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Susan G. Clark
Aaron M. Hohl
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Large-Scale Conservation in the Common Interest

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Preface

Many people are currently working toward sustainability using available natural and human resources. These efforts include locally focused initiatives and others at regional, national, and international scales. As we see it, a sustainable world is characterized by intact and healthy environments that support clean air, abundant water, and a diversity of life. This is also a world in which people live and enjoy well-being and dignity. Large-scale conservation inherently involves large spatial, temporal, and complexity scales. It also includes intermixed geophysical, biological, and political dimensions. Coming to grips with these many natural and human forces and factors at large scales, much less the myriad details in any single case, is challenging to the extreme. There are many well-intentioned and near-heroic sustainability initiatives underway throughout the world. Presently, some are more successful than others. We can learn from them in our search for the most appropriate concepts, methods, and tools to aid this vital work. This book aims to help those who are engaged in the interactive tasks of conserving sustainability and human dignity.

This volume draws on a proven integrative, interdisciplinary framework called the policy sciences or the configurative approach to address these dynamic dimensions, natural and human. Throughout the book we argue that a more holistic and genuinely interdisciplinary approach is required to solve the growing complex challenges associated with large-scale conservation. Continuing to rely solely on the principles of reductionist management and techno-rational expertise is not an option: such approaches often overlook important contextual matters and will ultimately result in the further erosion of ecosystems and human well-being.

Scientists, lawyers, and activists have successfully used this interdisciplinary framework across the globe in natural resource conservation over the last half century. The framework that we introduce in the early chapters and use throughout the book, including in all the case studies, can significantly strengthen large-scale conservation efforts. We believe that large-scale conservation poses many complex challenges that single disciplines (e.g., ecology), approaches (e.g., systems theory), or methods (e.g., quantitative models)—although helpful and often necessary—cannot fully address alone. Interdisciplinarity is a comprehensive method to identify, arrange, and integrate variables that otherwise may be overlooked by established

disciplines or combinations of them (e.g., via multidisciplinarity). Applying interdisciplinary problem solving successfully to the complex problems of large-scale landscape conservation, sustainability issues, and human dignity can produce reliable and persuasive decision making for management and policy. People knowledgeable and skilled in interdisciplinarity can put it into practice in a broad range of cases.

This book was written by 13 authors. Three chapters were originally written for Yale University graduate seminars on interdisciplinary large-scale conservation (described in Chap. 1) taught by Susan Clark. Our perspective, in the seminars and in this book, focuses on the contextual, foundational, and practical elements of large-scale conservation, including the formulas, doctrines, and symbols that are typically used, regardless of the case. Our volume is intended to help readers move beyond existing paradigms, while retaining the best of what they have to offer. Our goal is to encourage movement toward greater integration, interdisciplinarity, comprehensiveness, and effectiveness that seeks human dignity and sustainability for all.

This book is intended for a broad audience, including students and professors new to the field of large-scale conservation, experienced field-based practitioners in science and management, and decision and policy makers who set specific and strategic direction for large landscapes. Professors can use this book to introduce students to the challenges of successful large-scale conservation design and implementation and to teach interdisciplinarity as a framework, concept, and tool. Professionals will find this book offers a new way of using science, management, and policy to make decisions. Finally, this volume can be used also as a guide to set up workshops, seminars, or projects involving diverse people and perspectives.

The book's introduction (Chap. 1) provides a first look at the interdisciplinary approach. It offers a problem-oriented perspective of large-scale conservation, defining key terms used throughout the book and making recommendations. Part I provides an overview of large-scale conservation, the interdisciplinary method, and the educational strategy used throughout the book. Chapter 2 presents our problem typology: a view of human behavior that can be summarized as "people seek values through institutions using and affecting resources," along with some observations. Chapter 3 surveys seven major approaches to large-scale conservation, the last being adaptive governance, which is the approach detailed and illustrated in the book.

In Part II, three "rapid appraisals," conducted by student teams and informed by the fundamentals described in Part I, illustrate the application of the interdisciplinary approach: the Connecticut River watershed that connects much of New England (Chap. 4), the Greater Yellowstone Ecosystem in the Rocky Mountains (Chap. 5), and the Last Green Valley, an initiative involving three states in the northeastern United States (Chap. 6). All three chapters offer practical and strategic recommendations.

Part III offers three more in-depth cases by "participant observers" on specific issues, again applying the interdisciplinary approach: a national hiking trail (Chap. 7), wildlife conservation in Tanzania (Chap. 8), and the Humboldt Bay Initiative (Chap. 9). Again, all three chapters make practical, strategic recommendations. The

conclusion (Chap. 10) offers final words on large-scale conservation using interdisciplinary means and makes recommendations.

We owe a deep thanks to the many students and guest speakers who took part in the Yale graduate seminars on which this volume was based over the last decade. We have also had the opportunity to learn from our own field work in over a dozen countries. More broadly, we thank the professionals, officials, and citizens in the numerous large- (and small)- scale conservation programs that we visited in Africa, Europe, Asia, Australia, North America, and South America in the last few years. We thank our colleagues at the Yale School of Forestry & Environmental Studies and elsewhere, including Christina M. Cromley, Quint Newcomer, Richard P. Reading, Murray Rutherford, Seth Wilson, Doug Clark, Steve Primm, Jason Wilmot, David Mattson, and Mike Gibeau. Emily Biesecker helped with the production of this volume early on, and Ambikad Khadka helped format the original draft. Denise Casey helped with copy editing, formatting the final draft, and readying the manuscript for publication. Matt Decker prepared the maps. We also have benefited from financial and institutional support and encouragement from many sources, particularly the Yale School of Forestry & Environmental Studies, the Northern Rockies Conservation Cooperative (NRCC) in Jackson, Wyoming, and the Denver Zoological Foundation (DZF). As well, many individuals supported this work, importantly, Cathy Patrick. We thank them all.

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Susan Clark's primary goal in her research and teaching is to improve conservation of species and ecosystems at professional, scientific, organizational, and policy levels. In addition to ecological and behavioral field research on thirty-five mammals and other species, she has conducted research and applied projects in North America, Australia, Asia, and Central America, building case studies, evaluating policies and programs, helping organizations to incorporate reliable science into management, helping students to develop proficiency in the policy sciences method of problem solving, and working with a wide range of groups to improve conservation problem solving through workshops and other analytic exercises. Recent books include *Large Carnivore Conservation: Integrating Science and Policy in the North American West* (2014)*, The Policy Process: A Practical Guide for Natural Resource Professionals* (2002)*,* and *Foundations of Natural Resources Policy and Management* (2000)*.* She is a professor (adjunct) at the Yale School of Forestry and Environmental Studies.

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Chapter 1
A Problem-Oriented View of Large-Scale Conservation

Susan G. Clark, Catherine H. Picard and Aaron M. Hohl

Abstract This introductory chapter provides an overview of large-scale conservation, which takes into account both the content (biophysical substance) and process (relations, procedures, and decision-making patterns) of conservation. Large-scale conservation recognizes technical problems but also looks well beyond them to political problems (in decision-making systems) and cultural problems (in the underlying assumptions, expectations, and norms that guide societies and determine how people make decisions). This analysis adopts an explicitly interdisciplinary and problem-oriented approach that focuses on the social and decision-making processes inherent in large-scale conservation. A brief problem-oriented appraisal looks at people's goals, ideally, environmental sustainability, human dignity, and common interests. It also looks at current trends in conservation toward larger scales and at underlying conditioning factors behind the widespread adoption of large-scale conservation, specifically, innovations in ecology, economic factors, and sociopolitical dynamics. Finally, it offers future projections, i.e., the widespread assessment that environmental problems are likely to worsen in the coming decades. The chapter concludes by summarizing the proposed alternative to current efforts—the practice of adaptive governance—which promises to be more effective in achieving these goals because it is more contextual and practical, fosters integrative decision making and sound judgment by skilled leaders, and creates more inclusive social and decision-making processes.

Keywords Large-scale conservation · Interdisciplinary problem solving · Sustainability · Common interest · Human dignity · Adaptive governance · Problem orientation

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1.1 Introduction

A growing number of scientists, managers, and resource users worldwide recognize that short-term, local, and narrowly focused remedies to environmental problems are not tenable. Traditional, "expert-knows-best" interventions based on the principles of reductionistic, scientific management, wherein communities' values are ignored, frequently fail to achieve the desired outcome. Moreover, these approaches have failed to meet the demands for increased community participation in policy and management (Wilkinson et al. 2007). As a result, people are increasingly turning to large-scale conservation strategies—from ecosystem management to transboundary conservation—to address the growing number, scope, and complexity of environmental problems (Gordon et al. 2005; Robbins 2013). However, facile solutions for alleviating environmental problems do not exist, and scaling up existing models is insufficient for several reasons (Clark 1993). First, sustainable solutions to large-scale conservation challenges must account not only for large spatial and temporal scales but also for biophysical and sociopolitical complexity. Second, they must attend not only to intergenerational equity but also to spatial equity (Chapin et al. 2009). Finally, they must account for both human uses and the needs of other species (Kellert and Wilson 1993; Craighead and Convis 2013). The problem-oriented approach used throughout this volume seeks to overcome the incomplete formulas currently in use by integrating knowledge and action in order to meet the twin goals of human dignity and sustainability.

1.2 Large-Scale Conservation: A Problem Orientation

Large-scale conservation is being intensely promoted and rapidly adopted around the world; however, there is no agreed definition of the concept. Large-scale conservation is used simultaneously to refer to increased spatial scales (e.g., landscape-level conservation), ecological criteria (e.g., biodiversity hotspots), as well as the need to attend to the political dimensions of conservation (e.g., transboundary protected areas and peace parks). These approaches are promoted under different labels and rationales, some of which have garnered great symbolic appeal (e.g., the Yellowstone to Yukon, "rewilding" North America, and the "Free to Roam" initiatives). With so many overlapping conceptions, definitions, and typologies in use, it has become difficult to distinguish among the many approaches and how they differ with respect to their underlying assumptions and beliefs, formulas for implementation, and symbolic appeals.

In this volume, we use the term large-scale conservation to refer to conservation efforts that deliberately seek to function and integrate at larger and more complex spatial, temporal, and governance scales than previous efforts. Our approach requires that the mix of technical, political, and sociological challenges inherent at large scales be addressed simultaneously, pragmatically, and justifiably. Considering

larger spatial scales, for example, shifts the target of conservation from individual protected areas to ecosystem dynamics and functions and finally to human dignity and sustainability. Accounting for expanded temporal scales requires giving explicit attention to the historical context and future impact of a conservation intervention. Finally, addressing more complex scales of governance depends on expanded participation, coordination, and cooperation in natural resource decision making. This volume introduces concepts, methods, and case studies to meet the goals of human dignity and sustainability in large-scale conservation.

Large-scale conservation is inherently complex and requires integrating information and action from disparate disciplines and participants into a rational, intentional, and systematic framework for decision making. A variety of research methods, policy instruments, and management approaches is currently used to address the challenges posed by large-scale conservation, with varying degrees of success. Our analysis differs from many existing efforts by adopting a logically comprehensive, problem-oriented approach that focuses on the social and decision-making processes that characterize large-scale conservation as well as the biophysical elements. Being problem oriented instead of solution oriented requires that problem solvers clarify participants' goals and values, describe the history of the problem, analyze why the problem exists, and envision possible future developments; this exercise produces a problem definition. Finally, it requires the identification, evaluation, and selection of management policy alternatives. These problem-oriented tasks must be addressed explicitly and systematically in an interactive fashion (Clark 2002).

1.2.1 Content and Process

Large-scale conservation takes into account the interrelationship between content and process (Clark 2008). The content (biophysical substance) of a problem and the process (relations, procedures, and decision-making patterns) of its development and solution are interrelated elements of any real-world problem. Traditional ecologists and conservation biologists typically prioritize content issues and ignore or underappreciate process issues. Maris and Bechét (2010) argued, for example, that adaptive management takes scientific uncertainty (e.g., how to preserve biodiversity) into account but ignores normative uncertainty (e.g., which biodiversity to preserve and why). And as Li (2007, p. 7) notes, "Questions that are rendered technical are simultaneously rendered nonpolitical. For the most part, experts tasked with improvement exclude the structures of political economic [process] relations for their diagnosis and prescriptions." Conversely, social scientists tend to emphasize processes or relations (such as power and economic wealth) at the expense of biophysical dimensions, including the structure and function of ecosystems. Whatever the discipline used, each has strengths in clarifying challenges, but each also suffers from blind spots that cause important aspects to be overlooked and not integrated into the picture as a whole (Clark 1997). We contend that successful large-scale conservation efforts must simultaneously attend to both content and process

issues in a manner that is realistic, explicit, and practical. Concepts and methods exist to do this but are underused at present in large-scale conservation. The adaptive governance approach proposed and detailed throughout this volume is an example of an integrated, balanced approach between content and process concerns.

1.3 Our Goals

We specifically recommend three goals for improving the design and practice of large-scale conservation—human dignity, sustainability, and the common interest—which we offer not as ambiguous abstractions but rather as concrete objectives that can be subjected to empirical criteria, standards, and tests, and achieved in practice (Brunner et al. 2002, 2005).

1.3.1 Human Dignity

We believe there is no higher goal than human dignity (McDougal et al. 1980). Some may feel that discussions of such topics are far removed from natural resources, but large-scale conservation cannot be achieved without sustainable, healthy societies based on human dignity for all people. The goal of human dignity arises from respect for the value of the individual, equal treatment under the law, individual freedom, and social justice (Lasswell and McDougal 1992). This widely supported goal in human affairs is articulated in the United Nations Universal Declaration of Human Rights and many other constitutions, declarations, and conventions worldwide (Hunt 2007; Weston 2008; Mattson and Clark 2011). Human dignity rests on the principles of respect, participation, and freedom of choice. Applying these principles in practice is often problematic. The perennial challenge is to honor the principles without violating the basic rights of others. Freedom of choice, for example, requires mutual deference to others' choices. Finding the most efficacious approach to achieve human dignity in large-scale conservation can be both difficult and contentious, but it is possible.

1.3.2 Sustainability

Sustainability in large-scale conservation requires maintaining the potential of a system to persist or improve its functioning and the benefits derived from that system over time. There are no precise criteria to determine if something is sustainable, although it is often painfully clear when policies and practice fall far short of sustainability (Rayner 2001). Sustainability has been criticized as a "woolly, ambiguous concept that is resistant to precise definition, fraught with internal inconsistencies, and difficult to apply in practice. It shares these difficulties with

other core societal values, such as freedom, equality, and justice" (Sarewitz 2001, p. 74). To achieve institutions and practices of sustainability will require learning and change at the individual and organizational level (Clark 2002, 2008). It will also require a special kind of strategic leadership and professionalism, which is why this volume stresses the importance of leadership skills, critical thinking, and problem solving.

1.3.3 Common Interest

An interest is a demand for values made on behalf of a person or group and supported by expectations that the demand will be advantageous (McDougal et al. 1980). A common interest is at stake for people "whenever people act on their perceived interests and form a community around an issue" (Brunner et al. 2002, p. 12). A distinction can be made between common and special interests. In the simplest conception, "interests are 'common' when they are shared, 'special' when they are incompatible with comprehensive goals" (Lasswell and McDougal 1992, p. 360). For example, safe drinking water and clean air are inclusive common interests. The common interest should not be assumed or taken to be permanent. Nor is it a collection of special interests that are fused together into a forced "win–win" scenario. The common interest is composed of mutually dependent interests such that, in order to further any one set of values, the interests of other participants must also be advanced. It is "a process of balancing, accommodating, and integrating the rich diversity of culture, class, interest and personality which characterizes all arenas" (McDougal et al. 1980, p. 207), including, we add, large-scale conservation. Finally, the common interest should not be confused with unanimity. "Unanimity is a euphemism for minority veto power, in which the negative decision of one community member enforces policies on all" (McDougal et al. 1980, p. 202).

Steelman and DuMond (2009, p. 408) note that "We have lost the language, vocabulary, and ability to talk about the common interest." The job of clarifying the common interest in large-scale conservation may depend on distinguishing between valid (evidence-based) versus assumed or expedient interests (McDougal et al. 1980). In practice, determining the common interest is full of procedural, substantive, and pragmatic challenges. We must relearn how to clarify, secure, and sustain our common interest. There are partial tests that can be applied to determine if a project or policy is achieving the goals described above. These include a procedural test to determine if decision making is inclusive, participatory, and representative, a substantive test that asks if concerns are valid, appropriate, and broadly supported, and finally a pragmatic test that determines if participants' expectations have been upheld and if policies or decisions work in practice (Cromley 2002).

Effective leadership is essential if large-scale conservation is going to achieve the goals described above. According to Dietz et al. (2004), among other characteristics, effective conservation leaders have an ability to inspire and influence others, the courage necessary to vocalize controversial opinions, strong interpersonal skills, passion for their work, and the skills to apply insight and creativity to

real-world problems. They are also viewed as being fair, respectful, and nurturing. Manolis et al. (2009) define leadership as the ability to inspire and mobilize others to achieve purposeful change while noting that effective conservation leaders may or may not have formal authority. They suggest that effective leaders need to be able to recognize the social dimensions of conservation problems, cycle frequently through action and reflection, get and maintain attention, combine the strengths of multiple leaders, extend their influence through networks of relationships, time their efforts strategically, nurture productive conflict, and cultivate diversity. One of the goals of this volume is to help practitioners and students to become skilled leaders—aware of their own standpoints and psychodynamics—in the service of large-scale conservation.

1.4 Historic Trends

A core premise of large-scale conservation, according to Noss (2002, p. 10), "is that the integrity of any piece of land or water is ultimately dependent on the health and quality of the broader landscape that surrounds it…. Therefore, larger scales are ultimately more meaningful than smaller, isolated efforts." A consequence of this premise has been an expansion of the scale and breadth of conservation efforts from isolated protected areas and single-use management strategies to regional and even international efforts that transcend political boundaries and encompass multiple goals (e.g., integrated conservation and development projects). These large-scale conservation approaches are justified as efficient, science- or development-based strategies that enable practitioners and donors to identify the most effective means of expending their limited resources (Groves et al. 2002).

Large-scale conservation strategies are now embraced by most major conservation organizations and donor agencies around the world (Gordon et al. 2005). Between the late 1980s and 2007 (the last year for which a global inventory has been published), the number of transboundary protected area complexes increased globally from 59 to 227 (Lysenko et al. 2007). In 2010, 12.7% of the world's terrestrial and inland water areas and 1.6% of the global ocean area were protected (Bertzky et al. 2012). More land is now under official protected status than is currently used for permanent arable crops (Chape et al. 2003). However, in spite of the significant increase in the number, size, and type of large-scale conservation initiatives established around the world, biological diversity and ecosystem services remain severely threatened.

According to the Millennium Ecosystem Assessment report (2005), human activities have accelerated the rate of species' extinction by as much as 1000 times the historical average. This means that more biodiversity has been lost over the past 50 years than during any other period of human history. Fifteen out of 24 of the world's ecosystem services considered in the assessment are listed as "degraded," including air and water quality, the health of marine fisheries, and the ability to protect against