PN-ABY-10

A Regional Analysis of Geographic Priorities For Biodiversity Conservation in Latin America and the Caribbean

Prepared by:

Biodiversity Support Program
Conservation International
The Nature Conservancy
Wildlife Conservation Society
World Resources Institute
World Wildlife Fund

For the United States Agency for International Development
July 1995

A Regional Analysis of Geographic Priorities for Biodiversity Conservation in Latin America and the Caribbean

ISBN 1-887531-17-3

© 1995 by The Biodiversity Support Program. All rights reserved. No part of this book may be reproduced without the permission of The Biodiversity Support Program, c/o World Wildlife Fund, 1250 24th Street, N.W., Washington, D.C. 20037, USA.

The BiodiversitySupport Program (BSP) was established in 1988 with funding from the Research and Development Bureau of the U.S. Agency for International Development (USAID), under cooperative agreement number DHR-5554-A-00-8044. BSP is implemented by a consortium of World Wildlife Fund, The Nature Conservancy and World Resources Institute. BSP works to conserve biodiversity in developing countries by supporting innovative, on-the-ground projects that integrate conservation with social and economic development; research and analysis of conservation and development techniques; and information exchange and outreach.

Cover design by Leslie Murray, Leslie Murray Art and Design and Ilana Locker, BSP. Map by Avis Webster, WWF. Photo on right, taken by Kathryn Saterson, shows Daniel Nepstad of the Woods Hole Research Center at the September 1994 Miami Workshop on Setting Geographic Biodiversity Conservation Investment Priorities in Latin America and the Caribbean. Photo on left, taken by Russell Mittermeier, is of the Pantanal in Brazil.

Citation: Biodiversity Support Program, Conservation International, The Nature Conservancy, Wildlife Conservation Society, World Resources Institute, and World Wildlife Fund. 1995. **A Regional Analysis of Geographic Priorities for Biodiversity Conservation in Latin America and the Caribbean.** Biodiversity Support Program, Washington, D.C., USA. 140 pp.

For more information and/or copies of this publication contact: The Biodiversity Support Program, c/o World Wildlife Fund, 1250 24th Street, N.W., Washington, D.C. 20037, USA. Tel. 202-293-4800, Fax 202-293-9211.

Printed by Corporate Press, Landover, MD.

Printed on recycled paper.

CONTENTS

List of Figures ix

List of Tables xi

List of Acronyms xiii

Acknowledgements xv

Preface xvii

Executive Summary xix

Chapter One. Background and Purpose

Introduction 1
Definitions and Conceptual Issues 2
Data and Methodological Issues 5

Chapter Two. Assessing Biological Value

Introduction 7
Approach 7
Results 8
Data Limitations and Qualifiers on Use 11
Conclusions 12

Chapter Three. Assessing the Conservation Status of Ecoregions

Introduction....13
Approach....13
Results....15
Data Limitations and Qualifiers on Use....17
Conclusions....17

Chapter Four. Assessing Policy/Institutional Feasibility

Introduction....19
Approach....20
Results....20
Data Limitations and Qualifiers on Use....21
Conclusions....21

Chapter Five. Assessing Utility

Introduction....23
Approach....23
Results....24
Data Limitations and Qualifiers on Use....24
Conclusions....26

Chapter Six. Integration Results

Introduction....27
Approach....27
Integration Models....27
Integration Results....28
Data Limitations and Qualifiers on Use....31

Chapter Seven. Recommendations and Next Steps

How USAID Should Use These Recommendations....33
How Others Might Use This Report....34
Next Steps....35

Appendices

Appendix A: Maps....37
Appendix B: Integration: Regional Habitat Units Characterized by Biological Value and Conservation Status....55
Appendix C: Summary of Four Integration Models....63
Appendix D: Sample Data Forms Used by Workshop Participants to Assess Biological Value, Conservation Status and Policy/Institutional Feasibility....69

Appendix E: Using Policy/Institutional Data in Assessing Conservation Priorities 85
Appendix F: Alphabetical List of Workshop Participants 95
Appendix G: Workshop Agenda 107
Appendix H: Literature Cited and Bibliography of Other Selected Biodiversity Priority-Setting References 115

LIST OF FIGURES

Figures in Main Text

Figure 1. Regional Habitat Units of Latin America and the Caribbean 3

Figure 2. Biological Value of Regional Habitat Units 10

Figure 3. Conservation Status of Regional Habitat Units 16

Figure 4. Priority Regional Habitat Units for Biodiversity Conservation 30

Figures in Map Appendix A

Figure A-1. Biological Value: Plants 39

Figure A-2. Biological Value: Mammals 41

Figure A-3. Biological Value: Birds 43

Figure A-4. Biological Value: Insects 45

Figure A-5. Biological Value: Herpetofauna 47

Figure A-6. Biological Value: Fish 49

Figure A-7. Conservation Status of Ecoregions of Latin America and the Caribbean: Current Conservation Status 51

Figure A-8. Conservation Status of Ecoregions of Latin America and the Caribbean: Modification of Current Status Based on Threat Analysis 53

LIST OF TABLES

Table 1. Ranking Priority Habitat Units xxi

Table 2. Hierarchical Classification of Major Habitat Types and Regional Habitat Units for the Latin American and Caribbean Region 4

Table 3. Final Ranking of Regional Habitat Units for Biological Value 9

Table 4. Investment Portfolio Model of Policy/Institutional Feasibility 20

Table 5. Final Ranking of Regional Habitat Units for Utility 25

Table 6. Integration Ranking of Regional Habitat Units for Conservation Priority 29

LIST OF ACRONYMS

BSP	Biodiversity Support Program
CI	Conservation International
CITES	Convention on International Trade in Endangered Species
ESRI	Environmental Systems Research Institute
GEF	Global Environmental Facility
GIS	Geographic Information System
GNP	Gross National Product
IUCN	International Union for the Conservation of Nature
LAC	Latin America/Caribbean
LATEN	Latin American Environment Division of the World Bank
MHT	Major Habitat Type
NGO	Non-Governmental Organization
ODA	Overseas Development Assistance
PI	Policy/Institutional
RHU	Regional Habitat Unit
TFAP	Tropical Forestry Action Plan
TNC	The Nature Conservancy
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WCMC	World Conservation Monitoring Center
WCS	Wildlife Conservation Society
WRI	World Resources Institute
WWF	World Wildlife Fund

ACKNOWLEDGEMENTS

The Biodiversity Support Program would like to fully acknowledge the collaborative nature of this exercise. The results reported here would not have been possible without the significant contributions of time and expertise from the following institutions and individuals who served on the NGO Working Group:

- Conservation International (CI)—Russ Mittermeier, Silvio Olivieri, Chris Rodstrom
- The Nature Conservancy (TNC)—Kent Redford, Roger Sayre
- Wildlife Conservation Society (WCS)—John Robinson, Alejandro Grajal
- World Resources Institute (WRI)—Dirk Bryant, Nels Johnson
- World Wildlife Fund (WWF)—Eric Dinerstein, David Olson, Frances Seymour
- Biodiversity Support Program (BSP)—Meg Symington, Kathryn Saterson

We thank Lisa Justice of TNC and Ilana Locker of BSP for their tireless efforts to organize participant invitations and logistics for the workshop.

The participants in the Miami workshop are the source of much of the data that the exercise required. They worked long hours and we thank them for their willingness to apply their detailed knowledge to a regional scale in order to assist policy makers at USAID.

For their long nights of map making, we thank the GIS specialists: Ludmilla Aguiar, Ricardo Machado and Chris Rodstrom (CI), Roger Sayre (TNC) and Avis Webster (WWF). Environmental Systems Research Institute (ESRI) contributed the time of Lance Shipman and Steve Vu, and provided logistical support with computer hardware and software in Miami. Elizabeth McCance did the lion's share of the data collection and synthesis for WCS's biological value section.

Data and analysis for the utility component were provided by Bruce Wilcox of the Institute for Sustainable Development (ISD). The World Conservation Monitoring Center (WCMC) provided digitized data on parks and protected areas and wetlands. Janet Abramovitz and WCMC provided data on biodiversity budgets and spending. The

World Bank's LATEN Division's work with WWF provided the ecoregion classification that was the basis for the biogeographic units used in this exercise and moved this project forward faster than would have been otherwise possible.

Useful comments on various drafts of the priority-setting framework and approach were provided by Jim Adriance, Janis Alcorn, Walter Arensberg, Andrew Balmford, Garo Batmanian, Bruce Cabarle, Jason Clay, Steve Cornelius, Pat Foster-Turley, Peter Frumhoff, Doug Fuller, Rodrigo Gamez, Robert Goodland, Pamela Hathaway, Dan Janzen, Steve Kellert, Krishna Kumar, Michelle Lemay, Kathy MacKinnon, Jeff McNeely, Kate Newman, Marianne Schmink, Bill Siemer, Mike Smith, Michael Soulé, John Terborgh and Monique Zegarra.

And finally, we thank our colleagues at USAID for providing funding and technical input to this work. In particular, we thank Glenn Prickett, for initiating the project, and Mike Philley, Jeff Brokaw and Eric Fajer.

PREFACE

After many years of leadership by USAID and our partners, biodiversity conservation has truly arrived as a global priority. The Clinton Administration, for its part, has identified biodiversity as one of two global environmental priorities for USAID, along with the mitigation of global climate change.

This report marks an important step in our effort to turn that general commitment into a specific operational strategy. USAID asked the Biodiversity Support Program to work with leading conservation institutions—Conservation International, The Nature Conservancy, Wildlife Conservation Society, World Resources Institute, and World Wildlife Fund—to produce a framework for setting geographic priorities for biodiversity conservation. These organizations in turn called together leading experts from Latin America and the Caribbean to produce the findings you have in your hands.

Setting biodiversity priorities is a complex and often controversial task. And yet, conservation and development institutions set priorities every day through their budget decisions. USAID believes that establishing clear criteria and seeking advice from outside experts will help us set more effective priorities for our biodiversity programs.

USAID will consider the priorities identified in this report in making strategic decisions about our biodiversity programs. The report employs a sound set of criteria that USAID endorses: biological value, conservation status, biodiversity's usefulness to human communities, and the institutional and political feasibility for conservation. While we act on biodiversity priorities, we will remain mindful that every nation's biodiversity is critical to its own sustainable development. Thus, we will continue to support biodiversity conservation where appropriate on a country-by-country basis.

By supporting the development of this report, USAID also hopes to contribute to a broader debate in the international community on setting biodiversity priorities. We look forward to a continuing dialogue on these issues with our colleagues in biodiversity conservation—national governments, NGOs, the private sector, and other donors.

—Glenn T. Prickett
Chief Environmental Advisor
U.S. Agency for International Development

EXECUTIVE SUMMARY

BACKGROUND

The U.S. Agency for International Development (USAID) has identified biodiversity conservation as one of two global environmental priorities. As a result, the Agency hosted a meeting in December 1993 to explore criteria for setting geographic priorities for biodiversity conservation. The criteria agreed upon at this meeting included biological importance, threat, utility, and institutional feasibility. Following this meeting, USAID requested that the Biodiversity Support Program (BSP) lead an effort to develop a priority-setting framework, starting from the criteria listed above, to identify priority geographic areas for biodiversity conservation. BSP invited five leading conservation organizations—World Wildlife Fund, The Nature Conservancy, World Resources Institute, Conservation International and Wildlife Conservation Society—to serve on a Non-Governmental Organization (NGO) Working Group to assist in developing a framework for determining geographic conservation priorities and then applying it to Latin America and the Caribbean. The framework was developed from January - May 1994. Data were collected for the Latin American region from June - August, and a workshop with the participation of Latin American biodiversity experts was held in Miami in September 1994 to review the data and apply the framework to determine geographic conservation priorities.

PRINCIPLES

The principles underlying this geographic priority-setting approach follow:

- Every nation's biodiversity is critical to its own sustainable development. Therefore, biodiversity conservation is important for every country. The recommendations from this exercise will help determine which areas should be priorities for biodiversity conservation *at the regional level.* The focus of this exercise is on where to conserve, not on what, how or why to conserve.

- Biodiversity includes not only diversity of species but also diversity of biological communities and ecosystems. Therefore, effective biodiversity conservation requires maintaining repre-

sentation of all major habitat types found in the region (tropical moist lowland forests, tropical montane forests, tropical dry forests, xeric or desert systems, lowland and montane grasslands, and temperate forests). Since Major Habitat Types (MHT) cut across national boundaries, the priority-setting analysis should be based on biogeographic units, not country units.

- Biological importance alone is not a sufficient criterion for determining biodiversity conservation priorities at a regional level since natural habitats have been degraded to varying extents and because national commitment to biodiversity conservation varies. Biodiversity conservation priorities should integrate consideration of an area's biological importance, conservation threat and opportunity, policy/institutional feasibility and utility factors.

Approach

The approach used to determine investment priorities included four levels of analysis: 1) biological importance; 2) conservation threat and opportunity; 3) policy/institutional feasibility; and 4) human utility. All of the analyses, with the exception of policy/institutional feasibility, were based on biologically and ecologically distinct geographic units, not countries. These geographic units were called Regional Habitat Units (RHUs). The NGO Working Group collected preliminary data which were then critiqued, revised and supplemented at the Miami workshop by biological and social scientists with regional expertise.

The biological importance of areas was determined following a process that first defined priority areas for six taxonomic groups (plants, insects, birds, herpetofauna (reptiles and amphibians), mammals, and freshwater fish) and then integrated these taxonomic priority areas to define biological priority areas. To determine conservation threat and opportunity, data on five key landscape-level features were collected: the presence/absence of large blocks of original habitat, the percent of remaining original habitat, the rate of conversion, degree of degradation and fragmentation, and degree of protection. The policy/institutional (PI) component defined national institutional and policy characteristics which are favorable to the effectiveness of conservation-oriented investments. In the utility component of the analysis, genetic resources, productive and protective resources, and carbon sequestration were used to rank the potential utility of areas. All of the levels of analysis were then integrated by workshop participants to determine biodiversity conservation priorities at the regional level.

The regional geographic priorities identified by the NGO Working Group are based on an approach to integrating the four levels of analysis drawn from the integration approaches developed by workshop participants. Ranking of Regional Habitat Units within Major Habitat Types was based on a consideration and weighting of biological value and conservation status. Regional Habitat Units with the same rank based on these two values were differentiated based on the results of the utility analysis. Due to lack of satisfactory data, political/institutional criteria were not incorporated into the NGO Working Group's final ranking of priorities.

Results

The results of the biological value and conservation status analyses, as well as the final ranking of priority areas are presented in Table 1. Seven Regional Habitat Units are recommended as *highest priority* for biodiversity conservation (one within each Major Habitat Type):

- Atlantic Forest - lowland moist forest found along the Atlantic coast of Brazil from Natal to Rio Grande do Sul, with smaller portions found in eastern Paraguay and the Misiones province of Argentina.

- Tropical Andes - montane moist forest reaching from the northern Andes in Venezuela and Colombia to the eastern slope of the Andes in Argentina.

TABLE 1. RANKING PRIORITY HABITAT UNITS

MAJOR HABITAT TYPES (MHTs) / Regional Habitat Units (RHUs) (COUNTRIES WITHIN WHICH RHUs OCCUR)	Biological Value*[1]	Conservation Status*	Conservation Priority*[2]
1. TROPICAL MOIST LOWLAND FORESTS			
1-1 **Atlantic** (BRAZIL, ARGENTINA, PARAGUAY)	R	Critical	1
1-2 **Upper Amazon** (BRAZIL, COLOMBIA, BOLIVIA, PERU, ECUADOR)	R	Stable	2
1-3 **NE Amazon** (BRAZIL, GUYANA)	S	Stable	3
1-4 **SE Amazon** (BRAZIL)	L	Vulnerable	3
1-5 **Chocó-Darién** (COLOMBIA, PANAMA, ECUADOR)	S	Vulnerable	3
1-6 **Central American Lowland** (MEXICO to PANAMA)	L	Endangered	3
2. TROPICAL MOIST MONTANE FORESTS			
2-1 **Tropical Andes** (VENEZUELA, COLOMBIA, ECU, PERU, BOL, ARG)	R	Endangered	1
2-2 **Central Am. Montane** (COSTA RICA, PAN, GUA, HON, SAL, MEX)	S	Vulnerable	3
2-3 **Caribbean Moist** (GREATER & LESSER ANTILLES)	S	Vulnerable	2[3]
2-4 **Venezuelan Coastal** (VENEZUELA)	L	Vulnerable	3
2-5 **Guayana Montane** (VENEZUELA, GUYANA, SURINAME, FR.GUI, BRZ)	S	Intact	3
3. TROPICAL DRY FORESTS			
3-1 **Northern South American Dry** (COLOMBIA, VENEZUELA)	S	Critical	3
3-2 **Western Andes** (ECUADOR)	L	Endangered	3
3-3 **Chaco** (PARAGUAY, BOLIVIA, ARGENTINA)	R	Vulnerable	2
3-4 **Central American Dry** (COSTA RICA, PANAMA, EL SALV, NICAR)	L	Critical	3
3-5 **Mexican Dry** (MEXICO, GUATEMALA)	S	Endangered	3
3-6 **Cerrado-Pantanal** (BRAZIL, BOLIVIA, PARAGUAY)	R	Endangered	1
4. XERIC FORMATIONS			
4-1 **Mexican Xerics** (MEXICO, USA)	R	Vulnerable	1[4]
4-2 **Caribbean Xerics** (COLOMBIA, VENEZUELA, GRTR & LSSR ANTLLS)	S	Endangered	3
4-3 **Caatinga** (BRAZIL)	R	Vulnerable	2
4-4 **Peru-Chile Deserts** (PERU, CHILE)	L	Vulnerable	3
4-5 **Chilean Winter Rainfall** (CHILE)	S	Endangered	3
4-6 **Argentine Monte** (ARGENTINA)	L	Vulnerable	3
5. HERBACEOUS LOWLAND GRASSLANDS			
5-1 **Central Am. Pine Savanna** (NICARAGUA, HONDURAS, BELIZE)	L	Stable	3
5-2 **Llanos-Gran Sabana** (VENEZUELA, COLOMBIA)	S	Vulnerable	3
5-3 **Pampas** (ARGENTINA, URUGUAY, BRAZIL)	L	Critical	2
5-4 **Patagonian Steppe** (ARGENTINA, CHILE)	R	Vulnerable	1
5-5 **Amazonian Savannas** (BRAZIL, PERU, GUYANA, VENEZUELA)	L	Vulnerable	3
6. HERBACEOUS MONTANE GRASSLANDS			
6-1 **Paramo** (COLOMBIA, VENEZUELA, PERU, CR, ECU)	R	Vulnerable	2
6-2 **Puna** (PERU, BOLIVIA, ARGENTINA, CHILE)	R	Vulnerable	1[5]
6-3 **Southern Andean Alpine** (CHILE, ARGENTINA)	L	Vulnerable	3
6-4 **Pantepui** (VENEZUELA, GUYANA)	S	Intact	3
7. TEMPERATE FORESTS			
7-1 **Southern Temperate Forest** (CHILE, ARGENTINA)	R	Endangered	2
7-2 **Brazilian *Araucaria*** (BRAZIL, ARGENTINA)	S	Critical	3
7-3 **Mexican Pine-Oak** (MEXICO)	R	Endangered	1[6]

* Biological Value, Conservation Status and Conservation Priority are ranked within each Major Habitat Type.
[1] R= Regionally Outstanding; S= Regionally Significant; L= Locally Important.
[2] 1= Highest Regional Priority; 2= High Regional Priority; 3= Locally Important.
[3] Distinguished from Central American Montane on the basis of higher utility ranking.
[4] Distinguished from Caatinga on the basis of higher utility ranking.
[5] Distinguished from Paramo on the basis of higher utility ranking.
[6] Distinguished from Southern Temperate Forests on the basis of higher utility ranking.

- Cerrado-Pantanal - a large area of mixed dry and seasonal forests, savannas and grasslands found south of the Amazon basin, primarily in Brazil, with smaller portions in Bolivia and Paraguay. The Pantanal, Latin America's largest wetland, is found within the Cerrado and included in this unit.

- Mexican Xerics - desert and semi-desert scrub in northern and north central Mexico, including both the Sonoran and Chihuahuan deserts.

- Patagonian Steppe - an area of lowland grassland found primarily in southern Argentina, with a small portion in Chile.

- Puna - a dry high-altitude grassland of the Andean altiplano stretching from Peru to Chile.

- Mexican Pine-Oak - a temperate forest of mixed pine and oak in the mountains of northern Mexico.

Another seven Regional Habitat Units are recommended as *high priority* for biodiversity conservation (also one from each Major Habitat Type):

- Upper Amazon - a large area of tropical lowland forest stretching along the western edge of the Amazon basin in Colombia, Ecuador, Peru, Brazil and Bolivia.

- Caribbean Moist - moist forests of the lowlands and montane elevations in the Greater and Lesser Antilles. Montane and lowland forests were combined into one RHU and placed in the montane forest habitat type since the vast majority of moist forests remaining in the Caribbean are montane forests.

- Chaco - an area of mixed dry forest and grassland in northern Argentina, western Paraguay and eastern Bolivia.

- Caatinga - an area of semi-desert scrub and xeric vegetation found in northeastern Brazil.

- Pampas - an area of lowland grassland found in Argentina and Uruguay, with a small portion in southeastern Brazil.

- Paramo - a humid high-altitude shrub or grassland found above the treeline on many of the highest peaks from Costa Rica to Peru.

- Southern Temperate Forest - broadleaf and evergreen forests of southern Chile and southwestern Argentina.

Because of this exercise's emphasis on representation of different Major Habitat Types, and the integration of multiple criteria to assess biological value and conservation status, the list of priority Regional Habitat Units contains a number of areas that have not received significant conservation attention in the past. For example, temperate forest (pine- oak forests in Mexico and southern temperate forests in Chile), xeric (Caatinga in Brazil, deserts and other xeric formations in Mexico) and dry forest (the Chaco in Argentina, Paraguay and Bolivia, the Cerrado of Brazil) ecosystems were identified by the workshop participants as having high priority for biodiversity conservation efforts at the regional level.

Caveats and Limitations

The workshop was extremely useful in refining the approach taken to the policy/institutional (PI) level of analysis. However, workshop participants agreed that the data collected prior to the workshop were insufficient to apply in the context of recommending biodiversity conservation priorities. Therefore, although PI criteria are not incorporated into the results presented above, examples of how PI data might be applied in future priority-setting exercises are provided in an appendix to this report. The PI criteria developed in the context of this exercise should be used by USAID to help determine where biodiversity conservation investments should be made within the large Regional Habitat Units identified above, as well as for determining what types of investments should be made in these areas.

The results of any attempt to determine geographic priorities for biodiversity conservation are obviously dependent on the scale at which the analysis is done. The scale of this analysis is region-wide, and thus it would be inappropriate to use the results presented here to make investment recommendations on a smaller, sub-regional (e.g., Central America) or country-level, scale. It is our hope that this priority-setting exercise is only the first step in an ongoing process, that would use continually finer scales to determine biodiversity conservation priorities. Indeed, an evaluation provided by workshop participants indicated that a significant number were so impressed with the overall approach that they wanted to try it at the national level within their own countries.

The exclusion of marine, freshwater, and mangrove ecoregions from this analysis limits our recommendations to terrestrial priorities. We are currently moving forward with an initiative to adapt and apply the framework to identify aquatic (including marine) biodiversity conservation priorities in Latin America and the Caribbean.

Neither biological value nor conservation status are static qualities. As new data are collected and new threats emerge, the results and rankings reported here could change. The data used in this exercise are all available in tabular format so that results can be amended and modified as new data become available.

Conclusions and Recommendations

This report highlights those areas in Latin America and the Caribbean which merit special focus because of their importance for biodiversity conservation at the regional level. This report does not address what types of biodiversity conservation investments (e.g., protection, institution building, sustainable use) should be made in these areas. These areas may not necessarily be of highest priority for achieving other USAID strategic goals apart from biodiversity conservation.

We recommend that USAID continue to play a leadership role within the donor community with regard to biodiversity conservation by reviewing current USAID, other donor, and national investments in the 14 RHUs identified as high priority by this exercise. USAID should then work to increase its and other donors' investments in those areas not currently receiving sufficient conservation investment. All remaining RHUs are considered appropriate for continued biodiversity conservation investments at the national and local levels.

We believe that the production and application of a logical and transparent geographic priority-setting framework represents a significant improvement over the ad-hoc decision-making that has characterized biodiversity funding by most NGOs, governmental agencies, bilateral and multilateral funding agencies to date. We hope that the priority-setting framework developed by the NGO Working Group and presented in this report, will be a useful tool for conservationists and donors to apply at different scales and in different regions.

CHAPTER ONE

BACKGROUND AND PURPOSE

INTRODUCTION

In December 1993, the U.S. Agency for International Development (USAID) convened an informal workshop for Agency staff and outside experts to explore criteria for setting geographic priorities for biodiversity conservation. USAID had recently identified biodiversity as one of two global environmental priorities and, consequently, had an interest in targeting its biodiversity programs more strategically. The consensus of the group assembled was that, given declining financial resources at USAID, geographic priorities would help ensure that USAID biodiversity investments remain focused and relevant. The group also agreed that priorities should not be based on species richness alone, but should consider multiple criteria such as phyletic and ecosystem diversity, threat, usefulness of biodiversity to humans and the policy and institutional factors that affect the probability of conservation investments being successful.

The Biodiversity Support Program (BSP) was then requested by USAID to lead an effort to develop a framework for setting geographic biodiversity conservation priorities and to then use the framework to generate geographic conservation priorities for USAID's use in Latin America and the Caribbean (LAC). BSP invited representatives of five major international NGOs to form a collaborative NGO Working Group to assist in this effort. The Working Group included representatives of Conservation International (CI), The Nature Conservancy (TNC), Wildlife Conservation Society (WCS), World Resources Institute (WRI), and World Wildlife Fund (WWF). Over a 9-month period, beginning in January 1994, the Working Group developed a framework and collected and synthesized data to identify geographic conservation priorities for USAID. In September 1994, a workshop, in which regional experts participated, was held in Miami, Florida to review the framework methodology, review and refine collected data, identify additional data sources, and apply the framework and data to identify preliminary regional geographic priorities for USAID in Latin America and the Caribbean.

The purpose of this priority-setting exercise was to identify areas of outstanding regional importance

for biodiversity conservation. The approach taken can be characterized as "integrative" in that it integrates a number of criteria in determining priorities. We believe that the production and application of a logical, transparent and integrative geographic priority-setting framework represents a significant improvement over less systematic decision-making that has characterized biodiversity funding by most NGOs, government agencies, bilateral and multilateral funding agencies to date.

The approach we developed identifies geographic priorities based on a combination of four major categories of criteria: 1) the biological value of an area; 2) the conservation status of an area at the landscape level; 3) the policy and institutional characteristics that indicate whether a conservation investment in a given area is likely to have an impact; and 4) the potential human utility of an area's biodiversity. USAID and other donors are increasingly concerned with the role of biological diversity in sustainable development and with maximizing the cost effectiveness of their investment. The integrative approach resulting from the consideration of policy/institutional feasibility and human utility distinguishes this framework from previous priority-setting exercises. Another characteristic that distinguishes this exercise from many previous efforts is the emphasis on representation of different habitat types in the conservation priorities identified, and the use of biogeographic units, rather than countries as the basis for the analysis.

Definitions and Conceptual Issues

Biodiversity is a term which refers to the variety and variability among living organisms, the ecological complexes in which they naturally occur, and the ways in which they interact with each other and the geosphere.

Priorities (and criteria for setting priorities) must be derived from clearly stated goals and objectives. The NGO Working Group recommends that USAID's support for conservation should help to conserve the broadest possible range of the Earth's biological diversity through conservation of priority ecoregions within the major habitat types of each biogeographic realm. Thus, the analysis presented here is based on ecologically distinct biogeographic units (ecoregions), not country units. The ecoregion classification scheme that is the basis for this approach is based on a system derived by WWF's Conservation Science Program (Dinerstein et al. 1995). An ecoregion represents a geographically distinct assemblage of communities that share a large majority of their species, ecological dynamics, and similar environmental conditions, and whose ecological interactions are critical for their long-term persistence. Ecoregions are grouped into Major Habitat Types (MHTs) based on similarities in terms of their general structure, climatic regimes, major ecological processes, level of species turnover with distance (beta diversity), and whose flora and fauna show similar guild structures and life histories.

For the purposes of the USAID priority-setting exercise, however, ecoregions were considered too fine a scale, so we used clusters of biogeographically similar ecoregions, which we called Regional Habitat Units (or RHUs), as the basic unit of analysis (Figure 1). It was felt that this scale of analysis was feasible given time and budget constraints without unduly sacrificing representation. A listing of the hierarchical classification for Major Habitat Types and Regional Habitat Units used in this priority-setting process can be found in Table 2. Using this hierarchical system, conservation priorities for each Major Habitat Type were identified. The approach calls for comparing biological value, conservation status, policy/institutional characteristics and utility of Regional Habitat Units only *within* the same Major Habitat Type, e.g., tropical dry forests in Mexico would be compared with tropical dry forests in Central America—both within the tropical dry forest major habitat—but not with an RHU such as Paramo, which is from the herbaceous montane major habitat.

The purpose of this priority-setting process was to determine *where* to undertake conservation initia-

Figure 1. Regional Habitat Units of Latin America and the Caribbean

Table 2. Hierarchical Classification of Major Habitat Types and Regional Habitat Units For the Latin American and Caribbean Region

Major Habitat Type (MHT)	Regional Habitat Unit (RHU)
1. Tropical Moist Lowland Forests	1. Atlantic 2. Upper Amazon 3. NE Amazon 4. SE Amazon 5. Chocó-Darién 6. Central American Lowland
2. Tropical Moist Montane Forests	1. Tropical Andes 2. Central American Montane 3. Caribbean Moist 4. Venezuelan Coastal 5. Guayana Montane
3. Tropical Dry Forests	1. Northern South American Dry 2. Western Andes 3. Chaco 4. Central American Dry 5. Mexican Dry 6. Cerrado-Pantanal
4. Xeric Formations	1. Mexican Xerics 2. Caribbean Xerics 3. Caatinga 4. Peru-Chile Deserts 5. Chilean Winter Rainfall 6. Argentine Monte
5. Herbaceous Lowland Grasslands	1. Central American Pine Savanna 2. Llanos-Gran Sabana 3. Pampas 4. Patagonian Steppe 5. Amazonian Savannas
6. Herbaceous Montane Grasslands	1. Paramo 2. Puna 3. Southern Andean Alpine 4. Pantepui
7. Temperate Forests	1. Southern Temperate Forest 2. Brazilian *Araucaria* 3. Mexican Pine-Oak

tives, and it does not address what types of initiatives should be supported, although the form and quality of these conservation investments is obviously of critical importance. An important assumption of the exercise is that the list of priority areas will not be interpreted as an exclusive list of where USAID should invest its biodiversity conservation funds. It is recognized that biodiversity and biological resources are important to every country's sustainable development. USAID's March 1994 *Strategies for Sustainable Development* states that "USAID will...support conservation and sustainable use of biological resources where this is judged to be a priority for sustainable development at the country level."

This report addresses only biodiversity conservation priorities for terrestrial systems. The time and budget constraints of the exercise precluded consideration of aquatic/marine ecosystems at this time. We are currently moving forward with an initiative to adapt and apply the framework to aquatic and marine systems. Although several freshwater fish experts attended the workshop in Miami and identified preliminary biological priority areas based on fish faunas, they felt that freshwater aquatic systems should be addressed more fully in the context of a combined aquatic/marine priority-setting exercise for Latin America and the Caribbean. Mangrove ecoregions also were not addressed at the Miami workshop, but were the subject of a separate WWF workshop in November 1994 (Olson and Cintron, in prep.).

Data and Methodological Issues

This priority-setting effort collected existing data from a variety of sources, attempted to capture new data where possible, and provided this information to workshop participants in a spatially referenced form when possible. The biological value data were compiled by Conservation International and the Wildlife Conservation Society. Information on species identities, abundances and geographic distribution, and other relevant data were collected from primary, secondary and tertiary references, entered into tabular databases and mapped using geographical information systems (GIS).

The World Wildlife Fund Conservation Science Program provided an analysis of conservation status (threat and opportunity) at the landscape level by mapping the entire LAC region into 212 ecoregions, which, for the purposes of this exercise, were combined and consolidated to form Regional Habitat Units as described above.

The World Resources Institute compiled the policy/institutional (PI) data to be used in characterizing countries and sub-national units and worked with the World Wildlife Fund Policy Program to develop a PI assessment instrument. An analysis of the potential utility of the biodiversity found in the RHUs was prepared by the Institute for Sustainable Development (ISD).

Because most of these data sets are incomplete, and because some of the priority-setting criteria required subjective judgements, the knowledge and experience of individuals from the LAC region was incorporated into the priority-setting process during the workshop in Miami. The workshop involved 74 participants, including 40 regional experts on Latin America and the Caribbean (including both biologists and social scientists), 15 representatives of the NGO Working Group, 5 GIS/administrative staff, 11 USAID staff from Washington and Missions, and 3 observers. The workshop also provided an opportunity to incorporate the outlook and viewpoints of Latin Americans into the priority-setting process. A list of the workshop participants and invitees can be found in Appendix F.

Background information compiled by Working Group members and made available to the workshop participants included: a 1:10,000,000 map describing major ecoregions and regional habitat units for the region; a set of background maps describing the distribution of particular taxa in the region (in 8-1/2 x 11" format); and a set of maps describing the region's topography, hydrology, climate, vegetation types, soil types, and various eco-

logical zonings (Holdridge, Bailey, Udvardy) to be used as references (at a scale of 1:10,000,000). Numerous maps of the region, including coastline, country boundaries, major rivers and lakes, were produced on transparent mylar at a scale of 1:10,000,000 and distributed to workshop participants to be used for overlaying on base maps and drawing the boundaries of areas that needed to be defined over the course of the workshop. Policy/institutional and utility data were provided to workshop participants in tabular form.

The workshop took place over four days. The first two days were spent in working groups characterizing the biological value of areas and considering how to assess policy and institutional characteristics. The third day of the workshop was devoted to assessing the conservation status (threat and potential) of the ecoregions and RHUs. On the final day of the workshop, participants were asked to develop a methodology for integrating the various levels of data to determine conservation priorities. The results of the four levels of analysis and the final regional geographic conservation priorities resulting from the integration of these layers are presented in this report. A detailed agenda of the Miami workshop can be found in Appendix G.

CHAPTER TWO

ASSESSING BIOLOGICAL VALUE

INTRODUCTION

The methodology used to determine the biological value of Regional Habitat Units in Latin America and the Caribbean was developed jointly by Conservation International and the Wildlife Conservation Society. Methods developed for previous priority-setting exercises conducted by Conservation International were drawn upon to incorporate biological data and expert opinion in a workshop setting (IBAMA/INPA/CI, 1991; Conservation International, 1995). The methods were designed to achieve three major goals: 1) to provide a sound basis for understanding the biological importance of different areas in the region; 2) to provide thorough documentation of each phase of the process using both maps and tables, to allow USAID and others interested in the results to revisit the conclusions from the workshop; and 3) to identify biological priority areas within each Major Habitat Type.

APPROACH

Biological priority areas were determined following a process that first defined areas identified as priorities for the six taxa being analyzed (plants, insects, birds, herpetofauna, mammals, and freshwater fish) and then integrated these taxonomic priority areas to define integrated biological priority areas. This two-phase approach allowed for the experts to first review the data and define priorities for the taxonomic group with which they were most familiar. This provided a valuable first step before attempting an integrated assessment of biological value. Further, it allowed for a separate comparison of the individual taxonomic priorities and integrated biological priorities following the workshop, and highlights the strengths and weaknesses of each step.

Taxonomic priority areas were delineated concurrently by six taxonomic expert groups: plants; mammals; birds; insects; herpetofauna; and fish. The composition of these taxonomic working groups can be found in Appendix G. Each taxonomic priority area was characterized using a standard form (see Appendix D), and rated as being of "high," "medium" or "low" biological value based on a variety of criteria that differed slightly for each taxonomic group but included species richness, phyletic diversity, number of endemic species, beta diversity and presence of rare/endangered species. Subsequent to

the workshop, those areas rated to be of "high" biological value were designated as regionally outstanding, areas of "medium" biological value as regionally significant, and areas of "low" biological value as locally important. The NGO Working Group felt that this revised terminology better reflected the workshop participants' conviction that biodiversity is valuable everywhere, and will minimize the potential for misunderstanding the results.

The second phase of the biological value analysis integrated the results from each taxonomic group. This phase of the analysis was conducted during a single plenary session with each of the taxonomic groups represented. First, a common characterization of Major Habitat Types and Regional Habitat Units was agreed upon to make comparisons of rankings of the taxonomic priority areas across taxonomic groups possible. The plenary session harmonized the different geographic delineations used by the different taxonomic groups, adjusting the boundaries to reflect the consensus of all groups. It was decided to group 35 Regional Habitat Units (RHUs) within seven Major Habitat Types (MHTs) as described in Table 2.

With the common base map set, the groups provided their scores, adjusting their taxonomic analyses to the newly defined areas. Each taxonomic group provided a biological value ranking for their taxonomic group for every RHU. The fish taxonomic group did not provide a numeric ranking for the integration process. It was decided to keep their results separate, since the base map decided upon by the other five taxonomic groups was not felt to be appropriate for freshwater organisms. The fish taxonomic group analysis (see Figure A-6) was used as a separate modifier in some models when biological value was integrated with conservation status (see Chapter Six, Integration Results). A final biological value rank was determined from the sum of the five taxonomic values (plants, mammals, birds, insects and herpetofauna) within each Major Habitat Type. RHUs were ranked for biological value *within* each MHT, thus ensuring that each of the seven major habitats had high priority areas.

Results

The final scoring for each of the taxonomic groups and the integrated biological value ranking for each RHU is shown in Table 3. These results are illustrated in map form in Figure 2 and Figures A-1 to A-6. Some initial generalizations concerning the results obtained are apparent. Two RHUs, the tropical Andes and the Atlantic coastal forests of Brazil, consistently scored high and were identified as regionally outstanding across all taxonomic groups. There is no similar consensus for lower priority areas.

The results from the separate taxonomic analyses provide valuable insight into the perspective each biological discipline has on biological value. The different delineations and scoring by each taxonomic group reflect the way in which biologists group organisms within their discipline and how those organisms are distributed. There are also interesting results from the reports of the taxonomic working groups regarding the kind of scientific knowledge that exists for the region. According to taxonomic working group members, there is generally greater understanding of species composition than of ecosystem functioning. This may be partly due to the historical pattern of biological research which has often focused on species and populations, rather than complex interactions among groups of organisms.

Several important results emerge from the integrated biological priorities component of the workshop. In the context of Latin America and the Caribbean, numerous biological priority areas emerge that have not received significant attention in the past. Of particular note are the temperate forest and xeric formations. Temperate forests with regionally outstanding biological value include the pine-oak forests of Mexico and the southern temperate forests of Chile. Xeric formations and tropical dry forest, including the Caatinga of Brazil, the deserts and xeric formations of Mexico, the Chaco of Argentina, Paraguay and Bolivia, and the Cerrado of Brazil, were also identified as having regionally outstanding biological value.

Table 3. Final Ranking of Regional Habitat Units For Biological Value

Regional Habitat Units (within Major Habitat Types (MHTs))	Plants[1]	Insects	Birds	Herps	Mammals	Total[2]	Rank[3]	Biological Value[4]
1. TROPICAL MOIST LOWLAND FORESTS								
1-1 Atlantic	3	3	3	3	3	15	1	R
1-2 Upper Amazon	3	3	2	3	2.5	13.5	2	R
1-3 NE Amazon	3	3	2	2	1	11	3	S
1-4 SE Amazon	1	1	2	1	2	7	5	L
1-5 Chocó-Darién	2	3	2	3	1	11	3	S
1-6 Central American Lowland	2	2	1	2	1	8	4	L
2. TROPICAL MOIST MONTANE FORESTS								
2-1 Tropical Andes	3	3	3	3	3	15	1	R
2-2 Central American Montane	2	2	2	3	1	10	3	S
2-3 Caribbean Moist (Montane & Lowlands)	2	2	3	3	1	11	2	S
2-4 Venezuelan Coastal	2	2	2	2	1	9	4	L
2-5 Guayana Montane	2	2	3	3	1	11	2	S
3. TROPICAL DRY FORESTS								
3-1 Northern South American Dry	2	2	3	1	3	11	3	S
3-2 Western Andes	1	3	2	1	2	9	4	L
3-3 Chaco	2	2	3	2	3	12	2	R
3-4 Central American Dry	1	2	2	1	1	7	5	L
3-5 Mexican Dry	2	3	3	1	2	11	3	S
3-6 Cerrado-Pantanal	3	3	3	1	3	13	1	R
4. XERIC FORMATIONS								
4-1 Mexican Xerics	3	3	3	2	2	13	1	R
4-2 Caribbean Xerics	1	2	3	2	1	9	3	S
4-3 Caatinga	2	2	3	3	3	13	1	R
4-4 Peru-Chile Deserts	2	2	1	1	1	7	4	L
4-5 Chilean Winter Rainfall	3	2	2	1	2	10	2	S
4-6 Argentine Monte	2	1	1	1	1	6	5	L
5. HERBACEOUS LOWLAND GRASSLANDS								
5-1 Central American Pine Savanna	1	2	1	1	1	6	5	L
5-2 Llanos-Gran Sabana	3	2	2	1	2	10	2	S
5-3 Pampas	2	1	2	2	1	8	3	L
5-4 Patagonian Steppe	3	2	3	3	3	14	1	R
5-5 Amazonian Savannas	2	2	1	1	1	7	4	L
6. HERBACEOUS MONTANE GRASSLANDS								
6-1 Paramo	3	2	3	3	1	12	1	R
6-2 Puna	3	2	2	2	3	12	1	R
6-3 Southern Andean Alpine	1	2	2	1	2	8	3	L
6-4 Pantepui	3	2	1	3	1	10	2	S
7. TEMPERATE FORESTS								
7-1 Southern Temperate Forest	3	2	2	3	3	13	2	R
7-2 Brazilian *Araucaria*	2	2	2	1	3	10	3	S
7-3 Mexican Pine-Oak	2	3	3	3	3	14	1	R

[1] For individual taxonomic groups, 3 is the highest score and 1 the lowest.
[2] Total score is the sum of the scores for the five taxonomic groups.
[3] RHUs are ranked from highest total score to lowest total score.
[4] R = Regionally Outstanding; S = Regionally Significant; L = Locally Important.

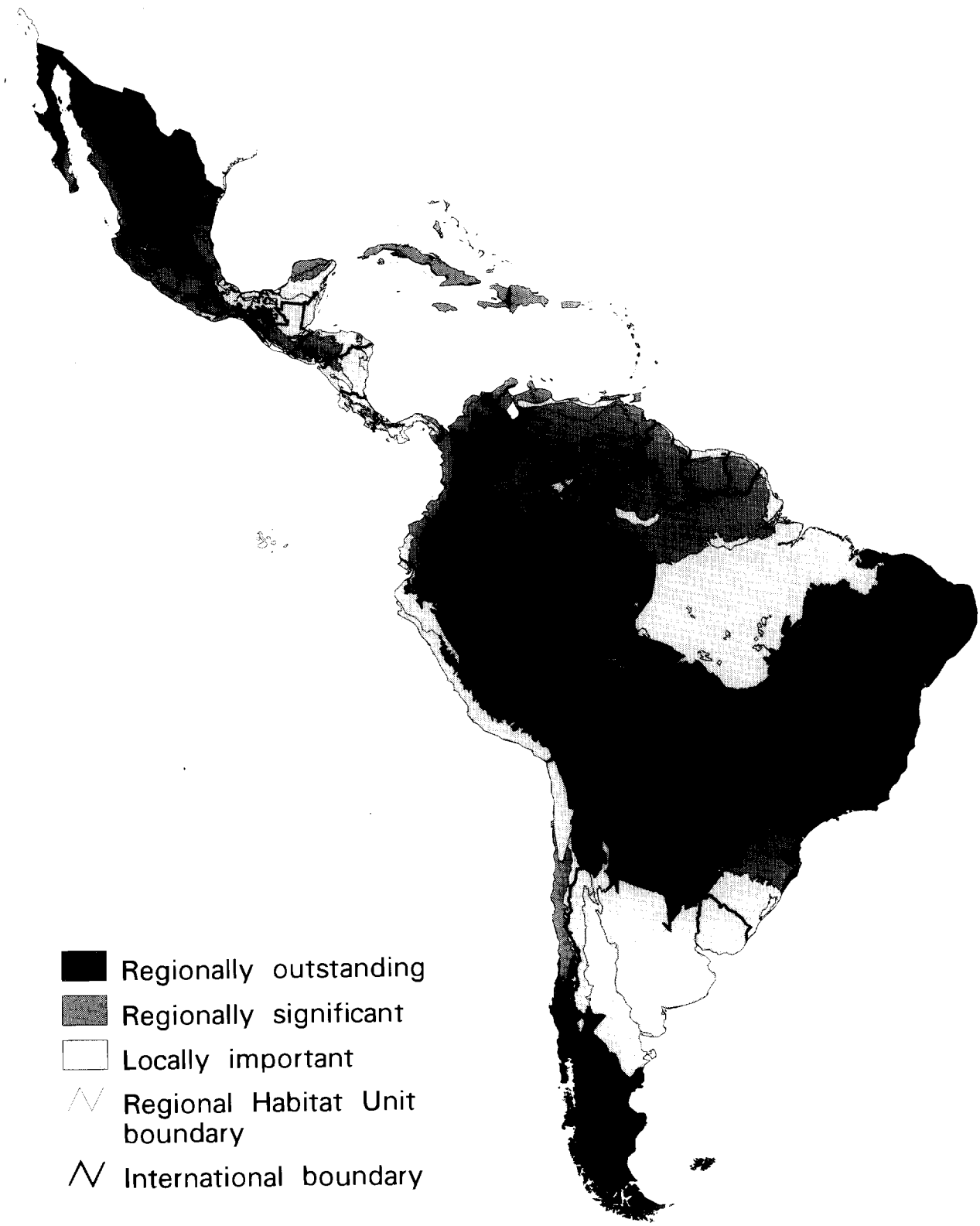

Figure 2. Biological Value of Regional Habitat Units

Some of the areas identified in Miami as having regionally outstanding biological value were also identified in previous priority-setting efforts that focused solely on tropical moist forests (Myers 1988, Conservation International 1990). The Atlantic coastal forests of Brazil, the upper Amazon basin and the tropical Andes are thus reaffirmed from a biological perspective as critical areas for conservation within the tropical forest habitat type. Some areas that were identified as priorities in previous efforts, such as portions of the Central American lowland forest (Myers 1990) and many of the endemic bird areas in Latin America and the Caribbean (Bibby et al. 1992) were not identified in the current exercise, primarily as a result of the larger scale at which our analysis was conducted (see Data Limitations and Qualifiers on Use below).

Data Limitations and Qualifiers on Use

Any attempt to assess biological value must address the fact that the definition of priority areas is dependent upon the scale of the analysis. The way in which habitats are grouped will affect any assessment of their biological value. Endemism is a particularly elusive factor to quantify, since the unit of analysis itself determines what is and is not endemic. Small patches of habitat containing a large number of endemic and rare species may be overlooked within a larger, less biologically rich region. Conversely, smaller, less biologically rich areas may be swept up within a larger, more valuable region and classified similarly.

The Regional Habitat Units used in this analysis reflect the consensus of experts from five separate biological disciplines. Each RHU was developed with an assumption that the biological value assigned by each taxonomic group would represent the average value across the entire unit. This assumption does not imply, however, that the entire area within an RHU is of completely uniform biological value. In fact, given the size of the units, and the fact that the RHUs are based on potential, rather than actual vegetation, heterogeneity within an RHU is inevitable and a finer scale analysis will be required to identify specific areas within each RHU that should be the focus of conservation efforts.

The RHUs and biological priority areas, as defined by workshop participants, vary widely in size. An examination of the spatial characteristics of the biological value map reveals two clear relationships. First, the average size of RHUs categorized as regionally outstanding is twice that of RHUs categorized as regionally significant or locally important. Second, the total area of regionally outstanding RHUs is more than twice that of the regionally significant and locally important areas combined, with two of the regionally outstanding RHUs—Upper Amazon and Cerrado-Pantanal—accounting for nearly 25% of the total land area in Latin America and the Caribbean. Obviously, a finer level of resolution is required to determine what specific sites within each of these large biologically valuable areas should be targeted for investment.

Although inclusion of broad regional and taxonomic expertise was the workshop goal, the composition of specific taxonomic working groups (see detailed workshop agenda, Appendix G) reflected inevitable occasional gaps in comprehensive knowledge. The insect group focused primarily on butterflies, since this was the primary expertise of its members, as well as being the most well known group in terms of its distribution and taxonomy. The insect working group also did not feel qualified to assess the biological value of large areas in northern Mexico and southern South America. Other groups had similar biases in expertise, such as for primates in the mammal group and tree frogs in the herpetofauna group. Neotropical migrants were not weighted heavily by the bird taxonomic group because migrant species constitute a small percentage of the total avifauna in the region as a whole and because the group focused on endemism as the most important feature determining biological value, and most migrants have wide winter ranges. We believe the specific emphases found within the taxonomic groups in Miami do not compromise the results obtained, but should be noted for purposes of transparency.

Conclusions

The workshop brought together leading biologists who are experts on the species and ecosystems of Latin America and the Caribbean. While each of these scientists has an individual expertise on some species or geographic areas, their collective knowledge and experience provide the best possible understanding of the region as a whole. The workshop approach and use of GIS allowed us to quickly capture the information these biologists have gained through decades of field work. Detailed biological information on species distribution, areas of endemism, and the physiography of the region, provided a basis from which to work. The result of this process was a broad consensus about which areas are of greatest importance biologically at a regional level.

CHAPTER THREE

ASSESSING THE CONSERVATION STATUS OF ECOREGIONS

INTRODUCTION

The second major step in determining which areas are highest priority for biodiversity conservation across Latin America and the Caribbean was to assess the landscape integrity and conservation status (threat and opportunity) of biogeographic units within the region. This step ensures that the regional conservation strategy: 1) intervenes quickly to ward off complete degradation and conversion in the most threatened ecoregions; and 2) creates programs to conserve the most intact examples of biologically valuable habitats with the best chances for long-term persistence.

The most robust method for assessing conservation status is to evaluate landscape condition, now a major focus in the field of conservation biology. An assessment of landscape-level features and dynamics provides powerful insights into the integrity of an ecoregion and helps to predict the long-term persistence of ecological processes that maintain biodiversity. Because the alteration of ecological processes is difficult to measure, biologists rely instead on specific landscape level features as indicators that prove easier to estimate. The analysis of these features, summarized in the section below, provides an objective and transparent method for generating one type of information needed by USAID and other donors to identify the most urgent biodiversity conservation needs in LAC.

APPROACH

For the benefit of this exercise (and its own project with the World Bank LATEN division and the Global Environmental Facility (GEF)), the Conservation Science Program of WWF developed an approach to assess the conservation status of ecoregions in the tradition of the IUCN Red Data Book for threatened and endangered species. This method was used successfully at the Miami workshop to clarify the conservation status of 148 LAC ecoregions. Workshop participants provided data for each ecoregion using a standard form (see Appendix D) to assess the current (or "snapshot") conservation status of an ecoregion based on current habitat configurations. Data on five key landscape-level features were collected: 1) the presence/absence of large blocks of original habitat; 2) the percent of remain-

ing original habitat; 3) the rate of conversion; 4) degree of degradation and fragmentation; and 5) degree of protection.

Each variable considered received a numerical value that, when weighted and summed, provided a snapshot assessment of ecoregion conservation status. In weighting these variables, greater weight was given to total loss of original habitat (40%) and number of large blocks of intact habitat (20%) and degree of fragmentation and degradation (20%) since these variables are the best indicators of the probability of persistence of ecological processes within ecoregions. Rate of conversion of remaining habitat (10%) and degree of protection (10%) accounted for the remainder of the 100 point score. The presence of large blocks of original habitat, a high percentage of remaining habitat, and some degree of formal protection highlight opportunities for conservation within the ecoregion. Combined with degree of fragmentation and degradation, these variables also help predict the maintenance of ecological processes (e.g., predation, pollination and seed dispersal systems, nutrient cycling, migration, dispersal, and gene flow) that, ultimately, will determine how much biodiversity will persist over the long-term.

Based on the numerical value obtained, as explained above, ecoregions were classified as falling within one of six categories: Extinct (completely converted); Critical; Endangered; Vulnerable; Stable; and Relatively Intact. Brief definitions of these categories follow below.

EXTINCT: No natural communities resembling original ecosystems remain. Some of the original biota still present but persist only within highly modified communities and landscapes.

CRITICAL: Remaining intact habitat restricted to isolated small fragments with low probabilities of long-term persistence (e.g., < 5 years) without immediate or continuing protection and restoration.

ENDANGERED: Remaining intact habitat restricted to isolated fragments of varying size (some larger blocks still present) with medium to low probabilities of long-term persistence (e.g., 5-10 years) without immediate or continuing protection or restoration.

VULNERABLE: Remaining intact habitat occurs in habitat blocks ranging from large to small, but many intact clusters will likely persist over the next 10-20 years given adequate protection and moderate restoration.

RELATIVELY STABLE: Natural communities have been altered in certain areas, causing local declines in exploited populations and disruption of ecosystem processes. These disturbed areas can be extensive, but are still patchily distributed relative to the area of intact habitats.

RELATIVELY INTACT: Natural communities within an ecoregion are largely intact with species, populations, and ecosystem processes occurring within their natural ranges of variation.

The criteria for classifying ecoregions was tailored to reflect biological and ecological differences among Major Habitat Types. For example, large blocks in forested ecoregions were defined as greater than 250 km^2 in extent, whereas large blocks in grasslands and xeric systems were defined as greater than 100 km^2. Consequently, the snapshot assessment of an ecoregion was assessed only in comparison with other ecoregions in its same Major Habitat Type.

In the second step, the current conservation status was modified by workshop participants based on their best assessment of the type, intensity, and timeframe of severe threats to the biota and landscapes of an ecoregion (see Appendix D for sample threat analysis worksheet) to yield a modified conservation status. The next step was to scale up from the ecoregion level to the Regional Habitat Unit (RHU) level to allow comparisons with the other data layers. Because many of the RHUs cover large areas, it proved helpful to conduct the conservation status assessment at the ecoregion level first to ensure transparency of results and greater objectivity. Conservationists interested in how any RHU's con-

servation status was determined can refer to the status assigned to the ecoregions that compose that RHU and the values assigned to the landscape-level variables and threat indicators for each ecoregion.

RESULTS

Ecoregion Analysis

The most striking observation in comparing the snapshot conservation status map of ecoregions (Figure A-7) and the final conservation status map (Figure A-8) is how few ecoregions are designated as either STABLE or INTACT. Essentially, much of the area in these two categories is located in the Amazon basin, temperate forests of the southern cone, and western Mexican xeric systems. In contrast, many more ecoregions are identified as CRITICAL or ENDANGERED. Several regions have a high proportion of critical ecoregions: the northern Andes and lowland dry forests; the Atlantic coastal forests of Brazil and the Pampas of the southern cone. Endangered ecoregions are abundant in the northern and central Andes, most of Central America, the steppe and winter rainfall areas of the southern cone, the Cerrado and other dry forests south of the Amazon basin, and the Caribbean. Two ecoregions, both in Mexico (Tehuantepec savanna and Gulf of Mexico Palmar), were considered EXTINCT by workshop participants. This observation indicates the importance of conducting the conservation status assessment at the ecoregion level since the two extinct ecoregions would not have been classified as such under the more coarse-grained RHU classification scheme.

At the ecoregion level, final conservation status was estimated as follows:

Conservation Status	# of ecoregions	% of ecoregions
EXTINCT:	2	1%
CRITICAL:	25	17%
ENDANGERED:	51	34%
VULNERABLE:	41	28%
RELATIVELY STABLE:	20	14%
RELATIVELY INTACT:	9	6%
Totals:	148	100%

Thirty-four ecoregions move up in category (i.e., were considered more threatened) after the assessment of threat was applied to the snapshot conservation status. In contrast, three ecoregions (Belizean swamp forests, pantepui, and subpolar *Nothofagus* forests), were downgraded to a less threatened category.

Among the Major Habitat Types, the only extinct ecoregions occurred in the herbaceous lowland grassland category. Numerically, the highest number of critical and endangered ecoregions occurred in tropical moist forests and tropical dry forests. However, only 7% of the tropical dry forest ecoregions were relatively stable or intact, whereas 25% of the tropical moist forests were stable or intact. From these data, we can conclude that tropical dry forests are on average more threatened than tropical moist forests in the LAC region. Most xeric ecoregions were either critical, endangered, or vulnerable. Grassland ecoregions illustrated the widest spread in conservation status.

Regional Habitat Unit (RHU) Analysis

The final conservation status for the RHUs was estimated as follows and is illustrated in Figure 3. The conservation status of each RHU is also listed in Table 1.

Conservation Status	# of RHUs	% of RHUs
CRITICAL:	5	14%
ENDANGERED:	9	26%
VULNERABLE:	16	46%
RELATIVELY STABLE:	3	8%
RELATIVELY INTACT:	2	6%
Totals:	35	100%

Almost half of all RHUs (16) were classified as vulnerable (46%), and only two RHUs (Pantepui and Guayana montane) were classified as relatively intact. Three out of three temperate forest RHUs (100%) and 5 out of 6 tropical dry forest RHUs (83%) were classified as critical or endangered. From these data, we can conclude that temperate forests and tropical dry forests are the most threatened Major Habitat Types in the LAC region.

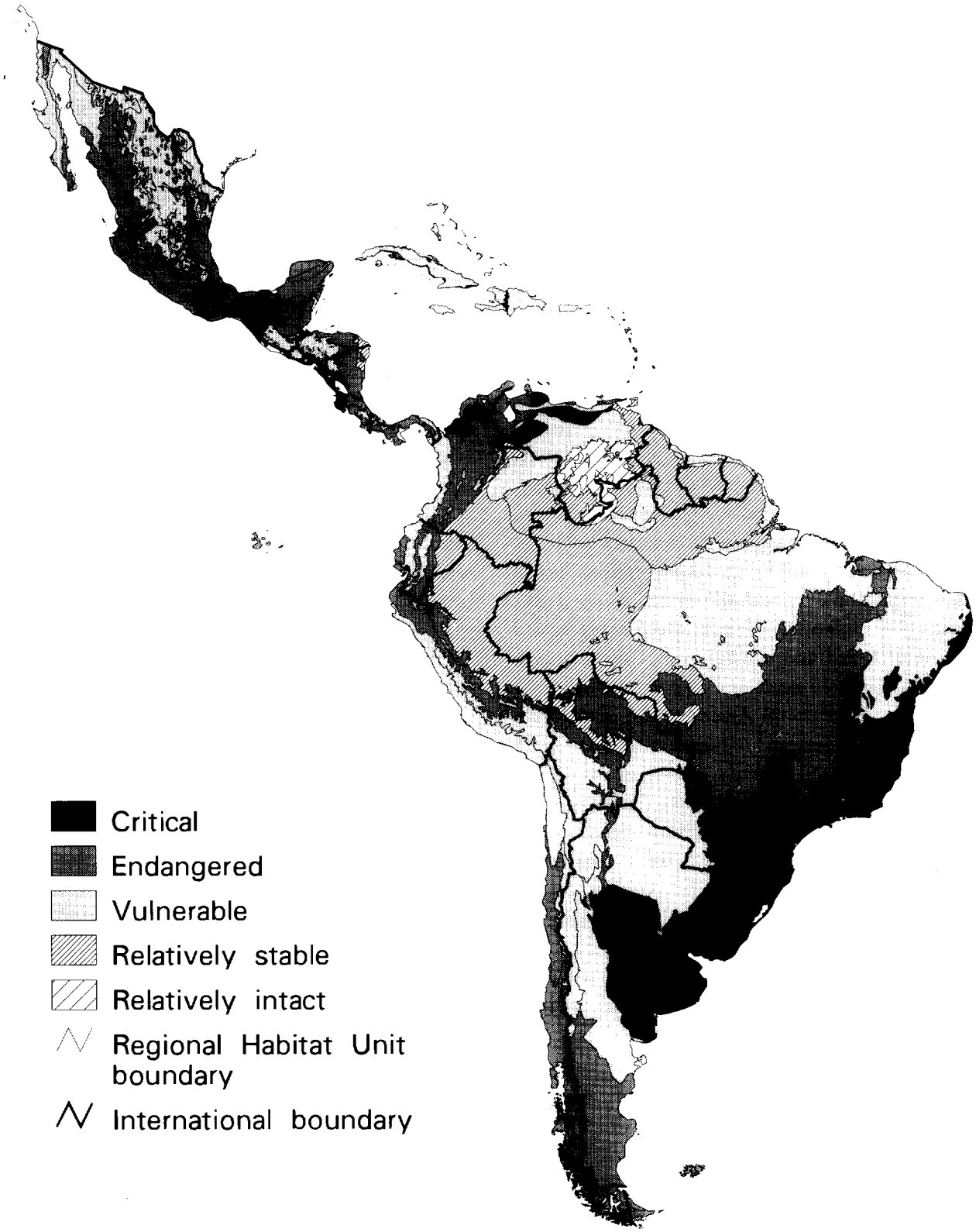

Figure 3. Conservation Status of Regional Habitat Units

Aquatic Biodiversity

The experts for freshwater fish who attended the workshop developed a preliminary method to assess the conservation status of aquatic ecoregions based on the following eight watershed-level parameters: 1) unimpacted basin area; 2) aquatic habitat loss; 3) barriers to movement; 4) conversion rate of aquatic and associated terrestrial systems; 5) degree of protection; 6) water quality; 7) riparian modification; and 8) introduced organisms. The aquatic biodiversity team delineated forty-two aquatic ecoregions for the LAC region. They urged the NGO Working Group to seek support for completing a full analysis of aquatic biodiversity priorities. Input from experts for different aquatic taxonomic groups (e.g., fish, insects, mollusks, crustaceans, plants) was strongly recommended.

Data Limitations and Qualifiers on Use

The method developed by the fish taxonomic group represents an excellent start towards addressing the conservation status of aquatic ecosystems. The conservation community could greatly benefit by supporting a program to assess the conservation status of freshwater ecoregions in the near future. The inclusion of data on the conservation status of aquatic/marine and mangrove ecoregions would strengthen the analysis presented here.

It should be emphasized that the ecoregions and RHUs were all based on "potential vegetation" and not actual. Although good maps of existing vegetation were available for some areas, workshop participant expertise was used to estimate the percentage of original habitat remaining in most ecoregions and RHUs. In general, workshop participants found it easier to assess the conservation status of ecoregions within forested habitat types than non-forested habitat types, due to the relative ease with which habitat degradation can be judged in forested habitats. A further improvement on the process used to determine conservation status at the Miami workshop would involve providing workshop participants with detailed reference material—hard data, spatially referenced where possible—on threats: population growth rates; deforestation rates; land use; etc., which might guide them in their threat analysis assessment.

It should also be noted that the criteria used in this analysis of conservation threats do not reflect the higher order threats to the integrity of terrestrial ecosystems in Latin America and the Caribbean posed by changes in the biotic regulation of the flow of energy, water, carbon and nutrients through the biosphere (e.g., regional climate change, global climate change, soil loss and changes in net primary productivity). A priority-setting exercise that addressed the biotic life-support functions of ecosystems would require a closer collaboration between ecosystem ecologists and conservation biologists than has existed to date.

Conclusions

Critical vs. Intact Ecosystems

Conservationists correctly emphasize the importance of conserving the last remaining habitats in critical ecosystems. The complete loss of a habitat within a critical RHU, or ecoregion for that matter, would entail the total extinction of numerous species, particularly invertebrates and plants, as well as unique communities. Because the level of endemicity for invertebrates and plants is relatively high at the RHU level, even for RHUs that have been assessed as having locally important biological value, all critical RHUs (or ecoregions) should be viewed as highest priorities. The conservation community must act decisively to reverse the complete alteration of natural habitats within critical RHUs or ecoregions if we are to avoid losing significant biodiversity.

At the same time, the few RHUs that still contain relatively intact ecosystems deserve immediate conservation investment because it is within these now rare intact landscapes that ecosystem processes and species have the best chance for long-term persistence. Conservation investments within these areas are also the most cost-effective, and it would

be unwise to miss the window of opportunity for strategic conservation planning. Therefore, a wise strategy would be to distribute conservation investments across the spectrum of conservation status categories from critical to relatively stable.

CHAPTER FOUR

ASSESSING POLICY/ INSTITUTIONAL FEASIBILITY

INTRODUCTION

The purpose of the Policy/Institutional (PI) component of the priority-setting analysis is to factor in features of the institutional and policy "landscape" favorable to the effectiveness of conservation-oriented investments. In the same way that certain physical characteristics (such as extent of habitat conversion) render some areas more amenable to the achievement of long-term conservation objectives than other areas, institutional and policy environments can also influence the likelihood of success.

Decision-makers involved in allocating scarce resources for conservation investments often do take policy/institutional factors into account, but usually in an intuitive, ad hoc fashion. The attempt to design an instrument to take these factors into account in a systematic, transparent manner is one of the key aspects of the framework that sets it apart from previous priority-setting methods, and is the one aspect of this approach that received the most favorable comment from external reviewers prior to the Miami workshop.

Because little work has been done on quantifying institutional and policy factors for biodiversity priority-setting or other purposes, a considerable amount of preparatory work and review had to take place before the Miami workshop. NGO Working Group members assembled a Washington-based advisory group familiar with conservation policy issues in Latin America. This advisory group met twice in mid-1994 to help develop and review an assessment methodology. WRI compiled data on 16 indicators of national level political commitment and institutional capacity that were available in existing databases for the LAC countries.

NGO Working Group members crafted a draft checklist assessment instrument (a questionnaire to capture expert opinion on unquantifiable variables favoring the success of conservation investments). The checklist assessment instrument was reviewed by several experts in public opinion and delphi technique assessment methodologies. Members of the Washington-based advisory group were then asked to use the instrument to evaluate two or three countries with which they were most familiar, and provide feedback on the process. The survey instrument

was then further revised, incorporating these comments, prior to being presented at the Miami workshop.

Approach

Nineteen experts in the area of policy and institutions in the LAC region (including 5 USAID Mission staff) comprised the PI working group at the Miami workshop. Members of the PI working group focused much of their discussion on the fact that the relevance of PI analysis to geographic priority-setting is directly linked with the nature of the proposed conservation investment. In other words, in order to answer the question of where to invest, one must specify what type of investment is being made.

As a partial resolution of this issue, members of the PI working group in Miami developed an "investment portfolio" model that would balance short and longer term payoffs and greater and lesser degrees of risk. The group defined two different PI vectors relevant to priority-setting:

1) existing policy and institutional capacity conducive to effective, on-the-ground conservation interventions in the short-term; and

2) policy and institutional environments conducive to productive investments in the development of such capacity (i.e., currently weak institutional capacity combined with strong political commitment and positive trend).

In Table 4 below, areas with PI characteristics of Cell A would be favored for short-term, low-risk investments in immediate, on-the-ground conservation interventions, followed by those in Cell C. Areas with PI characteristics of Cell B would be favored for longer-term, higher risk investments in capacity-building. Areas with PI characteristics of Cell D would not be favored for conservation investments of either type.

Results

Workshop participants in the PI working group reviewed and critiqued the PI data sets that had been compiled by WRI prior to the workshop. The group discussed the strengths and weaknesses of various indicators of political commitment and institutional capacity for conservation, and determined that, given the nature and quality of available data sets, an expert-opinion driven approach was a necessary alternative.

The PI working group then considered, critiqued, and revised a draft checklist assessment instrument (see Appendix D) to gather expert opinion on features of the policy/institutional landscape deemed relevant to the success of conservation investments. Utilizing their own regional expertise, PI working group members attempted to apply the expert opinion approach to countries in the region to generate a preliminary PI data set for use at the workshop. However, due to the limited number and country expertise of participants, an insufficient standardization of responses, and the difficulty of

Table 4. Investment Portfolio Model of Policy/ Institutional Feasibility

	High Institutional Capacity	Low Institutional Capacity
High Political Commitment	Cell A: High P / High I	Cell B: High P / Low I
Low Political Commitment	Cell C: Low P / High I	Cell D: Low P / Low I

"grading" national commitment and capacity, they decided not to report a data set back to the full workshop.

Data Limitations and Qualifiers on Use

PI working group members agreed that the data compiled by WRI prior to the workshop were not adequate to serve as PI indicators. The working group produced a "wish list" of data that would be useful in future PI decision-making processes (see Appendix E1).

For the purposes of the workshop, the group produced a checklist to assess PI characteristics at the country level; however, there was wide agreement that the instrument should be applied at the national level and then supplemented with sub-national level assessment as necessary. Participants also agreed that the checklist provided insufficient guidance to standardize scoring, and recommended that a further revision include explicit definitions of each possible score for each indicator. Appendix E2 notes other qualifiers on the use of PI data that were identified by the PI working group members in Miami.

Conclusions

The workshop resulted in an overall consensus, with some remaining reservations, that PI analysis can help answer the question—at least as a tie-breaker—of where scarce conservation resources should be invested, and can certainly help answer the question of what kind of investment should be made. A consensus statement (see Appendix E2) produced by the PI working group describes areas of agreement. It was also agreed that there was a need for further PI data collection and analysis in countries and, due to variation within countries, parts of countries where it might make a difference in priority rankings within and among priority RHUs. Data obtained from a mail survey administered by WRI subsequent to the workshop is used to provide examples of how PI data might be used in these contexts (see Appendix E3).

The Miami workshop also generated several "lessons learned" for structuring the PI component analysis in future priority-setting workshops. For example, bringing an expert opinion-generated data set to the workshop to be critiqued would likely accelerate the consensus-building process in the future.

Two other conclusions emerged from the PI working group sessions in Miami, with implications that reach beyond the immediate priority-setting goal of this exercise. First, working group members concluded that the checklist instrument could be useful to project managers within country missions to collect data relevant to decisions about the types of conservation-oriented activities USAID (or other donor organizations) should fund. Second, working group members concluded that while a considerable amount of uncaptured PI data exists (e.g., data collected by individual countries, or found within grey literature), very little of it is actually available for drawing sub-national, national, or regional, much less global, comparisons. This presents a challenge to international organizations that consider environmental data collection and dissemination to be part of their mandate, as socioeconomic and political data of this type are important for assessing national progress in meeting requirements as called for in both the Convention on Biological Diversity and Agenda 21.

CHAPTER FIVE

ASSESSING UTILITY

INTRODUCTION

Elements of biodiversity—specific and unique ecosystems/habitats, species/populations, gene pools/genetic material—which are perceived as useful or beneficial to humans are said to have utility value. This contrasts with "non-utility" value, which includes the intrinsic or aesthetic value humans attach to natural objects. The intrinsic values of biodiversity based on taxonomic diversity (e.g., number of species found in an ecoregion) or phylogenetic uniqueness are purely a matter of scientific data and judgment, while those based on utility ultimately reflect the normative values of society at large. Such normative values vary among the different groups benefiting from biodiversity. However, some utility benefits can be considered more or less universal. The purpose of the utility component of this priority-setting analysis is to consider high human utility value as a possible means of discriminating among otherwise equal regional habitat units.

APPROACH

Prior to the workshop in Miami, the Institute for Sustainable Development assembled data on five categories of biodiversity utility. Regional Habitat Units were characterized and ranked within Major Habitat Types based on these data. The five categories were carbon sequestration, genetic resources, productive and protective resources, hydrological resources and indigenous resources. The latter two were eliminated from further consideration in Miami because workshop participants thought the current data were incomplete or inappropriate. Descriptions of the categories which were used follow below.

Carbon Sequestration: This value attempts to measure the capacity of an ecosystem to contribute to the amelioration of global climate change through the storage of carbon. Biomass carbon content is the amount of carbon per area in live vegetation characteristic of a given Regional Habitat Unit. Its significance as an indicator of utility value is two-fold. Forests, in particular, can act either as sources or sinks of atmospheric carbon, and thus potentially exacerbate or ameliorate the potential for global warming resulting primarily from the combustion of fossil fuels. Considerable carbon is also stored in (and potentially lost to the atmosphere from) soil, and is measured as the rate of carbon accumulation per area.

Genetic Resources: A genetic resource is the genetic variability of a species (or variety or breed), useful or potentially useful to humans for the domestication or improvement of crop plants, livestock, poultry, fish, etc. The world food supply and all agricultural economies are dependent on a continual flow of genetic material which ultimately is derived from wild relatives and so-called land races (locally cultivated varieties or breeds). The centers of origin (and centers of diversity) of a number of the world's most important crops are in Latin America—cotton, tomato, potato, cocoa, sweet potato, pineapple, rubber, and others. Four separate categories were used to arrive at a value for genetic resources: Centers of Plant Diversity; Origins of Important Crop Species; Forest Tree Genetic Resources; and Domesticated Animal Origins.

Productive and Protective Resources: This value category combines a measure of an RHU's allochthonus resources (i.e., energy, biomass or nutrients that are exported beyond the boundaries of the RHU), the physical protection it provides, and its net primary productivity. Their measurement indicates relative importance of Regional Habitat Units in providing such benefits as being a source of nutrients or nursery site for fishery stocks, providing protection from coastal or riparian erosion, or assimilating pollutants.

More detail on how such utility data are compiled and weighted to produce a rank for each RHU for each of these categories can be found in Wilcox (1994).

Results

Workshop participants agreed that human utility values were important in setting priorities for conservation investments, and stressed the need to consider local as well as global utility values. Participants recognized that measures of utility could potentially capture ecosystem function values of biodiversity not captured by biological values. The PI working group considered, critiqued, and agreed on the relative weighting of utility value categories presented at the workshop. They recommended a weighting that gives the highest value to genetic resources, followed by productive and protective resources, and carbon sequestration, in that order. The group agreed that "unique" utility values attributable to a specific ecoregion, such as wild relatives of important food grains, are more important than an ecoregion's incremental contribution to a "non-unique" value, such as carbon sequestration. Table 5 summarizes the final results of the utility analysis according to the weightings agreed upon by the working group participants.

While workshop participants found that human utility values are generally correlated with biological value, in some cases their explicit consideration would change the overall ranking of priority Regional Habitat Units depending on the particular integration model used (see Chapter Six, Integration Results, below). This was especially the case for RHUs with a high concentration of genetic resources, although the presence of wetlands, mangroves, or other "protective and productive resources" would also make a difference. Notable differences were found within Tropical Moist Lowland Forests and Tropical Dry Forests, in which genetic resources scores varied independently of biological value for some RHUs. Other differences were found in the Herbaceous Lowland Grasslands category.

Data Limitations and Qualifiers on Use

Workshop participants were concerned about the lack of local data on human utility values, and indeed decided to discard the utility category that included hydrological values due to the lack of data. They recommended that additional investment be made in obtaining the local data, particularly data on hydrological resources such as watersheds.

The PI working group also discussed the appropriate use of available data on the presence of indigenous peoples. It was agreed that the measure should not be used as an overall indicator of utility value because it does not capture the dependence of

Table 5. Final Ranking of Regional Habitat Units For Utility

Regional Habitat Units (within Major Habitat Types (MHTs))	Carbon Sequestration[1]	Genetic Resources[2]	Productive and Protective Resources[3]	Total[4]	Rank[5]
1. TROPICAL MOIST LOWLAND FORESTS					
1-1 Atlantic	2	2.25	2	13	3
1-2 Upper Amazon	1	1.75	1	8	1
1-3 NE Amazon	1	1.50	1	8	1
1-4 SE Amazon	1	2.75	1	11	2
1-5 Chocó-Darién	2	3.25	2	16	4
1-6 Central American Lowland	2	1.50	2	11	2
2. TROPICAL MOIST MONTANE FORESTS					
2-1 Tropical Andes	3	1.50	2	12	1
2-2 Central American Montane	3	2.50	2	15	4
2-3 Caribbean Moist	3	2.00	2	13	2
2-4 Venezuelan Coastal	3	2.75	2	15	4
2-5 Guayana Montane	3	2.25	2	14	3
3. TROPICAL DRY FORESTS					
3-1 Northern South American Dry	3	4.00	3	21	5
3-2 Western Andes	3	3.75	3	20	4
3-3 Chaco	3	3.25	3	19	3
3-4 Central American Dry	3	3.75	3	20	4
3-5 Mexican Dry	3	1.25	3	13	1
3-6 Cerrado-Pantanal	3	2.00	3	15	2
4. XERIC FORMATIONS					
4-1 Mexican Xerics	5	1.25	5	19	1
4-2 Caribbean Xerics	5	3.00	5	24	3
4-3 Caatinga	5	2.50	5	23	2
4-4 Peru-Chile Deserts	5	2.50	5	23	2
4-5 Chilean Winter Rainfall	5	3.75	5	26	4
4-6 Argentine Monte	5	3.75	5	26	4
5. HERBACEOUS LOWLAND GRASSLANDS					
5-1 Central American Pine Savanna	3	1.75	4	16	2
5-2 Llanos-Gran Sabana	3	1.50	4	16	2
5-3 Pampas	3	1.00	4	14	1
5-4 Patagonian Steppe	4	1.50	4	17	3
5-5 Amazonian Savannas	3	2.00	4	17	3
6. HERBACEOUS MONTANE GRASSLANDS					
6-1 Paramo	4	2.00	4	18	2
6-2 Puna	4	1.50	4	17	1
6-3 Southern Andean Alpine	4	2.50	4	20	3
6-4 Pantepui	4	2.75	4	20	3
7. TEMPERATE FORESTS					
7-1 Southern Temperate Forest	2	2.00	3	14	2
7-2 Brazilian Araucaria	3	2.25	3	16	3
7-3 Mexican Pine-Oak	3	1.25	3	13	1

Notes:
[1] Rank based on carbon content of biomass and soil carbon accumulation.
[2] Based on number of centers of plant diversity, domesticated animal origins, important crop species origins and forest tree genetic resources.
[3] Measure of productive and protective role of Regional Habitat Units; includes value as source of nutrients/nursery for fishery stocks, and for protection from coastal/riparian erosion, assimilation of pollutants and biotic production potential.
[4] Total value is a weighted sum which gives genetic resources three times the value of carbon sequestration and productive and protective resources two times the value of carbon sequestration. Sum is rounded to nearest integer.
[5] RHUs are ranked within Major Habitat Types from lowest total value (1) to highest total value (5).

non-indigenous or mixed cultural groups on biodiversity. However, it was agreed that data on indigenous populations would be valuable as an indicator of knowledge of biodiversity utility.

It should be noted that the three categories of utility chosen to generate the utility score (carbon sequestration, genetic resources and productive and protective resources) are by definition higher in forests than non-forests. Therefore, these data should only be used to make comparisons within Major Habitat Types, as they are in this report, and should not be used to make comparisons between areas from different Major Habitat Types.

Conclusions

There was general consensus at the workshop that human utility values are important to include in biodiversity priority-setting, although they would be greatly strengthened by adding local data on hydrological resources such as watersheds and other local utility values. In future priority-setting exercises, more time and thought should be devoted to consideration of how utility values should be integrated into the overall framework.

CHAPTER SIX

INTEGRATION RESULTS

INTRODUCTION

The priority-setting framework produced by the NGO Working Group prior to the Miami workshop stated that a list of priority areas for biodiversity conservation would be produced by combining the results of the biological value, conservation status and policy/institution analyses, and incorporating considerations of human utility as a modifier for particular areas as appropriate. It was agreed that this integration process would occur in the context of the Miami workshop.

APPROACH

On the final day of the workshop, participants were divided into four groups, and each asked to devise a methodology to integrate the results obtained over the first three days of the workshop to arrive at a list of priority areas for biodiversity conservation. Each of the four groups contained a mixture of participants who had focused primarily on biological value, conservation status or policy/institutional feasibility. An illustrative model for integrating biological value and conservation status that had been developed by the NGO Working Group was presented to participants before breaking up into working groups. Each integration group developed an integration model and a resulting list of priority Regional Habitat Units, which were then presented in a plenary session.

INTEGRATION MODELS

The approaches taken by the four integration groups all produced remarkably similar lists of final recommendations. The four models were all based on the rankings of Regional Habitat Units according to biological value and conservation status (see matrices in Appendix B), but differed somewhat in their weightings of these two factors and their differential incorporation of policy/institutional (PI) and utility data. Summaries of all four integration models can be found in Appendix C. Three of these models were substantively the same (Models #1, 3, and 4 in Appendix C), in that they weighted biological value and conservation status equally, with regionally outstanding biological value > regionally significant > locally important; and Critical conservation status > Endangered > Vulnerable > Relatively

Stable > Relatively Intact. Several of these integration groups explicitly discussed using utility as a "tie-breaker" among otherwise equivalent RHUs; others discussed using utility to "boost" the biological value of a particular RHU. Fish biodiversity was also used by one integration group to add "bonus points" to those regional habitat units identified as priorities using biological value and conservation status criteria. Model #4 (in Appendix C) was the most specific in its decision rules, and is thus considered representative of the other two, very similar, models.

In contrast, Model #2 (in Appendix C) considered biological value first in setting priorities. In considering conservation status, the model ranked Critical conservation status > Endangered > Relatively Intact > Relatively Stable > Vulnerable. This is different from the three other models which ranked RHUs within the same biological value group in order of increasing threat to habitat integrity. The integration group that developed this model, however, felt that relatively intact RHUs also deserve immediate conservation investment because it is within these now rare landscapes that ecosystem processes and species have the best chance for long-term persistence. Model #2 also explicitly considered PI criteria when prioritizing Regional Habitat Units within the medium biological value category. However, the highest priority RHUs as identified by Model #2 and listed in Table 6 can be identified without reference to PI characteristics since these all fall within the regionally outstanding biological value category. If adequate PI data were available, the order in which the six RHUs in the Regionally Significant category for biological value should be selected for investment could be affected.

Depending on whether these integration models are applied within Major Habitat Types or across Major Habitat Types, slightly different results are obtained. It was not completely clear to all workshop participants whether our goal of conservation in all the Major Habitat Types, and the fact that the biological and conservation threat analyses were done within Major Habitat Types, would require that integration rankings also be done within Major Habitat Types. Some groups made recommendations across Major Habitat Types (and there was even confusion within a single group on whether their results were across or within Major Habitat Types). Therefore, Table 6 reports the recommended biodiversity conservation priorities based on Model #4 and Model #2 applied both within Major Habitat Types and across Major Habitat Types.

Integration Results

The NGO Working Group recommends geographic priorities based on an approach to integrating the four levels of analyses that is a hybrid of the two basic integration approaches developed by workshop participants. The NGO Working Group considered it important to recommend equal numbers of RHUs from all Major Habitat Types. Ranking of Regional Habitat Units within Major Habitat Types was based on a consideration and weighting of biological value and conservation status. Two RHUs with the same rank based on these two values were differentiated based on their rank for utility. Due to a lack of satisfactory data, political/institutional criteria were not incorporated into the NGO Working Group's ranking (see Data Limitations, below).

Based on the NGO Working Group's model, the following seven RHUs are identified as highest priority for biodiversity conservation (one within each Major Habitat Type): Atlantic Forest; Tropical Andes; Cerrado-Pantanal; Mexican Xerics; Patagonian Steppe; Puna; and Mexican Pine-Oak. Seven additional RHUs (also one from each MHT) that are recommended as high priority are: Upper Amazon; Caribbean Moist; Chaco; Caatinga; Pampas; Paramo; and Southern Temperate Forest. These recommendations are illustrated in Figure 4 and presented in tabular form in the final column of Table 6.

Table 6. Integration Ranking of Regional Habitat Units For Conservation Priority

Regional Habitat Units (within Major Habitat Types (MHTs))	Model #4 Rank across all MHTs	Model #4 Rank within MHTs	Model #2 Rank across all MHTs	Model #2 Rank within MHTs	NGO Working Group Model[a]
1. TROPICAL MOIST LOWLAND FORESTS					
1-1 Atlantic	1	1	1	1	1
1-2 Upper Amazon	2	2	1	2	2
1-3 NE Amazon	3	3	3	3	3
1-4 SE Amazon	3	3	3	3	3
1-5 Chocó-Darién	3	3	3	3	3
1-6 Central American Lowland	2	3	3	3	3
2. TROPICAL MOIST MONTANE FORESTS					
2-1 Tropical Andes	1	1	1	1	1
2-2 Central American Montane	2	2	3	3	3
2-3 Caribbean Moist	2	2	3	3	2
2-4 Venezuelan Coastal	3	3	3	3	3
2-5 Guayana Montane	3	3	2	2	3
3. TROPICAL DRY FORESTS					
3-1 Northern South American Dry	1	2	2	3	3
3-2 Western Andes	2	3	3	3	3
3-3 Chaco	1	3	1	2	2
3-4 Central American Dry	2	3	2	3	3
3-5 Mexican Dry	2	3	3	3	3
3-6 Cerrado-Pantanal	1	1	1	1	1
4. XERIC FORMATIONS					
4-1 Mexican Xerics	1	1	1	1	1
4-2 Caribbean Xerics	2	3	3	3	3
4-3 Caatinga	1	1	1	1	2
4-4 Peru-Chile Deserts	3	3	3	3	3
4-5 Chilean Winter Rainfall	2	3	3	3	3
4-6 Argentine Monte	3	3	3	3	3
5. HERBACEOUS LOWLAND GRASSLANDS					
5-1 Central American Pine Savanna	3	3	3	3	3
5-2 Llanos-Gran Sabana	2	3	3	3	3
5-3 Pampas	2	2	2	2	2
5-4 Patagonian Steppe	1	1	1	1	1
5-5 Amazonian Savannas	3	3	3	3	3
6. HERBACEOUS MONTANE GRASSLANDS					
6-1 Paramo	1	1	1	1	2
6-2 Puna	1	1	1	1	1
6-3 Southern Andean Alpine	3	3	3	2	3
6-4 Pantepui	3	3	2	2	3
7. TEMPERATE FORESTS					
7-1 Southern Temperate Forest	1	1	1	1	2
7-2 Brazilian *Araucaria*	1	3	2	3	3
7-3 Mexican Pine-Oak	1	1	1	1	1

[a] NGO Working Group Model is ranked within MHTs and results are mapped on Figure 4.
1 = Highest regional priority; 2 = High regional priority; 3 = Locally important.

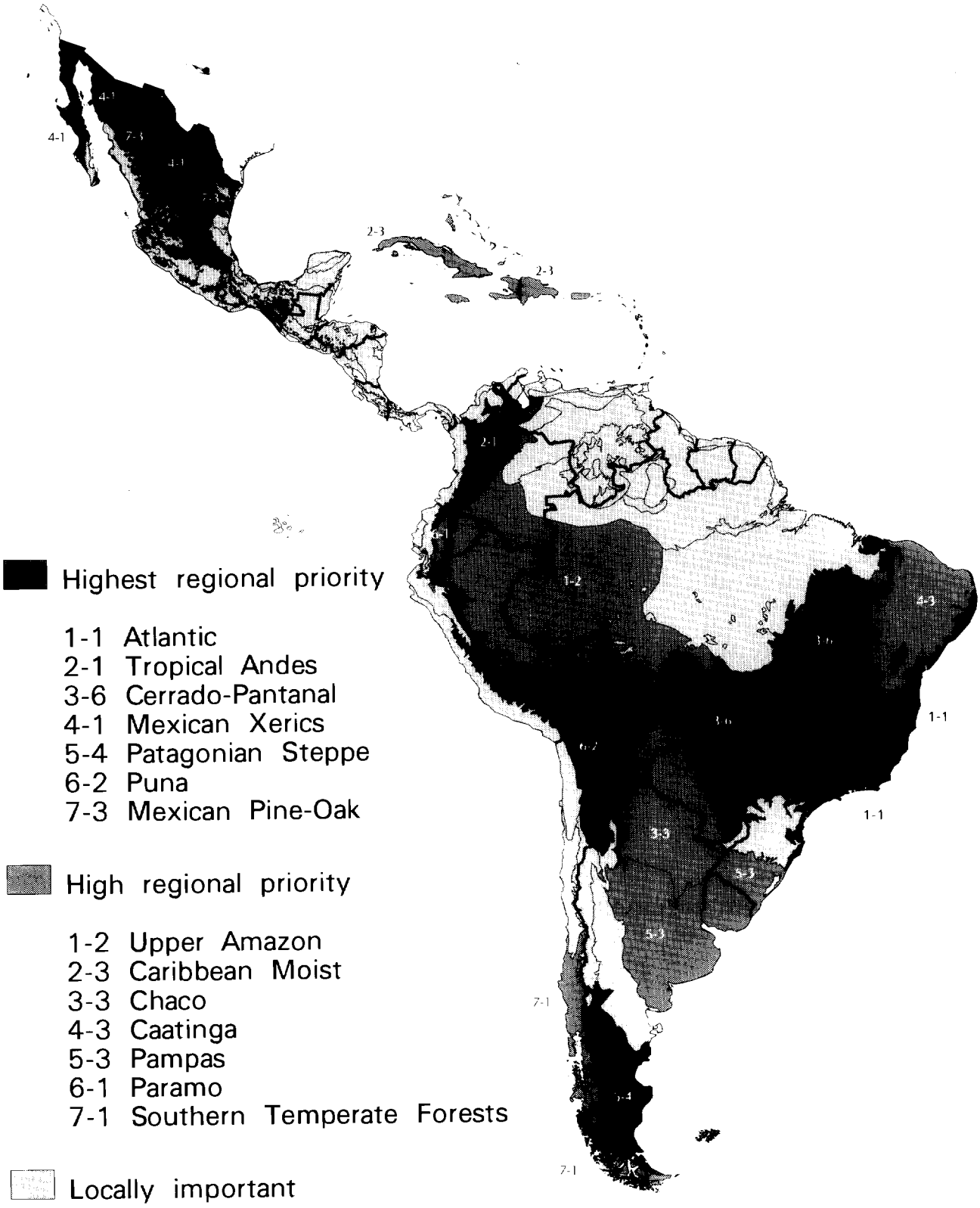

Figure 4. Priority Regional Habitat Units for Biodiversity Conservation

Data Limitations and Qualifiers on Use

Lack of Satisfactory PI Data

Workshop participants discussed three ways to integrate PI analysis into the recommended geographic priorities:

1) Non-Integration: Some workshop participants argued that PI analysis should be used only to determine the kind of investment to be made after geographic priorities have been set based on other criteria.

2) Integration as a Tiebreaker: Many participants agreed that PI analysis should be used to choose between two otherwise equivalent regional habitat units (RHUs), or to prioritize among parts of single RHUs that straddle political boundaries.

3) Integration as a Decision Rule: Participants in one of the integration groups proposed that PI analysis could be used as a decision rule to prioritize among non-equivalent RHUs. For example, Model #2 (described above) would reject critically threatened RHUs of regionally significant or locally important biological value if PI values were low (i.e., fell into Cell D in Table 4) in favor of less threatened RHUs of similar biological value characterized by higher levels of political commitment or institutional capacity (Cells A, B, or C in Table 4).

Because a satisfactory data set was not available in Miami, PI criteria are not incorporated into the geographic priorities recommended by the NGO Working Group. However, two examples of how better PI data could be incorporated into the integration models described above can be found in Appendix E3.

Scale

As mentioned in Chapter Two, Assessing Biological Value, any attempt to assess biodiversity priorities must address the fact that the definition of priority areas is dependent on the scale of the analysis. Since the scale of this analysis was at the regional (LAC-wide) level, the resulting geographic priorities should only be used at the regional level, and should not be used to determine priorities at the sub-regional or country level. The geographic priorities identified in this report say very little about what biodiversity conservation priorities for the Caribbean, Central America or Bolivia should be. This exercise would have to be repeated at a sub-regional or country-wide scale in order to obtain geographic priorities relevant at the sub-regional or national level. Different criteria would undoubtedly be used at national and sub-regional scales than were used at the hemispheric regional scale.

Use of Expert Opinion

All four levels of analysis used in this priority-setting exercise, biological value, conservation status, policy and institutional feasibility, and utility, relied to some extent on expert opinion to confirm and supplement available published data. Although the workshop included broad regional and taxonomic expertise among participants, it is possible that a different set of experts might have generated a somewhat different list of biodiversity conservation priorities. The criteria and methods used by experts to rank areas for biological value and conservation status were standardized through the use of forms (see Appendix D) and the completed forms are available for review. We encourage all nations and donors to continue to support on-the-ground biological and conservation surveys to improve the availability of published data.

CHAPTER SEVEN

RECOMMENDATIONS AND NEXT STEPS

HOW USAID SHOULD USE THESE RECOMMENDATIONS

We recommend that USAID continue to play a leadership role within the donor community with regard to biodiversity conservation by reviewing current USAID, other donor, and national investments in the 14 RHUs identified as high priority by this exercise. USAID should then work to increase its and other donors' investments in those areas not currently receiving sufficient conservation investment. All remaining RHUs are considered appropriate for continued biodiversity conservation investments at the national and local levels. USAID should undertake the necessary policy/institutional feasibility analysis to determine which countries within the priority RHUs should receive increased investment. This does not mean that USAID must necessarily develop a new biodiversity project in each of the 14 RHUs identified as high priority for biodiversity conservation in this report. USAID could choose to increase investment in some of these areas by increasing awareness of their importance to biodiversity conservation on the part of other private, bilateral or multilateral donors making biodiversity investments in Latin America and the Caribbean. In an era of declining budgets and financial constraints, USAID must be creative to maintain its leadership in the field of biodiversity conservation.

USAID should not use the recommendations of this report to assess the appropriateness of biodiversity investments by USAID missions at the country level. The fact that Central American Lowland Forest was not identified in this exercise as a high priority, does not mean that USAID/Guatemala or USAID/Nicaragua should not support the conservation of this unique and important ecosystem. The conservation of this RHU at a Central America-wide scale, and certainly at a national scale, is undeniably important. There are many other similar examples throughout Latin America of the dangers of applying the results of this exercise at the wrong scale (see section on Scale, above). The approach used in this regional analysis could be applied to identify priorities at the national or sub-regional level, if criteria and data were adapted to the scale of the analysis.

USAID should use the results of this exercise to diversify its biodiversity investments into RHUs across the full spectrum of conservation status, from critical to relatively intact. At the regional scale, the "Red Data Book" approach used to assess conservation status can target those ecoregions in a critical state, where investments over the next five years will largely determine the fraction of species and habitats that might persist over the next few decades. The method also identifies those ecoregions where investments are needed to ensure that some of the most intact examples of each Major Habitat Type can be conserved for posterity and, for the present, can be kept from being degraded to vulnerable. We suggest that there is an inverse relationship between the conservation status of an ecoregion and the costs required to restore or protect its biota: the more threatened, the more costly it will be to maintain its integrity. Investing now in the more intact areas should also be part of any portfolio that emphasizes cost-effective investment.

It is also recommended that USAID continue to advocate the importance of geographic priority-setting, using the approach outlined in this report, in the Agency's dealings with other multilateral and bilateral donors and national governments. The Global Environmental Facility should be encouraged to undertake systematic geographic priority analyses using biological importance, conservation status and policy/institutional feasibility (as they have begun to do in the LAC region) to better justify the grants they make. USAID is supporting a number of national biodiversity conservation strategies around the globe in order to help countries meet their obligations under the biodiversity convention. Such strategies have, in the past, focused primarily on what types of conservation investments to make, with little attention to a systematic analysis of where in the country conservation action is most important. USAID has an opportunity to strengthen national conservation strategies by supporting cooperating country efforts to address both the "what" and the "where" simultaneously. Similar data are collected for both types of analyses, so inclusion of geographic considerations should not increase costs significantly.

How Others Might Use This Report

The Working Group feels that this priority-setting exercise has produced an innovative framework and set of useful indicators for conservation decision-making (verified and validated by a wide variety of regional experts) that should be useful to other organizations involved in priority-setting and conservation planning. By overlaying the conservation status of ecoregions with the data layer on biological value, conservationists create a powerful tool that guides investments in a more objective fashion than in past priority-setting strategies. This report should be a useful reference for countries and organizations seeking advice on what types of data are useful to guide decision-making and how these data might be effectively presented. It is hoped that this report will provide a baseline for future efforts.

The valuable biological, conservation status, policy/institutional and utility data collected for this priority-setting process will be made available to a wide audience of potential users. New data can be incorporated as they become available and the approach can be reapplied with new assumptions and weightings, as appropriate.

The approach and criteria developed for this exercise could also help guide countries in the LAC region to objectively prioritize biodiversity investments within their political boundaries. By applying biological value, conservation status and sub-national political and institutional feasibility criteria to the ecoregions within their national boundaries, as Argentina is now doing, they can better identify and protect the larger blocks of remaining habitat that are critical for biodiversity conservation, as well as the biologically rich but highly fragmented and altered ecoregions requiring urgent attention. One of the first things that countries are expected to do after ratifying the Biodiversity Convention is to prepare a National Biodiversity Conservation Strategy. As noted above, such strategies have tended to focus primarily on what types of conservation investments to make, with little attention to a systematic analysis of

where in the country conservation action is most important. We hope that the geographic priority-setting framework presented here will be useful to many countries to assist them in identifying the "where" as well as the "what" in their national biodiversity conservation strategies.

Next Steps

Marine

The fact that marine and freshwater aquatic biodiversity conservation priorities are not addressed in this report is a serious limitation. Recognizing this limitation, USAID has provided BSP with funds to carry out a parallel priority-setting exercise for marine and freshwater habitats. This exercise is now underway and a final report that identifies regional biodiversity conservation priorities in marine and freshwater habitats in Latin America and the Caribbean should be available in 1996.

Other Regions

The application of this geographic priority-setting framework to Latin America and the Caribbean was intended to serve as a pilot effort which would be followed by similar exercises for identifying biodiversity conservation priorities in other regions, such as Asia and Africa. Given the interest that many Miami workshop participants expressed in applying the framework at a national level, BSP is now exploring the possibility of refining the methodology so that it is useful at a variety of scales, including at the national level. As we learned from our experience in applying the framework in Latin America and the Caribbean, the question of where to conserve is directly linked to the question of what types of activities should be supported. We feel there would be many benefits to a country in identifying its geographic biodiversity conservation priorities at the same time that it is establishing its national biodiversity conservation priorities sectorally and programmatically.

APPENDIX A

MAPS

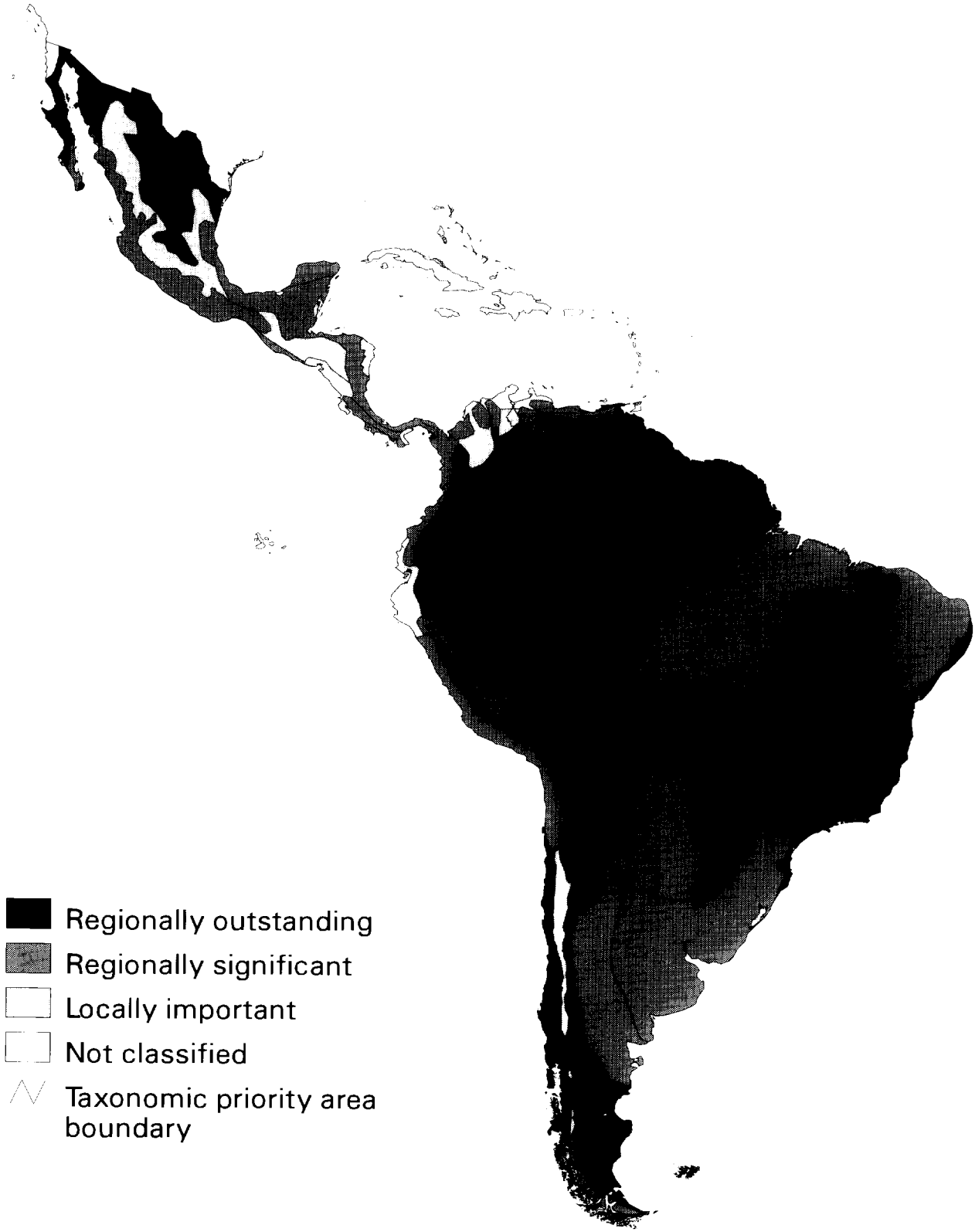

Figure A-1. Biological Value: Plants

Figure A-2. Biological Value: Mammals

Figure A-3. Biological Value: Birds

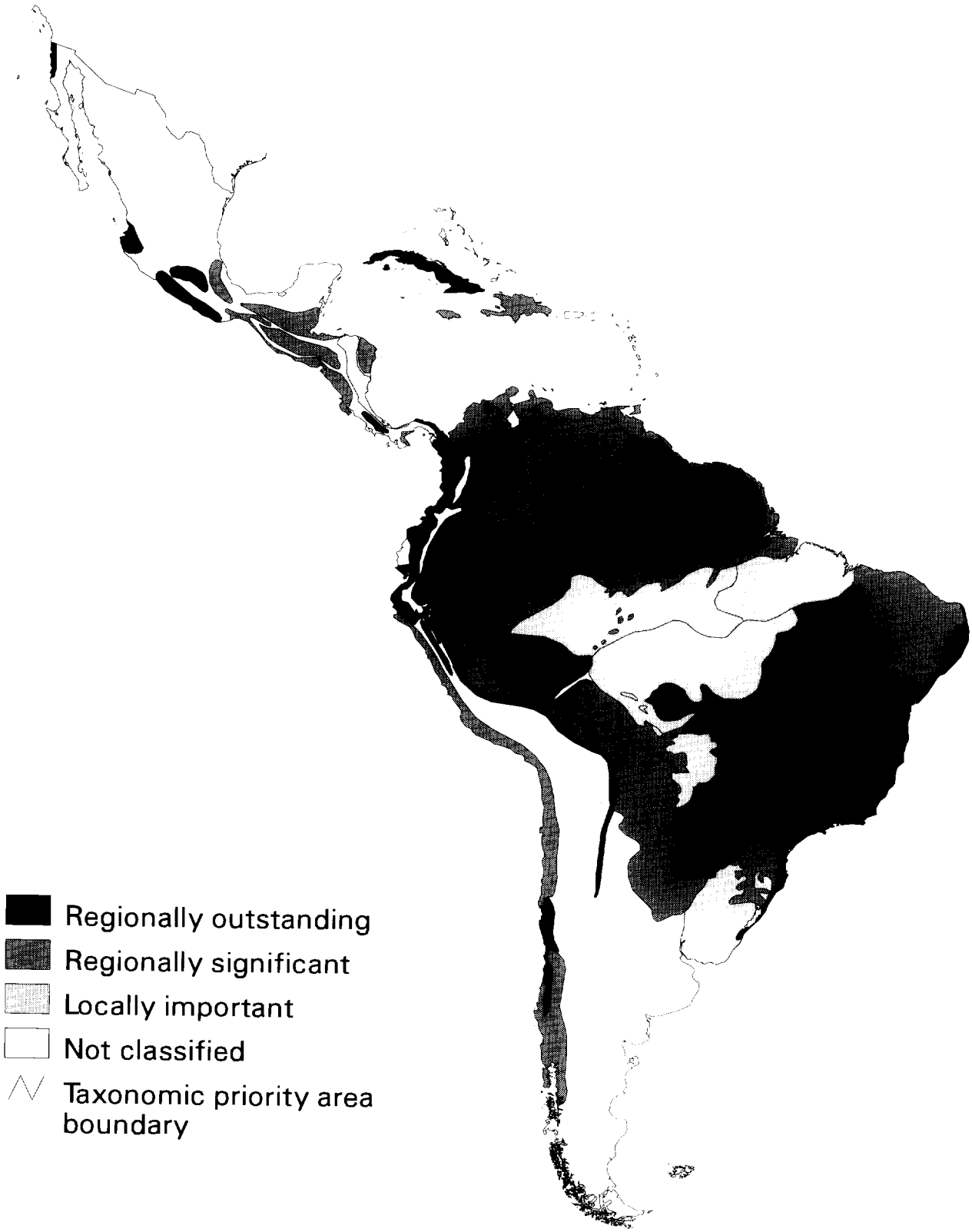

Figure A-4. Biological Value: Insects

Figure A-5. Biological Value: Herpetofauna

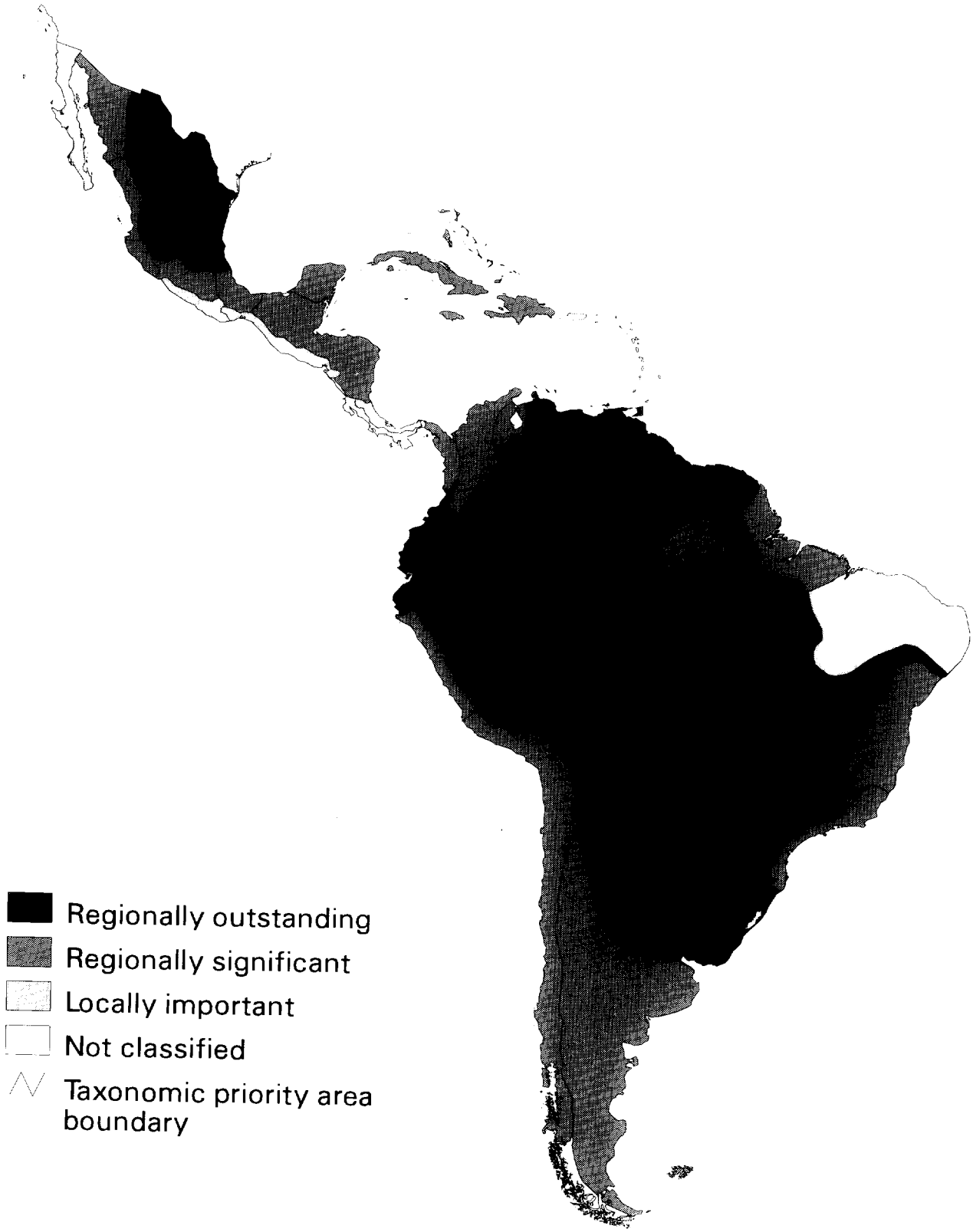

Figure A-6. Biological Value: Fish

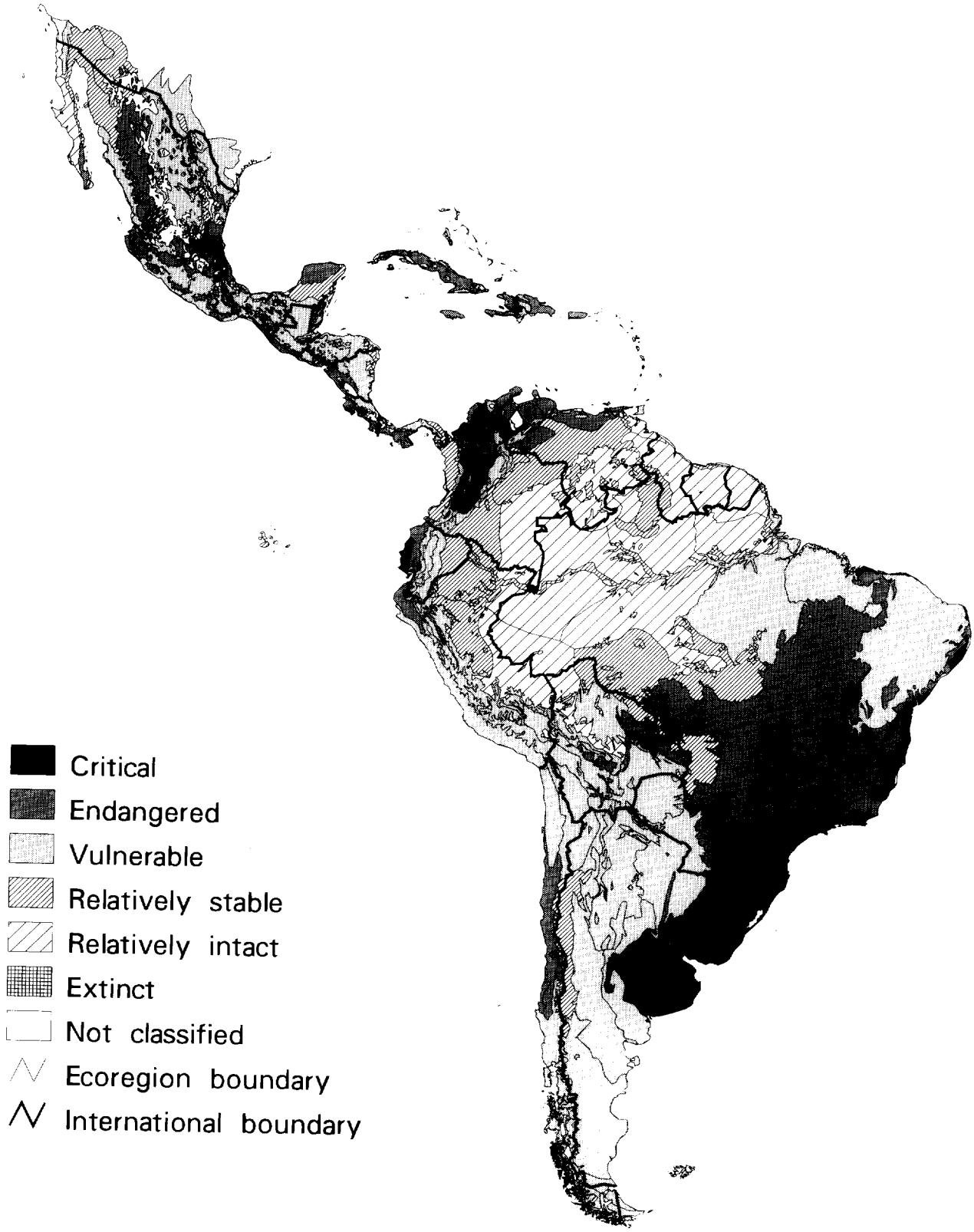

Figure A-7. Conservation Status of Ecoregions of Latin America and the Caribbean: Current Conservation Status

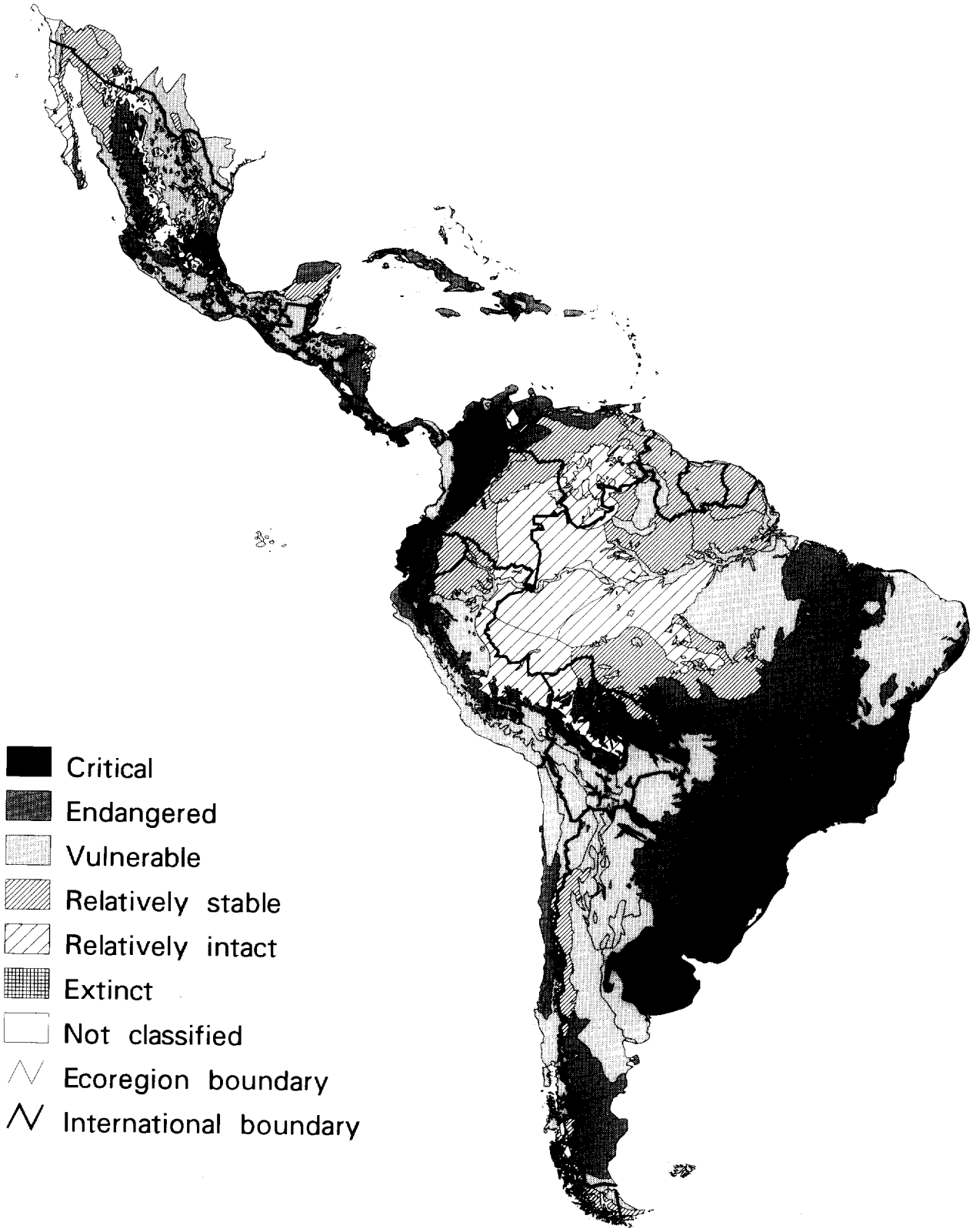

Figure A-8. Conservation Status of Ecoregions of Latin America and the Caribbean: Modification of Current Status Based on Threat Analysis

APPENDIX B

INTEGRATION: REGIONAL HABITAT UNITS CHARACTERIZED BY BIOLOGICAL VALUE AND CONSERVATION STATUS

MAJOR HABITAT TYPE 1 - TROPICAL MOIST LOWLAND FORESTS

BIOLOGICAL VALUE	Critical	Endangered	Vulnerable	Stable	Intact
Regionally Outstanding	ATLANTIC Brazil Argentina Paraguay			UPPER AMAZON Brazil Colombia Bolivia Peru Ecuador	
Regionally Significant			CHOCO-DARIEN Colombia Panama Ecuador	NE AMAZON Brazil Guyana	
Locally Important		CENTRAL AMERICAN LOWLAND Mexico to Panama	SE AMAZON Brazil		

CONSERVATION STATUS

MAJOR HABITAT TYPE 2 - TROPICAL MOIST MONTANE FORESTS

BIOLOGICAL VALUE					
Regionally Outstanding		TROPICAL ANDES Venezuela Colombia Ecuador Peru Bolivia Argentina			
Regionally Significant			C. AMERICAN MONTANE Costa Rica, Panama Guatemala Honduras El Salvador Mexico CARIBBEAN MOIST Greater & Lesser Antilles		GUAYANA MONTANE Venezuela Guyana Suriname French Guiana Brazil
Locally Important			VENEZUELAN COASTAL Venezuela		
	Critical	**Endangered**	**Vulnerable**	**Stable**	**Intact**
	CONSERVATION STATUS				

MAJOR HABITAT TYPE 3 - TROPICAL DRY FORESTS

BIOLOGICAL VALUE	Critical	Endangered	Vulnerable	Stable	Intact
Regionally Outstanding		CERRADO-PANTANAL Brazil Bolivia Paraguay	CHACO Paraguay Bolivia Argentina		
Regionally Significant	N. SOUTH AMERICA Colombia Venezuela	MEXICAN DRY Mexico Guatemala			
Locally Important	C. AMERICAN DRY Costa Rica Panama El Salvador Nicaragua	W. ANDES Ecuador (incl. Galapagos)			

CONSERVATION STATUS

MAJOR HABITAT TYPE 4 - XERIC FORMATIONS

BIOLOGICAL VALUE	Critical	Endangered	Vulnerable	Stable	Intact
Regionally Outstanding			MEXICAN XERICS Mexico, U.S. CAATINGA Brazil		
Regionally Significant		CARIBBEAN XERICS Colombia Venezuela Greater & Lesser Antilles CHILEAN WINTER RAINFALL Chile			
Locally Important			PERU-CHILE DESERTS Peru, Chile ARGENTINE MONTE Argentina		

CONSERVATION STATUS

Major Habitat Type 5 - Herbaceous Lowland Grasslands

BIOLOGICAL VALUE	Critical	Endangered	Vulnerable	Stable	Intact
Regionally Outstanding			PATAGONIAN STEPPE Argentina Chile		
Regionally Significant			LLANOS-GRAN SABANA Venezuela Colombia		
Locally Important	PAMPAS Argentina Uruguay Brazil		AMAZONIAN SAVANNAS Brazil Peru Guyanas Venezuela	CENTRAL AMERICAN PINE SAVANNA Nicaragua Honduras Belize	

CONSERVATION STATUS

MAJOR HABITAT TYPE 6 - HERBACEOUS MONTANE GRASSLANDS

BIOLOGICAL VALUE	Critical	Endangered	Vulnerable	Stable	Intact
Regionally Outstanding			PARAMO Costa Rica Colombia Venezuela Peru Ecuador PUNA Peru, Bolivia Argentina, Chile		
Regionally Significant					PANTEPUI Venezuela Guyana
Locally Important			SO. ANDEAN ALPINE Chile Argentina		

CONSERVATION STATUS

MAJOR HABITAT TYPE 7 - TEMPERATE FORESTS

BIOLOGICAL VALUE	Critical	Endangered	Vulnerable	Stable	Intact
Regionally Outstanding		SOUTHERN TEMPERATE FOREST Chile Argentina MEXICAN PINE-OAK Mexico			
Regionally Significant	BRAZILIAN *ARAUCARIA* Brazil Argentina				
Locally Important					

CONSERVATION STATUS

APPENDIX C

SUMMARY OF FOUR INTEGRATION MODELS

Integration Group #1 *(Buenos Aires Room)*
Barry Chernoff - moderator
Meg Symington - rapporteur
Rhema Kerr, Dan Nepstad, Adriana Moreira, Mary Kalin Arroyo, David Neill, Bruce Potter, Tobey Pierce, Bruce Wilcox, Carlos Peres

This group reached consensus that a three level hierarchical model that first looked at the intersection of biological value and conservation status, next at utility and finally at PI data was appropriate. Other criteria, including geographic distribution, degree of neglect and amount of previous investment were also considered appropriate to modify the results of the first hierarchical level of analysis.

The thickly outlined squares in the table below were rated of urgent investment priority, the shaded squares of high investment priority, and the unshaded squares of moderate investment priority.

The group agreed that in differentiating Regional Habitat Units that fell within the same cell, utility and PI consideration could be used, but since only 14 units were classified as of urgent priority using this model, the need to differentiate between RHUs on this basis was not applied in practice. As applied by the group, this model did not rank order the RHUs within each major habitat, but merely classified them as urgent, high or moderate investment priority. In theory, utility and PI screens could differentiate between RHUs found within the same cell and result in a rank ordering of RHUs within Major Habitat Types.

	C (5)	E (4)	V (3)	S (2)	I (1)
R (5)	10	9	8	7	6
S (4)	9	8	7	6	5
L (3)	8	7	6	5	4

Integration Group #2 *(Brasilia Room)*
Doug Stotz - moderator
Gustavo Fonseca - rapporteur
Jorge Soberón, Frances Seymour, Otto Huber, Miguel Cifuentes, Raul Gauto, Pablo Marquet, George Burgess, Kent Redford, Alejandro Grajal, Silvio Olivieri

Guiding Principle: Regionally Outstanding Biological Value Units Receive First Priority.

Within the regionally outstanding biological value group, conservation/threat placed in following order: critical > endangered > intact > stable > vulnerable.

Then treat regionally significant biological value, critical conservation status units.

For those units, evaluate whether the PI measure of short-term capacity in countries of relevance is sufficient to make it likely that investment would greatly and positively impact the aggregate unit. If PI rating suggests that investment is likely to make a positive impact (not low-low, see Cell D in Table 4), then investment would be appropriate. Otherwise, investment would not be appropriate.

Next treated are units of locally important biological value and critical conservation status. We ask at this point whether the unit is adequately represented in protected areas (the Olivieri test). If it is, then no investment is warranted. If it is not, then we treat it as we previously treated units of regionally significant biological value and critical conservation status.

A. We then go to units of regionally significant biological value that are considered intact. We first ask whether there exists an "intact" unit of regionally outstanding biological value in the same Major Habitat Type. If so, we postpone a decision on the unit and consider units of regionally significant biological value that are considered endangered.

B. If we consider the endangered units at this point, we recommend investment.

C. If an intact unit of regionally outstanding biological value is found within the same Major Habitat Type, then we ask a question regarding the effectiveness of investment in maintaining the intact units of regionally significant biological value (whose treatment was begun in A) as an extensive "functional" ecosystem. If investment of a long-term nature in increasing capacity is expected to have a significant positive influence on the maintenance of the unit in the long-term, then investment is appropriate (low existing capacity; high commitment/trend). If it is judged that investment would have little effect on long-term maintenance of the ecosystem, we postpone action on the unit and consider units of regionally significant biological value that are considered endangered.

D. Endangered units of regionally significant biological value should receive investment after intact units, if investment is appropriate in intact units (as described in C above), or before those units, if investment was deemed not appropriate. If endangered units of regionally significant biological value have been dealt with and intact regions of regionally significant biological value remain in which investment has not been placed, due to the decision rules at A and C, investment to ensure long-term protection of those units is considered the next priority.

E. At this point we consider those units considered of regionally significant biological value and relatively stable conservation status. We now ask a question similar to point C for intact regions. Will investment of a long-term nature in increasing capacity of the appropriate institutions have a significant positive influence on the maintenance of a major area of the unit with substantial integrity as a "functional" system (e.g., PI commitment high, capacity low)? If so, then investment is appropriate. If not, then return to units

of regionally significant biological value and vulnerable conservation status, and ask question above for these units. Again, if the answer is yes, then investment would be appropriate. If not, then return to the units of regionally significant biological value and relatively stable conservation status. Any of these not deemed appropriate for investment by the question above, are now appropriate for investment. Any remaining units of regionally significant biological value and vulnerable conservation status without investment, would at this point, following investment in relatively stable units, be appropriate for investment.

Notes:

1. This provides a set of decision rules by which to rank units for investment priority *within* a single Major Habitat Type.

2. Utility was not included in this ranking scheme. A plan whereby a utility ranking of "high" for a unit which scored as locally important in biological value would cause that unit to be treated in the previous scheme just as if it had been ranked as being regionally significant was proposed, discussed and generally considered a good idea. When the model presented here was completely elaborated, this idea was not revisited however, so the group did not formally incorporate this into the model. It is presented here as an idea on how utility information might be integrated into this approach.

3. Because this model places emphasis on intact units for their potential to protect "ecosystem-level" values, for the purpose of evaluating which units are "intact," the snapshot conservation status ranking should be used rather than the conservation status modified by dynamic threat. This provides a measure of the current conditions within the unit which is appropriate to the analysis.

Integration Group #3 *(Kingston Room)*
Mario Baudoin - moderator
Juan Pablo Ruiz - rapporteur
Salvador Contreras, Phil DeVries, José Ottenwalder, Andrew Henderson, Jorge Hernandez Camacho, Roberto Cavalcanti, Shirley Keel, Agustin Iriarte, Michael Yates, Eric Dinerstein, John Robinson

The group took as its starting point the seven squares of the matrix that were highlighted in the illustrative model presented in the plenary as of highest priority.

These cells were selected as a priority based on the need to keep RHUs from falling into the critical category, as well as the need to diversify the donor's investment over the full spectrum of conservation threat. Since investment in critical areas is much more costly per unit of biodiversity conserved than investment in intact areas, donors should diversify their portfolio in relation to conservation threat.

If the RHU in these squares fell entirely within one country, then investment should be in that country, regardless of PI.

If the RHUs in these cells crossed national boundaries, then another iteration of the biological value/conservation status model should be carried out to determine which country within the RHU should receive investment. The country whose portion of the RHU is regionally outstanding in terms of biological value and most intact (upper right corner of the matrix) should receive investment. If the portions of the RHU in different countries are equal in terms of biological value and conservation status, then the PI value should be used to determine where and what.

	Critical	Endangered	Vulnerable	Stable	Intact
Regionally Outstanding					
Regionally Significant					
Locally Important					

Integration Group #4 *(Nassau Room)*
Jim Barborak - moderator
Keith Brown - rapporteur
Pablo Canevari, Richard Howard, Gerardo Lamas, Márcio Ayres, Bill Duellman, Francisco Erize, Ernesto Barriga, David Heesen, Frank Zadroga, Russ Mittermeier, Kathy Saterson, Doug Graham, Roberto de la Maza

1. Group members present gave a summary of their ideas on how to integrate, weight, use or work with the data at hand: biological value (R,S,L); conservation status/threat (C,E,V,S,I); aquatic systems (fish group); ecosystem utility; and policy/institutional summary ratings (capacity/commitment, H,M,L). These included some important points:

a) some felt that biological values should receive higher weight than landscape.

b) many felt that data were not satisfactory even in these two levels of analysis, and that great biases were present related to taxon, size of RHU, country, and threat. Others pointed out that these will never be ideally perfect.

c) aquatic systems: group consensus that these were best used for a posterior adjustment, (i.e., adding bonus points to those high priority RHUs which were also important for fish).

d) major habitats: in smaller or narrow countries, several major habitats can be included in a single conservation study, process or unit. This is not possible in larger countries. (Editor's note: even in larger countries project/conservation units can span major habitats, e.g. in Manu National Park, montane grassland, montane forest, and lowland forest are all found).

e) threat levels almost all guesses, many inflated, subjective.

f) PI data, applied just on upper left six squares of biological value/conservation status matrix, gives a very broad geographic and unit coverage (20/21) if only four high capacity countries (Brazil, Argentina, Colombia, Barbados) plus Mexico and three more medium capacity countries receive extra funds for biodiversity investments. This sliding data set may prove useful for priority determination.

g) PI data are insufficient and should be mostly used to determine how to distribute aid among countries within a unit.

h) might be good to distribute to lots of countries and units as "bet-hedging."

2. It was noted that PI ranking of high capacity and high commitment could favor investment in short-term critical situations whereas low PI rank could identify those countries to be selected for long-term capacity-building investments.

3. MODEL for Integration proposed: A 1:1 non-biased square accepted, and the RHUs occupying the cells up to Rank #10 were identified from the previous days' work. In the matrix below, the point value and rank (in parentheses) of the cells are given.

	C 15	E 12	V 9	S 6	I 3
R 15	30 (1)	27 (2)	24 (4)	21 (6)	18 (9)
S 10	25 (3)	22 (5)	19 (8)	16 (11)	13 (13)
L 5	20 (7)	17 (10)	14 (12)	11 (14)	8 (15)

The three top left squares (ranked 1-3) include 7 units. The six upper left squares (ranked 1-6) include 18 units.

Some RHUs moved between cells on the basis of fish analysis and utility for tropical moist forest (low, montane). This "upgraded" Upper Amazon, Llanos and Chocó-Darién.

PI would be used only for noting differences in various countries within each unit. This data will also be useful in determining the type of investment (the "what" as opposed to the "where").

Combination of units that can be treated together in local or country-level work permits reduction of RHUs to only 17, drawing in two more units. These are recommended with top seven of required attention (RHUs in darkly outlined cells below) and next 10 of urgent priority (RHUs in shaded cells below).

APPENDIX D

SAMPLE DATA FORMS USED BY WORKSHOP PARTICIPANTS TO ASSESS BIOLOGICAL VALUE, CONSERVATION STATUS AND POLICY/INSTITUTIONAL FEASIBILITY

Form 1: 1st. Phase - Taxonomic Biodiversity Priority Areas (TBP)

Group: _____ **TBP Number:** _____

TBP Name: _____

Map Name: _____

Geographic Location: Country(ies) State(s) / Province(s)

_____ _____

_____ _____

Location Description:

Unit Description / Importance as Priority Area:

Form Author: **Date:**

Form 1 - Page 1

TBP DIAGNOSTIC

	don't know	unknown	low	medium	high
Knowledge - Species Composition [1]					
Knowledge - Ecosystem Functioning [1]					
Knowledge - Land Use Dynamics [1]					
Knowledge - Water System Dynamics					
Species Richness [3]					
Phyletic Diversity [2]					
Beta Diversity [4]					
Number of Endemic Species [3]					
Rare / Endangered Species [3]					
Resilience [6]					

Main Gaps in Knowledge:

[1] Values range from low (meaning knowledge is fragmentary at best) to high (meaning that many comprehensive field studies have been conducted in the area). If area has not been subjected to any reported research, mark unknown. If you feel you are not informed enough to make a decision on an appropriate score, mark don't know.

[2] Diversity at the genus and family levels.

[3] Consider the scores on a sliding scale of gradients of species diversity, ranging from a group of areas with the least number of species to a group of areas with the highest number of species, within a particular taxonomic assemblage. The same analysis should be performed for endemic and rare/threatened species.

[4] Subjective measure of habitat heterogeneity in terms of its repercussions to the substitution of species on the geographical space, ranging from highly homogeneous (Low) to highly heterogeneous (High).

[5] From low (30% or less remaining) to high (60% or more remaining).

[6] Ability to withstand change and perturbations at the TBP Unit level for your taxonomic group.

NOTE: Please report in your session's report on how you define or interpret these index definitions for the particular case of your taxonomic group.

ANTHROPIC PRESSURE (AP)

	don't know	unknown	low	medium	high
AP on Area					
AP on Protected Areas within Area					
Degree of Protection from Prot. Areas[1]					
Habitat Integrity					

AP Primary Driving Process[2] _____

_____

_____

AP Additional Driving Process(es)[2] _____

_____

_____

List of endangered / threatened species (include reference or indicate the name and source of more complete databases)

[1] Degree of protection of the area's biodiversity afforded by the protected area system. Values range from high (adequate) to low (completely inadequate).

[2] Examples include major development project in area/neighboring area driving colonization; extractive forestry impacting habitat/fauna; un-planned colonization by subsistence agriculture leading to habitat destruction/fragmentation.

Form 1 - Page 3

Active Institutions / Individuals (Type of Activity, Contact Person(s) & Address):

Additional Notes:

Form 1 - Page 4

SAMPLE DATASHEET FOR CONSERVATION STATUS ASSESSMENT

Ecoregion/ Size	# of Habitat Blocks	% Habitat Loss	Degree of Fragmentation	Conversion Rate	Degree of Protection	TOTAL	Snapshot Conservation Status	Final Conservation Status
34. E Andes of Colombia - Colombia								
66,712 ha								
35. E. Andes of Ecuador-Ecuador Colombia								
84,442 ha								
36. Peruvian Yungas - Peru								
162,007 ha								
37. Bolivian Yungas - Bolivia Argentina								
47,806 ha								
41. Tepuis - Venezuelan, Brazil, Guyana,Surinam								
8,220 ha								
42. S Andean Yungas - Argentina, Bolivia								
50,423 ha								
43. Ceja de Monte forests - Bolivia								
56,473 ha								

ECOREGION THREAT ANALYSIS DATASHEET

Region:_____

ECOREGION NAME:_____

Author
(Expert(s)):_____

_____

a. Type of Threat: b. Intensity: c. Timeframe: d. Comments

_____

(Most Severe)

1.

_____

2.

_____

3.

_____

(Severe)

1.

_____

2.

_____

3.

EXPERT OPINION CHECKLIST FOR INSTITUTIONAL/POLICY OVERLAY

Country: _____ **Region (if applicable):** _____ **Person filling out form:** _____

0.0 BASIS OF EXPERTISE

0.1 Nature of experience/source of knowledge: Please provide an indication of the nature of your experience and/or the source of your knowledge about the country or specific region being assessed. For example: "Served as a long-term advisor to the Ministry of Forestry with extensive travel to X and Y provinces; also extensive contact with the NGO community at the national level."

_____

_____

_____

_____

_____

0.2 Timing and duration of association: Please provide an indication of the timing and duration of your association with the country or specific region being assessed upon which your expertise is based. For example: "Resident in capital city for five years from 1987-1992; occasional short-term visits 1992-1993."

_____

_____

_____

_____

0.3 Other: Please provide any additional information that you think is relevant to your ability to provide an assessment of the institutional and policy factors relevant to biodiversity conservation in this country of specific region.

_____

_____

_____

_____

_____

Country: _____ **Person filling out form:** _____

1.0 NATIONAL LEVEL POLITICAL COMMITMENT TO CONSERVATION

Possible indicators: — Score* 1 = Low 5 = High

1.1 **Existence** of national legislation and policies favorable to conservation of terrestrial and freshwater aquatic biodiversity re:

- 1.1.1 protected area management
- 1.1.2 *in situ* protected species management _____
- 1.1.3 *ex situ* protected species management _____
- 1.1.4 environmental impact assessment _____
- 1.1.5 sustainable natural resources management (e.g. forestry, fisheries, agriculture) _____
- 1.1.6 landscape-level land-use planning and watershed management _____
- 1.1.7 public participation in resource management decision-making _____
- 1.1.8 recognition of local proprietorship/community-based management _____
- 1.1.9 Other _____ _____

5 = strong and comprehensive laws and policies in place
1 = legal and policy framework completely lacking

1.2 **Enforcement** of national legislation and policies favorable to conservation of terrestrial and freshwater aquatic biodiversity re:

- 1.2.1 protected area management
- 1.2.2 *in situ* protected species management _____
- 1.2.3 *ex situ* protected species management _____
- 1.2.4 environmental impact assessment _____
- 1.2.5 sustainable natural resources management (e.g. forestry, fisheries, agriculture) _____
- 1.2.6 landscape-level land-use planning and watershed management _____
- 1.2.7 public participation in resource management decision-making _____
- 1.2.8 recognition of local proprietorship/community-based management _____
- 1.2.9 Other _____ _____

5 = strong and consistent enforcement of existing law and policy
1 = laws and policies never enforced

1.3 Political strength of government agencies with a conservation mandate _____

5 = consistently stronger than competing government agencies and private interests
1 = always weaker than competing government agencies and private interests

1.4 Track record of gov't. agencies in resolving conflicts between conservation and other objectives _____

5 = many recent examples of conflict resolution favorable to conservation
1 = no recent examples of conflict resolution favorable to conservation

1.5 Government promotion/tolerance of public debate on conservation issues _____

5 = government actively disseminates information/encourages debate on conservation issues
1 = government withholds information and suppresses debate on conservation issues

1.6 Government incorporation of biodiversity concerns into long-term strategic planning processes _____

5 = Biodiversity Action Plan & monitoring system in place; movement towards "green accounting"
1 = no long-term strategic planning for biodiversity concerns

1.7 Overall trend in political commitment to conservation _____

5 = strong positive trend
1 = strong negative trend

1.8 Other _____ _____

Overall Rating* (1-5) _____

Notes on principal factors considered: _____

_____

_____

*Scores are indicative only; overall rating is not a mathematical function of indicator scores.

EXPERT OPINION CHECKLIST FOR INSTITUTIONAL/POLICY OVERLAY (continued)

Country: _____ **Person filling out form:** _____

2.0 NATIONAL LEVEL INSTITUTIONAL CAPACITY FOR CONSERVATION

Possible indicators: — Score* 1 = Low 5 = High

2.1 Leadership, staff capacity, and stability of relevant national-level institutions:

- 2.1.1 government agencies _____
- 2.1.2 academic/research institutes _____
- 2.1.3 training centers _____
- 2.1.4 non-governmental organizations:
  - policy advocacy NGOs _____
  - community development NGOs _____
  - environmental NGOs _____
  - peoples organizations/confederations _____
  - 5 = strong leadership, highly trained and motivated staff, continuity of staff and policy
  - 1 = lack of leadership, untrained or unmotivated staff, high turnover of staff

2.2 Demonstrated ability of above organizations (2.1) to collaborate effectively to achieve conservation objectives _____
- 5 = many recent examples of effective collaboration among some or all types of groups
- 1 = no recent examples of effective collaboration

2.3 Demonstrated ability of above organizations (2.1) to collaborate effectively with community-level organizations to achieve conservation objectives _____
- 5 = many recent examples of effective collaboration between groups in 2.1 and communities
- 1 = no recent examples of effective collaboration

2.4 Economic resources available to invest in conservation _____
- 5 = domestic and international financial resources abundant; national trust fund exists
- 1 = no funds available for conservation

2.5 Overall trend in institutional capacity for conservation
- 5 = strong positive trend
- 1 = strong negative trend

2.6 Other _____ _____

Overall Rating* (1-5) _____

Notes on principal factors considered: _____

_____

_____

_____

_____

*Scores are indicative only; overall rating is not a mathematical function of indicator scores.

EXPERT OPINION CHECKLIST FOR INSTITUTIONAL/POLICY OVERLAY (continued)

Country: _____ **Person filling out form:** _____

3.0 ADDITIONAL NATIONAL LEVEL FACTORS AFFECTING THE EFFECTIVENESS OF EXTERNAL ASSISTANCE

Possible indicators: — Scores* 1 = Low, 5 = High

3.1 Level of interest in receiving external assistance for conservation
- 3.1.1 government agencies _____
- 3.1.2 academic/research institutes _____
- 3.1.3 training centers _____
- 3.1.4 non-governmental organizations: _____
  - policy advocacy NGOs _____
  - community development NGOs _____
  - environmental NGOs _____
  - peoples organizations/confederations _____
  - 5 = highly receptive to external financial assistance and policy advice
  - 1 = antagonistic to external financial assistance and policy advice

3.2 Absorptive capacity for effectively utilizing additional assistance:
- 3.2.1 government agencies _____
- 3.2.2 academic/research institutes _____
- 3.2.3 training centers _____
- 3.2.4 non-governmental organizations: _____
  - policy advocacy NGOs _____
  - community development NGOs _____
  - environmental NGOs _____
  - peoples organizations/confederations _____
  - 5 = significant human and institutional capacity to be mobilized
  - 1 = existing human and institutional capacity already overstretched

3.3 Freedom from political, security, cultural, or other barriers (such as corruption) to effective international collaboration _____
- 5 = international collaboration unobstructed by barriers
- 1 = international collaboration effectively precluded by barriers

3.4 Accessibility of maps, databases, and other basic information on country's geographic, biological, and social characteristics _____
- 5 = maps and databases complete, well-maintained, and accessible
- 1 = maps and databases incomplete and difficult to access

3.5 Overall trend in factors affecting the effectiveness of external assistance _____
- 5 = strong positive trend
- 1 = strong negative trend

3.6 Other _____ _____

Overall Rating* (1-5) _____

Notes on principal factors considered: _____

*Scores are indicative only; overall rating is not a mathematical function of indicator scores.

EXPERT OPINION CHECKLIST FOR INSTITUTIONAL/POLICY OVERLAY (continued)

Country: _____ **Region:** _____ **Person filling out form:** _____

4.0 SUB-NATIONAL LEVEL POLITICAL COMMITMENT TO CONSERVATION

Score*
1 = Low
5 = High

Possible indicators:

4.1 **Existence** of sub-national legislation and policies favorable to conservation of terrestrial and freshwater aquatic biodiversity re:

- 4.1.1 protected area management _____
- 4.1.2 *in situ* protected species management _____
- 4.1.3 *ex situ* protected species management _____
- 4.1.4 environmental impact assessment _____
- 4.1.5 sustainable natural resources management (e.g. forestry, fisheries, agriculture) _____
- 4.1.6 landscape-level land-use planning and watershed management _____
- 4.1.7 public participation in resource management decision-making _____
- 4.1.8 recognition of local proprietorship/community-based management _____
- 4.1.9 Other_____ _____

5 = strong and comprehensive laws and policies in place
1 = legal and policy framework completely lacking

4.2 **Enforcement** of sub-national legislation and policies favorable to conservation of terrestrial and freshwater aquatic biodiversity re:

- 4.2.1 protected area management _____
- 4.2.2 *in situ* protected species management _____
- 4.2.3 *ex situ* protected species management _____
- 4.2.4 environmental impact assessment _____
- 4.2.5 sustainable natural resources management (e.g. forestry, fisheries, agriculture) _____
- 4.2.6 landscape-level land-use planning and watershed management _____
- 4.2.7 public participation in resource management decision-making _____
- 4.2.8 recognition of local proprietorship/community-based management _____
- 4.2.9 Other_____ _____

5 = strong and consistent enforcement of existing law and policy
1 = laws and policies never enforced

4.3 Political strength of sub-national level government agencies with a conservation mandate _____

5 = consistently stronger than competing government agencies and private interests
1 = always weaker than competing government agencies and private interests

4.4 Track record of sub-national level government agencies in resolving conflicts between conservation and other objectives

5 = many recent examples of conflict resolution favorable to conservation
1 = no recent examples of conflict resolution favorable to conservation

4.5 Government promotion/tolerance of public debate on conservation issues in this region _____

5 = government actively disseminates information/encourages debate on conservation issues
1 = government withholds information and suppresses debate on conservation issues

4.6 Government incorporation of biodiversity concerns into long-term strategic planning processes at the sub-national level _____

5 = Biodiversity Action Plan and monitoring system in place
1 = no long-term strategic planning for biodiversity concerns

4.7 Overall trend in political commitment to conservation in this region _____

5 = strong positive trend
1 = strong negative trend

4.8 Other _____ _____

Overall Rating* (1-5) _____

*Notes on principal factors considered:*_____

_____

_____

*Scores are indicative only; overall rating is not a mathematical function of indicator scores.

EXPERT OPINION CHECKLIST FOR INSTITUTIONAL/POLICY OVERLAY (continued)

Country: _____ **Region:** _____ **Person filling out form:** _____

5.0 SUB-NATIONAL LEVEL INSTITUTIONAL CAPACITY FOR CONSERVATION

Possible indicators: — Score* 1 = Low 5 = High

5.1 Leadership, staff capacity, and stability of relevant sub-national level institutions:

- 5.1.1 government agencies
- 5.1.2 academic/research institutes _____
- 5.1.3 training centers _____
- 5.1.4 non-governmental organizations: _____
  - policy advocacy NGOs
  - community development NGOs _____
  - environmental NGOs _____
  - peoples organizations/confederations _____
  - 5 = strong leadership, highly trained and motivated staff, continuity of staff and policy _____
  - 1 = lack of leadership, untrained or unmotivated staff, high turnover of staff

5.2 Demonstrated ability of above organizations (5.1) to collaborate effectively to achieve conservation objectives _____

- 5 = many recent examples of effective collaboration among some or all types of groups
- 1 = no recent examples of effective collaboration

5.3 Demonstrated ability of above organizations (5.1) to collaborate effectively with community-level organizations to achieve conservation objectives _____

- 5 = many recent examples of effective collaboration between groups in 5.1 and communities
- 1 = no recent examples of effective collaboration

5.4 Economic resources available to invest in conservation _____

- 5 = domestic and international financial resources abundant in this region
- 1 = no funds available for conservation

5.5 Overall trend in institutional capacity for conservation in this region _____

- 5 = strong positive trend
- 1 = strong negative trend

5.6 Other _____ _____

Overall Rating* (1-5) _____

Notes on principal factors considered: _____

_____

_____

_____

*Scores are indicative only; overall rating is not a mathematical function of indicator scores.

EXPERT OPINION CHECKLIST FOR INSTITUTIONAL/POLICY OVERLAY (continued)

Country: _____ **Region:** _____ **Person filling out form:** _____

6.0 ADDITIONAL SUB-NATIONAL LEVEL FACTORS AFFECTING THE EFFECTIVENESS OF EXTERNAL ASSISTANCE

Scores*
1 = Low
5 = High

Possible indicators:

Is this region identified as a priority in sub-national level conservation plans? (yes/no)

6.1 Level of interest in receiving external assistance for conservation in this region
- 6.1.1 government agencies _____
- 6.1.2 academic/research institutes _____
- 6.1.3 training centers _____
- 6.1.4 non-governmental organizations:
  - policy advocacy NGOs _____
  - community development NGOs _____
  - environmental NGOs _____
  - peoples organizations/confederations _____
  - 5 = highly receptive to external financial assistance and policy advice
  - 1 = antagonistic to external financial assistance and policy advice

6.2 Absorptive capacity for effectively utilizing additional assistance:
- 6.2.1 government agencies _____
- 6.2.2 academic/research institutes _____
- 6.2.3 training centers _____
- 6.2.4 non-governmental organizations:
  - policy advocacy NGOs _____
  - community development NGOs _____
  - environmental NGOs _____
  - peoples organizations/confederations _____
  - 5 = significant human and institutional capacity to be mobilized
  - 1 = existing human and institutional capacity already overstretched

6.3 Freedom from political, security, cultural, or other barriers (such as corruption) to effective international collaboration in this region _____
- 5 = international collaboration unobstructed by barriers
- 1 = international collaboration effectively precluded by barriers

6.4 Accessibility of maps, databases, and other basic information on the geographic, biological, and social characteristics of this region _____
- 5 = maps and databases complete, well-maintained, and accessible
- 1 = maps and databases incomplete and difficult to access

6.5 Overall trend in factors affecting the effectiveness of external assistance in this region _____
- 5 = strong positive trend
- 1 = strong negative trend

6.6 Other _____ _____

Overall Rating* (1-5) _____

Notes on principal factors considered: _____

_____

_____

*Scores are indicative only; overall rating is not a mathematical function of indicator scores.

EXPERT OPINION CHECKLIST FOR INSTITUTIONAL/POLICY OVERLAY (continued)

Country: _____ **Region (if applicable):** _____ **Person filling out form:** _____

7.0 ADDITIONAL COMMENTS

Please use this space to provide any additional comments that you think should be considered in assessing the institutional and policy factors relevant to biodiversity conservation in this country or specific region:

APPENDIX E1

ANALYSIS OF DATA INDICATOR USEFULNESS AND DATA NEEDS FOR POLICY AND INSTITUTIONAL (PI) COMPONENT

Latin American experts assessed the usefulness of data indicators presented at the Miami BSP Biodiversity Priority-Setting Workshop in terms of their usefulness for evaluating national-level institutional capacity, commitment and other factors affecting the effectiveness of external assistance. Experts were also asked to define what other data (both existing and uncaptured) would be useful in such an exercise. The results of this assessment, gathered through a questionnaire survey and a workshop session, are presented below.

A. Indicator data made available for PI component, considered useful by Latin American experts.

Each of the 18 data indicators presented at the Miami Workshop were considered to be at least somewhat useful by at least one of the questionnaire respondents, with one exception—paved road density—which has been deleted from the list below.

** ranked as a "5" on a 1-5 ranking scale (5 = very useful) by at least one respondent.

* ranked as a "4" on a 1-5 ranking scale (5 = very useful) by at least one respondent.

* National level biodiversity reporting and planning: Tropical Forestry Action Plan (TFAP); UNCED National Report; UNEP Country Study; and Biodiversity Strategy or Action Plan

** Ratification of regional treaties: 1940 Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, Conservation of Biological Diversity, Regional Seas

* Participation in major global conventions: Ramsar, World Heritage, CITES, Migratory Species (1979) and Biodiversity Convention

* CITES reporting requirement met

Per capita GNP

** Overseas Development Assistance (ODA) as a percent of GNP

Debt service as a percent of export revenue

* Percent of R&D scientists in the natural resource sector

* Scientists and technicians per 1,000 population

* Average number of zoos

* Average number of vertebrate species per zoo

* Average number of botanical gardens

** Protected areas staffing and funding

** UNDP Human Development Index (Index is based on 3 equally weighted indicators: longevity as measured by life expectancy; knowledge as measured by adult literacy and mean years of schooling; and income as measured by per capita purchasing power parity)

** "Human Freedom" Index (Index is based on sum of two scores: "civil liberties" and "political rights")

* U.S. funding for biodiversity conservation

** Donor funding for biodiversity conservation from European Union and U.S. bilateral and multilateral organizations

B. Existing data that experts felt should be included in future PI assessments:

- number of NGOs per country (based on UNCED data)
- disbursements of externally-provided funds (as indicators of absorptive capacity)
- number of gene banks in a country
- distribution of landholdings (average size of holding, % of farmers per holding class size)
- actual land use vs. potential land use
- literacy rate (male, female)
- % of men and women voting
- media (number of newspapers, radios, per 1,000 people)
- access to family planning
- income distribution
- existence of national environmental funds (IUCN)

C. Data indicators we wish we had (data may exist, but have not been captured) for use in a PI assessment:

- % gov't. budget allocated to conservation (include trend data)
- external funds going to national spending on biodiversity conservation (trend data)
- money spent to implement treaties (by source)
- donor funding for all forms of development (trend data, disaggregated by source)
- government funding spent on conservation legislation enforcement
- (complete) data on protected area staffing and funding
- number of visitors (national, international) to protected areas
- revenues from park fees (and other measures of revenues from biodiversity conservation)
- numbers of guards in protected areas
- ratio of protected area personnel in field vs. central office
- protected areas: actual boundaries
- disaggregated data on number of employed scientists in natural resource sector (i.e. those directly involved in conservation)
- disaggregated data on number of research and development scientists in natural resource sector (i.e. those directly involved in conservation)
- proxies for indigenous ownership/control (of biodiverse lands), e.g., existence of supportive laws, number of indigenous groups
- number of environmental impact assessments completed per country
- budgets allocated to gene banks
- percent of newspaper coverage (in column inches) devoted to conservation issues

APPENDIX E2

CONSENSUS STATEMENT POLICY/INSTITUTIONAL WORKING GROUP

IMPORTANCE OF POLICY/ INSTITUTIONAL INFORMATION

Working group members agree that policy/institutional factors should be taken into account in the setting of geographical priorities for the allocation of limited biodiversity conservation investment resources. Policy/institutional data and analysis can be used as a discriminator ("tie-breaker") when choosing among similar alternatives generated by biological value and threat/opportunity assessments. It can also be used to inform decision-making related to the types of activities to be supported.

ADEQUACY OF CHECKLIST ASSESSMENT INSTRUMENT

Working group members agree that while imperfect, the checklist assessment instrument refined during the workshop effectively identifies the key features of the country-level policy/institutional landscape relevant to strategic, course-scale, region-wide decision-making regarding the allocation of conservation investment resources.

In order to inform decision-making at the country level, the instrument would have to be reapplied at a smaller scale. In addition, comparisons among parts of countries such as Brazil, where sub-national level policy/institutional landscapes may be very different from national or country-wide landscapes, would require repeating the analysis at the sub-national level.

THE INDIVISIBILITY OF "WHERE" FROM "WHAT" AND "HOW"

Working group members agree that in the case of policy/institutional factors, it is not possible to separate the analysis of *where* investments should be directed from the question of *what* conservation interventions are proposed and *how* they will be implemented, including their time horizon.

Working group members recommend that policy/institutional analysis should be used to develop a diversified portfolio of investments to achieve conservation goals that balances risk and benefit over any given time horizons. For example, where impor-

tant biological units are highly threatened in the short-term, on-the-ground investments in countries with existing institutional capacity and other factors affecting the effectiveness of external assistance should be given priority. Conversely, where important biological units are not immediately threatened, capacity-building investments in countries with low institutional capacity and other factors but high political commitment and a positive trend should be given priority.

Sample Size and Country Expertise Limitation

Working group members agree that due to the limited number and country expertise of workshop participants, there is an insufficient basis of expert opinion to inform the policy/institutional characterization of certain countries.

Standardization and Scale Issues Among Countries and Sub-Regions

Working group members agree that standardization presents an important methodological problem constraining the comparability of expert opinion data due to the insufficiently detailed scoring instructions, the lack of overlap among participants' country expertise, and insufficient time to standardize scoring through group discussion at the workshop. Further specification of the meaning of intermediate scores in the checklist assessment instrument would improve the standardization of the methodology.

Working group members agree that the methodology is most useful for comparisons across countries that are similar in scale. For example, standardization problems would be lessened if comparisons were limited to within three groups: South America and Mexico, Central America and the Greater Antilles, and the Lesser Antilles.

Post-Workshop Use of Data and Analysis

Working group members agree that a wealth of useful data and analysis has been captured through the checklist assessment and PI working group discussions. However, there are important limitations on how that data and analysis, and any analysis conducted subsequent to the workshop, should be used.

Reporting of workshop data and analysis of policy/institutional factors should be accompanied by explanatory text asserting the preliminary and experimental nature of the workshop exercise. Such text should include detailed statements of the limitations of the data and analysis, including, among others, the issues of sample size, standardization, and scale mentioned above.

In addition, reporting of workshop data and analysis of policy/institutional factors should be accompanied by explanatory text that could function as a "users' guide." Such text should include, for example, an explanation of how the data and analysis should be used to provide different answers to different questions, such as priorities for short-term, on-the-ground conservation interventions vs. long-term institutional strengthening strategies.

Working group members agree that it may be preferable to present data and analysis in qualitative rather than quantitative terms (i.e. high/medium/low as opposed to 1-5) to avoid creating an illusion of false precision, and to prevent users from focusing on numbers at the expense of the valuable qualitative information captured through the assessment process.

Working group members agree that policy/institutional data and analysis have a short half-life, and should be updated to coincide with the time-frame of decision-making processes.

Post-Workshop Refinement of Analysis

Working group members recommend that the analysis be improved by expanding the number of experts providing opinions. Accordingly, a broader, representative group (which could include USAID mission staff as well as additional in-country expertise) should be surveyed through the checklist instrument for each country being assessed.

Working group members recommend that for large countries in particular, supplementary expert opinion data should be collected for the sub-national level. This implies the development of two separate checklist assessment instruments, national and sub-national, in order to be able to disaggregate sub-national conditions and trends by province or state for countries such as Mexico and Brazil.

Other Recommendations

Working group members recommend that the checklist assessment instrument be provided to individual USAID missions and other organizations; these organizations should make an effort to collect some of the existing but "uncaptured" policy/institutional data identified by workshop participants as being useful for decision-making to inform future priority-setting exercises.

Working group members recommend that the names of individual experts should not be associated with specific policy/institutional scores in public reports.

APPENDIX E3

USING POLICY AND INSTITUTIONAL DATA - EXAMPLES

Following up on a recommendation from the Policy and Institutional (PI) working group at the Miami workshop, a mail survey was conducted subsequent to the workshop to obtain additional expert opinion data. The survey was sent to individuals suggested by members of the PI working group as having expertise on the political and institutional climates of a subset of seven Latin American countries selected for further PI analysis. A copy of the survey instrument is included in Appendix D.

The individuals surveyed represented a variety of institutional affiliations—including NGO representatives, academics, and government officials—and it was hoped that the sample would capture a range of perspectives. The purpose of the survey was to:

- develop a sample PI dataset to illustrate how PI factors could be used in the biodiversity priority-setting process; and
- test the utility of a mail survey as a mechanism for collecting PI data.

Slightly more than one-quarter of the 22 individuals contacted responded to the survey. Based on this experience, it would appear that a mail survey is an efficient method for collecting preliminary PI data, as a 25 percent response rate is considered average for mail surveys of this type. None of the respondees indicated that they had difficulty understanding and completing the questionnaire they received. The individuals surveyed were given only two weeks to respond. Through a combination of a longer grace period and follow-up phone calls to non-respondents, one might expect a higher response rate in future surveys.

Table 1 presents the results of the mail survey, augmented by expert opinion data collected from experts at the Miami workshop. For the seven countries depicted, the table shows average scores (on a five-point scale) questionnaire respondents gave when rating each country on the following four characteristics:

(i) political commitment;
(ii) institutional capacity;
(iii) additional factors affecting the effectiveness of external assistance; and
(iv) overall trend (for the previous three criteria).

TABLE 1. EXAMPLE OF POLICY/INSTITUTIONAL COUNTRY RANKINGS

Country	Total # of Responses	Political Commitment	Institutional Capacity	Other Factors	Overall Trend
Argentina	3	4.0	4.0	4.5	4.0
Bolivia	5	3.0	3.0	3.0	3.5
Chile	2	3.0	3.0	3.5	3.0
Colombia	2	3.5	3.0	3.5	4.0
Ecuador	7	2.5	2.5	3.0	3.0
Peru	6	2.5	3.0	3.0	3.0
Venezuela	3	3.0	2.5	2.5	3.0

Notes:

1. Data were collected from a survey of Miami workshop experts and of additional country experts identified at that workshop. Because of the relatively small total number of responses per country and the lack of standardization across responses, results presented here are illustrative only, and should not be used for priority-setting.

2. Numbers are rounded.

Data presented here are for illustrative purposes only. Because of the lack of standardization and small sample size (an average of only four responses per country), results should not be used for priority-setting.

To avoid the appearance of false precision in reporting inherently qualitative data, the PI working group recommended that PI results be reported as qualitative descriptions rather than as quantitative, raw scores (e.g., "low," "medium," and "high," rather than numerical scores on a 1-5 scale). As is evident from Table 1, PI scoring tended to cluster around the middle of the 1-5 range, perhaps due to reluctance on the part of experts to score countries as either an abysmal 1 or a perfect 5 (particularly in the absence of clear guidance on how to standardize the scoring). However, as differences between countries are indistinguishable when raw scores are lumped into three qualitative categories, for the limited purpose of this illustrative example the survey results are reported here as raw scores (which could easily be translated into five rather than three qualitative descriptors: very low, low, medium, high, and very high.)

Two examples illustrate how PI data might be used in a priority-setting framework. In these examples, only "institutional capacity" and "political commitment" scores are counted (i.e., scores for "additional factors" and "overall trends" do not weigh into the process). Figure 1 is a matrix showing the relative institutional capacity and political commitment scores of the seven countries included in this sample. Countries falling closest to the top left-hand axis represent countries with the highest capacity and commitment (corresponding to "cell A" in Table 4).

For the purposes of these examples, it is assumed that policy-makers are building a portfolio of biodi-

versity conservation investments, some with short-term, low-risk returns, and others with longer-term, higher-risk returns. It is further assumed that where priority RHUs are highly threatened (i.e., toward the critical end of the critical-intact spectrum in the conservation status analysis), policy-makers would favor investment where high institutional capacity exists, so that immediate, on-the-ground conservation activities would have a high probability of success. Conversely, it is assumed that where priority RHUs are toward the other end of the landscape integrity scale (i.e., representing more conservation potential than threat), policy-makers would be interested in investment in long-term capacity-building activities, and would weigh existing political commitment more heavily than existing institutional capacity.

Example 1: PI Data Used to Prioritize Among Countries that Share a Priority RHU

Many RHUs in the Latin America and Caribbean region straddle national boundaries, and policy-makers will be faced with the decision of which national portion to prioritize for investment. (Clearly, RHUs are not internally homogeneous in biological importance, conservation threat and opportunity, and utility either; for the purposes of this example, PI data will be assumed to be the most important discriminating variable.)

The tropical Andes, a priority RHU generated by the "hybrid" integration model, has significant portions of its area in four countries: Colombia, Peru, Ecuador, and Venezuela. For the purposes of illustration only, the PI expert opinion data set generated by Miami workshop participants and the mail survey is used to rank order the four countries for the two different investment objectives described above. As the tropical Andes RHU was rated as "endangered" on the landscape integrity scale, it is likely that policy-makers would favor investment in countries with high institutional capacity, where immediate conservation interventions could be expected to be effective in the short term (with political commitment also preferred

FIGURE 1. REPRESENTATION OF COMMITMENT AND CAPACITY OF SEVEN COUNTRIES SURVEYED

		INSTITUTIONAL CAPACITY								
	high	5	4.5	4	3.5	3	2.5	2	1.5	1
	5									
	4.5									
	4			Arg						
POLITICAL COMMITMENT	3.5					Col				
	3					Bol, Chi	Ven			
	2.5					Per	Ecu			
	2									
	1.5									
	1									

but given less weight). Priorities in this example would be, in descending order: Colombia, Peru, Venezuela, and Ecuador (see Figure 1).

If, in contrast, the Tropical Andes RHU had been rated as "stable" or "intact," policy-makers would be expected to favor opportunities to invest in building institutional capacity where political commitment is high to assure conservation of these areas in the long term. Priorities in this example would be, in descending order: Colombia, Venezuela, Peru, and Ecuador (see Figure 1).

Example 2: PI Data Used as a Tie-breaker Between Equivalent RHUs

In a few cases in the Latin American and Caribbean region, more than one RHU from a single major habitat type are given the same ratings for biological value and conservation status (i.e., the RHUs end up in the same box in the matrix included in Appendix B). In that case, integration models require a decision-rule for discriminating between the two otherwise equivalent RHUs, and using PI data to break the tie is one option. (Other options considered at the Miami workshop included utility data and aquatic biodiversity data.)

The NGO Working Group integration model ranks two herbaceous montane RHUs, Paramo and Puna, as having "high" biological value and "vulnerable" conservation status. For the purposes of illustration only, the PI expert opinion data set generated by Miami workshop participants and the mail survey is used to rank order the two RHUs for the two different investment objectives described above. In order to generate numerical PI scores for each RHU, the PI scores for each of the countries that harbors at least 10 percent of the Paramo (Colombia and Ecuador) and the Puna (Peru, Bolivia, Argentina, Chile) RHUs are combined. (In this example, the scores were given equal weight; alternatively, country scores could be weighted for percent area.) Ideally, sub-national level data for the PI characteristics of the relevant portion of each country would be available, facilitating comparison of all otherwise-equivalent RHU segments.

In this illustrative example, whether policy-makers wanted to make a short-term investment in on-the-ground conservation activities or a long-term investment in capacity-building, the Puna would be somewhat favored over the Paramo due to its higher composite scores for both institutional capacity and political commitment, although the difference in raw scores is small (see Table 2).

TABLE 2. USING PI DATA AS A TIE-BREAKER

Country	Political Commitment	Institutional Capacity
Argentina	4.0	4.0
Bolivia	3.2	3.1
Chile	2.8	2.8
Peru	2.5	2.8
Puna - PI average scores	3.1	3.1
Colombia	3.4	3.2
Ecuador	2.4	2.5
Paramo - PI average scores	2.9	2.8

APPENDIX F

ALPHABETICAL LIST OF WORKSHOP PARTICIPANTS

WORKSHOP ON GEOGRAPHIC BIODIVERSITY CONSERVATION INVESTMENT PRIORITIES IN LATIN AMERICA AND THE CARIBBEAN

MIAMI, FLORIDA, SEPTEMBER 27 - OCTOBER 1, 1994

Janet N. Abramovitz
8312 Garland Avenue
Takoma Park, MD 20912, USA
Tel/Fax: 301-587-1682

Ludmilla Aguiar
Conservation International
1015 18th Street, N.W., Ste 1000
Washington, D.C. 20036, USA
Tel: 202-429-5660
Fax: 202-887-0193

Márcio Ayres
Universidade Federal do Pará
Campus do Guamá
Belém - Pará, BRAZIL
Tel: (h) 55-91-225-1124
Fax: 55-91-229-0069

Tom Bancroft
Archbold Biological Station
P.O. Box 2057
Lake Placid, FL 33852, USA
Tel: 813-465-2571
Fax: 813-699-1927

Jim Barborak
Wildlife Conservation Society
4424 N.W. 13th Street, Suite A-2
Gainesville, FL 32609, USA
Tel: 904-371-1713
Fax: 904-373-6443

Ernesto Barriga
American Embassy
USAID/Bogota
APO AA 34038
Tel: 57-1-232-2100
Fax: 57-1-287-9397
email: Ernesto Barriga@usaid@bogota

Mario Baudoin
Casilla 3079
La Paz, BOLIVIA
Tel: 591-2-71-16-45
Fax: 591-2-79-75-11

Jeff Brokaw
USAID/LAC/DR/E
Room 2242 NS
Washington, D.C. 20523-0010, USA
Tel: 202-647-8070
Fax: 202-647-8098

Keith Brown
Department of Zoology
Institute of Biology
UNICAMP, CP 6109
Campinas, Sao Paulo
CEP 13083-970, BRAZIL
Tel: 55-192-397-022
Fax: 55-192-393-124

Dirk Bryant
World Resources Institute
1709 New York Avenue, N.W.
Washington, D.C. 20006, USA
Tel: 202-638-6300
Fax: 202-638-0036

George Burgess
Florida Musuem of Natural History
Museum Road
University of Florida
Gainesville, FL 32611, USA
Tel: 904-392-1721
Fax: 904-846-0287

Pablo Canevari
Wetlands for the Americas
Monroe 2142
1428 Buenos Aires, ARGENTINA
Tel/Fax: 541-781-6115
e-mail: canevari@wamani.apc.org

Roberto Cavalcanti
Universidade de Brasilia
Departamento de Ecologia
Brasilia, D.F. 70910-000, BRAZIL
Tel: 55-61-348-2265
Fax: 55-61-272-1497

Barry Chernoff
Field Museum of Natural History
Roosevelt Road at Lakeshore Drive
Chicago, IL 60605, USA
Tel: 312-922-9410, x. 255
Fax: 312-663-5397

Miguel Cifuentes
World Wildlife Fund
Central America Regional Office
Apdo 70 - CATIE 7170
Turrialba, COSTA RICA
Tel: 506-556-1383
Fax: 506-556-1421
e-mail: econet: wwfcr@en.igc.org

Salvador Contreras Balderas
Facultad de Ciencias Biológicas
Laboratorio de Ictiología
Universidad Autónoma de Nuevo Leon
A.P. 504
San Nicolas, NL, MEXICO 66450
Tel: 52-8-376-2813
Fax: 52-8-376-2231

Philip DeVries
Department of Biology
University of Oregon
Eugene, OR 97403, USA
Tel: 503-346-5953
Fax: 503-346-2364
e-mail: pdevries@darkwing.uoregon.edu

Alex Dickie
USAID/ROCAP
American Embassy/Guatemala
Unit 3324 APO AA 34024
APO Miami 34024-3190
Tel: 502-2-320-541
Fax: 502-2-320-523

Antonio Carlos Diegues
Universidade de São Paulo
Programa de Pesquisa e Conservação de
Area Umidas
Rua Anfiteatro 181
Colmeia Favo #6
Cidade Universitaria
05508-900, São Paulo, SP, BRAZIL
Tel: 55-11-818-3307
Fax: 55-11-813-5819

Eric Dinerstein
World Wildlife Fund
1250 24th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-293-4800
Fax: 202-293-9211

William Duellman
Museum of Natural History
University of Kansas
Lawrence, KS 66045, USA
Tel: 913-864-3342
Fax: 913-864-5335

Francisco Erize
Riobamba 1236 10Y "A"
1116 Buenos Aires, ARGENTINA
Tel: 54-1-813-7468
Fax: 54-1-112-707

Gustavo Fonseca
Conservation International - Brazil
Av. Antonio Abrahão Caram 820
Conj. 302
CEP 31275-000
Belo Horizonte, MG, BRAZIL
Tel/Fax: 55-31-441-1795

Robin Foster
Field Museum of Natural History
Botany Department
Roosevelt Road at Lakeshore Drive
Chicago, IL 60605-2496, USA
Tel: 312-922-9410, x229
Fax: 312-427-4920
email: foster@fmnh785.fmnh.org

Pat Foster-Turley
USAID/G/R&D/ENR
SA-18
Room 509-D
Washington, D.C. 20523, USA
Tel: 703-875-4539
Fax: 703-875-4639
e-mail: pfoster-turley@usaid.gov

Raul Gauto
Fundación Moises Bertoni
Casilla de Correos 714
Av. Rodriguez de Francis 770
Asunción, PARAGUAY
Tel: 595-21-440-238
Fax: 595-21-440-239

Douglas Graham
The World Bank
1818 H Street, N.W.
Washington, DC 20433, USA
Tel: 202-473-6667
Fax: 202-676-9373

Alejandro Grajal
Wildlife Conservation Society
185th Street and Southern Blvd.
Bronx, NY 10460-1099, USA
Tel: 718-220-7158
Fax: 718-364-4275
e-mail: wcsgrajal@aol.com

David Heesen
USAID/Costa Rica
Unit 2503
APO AA 34020
Tel: 506-220-4545
Fax: 506-220-3434

Andrew Henderson
New York Botanical Garden
200th Street and Southern Blvd.
Bronx, NY 10458-5126, USA
Tel: 718-817-8705
Fax: 718-220-6783

Jorge Hernandez Camacho
Calle 39, #18A-14
Apt. 401
Bogota, COLOMBIA
Tel: 57-1-288-0946
Fax: 57-1-245-5031

Richard Howard
Arnold Arboretum
Harvard University
22 Divinity Ave.
Cambridge, MA 02138, USA
Tel: 617-496-8923 (personal line)
Tel: 617-495-2365 (for messages)
Fax: 617-495-9484

Otto Huber
Fundación Botánico
Apartado 80-405
Caracas 1080-A, VENEZUELA
Tel/Fax: 58-2-977-2528
email: ohuber@dino.conicit.ve

Augustin Iriarte Walton
Chief of Wildlife Protection
Servicio Agrícola y Ganadero
Ministerio de Agricultura
Avenida Bulnes 140
Santiago, CHILE
Tel: 562-672-1394
Fax: 562-699-2778

Lisa Justice
The Nature Conservancy
1815 N. Lynn Street
Arlington, VA 22209, USA
Tel: 703-841-5300
Fax: 703-841-4880

Mary Kalin de Arroyo
Departamento de Biología
Facultad de Ciencias
Universidad de Chile
Casilla 653
Santiago, CHILE
Tel: 56-2-271-2865, x467
Fax: 56-2-271-5464

Shirley Keel
The Nature Conservancy
Latin American Division, CS&S
1815 N. Lynn St.
Arlington, VA 22209, USA
Tel: 703-841-5300
Fax: 703-841-4880

Stephen Kelleher
Biodiversity Support Program
c/o World Wildlife Fund
1250 24th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-293-4800
Fax: 202-293-9211

Rhema Kerr
The Hope Zoo
Hope Gardens
Kingston 7, JAMAICA
Tel/Fax: 809-927-1085

Molly Kux
U.S. Agency for Int'l Development
State Annex 2
AID/ANE/SEA/SPA, Room 102
Washington, D.C. 20523-0216, USA
Tel: 202-663-2618
Fax: 202-663-2643

Gerardo Lamas
Museo de Historia Nacional
Universidad Nacional Mayor San Marcos
Avenida Arenales 1256
Apartado 14-0434
Lima 14, PERU
Tel: 511-471-0117
Fax: 511-430-0607
e-mail: gerardo@musm.edu.pe

Craig MacFarland
836 Mabelle
Moscow, ID 83843, USA
Tel: 208-883-4876
Fax: 208-883-0653

Ricardo Machado
Conservation International
Washington, D.C. 20036, USA
Tel: 202-429-5660
Fax: 202-887-0193

Stanley A.J. Malone
Conservation International Suriname
Burenstraat No. 17, Tweede Etage
Gebouw Stadszendigs Complex
P.O. Box 2420
Paramaribo, SURINAME
Tel: 597-421-305
Fax: 597-421-172

Pablo Marquet
Departamento de Ecología
Pontificia Universidad Católica de Chile
Alameda 340, Casilla 114 - D
Santiago, CHILE
Tel: 562-686-2639/2620
Fax: 562-222-5515
e-mail: pmarquet@axon.bio.puc.cl

Roberto de la Maza
Conservational International Mexico
Camino al ajusco No. 124 1er piso
Jardines de la Montana
Codigo Postal 1410
Tlalpan, Mexico D.F. 14210, MEXICO
Tel: 52-5-631-3899/630-1407/630-1282
Fax: 52-5-631-3032

Naércio Aquino Menezes
Universidade de Sao Paulo
Instituto de Biociencias
Rua Do Matao - Travessa 14 N. 321
CEP 05508-900
Cidade Universitaria - SP, BRAZIL
Tel: 55-11-211-4773
Fax: 55-11-818-7416

Russell Mittermeier
Conservation International
1015 18th Street, N.W., Suite 1000
Washington, DC 20036, USA
Tel: 202-429-5660
Fax: 202-887-0193

Adriana Moreira, GCC Advisor
USAID/Brasilia
Office of AID Rep.
American Embassy/USAID
Unit 350
APO AA 34030
Tel: 55-61-225-8607
Fax: 55-61-225-9136

David Neill
Fundación Jatun Sacha
Casilla 17-12-867
Avenida Rio Coca 1734
Quito, ECUADOR
Tel/Fax: 593-2-441-592 or
c/o Missouri Botanical Garden
P.O. Box 299
St. Louis, MO 63166, USA
Tel: 314-577-9520
Fax: 314-577-9596

Daniel Nepstad
Woods Hole Research Center
13 Church Street
Box 296
Woods Hole, MA 02543, USA
Tel: 508-540-9900
Fax: 508-540-9700

Silvio Olivieri
Conservation International
1015 18th Street, N.W., Suite 1000
Washington, D.C. 20036, USA
Tel: 202-429-5660
Fax: 202-887-0193

David Olson
World Wildlife Fund
1250 24th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-293-4800
Fax: 202-293-9211

José Alberto Ottenwalder
Programa de las Naciones Unidas para
el Desarrollo
Avenida Anacaona No. 9
Apartado 1424
Santo Domingo, DOMINICAN REPUBLIC
Tel: 809-531-3403
Fax: 809-531-3507

Carlos A. Peres
Dept. of Ecology
Universidade de Sao Paulo
C.P. 11.461
Sao Paulo - S.P. 05422-970, BRAZIL
Tel: (h) 44-954-211-530
Fax: 44-223-333-786
email: peres001@cat.cce.usp.br

Bruce Potter
Island Resources Foundation
1718 P Street, NW, Suite T4
Washington, D.C. 20036, USA
Tel: 202-265-9712
Fax: 202-232-0748
e-mail: iresources@aol.com

Glenn Prickett
Policy and Program Coordination, Room 3673
USAID/PPC/POL/SP
320 21st Street, N.W.
Washington, D.C. 20523, USA
Tel: 202-647-8244
Fax: 202-647-9747

John Robinson
Wildlife Conservation Society
185th Street and Southern Blvd.
Bronx, NY 10460-1099, USA
Tel: 718-220-5155
Fax: 718-364-4275

Chris Rodstrom
Conservation International
1015 18th Street, N.W., Suite 1000
Washington, D.C. 20036, USA
Tel: 202-429-5660
Fax: 202-887-0193

Tobey Pierce
USAID/Guatemala
American Embassy/Guatemala
Unit #3323
APO AA 34024
Tel: 502-2-320-101
Fax: 502-2-311-151

George Powell
Centro Científico Tropical
San Pedro Montes de Oca
Barrio la Granja
100 al sur y 125 al este del Higueron
San Jose, COSTA RICA
Tel: 506-645-5024
Fax: 506-645-5003/645-5104

Kent Redford
The Nature Conservancy
1815 N. Lynn Street
Arlington, VA 22209, USA
Tel: 703-841-5300
Fax: 703-841-4880

Miguel Trefault Rodrigues
Universidade de São Paolo
Instituto da Biociencias
Caixa Postal 20.520
CEP 01452-990
São Paulo, BRAZIL
Tel: 55-11-818-7570
Fax: 55-11-818-7416/815-4272

Juan Pablo Ruiz
ECOFONDO
Carrera 12, No. 70-96
Santafé de Bogotá, COLOMBIA
Tel: 571-346-2310
Fax: 571-249-7590

Kathryn Saterson
Biodiversity Support Program
c/o World Wildlife Fund
1250 24th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-293-4800
Fax: 202-293-9211
email: saterson%wwfus@mcimail.com

Roger Sayre
The Nature Conservancy
1815 N. Lynn Street
Arlington, VA 22209, USA
Tel: 703-841-5300
Fax: 703-841-4880

Frances Seymour
World Wildlife Fund
1250 24th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-293-4800
Fax: 202-293-9211

Jorge Soberón
Comisión para el Conocimiento y Uso de la Biodiversidad
Dirección Técnica de Análisis y Prioridades
Periférico Sur 4118 - 1er piso
Col. Jardines de Pedregal
01900, México, D.F., MEXICO
Tel: 525-652-8069
Fax: 525-554-4332/1915

Douglas Stotz
Field Musuem of Natural History
Ornithology Department
Roosevelt Road at Lakeshore Drive
Chicago, IL 60605, USA
Tel: 312-922-9410
Fax: 312-922-1683
email: Stotz @ FMNH785.FMNH.org

Meg Symington
Biodiversity Support Program
c/o World Wildlife Fund
1250 24th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-293-4800
Fax: 202-293-9211
email: symingto%wwfus@mcimail.com

Avis Webster
World Wildlife Fund
1250 24th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-293-4800
Fax: 202-293-9211

Bruce Wilcox
Institute for Sustainable Development
3000 Sand Hill Road
Building 1, Suite 102
Menlo Park, CA 94025, USA
Tel: 415-854-5510
Fax: 415-854-2330

Michael Yates
USAID/Bolivia
APO Miami 34032
Tel: 591-2-786-358
Fax: 591-2-782-325

Frank Zadroga
c/o American Embassy/AID/M
P.O. Box 3087
Laredo, TX 78044, USA
Tel: 52-5-211-0042 x3550
Fax: 52-5-207-7558

INVITEES WHO WERE NOT ABLE TO ATTEND THE MIAMI WORKSHOP

Janis Alcorn
Biodiversity Support Program
c/o World Wildlife Fund
1250 24th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-293-4800
Fax: 202-293-9211

Mary Allegretti
c/o 925 25th Street, N.W.
Washington, D.C. 20037, USA
Tel: 202-623-2578/1852 (for messages)
Fax: 202-623-1786

Steve Beissinger
Yale University
School of Forestry & Environmental Studies
205 Prospect St.
New Haven, CT 06511, USA
Tel: 203-432-5100
Fax: 203-432-5942

Brian Boom
New York Botanical Garden
Bronx, NY 10458-5126, USA
Tel: 718-817-8705
Fax: 718-817-6504

Mario Boza
Caribbean Conservation Association

Courier Address:
Del Supermercado Mas por Menos
Cien metros al norte
Apartados Casa Mena #1
San Pedro de Montes de Oca, COSTA RICA
Tel: 506-224-9215
Fax: 506-225-7516

Postal Address:
AP 246
2050, San Pedro de Montes de Oca, COSTA RICA

Antonio Brack
PNUD - Guion Tratada Cooperación
Amazonica
Prolongación Primavera 654
Chacarilla Surco
Lima, PERU
Tel: 51-14-389-664/662
Fax: 51-14-49-87-18

Enrique Bucher, Director
Centro de Zoologia Aplicada
Universidad Nacional de Córdoba
Casilla 122
5000 Córdoba, ARGENTINA
Tel: 54-51-235-264
Fax: 54-51-241-191

William Bussing
Escuela de Biología
Universidad de Costa Rica
Ciudad Universitaria
San Pedro Montes de Oca
2060 San José, COSTA RICA
Tel: 506-224-1924
Fax: 506-224-9367

Bráulio Dias
Coordenador de Biodiversidade
Ministério do Meio Ambiente e da Amazonia Legal
Esplanada dos Ministérios - Bloco B - 5° andar
70068-900 Brasília DF, BRAZIL
Tel: 55-61-322-5635
Fax: 55-61-223-6800

Louise Emmons
The Smithsonian Institution
Division of Mammals
10th and Constitution Avenue, N.W.
Washington, DC 20560, USA

Oscar Flores
Instituto de Biología
UNAM
Ciudad Universitaria
AP 70-399
México D.F. 04510, MEXICO
Tel: 525-622-4825
Fax: 525-622-4828

Mark Collins
World Conservation Monitoring Centre
219 Huntington Road
Cambridge, CB3 0DL, UNITED KINGDOM
Tel: 44-223-277-314
Fax: 44-223-277-136

Rodolfo Dirzo
Centro de Ecología
Universidad Nacional Autónoma de México
Circuito Exterior
Ciudad Universitaria
Apartado Postal 70-399
México, D.F., MEXICO
Tel: 525-550-5485
Fax: 525-548-5259/662-8995

Ezequiel Ezcurra
Director General de Planeación Ecológica
Secretaria de Desarrollo Social (SEDESOL)
Av. Constituyentes 947
Edificio A, Planta Baja
Col. Belen de las Flores
México D.F. 01110, MEXICO
Tel: 525-271-2820
Fax: 525-271-1270

Enrique Forero, Director
Institute of Systematic Botany
New York Botanical Garden
Bronx, NY 10458-5126, USA
Tel: 718-817-8705
Fax: 718-562-6780

Luis Diego Gomez
Organization for Tropical Studies
Director Estación Las Cruces
Apartado 676-2050
San Pedro de Montes de Oca
San Jose, COSTA RICA
Tel: 506-440-6696
Fax: 506-773-3278 Biological Station
506-240-6783 San Jose Office

Arturo Gomez-Pompa
University of California-Riverside
Riverside, CA 92521, USA
Tel: 714-787-3519
Fax: 714-787-3856

Michael Goulding
6605 NW 57th Way
Gainesville, FL 32606, USA
Tel: 904-371-7490
Fax: 904-377-1323

Kathy MacKinnon
World Bank
Environment Department - GEF Office
Room S2129
1818 H Street, N.W.
Washington, D.C. 20433, USA
Tel: 202-458-4682
Fax: 202-522-3256

Dan Martin
The MacArthur Foundation
140 South Dearborn Street
Suite 1100
Chicago, IL 60603-5285, USA
Tel: 312-726-8000
Fax: 312-917-0334

Eduardo Martins
WWF
SHIS EQ QL 6/8-Conjunto E 2° andar
71620-430 Brasília DF, BRAZIL
Tel: 55-61-248-2899
Fax: 55-61-248-7176

Javier de la Maza
Conservational International Mexico
Camino al ajusco No. 124 1er piso
Jardines de la Montana
Codigo Postal 1410
Tlalpan, Mexico D.F. 14210, MEXICO
Tel/Fax: 52-5-543-8344

James Nations
Conservation International
1015 18th Street, N.W., Suite 1000
Washington, D.C. 20036, USA
Tel: 202-429-5660
Fax: 202-887-5188

Herbert Raffaele
Western Hemisphere Coordinator
U.S. Fish and Wildlife Service
4401 N Fairfax Drive, Room 860
Arlington, VA 22203, USA
Tel: 703-358-1767
Fax: 703-358-2849

Mario Ramos
World Bank
1818 H Street, N.W.
Washington, D.C. 20433, USA
Tel: 202-473-3297
Fax: 202-522-3240/3245

Yves Renard
Caribbean Natural Resources Institute
(CANARI)
Clark Street
Vieux Fort, ST. LUCIA
Tel: 809-454-6060
Fax: 809-454-5188

Ronald Ruybal
USAID/Ecuador
Office of the AID Representative
American Embassy/Quito
Unit 5330
APO AA 34039-3420
Tel: 593-252-1100
Fax: 593-256-1228

Steve Sanderson
Center for Latin American Studies
University of Florida
314 Grinter Hall
Gainesville, FL 32611-5531, USA
Tel: 904-392-0375
Fax: 904-392-7682

Jay M. Savage
Department of Biology
University of Miami
Coral Gables, FL 33124, USA
Tel: 305-284-2130/3973 (for messages)
Fax: 305-284-3039

Javier Simonetti
Universidad de Chile
Departamento de Biología
Facultad de Ciencias
Casilla 653
Santiago, CHILE
Tel: 56-2-271-2865, x. 313
Fax: 562-272-7363
email: jsimonet@abello.seci.uchile.cl.

Ed Towle
Island Resources Foundation
1718 P Street, N.W., Suite T4
Washington, D.C. 20036, USA
Tel: 202-265-9712
Fax: 202-232-0748

Brady Watson
TNC Nicaragua Office
Nica Box 271
P.O. Box 025640
c/o Trans-Express Nicaragua
2898 Northwest 79th Ave.
Miami, FL 33122, USA
Tel/Fax: (in Nicaragua) 505-2-780-074

Stanley Weitzman
Division of Fishes
National Museum of Natural History
Smithsonian Institution
Washington, D.C. 20560, USA
Tel: 202-357-3379
Fax: 202-357-2986

Tom Zanoni
Institute of Systematic Botany
New York Botanical Garden
Bronx, NY 10458-5126, USA
Tel: 718-817-8705
Fax: 718-562-6780

APPENDIX G

WORKSHOP AGENDA: GEOGRAPHIC BIODIVERSITY CONSERVATION INVESTMENT PRIORITIES IN LATIN AMERICA AND THE CARIBBEAN

SHERATON BISCAYNE BAY, MIAMI, FLORIDA

September 27 - October 1, 1994

MONDAY, SEPTEMBER 26

NGO Working Group members arrive
GIS/Administrative staff arrive

TUESDAY, SEPTEMBER 27

All other participants arrive

2 pm - 6 pm	Workshop Registration. Look for table near the Hotel Lobby Registration Desk.
6 pm - 8 pm	OPENING PLENARY Session: Introduction of priority setting project, project objectives, expected results, introduction of participants
8 pm - 10 pm	Reception - Bayside Terrace

WEDNESDAY, SEPTEMBER 28

Biological (Taxonomic) Maps and Policy/Institutional Methods

7:00 - 8:00 Continental Breakfast

8:00 - 9:30 PLENARY Session: Review of agenda; review of process and products; assignment of tasks and working groups; introduce habitats and aggregated ecoregions

9:30 - 10:30 Seven Simultaneous Working Group Sessions

Six taxonomic working groups (see List A for proposed members) convene to review data collected for birds, mammals, herps, butterflies, plants and freshwater fish, revise and add data as necessary.

Policy/institutional (PI) working group (see List B for proposed members) convenes for introduction and overview of the institutional component—purpose, data, methodology. Review additions and revisions to data indicators, revise where necessary.

10:30 - 10:45 Morning Coffee Break

10:45 - 12:30 Continue with Working Group Sessions

12:30 - 1:30 Lunch Buffet

1:30 - 4:15 Simultaneous Taxonomic and PI working groups reconvene. By the end of the day biological priority maps are produced for 6 taxonomic groups: birds, mammals, freshwater fish, insects (butterflies), herps and plants. These taxonomic priority maps integrate considerations of alpha diversity, beta diversity, higher taxonomic diversity, endemism and presence of threatened and endangered species for each taxonomic group. Methods for weighting these indicators and proxy indicators for habitat diversity discussed.

PI working group reviews checklist indicators and revises where necessary. Trial application of country-level assessment. Assess and refine overall methodology. Discuss weighting schemes. Bruce Wilcox will confer with individuals from biological priorities group to complete assessment of species-level utility data. Outputs: By end of day, will have a revised institutional assessment methodology, and proposals for how to weight component categories.

4:15 - 4:30 Afternoon Coffee Break

4:30 - 7:30 Continue with Working Group Sessions

7:30 Adjourn for the Day

THURSDAY, SEPTEMBER 29

Overall Biological Priority Maps and Policy/Institutional Feasibility

7:00 - 8:00	Continental Breakfast
8:00 - 10:30	Simultaneous Subregional Biological Working Groups (see List C attached) convene to prepare one integrated biological priority map (integrating six separate taxonomic priority maps). PI Working Group: regional subgroups apply revised methodology to assess all LAC countries. Review data and possible weighting schemes.
10:30 - 10:45	Morning Coffee Break
10:45 - 12:30	Continue Subregional Biological and PI working groups. PI working group: presentation of utility component. Data assessment.
12:30 - 1:30	Lunch Buffet
1:30 - 4:15	Continue Subregional Biological and PI working groups. PI Working Group: Complete utility data assessment, discuss ranking scheme. Outputs: By end of day will have completed national-level institutional assessment, collected and revised all data for utility overlay.
4:15 - 4:30	Afternoon Coffee Break
4:30 - 5:30	Continue Subregional Biological and PI working groups.
5:30 - 7:30	PLENARY Session for presentation of subregional integrated biological priority maps and discussion
7:30	Adjourn for the Day

FRIDAY, SEPTEMBER 30

Conservation Threat & Opportunity and Policy/Institutional at Sub-National Level

7:00 - 8:00	Continental Breakfast
8:00 - 9:30	PLENARY Session to explain data needs from experts concerning conservation threat and opportunity. PI Working Group will explain sub-national institutional assessment methodology.
9:30 - 10:30	Subregional Conservation Threat & Opportunity Working Groups (see List D attached) will convene to identify and delineate relatively intact blocks of original habitat, identify and delineate important landscape features such as corridors, areas containing critical habitat for various components of biodiversity and areas important for critical ecosystem functions (e.g., watershed protection). Discussion of methods for assessing the relative degree of degradation of habitat types. PI Working Group's core institutional members (several individuals not involved in threat assessment) will review and revise national-level assessment, propose methods for integrating with utility sub-component.
10:30 - 10:45	Morning Coffee Break
10:45 - 12:30	Continue Subregional Conservation Threat & Opportunity and PI working groups.
12:30 - 1:30	Lunch Buffet
1:30 - 4:15	Subregional Conservation Threat & Opportunity Working Groups continue to meet. PI Working Group: regional subgroups will complete sub-national assessment for select areas (AUs that look like they will emerge as investment priorities biologically). Outputs: By the end of the day, will have completed both the utility and sub-national institutional overlay.
4:15 - 4:30	Afternoon Coffee Break
4:30 - 7:30	Continue subregional conservation threat & opportunity and PI working groups. Produce conservation threat & opportunity maps by subregion. Produce national and sub-national policy/institutional feasibility priorities.
7:30	Adjourn for the Day

SATURDAY, OCTOBER 1

Integration and Recommendation of Investment Priorities

7:00 - 8:00	Continental Breakfast
8:00 - 9:30	PLENARY Session to present conservation threat and opportunity priority maps by subregions.
9:30 - 10:45	PLENARY Presentation of policy/institutional feasibility, and human utility priorities.
10:45 - 11:00	Morning Coffee Break
11:00 - 12:30	PLENARY to explain and begin integration.
12:30 - 1:30	Lunch buffet
1:30 - 4:15	Smaller working groups meet to produce integration of three levels of analysis (Biological, Threat/Opportunity, Policy/Institutional). Preliminary integration scenarios attempted for the aggregated ecoregions within one Major Habitat Type.
4:15 - 4:30	Afternoon Coffee Break
4:30 - 5:00	Smaller integration groups continue to meet.
5:00 - 6:30	PLENARY to present integration results. Closing.
7:30 - 10:30	Closing dinner (Cash bar opens at 7:30, dinner at 8:30)

SUNDAY, OCTOBER 2

Regional Experts and observers depart.

8:00 - 11:00	Core NGO/USAID Working Group meeting to discuss workshop results and discuss schedule and activities for integration and development of products for USAID.

LIST A

BIOLOGICAL (TAXONOMIC) WORKING GROUPS

Birds
Alejandro Grajal
Doug Stotz
Roberto Calvalcanti
José Ottenwalder
George Powell
Pablo Canevari

Mammals
Ernesto Barriga
Jorge Hernandez Camacho
Russ Mittermeier
Gustavo Fonseca
Carlos Peres
John Robinson
Kent Redford
Eric Dinerstein
Meg Symington
Rhema Kerr
Pablo Marquet
Márcio Ayres
Agustin Iriarte

Plants
Adriana Moreira
Richard Howard
Robin Foster
David Neill
Shirley Keel
Andrew Henderson
Stan Malone
Mary Kalin Arroyo
Otto Huber
Jorge Soberón

Herps
Miguel Rodrigues
Bill Duellman

Insects
David Olson
Roberto de la Maza
Keith Brown
Gerardo Lamas
Phil DeVries

Fish
Naercio Menezes
Barry Chernoff
George Burgess
Salvador Contreras
Pat Foster-Turley

LIST B

POLICY/INSTITUTIONAL FEASIBILITY WORKING GROUP

Working Group Members
Frances Seymour
Dirk Bryant
Bruce Wilcox

Mexico/Central America/Caribbean
Miguel Cifuentes
Jim Barborak
Bruce Potter
David Heesen
Alex Dickie
Frank Zadroga
Tobey Pierce

South America
Dan Nepstad
Antonio Carlos Diegues
Juan Pablo Ruiz
Francisco Erize
Mario Baudoin
Raul Gauto
Mike Yates

LIST C

SUBREGIONAL BIOLOGICAL WORKING GROUPS

Mexico
Jorge Soberón
Roberto de la Maza
Salvador Contreras

Central America
George Powell
George Burgess
Phil DeVries

Caribbean
Richard Howard
Rhema Kerr
Stan Malone
José Ottenwalder

Northern South America
Robin Foster
David Neill
Gerardo Lamas
Doug Stotz
Andrew Henderson
Carlos Peres
Márcio Ayres
Barry Chernoff
Otto Huber
Jorge Hernandez Camacho
Bill Duellman

Southern South America
Gustavo Fonseca
Naercio Menezes
Roberto Calvalcanti
Keith Brown
Miguel Rodrigues
Adriana Moreira
Shirley Keel
Pablo Canevari
Pablo Marquet
Mary Kalin Arroyo
Agustin Iriarte

LIST D

CONSERVATION THREAT/OPPORTUNITY WORKING GROUPS

Mexico
Frank Zadroga
Jorge Soberón
Roberto de la Maza
Salvador Contreras

Central America
Miguel Cifuentes
Jim Barborak
George Powell
Alex Dickie
George Burgess
David Heesen

Northern South America
Bill Duellman
Juan Pablo Ruiz
Jorge Hernandez Camacho
Otto Huber
Gerardo Lamas
Robin Foster
David Neill
Andrew Henderson
Dan Nepstad
Antonio Carlos Diegues
Carlos Peres
Márcio Ayres
Barry Chernoff
Mario Baudoin
Mike Yates

Caribbean
Richard Howard
Rhema Kerr
Bruce Potter
Stan Malone
José Ottenwalder

Southern South America
Shirley Keel
Roberto Calvalcanti
Keith Brown
Miguel Rodrigues
Gustavo Fonseca
Phil DeVries
Pablo Canevari
Pablo Marquet
Agustin Iriarte
Francisco Erize
Raul Gauto
Naercio Menezes
Adriana Moreira
Mary Kalin Arroyo
Ernesto Barriga

APPENDIX H

LITERATURE CITED AND BIBLIOGRAPHY OF OTHER SELECTED BIODIVERSITY PRIORITY SETTING REFERENCES

Bibby, C.J., N.J. Collar, M.J. Crosby, M.F. Heath, T.H. Johnson, A.J. Long, A.J. Stattersfield, and S.J. Thirgood. 1992. *Putting Biodiversity on the Map: Priority Areas for Global Conservation.* International Council for Bird Preservation, Cambridge, U.K.

Conservation International. 1990. *The Rainforest Imperative.* Conservation International, Washington, D.C.

Conservation International. 1995. *Map of Biodiversity Conservation Priority Areas in the Atlantic Coastal Forest Region of Northeastern Brazil.* Conservation International, Washington, D.C.

Dinerstein, E., D.M. Olson, D.J. Graham, A. Webster, S. Primm, M. Bookbinder, M. Forney, G. Ledec. 1995. *A Conservation Assessment of the Terrestrial Ecoregions of Latin America and the Caribbean.* World Wildlife Fund Report to The World Bank/LATEN, January 1995.

Dinerstein, E. and E. Wikramanyake. 1993. "Beyond "Hotspots": How to Prioritize Investments in Biodiversity in the Indo-Pacific Region." *Conservation Biology* 7:55-65.

Forey, P.L., C.J. Humphries, and R.I Vane-Wright (eds.) 1994. *Systematics and Conservation Evaluation.* Clarendon Press, Oxford, U.K.

IBAMA/INPA/CI. 1991. *Workshop 90: Biological Priorities for Conservation in Amazonia.* Map and legend prepared from January 1990 conference in Manaus sponsored by IBAMA, INPA, Conservation International, the New York Botanical Graden, the Smithsonian Institution, and the Royal Botanic Gardens. Conservation International, Washington, D.C.

IUCN. 1987. *Centres of Plant Diversity: A Guide and Strategy for their Conservation.* IUCN Threatened Plants Unit, Kew, Richmond, U.K.

Johnson, N. (In Press). *Biodiversity in the Balance: Approaches to Setting Geographic Conservation Priorities.* Biodiversity Support Program, Washington, D.C.

MacKinnon, J. and K. MacKinnon. 1986. *Review of the Protected Areas System in the Indo-Malayan Realm.* IUCN/UNEP, Gland, Switzerland.

Margules, C.R., A.O. Nicholls, and R.L. Pressey. 1988. "Selecting Networks of Reserves to Maximize Biological Diversity." *Biological Conservation* 43: 63-76.

Mittermeier, R.A. 1988. "Primate Diversity and the Tropical Forest: Case Studies from Brazil and Madagascar and the Importance of Megadiversity Countries." In: E.O. Wilson (ed.), *Biodiversity*, pp. 145-154. National Academy Press, Washington, D.C.

Myers, N. 1988. "Threatened Biotas: Hot-Spots in Tropical Forests." *The Environmentalist* 8(3):187-208.

Myers, N. 1990. "The Biodiversity Challenge: Expanded Hot-Spots Analysis." *The Environmentalist* 10(4):243-256.

Olson, D. M. and Cintron, G. In prep. "Conservation Assessment of Mangrove Ecosystems."

Sisk, T.D., A.E. Launer, K.R. Switky, and P.R. Ehrlich. 1994. "Identifying Extinction Threats." *BioScience* 44(9):592-604.

Terborgh, J. 1974. "Preservation of Natural Diversity: The Problem of Extinction Prone Species." *BioScience* 24:715-722.

Terborgh, J. 1986. "Keystone Plant Resources in the Tropical Forest." In: M.E. Soulé, (ed.) *Conservation Biology: The Science of Scarcity and Diversity*, pp. 330-344. Sinauer Associates, Sunderland, MA.

USAID. March 1994. "Strategies for Sustainable Development."

Wilcox, B. 1994. "Valuing Biodiversity: The Concept and Enumeration of Ecosystem Goods and Services." Working paper, Institute for Sustainable Development, Menlo Park, CA.

Biodiversity Support Program

WWF

The Nature Conservancy

A U.S.A.I.D.-funded consortium of World Wildlife Fund, The Nature Conservancy, and World Resources Institute

Dear Colleague,

It is with great pleasure that we enclose the report, "A Regional Analysis of Geographic Priorities for Biodiversity Conservation in Latin America and the Caribbean." The Biodiversity Support Program (BSP), in collaboration with five leading conservation organizations (Conservation International, The Nature Conservancy, Wildlife Conservation Society, World Resources Institute, and World Wildlife Fund) produced this report at the request of the U.S. Agency for International Development (USAID). The report highlights those areas in Latin America and the Caribbean which merit special focus because of their importance for biodiversity conservation at the regional level. Using an integrative methodology that considers a diverse array of biological as well as social and institutional criteria, 14 habitats are identified as highest or high priority for biodiversity conservation efforts.

Although the report was prepared for USAID, we anticipate that other donors, conservation organizations, and practitioners will find it useful in developing more effective processes for setting geographic biodiversity conservation priorities. The report has already had a significant impact on USAID programs in the field, enabling USAID missions in Brazil and Paraguay to justify new biodiversity conservation investments in the Atlantic Forest and Chaco, respectively. The framework used in this exercise could also be easily adapted to set geographic priorities at a subregional or national level.

We welcome your comments or questions concerning the report. You can contact us at the address or fax number given below, or via e-mail at <symingto%wwfus@mcimail.com>.

Kathy Saterson

Kathryn A. Saterson
Executive Director

Meg Symington

Margaret M. Symington
Director for Latin America
and the Caribbean

c/o World Wildlife Fund • 1250 24th Street, NW • Washington, DC 20037 • Tel: (202) 293-4800 • Fax: (202) 293-9211 • Telex: 64505 PANDA