CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Edited and Translated by
Eduardo Alvarez-Cordero, Julieta Samudio, César Márquez Reyes,
Belkys Jiménez Ruíz, Jorge Zalles and Susie Ellis

Compiled by the Workshop Participants

A Collaborative Workshop

ANCON

IUCN/SSC Tapir Specialist Group

IUCN/SSC Conservation Breeding Specialist Group

Sponsored by

The Zoological Society of San Diego

The Wildlife Conservation Society

American Airlines

Walt Disney World Co.

A contribution of the IUCN/SSC Conservation Breeding Specialist Group.

Conservation Assessment and Management Plan for Bird and Mammal Species Endemic to Panama. Working Draft Report. Eduardo Alvarez-Cordero, Julieta Samudio, César Márquez Reyes, Belkys Jiménez Ruíz, Jorge Zalles and Susie Ellis (Eds.). IUCN/SSC Conservation Breeding Specialist Group: Apple Valley, MN 1997.

Additional copies of this publication can be ordered through the IUCN/SSC Conservation Breeding Specialist Group, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124 USA. Send checks for US $35 (for printing and shipping costs) payable to CBSG; checks must be drawn on a US bank. Funds may be wired to First Bank NA ABA 091000022, for credit to CBSG Account No. 1100 1210 1736.

The CBSG Institutional Conservation Council : these generous contributors make possible the work of the Conservation Breeding Specialist Group

Conservators ($10,000 and above)
Australasian Species Management Prog.
California Energy Co., Inc.
Chicago Zoological Society
Columbus Zoological Gardens
Denver Zoological Gardens
Exxon Corporation
Fossil Rim Wildlife Center
International Union of Directors of Zoological Gardens
Metropolitan Toronto Zoo
Minnesota Zoological Garden
Omaha's Henry Doorly Zoo
Saint Louis Zoo
Sea World, Inc.
Walt Disney World Company
White Oak Conservation Center
Wildlife Conservation Society - NY
Zoological Society of Cincinnati
Zoological Society of San Diego

Guardians ($5,000-$9,999)
Cleveland Zoological Society
Friends of Zoo Atlanta
John G. Shedd Aquarium
Loro Parque
Lubee Foundation
Toledo Zoological Society
Zoological Parks Board of New South Wales

Protectors ($1,000-$4,999)
Allwetter Zoo Munster
Africam Safari
Audubon Institute
Bristol Zoo
Burgers' Zoo
Caldwell Zoo
Calgary Zoo
Cologne Zoo
Copenhagen Zoo
Detroit Zoological Park
El Paso Zoo
Federation of Zoological Gardens of Great Britain and Ireland
Fort Wayne Zoological Society
Fort Worth Zoo
Gladys Porter Zoo
Greater Los Angeles Zoo Association
Houston Zoological Garden
Indianapolis Zoological Society
International Aviculturists Society
Japanese Association of Zoological Parks & Aquariums
Jersey Wildlife Preservation Trust
Living Desert
Marwell Zoological Park
Milwaukee County Zoo
NOAHS Center
North Carolina Zoological Park
North of England Zoological Society,
Zoological Society of London
Chester Zoo
Oklahoma City Zoo
Paignton Zoological & Botanical Gardens
Parco Natura Viva Garda Zoological Park
Penscynor Wildlife Park
Philadelphia Zoological Garden
Phoenix Zoo
Pittsburgh Zoo
Royal Zoological Society of Antwerp
Royal Zoological Society of Scotland
San Antonio Zoo
San Francisco Zoo
Schoenbrunner Tiergarten
Sedgwick County Zoo
Sunset Zoo (10 year commitment)
Taipei Zoo
The WILDS
The Zoo, Gulf Breeze, FL
Urban Council of Hong Kong
Union of German Zoo Directors
Washington Park Zoo
Wassenaar Wildlife Breeding Centre
Wilhelma Zoological Garden
Woodland Park Zoo
Yong-In Farmland
Zoological Parks Board of Victoria
Zoological Park Organization
Zurich Zoological Garden

Stewards ($500-$999)
Aalborg Zoo
Arizona-Sonora Desert Museum
Banham Zoo
Camperdown Wildlife Center
Cotswold Wildlife Park
Dickerson Park Zoo
Dutch Federation of Zoological Gardens
Erie Zoological Park
Fota Wildlife Park
Givskud Zoo
Granby Zoological Society
Great Plains Zoo,
Knoxville Zoo
Lincoln Park Zoo
Nat. Zool. Gardens of South Africa
Odense Zoo
Orana Park Wildlife Trust
Paradise Park
Prudence P. Perry
Perth Zoological Gardens
Riverbanks Zoological Park
Rolling Hills Ranch (5 year commitment)
Rostock Zoo
Royal Zoological Society of Southern Australia
Rotterdam Zoo
Thrigby Hall Wildlife Gardens
Tierpark Rheine
Twycross Zoo
Wellington Zoo
World Parrot Trust
Zoo de la Casa de Campo-Madrid
Welsh Mt. Zoo/Zool. Society of Wales
Zoologischer Garten Frankfurt

Curators ($250-$499)
Emporia Zoo
Marie and Edward D. Plotka
Racine Zoological Society
Roger Williams Zoo
The Rainforest Habitat
Topeka Zoological Park
Tropical Bird Garden

Sponsors ($50-$249)
African Safari
Alameda Park Zoo
Shigeharu Asakura
Apenheul Zoo
Belize Zoo
Brandywine Zoo
Claws 'n Paws
Darmstadt Zoo
Elaine M. Douglass
Dreher Park Zoo
Endangered Wildlife Trust
Exotarium
Hancock House Publisher
Marvin Jones
Kew Royal Botanic Gardens
Lisbon Zoo
Miller Park Zoo
National Aviary in Pittsburgh
National Birds of Prey Centre
Jean H. Nudell
Ocean World Taipei Incorporation
Steven J. Olson
PAAZAB
Parco Faunistico "La Torbiera"
Potter Park Zoo
Teruku Shimizu
Tokyo Zoological Park Society
Touro Parc-France

Supporters ($25-$49)
Bighorn Institute
DGHT Arbeitsgruppe Anuren
Folsom Children's Zoo & Botanical Garden
Jardin aux Oiseaux
Lee Richardson Zoo
Memphis Zoo
Natur- u. Artenschutz in den Tropen
Oglebay's Good Children's Zoo
Speedwell Bird Sanctuary
Tautphaus Park Zoo
Terrasimia Preservation Trust
Zoocheck Canada Inc.
Zoological Society of Trinidad & Tobago

1 April 1997

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

TABLE OF CONTENTS

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Executive Summary

Over the past 20 years, the Neotropics have become a focal point for conservation efforts. Most species inhabiting this ecologically important region are particularly susceptible to human disturbance (both hunting and habitat destruction), and a significant number now are considered threatened. Many of these species are candidates for use as bio-indicators for monitoring and management of protected areas throughout Latin America, as well as for flagship species for the conservation of Neotropical rainforests.

This document is a result of a workshop held at facilities of ANCON (Asociación Nacional para la Conservación de la Naturaleza) at the Environmental Education Center Río Chagrés from 28 - 30 November 1994. The Walt Disney World Co., Wildlife Conservation Society, American Airlines, and the Zoological Society of San Diego sponsored the workshop. Twenty-four participants from four countries reviewed available data for the endemic birds and mammals of Panama and discussed the status of the wild populations of these species. Because few of these species are currently found in or require captive programs, considerable emphasis was placed on in-situ programs and the further development of the networks among Panamanian researchers.

The results of the CAMP underline the need for further collaborative efforts to conserve the endemic birds and mammals of Panama. The deteriorating conservation status of many species, even during the last decade, emphasized the need for immediate action. The participants reached consensus that efforts to conserve these species should focus on field programs, and that additional information on distribution, population status, ecology and biology are of vital importance.

Summary of CAMP Recommendations

One hundred and four (104) distinct avian taxa (subspecies or species if no subspecies are contained therein or regional populations of species or subspecies) and 38 distinct mammal taxa, distributed in Panama as well as the two neighboring countries, Costa Rica and Colombia, were considered by the Conservation Assessment and Management Plan for Species Endemic to Panama. Of the 142 taxa, 97 (68%) were assigned to one of three categories indicating threatened status, based on the new IUCN Red List criteria:

Extinct (?)	1 taxon
Critical	15 taxa
Endangered	37 taxa
Vulnerable	44 taxa
Conservation Dependent	2 taxa
Low Risk	37 taxa
Data Deficient	6 taxa

Of all the threats facing the endemic birds and mammals of Panama, the most striking is habitat loss and fragmentation, primarily caused by deforestation and conversion of forest to agriculture, as well as ranching, logging, and other human activities. Associated uses of biocides also contribute to species decline. Direct human activities, such as persecution (extermination of 'pest' species), hunting, and direct interference via activities such as ecotourism, also pose serious threats. The proposed construction of the Panamerican Highway, which will link Panama and Colombia, and its concomitant effect on land use and spontaneous human colonization will likely cause drastic changes in the diversity of both avian and mammalian species in the area through associated deforestation and fragmentation of forest. Workshop participants agreed that the detriment to the biodiversity in the corridor through which the project is to run is significant, and that the construction of the Highway will likely lead to irretrievable losses and changes in the plant and animal life in the region.

Seventy-four of the 142 taxa (52%) were recommended for Population and Habitat Viability Assessment (PHVA) workshops. Tentative or "pending" PHVA workshops were recommended for 13 taxa (9%).

Recommendations for Research Management were made in the following categories:

Survey	109 taxa
Monitoring	125 taxa
Life history research	34 taxa
Limiting factors research	24 taxa
Limiting factors management	18 taxa
Habitat management	38 taxa
Taxonomic research	13 taxa
Husbandry research	1 taxon

For most taxa, more than one type of research management was recommended. It was the consensus of the workshop participants that field investigations and management programs to aid conservation of Panamanian species *in situ* should be the highest priority among all activities recommended by the CAMP. We especially lack data from the field: surveys, ecological studies and applied investigations of species biology (including ethnobiological investigations of hunting and habitat modification pressures affecting the species) are of paramount importance. Monitoring of populations is also a high priority, particularly when

undertaken in conjunction with larger scale programs to monitor the status and ecological health of protected areas and other natural habitats.

Two taxa (1%) were recommended for one of three levels of captive programs (based in part on draft IUCN Red List criteria):

Level 1	1 taxon
Level 3	1 taxon

Captive programs for 18 taxa were listed as "pending," meaning that recommendations for such would be postponed until further information was available, either from survey, a PHVA, or from sources which need to be queried. One hundred and eighteen taxa were identified as not requiring captive programs.

The participants in the CAMP for the endemic bird and mammal species of Panama wish to emphasize that we do not view the recommendations of this document as "stand-alone" initiatives. Rather, the reader is encouraged to see these activities as components of the overall need for the conservation of Neotropical ecosystems. Many of the species reviewed in this document are excellent candidates (as bio-indicators, key species or flagships) to help facilitate larger-scale conservation programs. We therefore urge their inclusion in the planning stages of projects related to research, monitoring and further management of Panamanian forests, protected areas and other natural ecosystems.

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Section 1

CAMP Workshop Overview

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRDS AND MAMMALS ENDEMIC TO PANAMA

Introduction

Reduction and fragmentation of wildlife populations and habitat are occurring at a rapid and accelerating rate worldwide. For an increasing number of taxa, the results are small and isolated populations at risk of extinction. A rapidly expanding human population, now estimated at 5.25 billion, is expected to increase to 8 billion by the year 2025. This expansion and concomitant utilization of resources has momentum that cannot be stopped, the result being a decreased capacity for all other species to simultaneously exist on the planet.

In Latin America, habitat destruction and the over-exploitation of wildlife have become increasing threats to the survival of natural environments. As wildlife populations are diminished through hunting and fragmentation, their ecological roles in ensuring a well-balanced, regulated and sustainable ecosystem are also reduced. Still, most conservation actions are directed toward the protection of habitat and reserves, rather than the conservation and management of the wildlife components that are critical to the long-term survival of Neotropical ecosystems.

Wildlife managers realize that management strategies must be adopted that will reduce the risk of species depletion in order to ensure viable ecosystem functions. These strategies will be global in nature and will include habitat preservation, intensified information gathering in the field, investigations regarding the ecological roles of key species, the development of improved biological monitoring techniques, and in some cases, scientifically managed captive populations that can interact genetically and demographically with wild populations.

The successful conservation of wild species and ecosystems necessitates development and implementation of active management programs by people and governments living alongside that ecosystem. The recommendations contained within this document are based on conservation need only; adjustments for political and other constraints are the responsibility of the Panamanian agencies charged with the preservation of flora and fauna within their country.

Conservation Assessment and Management Plans (CAMPs)

Within the Species Survival Commission (SSC) of IUCN-The World Conservation Union, the primary goal of the Conservation Breeding Specialist Group (CBSG) is to contribute to the development of holistic and viable conservation strategies and management action plans.

Toward this goal, CBSG is collaborating with agencies and other Specialist Groups worldwide in the development of scientifically-based processes, on both a global and regional basis, with the goal of facilitating an integrated approach to species management for conservation. One of these tools is called Conservation Assessment and Management Plan (CAMP).
CAMPs provide strategic guidance for the conservation of threatened taxa. This may include recommendations for field investigations and improved data-gathering methods, as well as the application of intensive management techniques that are increasingly required for survival and recovery of threatened taxa. The CAMP process ensures an objective overall view of the status of the taxa in question with the intent of improving the effectiveness and synergy of conservation efforts. CAMPs are also one means of testing the applicability of the draft IUCN Red List criteria for threat (Mace et al., 1994) as well as the scope of its applicability. Additionally, CAMPs are an attempt to produce ongoing summaries of current data for groups of taxa, providing a mechanism for recording and tracking of species status.

CAMP recommendations are broad-based -- of paramount importance are those recommendations related to field surveys, applied investigations and *in situ* conservation and management programs. Ultimately, the survival of taxa in the wild will depend on the availability of field data regarding the status of natural populations, the ecological role of the species (and its interdependence on other taxa), life history parameters, and applied investigations related to management and conservation. Where such data are lacking, a primary recommendation of the CAMP will be to stimulate their collection.

In addition to management of taxa in their natural habitat, conservation programs leading to viable populations of threatened species may sometimes need a captive component. In general, captive populations and programs can serve several roles in holistic conservation:
1) as genetic and demographic reservoirs that can be used to reinforce wild populations either by revitalizing populations that are languishing in natural habitats or by re-establishing by translocation populations that have become depleted or extinct; 2) by providing scientific resources for information and technology that can be used to protect and manage wild populations; and 3) as living ambassadors that can educate the public as well as generate funds for *in situ* conservation.

Captive management programs should only be developed in conjunction with ongoing field investigations and conservation initiatives. This document does not intend to promote the establishment of captive programs in isolation from *in situ* programs. Rather, it is proposed that, when captive populations can assist species conservation, captive and wild populations should, and can be, intensively and interactively managed together. For instance, with the development of appropriate techniques, interchanges of animals between captive and wild populations can be undertaken as needed and as feasible to maintain genetic and demographic viability of the species in the field.

An Overview of the Endemic Birds and Mammals of Panama

Panama is one of the most important centers for biodiversity in Central America, yet there exists little information concerning its wildlife. Although there are more than 230 species of mammals, 929 species of birds (with 145 migratory species), 224 reptile species, 160 amphibians, and some 7,897 species of vascular plants, there has been a decrease in the number of species that is associated with the destruction of habitat. In particular, a great deal of habitat has been lost or fragmented by deforestation, and other factors affecting species survival including the use of pesticides, pollution, trade, and poaching.

As such, there are numerous species in Panama that likely are on the road to extinction, including mammals, birds, reptiles, and amphibians, indicating that there is great need for actions to provide for their protection and recovery in the wild.

Panama is making great efforts to conserve its biodiversity. Protected areas integrate 14 national parks (encompassing 1,340,372 hectares or 18% of the country); there also are 7 forest reserves, 9 wildlife refuges, 2 protected forests, and some 6 other categories comprising 748,511.5 hectares, making a grand total of 2,088,883 hectares. These protected areas provide refuge for a large number of species, and have been designed to overlay the distribution of many endemic species, in particular, the mammals.

The CAMP Process

The CAMP process assembles expertise on wild and captive management for the taxonomic group under review in an intensive and interactive workshop format. The purpose of the Conservation Assessment and Management Plan (CAMP) workshop for Endemic Birds and Mammals of Panama was to assist in the further development of a conservation strategy for these species. On 28-30 November 1994, 22 individuals met in at the Environmental Center at Río Chagres, Panama to review, refine, and develop further conservation strategies for the endemic birds and mammals of Panama. This workshop was held in conjunction with a Population and Habitat Viability Assessment workshop for Baird's tapir (*Tapirus bairdii).* Participants in the workshop are listed in Appendix I.

Participants in the CAMP divided into two groups, one focusing on birds and the other on mammals. The assessments and recommendations of the working group were circulated to the entire group prior to final consensus of the groups, as represented in this document. Summary recommendations concerning research management, field initiatives, assignment of all taxa to threatened status, and captive breeding were supported by the participants in each of the working groups.

CAMP Workshop Goals

The goals of the CAMP workshop were:

1) To review the population status and demographic trends for bird and mammal species endemic to Panama, to test the applicability of the draft IUCN Red List criteria for threat, and to discuss management options for these taxa.

2) To provide recommendations for *in situ* management, research and information-gathering for all reviewed taxa, including: field investigations; surveys, population monitoring and investigation of limiting factors; taxonomic studies; recommendations for PHVA workshops; more intensive management in the wild; or other specific research.

3) To provide recommendations for *ex situ* management and research for the taxa, including husbandry, maintenance of viable captive populations of the more threatened species (where feasible and desirable) and the development of collaborative captive/field programs.

4) To produce a discussion draft Conservation Assessment and Management Plan for Endemic Bird and Mammal Species of Panama, presenting the recommendations from the workshop, for distribution to and review by workshop participants and all parties interested in conservation of the taxa reviewed.

New IUCN Red List Categories

The threatened species categories now used in IUCN Red Data Books and Red Lists have been in place, with some modification, for almost 30 years (Mace et al., 1994). The Mace-Lande criteria (Mace & Lande, 1991) were one developmental step in an attempt to make those categories more explicit. These criteria subsequently have been revised and formulated into new IUCN Red List Categories (Mace et al., 1994), which are being used in the CAMP process.

During the workshop, all endemic bird and mammal taxa were evaluated on a taxon-by-taxon basis in terms of their current and projected status in the wild to assign priorities for conservation action or information-gathering activities. Data used in this evaluation were on a best-estimate basis as gathered by workshop participants, and are subject to further review by other experts in the field.

The newt IUCN Red List Categories provide a system that facilitates comparisons across widely different taxa, and is based both on population and distribution criteria. The latter is particularly important for taxa for which it is difficult or not possible to estimate or use

population-based data. Like the Mace-Lande criteria, the new criteria can be applied to any taxonomic unit at or below the species level, with sufficient range among the different criteria to enable the appropriate listing of taxa from the complete spectrum of taxa, with the exception of micro-organisms.

The categories of Critical, Endangered, and Vulnerable are all nested (i.e., if a taxa qualifies for Critical, it also qualifies for Endangered and Vulnerable). The draft IUCN Red List Categories Are: Extinct (EX); Extinct in the Wild (EW); Critical (CR); Endangered (EN); Vulnerable (VU); Conservation Dependent (CD); Low Risk (LR); Data Deficient (DD); and Not Evaluated (NE).

Definitions of these criteria are based on population viability theory. In assessing threat according to draft IUCN Red List criteria, workshop participants also used information on the status and interaction of habitat and other characteristics (Table 1). Information about population trends, fragmentation, range, and stochastic environmental events, real and potential, also were considered.

To assist in making recommendations, participants in the workshop were encouraged to be as quantitative or numerate as possible for two reasons: 1) CAMPs ultimately must establish numerical objectives for viable population sizes and distributions; 2) numbers provide for more objectivity, less ambiguity, more comparability, better communication, and, hence, cooperation. During the workshop, there were many attempts to estimate if the total population of each taxon was greater or less than the numerical thresholds for the three Mace-Lande categories of threat. In many cases, current population estimates for taxa were unavailable or available for species/subspecies within a limited part of their distribution. In all cases, if presented, conservative numerical estimates were used. **When population numbers were estimated, these estimates represented first-attempt, order-of-magnitude educated guesses that were hypotheses for falsification. As such, the workshop participants emphasized that these estimates should not be authoritative for any other purpose than was intended by this process.**

Table 1. DRAFT IUCN RED LIST CATEGORIES - FEBRUARY 1994

ANY of the following criteria may be used to assign categories:	**CRITICAL**	**ENDANGERED**	**VULNERABLE**
Population reduction	≥ 80% decline in last 10 yrs based on:	≥ 50% decline in last 10 yrs or 2 generations based on:	≥ 50% decline in last 20 yrs or 5 generations based on:
	a) direct observation OR b) decline in area of occupancy, occurrence and/or habitat quality OR c) actual or potential levels of exploitation OR d) introd. taxa, hybridization, pathogens, pollutants, competitors or parasites		
	OR	OR	OR
	≥ 80% decline/10yrs predicted in near future	≥ 50% decline/10 yrs or 2 generations predicted in near future	≥ 50% decline/20 yrs or 5 generations predicted in near future
Extent of occurrence	Est. <100 km^2 or area of occupancy est. <10 km^2, AND TWO of the following:	Est. <5,000 km^2 or area of occupancy est. <500 km^2, AND TWO of the following:	Est. <20,000 km^2 or area of occupancy est. <2,000 km^2, AND TWO of the following:
	Severely fragmented OR single location.	Severely fragmented OR ≤ 5 locations	Severely fragmented OR ≤ 10 locations
	Decline in ANY of the following: a) extent of occurrence b) area of occupancy c) area, extent, and/or quality of habitat d) # of locations or subpopulations e) # of mature individuals		
	Extreme fluctuations in ANY of the following: a) extent of occurrence b) area of occupancy c) # of locations or subpopulations		
Population estimates	Est. <250 mature indivs. AND:	Est. <2,500 mature indivs. AND:	Est. <10,000 mature indivs. AND:
	Decline ≥25% within 3 yrs or one generation, whichever is longer	Decline ≥15% within 5 yrs or 2 generations, whichever is longer	Decline ≥20% within 10 yrs or 3 generations, whichever is longer
	OR	OR	OR
	Decline in mature individuals AND population structure EITHER a) no pop. w/>50 mature indivs. OR b) all indivs. in single subpop.	Decline in mature individuals AND population structure EITHER a) no pop. w/>250 mature indivs. OR b) all indivs. in single subpop.	Decline in mature individuals AND population structure EITHER a) no pop. w/>1,000 mature indivs. OR b) all indivs. in single subpop.
# of mature individuals	Est. < 50 mature individuals	Est. < 250 mature individuals	Est. < 1,000 mature individuals
Probability of extinction	≥ 50% within in 5 yrs or 2 generations, whichever is longer	≥ 20% within 20 yrs or 5 generations, whichever is longer.	≥ 10% within 100 yrs

Draft IUCN Red List categories for the 142 taxa examined during this CAMP exercise are presented in Table 2. Specific taxa within each draft IUCN Red List category are presented in Sections 2 and 4.

Table 2. Threatened Panamanian taxa - New IUCN Red List Categories of Threat.

NEW IUCN RED LIST CATEGORY	BIRDS	MAMMALS	NUMBER OF TAXA	PERCENT OF TOTAL
Extinct (?)	1	0	1	1
Critical	14	1	15	11
Endangered	24	13	37	26
Vulnerable	30	14	44	32
Conservation Dependent	2	0	2	1
Low Risk	27	10	37	26
Data Deficient	6	0	6	4
TOTAL	104	38	142	100

Threats to the Endemic Bird and Mammal Species of Panama

For the purposes of the CAMP process, threats were defined as "immediate or predicted events that are or may cause significant population declines."

Birds. The primary threat to the endemic avifauna of Panama is deforestation and the consequent destruction and fragmentation of habitat. These are caused by different factors in different regions; this is described below and summarized in Table 3.

In the Macizo Central region, avian species are confined to altitudes higher than 900 m. In the central and western portions of Macizo, deforestation is destroying the vegetative cover, affecting the survival of forest species, particularly Black guan (*Chamaepaetes unicolor*) and quail (*Geotrygon spp.)*, among others. This area comprises the northern limit for 28 species of South American avifauna and the limit for various North American migratory species.

The Pacific Central region of Panama is characterized by high levels of deforestation -- the effects of which date back to the pre-Colombian period. The forests are reduced to remnant patches along rivers and waterways. The reduction of the lowland forests of this region has drastically affected populations of Scarlet macaws (*Ara macao)*. This has been one of the results of agricultural development and ranching in the past years. Because of characteristics of soil in this region, re-generation of forests, once they are destroyed, is very difficult. The lower forests the southwest Azuero peninsula are endangered, with one of the species most affected *Ara macao.*

Coiba Island is the largest island in Panama and is home to 20 races of Passeriformes and the largest Scarlet macaw population in the country. The principal threat for Coiba Island is eco-tourism, and associated human interference.

The eastern region of Panama consists of two slopes, one on the Atlantic side and one on the Pacific. On the lower side of the central portion there is an important forest area. In this zone, the high rate of deforestation as well as agricultural development and ranching represent the major threat to the birds of Lake Bayano and to the birds which use it as a migration corridor. In this area, deforestation rates have changed considerably in the past few years largely because of state and private logging campaigns.

Perhaps the greatest impact on the eastern province and the Darién region will be the proposed construction of the Panamerican Highway, which will connect Panama and Colombia. Some of the principal effects of this project on biodiversity are described detail below.

Table 3. Threats facing endemic bird species of Panama according to new IUCN Red List category

NEW IUCN RED LIST CATEGORY	Human inter-ference	Hab Loss	Hab Frag	Pest	Hab loss to exotic plants	Inter-spp competit livestock	Fire	Powr Lnes	Inter-spp compet	Volc	Hunting for food
Extinct in Wild	--	--	--	--	--	--	--	--	--	--	--
Critical	13	10	5	6	6	3	2	1	0	1	1
Endangered	22	23	21	13	12	7	7	5	3	1	0
Vulnerable	29	29	23	20	18	12	4	1	0	0	2
Conservation Dependent	1	1	1	1	1	1	0	0	0	0	0
Low Risk	27	26	14	12	14	5	2	5	0	1	0
Data Deficient	1	2	3	1	1	1	0	0	1	0	0
TOTAL	93	91	67	53	52	29	15	12	4	3	3

Mammals. The mammal species of Panama face a variety of potential threats concomitant with habitat loss associated with various human activities. During the CAMP process it was determined that endemic Panamanian mammals are placed at risk by 12 different threats. In addition, it was determined that a new threat (coded 'RR') should be added for those species which are rare but which may be widely distributed.

The threats encountered by the endemic mammals of Panama, in descending order, are presented in Table 4. Please see Sections 2 and 4 for a complete list of threat categories.

The loss of habitat is the most widespread threat and affects the majority of endemic mammal species. Habitat loss is directly associated with human activities such as logging, burning, ranching, agriculture, road construction, and industrial development. These activities are either directly or indirectly related to the threats encountered.

Pesticides are a threat that affect a high proportion of species, particularly those whose range extends into areas of agriculture where these products are used. Human persecution, equally, affects the population status and trends of many mammalian species. Humans often eliminate any animal populations considered to be pests; rodent species are the most affected by these activities. The threats not as directly associated with human activity are disease, predation, and the situation in which species are considered 'rare.'

A large portion protected areas provide protection designed around the distribution of the

many mammals is contained within. Those that range partially within protected areas derive benefits from that protection as well.

Table 4. Threats facing endemic mammal species of Panama according to new IUCN Red List category

NEW IUCN RED LIST CATEGORY	Hab Loss	Pesti-cides	Human persecut	Hunting food	Hunting Sport	Rare	Genetic Problems	Human inter-ference	Disease	Trade	Predation
Extinct (?)	--	--	--	--	--	--	--	--	--	--	--
Critical	1	1	--	1	1	--	--	--	--	--	--
Endangered	8	4	2	2	2	2	2	2	0	0	0
Vulnerable	8	5	3	2	1	2	2	1	1	1	1
Conservation Dependent	--	--	--	--	--	--	--	--	--	--	--
Low Risk	2	6	7	1	0	0	0	0	0	0	0
Data Deficient	--	--	--	--	--	--	--	--	--	--	--
TOTAL	19	16	12	6	4	4	4	3	1	1	1

The Panamerican Highway. The proposed construction of the Panamerican Highway linking Panama and Colombia merits special consideration within the CAMP for Endemic Birds and Mammals of Panama. It is likely that the project could have an important impact on the biodiversity of the area with repercussions at the local, regional, and world level.

Among the three phases of the project (planning, construction, and the actual functioning of the highway), the last two may generate the most important environmental impacts, particularly the activities surrounding the project (movement of earth and deforestation, among others) and their associated effects (e.g., colonization and changes in land use practices). These activities will cause habitat fragmentation and destruction, and isolate populations of birds and mammals, which, for the most part, are little known. The avian species that could be seriously affected at the local and regional level are presented in Table 5; mammals are presented in Table 6.

Table 5. List of avian species that will be seriously affected by the construction of the Panamerican Highway.

Crypturellus kerriae
Odontophorus dialeucos
Geotrygon goldmani
Otus clarkii
Lepidopyga coeruleogularis
Hylocharis grayi humboldtii
Goldmania violiceps
Goethalsia bella
Brachygalba salmoni
Pteroglossus sanguineus
Capito maculicoronatus
Piculus callopterus
Xenerpestes minlosi
Margarornis bellulus
Thamnophilus nigriceps
Xenornis setifrons
Scytalopus panamensis
Oncostoma olivaceum
Aphanotriccus audax
Phylloscartes flavovirens
Manacus vitellinus
Carpodectes hopkei
Campylorhynchus albobrunneus
Thryothorus spadix
Myadestes coloratus
Basileuterus ignotus
Dacnis viguieri
Chlorospingus tacarcunae
Euphonia anneae
Tangara fucosa
Tangara palmeri
Chlorospingus inornatus
Psarocolius guatimozinus
Trogon bairdii

Table 6. List of mammals that will be seriously affected at the local and regional level by the construction of the Panamerican Highway,

Marmosa invictus
Cryptotis mera
Lasiurus castaneus
Saguinus geoffroyi
Saguinus oedipus
Orthogeomys dariénsis
Neacomys pictus
Rhipidomys scandens
Tylomys fulviventer
Tylomys watsoni
Tylomys panamensis
Reithrodontomys dariénsis
Isthmomys pirrensis
Rheomys raptor
Coendou rothschildi
Diplomys labilis

Along the Chepo-Yaviza zone in Panama (200 kms), the existing part of the Highway, the impact of spontaneous colonization by humans has created a swath of deforestation 15 kms wide along the road axis. The concomitant uncontrolled increase in the human population likely will be accompanied by land speculation and general destruction of the local natural areas. Some endemic plant and animal species are restricted to a corridor of remnant forest, through which this proposed project will run. If the proposed project is built, the Darién National Park will be seriously fragmented and two of its most important centers of endemism (Cerro Tacarcuna and Cerro Pirre) will be drastically separated by the Highway.
In Colombia, the proposed project will cross the Los Katios National Park which comprises a small (70,000 ha) protected remnant of an important biogeographic region of the Darién. This area represents the 'last stand' for many species of regional flora and fauna. The Highway project may bring about the conversion of areas of high biodiversity to monoculture (primarily bananas grown for export). The construction of the road to Juradó (Choco) will trigger extensive ranching and logging in the foothills of the Cerros Tacarcuna, Pirre, Alto Quia, and Nieve. Both these activities are known to cause drastic changes in the diversity of birds and mammals and their population densities.

The increased overland traffic between the two countries will provide an easy means for immigration by Colombians (and other South Americans looking for alternatives) to the Panamanian territory. Resulting deforestation and fragmentation of forests will contribute to

more rampant illegal wildlife trade; which at this time includes species such as *Ara chloroptera* (Green-winged macaw), *Ara severa* (Chestnut-fronted macaw), and *Ara araruana* (Blue and gold macaw) and many *Amazona* species. The poaching of various cracid species (guans, curassows, and chachalacas), most of which are already threatened (Strahl et al., 1994), also is likely to increase. The uncontrolled invasion of the area affected by the Highway by people from the central part of Panama and from Colombia will lead to social conflicts and will likely contribute to the displacement of indigenous peoples of the area, the loss of their culture and traditional practices that use local natural resources.

For the above reasons, the workshop participants agreed that the detriment to biodiversity in the corridor through which the proposed road will run is significant, and further, that the construction of the Highway would lead to irretrievable losses and changes in the plant and animal life of the region.

Recommendations for Intensive Management and Research Actions

Although threat processes and their gross effects on taxa found in Panama are evident, the amount of information available throughout the Neotropics from field study and management is scarce. For this reason the recommendations for most species reviewed in this workshop include surveys, monitoring and life-history studies, along with investigations in to limiting factors including the extent of human-wildlife conflicts and hunting pressure. However, for those threatened species that may be more negatively affected we recommend additional measures. These include the management and protection of habitat, as well as research and management aimed at controlling or eliminating the factors that limit species populations. Because of the uncertainty of taxonomic status, studies directed at resolving such limiting factors also are recommended for many of the taxa.

The development of coordinated efforts (possibly with rural assistance and land management programs) to negate the effects of threats such as subsistence hunting for food and habitat destruction on wildlife populations need to be carried forward. Combined with these, community-based environmental education programs can be a useful tool to augment the effectiveness of conservation initiatives. Some of the larger "flagship" species may be particularly useful in community-based education programs oriented towards the conservation of Neotropical ecosystems.

There is a chronic lack of reliable field data on many of the species reviewed, especially for birds, from which conservation recommendations can be implemented. This has resulted in delays in the initiation of the proper species and habitat management measures.

In particular, there is little reliable data from which to make population estimates, resulting in

the utilization of indirect information, such as remaining available habitat on which to base population estimates. For most of the species reviewed in this document, survey or population monitoring was identified as a priority both for birds and for mammals.

For all taxa, recommendations were generated for the kinds of intensive action necessary, both in terms of management and research, which were felt to be necessary for conservation. These recommendations, summarized in Tables 7 and 8, were: Population and Habitat Viability Assessment (PHVA) workshops; wild management and research; and captive programs. PHVA workshops provide a means of assembling available detailed biological information on the respective taxa, evaluating the threats to their habitat, development of management scenarios with immediate and 100-year time-scales, and the formulation of specific adaptive management plans with the aid of simulation models. In many cases, workshop participants determined that the current level of information for a taxa was not adequate for conduction of a PHVA; in those cases, recommendations are listed as "PHVA Pending."

Workshop participants attempted to develop an integrated approach to management and research actions needed for the conservation of Panamanian bird and mammal taxa. In all cases, an attempt was made to make management and research recommendations based on the various levels of threats impinging on the taxa (see summary above).

With only partial understanding of underlying causes for decline in some taxa, it was sometimes difficult to clearly define specific management actions needed for the conservation. Therefore, "research management" must become a component of conservation and recovery activities. Research management can be defined as a management program which includes a strong feedback between management activities and an evaluation of the efficacy of the management, as well as response of the taxa to that activity. Seven basic categories of research management activities were identified: survey (e.g., search and find); monitoring; translocation; taxonomic research or clarification; management of limiting factors; limiting factors research; and life history research. The frequent need for survey information to evaluate population status, especially for those taxa listed as Critical, emphasizes the need to quickly implement intensive survey methodologies. Research management recommendations are summarized in Tables 7 and 8.

Table 7. Research management recommendations for endemic bird species of Panama

NEW IUCN RED LIST CATEGORY	PHVA	PHVA PEND	SURV	MONITR	LIFE HIST RESRCH	LIMITG FACTRS RESRCH	LIMITG FACTRS MGMT	HAB MGMT	TAX RESRCH
Extinct (?)	1	0	1	0	0	0	0	0	0
Critical	13	0	13	11	2	4	6	6	0
Endangered	24	0	24	24	2	12	6	15	0
Vulnerable	24	0	30	30	1	1	1	5	0
Conservation Dependent	1	0	2	1	0	0	0	0	0
Low Risk	5	0	27	25	1	1	1	2	0
Data Deficient	3	1	4	4	0	0	0	0	1
TOTAL	71	1	101	95	6	18	14	28	1

Table 8. Research management recommendations for endemic mammal species of Panama

NEW IUCN RED LIST CATEGORY	PHVA	PHVA PEND	SURV	MONITR	LIFE HIST RESRCH	LIMITG FACTRS RESRCH	LIMITG FACTRS MGMT	HAB MGMT	TAX RESRCH	HUSB
Extinct (?)	--	--	--	--	--	--	--	--	--	--
Critical	1	0	1	1	0	0	1	1	0	0
Endangered	1	8	6	13	12	1	1	6	5	0
Vulnerable	1	4	1	14	11	5	2	2	4	1
Conservation Dependent	--	--	--	--	--	--	--	--	--	--
Low Risk	0	0	0	2	5	8	0	1	3	0
Data Deficient	--	--	--	--	--	--	--	--	--	--
TOTAL	3	12	8	30	28	6	4	10	12	0

Workshop participants wish to emphasize that further investigation into natural history, population status and distribution is urgent and will help to develop further management activities that will minimize threats and their affects on endemic species. For those species that were indicated as in need of a PHVA workshop, in particular, we wish to urge immediate planning for those evaluations.

March 1997

Captive Program Recommendations

For a handful of the taxa reviewed, it was determined that a captive component would be necessary to contribute to the maintenance of long-term viable populations. It is proposed that, when captive populations can assist species conservation, captive and wild populations can and should be intensively and interactively managed with interchanges of animals occurring as needed and as feasible. There may be problems with interchange between captive and wild populations with regard to disease, logistics, and financial limitations.

Today, as more and more species are threatened with population declines, cooperative recovery programs, including both zoos and the private sector, may provide a major avenue for survival. This cooperation must include support for field research, habitat conservation, as well as public education.

If *ex situ* programs are indicated, there is a demonstrated need to coordinate and review *in situ* and *ex situ* programs for species that are considered critical, endangered, or vulnerable. Captive populations of species considered in any of the threatened categories should generally be obtained from areas where the animals and/or the habitats can not be protected sufficiently to preserve the species.

Obtaining additional individuals from the wild to augment a captive population should only be sought after a careful review of the captive population has been made and there is a demonstrated management or genetic need for additional individuals. Such animals must be obtained from locations and in ways that do not further threaten the species or any local populations (unless such a local population is destined to be destroyed by other activities that can not be controlled).

When *ex situ* management was recommended, the "level" of captive program was also prepared, reflecting status, prospects in the wild, and taxonomic distinctiveness. The captive program levels considered during the CAMP for Birds and Mammals Endemic to Panama are defined below.

> **Level 1 (1)** - A captive population is recommended as a component of a conservation program. This program has a tentative goal of developing and managing a population sufficient to preserve 90% of the genetic diversity of a population for 100 years (90%/100). The program should be further defined with a species management plan encompassing the wild and captive populations and implemented immediately with available stock in captivity. If the current stock is insufficient to meet program goals, a species management plan should be developed to specify the need for additional founder stock. If no stock is present in captivity then the program should be developed collaboratively with appropriate wildlife agencies, SSC Specialist Groups, and

cooperating institutions.

Level 2 (2) - Similar to the above except a species/subspecies management plan would include periodic reinforcement of captive population with new genetic material from the wild. The levels and amount of genetic exchange needed should be defined in terms of the program goals, a population model, and species management plan. It is anticipated that periodic supplementation with new genetic material will allow management of a smaller captive population. The time period for implementation of a Level 2 program will depend on recommendations made at the CAMP workshop.

Level 3 (3) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies but is recommended for education, research, or husbandry.

Other captive recommendations include:

No (N) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies. Taxa already held in captivity may be included in this category. In this case species/subspecies shod be evaluated either for management toward a decrease in numbers or for complete elimination from captive programs as part of a strategy to accommodate as many species/subspecies as possible of higher conservation priority as identified in the CAMP or in SSC Action Plans.

Pending (P) - A decision on a captive program will depend upon further data either from a PHVA, a survey, or existing identified sources to be queried.

During the CAMP workshop, all taxa were evaluated relative to their current need for captive propagation. Recommendations were based upon a number of variables, including: immediate need for conservation (population size, draft IUCN Red List status, population trend, type of captive propagation program), need for or suitability as a surrogate species, current captive populations, and determination of difficulty as mentioned above. Based on all of the above considerations, in addition to threats and population trends, recommendations for captive programs were made. These recommendations, by category of threat, are presented in Table 9. Recommendations for levels of programs are presented in the spreadsheets in Section 2.

Table 9. Captive program recommendations for species endemic to Panama by new IUCN Red List category.

NEW IUCN RED LIST CATEGORY	Level 1		Level 3		Pending		No	
	Birds	Mamm	Birds	Mamm	Birds	Mamm	Birds	Mamm
Extinct (?)	0	--	0	--	0	--	--	--
Critical	0	1	0	0	3	0	9	0
Endangered	0	0	0	0	2	9	21	4
Vulnerable	0	0	0	1	0	2	27	11
Conservation Dependent	0	--	0	--	0	--	2	--
Low Risk	0	0	0	0	0	0	25	10
Data Deficient	0	--	0	--	2	--	2	--
TOTAL	0	1	0	1	7	11	86	25

A Conservation and Assessment Management Plan (as derived from a CAMP workshop) is intended to recommend a variety of actions, structured in order of priority that best aid the conservation of threatened taxa. These actions can be recommended in stages, starting with the more general and leading to the more specific. For a variety of reasons, most notably that CBSG maintains the lead role for providing captive breeding advice and guidelines within IUCN, the focus of progression to the more detailed and specific has been with captive programs, which can form a component of overall conservation and recovery programs.

General Recommendations

Avian Working Group.

1. It is recommended that a field evaluation be initiated on the distribution and relative abundance of the hummingbird species of the Tierras Altas del Occidente in Panama. This should be given priority in the higher sites of the Cordillera of Talamanca. One of the avian working group participants will make a preliminary visit to this area to define the feasibility of a field study.

2. It is recommended that a program be initiated as soon as possible to develop bird registries generated by observers and scientists in the various regions of the country. This information should be maintained in a central, computerized data base that is available to all interested parties and updated regularly. The institutions that already maintain databases on Panamanian avifauna should be invited to collaborate on this program to establish information exchange and to prepare Lists of Threatened Birds to be distributed to all that contribute to the list.

3. It is a priority to look for the means to conduct a methodology training course and to provide basic equipment to Panamanian ornithologists. We recommend that the U.S. Forest Service's "Partners in Flight" program be contact to initiate a workshop on bird monitoring in Panama. It is equally urgent to enlist the assistance of national and foreign institutions to donate basic equipment (e.g., books, binoculars and telescopes) to the research groups formed at this workshop.

4. We recommend that a team of researchers be assembled to define research priorities of for the avifauna of the area between Panama and Colombia, giving particular emphasis to the evaluation of the Panamerican Highway project. It is recommended that bi-national research proposals be integrated with the Biopacific program of Colombia and the Conservation of Biodiversity in the Darién in Panama program and other institutions.

Mammal Working Group.

1. It is recommended that field studies incorporating search and recovery, investigation of distribution and abundance of endemic rodents over the eastern zone (Tacarcuna, Mali, Pirre, and Cerro Sapo).

2. It is recommended to continue the investigations on the natural history and population of *Sylvilagus dicei* initiated by R. Samudio in 1992 in the Cordillera of Talamanca.

3. We recommend that the presence, distribution, and population status of *Bassaricon pauli* in the lowlands of Pando and the highlands of Chiriquí be verified.

4. It is recommended that the condition of the population of *Saimiri oerstedii* in the southeast zone of Panama (Punta Burica) be verified.

5. A management plan for the sustainable utilization of *Dasyprocta coibae* on Coiba Island should be developed.

6. We recommend that existing legislation for the protection of wildlife and the protection and conservation of forest habitats be reinforced.

7. It is recommended that a list of research priorities for endemic Panamanian mammals be distributed and professors of the University of Panama given incentive to promote theses on these priorities.

8. We recommend that a basic course on methodology for the study of Panamanian mammals be established, directed at those persons with particular interest in those groups.

The participants in the CAMP for the Endemic Birds and Mammals of Panama to emphasize that we do not view any of the recommendations of this document as "stand-alone" initiatives. Rather, the reader is encouraged to see these activities as components of the overall need for the conservation of Neotropical ecosystems. Many of the endemic bird and mammal species of Panama are excellent candidates (as bio-indicators, key species or flagships) to help facilitate larger-scale conservation programs. We therefore urge continuing and increased levels of research, monitoring and management of forests, protected areas and other natural ecosystems within Panama and adjacent countries.

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Section 2

CAMP Taxon Data Sheet Categories

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN SPREADSHEET CATEGORIES

The Conservation and Management Plan (CAMP) taxon data sheets and spreadsheet are working documents that provide information that can be used to assess the degree of threat and recommend conservation action. The first part of the sheets summarizes information on the status of the wild and captive populations of each taxon. It contains taxonomic, distributional, and demographic information useful in determining which taxa are under greatest threat of extinction. This information can be used to identify priorities for intensive management action for taxa.

TAXON
SCIENTIFIC NAME: Scientific names of extant taxa: genus, species, subspecies.

WILD POPULATION
RANGE: Geographical area where a species and its subspecies occur.

EST #: Estimated numbers of individuals in the wild. If specific numbers are unavailable, estimate the general range of the population size.

DATA QUALITY (DQ)

1 = Recent (<8 years) census or population monitoring
2 = Recent (<8 years) general field study
3 = Recent (<8 years) anecdotal field sightings
4 = Indirect information (trade numbers, habitat viability)

SUB-POP: Number of populations within the taxonomic unit. Ideally, the number of populations is described in terms of boundary conditions and indicates the degree of fragmentation.

TRND: Indicates whether the natural trend of the species/subspecies/population is currently (over the past 3 generations) increasing (I), decreasing (D), or stable (S). Note that trends should NOT reflect supplementation of wild populations. A '+' or '-' may be indicated to indicate a rapid or slow rate of change, respectively.

AREA: A quantification of a species' geographic distribution.

AAA:	> 5,000 sq km; geographic island
AA:	< 5,000 sq km; geographic island

AA-1: < 1,000 sq km; geographic island
AA-2: < 100 sq km; geographic island
AA-3: < 10 sq km; geographic island

IUCN: Status according to the new IUCN Red List criteria

EX = Extinct
EW = Extinct in the Wild
CR = Critical
EN = Endangered
VU = Vulnerable
CD = Conservation Dependent
LR = Low Risk
DD = Data Deficient
NE = Not Evaluated

THREATS: Immediate or predicted events that are or may cause significant population declines.

A = Aircraft
C = Climate
D = Disease
F = Fishing
G = Genetic problems
H = Hunting for food or other purposes
Hyb = Hybridization
I = Human interference or disturbance
Ic = Interspecific competition
Ice = Interspecific competition from exotics
L = Loss of habitat
La = Loss of habitat because of exotic animals
Lf = Loss of habitat because of fragmentation
Lp = Loss of habitat because of exotic plants
M = Marine perturbations, including ENSO and other shifts
P = Predation
Pe = Predation by exotics
Ps= Pesticides
Pl= Powerlines
Po= Poisoning
Pu= Pollution
S = Catastrophic events
    f: fire
    h: hurricane
    t: tsunami

T = Trade for the life animal market

PHVA/WKSP: Is a Population and Habitat Viability Assessment Workshop recommended? Yes or No? NOTE**A detailed model of a species' biology is frequently not needed to make sound management decisions.

Yes or No/Pending: pending further data from surveys or other research

RESEARCH MANAGEMENT:

It should be noted that there is (or should be) a clear relationship between threats and subsequent outlined research/management actions. The "Research/Management" column provides an integrated view of actions to be taken, based on the listed threats. Research management can be defined as a management program which includes a strong feedback between management activities and an evaluation of the efficacy of the management, as well as response of the bird species to that activity. The categories within the column are as follows:

T	=	Taxonomic and morphological genetic studies
Tl	=	Translocations
S	=	Survey - search and find
M	=	Monitoring - to determine population information
Hm	=	Habitat management - management actions primarily intended to protect and/or enhance the species' habitat (e.g., forest management)
Lm	=	Limiting factor management - "research management" activities on known or suspected limiting factors. Management projects have research components that provide scientifically defensible results.
Lr	=	Limiting factor research - research projects aimed at determining limiting factors. Results from this work may provide management recommendations and future research needs
Lh	=	Life history studies

CAPTIVE PROGRAMS

NUM: Number of individuals in captivity

DIFF: This column represents the level of difficulty in maintaining the species in captive conditions. It should be noted that there is little experience with the development of self-sustaining captive populations of passerines.

1 Techniques are in place for capture, maintenance, and propagation of similar taxa in captivity, which ostensibly could be applied to the taxon. Least difficult.

2 Techniques are only partially in place for capture, maintenance, and propagation of similar taxa in captivity, and many captive techniques still need refinement. Moderate difficulty.

3 Techniques are not in place for capture, maintenance, and propagation of similar taxa in captivity, and captive techniques still need to be developed. Very difficult.

REC: Level of Captive Program.

Level 1 (1) - A captive population is recommended as a component of a conservation program. This program has a tentative goal of developing and managing a population sufficient to preserve 90% of the genetic diversity of a population for 100 years (90%/100). The program should be further defined with a species management plan encompassing the wild and captive populations and implemented immediately with available stock in captivity. If the current stock is insufficient to meet program goals, a species management plan should be developed to specify the need for additional founder stock. If no stock is present in captivity then the program should be developed collaboratively with appropriate wildlife agencies, SSC Specialist Groups, and cooperating institutions.

Level 2 (2) - Similar to the above except a species/subspecies management plan would include periodic reinforcement of captive population with new genetic material from the wild. The levels and amount of genetic exchange needed should be defined in terms of the program goals, a population model, and species management plan. It is anticipated that periodic supplementation with new genetic material will allow management of a smaller captive population. The time period for implementation of a Level 2 program will depend on recommendations made at the CAMP workshop.

Level 3 (3) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies but is recommended for education, research, or husbandry.

No (N) - A captive program is not currently recommended as a demographic or genetic contribution to the conservation of the species/subspecies. Taxa already held in captivity may be included in this category. In this case species/subspecies shod be evaluated either for management toward a decrease in numbers or for complete elimination from captive programs as part of a strategy to accommodate as many species/subspecies as possible of higher conservation priority as identified in the CAMP or in SSC Action Plans.

Pending (P) - A decision on a captive program will depend upon further data either from a PHVA, a survey, or existing identified sources to be queried.

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Section 3

Avian Taxon Data Sheets

CAMP TAXON REPORT

SPECIES: *Crypturellus kerriae* Choco tinamou Tinamou Choco

STATUS: IUCN: Endangered
Criteria based on: Extent of Occurrence
CITES: Not listed
Other: Listed in *Birds to Watch 2* (Collar et al., 1994) and *Threatened Birds of the Americas* (Collar et al., 1992)

Taxonomic status: Species

Distribution: E. Darien, Quia Mts. (Panama) & Colombia (NW)

Wild Population: Unknown; but there are two fragmented subpopulations.

Field Studies: Not aware of specific recent efforts.

Threats: Habitat loss and fragmentation because of the Pan American Highway, human interference (mining and recent ecotourism),

Comments: Estimated range is 1,500 sq km. Population is thought to be stable; inhabits protected area. Ridgely & Gwynne (1989) state that this species is rare. First specimens collected in 1970-71; two skins. Two were frequently sighted in January 1994 (R. Heins); heard calls every day during five-day expedition. Two specimens in Colombia (Cerro Quia) at Cero Baudo at 450 m.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: Pending; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Odontophorus dialeucos* Tacarcuna Wood Quail Codoruiz Jaspeada

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Panama (E Darien, Cerro Tacarcuna, Cerro Malil above 1,050 m) & adjacent extreme NW Colombia

Wild Population: Unknown

Field Studies: Wetmore studied in the 1960s.

Threats: Habitat fragmentation, hunting for food, and human interference (mining and recent ecotourism), and habitat loss because of cocaine plantations in the area and possible use of biocides to control cocaine plantations.

Comments: Discovered only in 1963. Reported fairly common (Ridgely & Gwynne, 1989); single population is thought to be stable. Terrestrial forest species, found in pairs or small groups. One of the habitats in which observations were made by Wetmore (in 1963) was destroyed ten years ago (Heins, pers. comm.). Estimated range is 250 sq km. Reported in Los Katios National Park of Colombia in 1982 (Hilty & Brown, 1986).

Recommendations:

Research management: Survey, habitat management, limiting factors management, limiting factors research

PHVA: Yes

Captive Population:

Captive Program Recommendation: Pending; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Chamaepetes unicolor* Black Guan Pava Negra

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: W Panama to Costa Rica (highlands 900-2,250 m).

Wild Population: Unknown, one population.

Field Studies: Unaware of specific recent efforts

Threats: Hunting for food, human interference and persecution, loss and fragmentation of habitat, habitat loss to exotic plants (crops and plantations).

Comments: Estimated range in Panama is 6,000 sq km. Population may be stable in the Atlantic slope but declining in the Pacific side. Mostly recorded 900-2,250 m, but has been taken as low as 450 m at Bocas del Toro.

Recommendations:

Research management: Survey, Monitoring

PHVA: No

Captive Population: Unknown numbers

Captive Program Recommendation: No; difficulty level 2.

CAMP TAXON REPORT

SPECIES: *Geotrygon goldmani* Russet-Crowned Quail Dove Paloma Perdiz Corbecicastaña

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: E Panama (Cerro Jefe, Serrania de Maje), W San Blas (Cerro Brewster), & E Darien & extreme NW Colombia

Wild Population: Unknown; two fragmented subpopulations. 1993 Pigeon and Dove CAMP listed estimate of < 10,000.

Field Studies: Unaware of specific recent efforts

Threats: Habitat fragmentation, human interference (mining and recent ecotourism), habitat loss, power lines.

Comments: Estimated range is 250 sq km in Serrania de Maje; 250 sq km in Cerro Jefe and Cerro Brewster, and 400 sq km in Colombia in Cerro Tacarcuna and Río Cuti. Found 100 - 1,600 m. Species is thought to be declining.

Recommendations:

Research management: Survey, monitoring, habitat management, limiting factors management

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population: No

Captive Program Recommendation: Pending

CAMP TAXON REPORT

SPECIES: *Geotrygon chiriquensis* Chiriquí Quail-Dove
Paloma-Perdiz de Chiriquí

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: W Panama (highlands) & Costa Rica.

Wild Population: Unknown, one population.

Field Studies: None

Threats: Hunted for food, human disturbance, habitat loss and fragmentation, predators and use of biocides.

Comments: Range estimated to be 7,000 sq km in Panama. Recorded in highlands of Chiriquí and Veraguas (900-3,000 m, but mainly 1,200-1,950 m).

Recommendations:

Research management: Survey and monitoring.

PHVA: No.

Captive Population: No

Captive Program Recommendation: No; difficulty level 2.

CAMP TAXON REPORT

SPECIES: *Phyrrhura hoffmani* Sulphur-winged Parakeet Perico Aliamarillo

STATUS: IUCN: Low Risk
CITES: Appendix II

Taxonomic status: Species

Distribution: W Panama (western highlands only) & Costa Rica.

Wild Population: Unknown, one population

Field Studies: none

Threats: Human disturbance, loss and fragmentation of habitat, exotic plants.

Comments: Range in Panama estimated to be 6,000 sq km and the population is though to be stable. Recorded in highlands of western Chiriquí mostly above 1,200 m; also in highlands and foothills of Bocas del Toro and Veraguas.

Recommendations:

Research management: Survey and monitoring.

PHVA: No.

Captive Population: Unknown

Captive Program Recommendation: No; difficulty level 1.

CAMP TAXON REPORT

SPECIES: *Touit costarricensis* Red-fronted Parrotlet Periquito Frentirojo

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES: Appendix II
Other: Listed in *Birds to Watch 2* (Collar et al., 1994

Taxonomic status: Species

Distribution: W Panama & Costa Rica.

Wild Population: Unknown, one population.

Field Studies: None.

Threats: Human disturbance, loss and fragmentation of habitat.

Comments: Range estimated to be 7,000 sq km in Panama. Population declining. Recorded in Chiriquí above Boquete (1,200 m); Fortuna and N in adjacent foothills (750-1050 m) of Bocas del Toro and also above Cocoplum (near sea level); Caribbean slope in W Coclé.

Recommendations:

Research management: Survey and monitoring.

PHVA: No.

Other:

Captive Population:

Captive Program Recommendation: No; difficulty level 1.

CAMP TAXON REPORT

SPECIES: *Otus clarkii* Bare-shanked Screech-Owl Autillo Serranero

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES: Appendix II

Taxonomic status: Species

Distribution: Costa Rica to extreme NW Colombia. In Panama found only in highlands of the west and east.

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, human interference

Comments: Estimated range is about 2,500 sq km (2,000 in the west and 500 sq km in the east). In eastern Darien, recorded 1,080-2,100 m. Population is thought to be declining in the west (Cerro Pirre); stable in the east (Chiriquí and Veraguas highlands).

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Caprimulgus saturatus* Dusky Nightjar Tapacamino Sombrío

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: W Panama (only highlands) and Costa Rica.

Wild Population: Unknown, one population.

Field Studies: none

Threats: Interference from humans, loss of habitat and fragmentation, biocides, powerlines and communication towers.

Comments: Range estimated in 300 sq km.

Recommendations:

Research management: Survey and monitoring, life history, habitat management.

PHVA: Yes

Captive Population: No

Captive Program Recommendation: No, difficulty level 3.

CAMP TAXON REPORT

SPECIES: *Lepidopyga coeruleogularis* Sapphire-throated Hummingbird Colibrí Goryizafiro

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Chiriquí to Darien in Panama - lower Tuira and Chucunaque River Valleys; on Caribbean slope locally from canal area east through San Blas; also Coiba and Cebaco Islands - & Colombia (N)

Wild Population: Unknown

Field Studies: Two field studies about ten years ago (E. Ponce and S. Farrugia, 1988) reported capturing approximately five birds per day in a 5 ha. area. O. Brooks and D. Riley also conducted a study 'Distribución vertical y horizontal de una comunidad de vertebrados de manglar durante la epoca lluviosa' in 1986.

Threats: Human interference, habitat loss.

Comments: Found in about 30% of the country; common. Estimated range is 25,000 km.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Anthracothorax prevostii veraguensis* Veraguas Mango Mango Veraguensis

STATUS: IUCN: Low Risk.
CITES:

Taxonomic status: Subspecies

Distribution: W Panama highlands & Costa Rica

Wild Population: One fragmented population, stable

Field Studies: None

Threats: Human disturbance, loss and fragmentation of habitat

Comments: Range estimated to be 8,000 sq km in Panama. Pacific lowlands of Chiriquí to S Coclé. Only 2 specimens from Caribbean Slope (Gatún Lake).

Recommendations:
Research management: Survey

PHVA: No

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3

CAMP TAXON REPORT

SPECIES: *Hylocharis grayi humboldtii* Blue-headed Sapphire Zafiro Cabeciazul

STATUS: IUCN: Data Deficient
CITES:

Taxonomic status: One of two subspecies of *Hylocharis grayi*

Distribution: Extreme SE Darien, Panama to Pacific coast of Colombia to NW Ecuador

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, human interference

Comments: Estimated range is 20 sq km in Panama. Population is thought to be stable but very little is known. It is a mangrove species known from only four specimens collected in 1946.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON..

Captive Population:

Captive Program Recommendation: Pending PHVA and survey; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Goldmania violiceps* Violet-capped Hummingbird Colobrí Copetivioleta

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Panama (E Cerro Brujo in Colon, Cerro Brewster in W San Blas, Cerro Tacarcuna in E Darien, and E Panama) & extreme NW Colombia

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss

Comments: Estimated range is 500 sq km (Cerro Brujo/Cerro Azul/Cerro Brewster); 250 sq km in Cerro Tacarcuna. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Amazilia edward* Snowy-bellied Hummingbird Ventrinivosa

STATUS: IUCN: Low Risk.
Criteria based on: Extent of occurrence.
CITES:

Taxonomic status: Species

Distribution: E Panama & SW Costa Rica

Wild Population: One fragmented population, stable

Field Studies: None

Threats: Human interference, loss of habitat

Comments: Range is estimated to be 65,000 sq km. Recorded in lowlands and Pacific Slope foothills from Chiriquí (to 1,800 m) to Darien (lower Tuira River Valley to El Real). Only one specimen from Bocas del Toro (Chiriquí Grande) in Caribbean Slope; also Islands of Taboga, Perlas and others.

Recommendations:

Research management: Survey

PHVA: No

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Amazilia handleyi* Escudo Hummingbird Amazilia de Escudo.

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Isolated species, *Amazilia tzacatl* Rufous-tailed Hummingbird.

Distribution: W Panama, only Escudo de Veraguas Island, Bocas del Toro

Wild Population: One population, isolated

Field Studies: Wetmore, 1963

Threats: Human disturbance

Comments: Range estimated to be 7 sq km in Panama. Found in Escudo de Veraguas Island. Population believed to stable.

Recommendations:

Research management: Survey, Monitoring, Life history studies, Habitat management, Limiting factors research and management.

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Elvira chionura* White-tailed Emerald Esmeralda Coliblanca

STATUS: IUCN: Vulnerable.
Criteria based on: Extent of occurrence.
CITES:

Taxonomic status: Species

Distribution: W Panama highlands & Costa Rica

Wild Population: Declining and fragmented in Pacific slope

Field Studies: None

Threats: Human disturbance, loss and fragmentation of habitat, pesticides

Comments: Range estimated to be 4,000 sq km in Panama. Recorded in Montana forests of highlands (few records in Caribbean slope of Veraguas); from Chiriquí to E Coclé (El Valle).

Recommendations:

Research management: Survey, Monitoring, Habitat management

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Goethalsia bella* Rufous-cheeked Hummingbird

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: Panama (Cerro Sapo and Cana/Cerro Pirre in E Darien) & extreme NW choco in adjacent Colombia

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss

Comments: Estimated range is 100 sq km in Cerro Sapo and 400 sq km in Cana and Cerro Pirre. Recorded at 600-1,500 m but on Cerro Pirre commonest at 1,050-1,200 m. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Calliphlox bryantae* Magenta-throated Woodstar Estrella Gorgimorada

STATUS: IUCN: Endangered.
Criteria based on: Extent of occurrence.
CITES: Appendix II

Taxonomic status: Species. Note Genus name changed from *Philodice*

Distribution: W Panama & Costa Rica.

Wild Population: Unknown.

Field Studies: None.

Threats: Human disturbance, loss and fragmentation of habitat, interspecific competition with exotic species, fire, and biocides.

Comments: Range of distribution estimated to be 3,000 sq km in Panama. Recorded in lower highlands of Chiriquí and Veraguas, mostly 900-1,500 m.

Recommendations:

Research management: Survey, monitoring, habitat management and limiting factor research.

PHVA: Yes.

Captive Population: None.

Captive Program Recommendation: No; difficulty level 3.

CAMP TAXON REPORT

SPECIES: *Selasphorus ardens* Glow-throated Hummingbird

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES: Appendix II
Other: Listed in *Threatened Birds of the Americas* (Collar et al., 1992)

Taxonomic status: Species

Distribution: E Chiriqui (Cerro Colorado) & Veraguas highlands (Santa Fe, Castilla, and Calovévora (750-1800 m)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of the proliferation of coffee plantations, competition with domestic livestock (cattle), pesticides, fire (annual burning), drought.

Comments: Estimated range is 1,000 sq km. Highly fragmented remnant habitat. Found in foothills and lower highlands of eastern Chiriquí and Veraguas (Santa Fé, Castilla, and Calovévora. Recorded 750-1,800 m. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring, limiting factors management, limiting factors research, habitat management.

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Selasphorus flammula* Volcano Hummingbird Estrella Volcanera

STATUS: IUCN: Endangered.
Criteria based on: Extent of occurrence.
CITES: Appendix II

Taxonomic status: Species

Distribution: W Panama (W Chiriquí mountains) & Costa Rica

Wild Population: One population, declining

Field Studies: No recent studies

Threats: Human disturbance, loss and fragmentation of habitat, exotic plants and biocides.

Comments: Range estimated to be 250 sq km in Panama. Recorded mostly above 1,950 m in W Chiriquí (Volcan Barú massif).

Recommendations:

Research management: Survey, Monitoring, Habitat management and Limiting factor research.

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Selasphorus scintilla* Scintilla Hummingbird Estrella Centelleante

STATUS: IUCN: Endangered.
Criteria based on: Extent of occurrence.
CITES: Appendix II

Taxonomic status: Species

Distribution: W Panama (W Chiriquí highlands) & Costa Rica

Wild Population: One population, declining

Field Studies: No recent studies

Threats: Human disturbance, loss and fragmentation of habitat, exotic plants, fires and biocides.

Comments: Range estimated to be 700 sq km in Panama. Recorded mostly 1,200-2,100 m in highlands of W Chiriquí.

Recommendations:

Research management: Survey, Monitoring, Habitat management and Limiting factors research.

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Lampornis castaneoventris castaneoventris* White-throated Mountain-Gem
Colibrí-montañez Gorgiblanco

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES: Appendix II

Taxonomic status: Subspecies

Distribution: Extreme W Panama & southern Costa Rica

Wild Population: Unknown numbers. One population, declining

Field Studies: None

Threats: Human disturbance, loss and fragmentation of habitat, interspecific competition with exotic species, fire, and biocides.

Comments: Range is estimated to be 600 sq km. Recorded from highlands of W Chiriquí (to the E only near Boquete), mostly above 1,500 m.

Recommendations:

Research management: Survey, Monitoring, Habitat management and Limiting factors research.

PHVA: Yes.

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Lampornis hemileucus* White-bellied Mountain-Gem Colibrí-montañes Ventriblanco

STATUS: IUCN: Vulnerable.
Criteria based on: Extent of occurrence.
CITES: Appendix II

Taxonomic status: Species

Distribution: W Panama & Costa Rica

Wild Population: One fragmented population, declining

Field Studies: None

Threats: Human disturbance, loss and fragmentation of habitat, interspecific competition with exotic species, and biocides

Comments: Range is estimated to be 2,500 sq km. Recorded only from W humid highlands, mostly 750-1,050 m in Chiriquí (frequently in Fortuna); adjacent areas to Bocas del Toro in the Caribbean Slope; and Veraguas in Santa Fé.

Recommendations:

Research management: Survey, Monitoring, Habitat management.

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Lophornis adorabilis* White-crested Coquette Coqueta Crestiblanca.

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence.
CITES: Appendix II

Taxonomic status: Species

Distribution: Pacific W Panama (only in Chiriquí) & southern Costa Rica

Wild Population: One population, declining

Field Studies: None

Threats: Human interference, loss and fragmentation of habitat, exotic plants

Comments: Range is estimated to be 2,500 sq km. Recorded in lowlands and foothills (to about 1,200 m) of W Chiriquí.

Recommendations:

Research management: Survey, Monitoring, Habitat management and Limiting factors research.

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Chlorostilbon assimilis* Garden Emerald Esmeralda Jardinera

STATUS: IUCN: Low Risk.
CITES:

Taxonomic status: Species; separated from *C. canivetti*

Distribution: Panama & southern Costa Rica

Wild Population: One fragmented population, stable

Field Studies: None

Threats: Human interference, loss of habitat

Comments: Range is estimated to be 65,000 sq km. Recorded in lowlands and Pacific Slope foothills from Chiriquí to Darien (Garachiné). Only from Bocas del Toro in Caribbean Slope, also Canal Area; also Islands of Taboga, Perlas and others.

Recommendations:

Research management: Survey

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3

CAMP TAXON REPORT

SPECIES: *Panterpe insignis* Fiery-throated Hummingbird Colibrí Garganta de Fuego

STATUS: IUCN: Endangered.
Criteria based on: Extent of occurrence.
CITES: Appendix II

Taxonomic status: Species

Distribution: W Panama (only W highlands) & Costa Rica

Wild Population: One population, declining

Field Studies: No recent studies

Threats: Human disturbance, loss and fragmentation of habitat, interspecific competition with exotic species, power lines and communications towers, fire.

Comments: Range estimated to be 200 sq km in Panama. Recorded mostly above 2,100 m in W Chiriquí (mostly higher slopes of Volcan Barú). Rarely also in adjacent Bocas del Toro.

Recommendations:

Research management: Survey, monitoring, habitat management and limiting factor research.

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Eupherusa nigriventris* Black-bellied Hummingbird Colibrí Ventinegro

STATUS: IUCN: Endangered.
Criteria based on: Extent of occurrence.
CITES: Appendix II

Taxonomic status: Species

Distribution: W Panama highlands & Costa Rica

Wild Population: Declining and fragmented in Pacific slope

Field Studies: None

Threats: Human disturbance, loss and fragmentation of habitat

Comments: Range estimated to be 3,000 sq km in Panama. Recorded 900-1,800 m in Caribbean slope in Bocas del Toro, Chiriquí (Cerro Pando, Fortuna) and Veraguas (Cordillera del Chucú, Santa Fé and Calobre).

Recommendations:

Research management: Survey, Monitoring, Habitat management and Limiting factors research.

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No

CAMP TAXON REPORT

SPECIES: *Trogon bairdii* Baird's Trogon Trogón de Baird

STATUS: IUCN: Extinct?
CITES:
Other: Listed as 'K' in 1990 Red List
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: Western Chiriquí

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Unknown

Comments: According to Ridgely and Gwynne (1989) it is possible that this species may already be extinct.

Recommendations:

Research management: Survey

PHVA: Pending

Captive Population:

Captive Program Recommendation: Pending; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Trogon clathratus* Lattice-tailed Trogon Trogon Colirayado

STATUS: IUCN: Vulnerable.
Criteria based on: Extent of occurrence.
CITES:

Taxonomic status: Species

Distribution: W Panama (mainly W Caribbean slope) & Costa Rica

Wild Population: One fragmented population

Field Studies: None recent

Threats: Human disturbance, loss and fragmentation of habitat.

Comments: Range estimated to be 7,500 sq km in Panama. Recorded 150-1,050 m in Caribbean slope from Bocas del Toro to Coclé (río Cascajal); in Chiriquí is apparently rare (collected in Fortuna) and old records from Cordillera de Tolé and W Veraguas (Santa Fé).

Recommendations:

Research management: Survey, Monitoring, Habitat management

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Brachygalba salmoni* Dusky-backed Jacamar Jacamar Dorsioscuro

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES: Not listed

Taxonomic status: Species

Distribution: Panama (E Darien - lower Chucunaque and Ruira River valleys, ranging up in the latter to the Cana area) & to N Sucre and N end of central Andes in Colombia (NW)
. Ranges 0-600 m.

Wild Population: Unknown

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and habitat fragmentation (Pan American Highway), interspecific competition with livestock (cattle), habitat loss because of agricultural crops, and pesticides.

Comments: Estimated range is 3,000 sq km. Population is thought to be declining. Not inside forest areas. Prefers secondary growth.

Recommendations:

Research management: Survey, monitoring, limiting factors management, limiting factors research

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Pteroglossus sanguineus* Striped-billed Aracari

STATUS: IUCN: Data Deficient (Panama) / Low Risk (Colombia)
CITES:

Taxonomic status: Considered as one species in Panama but as two species in Colombia (*Pteroglossus torquatus* - Collared Aracari) because of narrow hybrid zone.

Distribution: E base of Cerro Tacarcuna, E bank of Golfo Uraba, S to E Darien in Panama, W of Andes and S to NW Ecuador

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, interspecific competition, and hybridization

Comments: Population is thought to be stable in Colombia. See comments above on taxonomic status; not fully accepted as species in Panama. It has only been collected a few times in Panama. Difficult to assign threat status for IUCN Red List for Panama because of hybridization.

Recommendations:

Research management: Survey, monitoring, taxonomic studies

PHVA: Pending

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: Pending survey and PHVA; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Pteroglossus frantzii* Fiery-billed Aracari Tucancillo Piquinaranja

STATUS: IUCN: Vulnerable.
Criteria based on: Extent of occurrence.
CITES:

Taxonomic status: Species

Distribution: W Pacific, Panama (Chiriquí and Coastal Veraguas) & Costa Rica.

Wild Population: 3 fragmented populations, declining

Field Studies: None recent

Threats: Human disturbance, loss and fragmentation of habitat

Comments: Range estimated to be 6,000 sq km in Panama. Found to 1,200 m(rarely to 1,800 m). Reported from Burica, Volcan Santa Clara in Coastal Veraguas. Declining due to accelerated deforestation in the Pacific.

Recommendations:

Research management: Survey, Monitoring, Habitat management

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; level of difficulty 2.

CAMP TAXON REPORT

SPECIES: *Capito maculicoronatus* Spot-crowned Barbet Barbudo Copetimanchado

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES: Not listed

Taxonomic status: Species

Distribution: Panama (Veraguas & E Panama to Darien) & Colombia (S and E to Andes Mts.)

Wild Population: Unknown; two fragmented populations separated by the Panama Canal.

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat fragmentation and loss, habitat loss because of agricultural, crops, interspecific competition with livestock, pesticides.

Comments: Estimated range is 30,000 sq km in Panama. Large range in Colombia also. Reported in lowlands to about 900 m; on Caribbean slope from Veraguas (Santa Fé), and northern Coclé east throughout San Blas; on Pacific side from eastern Panama province (Cerro Azul) and Darien, in canal area in Ochiote Road/Escobal region. The species is thought to be declining.

Recommendations:

Research management: Survey, monitor

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Semnornis frantzii* Prong-billed Barbet Barbudo Cocora

STATUS: IUCN: Vulnerable.
Criteria based on: Extent of occurrence.
CITES:

Taxonomic status: Species

Distribution: W Panama (only W highlands) & Costa Rica

Wild Population: One population, declining

Field Studies: No recent studies

Threats: Human disturbance, loss and fragmentation of habitat, biocides.

Comments: Range estimated to be 4,500 sq km in Panama. Recorded mostly above 1,500-2,250 m in highlands of Western and Central Chiriquí; locally (down to 1,050 m) above Fortuna and Cerro Flores; also in adjacent Bocas del Toro and Veraguas (Chitra).

Recommendations:

Research management: Survey and Monitoring.

PHVA: No

Captive Population: None

Captive Program Recommendation: No; level of difficulty 2.

CAMP TAXON REPORT

SPECIES: *Melanerpes chrysauchen* Golden-naped Woodpecker Carpintero Nuquidorado

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species, separated from isolated *M. pulcher* (Beautiful Woodpecker) from Magdalena Valley in Colombia.

Distribution: W Panama (only Chiriquí and W Veraguas) & Costa Rica

Wild Population: One population, declining

Field Studies: None recent

Threats: Human disturbance, loss and fragmentation of habitat

Comments: Range estimated to be 7,500 sq km in Panama. Found in Chiriquí (foothills); also recorded at Río San Lorenzo in Coastal Veraguas (to 1,200 m). Population believed to have declines markedly due to deforestation.

Recommendations:

Research management: Survey, Monitoring, Habitat management, Habitat management and Limiting factors research

PHVA: Yes

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Piculus callopterus* Stripe-cheeked Woodpecker Carpintero Carirrayado

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Veraguas to Darien (Cerro Pirre). Recent sea level sightings near Eastern Colon, Rio Piedras (Cerro Azul/Cerro Jefe area). Probably in Colombia.

Wild Population: Unknown. Three fragmented subpopulations.

Field Studies: Unaware of specific recent efforts.

Threats: Habitat fragmentation, human interference, interspecific competition with livestock, loss of habitat because of agricultural crops, pesticides.

Comments: Estimated range is 100 sq km in Rio Riedras, Colón; 400 sq km in Cerro Azul/Jefe; and 400 sq km in Pirre. Recorded mostly in foothills (300-900 m) on Caribbean slope; reported from Veraguas and eastern Colon province; on Pacific side only from eastern Panama province (Cerro Azul/Jefe) and Darien (Cerro Pirre). Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Xenerpestes minlosi* Double-banded Graytail Cologais Qilibaneado

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES: Not listed
Other: Listed as Rare to Uncommon in Ridgely & Gwynne (1989)

Taxonomic status: Species; Wetmore (1972) lists it as a separate subspecies (*Xenerpestes minlosi umbraticus)* ranging into Colombia.

Distribution: Panama (E Panama & Darien) & Colombia (east to Río Sinú) to 900 m

Wild Population: Unknown; one population but there is question as to whether there are really two.

Field Studies: Unaware of specific recent efforts

Threats: Human interference, habitat loss, habitat fragmentation, interspecific competition with livestock, habitat loss because of agricultural crops, and pesticides.

Comments: Lacking data to determine accurately the range in Panama. Four localities reported in Colombia (Hilty & Brown, 1986). Population is thought to be stable.

Recommendations:

Research management: Survey

PHVA: Pending survey

Captive Population: No

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Margarornis rubiginosus* Rudy Treerunner Subepalo Rojizo.

STATUS: IUCN: Vulnerable.
Criteria based on: Extent of occurrence.
CITES:

Taxonomic status: Species

Distribution: W Panama (only W highlands) & Costa Rica.

Wild Population: Two fragmented populations, in W Chirquí; and Veraguas and E Chiriquí.

Field Studies: No recent studies

Threats: Human disturbance, loss and fragmentation of habitat, biocides.

Comments: Range estimated to be 1,500 sq km in W Chiriquí; and 1,000 sq km in Veraguas and E Chiriquí. Recorded mostly above 1,800 m in Chiriquí; also in Eastern Cerro Flores and Chitra, Veraguas (down to 1,200 m).

Recommendations:

Research management: Survey, Monitoring, and Habitat management.

PHVA: No

Captive Population: None

Captive Program Recommendation: No; level of difficulty 3.

CAMP TAXON REPORT

SPECIES: *Cranioleuca dissita* Coiba Spinetail Colaespina de Coiba

STATUS: IUCN: Critical
Criteria based on: Probability of extinction
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species; described by Wetmore (1972) as a subspecies of *C. vulpina.*

Distribution: Coiba Is.

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts

Threats: Predation by exotics, hurricanes, human interference (ecotourism).

Comments: Estimated range is 450 sq km on Coiba Island (size 493 sq km). Population is thought to be stable by virtue of inhabiting a protected area. There are rats on the island which pose a threat.

Recommendations:

Research management: Survey, monitoring, limiting factors research, limiting factors management, habitat management, life history studies

PHVA: Yes

Captive Population:

Captive Program Recommendation: Pending; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Margarornis bellulus* Beautiful Treerunner Subepalo Bello

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: Cloud forest in E Darien in Cerros Pirre (Cerro Pirre, Cerro Tacarcuna, and Cerro Quia mostly above 1,350 m), Tacarcuna (above 1,350 m), & Quia (from 900 m).

Wild Population: Unknown; three fragmented subpopulations

Field Studies: Unaware of specific recent efforts

Threats: Human interference, habitat loss

Comments: Estimated range is 50 sq km in Cerro Quia; 75 sq km Tacarcuna; and 200 sq km in Cerro Pirre. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3.

CAMP TAXON REPORT

SPECIES: *Thripadectes rufobrunneus* Streak-breasted Treehunter Trepamusgo Pechirrayado

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Cordillera de Guanacaste (Costa Rica) S to W Panama (highlands of Ciriquí, adjacent Bocas del Toro, and Veraguas, ranging mostly 1,200 m. In Veraguas recorded as low as 750 m)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops, and pesticides

Comments: Range is estimated to be 7,000 sq km in western Panama. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; level 3 difficulty

CAMP TAXON REPORT

SPECIES: *Thamnophilus nigriceps* Black Antshrike Botará Negro

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Panama (E Panama & Darien) & Colombia (N)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts

Threats: Human interference, habitat loss, habitat fragmentation, interspecific competition with livestock, habitat loss because of agricultural crops, and pesticides.

Comments: Estimated range is 10,000 sq km in Panama, large range in Colombia. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Thamnophilus bridgesi* Black-hooded Antshrike Barará Negruzco

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence (see comments below)
CITES:

Taxonomic status: Species

Distribution: S Pacific slope from Volcan Tenorio (Costa Rica) S to Pacific W Panama

Wild Population: Unknown; one fragmented population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat fragmentation, interspecific competition with livestock, habitat loss because of agricultural crops, and pesticides.

Comments: Range estimated to be 15,000 sq km. Recorded on Pacific slope from Chiriquí east to eastern side of Azuero peninsula (Río Pedasi in Los Santos); at least formerly it ranged up in the foothills to about 1,100 m. Population is thought to be declining throughout the range. Although the range is large, the area of occupancy has decreased dramatically in the past decade (thought to be between 100 and 500 sq km), thus the Endangered assessment.

Recommendations:

Research management: Survey, monitoring, limiting factors management, habitat management, limiting factors management

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Xenornis setifrons* Speckled Antshrike Barará Moteado

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Panama (San Blas & E Darien) & along border of Colombia (NW)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts

Threats: Human interference, habitat loss, habitat fragmentation, interspecific competition with livestock, habitat loss because of agricultural crops, and pesticides.

Comments: Estimated range is 1,500 sq km in Panama. In eastern Darien, recorded only from middle slopes of Cerro Tacarcuna, recorded mainly 150-600 m. In San Blas in the east from hills above Qemila and more recently from Nusagandi in the west. Population is thought to be stable. Population is being protected by the Kuna Indians in San Blas.

Recommendations:

Research management: Survey and monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Scytalopus panamensis* Tacarcuna (Pale-throated) Tapaculo
Topaculo de Tacarcuna

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Panama (E Darien - Cerro Tacarcuna and Cerro Mali (1,020 - 1,380 m) & adjacent NW Colombia (1,100-1,500 m along high ridge of Cerro Tacarcuna)

Wild Population: Unknown; one population in a very small locality

Field Studies: Unaware of specific recent efforts

Threats: Habitat loss and human interference

Comments: Estimated range is 50 sq km. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Scytalophus argentifrons* Silvery-fronted Tapaculo Tapaculo Frentiplateado

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera de Guanacaste (Costa Rica) to W Panama (highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat fragmentation, interspecific competition with livestock, habitat loss because of agricultural crops, and pesticides.

Comments: Found in elevations above 1,050 m in Veraguas and above 1,800 m in Chiriqui. Range is estimated to be about 7,000 sq km in Panama. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring, limiting factors management, limiting factors research

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Oncostoma olivaceum* Southern Bentbill Picotorcudo Sureño

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: C Panama (Coclé to Darien) to N Colombia, to 1,000 m

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss because of agricultural crops, habitat fragmentation, pesticides, and habitat loss.

Comments: Estimated range is 40 sq km in Panama. Large range in Colombia (to Santa Maria range). Recorded on Caribbean slope from Coclé (Río Indio) east through San Blas and on Pacific slope from canal area east through Darien (where it occurs up to lower foothills around Cana). Population is thought to be declining.

Recommendations:

Research management: Survey and management

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Aphanotriccus audax* Black-bellied Flycatcher Mosquerito Piquinegro

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: E Panama (Panama province, upper Bayano River) & Darien (especially above the trail to Boca de Cupe) & Colombia (N) to Perija (100-600 m)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts

Threats: Human interference, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides.

Comments: Estimated range is 10,000 sq km in Panama. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Myiodynastes hemichrysus* Golden-bellied Flycatcher Mosquerito Ventridorado

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera de Guanacaste (Costa Rica) S to W highlands of Panama (Chiriquí, Bocas del Toro and Veraguas)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, pesticides, interspecific competition with livestock

Comments: Estimated range is 6,000 sq km. In Chiriquí, found at 1,200-1,800 m but elsewhere usually found ranging from 750-1,500 m. Population is declining, especially on the Pacific side.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Contopus lugubris* Dark Pewee Pibi Oscuro

STATUS: IUCN: Endangered (in Panama)
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (Costa Rica) S to W Panama (only Chiriquí highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, pesticides, interspecific competion with livestock

Comments: Range is estimated to be 200 sq km; only found on the Pacific side of Panama. Ranges 1,200 to 2,250 m but occurs somewhat lower eastward (900-1,500 m). Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Contopus ochraceus* Ochraceous Pewee Pibi Ocráceo

STATUS: IUCN: Critical (in Panama); Endangered (throughout the rest of its range)
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: Cordilleras Central and Talamanca (Costa Rica) to W Panama (Chiriquí highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, pesticides, interspecific competition with livestock

Comments: Range is estimated to be less than 100 sq km. Population is thought to be declining. Only reported in two localities - Fortuna and Boquete Trail to Cerro Punta. It is recorded mainly from 2,100-2,400 m; north of Fortuna it is recorded at 1,200 m.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: Pending; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Empidonax atriceps* Black-capped flycatcher Mosquinito Cabecinegro

STATUS: IUCN: Low Risk
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera Central (Costa Rica) S to W Panama (Chiriquí and adjacent Bocas del Toro)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, pesticides, interspecific competition with livestock

Comments: Range is estimated to be about 500 sq km; mostly found above 2.100 m. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Phyllomyias zeledoni* White-fronted Tyrannulet Tiranolete Frentiblanco

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (Costa Rica) S to W Panama (only in the Chiriquí highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, pesticides, interspecific Compton with livestock

Comments: Range is estimated to be about 200 sq km (in Panama). Recorded mostly from 1,200-2,100 m and in Central Chiriquí at 1,050 m. Population is thought to be declining; species needs large habitat.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Phylloscartes flavovirens* Yellow-green Tyrannulet Mosquerito Verdiamarillo

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: C and E Panama - canal area E to Darien (Garachiné, Cerro Quia)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides

Comments: Estimated range is 20,000 sq km. Population is thought to be stable

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Manacus vitellinus* Golden-collared Manakin Soltaria Cuellidorado

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Panama (W Bocas del Toro & Veraguas to Darien) & Colombia (W)

Wild Population: Unknown; two fragmented populations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides

Comments: Common in undergrowth of borders of humid forest, secondary growth woodlands and in dense regenerating clearings in the lowlands and lower foothills. Estimated range is 50,000 sq km. Recorded sparingly up to 450 m on the entire Caribbean slope. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Manacus aurantiacus* Orange-collared Manakin Saltaría Cuellinarouja

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Pacific slope from Carara (Costa Rica) S to Pacific W Panama

Wild Population: Unknown; one fragmented population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides

Comments: Estimated range is 15,000 sq km. Species has only been recorded at two sites, 750-2,500 m on the Pacific slope in Chiriquí, southern Veraguas, and on the Azuero peninsula (including its eastern side, in Herrera and Los Santos. Although the distribution is fairly large it is thought to occupy an area of less than 300 sq km; thus the assessment as Endangered. Population is thought to be declining. Ridgely and Gwynne (1989) report that the species has declined substantially because of deforestation over much of its Panamanian range.

Recommendations:

Research management: Survey, monitoring, limiting factors management, habitat management

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Cotinga ridgwayi* Turquoise Cotinga Cotinga Turquesa

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:
Other: Listed as 'K' in 1990 IUCN Red List

Taxonomic status: Species

Distribution: Pacific slope from Carara (Costa Rica) S to W Panama (only in western Chiriquí)

Wild Population: Unknown; one fragmented population. Uncommon and local

Field Studies: E. Ponce has been visiting the site for 14 years and has never seen the bird (pers. comm).

Threats: Habitat loss and fragmentation, human interference, loss of habitat to coffee plantations, pesticides

Comments: Estimated range is approximately 5,000 sq km in Santa Clara west of Volcán. The area of occupancy is thought to be less than 100 sq km. Recorded up to about 1,350 m. Area is very fragmented by coffee plantations. Remaining habitat is only in the upper portion of the range. Population is thought to be declining.

Recommendations:

Research management: Habitat management, limiting factors management, survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Carpodectes antoniae* Yellow-billed Cotinga Continga Piquiamarilla

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:
Other: Listed as 'K' in 1990 IUCN Red List; Listed in *Threatened Birds of the Americas* (Collar et al., 1992)

Taxonomic status: Species

Distribution: S Pacific slope from mouth of Rio Tarcoles (Costa Rica) S to W Panama (only western Chiriquí)

Wild Population: Unknown; one fragmented population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat fragmentation and loss, interspecific competition with agricultural crops, pesticides, human interference

Comments: Estimated range is approximately 5,000 sq km. The area of occupancy is thought to be less than 35 sq km - 10 sq km in Manglares near Corozal and 20 sq km in Punta Burica. Recorded in mangroves (at least formerly) and canopy and borders of humid forest in western Chiriquí. Population is thought to be declining.

Recommendations:

Research management: Habitat management, limiting factors management, survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Carpodectes hopkei* Black-tipped Cotinga Continga Blanca

STATUS: IUCN: Low Risk
CITES:
Other: Listed as 'K' in 1990 IUCN Red List

Taxonomic status: Species

Distribution: Pacific coast from PAN (Río Juradó & upper Atrato Valley) S to E Panama (SE Darien) to NW Ecuador

Wild Population: Unknown;

Field Studies: Unaware of specific recent efforts.

Threats: Human interference

Comments: Estimated range is 35,000 sq km. Reported in lowlands and foothills (up to about 900 m) of eastern Darien (Piñas Bay, Cerro Sapo, Cana/Cerro Pirre area, Cerro Quia, and Alturas de Nique. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Cephalopterus glabricollis* Bare-necked Umbrella Bird
Ave-sombrilla Cuellinuda

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence and probability of extinction
CITES:
Other: Listed as 'K' in 1990 IUCN Red List

Taxonomic status: Species

Distribution: Caribbean slope from Volcan Miracles (Costa Rica) S to W Panama (mostly in the highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, human interference, habitat loss because of agricultural crops

Comments: Estimated range is 2,000 sq km. In the highlands of Chiriquí, Boca del Toro, and Veraguas, apparently descends in non-breeding season to lowlands or Caribbean slope, at least in Bocas del Toro. Recorded mainly 900-1,200 m when presumed to be breeding (nests have never been found). Population is declining and has already disappeared entirely from one area.

Recommendations:

Research management: Survey, monitoring, limiting factors management, habitat management, limiting factors management

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Campylorhynchus albobrunneus* White-headed Wren Soterrey Cabeciblanco

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Panama (Central N Cocle & E Panama to Darien) & Colombia (W)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides

Comments: Estimated range is 40,000 sq km. In Darien, wher is ranges well up into the foothills, it has been found to about 1,200 m. Population is thought to be stable.

Recommendations:

Research management: Survey and monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Thryothorus spadix* Sooty-headed Wren Soterrey Cabecigris

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Panama (E Darien) & Colombia (W)

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides

Comments: Estimated range is 300 sq km. Known only from eastern Darien foothills (Cerro Tacarcuna, Cerro Pirre, Cerro Quia); recorded about 450-1,200 m. Population is thought to be stable.

Recommendations:

Research management: Survey and monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; level 3 difficulty

CAMP TAXON REPORT

SPECIES: *Thryothorus semibadius* Riverside Wren Soterrey Pechibarreteado

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: S Pacific slope from Carara (CR) S to W Panama

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, habitat loss because of agricultural crops, interspecific competition with livestock, pesticides.

Comments: Estimated range is less than 1,000 sq km. Found only in western Chiriquí, ranging up to around 1,200 m but in reduced numbers. Population is thought to be declining as a result of deforestation.

Recommendations:

Research management: Survey and monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Troglodytes ochraceous* Ochraceous Wren Soterrey Ocráceo

STATUS: IUCN: Low Risk
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (Costa Rica) S to E Panama (Chiriquí, adjacent Bocas del Toro, Veraguas, and E Darien, Cerro Pirre and Cerro Tacarcuna; a few sightings in Cerro Campana, W Panama province).

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, habitat loss because of agricultural crops, interspecific competition with livestock, pesticides.

Comments: Estimated range is less than 25,000 sq km. A highland bird. In western Chiriquí found mainly above 1,500 m; elsewhere lower (mostly 750-1,650 m). Population is thought to be declining.

Recommendations:

Research management: Survey and monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Thryorchilus browni* Timberline Wren Soterrey del Bambú

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Irazu-Turrialba massif (Costa Rica) S to W Panama (only high on Volcán Barú)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, interspecific competition with livestock, fires (every three years), power lines, volcanoes.

Comments: Estimated range is less than 25 sq km. Known only on higher slopes of Volcán Barú in western Chirquí, only above 2,700 m. Also occurs on summit of Barú's major spur, Cerro Copata, at about 5,000 m. Population is thought to be declining. There are a number of communication towers in the area and the road that goes to the communications center goes through the middle of the habitat.

Recommendations:

Research management: Survey, monitoring, limiting factors management, habitat management

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Turdus nigrescens* Sooty Thrush

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordilleras Central and Talamanca (Costa Rica) to W Panama (only high in western Chirquí mountains)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, interspecific competition with livestock, fires (every three years), power lines, volcanoes.

Comments: Estimated distribution is 50 sq km on the higher slopes of Barú Volcano in western Chiriquí; recorded mostly above 2,250 m. Occasionally wanders low as 1,830 m on the rocky llanos of the Volcán. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring, limiting factors management, habitat management

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Myadestes coloratus* Varied Solitaire Solitario Variado

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Panama (E Darien highlands and foothills) & adjacent NW Colombia

Wild Population: Unknown; three fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides

Comments: Estimated range is 1,000 sq km. Found in forests and highlands of eastern Darien (Cerro Pirre, Altos de Nique, Cerro Quia, and Cerro Tacarcuna). Recorded mostly above 1,200 m; occasionally somewhat lower and found at about 900 m on the summit of Cerro Quia. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Myadestes melanops* Black-faced Solitaire Solitario Carinegro

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Length of Caribbean & Pacific slopes (CR) to W Panama (only in W highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, hunting for sport,

Comments: Estimated range is 1,000 sq km. Recorded in montane forest and forest borders in highlands of Ciriquí adjacent Bocas del Toro, Veraguas, and western Caclé. In western Chiriquí, it is recorded mainly above 1,500 m; elsewhere found as low as 750-900 m. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Catharus gracilirostris* Black-billed Nightingale Thrush Zorzal Pinguinegro

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Cordillera Central (Costa Rica) S to W Panama (only in Chiriquí highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, pesticides, power lines

Comments: Estimated range is 3,000 sq km. In highlands of western Chiriquí mostly recorded above 2,100 m; a few occasionally seen at 1,500 m. Recorded also from eastern Chiriquí (Cerro Flores or Santiago, and Cerro Bollo) where it is found at 1,800-2,100 m. Population is thought to be declining on the Pacific slope and stable on the Atlantic side.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Pheucticus tibialis* Black-thighed Grosbeak Picoguesco Muslinegro

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Cordillera de Guanacaste (Costa Rica) S to W Panama (highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Threats: Human interference, habitat loss, habitat loss because of agricultural crops, pesticides, power lines

Comments: Estimated range is 3,000 sq km. Recorded in foothills and highlands of Chiriquí, adjacent Bocas del Toro, Veraguas, and Caclé, in western Chirquí mostly above 1,800 m but elsewhere much lower, usually 750-1,200 m. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Acanthidops bairdii* Peg-billed Finch Pinzón Piquiagudo

STATUS: IUCN: Data Deficient
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (CR) S to extreme W Panama

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Unknown.

Comments: Estimated range is unknown. Population trend is not known. Appeared in great numbers (>200 individuals) in Panama (1979) and then disappeared (Ridgely & Gwynne, 1989).

Recommendations:

Research management: Survey, management

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Diglossa plumbea* Slaty Flowerpiercer Pinchaflor Pizarroso

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Cordillera de Guanacaste (CR) S to W Panama (only in W highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Pesticides

Comments: Estimated range is 3,000 sq km. Recorded in highlands of western Chiriquí (mostly above 1,500 m) and in eastern Veraguas (1,380-1,500 m). Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring,

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON SHEET

SPECIES: *Pezopetes capitalis* Large-footed Finch Pinzón Patigrande

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Cordilleras Central and Talamanca (Costa Rica) and W Panama. Found only on higher mountains of western Chiriquí and Bocas del Toro.

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Power lines, habitat loss because of agricultural crops, habitat loss, human interference

Comments: Estimated range is 2,000 sq km. Recorded in higher mountains of western Chirquí and adjacent Bocas del Toro, mostly above 2,100 m, locally down to 1,500 m. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Pselliophorus tibialis* Yellow-thighed Finch Pinzón Musliamarillo

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (Costa Rica) S to W Panama (only in western Chiriquí)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Power lines, habitat loss because of agricultural crops, habitat loss, human interference

Comments: Estimated range is 2,000 sq km. Recorded in highlands of western Chiriquí, mostly above 1,500 m. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Pselliophorus leutoviridris* Yellow-green Finch Pinzón Verdiamarillo

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: E Chiriqui (Cerro Flores area) and Veraguas (Santa Fe and Chitra)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss because of agricultural crops, habitat loss, human interference, pesticides

Comments: Estimated range is 1,000 sq km. Recorded from highlands of eastern Chiriquí (Cerro Flores area) and Veraguas (Santa Fé and Chitra) at mostly 1,200 - 1,800 m. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring, habitat management

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Lysurus crassirostris* Sooty-faced Finch Pinzón Carisucio

STATUS: IUCN: Data Deficient
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (Costa Rica) S to E Panama - foothills and highlands on Caribbean slope in Bocas del Toro, Veraguas (both slopes) and Coclé, in Chiriquí with records from Cerro Pando and the Furtuna area in upper Río Ciriquí Valley, also Darien.

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Power lines, habitat loss because of agricultural crops, habitat loss and fragmentation, human interference

Comments: Estimated range is 4,000 sq km on the west of Panama; 800 sq km east of Panama in Cerro Tacarcuna. Found only in the humid foothills and highlands, mostly on Caribbean slope. In Darien (Cerro Tacarcuna) recorded mostly 1,200 m. Population trend is unknown.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Junco vulcani* Volcano Junco Junco Paramero

STATUS: IUCN: Critical
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Irazu-Turrialba massif (CR) S to W Panama (only above timberline on Volcán Barú.

Wild Population: Unknown; 3 subpopulations (2 in Costa Rica and 1 in Panama)

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, power lines, habitat loss, fire, volcano eruption

Comments: Estimated range is less than 10 sq km. Found mainly above timberline on Volcán Barú and recorded primarily above 3,000 m. Historically the species had been as low as 2,200 m. Population is thought to be declining. There is a lot of automobile traffic throughout the habitat (visitors to the volcano).

Recommendations:

Research management: Habitat management, survey, monitoring, limiting factors management, limiting factors research

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Basileuterus ignotus* Pirre Warbler Reinita de Pirre

STATUS: IUCN: Conservation Dependent
CITES:
Other: 1990 IUCN Red List - K
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: Panama (E Darien highlands) & adjacent NW Colombia (E slope Cerro Tacarcuna)

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides (only in Tacarcuna, one of the areas in which the species is found).

Comments: Estimated range is 150 sq m in Tacarcuna and 200 sq km in Pirre. Recorded mostly 1,350-1,650 m. Population is thought to be stable; status is contingent on ongoing management within protected area in the Darien.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Basileuterus melanogenys* Black-cheeked Warbler Reinita Carinegro

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera Central (Costa Rica) S to W Panama (only western highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, pesticides

Comments: Estimated range is about 600 sq km. Recorded in highland of western Chirquí (east only to slopes of Volcán Barú above Boquite), mostly between 1,500-2,400 m. Also recorded in Veraguas (Chitra), much lower to 1,200-1,500 m. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Parula gutturalis* Flame-throated Warbler Reinita Gorgirroja

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera Central (CR) S to W Panama (only Chiriquí highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, fires

Comments: Estimated range is less than 5,000 sq km. Highlands of western Chiriquí, mostly above 1,500 m. Population is thought to be declining on the Pacific coast and stable on the Atlantic coast.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Myioborus torquatus* Collared Redstart Candelito Collareja

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (Costa Rica) S to W Panama (only in western highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, fire, and pesticides

Comments: Estimated range is less than 5,000 sq km. Found in highlands of Chiriquí and adjacent Bocas del Toro, mostly above 1,800 m. Sometimes seen as low as 1,200 m. Found also in Veraguas highlands where it regularly ranges lower to 1,050-1,200 m. Population on the Pacific side is thought to be declining; on the Atlantic side it is thought to be stable.

Recommendations:

Research management: Survey and monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Zeledonia coronata* Wrenthrush Zeledonia

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera de Guanacaste (Costa Rica) S to Panama (only in western highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, fire, and pesticides

Comments: Estimated range is less than 5,000 sq km. Recorded in highlands of western Chiriquí (above 1,600 m) and at Cerro Colorado and in central and eastern Chiriquí. Also known from highlands of Veraguas (Chitra) where it is found at 1,050-1,200 m. Population is thought to be declining on the Pacific slope and stable on the Atlantic side.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Dacnis viguieri* Viridian Dacnis Dacnis Esmeraldino

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: Panama (E Darien) & Colombia (NW Golfo Uruba to Salaqui River, Juradó)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops, habitat fragmentation, interspecific competition with livestock, pesticides.

Comments: Range is about 400 sq km. Found in lowlands and lower foothills of the eastern Darien (to about 600 m). In the Darien, recorded near El Real, in the Carna Valley, and Jequí. Population is thought to be declining.

Recommendations:

Research management: Survey and monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Chlorospingus tacarcunae* Tacarcuna Bush Tanager
Tangara de Monte de Tacarcuna

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Panama (E Panama, W San Blas, & E Darien) & Colombia (extreme NW)
. Found only in foothills and highlands.

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops, power lines, pesticides

Comments: Range estimated to be 1,000 sq km for Tacarcuna (population declining); in Cerro Jefe, Cerro Azul, Cerro Brewster estimated 500 sq km (population declining). Found in foothills and highlands of eastern Panama and known only from Cerro Azul/Jefe in eastern Panama province, Cerro Brewster in western San Blas, and eastern Darien (Cerro Tacarcuna only) from 750-1,500 m.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; level 3 difficulty

CAMP TAXON REPORT

SPECIES: *Chlorospingus flavigularis hypophaeus* Yellow-throated Bush Tanager
Tangara de Monte Gorgiamarilla.

STATUS: IUCN: Vulnerable.
Criteria based on: Extent of occurrence.
CITES:

Taxonomic status: Subspecies

Distribution: Western and Central Panama; Bocas del Toro, Veraguas-Coclé, and San Blas.

Wild Population: 3 fragmented populations, stable

Field Studies: No recent studies

Threats: Human disturbance, loss and fragmentation of habitat

Comments: Ranges estimated to be 1,500 sq km for Bocas del Toro; 1,500 sq km for Central Area Veraguas, Coclé (El Copé). Recorded mostly 450-900 m on Caribbean slope (Boquete, Fortuna). Surprisingly reported from Cerro Brewster in 1985 by J. Blake.

Recommendations:
Research management: Survey, Monitoring

PHVA: No

Captive Population: None

Captive Program Recommendation: No; level of difficulty 2.

CAMP TAXON REPORT

SPECIES: *Chlorophonia callophrys* Golden-browed Chlorophonia Clorofonia Cejidorada

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Length of Caribbean and Pacific slopes (Costa Rica) to W Panama (only in western highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops

Comments: Estimated range is less than 5,000 sq km. Recorded in highlands of Chirqui and Veraguas, mostly above 1,500 m in Chiriquí; lower (750 m) in Veraguas. Population is thought to be stable.

Recommendations:

Research management: Survey and monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; level 2 difficulty

CAMP TAXON REPORT

SPECIES: *Euphonia imitans* Spot-crowned Euphonia Eufonia Coronimanchada

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: S Pacific slope from Carara (Costa Rica) S to W Panama (only in western Chiriquí)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops

Comments: Estimated range is less than 1,500 sq km. Found in western Chiriquí, ranging from lowlands up to lower highlands to approximately 1,200 m. Population is thought to be declining. Recent reports in forest patches in Santa Clara (E. Ponce, pers. comm.).

Recommendations:

Research management: Survey, monitoring, limiting factors management, habitat management

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; level 2 difficulty

CAMP TAXON REPORT

SPECIES: *Euphonia anneae* Tawny-capped Euphonia Euphonia Gorricando

STATUS: IUCN: Low Risk?
CITES:

Taxonomic status: Species

Distribution: W of Gulf of Curabá along Panama border (only in the foothills), Costa Rica to extreme NW Colombia

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss and fragmentation, human interference

Comments: Estimated range is 2,500 sq km and very local within that range. Recorded in foothills on both slopes, mostly 450-1,200 m but occasionally higher. Also from Caribbean lowlands (lower Río Changuinola, Bocas de Toro, and Río Guanche in eastern Colon province). In the eastern Darien, recorded only from Tacarcuna. Population is thought to be stable. Fairly common in Fortuna.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Tangara dowii* Spangle-cheeked Tanager Tangara Carisalpicada

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (Costa Rica) S to W Panama (only in western highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops

Comments: Estimated range is less than 5,000 sq km. Found in highlands of Bocas del Toro, Chiriquí, and Veraguas, mostly 1,350 - 2,100 m. Population is thought to be declining on the Pacific slope and stable on the Atlantic side.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; level 2 difficulty

CAMP TAXON REPORT

SPECIES: *Tangara fucosa* Green-naped Tanager Tangara Nuquiverde

STATUS: IUCN: Endangered
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: Highlands of E Darien (Cerro Pirre, Cerro Tacarcuna, and Cana) and probably in adjacent Colombia

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops, power lines, pesticides

Comments: Mainly above 1350 m; rare down to 600 m in Cana. Range estimated to be 600 sq km in Cerro Pirre (population stable); 600 sq km in Tacarcuna (Ridgely & Gwynne, 1989). Population in Tacarcuna is thought to be declining. Not mentioned in Hilty and Brown's (1986) *Birds of Colombia.*

Recommendations:

Research management: Survey and monitoring

PHVA: Yes

Other: Make an effort to consolidate a monitoring program in collaboration with birdwatching tours. This species should be listed on a "Birds to Watch" program initiated by ANCON.

Captive Population:

Captive Program Recommendation: No; level three difficulty

CAMP TAXON REPORT

SPECIES: *Tangara palmeri* Gray-and-Gold Tanager Tangara Doradigris

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Extreme E Panama (Nusagandi, Cerro Tacarcuna, Cerro Quia, Cerro Pirre and Cerro Sapo) to NW Ecuador

Wild Population: Unknown; two fragmented populations (one in Nusagandi and the other in the Cerro Tacarcuna, Cerro Quia, Cerro Pirre and Cerro Sapo

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss

Comments: Estimated range is 25 sq km (Nusagandi) and 10,000 sq km in Cerro Tacarcuna, Cerro Quia, Cerro Pirre and Cerro Sapo. In Darien, recorded 540-1,020 m but lower at Nusagandi (450 m). Population is thought to be stable in the mountains of the Darien but the trend is not known in Nusagandi.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Buthraupis (Bangsia) arcaei* Blue and Gold Tanager Tangara Azulidorada

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:
Other: Listed in *Birds to Watch 2* (Collar et al., 1994)

Taxonomic status: Species

Distribution: Cordillera de Guanacaste (Costa Rica) S to W Panama (central foothills)

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops

Comments: Estimated range is about 6,000 sq km. Found mostly 750-1,050 m from central Chririquí (upper Río Chiriquí valley in the Fortuna area), central Bocas del Toro (along the oleoducto road north to Fortuna), both slopes of Veraguas, western Coclí, eastern Panama province (Cerro Jefe area) and western San Blas (Cerro Brewster). May also occur eastward to San Blas and even on the slopes of Cerro Tacarcuna, Darien. Population is thought to be declining on the Pacific slope and stable on the Atlantic side.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; level 2 difficulty

CAMP TAXON REPORT

SPECIES: *Heterospingus rubrifrons* Sulphur-rumped Tanager Tangara Lomiazufrada

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: S Caribbean slope from Río Reventazon drainage (Costa Rica) to E Panama

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops

Comments: Estimated range is about 20,000 sq km. Found in lowlands and foothills (to about 900 m) on entire Caribbean slope. On the Pacific slope it is recorded only from Veraguas foothills; also found in eastern Panama province (Cerro Azul/Jefe and upper Bayano River valley). Population is thought to be declining on the Pacific slope (Cerro Jefe, Cerro Azul and the upper Bayano River valley) and stable on the Atlantic side.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; level 2 difficulty

CAMP TAXON REPORT

SPECIES: *Chrysothlypis chrysomelas* Black and Yellow Tanager Tangara Negriamarilla

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Caribbean slope from Cordillera de Guanacaste (Costa Rica) to E Panama. Mainly foothills on both slopes (central Chiriquí, Bocas del Toro along the oleoducto road), central Panama (Cerro Campana) and San Blas (Nusagandi).

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops

Comments: Estimated range is about 20,000 sq km. In Chiriquí known only from the Fortuna area; recorded mostly 450-1,200 m. Also found on both Cerro Campana and Cerro Jefe, and Nusagandi area of western San Blas. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; level 2 difficulty

CAMP TAXON REPORT

SPECIES: *Chlorospingus pileatus* Sooty-capped Bush-Tanager
Tangara de Monte Cejiblanca

STATUS: IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Cordillera de Tilaran (Costa Rica) to western Pacific Panama (highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops, and pesticides

Comments: Estimated range is less than 5,000 sq km. In western Chiriquí recorded mostly above 2,100 m, occasionally down o 1,650 m. In eastern Chiriquí it is known to range somewhat lower. Population is thought to be stable.

Recommendations:

Research management: Survey, monitoring

PHVA: No

Captive Population:

Captive Program Recommendation: No; level 2 difficulty

CAMP TAXON SHEET

SPECIES: *Chlorospingus inornatus* Pirre Bush Tanager Tangara de Monte de Pirre

STATUS: IUCN: Conservation Dependent
CITES:

Taxonomic status: Species

Distribution: Highlands of E Darien (Cerro Sapo, Cerro Pirre, & Alturas de Nique)

Wild Population: Unknown; two fragmented subpopulations

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops, power lines, pesticides

Comments: Between 780-1,560 m altitudinally, above 1,200 m in Cana. Range is estimated to be 100 sq km Cerro Sapo (population stable); range estimated to be 600 sq km in Cerro Pirre, Cana, and Alturas de Nique (population stable). Reported to be easily seen o slopes of Cerro Pirre to 1,200 m. Population is protected within the Darien National Park, thus the CD listing.

Recommendations:

Research management: Survey

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON SHEET

SPECIES: *Vireo carmioli* Yellow-winged Vireo Vireo Aliamarillo

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera Central (Costa Rica) S to W Panama (only Chiriquí highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss, habitat loss because of agricultural crops

Comments: Range estimated to 250 sq km. Found in highlands of western Chiriquí mainly above 1,800 m. Easily seen in forest patches along the Boquete Trail above Cerro Punta; not known to range east of the Boquete area. Population is thought to be stable.

Recommendations:

Research management: Survey

PHVA: No

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Psarocolius guatimozinus* Black Oropendola Oropéndola Negra

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: E Panama (Darien) and N Colombia

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, habitat loss because of agricultural crops, power lines, pesticides

Comments: Range estimated to be up to 10,000 sq km in the valleys of the Chucunaque and Tuira Rivers. Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring, limiting factors management

PHVA: Yes

Captive Population:

Captive Program Recommendation:

CAMP TAXON REPORT

SPECIES: *Ptilogonys caudatus* Long-tailed Silky Flycatcher Capulinero Colilargo

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Cordillera Central (Costa Rica) S to W Panama (western Chiriquí highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Human interference, habitat loss and fragmentation, interspecific competition with livestock, fires, pesticides

Comments: Estimated range is 1,500 sq km. Recorded in highlands of western Chiriquí (mostly above 1,500 m); small numbers were found above Fortuna (down to about 1,050 m). Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Phainoptila melanoxantha* Black-and-Yellow Silky Flycatcher
Capulinero Negro y Amarillo

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: N Cordilleras (Costa Rica) S to W Panama (highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Power lines, habitat loss and fragmentation, fires, habitat loss because of agricultural crops, human interference, and pesticides

Comments: Estimated range is 4,000 sq km. Recorded in highlands of western Chiriquí (above 1,650 m). Also adjacent Boca del Toro, central and eastern Chiriquí, and in the Veraguas (Chitra), where it ranges down to 1,050 m. Species appears to be most numerous at higher elevations (above 2,250 m). Population is thought to be declining on the Pacific slide and stable on the Atlantic side.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Other:

Captive Population:

Captive Program Recommendation: No; difficulty level 3

CAMP TAXON REPORT

SPECIES: *Cyanolyca argentigula* Silvery-throated Jay Urraca Gorgiplateada

STATUS: IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: High mountains from Irazu-Turrialba massif (Costa Rica) S to W Panama (only western Chiriquí highlands)

Wild Population: Unknown; one population

Field Studies: Unaware of specific recent efforts.

Threats: Habitat loss, human interference, habitat loss because of agricultural crops, pesticides

Comments: Estimated range is 1,000 sq km. Recorded in highlands of western Chiriquí (1,500-3,000 m). Population is thought to be declining.

Recommendations:

Research management: Survey, monitoring

PHVA: Yes

Captive Population:

Captive Program Recommendation: No; difficulty level 2

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Section 4

CAMP Spreadsheet (Aves)

ENDEMIC BIRDS OF PANAMA

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
	AVES														
	TINAMIFORMES														
	Tinamidae														
1	Crypturellus	kerriae	PAN (E Darien) & COL (NW)	?	3	2/F	S	AA-1	EN	Lf,I,L	Y	S,M	P	2	0
	GALLIFORMES														
	Phasianidae														
2	Odontophorus	dialeucos	PAN (E Darien) & adjacent extreme NW COL	?	3	1	D	AA-1	CR	Hf,Lp,I,Ps ,Lf	Y	Lm,S, Hm,Lr	P	2	0
2a	Chamaepetes	unicolor	W PAN (highlands) TO CR	?	3	1	D	B	VU	Hf,Hp,I,L, Lf,Lp	N	S,M	N	2	0
	COLUMBIFORMES														
	Columbidae														
3	Geotrygon	goldmani	PAN (E Panama, W San Blas, & E Darien) & extreme NW COL	?	3	4/F	D	AA-1	EN	Lf,Pl,I,L	Y	S,M,Lm	P	?	O
3a	Geotrygon	chiriquensis	CR & W PAN	?	3	1	D	B	VU	Hf,I,L,Lf,P ,Ps	N	S,M	N	2	0
3b	Pyrrhura	hoffmani	CR & W PAN	?	3	1	S	B	LR	I,L,Lf,Lp	N	S,M	N	2	0
3c	Touit	costaricensis	CR & W PAN	?	3	1	D	B	VU	I,L,Lf	N	S,M	N	2	0
	STRIGIFORMES														
	Strigidae														

	TAXON		WILD POPULATION									CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
4	Otus	clarkii	CR to extreme NW Colombia	?	3	2/F	D	A	EN	L,Lf,I	Y	S,M	N	1	0
4a	Caprimulgus	saturnatos	CR and E PAN (Chiriqui highlands)	?	3	1	D	AA-1	EN	I,L,Lf,Ps, Pl,Sf	Y	S,M,Lh, Hm	N	3	0
	APODIFORMES														
	Trochilidae														
5	Lepidopyga	coeruleogularis	PAN (Chiriqui to Darien) & COL (N)	?	2	1	S	C	LR	I,L	N	S,M	N	3	0
5a	Anthracothorax	prevostii veraguensis	W PAN - C PAN	?	3	1/F	S	B	LR	I,L,Lf	N	S	N	3	0
6	Hylocharis	grayi humboldtii	Extreme SE Panama to Pacific coast of Colombia to NW Ecuador	?	3	1	S	AA-2	DD	L,Lf,I	Y	S,M	P	3	0
7	Goldmania	violiceps	PAN (E Colon, W San Blas, E Panama, & E Darien) & extreme NW COL	?	3	2/F	S	C	LR	I,L	N	S,M	N	3	0
7a	Amazilia	edward	E PAN - SW CR	?	3	1/F	S	D	CR	I,L	N	S	N	3	0
7b	Amazilia	handleyi	PAN (Escudo de Veraguas Island)	?	3	1	AAA-3		CR	I,L,Lf	Y	S,M,Lh, Lm,Lr	N	3	0
7c	Elvira	chionura	C PAN - SW CR	?	3	1/F	D	A	VU	I,L,Lf,Ps	Y	S,M,Hm	N	3	0
8	Goethalsia	bella	PAN (E Darien) & adjacent COL	?	3	1	S	AA-2	CR	I,L	Y	S,M	N	3	0
8a	Calliphlox	bryantae	CR & W PAN	?	3	1	D	A	EN	Sf,Ps,I,L,Lp,Lf,Ic	Y	S,M,Hm,Lf	N	3	0
9	Selasphorus	ardens	E Chiriqui & Veraguas (750-1800 m)	?	3	1	D	AA-2	CR	Lp,I,Ps,Il, L,Sf, Sd	Y	S,M	N	3	0
9a	Selasphorus	flammula	CR & W PAN (W Chiriqui Mts.)	?	3	1	D	AA-1	EN	I,L,Lf,Lp,Ps,Sf	Y	S,M,Hm,Lr	N	3	0
9b	Selasphorus	scintilla	CR & W PAN (W Chiriqui highlands)	?	3	1	D	AA-11	EN	I,L,Lf,Lp,Ps,Sf	Y	S,N,Hm,Lr	N	3	0

	TAXON		WILD POPULATION									CAP POP			
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
9c	Lampornis	castaneoventris	S CR & extreme W PAN	?	3	1	D	AA-1	EN	Sf,Ps,I,L,Lf,Lp,Ic	Y	S,M,Hm,Lr	N	3	0
9d	Lophornis	adorabilis	CR & Pacific W PANAMA (Chiriqui)	?	3	1	D	A	EN	I,L,Lf,Lp	Y	S,M,Hm,Lr	N	3	0
9e	Lampornis	hemileucus	W PAN & CR	?	3	1/F	D	A	VU	I,L,Lf,Lp,Ps	Y	S,M,Hm	N	3	0
9f	Lophornis	adorabilis	CR & Pacific W PANAMA (Chiriqui)	?	3	1	D	A	EN	I,L,Lf,Lp	Y	S,M,Hm,Lr	N	3	0
9g	Chlorstilbon	assimilis	SE CR & PAN	?	3	1	S	D	LR	I,L	N	S	N	3	0
9h	Panterpe	insignis	CR & W PAN	?	3	1	D	AA-1	EN	PI,Sf,I,Ic,L,Lf	Y	S,M,Lr, Hm	N	3	0
9i	Eupherusa	nigriventris	CR & W PAN	?	3	1	D	A	EN	I,L,Lf	Y	S,M,Hm,Lr	N	3	0
10	Trogonidae														
11	Trogon	bairdii	?	?	3	1	D?	--	EX?	UNK	Y	S	--	3	0
11a	Trogon	clathratus	CR & W PAN (W Caribbean slope)	?	3	1/F	D	B	VU	I,L,Lf	Y	S,M,Hm	N	3	0
	PICIFORMES														
	Galbulidae														
12	Brachygalba	salmoni	PAN (E Darien) & COL (NW)	?	3	1	D	B	EN	I,L,Lp, Lf,Il,Ps	Y	S,M,Lh, Lr	N	3	0
	Rhamphastidae														
13	Pteroglossus	sanguineus	E base of Cerro Tacarcuna, E bank of Golfo Uraba, S to E Darien in Panama, W of Andes and S to NW Ecuador	?	4	1	?	--	DD (Pan) LR (Col)	L,Lf,Ic,Hyb	P	S,M,T	P	2	0
13a	Pteroglossus	frantzii	SW CR to W Pacific PAN	?	3	3/F	D	B	VU	I,L,Lf	Y	S,M,Hm	N	2	0
	Capitonidae														

	TAXON		WILD POPULATION									CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
14	Capito	maculicoronatus	PAN (Veraguas & E Panama to Darien) & COL (W)	?	3	2/F	D	C	VU	Lp,I,L, Lf,II,Ps	Y	S,M	N	2	0
14a	Semnornis	frantzii	CR & W PAN (only in W highlands)	?	3	1	D	A	VU	I,L,Lf,Ps	N	S,M	N	2	0
	Picidae														
14b	Melanerpes	chrysauchen	SW CR to W PAN, N COL	?	3	1	D	B	CR	L,Lf,I	Y	S,M,Hm,Lr	N	2/3	0
15	Piculus	callopterus	Veraguas to Darien (300-900 m)	?	3	3/F	D	C	VU	Lp,I,L, Lf,II,Ps	Y	S,M	N	2/3	0
	PASSERIFORMES														
	Furnariidae														
16	Cranioleuca	dissita	Coiba Is.	?	3	1	S	AA-1	CR	Pe,Sh,I	Y	Lh,Lm, Lr,Hm	P	3	0
17	Xenerpestes	minlosi	PAN (E Panama & Darien) & COL (N)	?	3	1	S	B	VU	I,L,Lf,II,Ps	Y	S,M	N	3	0
18	Margarornis	bellulus	Cloud forest in E Darien (Cerros Pirre, Tacarcuna, & Quia)	?	3	1/F	S	AA-2	CR	I,L	Y	S,M	N	3	0
18a	Margarornis	rubiginosus	CR & W PAN	?	3	2/F	D	A	VU	I,L,Lf	N	S,M,Hm	N	3	0
19	Thripadectes	rufobrunneus	Cordillera de Guanacaste (CR) S to W Panama	?	3	1	S	B	LR	I,L,Lf,LPs	Y	S,M	N	3	0
	Formicariidae														
20	Thamnophilus	nigriceps	PAN (E Panama & Darien) & COL (N)	?	3	1	D	B	VU	I,L,Lp, Lf,IL,Ps	Y	S,M	N	3	0
21	Thamnophilus	bridgesi	S Pacific slope from Volcan Tenorio (CR) S to W Panama	?	3	1/F	D	C	EN	I,L,Lp, Lf,II,Ps	Y	Hm,Lr, S,M.Lm	N	3	0
22	Xenornis	setifrons	PAN (San Blas & E Darien) & COL (NW)	?	3	1	S	A	VU	I,L,Lp, Lf,II,Ps	Y	S,M	N	3	0
	Rhinocryptidae														

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
23	Scytalopus	panamensis	PAN (E Darien) & adjacent NW COL	?	3	1	D	AA-1	CR	I,L	Y	S,M	N	3	0
24	Scytalopus	argentifrons	Cordillera de Guanacaste (CR) to Panama	?	3	1	D	B	VU	I,L,Lp,Lf,II, Ps	Y	S,M Lr,Lm	N	3	0
	Tyrannidae														
25	Oncostoma	olivaceum	PAN (Cocle to Darien) & COL (N)	?	3	1	S	C	LR	I,L,Lf,II,Lp, Ps	Y	S,M	N	2	0
26	Aphanotriccus	audax	PAN (E Panama & Darien) & COL (N)	?	3	1	D	B	CR	I,L,Lp, Lf,II,Ps	Y	S,M	N	2	0
27	Myiodynastes	hemichrysus	Cordillera de Guanacaste (CR) S to W Panama	?	3	1	D	B	VU	I,L,Lp, Ps,II	Y	S,M	N	2	0
28	Contopus	lugubris	Cordillera de Tilaran (CR) S to W Panama	?	3	1	D	AA-1	EN	I,L,Lp, Ps,II	Y	S,M	N	2	0
29	Contopus	ochraceus	CR (Cordilleras Central & Talamanca) & PAN (W)	?	3	1	D	AA-2	CR	I,L,Lp, Ps,II	Y	S,M	P	2	0
30	Empidonax	atriceps	Cordillera Central (CR) S to W Panama	?	3	1	S	AA-1	LR	I,L,Lp, Ps	Y	SM	N	2	0
31	Phyllomyias	zeledoni	Cordillera de Tilaran (CR) S to W Panama	?	3	1	D	A	EN	I,L,Lp, Ps,II	Y	S,M	N	2	0
32	Phylloscartes	flavovirens	Canal area E to Darien	?	3	1	S	C	LR	I,L,Lp, Lf,II,Ps	N	S,M	N	3	0
	Pipridae														
33	Manacus	vitellinus	PAN (W Bocas del Toro & Veraguas to Darien) & COL (W)	?	3	2/F	S	D	LR	I,L,Lp, Lf,II,Ps	N	S,M	N	3	5
34	Manacus	aurantiacus	Pacific slope from Carara (CR) S to W Panama	?	3	1/F	D	C	EN	I,L,Lp, Lf,II,Ps	Y	Hm,S,M,L m	N	2	0
	Cotingidae														

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
35	Cotinga	ridgwayi	Pacific slope from Carara (CR) S to W Panama	?	3	1/F	D	A	CR	Lf,I,Lp,Ps, L	Y	Hm,S,M,L m	N	2	0
36	Carpodectes	antoniae	S Pacific slope from mouth of Rio Tarcoles (CR) S to W Panama	?	3	1/F	D	A	CR	Lf,I,Lp, Ps,L	Y	Hm,S,M,L m	N	2	0
37	Carpodectes	hopkei	Pacific coast from PAN (Río Juradó & upper Atrato Valley) S to E PAN (SE Darien) to NW Ecuador	?	3	1	S	C	LR	I	N	S,M	N	2	0
38	Cephalopterus	glabricollis	Caribbean slope from Volcan Miravalles (CR) S to W Panama	?	3	1	D	AA	EN	I,L,Lf, Lp	Y	Hm,Lr,S,M ,Lm	N	2	0
	Troglodytidae														
39	Campylorhynchus	albobrunneus	PAN (N Cocle & E Panama to Darien) & COL (W)	?	3	1	S	C	LR	I,L,Lp, Lf,II,Ps	N	S,M	N	3	0
40	Thryothorus	spadix	PAN (E Darien) & COL (W)	?	3	2/F	S	B	VU	I,L,Lp, Lf,II,Ps	Y	S,M	N	3	0
41	Thryothorus	semibadius	S Pacific slope from Carara (CR) S to W Panama	?	3	1	D	AA-1	EN	I,L,Lp, Lf,II,Ps	Y	S,M	N	3	0
42	Troglodytes	ochraceus	Cordillera de Tilaran (CR) S to E Panama	?	3	1	S	C	LR	I,L,Lp, Lf,II,Ps	Y	S,M	N	3	0
43	Thryorchilus	browni	Irazu-Turrialba massif (CR) S to W Panama	?	3	1	D	AA-2	CR	I,L,Lf, Pl,Sv, Sf	Y	S,M,Lm,H m	N	3	0
	Turdidae														
44	Turdus	nigrescens	CR (Cordilleras Central & Talamanca) & PAN (W)	?	3	1	D	AA-2	EN	I,L,Sf,LfSv	Y	Lm,Hm,S, M	N	2	0
45	Myadestes	coloratus	PAN (E Darien) & adjacent NW COL	?	3	3/F	S	A	VU	I,L,Lp, Lf,II,Ps	Y	S,M	N	2	0
46	Myadestes	melanops	Length of Caribbean & Pacific slopes	?	3	1	S	B	LR	I,Hs,L	N	S,M	N	2	1

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
			(CR) to W Panama												
47	Catharus	gracilirostris	Cordillera Central (CR) S to W Panama	?	3	1	D-Pac S-Atl	A	LR	I,L,Pl,LpPs	N	S,M	N	2	0
	Emberizidae														
48	Pheucticus	tibialis	Cordillera de Guanacaste (CR) S to W Panama	?	3	1	S	A	LR	I,L,Pl,Lp,Ps	N	S,M	N	2	0
49	Acanthidops	bairdii	Cordillera de Tilaran (CR) S to extreme W Panama	?	3	1	?	?	DD	?	Y	S,M	N	3	0
50	Diglossa	plumbea	Cordillera de Guanacaste (CR) S to W Panama	?	3	1	S	A	LR	Ps	N	S,M	N	3	0
51	Pezopetes	capitalis	CR (Cordilleras Central & Talamanca) & PAN (W)	?	3	1	S	A	LR	Pl,Lp,L,I	N	S,M	N	3	0
52	Lysurus	crassirostris	Cordillera de Tilaran (CR) S to E Panama	?	3	2/F	?	AA	DD	IL,Lf,Ps,Lp,Il	Y	S,M	N	2	0
53	Pselliophorus	tibialis	Cordillera de Tilaran (CR) S to W Panama	?	3	1	S	A	LR	Pl,Lf,L,I	N	S,M	N	3	0
53a	Pselliphorus	leutoviridis	E Chiriqui (Cerro Flores area) and Veraguas (Santa Fe and Chitra)	?	3	1	D	A	EN	Lf,L,Ps	Y	S,M,Hm	N	3	0
54	Junco	vulcani	Irazu-Turrialba massif (CR) S to W Panama	?	3	1	D	AA-3	LR	I,Pl,Sf,L,Sv	Y	S,M,Lm,Lr,Hm, Lh	N	2	0
	Parulidae														
55	Basileuterus	ignotus	PAN (E Darien) & adjacent NW COL	?	3	2/F	S	AA-2	CD	I,L,Lp, Lf,Il,Ps	Y	S,M	N	3	0
56	Basileuterus	melanogenys	Cordillera Central (CR) S to W Panama	?	3	1	D	AA-1	VU	I,L,Lp, Ps	Y	S,M	N	3	0
57	Parula	gutturalis	Cordillera Central (CR) S to W Panama	?	3	1	D-Pac	A	VU	I,L,Sf	Y	S,M	N	3	0

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
							S-Atl								
58	Myioborus	torquatus	Cordillera de Tilaran (CR) S to W Panama	?	3	1	D-Pac S-Atl	A	LR	I,L,Sf, Ps	N	S,M	N	3	0
59	Zeledonia	coronata	Cordillera de Guanacaste (CR) S to Panama	?	3	1	D-Pac S-Atl	A	VU	I,L,Sf, Ps	Y	S,M	N	3	0
	Emberizidae														
60	Dacnis	viguieri	PAN (E Darien) & COL (NW)	?	3	1	D	AA-1	VU	I,L,Lp, Lf,II,Ps	Y	S,M	N	3	0
61	Chlorospingus	tacarcunae	PAN (E Panama, W San Blas, & E Darien) & COL (extreme NW)-	?	3	3/F	D	A	EN	I,L,Lf, Lp,Pl	Y	S,M	N	3	0
61a	Chlorospingus	flavigularis	W & CE PAN	?	3	3/F	S	A	VU	I,L,Lf	N	S,M	N	2	0
62	Chlorphonia	callophrys	Length of Caribbean & Pacific slopes (CR) to W Panama	?	3	1	S	A	LR	I,L,Lf, Lp	N	S,M	N	2	0
63	Euphonia	imitans	S Pacific slope from Carara (CR) S to W Panama	?	3	1	D	A	EN	I,L,II, Lf,Lp	Y	S,M, Lr,Lm, Hm	N	2	0
64	Euphonia	anneae	W of Gulf of Curabá along PAN boundary, CR to extreme NW COL	?	3	1	S?	C	LR	L,Lf,I	N	S,M	N	2	0
65	Tangara	dowii	Cordillera de Tilaran (CR) S to W Panama	?	3	1	D-Pac S-Atl	B	VU	L,I,Lf, Lp	Y	S,M	N	2	0
66	Tangara	fucosa	Highlands of E Darien and probably in adjacent Colombia	?	3	2/F	D-Pac S-Atl	A	EN	I,L,Ps, Lf,Lp,Pl	Y	S,M	N	2	0
67	Tangara	palmeri	Extreme E PAN Nusagandi, Cerro Tacarcuna, Cerro Quia, Cerro Pirre and Cerro Sapo to NW Ecuador	?	3	1	?-Nus S-Dar	C	LR	I,L	N	S,M	N	2	0
68	Buthraupis	arcaei	Cordillera de Guanacaste (CR) S to C Panama	?	3	2/F	D-Pac S-Atl	B	VU	L,I,Lp, Lf	Y	S,M	N	2	0

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	NEW IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
69	Heterospingus	rubrifrons	S Caribbean slope from Rio Reventazon drainage (CR) to E Panama	?	3	2/F	D-Pac S-Atl	C	LR	L,I,Lf, Lp	N	S,M	N	2	0
70	Chrysothlypis	chrysomelas	Caribbean slope from Cordillera de Guanacaste (CR) to E Panama	?	3	2/F	S	C	LR	L,I,Lf, Lp	N	S,M	N	2	0
71	Chlorospingus	pileatus	Cordillera de Tilaran (CR) S to W Panama	?	3	1	S	A	LR	L,I,Ps, Lf,Lp	N	S,M	N	2	0
72	Chlorospingus	inornatus	Highlands of E Darien (Cerro Sapo, Cerro Pirre, & Alturas de Nique)	?	3	2/F	S	AA-1	CD	--	N	S	N	3	0
	Vireonidae														
73	Vireo	carmioli	Cordillera Central (CR) S to W Panama	?	3	1	S	AA-1	VU	I,L,Lp	Y	S,M	N	2	0
	Icteridae														
74	Psarocolius	guatimozinus	PAN (Darien & perhaps E Panama) & COL (N)	?	3	1	D	B	VU	I,L,Lp, Lf,II,Ps	Y	Lh,S,M	N	3	0
	Ptilogonatidae														
75	Ptilogonys	caudatus	Cordillera Central (CR) S to W Panama	?	3	1	D	A	VU	I,L,Lp, Sf,Lf,II,Ps	Y	S,M	N	3	0
76	Phainoptila	melanoxantha	N cordilleras (CR) S to W Panama	?	3	1	D-Pac S-Atl	A	VU	PI,L,Lp,Sf, Lf,I,Ps	Y	S,M	N	3	0
	Corvidae														
77	Cyanolyca	argentigula	High mountains from Irazu-Turrialba massif (CR) S to W Panama	?	C	1	D	A	VU	L,I,Lp, Ps	Y	S,M	N	2	0

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Section 5

CAMP Taxon Data Sheets (Mammals)

CAMP TAXON REPORT

SPECIES: *Marmosa invictus* Goldman 1912
common names: zorra murina (Mendez 1970); slaty slender mouse opossum (Emmons 1990)

STATUS:
IUCN: Vulnerable
Criteria based on: Extent of occurrence and population estimates
CITES: not included

Taxonomic status: Also known as *Marmosops invictus* (Goldman 1912), Wilson and Reeder (1993); Emmons (1990);

Distribution: fragmented populations reported in four places/mountains
total area estimated based on available literature in this workshop close to 20,000 ha. or 200 square km (less than 5,000 = A)

Wild Population: 3,000 to 6,000 individuals; stable population trend

Field Studies: No information available

Threats: Rare species (RR)

Comments: localized habitat in Cana, province of Darien. Has been reported only in the provinces of Darien (Cana y, Tacarcuna), Panama (Cerro Azul) y Bocas del Toro (Cylindro); recent additional unpublished reports from Smythe (canal alternatives study) indicate it is a rare species vulnerable due to fragmented habitat and small populations; RR was defined as a new subdivision for threat because the species exists in a habitat that is fragmented (top of mountains).

Recommendations:
Research management: natural history, monitoring population, habitat management, limiting factor management

PHVA: No; this species is not a priority for human needs or other to require a special workshop, its reported distribution is within protected areas which in appearance will give some stability to the species.

Captive Population: Unknown; but related species have been kept in captivity

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Cryptotis endersi* Setzer 1950
common names: musaranas; Ender's small eared shrew (Hall 1981)

STATUS:

IUCN: Endangered
Criteria based on: rare species, population estimates would characterize it as critical but the stable conditions of the habitat (protected) made the workshop group decide for endangered
CITES: Not listed

Taxonomic status: Species

Distribution: Only one known locality Cylindro in Bocas del Toro within protected area (PILA-Panama).

Wild Population: Estimated to be between 1,000-3,000 individuals; based on accounts from researchers in the area (Handley, accounts from surveys that occurred during the last 8 years); stable population trend

Field Studies: Handley (pers. comm., workshop on Neotropical mammals held in Panama in 1993)

Threats: Is found within a national park; no human interference but as the species is considered as rare, some genetic problems could arise.

Comments: Rare even within its known locality

Recommendations:

Research management: natural history, monitoring population, habitat management, limiting factor management.

PHVA: No

Captive Population: No

Captive Program Recommendation: not recommended although technique to breed similar species are in place (*C. parva);* difficulty level 2

CAMP TAXON REPORT

SPECIES: *Cryptotis gracilis* Miller 1911
common names: musarana; Talamanca small eared shrew (Hall 1981)

STATUS:
IUCN: Vulnerable
Criteria based on: Population estimates and extent of occurrence
CITES: Not listed

Taxonomic status: Species

Distribution: some 1,000 sq. km., South Eastern Costa Rica and Western Panama within the two contiguous protected areas known as PILA,

Wild Population: 1,000-3,000 individuals between C. Rica and Panama

Field Studies: Indirect information, habitat availability-- Workshop on Neotropical Mammals held in Panama 1993.

Threats: potential genetic problems

Comments: regional endemism (C. Rica and Panama)

Recommendations:
Research management: monitoring, life history studies

PHVA: No

Captive Population: no information available but it is considered as a moderately difficult species to breed in captivity.

Captive Program Recommendation: None; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Cryptotis nigrescens* J.A. Allen 1895
common names: musarana; Blackish small eared shrew (Hall 1981)

STATUS:

IUCN: Low Risk
Criteria based on: Extent of occurrence (wide range of distribution regarding habitat and extension).
CITES:

Taxonomic status: Wilson and Reeder (1993) still consider *C. nigrescens* as a species ranging from Mexico to Panama (and including *C. mera)* while Woodman (1992) maintains that C. *nigrescens* is a species present only in Costa Rica and Panama

Distribution: Costa Rica - Panama

Wild Population: 10,000-50,000 individuals; fragmented population

Field Studies: Indirect information; habitat availability

Threats: None

Comments: None

Recommendations:

Research management: Taxonomic and morphological genetic studies, Life history studies, Monitoring

PHVA: No

Captive Population: No information available

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Cryptotis mera* Goldman 1912
common names: musarana; blackish small eared shrew

STATUS:
IUCN: Endangered (
Criteria based on: Extent of occurrence (distribution area is very small; habitat specific species)
CITES:

Taxonomic status: synonymous *C. merus*. Considered as a sub-species of *C. nigrescens* by other authors: Walker 1983, Wilson and Reeder 1993; Woodman 1992 validates the species *Cryptotis mera* based on biogeography and evolution of the genera.

Distribution: Mali, Tacarcuna and Pirre mountains in Darien Province.
Fragmented population, occupies an area of 100 square kilometers.

Wild Population: 1,000-3,000 individuals; stable population trend

Field Studies: Indirect information; habitat availability

Threats: genetics-; potential inbreeding process

Comments: inhabits less than 100 square kilometers

Recommendations:
Research management: Genetic taxonomy and morphology studies, Monitoring to determine population status, Life history.

PHVA: No

Captive Population: Not known

Captive Program Recommendation: No; difficulty level 2

CAMP TAXON REPORT

SPECIES: *Sturnira mordax*

STATUS:

IUCN: Vulnerable
Criteria based on : Population estimates
CITES: Not listed

Taxonomic status: genus *Sturnirops* formerly included the subgenus Sturnira (Jones and Carter 1976)

Distribution: 10,000 - 49,000 square kilometers; PILA and Fortuna Forest Reserve in Panama, Cartago in Costa Rica; wide altitudinal range from lowland to cloud forest environment

Wild Population: 1,000-3,000 individuals; population is in decline

Field Studies: Bachelors Thesis in Fortuna; Masters Thesis in PILA; museum specimens recently collected

Threats: habitat deforestation (L), pesticides

Comments: None

Recommendations:

Research management: Limiting factor research, Life Histories, Monitoring

PHVA: No

Captive Population: Not known

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

7. SPECIES: *Lasiurus castaneus*
common name: murcielago de cola peluda; hoary tailed bat (Eisenberg 1989)

STATUS:
IUCN: Vulnerable
Criteria based on: Extent of occurrence (habitat reduction) and population estimates
CITES:

Taxonomic status: Species

Distribution: Northern Colombia-Eastern Panama, 10,000-49,999 square km, wet tropical forests, patchy distribution at altitudes lower than 1,500 m.

Wild Population: 3,000 to 10,000 individuals; declining population trend

Field Studies: Three recent anecdotal field sightings Workshop of Neotropical mammals held in Panama 1993) .

Threats: habitat reduction, pesticides

Comments: Wilson and Reeder (1993) reported the species as present in Panama and Costa Rica as opposed to Eisenberg (1989) that reports the species as inhabiting Panama-Colombia.

Recommendations:
Research management: Monitoring, Limiting factor research. Results from this work may provide management recommendation and future research priorities.

PHVA: No, because the area it occupies is relatively large and includes protected areas (National Parks)

Captive Population: Unknown

Captive Program Recommendation: No (it is included within protected areas); difficulty level 1.

CAMP TAXON REPORT

SPECIES: *Saguinus geoffroyi* (Pucheran 1845)
common names: mono titi; Geoffroy's Tamarin (Eisenberg 1989)

STATUS:
IUCN: Vulnerable
Criteria based on: size of the population, distribution, threats
CITES:

Taxonomic status: Eisenberg (1989) considers this case as a valid species although he states that some other authors consider it as a sub-species called *Saguinus oedipus geoffroyi* occurring in Panama and extending to northwestern Colombia.

Distribution: 10,000-49,999 sq km Panama - Northern Colombia, and a 1935 report from Rio Vaca/Costa Rica locates it within the Burica Peninsula which is shared with Panama, fragmented distribution.

Wild Population: 20-30 per square km, between 3,000 and 5,000 individuals, population is thought to be declining.

Field Studies: Two recent general field studies (less than 8 years old). See proceedings of the workshop on Neotropical Mammals held in Panama in 1993.

Threats: Used as pet and hunted as a food source, trade for the life animal market

Comments: Education to raise people's consciousness of the status of the species is needed.

Recommendations:
Research management: Taxonomic research (to define issues), Monitoring, Limiting factors management (human impact).

PHVA: Yes to quantify effect of human pressure

Captive Population: 100 listed in ISIS, plus about 100 in local zoos, residences; some officially registered at DAPVS/INRENARE.

Captive Program Recommendation: Pending until results from PHVA; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Saguinus oedipus* (Linneaus 1758)
common names: Titi leon, Cotton-topped Tamarin

STATUS:
IUCN: Endangered
Criteria Based on: Population estimates
CITES:

Taxonomic Status: Eisenberg (1989) considers this species as a valid species confined to lowland tropical evergreen forest in North- Central Colombia although he clarifies that some other authors consider it as a sub-species named *Saguinus oedipus oedipus* occurring in Colombia and probably extending into Darien in Panama (also see table and notes of the proceedings of the Neotropical mammals workshop held in Panama 1993)

Distribution: North-Central Colombia and probably extending to Darien in Panama.

Wild population: No real data available in Panama or Colombia, but estimated in less than 2,500 individuals.

Field Studies: Limited to sightings and anecdotal information

Threats: Hunting for sport, human interference, and habitat loss. There is habitat destruction and there also is a potential hydroelectric project in the region where it exists in Colombia. This population is considered in decline although higher altitudes of its range is within a protected habitat. It is also used as a pet and is found in trade.

Comments: None

Recommendations:
Research management: Survey, Monitoring, Limiting factors management

PHVA: Yes

Captive Population: 354 on ISIS. There is a project in Colombia for breeding in captivity to reintroduce them into natural habitats. Captive animals are also kept in several zoos abroad.

Captive Program Recommendation: Pending; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Saimiri oerstedii* Reinhardt 1872
common names: mono titi (Mendez 1970); Oersted's titi monkey (Mendez 1970)

STATUS:

IUCN: Critical (

Criteria based on: Extent of occurrence and population reduction (habitat and population reduction during the last ten to fifteen years).

CITES: Appendix I

Other: USDI (1980)

Taxonomic status: 2 contiguous sub-species *S. o. citrinellus* (Costa Rica) and *S. o. oerstedii* (Panama), in Panama only expected to survive within Peninsula Burica or along mangrove coastal habitat

Distribution: Less than 5,000 sq. km from coastal Quepos in Costa to coastal Remedios Chiriqui; fragmented habitat; type from David, Panama

Wild Population: Fewer than 1,000; population is decreasing.

Field Studies: Baldwin and Baldwin (1971, 1976), S. Boinski (U. of Florida-USA), Jacobo Arauz (UNA-Costa Rica), Graciela Wong (UNA-Costa Rica), see Proceedings of the Workshop on Neotropical Mammals held in Panama in 1993.

Threats: Habitat loss and reduction; used as pet and hunted as food source and for sport, trade, pesticides

Comments: In Costa Rica, Jacobo Arauz (1993) reports changes in feeding habits from traditionally reported fruits to palm oil fruits.

Recommendations:

Research management: Survey, Monitoring, Habitat management, Limiting factors management

PHVA: Yes, because of human pressure, low numbers of individuals

Captive Population: < 10 listed in ISIS

Captive Program Recommendation: Yes as part of a conservation program; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Alouatta coibensis* Thomas 1902
common names: mono aullador de Coiba; howler monkey (Hall 1981)

STATUS:
IUCN: Vulnerable
Criteria based on: Population estimates, Extent of occurrence (restricted habitat)
CITES:

Taxonomic status: Species

Distribution: Less than 5,000 sq. km. disjunct distribution along Rio Quebro within Cerro Hoya (National Park) in Azuero Peninsula and Coiba Island (National Park)

Wild Population: 3,000- 10,000 individuals; population trend is stable in Coiba Island but the population is decreasing in Azuero Peninsula.

Field Studies: Montgomery (1976, 1988),

Threats: Mainland sub-population affected by habitat destruction and because it is used as a food source.

Comments: Wilson and Reeder (1993) remark that this species is not included in CITES but it is very threatened.

Recommendations:
Research management: Habitat management, Monitoring, Taxonomic and morphological genetic studies

PHVA: Pending, due to the fact that the areas where it inhabits are now protected areas (National Parks)it is expected that the risks for this species would diminish.

Captive Population: Unknown

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Bassaricyon pauli* Enders 1936

STATUS:

IUCN: Endangered
Criteria based on: Extent of occurrence (restricted distribution range) and population estimates
CITES: Not listed

Taxonomic status: *B. pauli* is probably only subspecifically distinct from the other nominal species from Central America of this genus but there is not yet sufficient material to demonstrate this (Hall 1981). Wonzencraft (1989) concluded that there is no evidence to support considering *B. pauli* as a different species from *B. gabii*.

Distribution: Less than 100 sq km. only known from type locality: Cerro Pando near El Volcán, Chiriqui at 4,800 ft. (Wilson and Reeder 1993 , Hall 1981).

Wild Population: Less than 1,000 individuals; population is declining.

Field Studies: Indirect information, habitat availability. Proceedings of the workshop on Neotropical mammals held in Panama in 1993.

Threats: Habitat loss, human pressure/persecution

Comments: None

Recommendations:

Research management: Survey, Life history, Monitoring, Taxonomic research

PHVA: No; need more information

Captive Population: Unknown

Captive Program Recommendation: Pending, until results from research offer additional guidelines; difficulty level 3.

CAMP TAXON REPORT

SPECIES: *Syntheosciurus brochus* (Bangs 1902)
common names: ardilla pigmea montanesa (Mendez 1993); Bang's mountain squirrel (Hall 1981)
STATUS:
IUCN: Endangered
Criteria based on: population size, distribution range
CITES:

Taxonomic status: Two subspecies are acknowledged by Mendez (1993) *S. b. poasencis* and *S. b. brochus*.

Distribution: Western Panama southern Costa Rica within the Talamanca mountain range, cloud forest type environment, less than 100 sq. km. within 6,000-7,000 ft.

Wild Population: Fewer than 1,000; but trend is stable.

Field Studies: Wells and Giacalone (1985); recent general field studies, Proceedings of the workshop on Neotropical Mammals held in Panama (1993).

Threats: Hunting for food and for sport. Also used as a pet.

Comments: None

Recommendations:
Research management: Monitoring, life history research, limiting factors research

PHVA: Pending, need more information

Captive Population: Unknown.

Captive Program Recommendation: Pending a program for education, research and reintroduction
purposes; difficulty level 2 (sometimes successfully kept as pet, but considered as moderately difficult to maintain and breed in captivity)

CAMP TAXON REPORT

SPECIES: *Orthogeomys cavator*
common names: arador chiricano; Chiriqui pocket gopher

STATUS:
IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: 10,000 to 49,999 sq. km. from Northwest Panama to central Costa Rica, disjunct distribution at altitudes between 120 -to 2400 m; considered as pest in agricultural fields in Boquete and Volcan in Panama.

Wild Population: More than 10,000; population is declining.

Field Studies: General field studies on biology, morphology, habitat and diseases (Mendez 1993); Proceedings of the workshop on Neotropical Mammals held in Panama in 1993.

Threats: Human persecution (considered an agricultural pest), pesticides

Comments: None

Recommendations:
Research management: Limiting factor research --identify negative factors that could be affecting the population to establish any management program

PHVA: No; species is very abundant.

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Orthogeomis dariensis* Goldman 1912

STATUS:
IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: Eastern Panama fragmented distribution: Tacarcuna lower watershed of the Chucunaque River and other areas within Darien, below 800 m.

Wild Population: At least 10,000; the population is increasing

Field Studies: General field studies with information on habitat, biology, zoonosis (Mendez 1993); Proceedings of the workshop on Neotropical Mammals held in Panama in 1993.

Threats: Human persecution (considered a pest in agricultural fields)

Comments: None

Recommendations:
Research management: Limiting factor research

PHVA: No

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Liomys adspersus* Peters 1874
common names: raton de bolsas rosillo; Panamanian spiny pocket-mouse

STATUS:
IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: 10,000 to 49,999 sq. km, central Panama (Veraguas, Herrera, Los Santos, Cocle and Panama, below 600 m.

Wild Population: More than 10,000 individuals

Field Studies: General field studies have generated data on habitat, morphology, diseases and biology among others (Mendez 1993); Proceedings from the workshop on Neotropical Mammals held in Panama (1993).

Threats: Pesticide, human persecution (considered a pest in agriculture fields)

Comments: None

Recommendations:
Research management: Limiting factor research

PHVA: No

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Orizomys devius* Bangs 1902

STATUS:
IUCN: Low Risk
CITES:

Taxonomic status: Type locality in Volcan, Panama; cited as a sub-species of *O. albigularis* by Mendez (1993), Handley (1966). Gardner (1983) still considers it as a species.

Distribution: Westernmost Panama and Costa Rican highlands between 1,100 and 3,050 m; included protected areas: Parque Internacional La Amistad (PILA) and Parque Nacional Volcan Baru

Wild Population: At least 10,000; population is increasing

Field Studies: General field studies on biology, habitat and diseases (Mendez 1993); proceedings of the workshop on Neotropical Mammals held in Panama 1993.

Threats: Pesticides, human persecution: even though present in protected areas, it is considered as an agricultural pest and can be also affected by pesticide use.

Comments: None

Recommendations:
Research management: Limiting factor research

PHVA: No; it is considered as a species with a trend to increase its population numbers and is adaptable to a variety of habitats.

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Oligoryzomys vegetus* (Bangs 1902)
common names: rata arrocera enena (Mendez 1993); pygmy rice rat
STATUS:
IUCN: Low Risk
CITES:

Taxonomic status: Considered as a sub-species within *Oryzomys fulvescens vegetus* (Mendez 1993), but Wilson and Reeder (1993) considers it as *Oligoryzomys vegetus* (also see Wilson et al. 1990)

Distribution: 10,000 to 49,999 sq. km highlands from western central cordillera in Panama to Talamanca range in Costa Rica; estimated to inhabit from sea level to 2,300 m.

Wild Population: More than 10,000; population is increasing

Field Studies: General field studies (Mendez 1993)

Threats: Pesticides and human persecution (considered an agricultural pest)

Comments: Species distribution area includes protected areas (PILA)

Recommendations:
Research management: Limiting factors research

PHVA: No

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Neacomys pictus* (Goldman 1912)
common name: raton semi-espinoso; painted bristly mouse (hall 1981)

STATUS:
IUCN: Vulnerable
Criteria based on: Population estimates and extent of occurrence
CITES:

Taxonomic status: Mendez (1993) considers *Neacomys pictus* and *N. pusillus* as synonyms of *N. tenuipes;* type locality in Cana 1800 ft

Distribution: Less than 5,000 ft in Eastern Darien within Darien National Park: Cana and neighboring areas, between 500 and 800 m.

Wild Population: 3,000- 10,000; population trend is stable

Field Studies: General field studies

Threats: Not known, the species inhabits within a protected area.

Comments: Potential vector of ectoparasites that may affect humans (Mendez 1993)

Recommendations:
Research management: Limiting factor research, Life history studies, Monitoring

PHVA: Pending (check on sanitary reasons)

Captive Population: No

Captive Program Recommendation: No (lives in protected areas); difficulty level 1

CAMP TAXON REPORT

SPECIES: *Sigmodontomys aphrastus* (Harris 1932)
common name: raton arrocero colilargo; rice rat

STATUS:
IUCN: Endangered
Criteria based on: Population estimates
CITES:

Taxonomic status: only known from type locality in Costa Rica (San Jose) and western Panama at Cerro Colorado (1500 m) in Chiriqui as collected by Pine 1982 (Mendez 1993); usually listed as a species of Oryzomys of uncertain relationship (Hall 1981, Wilson and Reeder 1993)

Distribution: seems to have a fragmented distribution, in an area less than 100 sq. km western Panama and Costa Rica; population trend is decreasing

Wild Population: less than 1,000 -- Mendez cites it as rare (1993)

Field Studies: general field studies have been conducted

Threats: human disturbance or interference, habitat loss

Comments: comments mostly based in knowledge of the Panamanian side

Recommendations:
Research management: survey, monitoring, life history, habitat management

PHVA: Pending on additional information

Other:

Captive Population: not known of, but considered as least difficult due to the experience with similar species

Captive Program Recommendation: Pending on results from future studies

CAMP TAXON REPORT

SPECIES: *Rhipidomys scandens* Goldman 1913
common name: raton trepador; mount Pirre climbing mouse
STATUS:
IUCN: Vulnerable
Criteria based on: Population reduction, extent of occurrence (plus potential habitat destruction - it is arboreal)
CITES:

Taxonomic status: Handley reported the species is conspecific with *R. latimanus* and probably belongs to the same complex group (also see Wilson and Reeder 1993)

Distribution: Less than 1,000 sq. km. at approximately 2,000 m in Panama-Darien National Park: Pirre mountain region within Limon River and Serrania del Darien between Embera/Kuna reservations.

Wild Population: Fewer than 1,000 individuals; population is stable although it is fragmented.

Field Studies: General field studies; proceedings of the workshop on Neotropical mammals held in Panama in 1993.

Threats: Habitat loss

Comments: None

Recommendations:
Research management: Survey, Taxonomic genetic studies, Life history studies, Monitoring

PHVA: No; stable population

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Tylomys fulviventer* (Anthony 1916)
common name: raton trepador de vientre fulvo; fulvous bellied climbing rat
STATUS:
IUCN: Endangered
Criteria based on: Extent of occurrence, population estimates
CITES:

Taxonomic status: Status

Distribution: Less than 100 sq. km. in Easternmost Panama: Tacarcuna approximately between 600-1,000 m

Wild Population: Fewer than 1,000 individuals; stable population

Field Studies: General field studies have been conducted; Proceedings of the Neotropical mammals workshop held in Panama 1993.

Threats: No apparent threats; it exists in a protected area and areas difficult to access.

Comments: None

Recommendations:
Research management: Genetic studies, Monitoring, Surveys, Life history research

PHVA: No; stable population and no apparent threats.

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Tylomys watsoni* (Thomas 1899)
common name: rata trepadora común; Watson's climbing rat

STATUS:
IUCN: Low Risk
CITES:

Taxonomic status: Species

Distribution: 10,000 to 49,999 sq. km. throughout Western Panama, central and eastern Panama except southwestern Panama province and central Darien province (see Mendez map 1993); from low elevations up to 1,000 m

Wild Population: At least 10,000; population is declining

Field Studies: Proceedings of Neotropical mammals workshop held in Panama 1993; general field studies

Threats: Habitat loss

Comments: None

Recommendations:
Research management: Life history research, Limiting factors research, Habitat management

PHVA: No

Captive Population: Unknown; have been kept in captivity in Gorgas memorial Laboratory and, see additional Mendez (1993) comments on laboratory breeding of *T. nudicaudatus*.

Captive Program Recommendation: No

CAMP TAXON REPORT

SPECIES: *Tylomys panamensis* Gray 1873
common name: rata trepadora oscura; Panama climbing rat
STATUS:
IUCN: Endangered
Criteria based on: Extent of occurrence, population estimates
CITES:

Taxonomic status: Status

Distribution: Less than 100 sq. km. Easternmost Panama: Cana, lower course of Rio Paya and neighboring areas, from low levels to 610 m.

Wild Population: Fewer than 1000 individuals; population is declining

Field Studies: General field studies on biology, distribution, among others (Mendez 1993, Proceeding on Neotropical Mammals -Panama 1993)

Threats: Habitat loss

Comments: None

Recommendations:
Research management: Survey, Limiting factors management, monitoring, Life history studies

PHVA: Pending

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Reinthrodontomys creper* (Bangs 1902)
common names: raton cosechero chiricano; Chiriqui harvest mouse

STATUS:
IUCN: Vulnerable
Criteria based on: Population reduction, population estimates
CITES:

Taxonomic status: Species

Distribution: Areas less than 100 sq. km. upper elevations from 2,00-3,500 m in cordillera central and Talamanca range Costa Rica, to Chiriqui region in Western Panama

Wild Population: 3,000-5,000 individuals, stable population trend adaptable to open areas

Field Studies: General field studies Proceedings of the Neotropical mammals workshop Panama (1993)

Threats: Habitat loss and pesticides

Comments: None

Recommendations:
Research management: Monitoring, Habitat management, Life history studies

PHVA: No; population is stable and is not suffering significant pressures.

Captive Population: No

Captive Program Recommendation: No; habitat management seems to be enough. Difficulty level 1

CAMP TAXON REPORT

SPECIES: *Reithrodontomys darienensis* Pearson 1939
common names: raton cosechero darienita; darien harvest mouse

STATUS:
IUCN: Low Risk
Criteria based on: Population estimate and extent of occurrence
CITES: Not listed

Taxonomic status: Species

Distribution: Panama Darien province, Eastern Panama including Azuero Peninsula and perhaps adjacent Colombia on an area between 10,000 and 49,000 sq km. ,

Wild Population: At least 10,000; population trend is stable

Field Studies: General field surveys (Mendez 1993, Hall 1981, Proceedings of Neotropical mammals workshop-Panama 1993)

Threats: Pesticides, human persecution (pest control) in agricultural areas.

Comments: None

Recommendations:
Research management: Life history, Limiting factors research

PHVA: No

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Peromyscus nudipes* (J. A. Allen 1891)
common names: raton volcanico patiblanco; naked-footed deer mouse (Hall 1981)

STATUS:
IUCN: Low Risk
Criteria based on: Extent of occurrence
CITES: Not listed

Taxonomic status: Wilson and Reeder (1993) consider this species as a synonymous of *P. mexicanus* but Mendez (1993) considers it as a separate species. Also, Samudio (in prep) agrees with Rogers et al. (1984) and Smith et al (1986) considering *C. rica* and Panamanian populations from the highlands as a different species from *P. mexicanus* (Saussure 1860)

Distribution: Between 10,000 to 49,999 sq. km with a fragmented distribution in Costa Rican highlands and Central Cordillera in Panama

Wild Population: At least 10,000 individuals; stable population trend

Field Studies: General field studies (Mendez 1993)

Threats: Human persecution (considered an agricultural pest); affected by pesticides

Comments: None

Recommendations:
Research management: Taxonomic and morphological genetic studies, Life history studies, Limiting factors research

PHVA: No

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Isthmomys flavidus* (Bangs 1902)
common names: raton volcanico; yellow deer mouse (Hall 1981)

STATUS:

IUCN: Vulnerable
Criteria based on: Extent of occurrence (fragmented habitat and restricted to altitudes higher than 900 m)
CITES: Not listed

Taxonomic status: Hall 1981 considers this species as a member of the genus *Peromyscus,* subgenus *Isthmomys*

Distribution: Fragmented distribution between 5,000 to 9,999 sq. km. beyond 900 m altitude Chiriqui, Bocas del Toro, Azuero Peninsula in Panama, Mendez also mentions this species is present along the Talamanca range in Costa Rica

Wild Population: 3,000-10,000 individuals; stable population trend

Field Studies: General field studies Mendez 1993, Proceedings from the workshop on Neotropical Mammals Panama (1993)

Threats: Human persecution (hunted for control in agricultural areas), pesticides

Comments: None

Recommendations:

Research management: Life history studies, Monitoring to determine population information

PHVA: No

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Isthmomys pirrensis* (Goldman 1912)
common names: raton montepirrense; mount pirre deer mouse

STATUS:

IUCN: Vulnerable
Criteria based on: Population estimates and extent of occurrence
CITES: Not listed

Taxonomic status: Hall 1981 includes *Isthmomys* as a subgenus of *Peromyscus*

Distribution: Less than 1,000 sq km from 750-1500 m of altitude in Easternmost Panama within Darien National Park and perhaps adjacent Colombia

Wild Population: 3,000-10,000 individuals; stable population trend

Field Studies: General field surveys (Mendez 1993) Proceedings Neotropical Mammals (Panama 1993)

Threats: Habitat destruction

Comments: None

Recommendations:

Research management: Habitat management, Life history studies; Monitoring

PHVA: No

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Scotinomys xerampelinus* (Bangs 1902)

STATUS:

IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES:

Taxonomic status: Species

Distribution: Less than 100 sq. km. within high elevations in Cordillera Central and Talamanca region of Costa Rica to Volcan Chiriqui in Western Panama

Wild Population: Fewer than 10,000 individuals

Field Studies: Not aware of specific recent efforts

Threats: Habitat loss, pesticides

Comments: None

Recommendations:

Research management: Monitoring, Life history research, Taxonomic research

PHVA: No

Captive Population: No

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Rheomys raptor* Goldman 1912
common name: raton acuatico darienta; Goldman's water mouse

STATUS:

IUCN: Endangered
Criteria based on: Population estimates and extent of occurrence (small population in a very restricted area)
CITES:

Taxonomic status: Wilson and Reeder 1993 cite Cabrera 1961 mentioned this species as a sub-species of *R. trichotis,* but Voss (1988) allocated the form as a subspecies of *R. raptor (R. raptor raptor* is one subspecies and *R. raptor hartmanni* as the other subspecies)

Distribution: Less than 10 sq km only reported from Darien National Park: Pirre sector about 1500 m (Mendez 1993)

Wild Population: Fewer than 1000 individuals

Field Studies: General field surveys (Mendez 1993); proceedings of the Neotropical mammals meeting (Panama 1993)

Threats: Unknown

Comments: None

Recommendations:

Research management: Survey, Monitoring, Life history research

PHVA: Pending

Captive Population: No

Captive Program Recommendation: Pending until new information is gathered. Difficulty level 1.

CAMP TAXON REPORT

SPECIES: *Rheomys hartmanni* (Enders 1939)
common names: raton acuatico menor; Hartman's water mouse (Hall 1981)

STATUS:

IUCN: Endangered
Criteria based on: Extent of occurrence (low population density and restricted habitat decreasing due to agricultural expansion)
CITES: Not listed

Taxonomic status: Species

Distribution: In altitude range of 600-1500 m, Costa Rica-Panama

Wild Population: 1,000-3,000 individuals; the population is not fragmented but the trend is to decrease

Field Studies: General field studies

Threats: Habitat loss, pesticides

Comments: Low population density and species seems to be restricted to riverine type habitat.

Recommendations:

Research management: Monitoring, Life history research, Habitat management

PHVA: Pending, until new information is available

Captive Population: No

Captive Program Recommendation: Pending until PHVA and other research; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Rheomys underwoodi* (Thomas 1906)
common names: raton acuatico maniblanco; Underwood's watermouse (Hall 1981)

STATUS:

IUCN: Endangered
Criteria based on: Population estimates and extent of occurrence (habitat restrictions)
CITES: Not listed

Taxonomic status: Species

Distribution: 1,600 to 2,200 m in Rio Poacita and Tres Rios (Cartago) in Costa Rica and Volcan in Panama

Wild Population: Rare species, 1,000-3,000 individuals, population could be in decline especially on the Costa Rican side due to human pressure for agriculture land.

Field Studies: General field studies and workshop on Neotropical Mammals (Panama 1993)

Threats: Habitat destruction and pesticides

Comments: None

Recommendations:

Research management: Monitoring, Life history studies, Habitat management/monitoring

PHVA: Pending; more field data is required

Captive Population: No

Captive Program Recommendation: Pending, until more information is available from PHVA or some other detailed analysis; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Coendou rothschildi* (Thomas 1902)
common names: puerco Epson común; Rothschild's porcupine (Hall 1981)

STATUS:

IUCN: Vulnerable
Criteria based on: Extent of occurrence (although relatively frequent, species is affected by habitat loss, human persecution and human perturbations as well as disease)
CITES: Appendix II

Taxonomic status: Considered as sub-species within *Coendou bicolor* (Hall 1981)

Distribution: Throughout Panama, except in Northwestern Bocas del Toro and the northwestern-most part of Chiriqui; also present in Brava and Sevilla Islands within the Chiriqui province (Mendez 1993). Probably present all the way to the Atrato region in Colombia (Mendez 1993, Eisenberg 1989). Lives in a wide range of habitats form forested areas or secondary forests and cultivated areas.

Wild Population: Fewer than 10,000 individuals, population is declining because of human colonization, agriculture, urbanization and logging.

Field Studies: Has been the subject of several field studies that have produced information on distribution, biology and diseases (several authors cited by Mendez 1993)

Threats: Humans eliminate them because they are considered a problem due to the spines; also loss of habitat, disease (see comments)

Comments: Susceptible to vesicular stomatitis and could be considered as an economical threat to domestic animals and other wild animals (Srihongse 1969)

Recommendations:

Research management: Monitoring, Taxonomic and morphological genetic studies to verify its taxonomic relation with *C. bicolor,* Limiting factors research

PHVA: Pending, the population is considered in decline.

Captive Population: No

Captive Program Recommendation: No (common species); difficulty level 2

CAMP TAXON REPORT

SPECIES: *Coendou laenatus* (Thomas 1903)
common names: puercoespin de Talamanca; prehensile-tailed porcupine

STATUS:

IUCN: Endangered
Criteria based on: Extent of occurrence and population reduction
CITES:

Taxonomic status: considered as *Sphiggurus mexicanus* by Wilson and Reeder 1993 and Eisenberg 1989; Hall 1981 and Mendez 1993 consider it as a sub-species of *Coendou mexicanus;* Emmons 1990 considers the specimens from Chiriqui in Panama as a separate species due to their small size (dwarf porcupines).

Distribution: Less than 5,000 sq. km. in Chiriqui province in territories beyond 1,800 m

Wild Population: 1,000-3,000 individuals; the trend of the population is to diminish although the population is not fragmented

Field Studies: General field studies

Threats: Loss of habitat, pesticides, considered a threat to agricultural production,

Comments: None

Recommendations:

Research management: Life history research, Monitoring, and Taxonomic genetic studies

PHVA: Pending additional data because much information on this species is lacking and its population could be threatened.

Captive Population: No

Captive Program Recommendation: Pending, until results from life histories and monitoring studies, it is considered as endangered, thus requires adequate management. Difficulty level 2.

CAMP TAXON REPORT

SPECIES: *Dasyprocta coibae* Thomas (1902)
common names: neque de coiba; Coiba Island agouti (Hall 1981)

STATUS:

IUCN: Vulnerable
Criteria based on: Extent of occurrence
CITES: Not listed

Taxonomic status: Species

Distribution: Only inhabits Coiba Island, approximately 473 sq km in forested areas as well as in cultivation plots.

Wild Population: At least 10,000 individuals; non-fragmented population with a stable trend

Field Studies: General information on the habitat and behavior (Mendez 1970, 1993)

Threats: Predation, hunted as food, human persecution.

Comments: Although the above-mentioned threats are present, the population is considered stable because it inhabits a recently protected area.

Recommendations:

Research management: Husbandry research (alternatives for this species), Monitoring,

Life history studies

PHVA: Pending; it is recommended that techniques already developed for captive breeding of Agouti paca be reviewed to determine its usefulness for this species.

Captive Population: Several kept historically at Lincoln Park Zoo (Chicago); at least a few individuals in local zoos

Captive Program Recommendation: Level 3 (education, management, and research (see previous section); difficulty level 2

CAMP TAXON REPORT

SPECIES: *Diplomys labilis* (Bangs 1901)
common name: rata espinosa trepadora; arboreal spiny rat or darling's spiny rat (Mendez 1993)

STATUS:

IUCN: Low Risk
CITES:

Taxonomic status: so known as *Diplomys darlingi* (Mendez 1993); two subspecies *D. l. labilis* and *D. l. darlingi* (Mendez 1993)

Distribution: A range of 1,000 sq. km. Eastern Panama from the eastern canal border to Darien; Eisenberg (1989), Hall (1981), Nowak and Paradiso (1983) and Emmons (1990) mention that this species is probably present in Colombia, while Mendez 1993 confirms its presence in the western region of Colombia. Wilson and Reeder (1993) confirm its presence in Colombia and suggest it may be present in Ecuador.

Wild Population: At least 10,000 individuals in fragmented habitat with declining population trend

Field Studies: Unaware of specific recent efforts

Threats: Hunting for food, habitat destruction

Comments: None

Recommendations:

Research management: Life history research, Taxonomic genetic studies, Monitoring

PHVA: No

Captive Population: Unknown; have historically been kept in captivity (Walker 1983)

Captive Program Recommendation: No; difficulty level 1

CAMP TAXON REPORT

SPECIES: *Sylvilagus dicei* (Harris 1932)
common names: conejo muleto de Talamanca; Talamanca cotton-tailed rabbit

STATUS:
IUCN: Endangered
Criteria based on: Extent of occurrence and population estimates
CITES:

Taxonomic status: Sometimes considered a sub-species of *S. brasiliensis* (Hall 1981)

Distribution: Less than 5,000 sq. km. South Eastern Costa Rica (Talamanca Range) and western Panama (several individual collected by Cerro Punta, Parque Internacional La Amistad at 1,800 m altitude by Rafael Samudio in 1992-in Prep)

Wild Population: Between 1,000- 3,000 individuals; stable population not fragmented

Field Studies: General field surveys Rafael Samudio Jr. (in Prep), Proceedings of the Neotropical Mammals workshop (Panama 1993)

Threats: Hunting for food and sport, pesticides, habitat loss.

Comments: None

Recommendations:
Research management: Life history, Taxonomic and morphological genetic research, Monitoring

PHVA: Pending on future data from research

Captive Population: No

Captive Program Recommendation: Pending, the techniques are not in place for captive maintenance and propagation of similar taxa; captive techniques need to be developed. Considered as relatively difficult to transport and maintain in laboratory conditions (Rafael Samudio, Jr. in prep). Difficulty level 3

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Section 6

CAMP Spreadsheet (Mammals)

Mammals Endemic to Panama

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	DRAFT IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
	MAMMALIA														
	DIDELPHIMORHIA														
	MARMOSIDAE														
1	Marmosa	invictus	Panama	3,000-6,000	4	F	S	A	VU	RR	N	M,Lr, Lh,Lm	N	2	0
	INSECTIVORA														
	SORICIDAE														
2	Cryptotis	endersi	Known only from type locality: Cylindro, Bocas del Toro	1,000-3,000	3	N	S	AA-2	EN	RR,G	N	M,Lr, Lh,Hm	N	2	0
3	Cryptotis	gracilis	CR (SE) & PAN (W)	1,000-3,000	4	N	S	AA-1	VU	RR,G	N	M,Lh	N	2	0
4	Cryptotis	nigrescens	CR (Tilaran, Central, & Talamanca Cordilleras) + PAN (Chiriqui = C. Cordillera)	10,000-50,000	4	F	S	C	LR	--	N	M,Lh,T	N	2	0
5	Cryptotis	mera	PAN (Mali, Tacarcuna, & Pirre Mts)	1,000-3,000	4	F	S	AA-2	EN	RR,G	N	M,Lh,T	N	2	0
	CHIROPTERA														

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	DRAFT IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
	PHYLLOSTOM-IDAE														
6	Sturnira	mordax	CR & PAN	1,000-3,000	2	N	D	C	VU	L,Ps	N	M,Lr, Lh	N	1	0
	VESPERTILION-IDAE														
7	Lasiurus	castaneus	COL & PAN	3,000-10,000	3	N	D	C	VU	L,Ps,Lh	N	M,Lr	N	1	0
	PRIMATES														
	CALLITHRICIDAE														
8	Saguinus	geoffroyi	PAN & N COL	3,000-5,000	2	F	D	C	VU	Hs,Hf, Lf,T	Y	M,Lm, T	P	1	100
9	Saguinus	oedipus	PAN & COL	1,000-3,000	2	N	D	A	EN	Hs,I,L	Y	S,M,Lm	P	1	354
	CEBIDAE														
10	Saimiri	oerstedii	CR & PAN	<1,000	2	F	D	A	CR	Lf,Hf, Hs,L,Ps	Y	M,S, Hm,Lm	1	1	<10
11	Alouatta	coibensis	PAN Coiba Is. & Azuero Peninsula	3,000-10,000	2	F	D	A	VU	L,Hf,G	P	M,Lh, T	P	1	0
	CARNIVORA														
	PROCYONIDAE														
12	Bassaricyon	pauli	Known only from type locality: Cerro Pando, near El Volcan, Chiriqui	<1,000	4	N	D	AA-2	EN	L,Hp	N	M,S,Lh, T	P	3	0
	RODENTIA														

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	DRAFT IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
	SCIURIDAE														
13	Syntheosciurus	brochus	CR & PAN (N)	<1,000	2	N	S	AA-2	EN	Hf,Hs	P	M,Lh, Lr	P	2	0
	GEOMYIDAE														
14	Orthogeomys	cavator	CR (C) to PAN (NW)	>10,000	2	F	I	C	LR	Hp,Ps	N	Lr	N	1	0
15	Orthogeomys	dariensis	Panama (E)	>10,000	2	F	I	C	LR	Hp	N	Lr	N	1	0
	HETEROMYIDAE														
16	Liomys	adspersus	Panama (C)	>10,000	2	N	I	C	LR	Hp,Ps	N	Lr	N	1	0
	MURIDAE														
17	Oryzomys	devius	CR (Highlands) & PAN (Westernmost)	>10,000	2	N	I	C	LR	Hp,Ps	N	Lr	N	1	0
18	Oligoryzomys	vegetus	CR (Talamanca Cordillera) + PAN (C. Cordillera)	>10,000	2	N	I	C	LR	Hp,Ps	N	Lr	N	1	0
19	Neacomys	pictus	Easternmost Panama	3,000 10,000	2	N	S	A	VU	--	P	M,Lr,Lh	N	1	0
20	Sigmodontomys	aphrastus	CR (San Joaquin de Dota, San Jose Prov.) & PAN (Chiriqui Prov.)	<1,000	2	F	D	AA-2	EN	L,I	P	M,S, Lh,Hm	P	1	0
21	Rhipidomys	scandens	E Panama (Serrania del Darien & Serrania de Pirre)	<1,000	2	F	S	AA-1	VU	L	N	M,S, T,Lh	N	1	0

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	DRAFT IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
22	Tylomys	fulviventer	Easternmost Panama	<1,000	3	N	S	AA-2	EN	--	N	M,S, T,Lh	N	1	0
23	Tylomys	watsoni	CR & PAN (W)	>10,000	2	F	D	C	LR	L	N	Lr,Lh, Hm	N	1	0
24	Tylomys	panamensis	Easternmost Panama	<1,000	2	N	D	AA-2	EN	L	P	M,S, Lh,Hm	N	1	0
25	Reithrodontomys	creper	CR (Cordilleras Central & Talamanca) to PAN (Chiriqui area)	3,000-5,000	2	F	S	AA-2	VU	L,Ps	N	M,Lh, Hm	N	1	0
26	Reithrodontomys	dariensis	E Panama (including Azuero Peninsula) & perhaps adjacent Colombia	>10,000	2	N	S	C	LR	Hp,Ps	N	Lr,Lh	N	1	0
27	Peromyscus	nudipes	CR (highlands) + PAN (C. Cordillera)	>10,000	2	F	S	C	LR	Hp,Ps	N	Lr,Lh,T	N	1	0
28	Isthmomys	flavidus	Intermediate elevations in Chiriqui region and on Azuero Peninsula	3,000-10,000	2	F	S	B	VU	Hp,Ps	N	M,Lh	N	1	0
29	Isthmomys	pirrensis	Easternmost Panama & perhaps adjacent Colombia	3,000-10,000	2	F	S	AA-1	VU	L	N	M,Lh, Hm	N	1	0
30	Scotinomys	xerampelinus	CR (Cordillera Central & Talamanca) to PAN (Chiriqui area)	3,000-10,000	2	N	S	AA-2	VU	L,Ps	N	M,Lh,T	N	1	0
31	Rheomys	raptor	PAN (Serrania de Pirre) Darien	<1,000	2	N	S	AA-3	EN	--	P	M,S,Lh	P	1	0

	TAXON		WILD POPULATION										CAP POP		
	SCIENTIFIC NAME		RANGE	EST#	DQ	SUB POP	TRND	AREA	DRAFT IUCN STS	THRTS	PHVA	RSCH MGMT	REC	DIF	NUM
32	Rheomys	hartmanni	CR & PAN	1,000-3,000	2	N	D	C	EN	L,Ps	P	M,Lh, Hm	P	1	0
33	Rheomys	underwoodi	CR (C) & PAN (W)	1,000-3,000	2	N	D	B	EN	L,Ps	P	M,Lh, Hm	P	1	0
	ERETHIZONTI- DAE														
34	Coendou	rothschildi	Panama	3,000-10,000	2	N	D	D	VU	D,L,I, Hp	P	M,T,Lr	N	1	0
35	Coendou	laenatus	PAN (Chiriqui-C. Cordillera)	1,000-3,000	2	N	D	A	EN	L,Hp,Ps	P	M,Lh,T	P	1	0
	DASYPROCTIDAE														
36	Dasyprocta	coibae	PAN (Coiba Is.)	>10,000	2	N	S	AA-1	VU	P,Hp	P	M,H,Lh	3	1	2
	ECHIMYIDAE														
37	Diplomys	labilis	PAN, W COL, and probably N Ecuador	>10,000	2	F	D	C	LR	L,Hf	N	M,Lh,T	N	1	0
	LAGOMORPHA														
	LEPORIDAE														
38	Sylvilagus	dicei	CR (SE) & PAN (NW) - endemic to Cordillera de Talamanca	1,000-3,000	2	N	S	A	EN	L,Hf, Hs,Ps	P	M,Lh, T	P	3	0

from Rafael Samudio, Jr. (in prep.) Current taxonomic, ecological, and conservation status of Panamanian mammals. University of Florida, Gainesville, Department of Zoology.

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Section 7

List of Participants

Lista de participantes, Taller CAMP
Centro de Educación Ambiental Río Chagres, ANCON
Panamá, Noviembre de 1994

Eduardo Alvarez-Cordero
Harpy Eagle Conservation Program
USA: 15251, Gainesville
Florida 32604 USA
Tel/fax: (904) 378-5318

Fernando A. Arosemena
Asociación Nacional para la
Conservación de la Naturaleza - ANCON
Apartado 1387
Panamá 1, Rep. de Panamá
Tel. (507) 64-8100
Fax (507) 64-2425

Rick Barongi
Walt Disney World Co.
1401 Flower St.
Glendale CA
Tel. 1 (818) 544-7409
Fax. 1 (818) 544-6540

Indra Candanedo
INRENARE
Apartado 2016
Paraíso, Corregimiento de Ancón
Panamá. Rep. de Panamá
Tel. (507) 32-4325
Fax. (507) 32-4083

Claudio Carasio
Instituto Smithsonian de Panamá
Isla de Barro Colorado
Apartado 2072
Balboa, Rep. de Panamá
Tel. (507) 52-2124 Fax. (507) 32-5978

Kruskaya Díaz de Melgarejo
INRENARE
Apartado 2016
Paraíso, Corrgimiento de Ancón
Panamá, Rep. de Panamá
Tel. (507) 32-4325
Fax. (507) 32-4083

Susie Ellis
IUCN / SSC / CBSG
138 Reservoir Road
Strasburg, VA 22657 USA
Tel/fax. 1 (540) 465-9589

Augusto C. González V.
Asociación Nacional para la
Conservación de la Naturaleza - ANCON
Apartado 1387
Panamá 1, Rep. de Panamá
Tel. (507) 64-8100
Fax. (507) 64-2445

Lewis Greene
Prospect Park Wildlife Center
450 Flatbush Ave.
Brooklyn, NY 11225 USA
Tel. 1 (718) 399-7310
Fax. 1 (718) 399-7337

Rudolf Hinds
Asociación Nacional para la
Conservación de la Naturaleza - ANCON
Apartado 1387
Panamá 1, Rep. de Panamá
Tel. (507) 64-8100
Fax. (507) 64-2445

Don Janssen
Zool. Soc. of San Diego
P.O. Box 551
San Diego CA 92112 USA
Tel. 1 (619) 231-1515
Fax. 1 (619) 480-9573

Belkys Jiménez Ruíz
Sociedad Audubon de Panamá
Apartado 2026
Balboa, Rep. de Panamá
Tel/fax: (507) 244740

Anabel de Julio
Parque Municipal y Jardín Botánico
Summit
Apartado 503
Panamá 1, Rep. de Panamá

César Márquez Reyes
AA. 094766
Bogotá 8, Colombia
Tel: 3450070
Fax 6813491

Carlos Mauricio Caballero
Finca El Nispero
Apartado 6-5789, El Dorado
Panamá, Rep. de Panamá
Tel. (507) 93-6142

Phil Miller
IUCN / SSC / CBSG
12101 Johnny Cake Ridge Rd.
Apple Valley MN 55124 USA
Tel. 1 (612) 431-9325
Fax. 1 (612) 432-2757

José A. Polanco J.
Asociación Nacional para la
Conservación de la Naturaleza - ANCON
Apartado 1387
Panamá 1, Rep. de Panamá
Tel. (507) 64-8100
Fax. (507) 64-2445

Ernesto Ponce Cabrera
Asociación Nacional para la
Conservación de la Naturaleza - ANCON
Apartado 1387
Panamá 1, Rep. de Panamá
Tel/fax: (507) 74-1365

Virginia Ríos
Asociación Nacional para la
Conservación de la Naturaleza - ANCON
Apartado 1387
Panamá 1, Rep. de Panamá
Tel. (507) 64-8100
Fax. (507) 64-2445

Julieta de Samudio *
Wildlife Conservation Society
NW 13 Street
Suite A-2 Gainesville
Florida 32609, USA
Fax. (904) 375-2449
* Additional address in Panamá
(after January)
Apartado 2062
Zona 9-A
Carrasquilla, Panamá
Rep. de Panamá
Tel. (507) 24-9716

Rogelio Samudio
Apartado 11178
Panamá 6, Rep. de Panamá

Ulie Seal
IUCN / SSC / CBSG
12101 Johnny Cake Ridge Rd.
Apple Valley MN 55124 USA
Tel. 1 (612) 431-9325
Fax. 1 (612) 432-2757

Jorge Ventocilla
Oficina de Educación y Conservación
Instituto Smithsonian de Panamá
Apartado 2072
Balboa, Rep. de Panamá
Tel. (507) 27-6022
Fax. (507) 32-5978

CONSERVATION ASSESSMENT AND MANAGEMENT PLAN FOR BIRD AND MAMMAL SPECIES ENDEMIC TO PANAMA

Working Draft Report
from the workshop held in
Panama City, Panama
28-30 November 1994

Section 8

IUCN Red List Reference

IUCN RED LIST CATEGORIES

Prepared by the

IUCN Species Survival Commission

As approved by the
40th Meeting of the IUCN Council
Gland, Switzerland

30 November 1994

March 1997

IUCN RED LIST CATEGORIES

I) Introduction

1. The threatened species categories now used in Red Data Books and Red Lists have been in place, with some modification, for almost 30 years. Since their introduction these categories have become widely recognised internationally, and they are now used in a whole range of publications and listings, produced by IUCN as well as by numerous governmental and non-governmental organisations. The Red Data Book categories provide an easily and widely understood method for highlighting those species under higher extinction risk, so as to focus attention on conservation measures designed to protect them.

2. The need to revise the categories has been recognised for some time. In 1984, the SSC held a symposium, 'The Road to Extinction' (Fitter & Fitter 1987), which examined the issues in some detail, and at which a number of options were considered for the revised system. However, no single proposal resulted. The current phase of development began in 1989 with a request from the SSC Steering Committee to develop a new approach that would provide the conservation community with useful information for action planning.

In this document, proposals for new definitions for Red List categories are presented. The general aim of the new system is to provide an explicit, objective framework for the classification of species according to their extinction risk.

The revision has several specific aims:

- to provide a system that can be applied consistently by different people;
- to improve the objectivity by providing those using the criteria with clear guidance on how to evaluate different factors which affect risk of extinction;
- to provide a system which will facilitate comparisons across widely different taxa;
- to give people using threatened species lists a better understanding of how individual species were classified.

3. The proposals presented in this document result from a continuing process of drafting, consultation and validation. It was clear that the production of a large number of draft proposals led to some confusion, especially as each draft has been used for classifying some set of species for conservation purposes. To clarify matters, and to open the way for modifications as and when they became necessary, a system for version numbering was applied as follows:

Version 1.0: Mace & Lande (1991)
The first paper discussing a new basis for the categories, and presenting numerical criteria especially relevant for large vertebrates.

Version 2.0: Mace *et al.* (1992)
A major revision of Version 1.0, including numerical criteria appropriate to all organisms and introducing the non-threatened categories.

Version 2.1: IUCN (1993)
Following an extensive consultation process within SSC, a number of changes were made to the details of the criteria, and fuller explanation of basic principles was included. A more explicit structure clarified the significance of the non-threatened categories.

Version 2.2: Mace & Stuart (1994)
Following further comments received and additional validation exercises, some minor changes to the criteria were made. In addition, the Susceptible category present in Versions 2.0 and 2.1 was subsumed into the Vulnerable category. A precautionary application of the system was emphasised.

Final Version
This final document, which incorporates changes as a result of comments from IUCN members, was adopted by the IUCN Council in December 1994.

All future taxon lists including categorisations should be based on this version, and not the previous ones.

4. In the rest of this document the proposed system is outlined in several sections. The Preamble presents some basic information about the context and structure of the proposal, and the procedures that are to be followed in applying the definitions to species. This is followed by a section giving definitions of terms used. Finally the definitions are presented, followed by the quantitative criteria used for classification within the threatened categories. It is important for the effective functioning of the new system that all sections are read and understood, and the guidelines followed.

References:

Fitter, R., and M. Fitter, ed. (1987) The Road to Extinction. Gland, Switzerland: IUCN.

IUCN. (1993) Draft IUCN Red List Categories. Gland, Switzerland: IUCN.

Mace, G. M. *et al.* (1992) "The development of new criteria for listing species on the IUCN Red List." Species 19: 16-22.

Mace, G. M., and R. Lande. (1991) "Assessing extinction threats: toward a reevaluation of IUCN threatened species categories." Conserv. Biol. 5.2: 148-157.

Mace, G. M. & S. N. Stuart. (1994) "Draft IUCN Red List Categories, Version 2.2". Species 21-22: 13-24.

II) Preamble

The following points present important information on the use and interpretation of the categories (= Critically Endangered, Endangered, etc.), criteria (= A to E), and sub-criteria (= a,b etc., i,ii etc.):

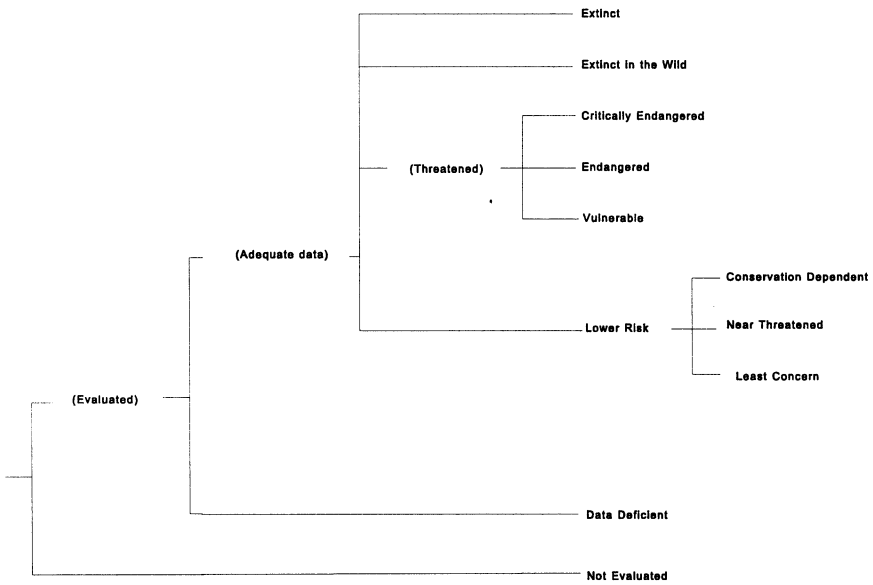
1. **Taxonomic level and scope of the categorisation process**

The criteria can be applied to any taxonomic unit at or below the species level. The term 'taxon' in the following notes, definitions and criteria is used for convenience, and may represent species or lower taxonomic levels, including forms that are not yet formally described. There is a sufficient range among the different criteria to enable the appropriate listing of taxa from the complete taxonomic spectrum, with the exception of micro-organisms. The criteria may also be applied within any specified geographical or political area although in such cases special notice should be taken of point 11 below. In presenting the results of applying the criteria, the taxonomic unit and area under consideration should be made explicit. The categorisation process should only be applied to wild populations inside their natural range, and to populations resulting from benign introductions (defined in the draft IUCN Guidelines for Re-introductions as "..an attempt to establish a species, for the purpose of conservation, outside its recorded distribution, but within an appropriate habitat and eco-geographical area").

2. **Nature of the categories**

All taxa listed as Critically Endangered qualify for Vulnerable and Endangered, and all listed as Endangered qualify for Vulnerable. Together these categories are described as 'threatened'. The threatened species categories form a part of the overall scheme. It will be possible to place all taxa into one of the categories (see Figure 1).

Figure 1: Structure of the Categories



3. **Role of the different criteria**

For listing as Critically Endangered, Endangered or Vulnerable there is a range of quantitative criteria; meeting any one of these criteria qualifies a taxon for listing at that level of threat. Each species should be evaluated against all the criteria. The different criteria (A-E) are derived from a wide review aimed at detecting risk factors across the broad range of organisms and the diverse life histories they exhibit. Even though some criteria will be inappropriate for certain taxa(some taxa will never qualify under these however close to extinction they come), there should be criteria appropriate for assessing threat levels for any taxon (other than micro-organisms). The relevant factor is whether any one criterion is met, not whether all are appropriate or all are met. Because it will never be clear which criteria are appropriate for a particular species in advance, each species should be evaluated against all the criteria, and any criterion met should be listed.

4. **Derivation of quantitative criteria**

The quantitative values presented in the various criteria associated with threatened categories were developed through wide consultation and they are set at what are generally judged to be appropriate levels, even if no formal justification for these values exists. The levels for different criteria within categories were set independently but against a common standard. Some broad consistency between them was sought. However, a given taxon should not be expected to meet all criteria (A-E) in a category; meeting any one criterion is sufficient for listing.

5. **Implications of listing**

Listing in the categories of Not Evaluated and Data Deficient indicates that no assessment of extinction risk has been made, though for different reasons. Until such time as an assessment is made, species listed in these categories should not be treated as if they were non-threatened, and it may be appropriate (especially for Data Deficient forms) to give them the same degree of protection as threatened taxa, at least until their status can be evaluated.

Extinction is assumed here to be a chance process. Thus, a listing in a higher extinction risk category implies a higher expectation of extinction, and over the time-frames specified more taxa listed in a higher category are expected to go extinct than in a lower one (without effective conservation action). However, the persistence of some taxa in high risk categories does not necessarily mean their initial assessment was inaccurate.

6. **Data quality and the importance of inference and projection**

The criteria are clearly quantitative in nature. However, the absence of high quality data should not deter attempts at applying the criteria, as methods involving estimation, inference and projection are emphasised to be acceptable throughout. Inference and projection may be based on extrapolation of current or potential threats into the future (including their rate of change), or of factors related to population abundance or distribution (including dependence on other taxa), so long as these can reasonably be supported. Suspected or inferred patterns in either the recent past, present or near future can be based on any of a series of related factors, and these factors should be specified.

Taxa at risk from threats posed by future events of low probability but with severe consequences (catastrophes) should be identified by the criteria (e.g. small distributions, few locations). Some threats need to be identified particularly early, and appropriate actions taken, because their effects are irreversible, or nearly so (pathogens, invasive organisms, hybridization).

7. **Uncertainty**

The criteria should be applied on the basis of the available evidence on taxon numbers, trend and distribution, making due allowance for statistical and other uncertainties. Given that data are rarely available for the whole range or population of a taxon, it may often be appropriate to use the information that is available to make intelligent inferences about the overall status of the taxon in question. In cases where a wide variation in estimates is found, it is legitimate to apply the precautionary principle and use the estimate (providing it is credible) that leads to listing in the category of highest risk.

Where data are insufficient to assign a category (including Lower Risk), the category of 'Data Deficient' may be assigned. However, it is important to recognise that this category indicates that data are inadequate to determine the degree of threat faced by a taxon, not necessarily that the taxon is poorly known. In cases where there are evident threats to a taxon through, for example, deterioration of its only known habitat, it is important to attempt threatened listing, even though there may be little direct information on the biological status of the taxon itself. The category 'Data Deficient' is not a threatened category, although it indicates a need to obtain more information on a taxon to determine the appropriate listing.

8. **Conservation actions in the listing process**

The criteria for the threatened categories are to be applied to a taxon whatever the level of conservation action affecting it. In cases where it is only conservation action that prevents the taxon from meeting the threatened criteria, the designation of 'Conservation Dependent' is appropriate. It is important to emphasise here that a taxon require conservation action even if it is not listed as threatened.

9. **Documentation**

All taxon lists including categorisation resulting from these criteria should state the criteria and sub-criteria that were met. No listing can be accepted as valid unless at least one criterion is given. If more than one criterion or sub-criterion was met, then each should be listed. However, failure to mention a criterion should not necessarily imply that it was not met. Therefore, if a re-evaluation indicates that the documented criterion is no longer met, this should not result in automatic down-listing. Instead, the taxon should be re-evaluated with respect to all criteria to indicate its status. The factors responsible for triggering the criteria, especially where inference and projection are used, should at least be logged by the evaluator, even if they cannot be included in published lists.

10. **Threats and priorities**

The category of threat is not necessarily sufficient to determine priorities for conservation action. The category of threat simply provides an assessment of the likelihood of extinction under current circumstances, whereas a system for assessing priorities for action will include numerous other factors concerning conservation action such as costs, logistics, chances of success, and even perhaps the taxonomic distinctiveness of the subject.

11. **Use at regional level**

The criteria are most appropriately applied to whole taxa at a global scale, rather than to those units defined by regional or national boundaries. Regionally or nationally based threat categories, which are aimed at including taxa that are threatened at regional or national levels (but not necessarily throughout their global ranges), are best used with two key pieces of information: the global status category for the taxon, and the proportion of the global population or range that occurs within the region or nation. However, if applied at regional or national level it must be recognised that a global category of threat may not be the same as a regional or national category

for a particular taxon. For example, taxa classified as Vulnerable on the basis of their global declines in numbers or range might be Lower Risk within a particular region where their populations are stable. Conversely, taxa classified as Lower Risk globally might be Critically Endangered within a particular region where numbers are very small or declining, perhaps only because they are at the margins of their global range. IUCN is still in the process of developing guidelines for the use of national red list categories.

12. **Re-evaluation**
Evaluation of taxa against the criteria should be carried out at appropriate intervals. This is especially important for taxa listed under Near Threatened, or Conservation Dependent, and for threatened species whose status is known or suspected to be deteriorating.

13. **Transfer between categories**
There are rules to govern the movement of taxa between categories. These are as follows: (A) A taxon may be moved from a category of higher threat to a category of lower threat if none of the criteria of the higher category has been met for 5 years or more. (B) If the original classification is found to have been erroneous, the taxon may be transferred to the appropriate category or removed from the threatened categories altogether, without delay (but see Section 9). (C) Transfer from categories of lower to higher risk should be made without delay.

14. **Problems of scale**
Classification based on the sizes of geographic ranges or the patterns of habitat occupancy is complicated by problems of spatial scale. The finer the scale at which the distributions or habitats of taxa are mapped, the smaller will be the area that they are found to occupy. Mapping at finer scales reveals more areas in which the taxon is unrecorded. It is impossible to provide any strict but general rules for mapping taxa or habitats; the most appropriate scale will depend on the taxa in question, and the origin and comprehensiveness of the distributional data. However, the thresholds for some criteria (e.g. Critically Endangered) necessitate mapping at a fine scale.

III) Definitions

1. **Population**
Population is defined as the total number of individuals of the taxon. For functional reasons, primarily owing to differences between life-forms, population numbers are expressed as numbers of mature individuals only. In the case of taxa obligately dependent on other taxa for all or part of their life cycles, biologically appropriate values for the host taxon should be used.

2. **Subpopulations**
Subpopulations are defined as geographically or otherwise distinct groups in the population between which there is little exchange (typically one successful migrant individual or gamete per year or less).

3. **Mature individuals**
The number of mature individuals is defined as the number of individuals known, estimated or inferred to be capable of reproduction. When estimating this quantity the following points should be borne in mind:

- Where the population is characterised by natural fluctuations the minimum number should be used.

- This measure is intended to count individuals capable of reproduction and should therefore exclude individuals that are environmentally, behaviourally or otherwise reproductively suppressed in the wild.

- In the case of populations with biased adult or breeding sex ratios it is appropriate to use lower estimates for the number of mature individuals which take this into account (e.g. the estimated effective population size).

- Reproducing units within a clone should be counted as individuals, except where such units are unable to survive alone (e.g. corals).

- In the case of taxa that naturally lose all or a subset of mature individuals at some point in their life cycle, the estimate should be made at the appropriate time, when mature individuals are available for breeding.

4. **Generation**

Generation may be measured as the average age of parents in the population. This is greater than the age at first breeding, except in taxa where individuals breed only once.

5. **Continuing decline**

A continuing decline is a recent, current or projected future decline whose causes are not known or not adequately controlled and so is liable to continue unless remedial measures are taken. Natural fluctuations will not normally count as a continuing decline, but an observed decline should not be considered to be part of a natural fluctuation unless there is evidence for this.

6. **Reduction**

A reduction (criterion A) is a decline in the number of mature individuals of at least the amount (%) stated over the time period (years) specified, although the decline need not still be continuing. A reduction should not be interpreted as part of a natural fluctuation unless there is good evidence for this. Downward trends that are part of natural fluctuations will not normally count as a reduction.

7. **Extreme fluctuations**

Extreme fluctuations occur in a number of taxa where population size or distribution area varies widely, rapidly and frequently, typically with a variation greater than one order of magnitude (i.e., a tenfold increase or decrease).

8. **Severely fragmented**

Severely fragmented is refers to the situation where increased extinction risks to the taxon result from the fact that most individuals within a taxon are found in small and relatively isolated subpopulations. These small subpopulations may go extinct, with a reduced probability of recolonisation.

9. **Extent of occurrence**

Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy. This measure may exclude discontinuities or disjunctions within the overall distributions of taxa (e.g., large areas of obviously unsuitable habitat) (but see 'area of occupancy'). Extent of occurrence can often be measured by a minimum convex

polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

10. **Area of occupancy**

Area of occupancy is defined as the area within its 'extent of occurrence' (see definition) which is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may, for example, contain unsuitable habitats. The area of occupancy is the smallest area essential at any stage to the survival of existing populations of a taxon (e.g. colonial nesting sites, feeding sites for migratory taxa). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the taxon. The criteria include values in km^2, and thus to avoid errors in classification, the area of occupancy should be measured on grid squares (or equivalents) which are sufficiently small (see Figure 2).

11. **Location**

Location defines a geographically or ecologically distinct area in which a single event (e.g. pollution) will soon affect all individuals of the taxon present. A location usually, but not always, contains all or part of a subpopulation of the taxon, and is typically a small proportion of the taxon's total distribution.

12. **Quantitative analysis**

A quantitative analysis is defined here as the technique of population viability analysis (PVA), or any other quantitative form of analysis, which estimates the extinction probability of a taxon or population based on the known life history and specified management or non-management options. In presenting the results of quantitative analyses the structural equations and the data should be explicit.

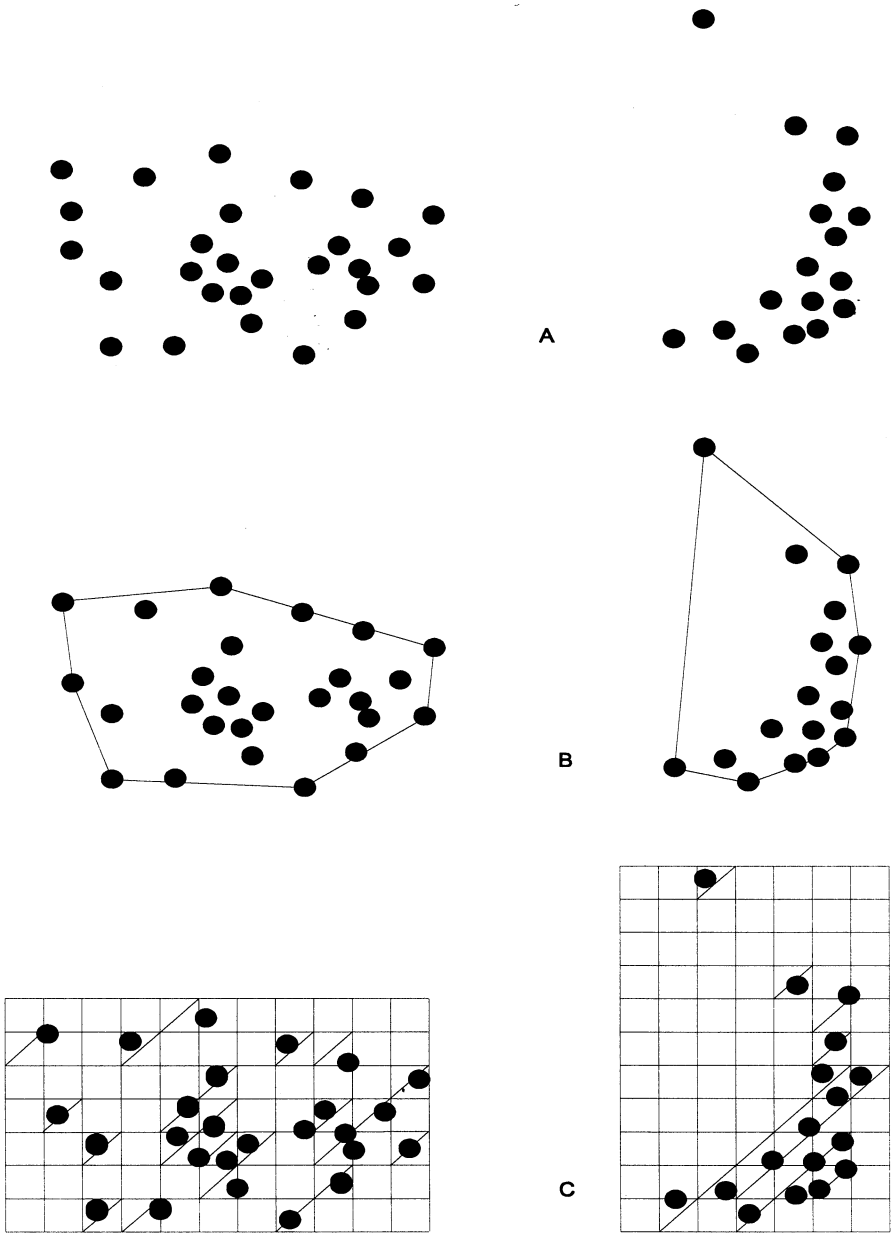


Figure 2:

Two examples of the distinction between extent of occurrence and area of occupancy. (a) is the spatial distribution of known, inferred or projected sites of occurrence. (b) shows one possible boundary to the extent of occurrence, which is the measured area within this boundary. (c) shows one measure of area of occupancy which can be measured by the sum of the occupied grid squares.

IV) The categories [1]

EXTINCT (EX)
A taxon is Extinct when there is no reasonable doubt that the last individual has died.

EXTINCT IN THE WILD (EW)
A taxon is Extinct in the wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the criteria (A to E) on pages 12 and 13.

ENDANGERED (EN)
A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the criteria (A to E) on pages 14 and 15.

VULNERABLE (VU)
A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the criteria (A to D) on pages 16 and 17.

LOWER RISK (LR)
A taxon is Lower Risk when it has been evaluated, does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. Taxa included in the Lower Risk category can be separated into three subcategories:

1. **Conservation Dependent (cd).** Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.

2. **Near Threatened (nt).** Taxa which do not qualify for Conservation Dependent, but which are close to qualifying for Vulnerable.

3. **Least Concern (lc).** Taxa which do not qualify for Conservation Dependent or Near Threatened.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance

---

Note: As in previous IUCN categories, the abbreviation of each category (in parenthesis) follows the English denominations when translated into other languages.

and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

NOT EVALUATED (NE)
A taxon is Not Evaluated when it is has not yet been assessed against the criteria.

V) The Criteria for Critically Endangered, Endangered and Vulnerable

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 80% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

a) direct observation
b) an index of abundance appropriate for the taxon
c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
d) actual or potential levels of exploitation
e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 80%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B) Extent of occurrence estimated to be less than 100 km^2 or area of occupancy estimated to be less than 10 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at only a single location.

2) Continuing decline, observed, inferred or projected, in any of the following:

a) extent of occurrence
b) area of occupancy
c) area, extent and/or quality of habitat
d) number of locations or subpopulations
e) number of mature individuals.

3) Extreme fluctuations in any of the following:

   a) extent of occurrence
   b) area of occupancy
   c) number of locations or subpopulations
   d) number of mature individuals.

C) Population estimated to number less than 250 mature individuals and either:

1) An estimated continuing decline of at least 25% within 3 years or one generation, whichever is longer or
2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

   a) severely fragmented (i.e. no subpopulation estimated to contain more than 50 mature individuals)
   b) all individuals are in a single subpopulation.

D) Population estimated to number less than 50 mature individuals.

E) Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or 3 generations, whichever is the longer.

ENDANGERED (EN)

A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 50% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:

   a) direct observation
   b) an index of abundance appropriate for the taxon
   c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
   d) actual or potential levels of exploitation
   e) the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2) A reduction of at least 50%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d), or (e) above.

B) Extent of occurrence estimated to be less than 5000 km^2 or area of occupancy estimated to be less than 500 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at no more than five locations.

2) Continuing decline, inferred, observed or projected, in any of the following:

   a) extent of occurrence
   b) area of occupancy
   c) area, extent and/or quality of habitat
   d) number of locations or subpopulations
   e) number of mature individuals.

3) Extreme fluctuations in any of the following:

   a) extent of occurrence
   b) area of occupancy
   c) number of locations or subpopulations
   d) number of mature individuals.

C) Population estimated to number less than 2500 mature individuals and either:

1) An estimated continuing decline of at least 20% within 5 years or 2 generations, whichever is longer, or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:
   a) severely fragmented (i.e. no subpopulation estimated to contain more than 250 mature individuals)
   b) all individuals are in a single subpopulation.

D) Population estimated to number less than 250 mature individuals.

E) Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or 5 generations, whichever is the longer.

VULNERABLE (VU)

A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the following criteria (A to E):

A) Population reduction in the form of either of the following:

1) An observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer,, based on (and specifying) any of the following:

   a) direct observation
   b) an index of abundance appropriate for the taxon
   c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
   d) actual or potential levels of exploitation
   e) the effects of introduced taxa, hybridisation, pathogens, pollutants,

competitors or parasites.

2) A reduction of at least 20%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of (b), (c), (d) or (e) above.

B) Extent of occurrence estimated to be less than 20,000 km^2 or area of occupancy estimated to be less than 2000 km^2, and estimates indicating any two of the following:

1) Severely fragmented or known to exist at no more than ten locations.

2) Continuing decline, inferred, observed or projected, in any of the following:

a) extent of occurrence
b) area of occupancy
c) area, extent and/or quality of habitat
d) number of locations or subpopulations
e) number of mature individuals.

3) Extreme fluctuations in any of the following:

a) extent of occurrence
b) area of occupancy
c) number of locations or subpopulations
d) number of mature individuals.

C) Population estimated to number less than 10,000 mature individuals and either:

1) An estimated continuing decline of at least 10% within 10 years or 3 generations, whichever is longer, or

2) A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

a) severely fragmented (i.e. no subpopulation estimated to contain more than 1000 mature individuals)
b) all individuals are in a single subpopulation.

D) Population very small or restricted in the form of either of the following:

1) Population estimated to number less than 1000 mature individuals.

2) Population is characterised by an acute restriction in its area of occupancy (typically less than 100 km^2) or in the number of locations (typically less than 5). Such a taxon would thus be prone to the effects of human activities (or stochastic events whose impact is increased by human activities) within a very short period of time in an unforeseeable future, and is thus capable of becoming Critically Endangered or even Extinct in a very short period.

E) Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.