

**Biodiversity
Support
Program**

**Biodiversity in the Balance:
Approaches to Setting Geographic
Conservation Priorities** By Nels Johnson

**The Biodiversity Support Program is a USAID-funded
consortium of World Wildlife Fund,
The Nature Conservancy, and
World Resources Institute**

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Approaches to Setting
Geographic Conservation Priorities**

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Cover photographs show various components of biodiversity (from left to right): 1) the species is *Chundropython uiridis*, a python native to the island of New Guinea, 2) the ecosystem is a tropical forest on St. Lucia, the Caribbean, and 3) the genetic diversity shown is a wealth of indigenous foods on display at a marketplace in Mexico. A map of Papua New Guinea shows priority areas for the conservation of biodiversity.

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FOREWORD

Growing awareness during the last fifteen years of the unprecedented elimination of the earth's biological diversity has stimulated new national and international conservation programs and policies. The geographic areas receiving the greatest conservation funding and attention from national governments, nongovernmental organizations, and international donors have been selected for many reasons, including biology (e.g., how rich in species an area is), politics (e.g., a foreign aid program operates in a certain country and elects biodiversity as its area of focus), and economics (e.g., people depend on an area's biological resources for their economic development). Conservation investment decisions have rarely been made in a systematic, analytical, and transparent manner.

Setting conservation priorities is not an easy or comfortable undertaking. We believe that biological diversity and biological resources should be conserved **everywhere** because of their critical role in meeting human needs (from the physical to the spiritual) and in maintaining local and global ecological processes. Some people reject the concept of priority setting because they fear that the very act of setting priorities will result in supposedly "low priority" areas never getting attention. Yet either explicitly or implicitly, every conservation investment decision is a statement of priorities, with the funding organization or government investing in areas it considers to be a high priority.

The realization that the magnitude of the biodiversity crisis far exceeds the financial resources available has led to numerous efforts over the last decade to determine geographic conservation priorities. At the same time, the information available to assist in determining priorities has been increasing due to new remote-sensing technologies and research results in many fields. We are gaining a better understanding of the distribution of biodiversity, of biodiversity's importance for meeting human needs and for maintaining ecological processes, and of the threats that human endeavors pose to the maintenance of biodiversity. All this information can play a role in determining where biodiversity conservation actions are needed with the greatest urgency.

The Biodiversity Support Program supported the production of *Biodiversity in the Balance: Approaches To Setting Geographic Conservation Priorities* because we believed it was important to review the various approaches to priority setting in order to encourage all those individuals, organizations, and agencies investing in conservation to analyze the assumptions behind their decisions and to clarify, and perhaps revise, the reasons for their investments.

Much of the literature on conservation priorities in the 1970s focused on identifying those highly visible species most at risk of extinction. Legislation such as the U.S. Endangered Species Act and the Convention on International Trade in Endangered Species (CITES) focused on conserving species vulnerable to extinction.

As the complexity of biodiversity received more attention during the 1980s, scientists and conservationists began to focus on other dimensions of biodiversity in setting priorities. They began to concern themselves with issues such as economically important plants and animals, marine biodiversity, and the importance of representative ecosystems and biogeographic regions. By the late 1980s, international agencies, national governments, and private foundations increasingly sought advice on how to clearly define conservation priorities in order to spend limited financial resources effectively. Even as a global perspective was added to priority setting, however, most methods continued to emphasize the evaluation of biological information. The establishment of the Global Environmental Facility (GEF) in 1990 and the initiation of the Convention on Biological Diversity in 1993 further increased recognition of

the need for priority setting in determining how best to support conservation. Most of the methods described by this book are based primarily on biological criteria. Yet, we know the success of conservation efforts depends on the influence of social, economic and institutional factors. For this reason, we believe newer approaches that integrate biological with non-biological criteria in the priority-setting process hold particular promise.

Biodiversity in the Balance clearly outlines why setting conservation priorities is important, what methods and approaches have been used to date, and how setting biodiversity priorities can be more effective for a range of conservation objectives. We believe that everyone concerned about the conservation of biodiversity -- non-governmental organizations, national governments, and international donors -- will benefit from this synthesis of priority-setting issues and approaches. We welcome your thoughts and reactions.

KATHRYN A. SATERSON
EXECUTIVE DIRECTOR
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EXECUTIVE SUMMARY

Government agencies, donor institutions, and nongovernmental organizations (NGOs) around the world face hard choices about where to conserve biodiversity with limited financial resources. One response to this problem has been to define conservation priorities geographically by identifying the ecosystems, habitats, or species most important to conservation goals. Efforts to implement the Convention on Biological Diversity will spur interest in setting such geographic priorities to help institutions choose among conservation actions in coming years.

Done well, this kind of priority-setting exercise can boost conservation efforts in several ways. Not only does priority setting save time, money, and personnel, but it often generates new knowledge about the distribution and status of biological resources in the geographic areas evaluated. A deliberate and well-documented priority-setting process can make conservation planning and decision-making more transparent, giving the public a sense of how priorities were selected and enhancing the scientific credibility of conservation decisions. Just as important, this process will appeal to conservation funders since they want to see their resources targeted on strategic and well-justified priorities.

Priorities reflect value judgments, so it follows that they flow from prior decisions about what matters most. Establishing biodiversity conservation priorities demands a conscious effort to assign values to genes, species, and/or ecosystems and to then evaluate risks and opportunities in light of those value judgments in order to decide which conservation efforts should get the highest priority. Biodiversity can be valued from so many different perspectives -- utilitarian, cultural, aesthetic, moral, political, and scientific -- that there cannot be a universal scheme for establishing priorities.

Any deliberate priority-setting effort uses criteria to narrow the elements of biodiversity considered for priority status. The complexity of biodiversity and the number of ways to value it make a host of criteria theoretically possible, but only a handful of them are commonly used. Among the biological criteria are *richness* (the number of species -- or ecosystems -- in a given area), *rarity*, *threat* (degree of harm or danger), *distinctiveness* (how much a species differs from its nearest relative), *representativeness* (how closely an area represents a defined ecosystem), and *function* (the degree to which a species or ecosystem affects the ability of other species or ecosystems to persist).

Some priority-setting approaches use social, policy, and institutional criteria as well. *Utility*, the most common non-biological criterion, points to biodiversity elements of known or potential use to humankind. Utility may be narrowly defined as economic value, but in a broader sense it can signify scientific, social, cultural, or religious significance as well. *Feasibility*, often paramount in deciding how to allocate conservation resources, may be defined in political, economic, logistical, or institutional terms. Considering feasibility along with biological criteria helps identify areas where conservation actions are most likely to succeed. These criteria are newer entries to the field than biological criteria, but their use will increase alongside growing recognition that social, policy, and institutional factors are crucial to conserving biodiversity.

Many methods of setting geographic priorities for a wide range of conservation objectives have emerged over the last decade. Some are based on *genetic* analysis, some on *species* analysis (including systematic analysis of evolutionary relationships at taxonomic levels higher than species), and some on *ecosystem* analysis. These three categories of methods rely mainly on biological information, but may use any of the biological or social and institutional criteria. A fourth category comprises *integrative* methods that include significant consideration of economic, social, and cultural factors in addition to biological factors.

No one priority-setting method fits all conservation objectives. For example, if the objective is to conserve a representative array of a country's natural ecosystems, a priority-setting approach that relies on species richness may neglect to represent important ecosystems that are relatively species-poor.

Global geographic priority-setting approaches have included identifying "megadiversity" countries that are unusually rich in biodiversity, "hotspots" where species-rich ecosystems are imminently threatened, and "major wilderness areas" where limited conservation efforts may avoid the intensive efforts needed in more threatened areas. Smaller-scale efforts-including the "centres of plant diversity" project initiated by the IUCN and the "endemic bird areas" project of Birdlife International -- identify specific sites where many species belonging to a major taxonomic group are found. Finally, the World Conservation Union's Commission on National Parks and Protected Areas (IUCN/ CNPPA) and others are working to identify a series of sites that could form the basis of a network of marine protected areas representing all of the world's major coastal and marine bioregions.

Global priority-setting efforts are driven by several considerations. First, biodiversity is unevenly distributed, with some nations having more diversity than others, just as some ecosystems have more species than others. An area's biological resources may be valuable to the world at large, not just to its community or nation, especially if the genetic material found therein holds the promise of agricultural or pharmaceutical advances. And conserving biodiversity will require international investments to share the cost of maintaining biological resources whose benefits often flow beyond national borders.

Some of the most innovative priority-setting is taking place at the regional level, an intermediate plane between national and global that avoids both the imprecision of global priorities and the arbitrariness of national borders. Regional approaches can form the basis of multinational networks and alliances to promote biodiversity conservation, share experiences, and develop cross-border conservation projects. For example, in South and Southeast Asia, sub-Saharan Africa, and Oceania, systematic reviews have been carried out to identify gaps in protected areas coverage. Conservation International and other groups have been using "expert workshops" to rapidly identify important conservation areas by using existing data and the consensus of experienced scientists and conservationists. Conservation biologists at World Wildlife Fund/U.S. and other organizations are developing dynamic models to categorize regional ecosystems by their conservation needs. A consortium effort led by the Biodiversity Support Program has developed an integrative framework that considers regional priorities from biological, conservation potential, and policy/institutional perspectives. While such approaches can only be as effective as the conservation strategies used to implement their recommendations by the region's nations, they are probably more promising than global approaches.

The priority-setting that takes place at national and local levels will have the most impact. Priorities set at these levels are indispensable because they are more likely to focus on specific conservation objectives; specify species, ecosystems, or sites; reflect national and local values and needs; mesh with policy and planning processes; engage a wider spectrum -- from government agencies to NGOs and local communities -- in the process; and fit their plans to the available financial and human resources. In addition, priorities set at this level indicate to international donor agencies and conservation organizations which ecosystems, habitats, and species are considered most important from a national perspective.

Relatively few countries have established clearly defined conservation priorities. Even fewer have consensus priorities that are actively used to guide conservation activities or to direct government and donor resources. As a result, biodiversity gets short shrift in many planning and policy processes (e.g., Tropical Forestry Action Plans and National Environmental Action Plans) that determine how resources

are used or where development takes place. In the absence of good conservation priorities, these processes may actually speed the loss of biodiversity rather than strengthen its conservation. At the very least, the absence of geographic priorities in such processes represents lost opportunities for focusing conservation efforts.

However, a growing number of priority-setting efforts have been applied in such countries as Brazil, Papua New Guinea, Bulgaria, the United States, Australia, and Mexico, and some of them have influenced the allocation of conservation resources. The wide range of approaches used at the national level illustrate an important point. There is no one "right" way to set priorities -- each approach reflects a unique set of objectives, underlying values or assumptions, and circumstances.

There are nonetheless principles that can make any such priority-setting exercise more effective:

1. Link Biodiversity Priorities with Clear Conservation Goals and Objectives.

All priorities are determined with some objective in mind -- the key is to ensure that the objective is explicit and can be understood by others. Whether the objective is to maintain the broad diversity of life associated with natural habitats, or to maintain the diversity of agricultural and semi-domesticated species and varieties, no set of priorities makes much sense without a link to clearly defined objectives.

2. Use a Replicable, Transparent Process to Develop Credible Priorities.

Using a transparent, replicable approach is important because it lends credibility to the priorities selected, minimizes the role of prejudice, clarifies assumptions and value judgments, and reveals what information was or was not evaluated. Explicitness is always a virtue in setting priorities, and it will save time, effort, and mistaken speculation when priorities are subsequently revised or reviewed by others.

3. Clarify Local, National, and Global Bio-diversity Conservation Priorities.

Conserving biodiversity is a common concern of all humanity, but this shared concern does not translate into shared priorities or perceptions -- which vary depending on whether the point of view is global, regional, national, or local. Enduring solutions demand that a partnership be reached among all interested parties and that the legitimacy of their perceptions and interests be recognized at whatever scale priorities are identified.

4. Evaluate the Advantages and Disadvantages of Relevant Priority-Setting Schemes.

Biodiversity can be thought of as a vast collection of many elements -- genes, species, and ecosystems -- differentially distributed in space. Any priority-setting scheme will only identify some subset of these elements and will usually consider only some portion of the biosphere's total space. For any given objective, some approaches will be more suitable than others and decisions about what methodology to use should be informed by consideration of the strengths and limitations of the chosen scheme with respect to the subset of biodiversity being considered.

5. Make Full Use of Relevant and Available Information.

Priorities are only as good as the information they are based on. Knowing where the data came from, when and how they were collected, and whether they were subject to expert review and ground-truthing is essential to any credible scientific effort. However, a dearth of data should seldom be used as an excuse

not to set priorities -- all available information should be fully utilized. For example, local communities can provide indispensable information on species distribution patterns and conservation status and identify social and economic issues which may be relevant to the priority-setting process.

6. Involve Those Responsible for Implementing Conservation Actions.

Who will be responsible for taking action once the biodiversity conservation priorities have been identified? For any particular subset of biodiversity in any particular place, certain institutions (e.g., government agencies, local communities, NGOs, or universities) will have responsibilities, interests, and capacities for taking actions to conserve priority species or ecosystems. It may be possible to identify sound priorities without involving these institutions, but it is unlikely that the actions given priority will be effectively carried out without their cooperation.

7. Involve Communities and Other Stake-holders.

People will be living in most areas identified as conservation priorities, and conservation efforts can have significant impacts on them. Bringing local people into the process offers opportunities to build respect, trust, and collaborative relationships between them and outside conservationists from the beginning. While it may be impractical to involve local people in large-scale (e.g., global or regional) priority-setting efforts, local involvement should be considered whenever possible.

8. Consider How Priorities Fit in a Policy and Institutional Context.

Once a basic set of conservation priorities has been determined, it will usually be impossible to undertake actions in all areas simultaneously. Decision-makers who must allocate resources inevitably confront this issue, but too often they must make decisions in a vacuum -- without knowing why a particular set of priorities was selected or which ones are most urgent. For this reason, priority-setters should be prepared to be involved in the policy process that transforms a set of systematically chosen and scientifically credible priorities into a series of decisions about where to spend money, what type of activities to support, how to allocate personnel, and what policies to revise.

9. Link Conservation Priorities to Other Planning and Policy Processes.

Conservation usually depends on the allocation of money, personnel, policy reforms, and land-use changes, and not simply on knowing which species and ecosystems are most important for a particular conservation objective. At all levels -- local, national, and global -- there are institutions, mechanisms, and planning processes that can significantly influence or directly take actions needed for the conservation of biodiversity priorities. Conservation priorities will be effective only when they are linked to economic and sectoral policy and planning processes that affect resource allocation, land use, and the consumption of natural resources. National biodiversity strategies and action plans, as called for under Article 6 of the Convention on Biological Diversity, provide an excellent opportunity to link geographic priorities with an important national planning and policy process.

10. Establish a Process to Revise or Reassess Priorities at Regular Intervals.

New information on species and ecosystems is constantly being generated, and the threats to those resources also change with time-even very short periods of time. The values that humans attach to species and ecosystems change as well. Change is inevitable with conservation priorities, and conservation planners should be flexible enough to accommodate new information and to revise existing priorities on a

periodic basis.

As efforts to implement the Convention on Biological Diversity increase, national and international institutions are seeking frameworks to help them allocate resources for biodiversity conservation. Several issues are vital to using priority-setting efforts to bolster biodiversity conservation policies and strategies. First, explicit objectives are essential, both to provide guidance to the selection process and to clarify what elements of biodiversity are included in the priorities. Second, biodiversity is important everywhere, so biogeographic representation should be an objective of initial efforts to set priorities. Third, the conservation of biodiversity is less a question of biology than of social, economic, and political factors. Therefore, while priorities must be scientifically sound, the social and institutional context in which conservation decisions are made should also be considered. Fourth, priority-setting must become an integral part of national biodiversity strategies, action plans, and related policy and planning processes. This will require investing in national capacities to develop and implement comprehensive conservation priorities. Finally, at the international level, priority-setting should complement but not supersede nationally and locally determined biodiversity conservation priorities.

If conservation priorities set during the next decade or so actually guide investment, they will influence conservation activities in many places for decades and perhaps centuries into the future. Biodiversity priorities set in the 1990s will not be the last, but they could well be the most important.

There is no single formula for developing effective biodiversity conservation priorities: the process will vary according to available information, local perceptions, and development objectives. Priority-setting will become more sophisticated in coming years, as more effective approaches and processes emerge, but priorities will have to be revised again and again as circumstances change. Therefore investments in building the information base, making appropriate technologies available (e.g., computer mapping and databases), defining participatory mechanisms, and providing training will be a valuable long-term contribution to the conservation of biodiversity. There will never be a better time to invest in developing the capacity to set priorities at all levels -- local, national, and global.