significant problem to the gecko, an immediate control program would be required.

4.1, 4.2. Review data gained from recovery objectives 1 through 3 and revise the Recovery Plan to include this information.

4.3. Based on the new data, formulate a quantifiable recovery level at which the Monito Gecko can be considered recovered and subsequently delisted.

4.4. Develop new recovery objectives that include specific recovery actions designed to bring the gecko population to the identified level.

5. The DNR Ranger detachment and the Resident Biologist on nearby Mona Island are in charge of the protection and management of Mona Island and Monito Island.

LITERATURE CITED

- Dodd, C. K., Jr. 1980. Proposed listing with endangered status and critical habitat for the Monito Gecko. Fed. Reg. 45(206): 70, 192-70, 195.
- ____ & P. R. Ortiz. 1983. An endemic gecko in the Caribbean. *Oryx* 17(3): 119-121.
- ____. 1985. Sphaerodactylus micropithecus Schwartz, Monito gecko. Catalogue of American Amphibians and Reptiles 363.1-363.2. Society for the Study of Amphibians and Reptiles Publications.
- Ewel, J. J. & J. L. Whitmore. 1973. The ecological life zones of Puerto Rico and the U.S. Virgin Islands. ITF Research Paper 18: 1-72.
- Gaa, A. 1981. Life histories for two species of Sphaerodactylus (Gekkonidae) in Puerto Rico. 25th Annual Meeting, Society for the Study of Amphibians and Reptiles, North Carolina.

- ____. 1983. Aspects of the life history of two species of Sphaerodactylus (Gekkonidae) in Puerto Rico. MS Thesis, Univ of Puerto Rico, 41pp.
- Hammerson, G. A. 1984. Monito gecko survey. Department of Natural Resources, Puerto Rico. 3pp.
- Ortiz, P. R. 1982. Status survey of the Monito gecko, Sphaerodactylus micropithecus (Sauria: Gekkonidae). Department of Natural Resources, Puerto Rico. 13pp.
- Schwartz, A. 1977. A new species of Sphaerodactylus (Sauria, Gekkonidae) from Isla Monito, West Indies. Proc. Biol. Soc. Wash. 90(4): 985-992.

Monito Gecko

Part III Implementation Schedule

Gen Cat	Plan Task	Task Number	Priority	Task Duration	Responsible Agency			Estimated Fiscal Year Costs		
					FWS Region	Program	Other	FY 1	FY 2	FY 3
R-1	Survey existing population	1.1	2	3 yr	4	FA/SE*	DNR	30,000	30,000	30,000
R-1	Perform periodic surveys to determine population trends	1.2	2	Cont	4	FA/SE*	DNR	30,000	30,000	20,000
R-3	Determine habitat preferences	2.1	2	2 yr	4	*SE/RES	DNR			
R-7	Determine seasonal fluctuations in reproductive biology & environmental correlations	2.2	3	3 yr	4	*SE/RES	DNR	30,000+	30,000+	30,000+
R-14	Determine seasonal fluctuations in activity patterns & environmental correlations	2.3	3	3 yr	4	*SE/RES	DNR			
R-9	Determine extent of predation by rats	3.11	2	2 yr	4	*SE/RES	DNR			
M-4	Control or eradicate rats as necessary	3.12	2	Cont	4	FA/SE*	DNR	10,000	10,000	10,000
R9-10	Determine extent, if any, of predation & competition by <u>Anolis</u> and <u>Mabuaya</u>	3.2	2	2 yr	4	*SE/RES	DNR			
M-7	Update Recovery Plan	4	2	1 yr	4	FA/SE*				
01-2	Discourage human visitation to Isla Monito	5.1	3	Cont	4	FA/SE	DNR*			

Monito Gecko

Part III Implementation Schedule (Page 2)

Gen Cat	Plan Task	Task Number	Priority	Task Duration	Responsible Agency			Estimated Fiscal Year Costs		
					FWS Region	Program	Other	FY 1	FY 2	FY 3
0-2	Maintain ranger detachment & resident biologist on nearby Mona Island	5.2	3	Cont	4	FA/SE	DNR*	175,000	175,000	175,000

DNR = Puerto Rico Department of Natural Resources
 SE = US Fish and Wildlife Service, Endangered Species
 RES = US Fish and Wildlife Service, Research

+Basic life history studies - (Task Numbers 2.1, 2.2, 2.3, 3.1, and 3.2) - should be conducted under one general study, Therefore, estimated yearly expenditures are reflected as one total cost.

*Asterisks indicate primary funding source either present or anticipated.

Enforcement (task 5.2) estimates cover all Mona Island and Isla Monito activities.

KEY TO IMPLEMENTATION SCHEDULE COLUMNS 1 & 4

General Category (Column 1):

Information Gathering - I or R (research)

1. Population status
2. Habitat status
3. Habitat requirements
4. Management techniques
5. Taxonomic studies
6. Demographic studies
7. Propagation
8. Migration
9. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. Other information

Acquisition - A

1. Lease
2. Easement
3. Management agreement
4. Exchange
5. Withdrawal
6. Fee title
7. Other

Other - 0

1. Information and education
2. Law enforcement
3. Regulations
4. Administration

Management - M

1. Propagation
2. Reintroduction
3. Habitat maintenance and manipulation
4. Predator and competitor control
5. Depredation control
6. Disease control
7. Other management

Priority (Column 4):

- 1 - An action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.
- 2 - An action that must be taken to prevent a significant decline in species population/habitat quality or some other significant negative impact short of extinction.
- 3 - All other actions necessary to provide for full recovery of the species.

APPENDIX

List of Reviewers for the Monito Gecko Recovery Plan - Technical/Agency Draft

Dr. Frank Wadsworth
Institute of Tropical Forestry
P.O. Box AQ
Rio Piedras, Puerto Rico 00928

Mr. Sean Furniss
Caribbean Islands NWR
P.O. Box 510
Boqueron, Puerto Rico 00622

Dr. Jim Wiley
Fish & Wildlife Service
P.O. Box 21
Palmer, Puerto Rico 00901

Dr. Kenneth Dodd
U.S. Fish and Wildlife Service
Department of the Interior
18th and C Streets, NW.
Washington, DC 20240

Dr. Juan Rivero
Biology Department
University of Puerto Rico
Mayaguez, Puerto Rico 00708

Dr. Richard Thomas/& A. Gaa
Biology Department
University of Puerto Rico
Rio Piedras, Puerto Rico 00931

Alejandro S. Nieves, Secretary
Department of Natural Resources
P.O. Box 588
Puerta-de-Tierra, Puerto Rico 00906