## EXPERIMENT in CONSILIENC

Integrating Sociated and Scientife Responses to SacEndangered Speci

Edited by

FRANCES R. WESTLEY and PHILIP S. MILLE

# EXPERIMENTS IN CONSILIENCE



Integrating Social
and Scientific Responses
to Save Endangered Species

Edited by
Frances R. Westley
and Philip S. Miller

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## List of Acronyms

AEUB Alberta Energy and Utility Board AWAG Algonquin Wolf Advisory Group

AZA American Zoo and Aquarium Association

CAMP Conservation Assessment and Management Plan

CBSG Conservation Breeding Specialist Group

COSEWIC Committee on the Status of Endangered Wildlife

in Canada

CPR common property regime
CRE Central Rockies Ecosystem

DEC Department of Environment and Conservation

DRC Democratic Republic of the Congo ESGBP Eastern Slopes Grizzly Bear Project GIS Geographic Information System

GNWT Government of the Northwest Territories

HTO hunters' and trappers' organization

ICDP Integrated Conservation and Development Project

IGCP International Gorilla Conservation Program
ISIS International Species Information System

IUCN World Conservation Union (formerly the International

Union for the Conservation of Nature and Natural

Resources)

LDR Less Developed Regions
LeastDR Least Developed Regions
MDR More Developed Regions

NGO nongovernmental organization

NWT Northwest Territories

OMNR Ontario Ministry of Natural Resources
PASS political-administrative system strength

PHVA Population and Habitat Viability Assessment

PNG Papua New Guinea

PRA Participatory Rural Appraisal PVA Population Viability Analysis

RENEW REcovery of Nationally Endangered Wildlife

RWED Department of Resources, Wildlife, and

**Economic Development** 

SSC Species Survival Commission

SSP Species Survival Plan

TEK traditional ecological knowledge

TEKS traditional ecological knowledge systems

TWS traditional Western science

USAID U.S. Agency for International Development

USFWS U.S. Fish and Wildlife Service

WCED World Commission on Environment and Development

## Preface

This book is the result of five years of walking a fine line: the line between theory and practice, the line between social and natural science, and the line between colleagues and friends. All people who were involved in any way in this volume were committed to trying to bridge these differences; ultimately we believed that such divides had to be crossed if we were to contribute to the survival of endangered species and spaces. But sometimes, each of us felt that we ourselves, or at least our disciplines, might be the endangered species. Consilience is a slow process and involves spending some time "far from land," in conceptual spaces where each and every one of us felt far from comfortable. This required patience and hard work and an ability to confront, but also to tolerate, our differences. We extend appreciation to our colleagues. Every person involved in the Network stayed with the process throughout. The result is this fascinating book, which documents our moments of convergence as well as the differences in perspective and approach that were maintained throughout.

There are many people to thank. We appreciate the insights and comments of Dr. Susie Ellis, Conservation International, who attended many of the meetings and enlivened them with her wit and wisdom. Colin Scott, Sally Walker, Sanjay Molur, Ruth Barretto, Oliver Coomes, Karen Peterson, and Mike Robinson also joined us for at least one meeting and gave us the benefit of their own experiences in consilience, both theoretical and practical. A very special expression of gratitude goes to Jenna Borovansky for the help she gave us in editing the final manuscript and for teaching us about megadocuments and why she hates Bill Gates.

Other much needed and valued assistance along the way came from Moriya McGovern and Tara Shaughnessy, who all helped with the diagrams and printing, and to Ronda Fisher and Emmanuel Raufflet, who both documented our rather intense meeting discussions.

We are grateful to Barbara Youngblood and Barbara Dean, from Island Press, for their enthusiasm, patience, insightful comments, and belief in this project.

We also would like to thank the Social Science and Humanities Research Council of Canada and the United States' National Science Foundation for their generous financial support of this Network research project.

To our families—Fred, Katie, Clara, and Jane, as well as Ellen, Sydney, and Jason—we of course owe a huge debt of gratitude for their support and patience, not only for this project but for all the projects that have taken us away from them through the years. No, Jason ... Daddy doesn't live at the airport!

Special thanks go to the participants in the various workshops that we attended as part of this project. One of the joys of being a part of this team has been witnessing this global band of conservationists in places as far-flung as Kampala, Canmore, Lae, Belo Horizonte, Yellowknife, and Dorset united in their determination against all odds to save the endangered species they love. We hope this book will be a tribute to their efforts.

Lastly, we owe the greatest debt of gratitude to one man, Ulysses S. Seal, who has inspired not only us, but thousands of conservationists and scientists around the world. Ulie's unique gifts fundamentally shaped CBSG and the workshop processes that are the subject of this book. His far-reaching vision, passion for conservation, and faith in the human species' ability to transform the world for the better gave us the energy and the determination to begin and complete this project.

Frances R. Westley
Philip S. Miller

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## PART ONE



## \*\* Introduction

## Chapter 1

## The Story of an Experiment: Integrating Social and Scientific Responses to Facilitate Conservation Action

FRANCES R. WESTLEY

Transdisciplinarity is a highly creative act; there are not formulas for reintegrating knowledge. However difficult the task, and however resistant it is to formalization, it is clear that the major failings of earth systems are due to the artificial fracturing of knowledge in the name of scholarship. The task ahead is to counter this tendency.

Rapport 2000

This is a story of an experiment. It centers on the problem of conserving the planet's endangered species, but it also tells the story of a new form of organizing for effective risk assessment, recommendation, and action. It focuses on the challenges of cross-disciplinary analysis as well as cross-functional, cross-disciplinary, and cross-sectoral action. Most centrally, it is the story of a sustained project in action research and the learnings that resulted.

In 1987, the Brundtland Commission published its influential report Our Common Future, which firmly established sustainable development on the international agenda for the coming decades. Among the priorities identified in the report was the conservation of species and ecosystems. "Species and their genetic materials," the authors argued, "promise to play an expanding role in development, and a powerful economic rationale is emerging to bolster the ethical, aesthetic, and scientific cases for preserving them" (World Commission on Environment and Development [WCED] 147). This imperative, in turn, became the focus of the World Resources Institute, the World Conservation Union, and the United Nations Environment Program's report, Global Biodiversity Strategy. In that document, a clear ethic of sustainable development, which implies a balance between social development and biological conservation, is presented.

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Development has to be both people centered and conservation based. Unless we protect the structure, functions, and diversity of the world's natural systems—on which our species and all others depend—development will undermine itself and fail. Unless we use Earth's resources sustainably and prudently, we deny people their future. Development must not come at the expense of other groups or later generations, nor threaten other species' survival (WRI 1992, v).

This ethic has been widely endorsed internationally, as witnessed by the number of nations which have signed the Biodiversity Convention, established at Rio in 1992. Embedded in this overarching statement, are additional values: that of maintaining diversity, balancing human and nonhuman rights, and economic development and conservation. It also stresses the value of participation ... that stakeholders in the Earth's resources all have an equal right to participate in decisions concerning distribution of those resources. But all this raises the specter of despair: are such goals impossible to achieve? Many challenge the notion of sustainable development as oxymoronic: can we continue to reap an endless economic harvest from an increasingly depleted planet?

Certainly, the application of these principles is a difficult and challenging task, both scientifically and socially. The *Global Biodiversity Strategy* report urges that action is needed both to strengthen the tools and technologies of biodiversity conservation (in order to identify priorities and strengthen the capacity of on and off-site institutions to conserve species and habitats); and to expand the human capacity to conserve biodiversity (in order to increase awareness, disseminate information, promote research links between social and natural sciences, transfer technology and know-how, and build partnerships). While biologists disagree on the exact rate of extinction of species on the planet, it is widely recognized that it is not only rapid, but that it is accelerating. "Conservative" estimates place the current rate of extinction at around 1,000 species a year, but with the continued destruction of habitats around the world, this is anticipated to rise to over 10,000 species per year by the end of this decade (approximately one species per hour) (Wilson 1989, 1992).

Whose problem is this? In the broadest sense, it is all of humanity's, including the future generations who will be deprived of the biodiversity that their ancestors enjoyed. As a species, humans have relied on rich biodiversity for nourishment, medicine, aesthetic satisfaction, and even for psychological well-being (Kellert and Wilson 1993). Biodiversity has been

the basis of trade and of much commerce. The loss of biodiversity challenges the very bases of human life on this planet.

In practical terms, therefore, implementing any strategy for maintaining biodiversity demands integrating both biological science and social science, expert and local knowledge, economic and conservation imperatives in actions designed to ensure stakeholder participation, equity, and justice, and even survival. The challenge is enormous and time is short. As the *Global Biodiversity Strategy* report states: "Irreplaceable genes, species and ecosystems are disappearing at a rate unprecedented in human history and essential development is at risk as a result. Immediate action is needed to defend these threatened living resources...." (WRI 1992,19).

## The Biodiversity Research Network

In 1997, with the help of a grant from the Social Science and Humanities Research Council of Canada, a research network (hereafter referred to as the Network) was created to build interdisciplinary connections and stimulate an exchange of expertise among specialists concerned with the conservation of biodiversity. Team members shared a concern to (a) understand the ecology and population dynamics of key species in particular ecosystems; (b) understand the impact of local human populations on the survival of threatened ecosystems and species; and (c) develop tools and processes for securing the involvement, collaboration, and responsibility of a wider range of local stakeholders in conserving species in their habitats and the ecosystem management required to achieve this.

The first principle of this initiative was that this discourse should be multidisciplinary, due to the complexity and magnitude of the problem. A number of scholars, chief among them E. O. Wilson, have recently highlighted the need to find an integration between social and biological or natural sciences if we are to address the environmental concerns. Wilson terms this rapprochement "consilience" and argues that sound environmental policy can only be formed at the juncture of ethics, social science, and biology (Wilson 1998).

Such transdisciplinary teamwork is difficult to achieve, however, even in the exploration of the kinds of environmental problems where it is most necessary. As a society of specialists, we have a low level of interaction. We know how to separate into disciplines, but not to put the pieces back again: "Transdisciplinarity is not an automatic process that can be successfully carried out simply by bringing together people from different

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disciplines. Something more is required, although the 'magic ingredient' is difficult to pinpoint. Transdisciplinarity requires 'transcendence,' the giving up of sovereignty on the part of any one of the contributing disciplines, and the formation, out of the diverse mix, of new insight by way of emergent properties" (Somerville and Rapport 2000, xv).

Recent research on transdisciplinary projects suggests that success demands no less than a revolution in our knowledge institutions: the commitment of senior people in the field, funding and publication outlets, and the arduous process of building transdisciplinary communication and trust (Daily and Ehrlich 1999). Developing a sound base of trust and understanding is extremely time consuming and requires patience. Levels of commitment to this process will clearly vary, and bringing on new people after the process has started is always challenging (Naiman 1999). Part of the difficulty resides in the fundamental difference in discourse and dialects that have developed within each discipline, as well as the discipline-based nature of reward systems (Kostoff 2002). Therefore, a period of translation and mutual learning is always required (Wear 1999; Somerville and Rapport 2000), and not all researchers are willing and able to engage in this kind of collaboration (Nicolson et al. 2002).

With most collaborations, the period of translation and mutual learning is demarcated by several stages and phases, each with its own dynamic. The first stage is "problem definition/recognition" in which a statement of the problem or problems under consideration needs to be crafted so that all involved disciplines can relate it to their base of knowledge. Here, power dynamics make an early appearance, as different disciplinary groups jockey to have their "problem definition" dominate (Nicolsen et al. 2002). A second phase involves "defining direction." At the interdisciplinary level this is often a problem of methodology (Prickett et al. 1999). Here again, issues of dominance and power are critical. If more powerful or influential disciplines "hijack" this process, the less powerful will become disaffected and be prone to withdraw (Gray 1989; Westley 1999; Hardy and Phillips 1998). The development of mutual trust and commitment is fragile and easily reversed. However, concrete experiences (field trips, simulations, a specific research site) can provide shortcuts to this process (Prickett et al. 1999). Also, the use of analogy and sustained metaphor (e.g., the comparison between ecological patch and neighborhood; Grove and Birch 1977) can help build and facilitate interdisciplinary communication, as can the choice of "middle level perspectives/phenomena," such as a species or a habitat (Prickett et al. 1999). Finally, the critical role of "social interaction and long-term associations that allow friendships to develop" (Daily and Ehrlich 1999, 278) cannot be underestimated. This is the glue which allows the collaboration to hang together through frustrations, and ultimately allows constructive conflict to surface. Such conflicts, in turn, seem a central element of creative problem resolution (Brown and Ashman 1996).

Our research team faced the challenge of interdisciplinary research on two different levels. The first was at the level of the team itself. Members of the Network included American and Canadian experts in interorganizational collaboration, stakeholder processes, human demography and the environment, participative research, management and development, conservation biology and wildlife management, population genetics, reproductive biology, ecosystem dynamics, business and the environment, environmental management, and planning. Some of the Network members were located in university faculties, some in research labs, and still others in nongovernmental organizations (NGOs). Some members of the group had worked together intensively in other research or action settings and others had not collaborated previously.

The second challenge was at the level of the experiments that the Network undertook. The work plan was to bring Network members together at least twice a year. These meetings revolved around intensive discussions of issues involved and around plans to experiment with new, more integrative approaches to stakeholder inclusion and information intensification in conservation workshops. It soon became clear that these "experiments" would have to deal with three challenges to interdisciplinary integration:

- Integrating tools: We were concerned with developing methods to allow some of the tools for analyzing human dimensions such as demography, economics, institutional and governance structures, and industry dynamics to interface with tools that assess a particular species' risk of extinction.
- 2. Creating processes for integrating expertise and expanding inclusion: We sought ways to link social scientists with expertise in such things as resource and agricultural economics, human demography, industrial geography, Indigenous cultures, and political and institutional processes, with biological scientists who understood conservation science. Our goal was to elucidate the dynamics of the social system that is the "human envelope" around endangered spaces and species.

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3. Exploring process: We examined and monitored the ways in which experiments in the above two areas affected the process of conservation planning workshops and the implications for redesigning that process. We explored ways in which a wider group of stakeholders and their information could be incorporated into the workshop process, without reducing their ability to carry out effective risk assessment and to formulate helpful recommendations.

In order to ground this experiment in an ongoing stream of action, the experiment was designed to focus on a single type of conservation-planning workshop run by a single organization. The Conservation Breeding Specialist Group (CBSG) is one of more than 120 specialist groups comprising the Species Survival Commission (SSC) of the World Conservation Union (IUCN). Its small group of paid staff and extensive network of volunteer scientists and managers around the world are supported by annual voluntary donations from more than 150 institutions and organizations worldwide. The mission of CBSG is to facilitate endangered species survival through developing, testing, and applying scientifically based tools for risk assessment and decision making in the context of wild and captive species management. One of a number of tools employed by CBSG is the Population and Habitat Viability Assessment (PHVA) workshop. A PHVA workshop brings together stakeholders from the scientific, nongovernmental, and governmental communities in a highly interactive, participatory process designed to assist in the development of strategic recovery plans for threatened species and their habitats. Such processes are not unique to CBSG, but for our research project they provided a focal process in which the parameters had been relatively constant over the past ten years (to allow for comparison) and in which the dynamics were flexible enough to allow for an experimental increase in the variety of data and stakeholders introduced.

This book tells the story of this experiment. After this introduction, part II begins by describing the history of CBSG and putting the organization and the PHVA workshop in the context of larger conservation efforts currently underway. In Part III we describe the six workshops that were the focus of this experiment and that concerned the mountain gorilla in Uganda, Rwanda, and Democratic Republic of the Congo; the muriqui in Brazil; the Peary and Arctic Islands caribou in the Inuvialuit region; the tree kangaroo in Papua New Guinea; the Eastern Slopes grizzly bear in western Canada; and the Algonquin wolf in eastern Canada. Part IV