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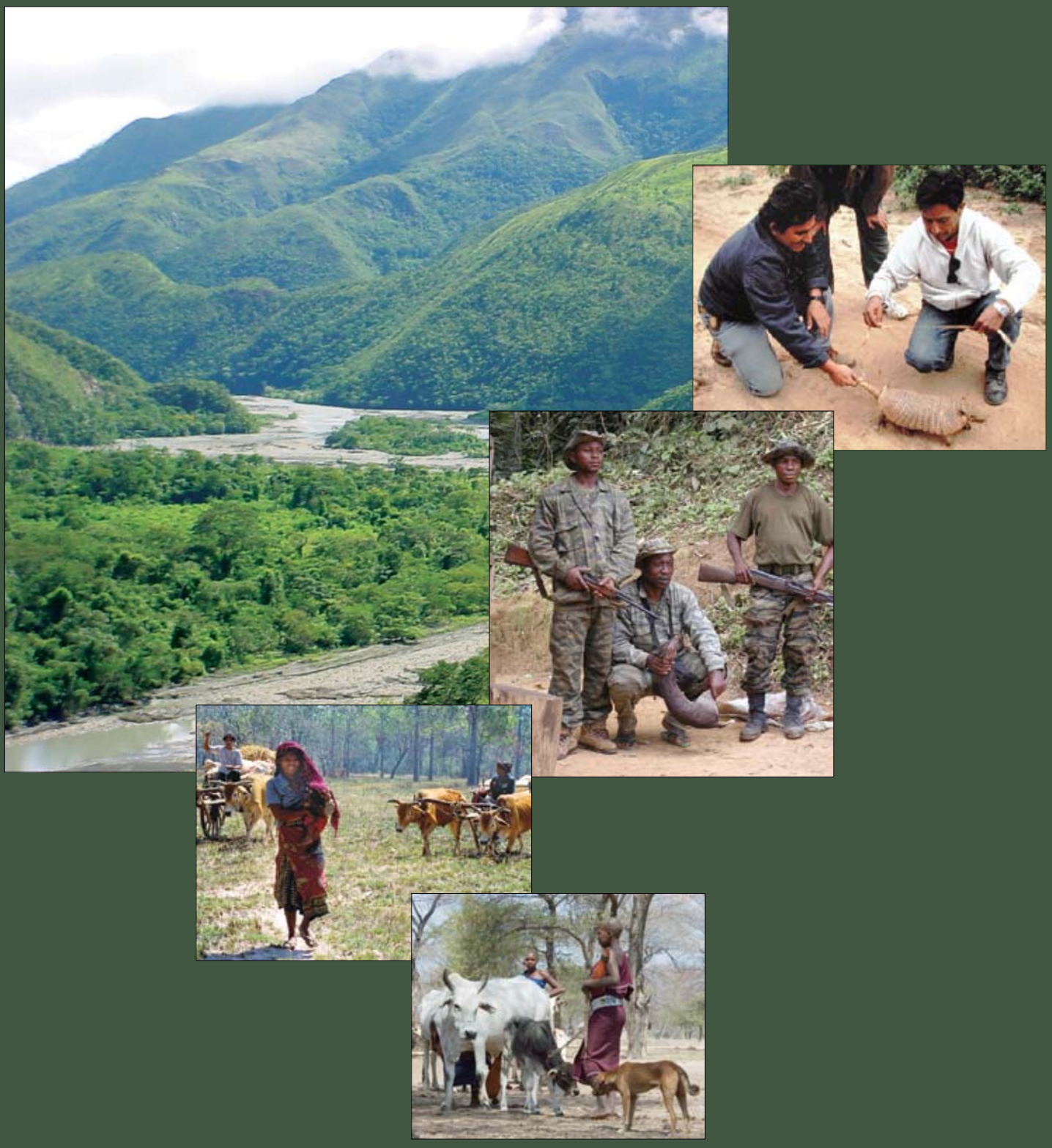

WILDLIFE CONSERVATION SOCIETY

CASTING FOR CONSERVATION ACTORS: PEOPLE, PARTNERSHIPS AND WILDLIFE

Oscar Castillo, Connie Clark, Peter Coppolillo, Heidi Kretser, Roan McNab, Andrew Noss, Helder Quieroz, Yemeserach Tessema, Amy Vedder, Robert Wallace, Joseph Walston, and David Wilkie

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The Wildlife Conservation Society (WCS) saves wildlife and wild lands around the world. We do this through science, conservation, education, and the management of the world's largest system of urban wildlife parks, led by the flagship Bronx Zoo. Together, these activities inspire people to imagine wildlife and humans living together sustainably. WCS believes that this work is essential to the integrity of life on earth.

This Working Paper was generated by WCS field staff during a "writers workshop" conceived and organized by the Living Landscapes Program (LLP). LLP develops wildlife-focused strategies for the conservation of large, wild ecosystems that are integrated in wider landscapes of human influence and, through innovative ideas and actions, inspires a growing community committed to conserving wildlife and wild places. Among other activities, LLP continues developing and testing, with our field programs, a set of decision support tools designed to help field staff select targets, map key threats, identify the most appropriate mix of actors and institutions to effect conservation, prepare conservation strategies, develop monitoring frameworks, and integrate strategic planning with annual workplanning, budgeting and progress reporting.

We describe the application of these tools and others in a series of brief bulletins and technical manuals which are available on our website www.wcslivinglandscapes.org or by email from llp@wcs.org.

The WCS Working Paper Series, produced through the WCS Institute, is designed to share with the conservation and development communities in a timely fashion information from the various settings where WCS works. These Papers address issues that are of immediate importance to helping conserve wildlife and wildlands either through offering new data or analyses relevant to specific conservation settings, or through offering new methods, approaches, or perspectives on rapidly evolving conservation issues. The findings, interpretations, and conclusions expressed in the Papers are those of the author(s) and do not necessarily reflect the views of the Wildlife Conservation Society. For a complete list of WCS Working Papers, please see the end of this publication.

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PREFACE

Applied social science in the cause of conservation was a lonely calling in the 1970s. Early in the decade, I first witnessed the incomparable wildlife spectacles and vast landscapes of more than a dozen east and central African parks. Yet outside those same parks, local human communities seemed to benefit little, if at all, while absorbing many of the direct costs of conservation. The juxtaposition of such great biological wealth with surrounding human poverty was striking. It was also an open field for someone with a social science background and conservation interest.

In 1978, I returned to Africa to study human factors affecting the status of Rwanda's highly endangered mountain gorilla population. Based on that analysis of attitudes and economics, a gorilla-focused tourism program was launched to generate revenues and employment. The program proved highly successful and changed local and government attitudes, ultimately leading to an increase in gorilla numbers. I like to think some of this resulted from good work; though I know some resulted from good fortune. None resulted from established models for community-based conservation, sustainable development, or ecotourism – concepts which did not yet exist.

The 1980s introduced a new paradigm that sought to balance the interests of wildlife, people, and the ecosystems they shared. Today, that paradigm dominates our field and all major conservation organizations have greatly expanded their investment in human aspects of conservation. The vast majority of these efforts have been directed toward what might be called social advocacy and intervention in support of various models stressing community involvement in conservation. However, there has been comparatively little investment in the kind of applied social science and interdisciplinary research needed to know whether these activities are actually helping either people or wildlife. The result is a paucity of field-based information and shared experience on this most important subject.

Casting for Conservation Actors seeks to address a key aspect of this need by drawing on the collective knowledge of a group of long-term conservation practitioners. Some are trained as social scientists; all have extensive, hands-on experience with social, economic, and political factors in conservation. Brought together by the Wildlife Conservation Society, with support from the Tinker Foundation, their mandate was to examine a particular subset of factors in the human-wildlife equation: the cast of actors – communities, political entities, government agencies, NGOs, and private business interests – and their proper roles and relationships within a variety of conservation contexts.

The context for conservation and the cast of actors that can effect conservation depend on a combination of factors. Is the ecosystem large or small? Are target species wide-ranging or highly localized? Is the human population large and concentrated? Impoverished? Empowered? And perhaps most important: What are the capacities and interests of the actors themselves?

In my own experience, the context for conservation and the capacities and interests of the cast of actors can change dramatically over time, even at the same site. In the late 1970s, Rwanda had minimal park service management capacity, virtually no interest in gorillas, and no NGOs of any kind. Launching the Mountain Gorilla Project required creating an international NGO consortium, because at that time only they had the interest and capacity to take action. Over the next decade, the Rwandan park service gradually took on primary responsibility for anti-poaching and tourism management. The civil war and genocide of the early 1990s turned back the clock, reducing government capacity once again to near-zero. For the rest of that decade, international NGOs led management of the parks and worked to re-create capacity, while government officials concentrated on re-building their country. By 2001, an effective park service began to reemerge, followed by local NGOs and communities empowered by a national policy of decentralization. Today, a growing cast of national and local actors now assumes more active roles in conservation management, while international NGOs are able to concentrate on technical advisory roles. Such temporal variation in actors' capacity and interest is not unique to Rwanda.

Identifying actors with the interest and capacity to effect conservation under different conservation contexts, and adapting the cast of actors as contexts, capacities and interests change over time is a continuing challenge. *Casting for Conservation Actors* provides much valuable information and lessons learned toward improving our performance in assuring the survival of wildlife and wildlands, while addressing the needs of local people and other interests.

Dr. Bill Weber

Dr. Bill Weber is a Senior Conservationist of the Wildlife Conservation Society. Dr. Weber lived and worked in central Africa for ten years, focusing on social, economic, and political aspects of conservation. His work included initiating the Mountain Gorilla Project and directing an integrated natural resource management project in Rwanda, where he continues to advise on community issues around protected areas. Dr. Weber also served as Director of both the WCS Africa Program and the WCS North America Program, prior to taking his current post. He is co-author of In the Kingdom of Gorillas: Fragile Species in a Dangerous Land, a book that treats issues of wildlife conservation in the context of poverty, undeveloped capacity, genocide and war.

SECTION 1: CASTING FOR CONSERVATION ACTORS

The Challenge

For decades, there was a widely held perception within the conservation community that strict protection of individual species and their habitats was the means to success in wildlife conservation. This approach provided the impetus for the creation of thousands of parks – forming a global system of reserves, with an estimated 12 percent of the Planet's land surface now under some protected status. While restrictions on resource access and use vary by degree, nearly all protected areas feature biodiversity conservation as a principal, though not sole, mandated objective.

Yet conservation efforts have not always been successful. Flawed design of protected areas and management systems, weak application of protected area legislation, human settlements with uncertain status and tenure inside protected areas, and conflicts with communities outside have all conspired to undermine full realization of the biodiversity goals of many parks and reserves. Responses to these complexities vary. On one hand, there are calls to 'harden' protected areas – strengthening levels of protection and increasing the separation of people and biodiversity. On the other, there is a movement to embrace communities and their livelihoods as a vital, sustainable part of the conservation process. Recently there has been an intensification and polarization of these two perspectives, with the successes and failures of each widely cited as evidence of their superiority or fatal flaws.

Recently there has been an intensification and polarization of perspectives, with the successes and failures of each widely cited as evidence of their superiority or fatal flaws.

In this fundamental debate, why has so little real progress been made? One answer underlies the oft-cited, iconic endpoints of "strictly protected national parks" and "indigenous extractive reserves" – that is, the failure to acknowledge that there is a much broader range of options for conservation models. Indeed, the endpoints cited reveal two separate domains that have become badly conflated. One is a management system specifying how much access or use is acceptable if resource conservation is the objective (from full protection to maximum sustainable harvest), and the other is recognition of who is engaged in resource management (whether government agencies, NGOs, communities, or individuals).

Assessing management systems and managers independently offers a wealth of new opportunities for conservation. After all, why can't a small group of local people managing village land opt for complete and strict protection? Likewise, it is common for nation-states to choose and enforce resource management strategies other than strict protection. In the end, separating these two axes might not simplify the process of conservation, but it can logically inform our discussion about the breadth of actors that could or should be playing different roles in effectively managing a diversity of natural resources.

So how can management systems and manager competencies be used to identify the best possible mix of actors to tackle different challenges in conserving wildlife across different contexts? Field practitioners around the world regularly struggle with this issue, and though many have found novel answers, rarely, if ever, have these been captured and made available to others. To address this gap, the *Living Landscapes Program* of the Wildlife Conservation Society assembled conservationists from WCS projects in Latin America, Asia,

Africa and North America, along with WCS program staff, to draw on their collective experience in addressing the following questions:

1. How do we identify an appropriate mix and arrangement of actors and institutions to effect conservation?
2. How do ecological, socio-economic, and political factors influence the mix of effective actors and institutions?

Here, we offer a modest step in articulating the logic underlying the identification of the most appropriate mix of actors for wildlife conservation under different contexts. This paper is a descriptive representation of that logic, derived from the point of view of *field practitioners* who focus specifically on wildlife. While this description distills some best practices, it is not intended to be a prescriptive methodology for choosing management actors with whom to work. Instead, it is offered as a heuristic device to help those who practice, participate in, and fund conservation to talk more explicitly about these issues, and thus enable more effective groups of conservation actors.

Briefly stated, our deliberations have led us to the following conclusions:

- **A cohesive, logical framework can help identify actors to effect conservation within different ecological, socio-economic, and political contexts.**
- **The intensity of management necessary (degree of control over access to and use of resources) is a key factor in designating a management system, defining essential management roles and, thereby, identifying competent and appropriate actors to effect conservation.**
- **Characteristics of wildlife, their use, and attributes of potential actors are essential factors that influence the type of management system necessary, and therefore the mix of actors likely to be effective in their conservation.**
- **The appropriate arrangement of actors may change over time according to the challenges and opportunities posed by a dynamic natural resource base, a changing social, economic and political landscape, and evolving attributes of conservation actors.**

To explain these conclusions and their underlying rationale, this paper: (a) describes the logic behind identifying the most appropriate mix of actors and institutions – based on ecological, socio-economic, and political conditions, and (b) presents a suite of eight case studies that illustrates the use of this logic in field-based conservation efforts.

A Logical Framework

As conservationists, how do we recognize, support, and promote the appropriate mix of actors to conserve wildlife in different contexts? How do we articulate this process of building strong constituencies for wildlife conservation in the field? Our logic may provide the basis for design of analytical tools and even suggest guidelines for partner engagement and promotion. It is not intended as a strict methodology, so much as a conceptual framework for describing the logical connections and relationships between management needs, the actors who may meet those needs, and the factors and conditions that influence them.

A framework for identifying the most appropriate mix and arrangement of actors can be represented through two simple diagrams (Figures 1 and 2), built around the central premise of matching management actors (and their skills, capacities, and interests) to the management system required to conserve specific target species or habitats. We believe that it is essential to identify individual or institutional actors who are able, motivated and positioned to address the degree and intensity of management needed to ensure conservation. It is this pairing of (a) management objectives and requirements as embodied in a management system with (b) the attributes of potential actors, that determines who is most likely to be effective in various management roles - thus promising the greatest likelihood of conservation success within different contexts over the long-term.

… the most effective mix of actors to effect conservation is one in which the quality of the actors' attributes matches the specific needs of the management system.

Figure 1: Conservation is best achieved by a mix of actors whose attributes most closely match specific management needs

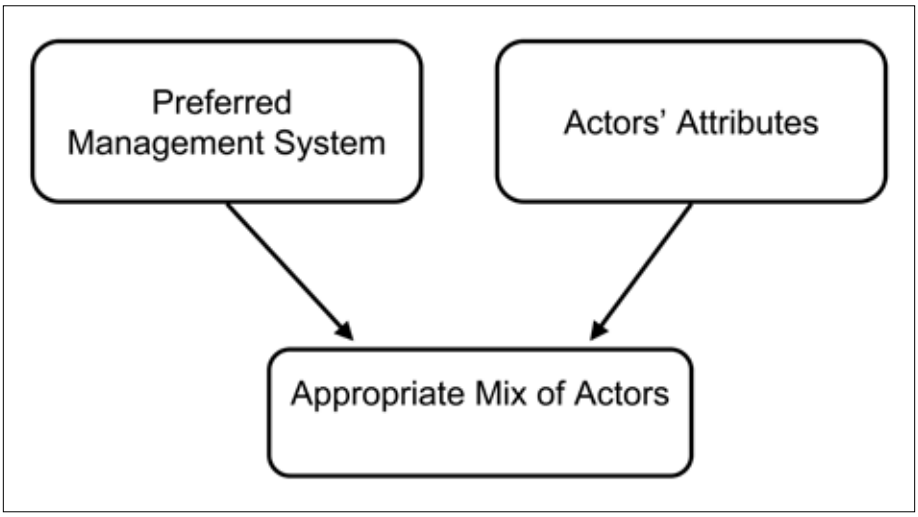


Figure 1 diagrams the overall logic. We assume that conserving wildlife or other biological resources requires a **management system** – a system that governs access, use, benefits, threats, and species and habitats with the intent of achieving conservation objectives. Such a system involves regulation (formal or informal) of who has an impact on which species and habitats, to what extent, over what time frame and frequency, and in what areas. The degree of access and use within a management system in turn helps to determine the roles of and qualifications for management actors who are likely to be able to ensure success of said system. These qualifications include aspects of ownership and authority with respect to particular sites or resources, motivation to engage in conservation, management capacity, and the power to promote or oppose conservation. As one considers the actors most likely to make conservation happen, it is important to assess their attributes relative to the qualifications required to implement a management system. While having the mandate, power, capacity and motivation to manage wildlife resources is clearly desirable in all management contexts, some conservation management systems demand actors with greater strengths in some or all of these characteristics. Thus, the most effective mix of actors to effect conservation is one in which the quality of the actors' attributes matches the specific needs of the management system.

Figure 2: The most appropriate mix of actors to effect conservation is influenced by ecological, resource use, management and human capital factors.

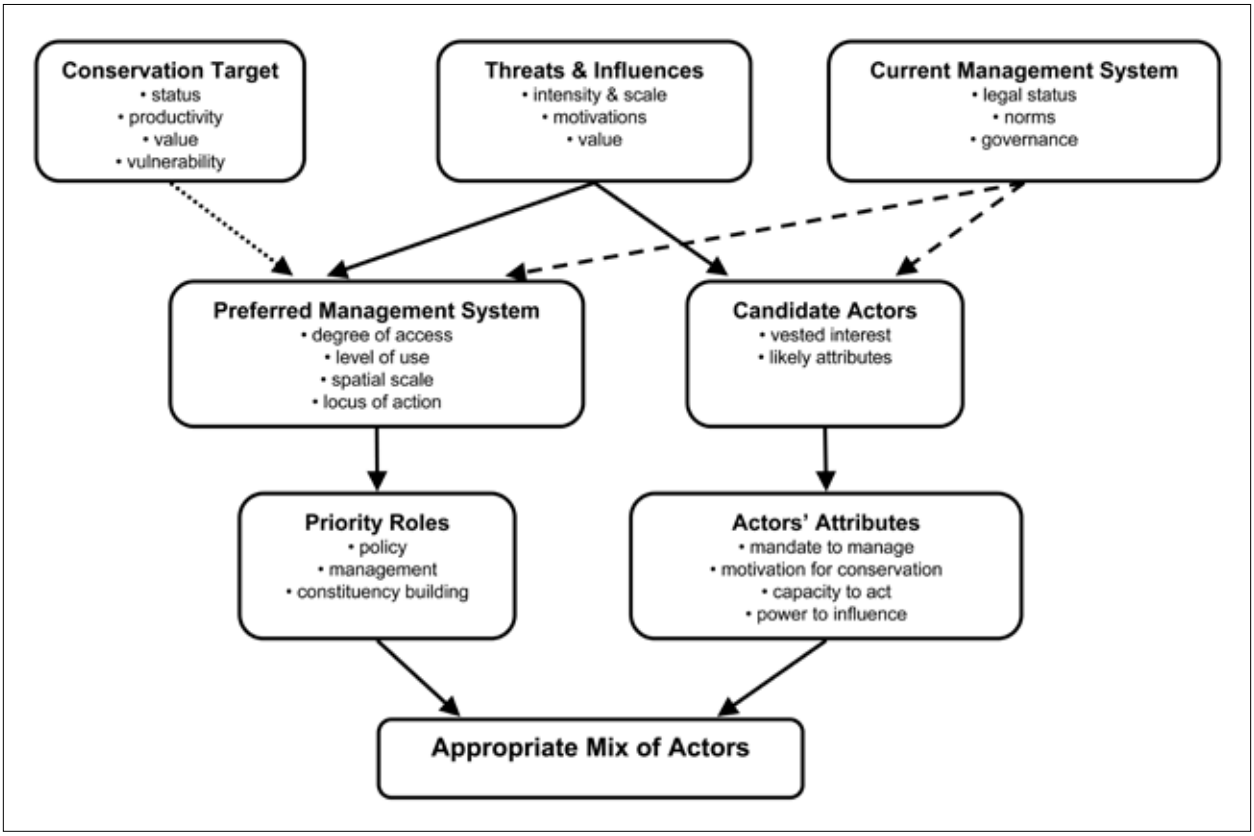


Figure 2 illustrates greater detail of the overall logic. We argue that three groups of factors are likely to influence the type of system needed to manage a particular natural resource or set of resources. These are:

- **characteristics of the conservation target**, including resource status, rarity, vulnerability, productivity, life history, and habitat requirements.
- **characteristics of resource use and users, threats, or other influences** on these resources, such as the intensity and scale of resource consumption, and the economic, social or cultural value of the resource.
- **characteristics of the current resource management system**, such as legal mandates, zoning restrictions and the resource governance that already exist, either constraining or providing opportunities for management options.

Together, these factors influence whether a management system should set high or low limits on use, establish areas of greater or lesser protection, control the inclusion or exclusion of certain users, or manage external forces or actions. In turn, the type of management system considered necessary to manage wildlife resources will suggest priority **management roles** and, thus, define the key **attributes of actors** needed to adequately fulfill these roles. Specific actors' attributes – including their interests in conservation, their skills, capacities, power and mandates, among other factors – reflect their ability to meet management needs and fulfill essential management roles. In other words, the best actors to effect conservation are those whose attributes correspond strongly with the qualifications believed to be essential to the conservation needs at hand. Overall, a functional and effective mix of actors will also depend on actors' ability to work together, to address the scale of action needed, and to establish and enforce resource management norms.

It is important to note that within any given conservation landscape there will be several conservation targets and multiple uses for different natural resources. No single management system (e.g., strict protection or sustainable harvesting) can meet the conservation needs of all wildlife and the economic needs of all natural resource users. So in reality, each large conservation landscape will be a mosaic of different management systems, each favoring particular values of wildlife and natural resources that, in concert, can generate desired ecological, livelihood and existence values simultaneously.

Determining the Level of Management Needed to Effect Conservation

How strictly access and use are controlled and how much information we need to make sound management decisions is determined by: (1) ecological characteristics of the resources that we want to conserve (our conservation targets), (2) how, why, and by whom the resource is used or influenced, and (3) the nature of present resource access, use, rights, and management.

Effective conservation is only likely over the long term if the management system is tailored to the characteristics of the conservation targets.

Conservation Targets

We define conservation targets as components of ecosystems that are valued by people and are at risk of being negatively impacted by human activities. These may be species, habitats, or other components of biodiversity. Identifying conservation targets and their desired states allows us to be explicit about what we hope to achieve, and to measure our success. By conserving a set of conservation targets with complementary ecological needs, we save other biodiversity sheltered under their collective conservation canopy.

Conservation targets are selected by the 'conservation community', be it a single organization or a set of stakeholders including local individuals and communities, various government agencies, and/or NGOs. Though targets may be as specific as a species or as broad as an ecosystem, each is selected because it is valued, and in some manner threatened by human activities, thereby warranting conservation action.

Though many characteristics of conservation targets could influence the management systems implemented to ensure their long-term survival, there are a few that stand out as particularly important. These include:

- **Abundance –** size of a population or habitat type
- **Distribution –** widespread or restricted, patchy or continuous
- **Fluctuation –** variability in abundance over time
- **Functional role –** ecologically pivotal
- **Productivity** – high to low
- **Resilience –** ability to recover from disturbance
- **Detectability –** ease or difficulty of monitoring
- **Scale** – extent necessary for effective conservation (site, landscape, region, country, continent, global)
- **Irreplacability** – degree to which the conservation site is vital for the overall conservation of the target
- **Life history** – breeding habits, parental investment, etc.

Most of these characteristics relate to a target's vulnerability to disturbance – principally human activities. On the other hand, a target's functional role is an indictor of the degree of impact on an ecosystem's structure and productivity if the target were lost from the landscape.

Linking target characteristics to management systems

Effective conservation is only likely over the long term if the management system is tailored to characteristics of the conservation targets. For example:

- Targets that are rare or restricted in distribution are more at risk of being lost as a result of human activities than are abundant or widely-dispersed targets. Access to, and use of, these targets are thus more likely to require a greater level of control.
- Some species may be locally abundant, but might warrant being managed under a relatively strict system if they are globally scarce. In some cases the opposite may be true, and a locally scarce species may require minimal management because it is abundant elsewhere.
- Highly productive targets are likely to be more tolerant of human pressure and may only warrant strict management if the level of use is so high that they are continuously declining in abundance. Targets that are not productive may be at greater risk of being depleted, particularly if they are also scarce. These may warrant more intensive management.
- Abundant, productive and widely-dispersed targets may be less at risk of significant degradation as a result of human use. As such, few access and use controls may be required, and given the larger margin of error associated with these parameters, may not require much information to ensure their successful management.
- Targets that show extreme fluctuations in abundance over time, and that impact significantly the structure and function of a landscape, may require more information for effective management because uninformed decisions risk adverse consequences.
- Targets that are difficult to monitor may warrant greater control over access and use because it is difficult to assess whether human use is causing a decline.
- Targets such as migratory species may require a larger cast of actors and coordination of management across the range of spatial scales they occupy.

Table 1. Illustrations of how characteristics of conservation targets may influence management systems.

Target	Characteristics	Management System
Lowland gorillas at site "A"	Locally abundant but globally scarce; low productivity, but highly detectable.	Relatively strict control of access and use.
Private lands linking protected area "B" with protected area "C"	Restricted distribution; little resilience to some threats; functionally important to landscape connectivity.	Landowners maintain their access rights and limit uses to those compatible with wildlife movements.
Mangrove forest at site "D"	Highly productive, critical nursery area for fish populations; resilient to present level of harvesting for building material.	Little active management required at present, but status monitoring is crucial in case threat level changes.

Threats and Influences

Just as specific characteristics of conservation targets affect the type of management system that would be appropriate, so too do the threats to, or influences on, these resources.

Just as specific characteristics of conservation targets affect the type of management system that would be appropriate, so too do the threats to, or influences on, these resources. The status of wildlife resources can be threatened directly through harvesting or removal of the resource, or less directly by pollution, modified hydrological systems, introduction of non-native species, or altered climates. Human use and dependence on natural resources can also positively influence conservation by providing incentives for sustainability where management systems are defined clearly and implemented soundly.

Knowing whose actions or inactions are causing a direct or indirect threat to wildlife resources can help conservationists to understand whether the threat is due to a lack of awareness, perceived benefit and interest, or a lack of norms and the capacity to enforce them. In addition, understanding who is linked to specific influences – positive or negative – also helps suggest a list of actors who could play roles in effectively managing the threatened resources.

Users of wildlife resources who value their persistence are prime candidates for active management roles (see **Identifying the Most Appropriate Mix of Actors**, below). In cases where consumers of a resource reside far from the boundaries of the landscape, they may have little knowledge that their consumption is a threat, or may not have the legal mandate to directly engage in management of the resource. Thus, a management system addressing threats that originate from "over the landscape horizon" will likely differ from those in which consumers live in close proximity to the resource and have legal tenure over the land.

Among characteristics of these uses, threats, or influences, the following are most likely to affect the management system required:

- **Intensity** – rate of off-take; severity at points of impact
- **Extent** – spatial area affected
- **Source location** – location of source of influence: local, site-specific or distant in origin

- **Timing** – seasonal, annual, decadal, constant
- **Direct or indirect** – directly or indirectly influencing the status of resources
- **Current or potential** – actually occurring or likely to occur
- **Actors** – number and motivations of actors engaged in activities that put natural resources at risk

Different levels and sources of threats – actual or potential – link logically to the type of management system needed to conserve wildlife resources.

Linking characteristics of use, threats, and influences to management systems

Characterizing the human activities that influence conservation targets, and understanding the factors that drive people, businesses and governments to act can help stakeholders to: (a) develop a management system that is likely to abate the direct and indirect causes of threats, and (b) assess the likely level of support for, or opposition to, resource management. For example:

- When conservation targets are heavily harvested or affected by ecosystem degradation, management would likely place greater controls over access, use, or levels of pollution than in systems where resource threats are less intense.
- When negative impacts already exist, active abatement activities will be required, whereas pending threats may be avoided through information sharing, proactive policymaking, and/or incentives.
- When a resource is threatened by the activities of a large number of actors, each of whom has a relatively small impact, restrictions to access may be the best way to ensure conservation. Conversely, simple reduction of access is unlikely to work when a single actor both poses the greatest threat and is economically dependent on the threatened resource.
- Where negative impacts on natural resources are constant, management practices differ from situations in which threats are episodic, or random (e.g., closed seasons are ineffective if a resource is used daily, and daily catch limits are inappropriate if harvesting only occurs in brief periods during the year, such as during an annual migration).
- Where threats have impacts over a large scale, conservation may require a management system that relies on formal regulations to address the relative anonymity of the sources of threats, engages multiple actors with complementary jurisdictions, and/or relies on actors who have the mandate to operate on a large scale. Threats operating on a small scale may be dealt with via more informal measures such as social pressure or economic incentives.
- When the perceived value or threat is local, management may be best vested in the hands of an effective local authority. This would also be the case when external threats might be successfully excluded by local managers. However, when values or threats are more distant or indirect and local authority has little influence, management systems may require the mandate and power of an authority at the regional, national, or international level.
- In cases where users recognize the enduring value of a resource, whether cultural or economic, effective management by user agreements or social pressure is more likely than in cases where users view the resource as expendable, making more formal management systems necessary. Perception of value

may evolve over time, depending on factors such as changes in technology, access to capital, and resource availability – thus changing the requirements for management.

Table 2. Influence of resource use, users, and threats on management systems: illustrative examples.

Use/influences	Characteristics	Management System
Bushmeat harvesting at site "E"	Commercial hunters from urban areas rapidly deplete large-bodied wildlife from forest opened up by logging.	Strict controls over the exportation of wildlife from the logging concession.
Deforestation at site "F"	Immigrants rapidly colonize the area to acquire land for subsistence agriculture.	Secure land-tenure of long-term residents with prior claims.
Deforestation at site "G"	Long-duration residents expand the area under cultivation in response to commodity prices.	Direct payments to land-owners to set aside high biodiversity value lands and connecting corridors.
Acidification of boreal lakes at site "H"	Sulfur emissions from energy plants result in acid precipitation, the mobilization of aluminum, and episodic fish die-offs.	Strengthen national clean air laws and national/state enforcement.

Combining Characteristics of Conservation Targets and Threats/ Influences

We have described the independent effects of the characteristics of conservation targets and the threats and influences upon management systems. Most often, though, it is the combination of these factors that gives us the best snapshot of the vulnerability of wildlife resources to human activities in any particular situation and, therefore, this combination that best informs the type of management required. While it is true that highly productive wildlife populations can sustain higher rates of harvesting and may require less stringent management controls than a slow-growing resource with only relatively light harvesting, if pressures on a productive resource increase beyond sustainable levels, stricter management may become necessary. Likewise, in cases where scarce, vulnerable resources are not under current or potential pressure, they may not demand explicit regulation or enforcement: existing informal, social norms may be adequate. Clearly, it is the combination of (a) the pressures on conservation targets, and (b) the characteristics of these targets to withstand such pressures, that determines the likelihood of loss or extinction of species and communities at a site and, in turn, indicates the type of management system necessary to ensure effective conservation.

Characteristics of Existing Management: The Current Cast

Conservation efforts never start with a blank slate. Rather, they evolve from existing resource management systems that are built on a longer history of systems. (This is true even when the 'system' might simply be the absence of explicit resource management.) Characterizing the present management system is an important step toward identifying the most appropriate mix of actors to effect conservation because it helps document: (1) the current level and purpose of resource use, (2) traditional or formal rights pertaining to resource use, (3) formal or informal norms and institutions governing resource management, and (4) technical and financial means employed to manage natural resources. This assessment can, in turn, help identify opportunities for improving the present system and, at the same time, expose constraints to change. Understanding the existing management system, including who plays each 'role' right now, also helps practitioners generate a candidate list of actors with vested interests in the use and/or management of wildlife. In this way, it is possible to identify the best actors to play key conservation roles or those who have the potential to attain competence with sufficient support.

For each existing or desired management system at a site, there is a corresponding set of management roles and activities that, if implemented well, is likely to positively affect conservation of wildlife and natural resources at the site.

Key Roles for Conservation Actors

Regardless of the most appropriate management system for a given site, a standard set of management roles and activities is typically necessary to positively affect conservation. Many of these roles can be summarized under the following headings (though additional, more specific, or alternative roles may sometimes be useful in various contexts):

Policy

Policy activities broadly include:

- Generating reliable information relevant to the formulation of norms[1].
- Creating the legal, regulatory, and/or socio-political framework for conservation.
- Facilitating public debate of proposed norms.
- Facilitating public debate on the values of biodiversity.
- Establishing systems of due process and legal recourse.

Management

Management encompasses the following activities:

- Enforcement of norms, ranging from formal or governmental law enforcement to informal social pressure or incentives.
- Coordination, execution and facilitation of management activities; provision of financial and human resources; logistical support; maintenance of offices, bases, materials, and other supportive roles.

[1] Norms are the explicit or implicit rules and regulations that a society uses to define appropriate and inappropriate values, beliefs, attitudes and behaviors.

- Monitoring a system's response to standards, regulations, and use (including both social and biological monitoring).
- Building actors' capacities to participate in conservation-related activities and interventions.

Constituency Building

Activities dedicated to growing political and financial support for conservation objectives and interventions include:

- Raising awareness of the importance of conserving biodiversity.
- Creating social and/or economic incentives for conservation.
- Lobbying decision-makers to create an enabling policy framework for conservation.
- Encouraging opinion leaders to advocate for conservation.

Key Elements of Management Systems

Broadly speaking, management systems can be described in terms of: (1) the degree of access to a resource, (2) how much of the resource can be used, (3) the spatial scale appropriate for resource management, (4) the locus of threat abatement, and (5) the amount of information needed to make management decisions. More specifically:

Access to a resource is regulated by defining who has access when. Licensing or the decree of a community elder can limit who has the rights to cut trees, hunt animals or harvest crabs. Entrance fees might reduce the number of tourists that visit a fragile site, and closed seasons control when access to the resource is allowed.

Level of use can be managed (formally or through peer agreement) through quotas, by regulating how people use a resource, or by shifting resource use to alternatives. Minimum size limits and fishing net mesh sizes can ensure that juvenile fish are not harvested. Likewise, land-use zoning and easements can define which modifications to the landscape are permissible and which are not.

Appropriate spatial scale for effective management is determined by the distribution of the resource, as well as geographic mandates and capacities of users or managers. For example, conservation of grizzly bears may require both local-scale management to minimize conflicts with adjacent ranchers and their cattle, and regional-scale management to ensure gene flow continuation across isolated sub-populations of bears.

The *locus of threat abatement* depends on whether the threat comes from within or outside of a particular landscape. Direct use of resources from hunting or logging might require a more local response and conservation actions within the landscape, whereas threats like acid rain might warrant interventions at the pollution source – well outside the 'managed' site.

Lastly, the *amount of information* needed to make sound management decisions relates to the risk implied by those decisions. For example, the risk of unintended consequences is likely to be higher when target resources are rare, fluctuate in abundance or play key ecological roles. In these contexts more information may be needed to better inform decision-making and, thus, safeguard the resources.

While in principle any management system will need to define, address and fulfill most or all of these roles, their relative importance varies according to the nature of the specific management system – and most particularly, the level of control deemed necessary over access to and use of wildlife resources. Thus, in a chaotic or lawless landscape under great pressure, conservation practitioners may place greater priority on the role of enforcement than on monitoring. Alternatively, a relatively stable site with motivated partners may need to emphasize capacity-building above all else.

Different Actors' Attributes for Different Management Roles

Defining the required management system for any given conservation target enables the associated identification of priority management roles. Likewise, determining priority management roles can indicate the most important attributes or qualifications of any actor to fulfill a specific policy, management or constituency-building role. Toward these ends, we propose the following attributes of actors as critical and comprehensive in playing key conservation policy, management and constituency-building roles (recognizing that specific situations might lead to a consideration of disaggregated or alternative attributes.):

Key Attributes of Conservation Actors

Mandate to Manage
Mandate to manage is defined here as the recognition of legal or moral authority, or the ownership of land or resources. Ownership implies recognized or legal rights; authority assumes jurisdiction over a given area or natural resource (conferred through legal or social processes). This qualification can be related to issues of legitimacy and credibility, although ownership and/or authority do not always connote legitimacy.

Capacity to Act
The capacity to act is predicated on having relevant knowledge, skills and resources. The latter can include both human and financial resources, while skill sets might include a broad range of aptitudes in everything from conflict resolution, writing and communication, to strategic planning and research. Knowledge refers to the information required for effective decision-making and action.

Motivation to Conserve
Motivation refers to an actor's interest in a conservation-related objective, activity or role. In general, the efficiency of conservation interventions by an actor positively correlates with the motivation of that actor. However, motivated actors can be either supportive of or opposed to conservation. Motivated actors tend to perceive a benefit from either conservation or subverting conservation, and are thus less passive than indifferent actors. Benefits may be material or economic in nature, or may be cultural, ethical or spiritual.

Power to Influence
Power refers to an actor's political, economic and/or social influence. Without politically powerful allies, a conservation program's efforts remain vulnerable to negative influence. Power in itself does not define an actor's value to conservation, but rather it is how that power is applied which could impact conservation positively or negatively. In this way, references to the actors' 'Motivation to Conserve' will indicate how these actors are likely to wield their power.

- **Mandate** to manage – in terms of authority and/or ownership
- **Motivation** to conserve – for economic, cultural and/or ethical reasons
- **Capacity** to act – encompassing skills, knowledge and resources
- **Power** to influence – in political, economic and/or social regards

Though these qualifications of actors are important for all policy, management and constituency-building roles, their relative importance varies according to the type of management system considered desirable. For example, in a context where conservation targets are not under significant pressure, building capacity to manage resources for the future may be a higher priority than creating and enforcing formal norms. Given this, motivation and capacity may be the most important attributes to advance conservation, more so than power and mandate (Table 3a). Table 3b depicts a different scenario, in which a globally irreplaceable target is highly threatened by uncontrolled poaching, and where formal and informal governance is weak. In this case, creating and enforcing norms are priority short-term roles, and power and capacity are the most important attributes of competent actors.

...candidate actors are those most likely to have the capacity, power, mandate, and motivation to undertake priority management roles.

Identifying the Most Appropriate Mix of Actors

At any given conservation site or landscape, a large number of stakeholders may have vested interest in, or be potentially affected by, conservation. However, not all stakeholders will be critical actors in effecting conservation. By determining what type of management system is needed to ensure conservation, and by characterizing the priority roles that must thus be filled, we can identify a short, prioritized list of candidate actors. These candidates are those most likely to have the capacity, power, mandate and motivation to undertake these roles – or who have the potential to develop these attributes over a time period consistent with conservation needs.

Using Radar Diagrams [2]

Visual tools for comparing the strengths of actors

One simple way to think about the most appropriate individuals, groups, firms, organizations and alliances to assume priority roles in a particular management system is to 'locate' actors along axes that represent important qualifications needed to fulfill these roles. The attributes that an actor possesses can be represented as a point along four axes indicating their mandate to manage, capacity to act, motivation to conserve and power to influence relative to other candidates at that site. It is important to note that capacity, mandate, motivation and power are composite, multi-faceted qualifications, and that indicating an actor's attributes as a location along an axis is a subjective judgment. We can formalize and graphically display our subjectivity by ranking actors' perceived competence as low, medium or high, or along a scale from 1 (low) to 5 (high) (with high competence near the center: see example in Figure 3). The different strengths represented along an axis are only meaningful relative to the position

[2] Radar diagrams, available in Microsoft Excel, are used here to visually compare the relative strengths of different actors for each priority role.

Tables 3a and 3b: These tables represent the logic involved in identifying and prioritizing conservation management roles and, in turn, pinpointing the qualifications necessary to fill those roles. The schematic is intended to elucidate the logic rather than define a selection process. Alternative roles and actors' qualifications may be considered for a particular target, scale of operation, or period of time. These tables illustrate the priority attributes needed under two different conditions: Table 3a illustrates a situation where conservation targets are not currently under significant pressure, while Table 3b illustrates a scenario where a target species is highly threatened by poaching pressure. In the first situation, it is advantageous to build capacity (to increase the ability to protect the resource in the future), while in the second case it is imperative to create and enforce rules that allow conservation of the threatened species at the present time.

Table 3a.

	Qualifications			
Roles	Power	Capacity	Motivation	Mandate
Policy: Create norms				
Management: Enforcement				
Management: Coordinate/facilitate				
Management: Monitor				
Management: Build capacity				
Constituency building				

Table 3b.

	Qualifications			
Roles	Power	Capacity	Motivation	Mandate
Policy: Create norms				
Management: Enforcement				
Management: Coordinate/facilitate				
Management: Monitor				
Management: Build capacity				
Constituency building				

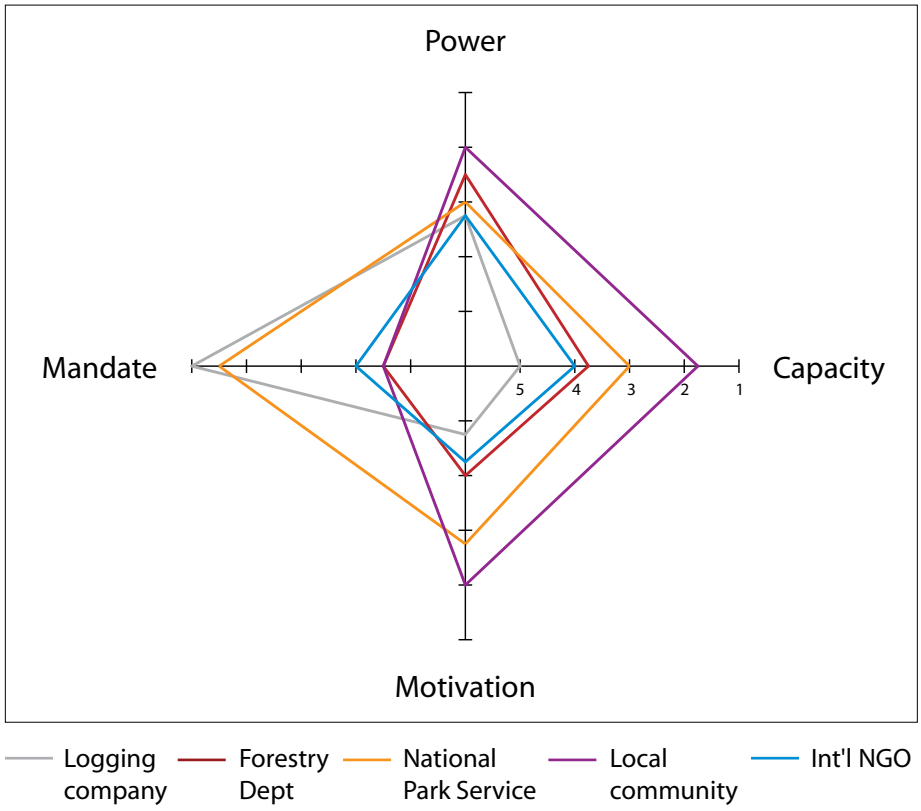
High Priority
Medium Priority
Low Priority

of other actors (i.e., being positioned closer to the center of the diagram indicates greater strength relative to actors positioned further from the center). The absolute location of an actor, then, is meaningless, making a comparison across radar diagrams developed for different management systems inappropriate.

Drawing lines to connect the locations of an actor along each axis results in a multi-sided polygon that visually depicts the overall, comparative strength of an actor to fulfill a desired role. Overlaying these diagrams for multiple actors for any given role enables us to review the relative strengths of different actors. We can thus use this assessment to help identify a complementary mix that is most likely to support conservation success. Different roles under different management systems may require different strengths and attributes, such that the shape of the polygon that depicts a 'strong' actor will vary. For some roles power, mandate and motivation may be the highest priorities; for others, capacity and mandate may be key.

...scale is an essential characteristic to consider

Figure 3: An illustrative example of using a radar diagram to compare attributes of conservation actors



In some cases it may be desirable to work with an actor who is not particularly strong across all axes, but who has the potential to become so. For example, an indigenous group may have strong traditional claims to territory, but no capacity to control outsider use of its resources. The group would rank highly on the mandate axis, but weakly on the capacity axis. Field conservation practitioners might *still* engage them in management activities because of moral authority and legitimacy, and presuming a potential to attain greater management capacity over time.

The analysis represented in Figure 3 describes dominant factors driving strategic and logical decision-making in the field. However, it is important to note that encouragement of actors in particular roles may also be influenced by other considerations. For example, a commercial resource extraction company may wield significant power, but may lack motivation, mandate or capacity for conservation. Given the firm's power and potential to impact the landscape, its engagement is imperative so that it might be swayed in conservation-favorable ways.

The optimal mix of actors to effect conservation

When considering an optimal mix of actors, efficiency suggests that we ought to engage actors with multiple strengths rather than multiple actors with single strengths. That said, while a radar diagram may reveal a single actor who is

relatively strong in all four qualifications, the need for checks and balances may warrant engaging additional (and even relatively weaker) actors to fulfill a particular role.

The appropriate mix also depends on interactions among and between actors, including their subjective perspectives and their perceptions of the legitimacy of others. In some cases, an actor's participation might diminish the motivation and power of other actors. The opposite is also true: a relatively weak actor might significantly strengthen the attributes of other actors. For example, a foundation could include a director with no direct management role at the site, but her reputation and ability to build consensus may reinforce other actors' motivation or capacity and, thus, support the sustainability of the management system itself.

In addition, scale is an essential characteristic to consider. The scale at which a conservation target functions, a threat acts, and an actor has interest or influence can strongly determine the effective mix of actors. For example, it may be that one actor is well-positioned to tackle a needed management role, but can only be effective at the scale required for conservation with the support of others.

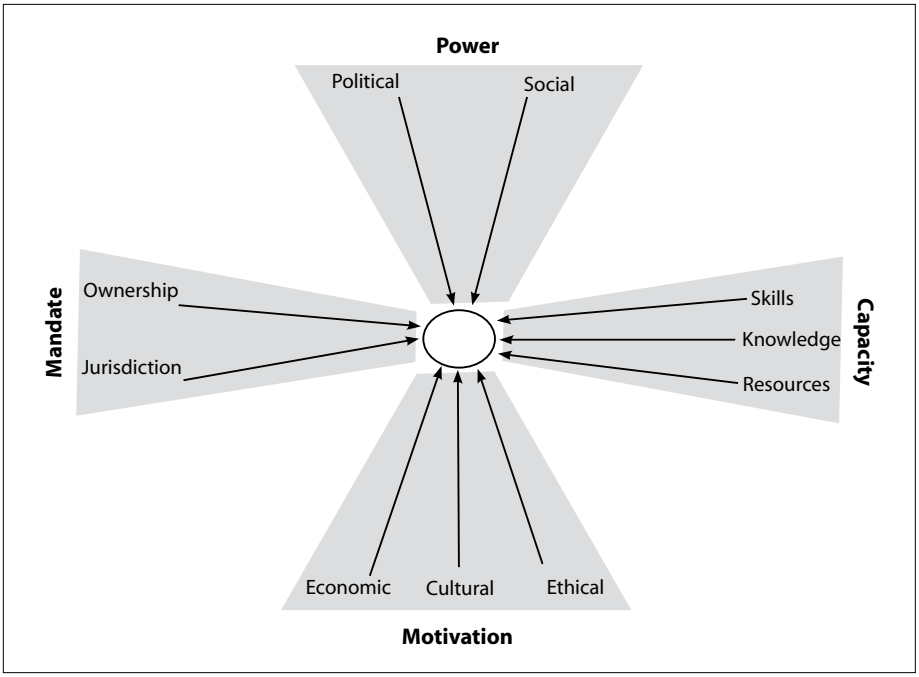
Visual tools for strengthening individual conservation actors

While these radar diagrams depict the logical thinking behind identification of appropriate or preferred conservation actors, they can also signify attributes of actors that, if strengthened, would increase the likelihood of conservation success at a site. Indeed, the diagrams may articulate gaps in attributes that need to be strengthened for particular actors if they are to assume an important and effective conservation management role. For example, an actor may have the legal mandate to manage wildlife, but have little or no motivation to do so. By working to increase the motivation through public awareness initiatives or economic incentives, conservationists might enhance the actor's interest - and thus more fully realize the conservation potential – of the actor.

Similarly, a diagram may illustrate how far the present actors are from attaining certain attributes, in which case other actors may have to be brought in or new alliances formed. (For example, if national law only allows hunters' associations to manage wildlife, it might be necessary to find or create such an organization.)

Over time, the process of strengthening actors or engaging new ones might result in substituting or replacing existing actors with others. At the onset of a project, for example, an international NGO may have the strongest relevant capacities for certain roles. But the tenets of subsidiarity (i.e., management by the lowest competent authority) suggest that a more appropriate arrangement for sustaining success in the long-term would include a local actor with increased capacity. Updated radar diagrams over time can thus reveal progress in a conservation process; the appropriate mix of actors, as suggested by the diagrams, will likely evolve with the actors' changing competencies.

Figure 4: Expanded radar diagram illustrating sub-components within each major qualification axis.



Permutations on the use of radar diagrams

While we have discussed using radar diagrams to recognize and identify the most appropriate actors for specific management roles, other uses of the diagrams may also be valid. One could use a radar diagram more generally, for example – with the same four axes (capacity, mandate, motivation and power) – to represent an appropriate mix of actors to address the overall suite of management needs at a site, to manage a specific conservation target, to abate a specific threat, or to establish and implement a particular management system. In the most general context, a radar diagram could help indicate, among a large set of stakeholders, key actors capable of effecting conservation.

In addition, although the radar diagram has been depicted as having four axes in our discussion, it may be desirable in some contexts to subdivide these composite qualifications or add new ones to adequately represent the nuances that are meaningful at a particular site (Figure 4). Practitioners can then plot actors on each of these disaggregated axes, draw polygons, and examine the actors based on relative strengths as previously described.

Lastly, some axes could be bi-directional, ranging from negative, through neutral, to positive.

Value of this Framework

The importance of this logical framework – defining needed management systems based on the characteristics of conservation targets, threats and existing management systems; identifying priority conservation roles based on needed management systems; and ranking the competence of each actor using radar diagrams – is its utility for illustrating the complex and reiterative thought

processes behind defining the particular management systems needed to effect conservation, and identifying and engaging the most local competent actors for promoting effective conservation. More specifically, it articulates the logic underlying an assessment of the mix of actors and institutions for any particular conservation effort across a full range of management systems and spatial and temporal scales. As such, it provides field-based conservationists with a common way of looking at their contextually unique circumstances, such that strategic planning, analysis, and implementation can be more transparent based on shared principles.

Conclusions: Toward Better Practices

The principle of subsidiarity argues that to maximize efficiency, matters of governance should be handled by the lowest competent authority. This is based on a general principle of public affairs: that the closer the locus of decision making is to the people it affects, the more likely it is to be based on reliable information and the more likely the process will reflect the interests of those affected. This principle is often interpreted to mean that local communities should always have the authority and responsibility for conserving wildlife. Others assert that biodiversity is part of the national or international patrimony and, as such, state agencies rather than local people should always hold management authority over access to and use of these resources. This paper argues that, from the point of view of field practitioners, there is no simple, universal answer to the question of who should be managing wildlife or, more generally, conserving natural resources. This understanding leads us away from simplistic paradigms. Instead, we explore systems of wildlife management and resource conservation that depend upon strategic, contextually-influenced mixes of actors and institutions, each fulfilling particular roles according to their strengths and the management requirements deemed necessary. The resultant mix of actors at any given site is, therefore, dependent on a combination of ecological, socio-economic and political circumstances as well as the attributes of those with a vested interest in wildlife resources. Because this logic results in unique arrangements of local people, community groups, companies, governments and non-governmental organizations, the debate of community-based vs. state-based conservation is superseded by a more sophisticated scenario that seeks the most local authority with the *competence* to manage wildlife resources effectively.

Deciding where to build housing, develop industry, or conserve biodiversity is more likely to address local interests and concerns when it is the purview of village or town councils, than if it were the mandate of the United Nations. As a result, local compliance with regulations is more likely. Similarly, a landowner who walks her property regularly is more likely to understand maintenance needs than a distant national forest agency that may never have visited the site. Thus she may be the better steward of the forest.

That said, the principle of subsidiarity does not always adequately address the fact that the interests of the most local competent authority may conflict with the interests of the broader national or international society. When society values a resource more than local people, a system of checks and balances may be needed such that the resource governance system is composed of a mix of

actors that reflects both local and broader societal interests.

Similarly, though it is relatively easy to identify the lowest authority, subsidiarity requires that the authority be competent to affect resource management. Too often this two-part test is separated so that local communities are always identified as the lowest, and national agencies are always deemed competent. Clearly, both determinations are simplistic, polarized and restrictive in their real-world applications.

The case studies that follow were selected to demonstrate a more complex reality, and to bear out the use of the logic described in this paper. Drawing on years of WCS field experience in many countries, we can show that the lowest competent authority varies considerably according to context, and that rarely does a single actor manifest *all* the qualifications to be the sole lowest competent authority. Indeed, the lowest competent authority at one site may be a community-based organization that is part of a powerful indigenous people's alliance. At another site requiring international coordination and foreign policy support, the lowest competent authority may well be the national government working with the active support of local people.

The logical framework and case studies presented here therefore highlight four major conclusions supported by WCS field experience in identifying and engaging the most appropriate actors to effect conservation. These are:

- **A cohesive, logical framework can help identify actors to effect conservation under different management contexts.**
- **The intensity of management necessary (degree of control over access to and use of resources) is a key factor in designating a management system, defining essential management roles and, thereby, identifying competent and appropriate actors to effect conservation.**
- **Characteristics of wildlife resources, their use, and attributes of potential actors are all essential factors in influencing the type of management system necessary, and the mix of actors likely to be effective in their conservation.**
- **The appropriate arrangement of actors may change over time according to the challenges and opportunities posed by a dynamic natural resource base, a changing social, economic and political landscape, and evolving attributes of conservation actors.**

As a general principle, then, management systems at a given site should help define the appropriate mix of actors with the power, capacity, mandate and motivation for assuming the roles required for advancing conservation. Recognizing and enabling individual actors, institutions, organizations and partnerships capable of fulfilling the roles required to manage conservation resources is a challenging and important undertaking. By identifying and engaging this important 'cast of conservation actors', we take a critical step toward ensuring that the long-term conservation needs of wildlife and wildlife habitats are met.

SECTION 2: CASTING FOR CONSERVATION ACTORS – LESSONS FROM THE FIELD

The following case studies are designed to provide diverse examples that all demonstrate the logic presented above. They are not intended to convey the full complexity and nuance that characterize the conservation projects and programs cited; they will not provide the reader with all details about all aspects of any one project. Rather, each case study highlights one or two examples of how: (1) the ecological characteristics of the landscape, and the characteristics of resource uses/threats/influences to wildlife and wildlife habitat, together help define the management system needed to conserve valued resources; (2) the management system helps identify which management role or roles will be most important, at present, in the area's context; (3) priority roles help to assess the match between potential conservation actors' attributes and the qualifications necessary to effect conservation; and (4) this thinking in turn provides a transparent logic for recognizing and engaging the most appropriate mix and arrangement of actors to make conservation happen.

The case studies are from field sites around the world – places that face very different conservation challenges. Each case study highlights how different contexts suggest different mixes of appropriate actors; that is, different inputs generate different outputs. All reflect the principle of subsidiarity, but vary in which actors are the lowest competent authority. We hope that these case studies, then, will help readers understand more clearly how the mix of appropriate actors is highly influenced by context, is not fixed or static across management systems and, most importantly, can be discussed transparently in association with partners, using the logical framework that we offer in this WCS working paper.

Case Study 1: Kaa-Iya Greater Landscape, Bolivia

Site Name:	Kaa-Iya Greater Landscape: Kaa-Iya del Gran Chaco National Park and Isoso TCO (indigenous communal lands)
Location:	Chaco-Chiquitania, Santa Cruz, Bolivia
Project Goal:	To ensure the long-term conservation of biodiversity and sustainable use of natural resources within the Kaa-Iya landscape- the most diverse and best-conserved portion of the Gran Chaco ecoregion.

The Kaa-Iya landscape is anchored by the 34,400 km^2 Kaa-Iya del Gran Chaco National Park (KINP), created in 1995 by presidential decree, and managed since its creation by the Capitanía de Alto y Bajo Isoso (CABI) under a co-management agreement with the Ministry of Sustainable Development and Planning (MDSP) and the National Parks Service (SERNAP). The other key element of the landscape is the 19,000 km^2 Isoso TCO (indigenous communal land), neighboring the protected area. This communal land also includes private properties owned by ranchers and Mennonites all of which is also administered by CABI. An agreement among CABI, MDSP, and the National Agrarian Reform Institute supports the land titling process currently underway in the Isoso TCO and the KINP. Also important to note are the hydrocarbon interventions in this area between 1998 and 2003 (such as exploration and gas pipelines), which generated significant indirect pressure on biodiversity through induced regional development.

Actors on the landscape include CABI and two other indigenous organizations; a number of national government bodies, including SERNAP; regional and municipal governments; NGOs and multilateral agencies; and the private sector, such as the Gas TransBoliviano (GTB, a company transporting natural gas via pipeline).

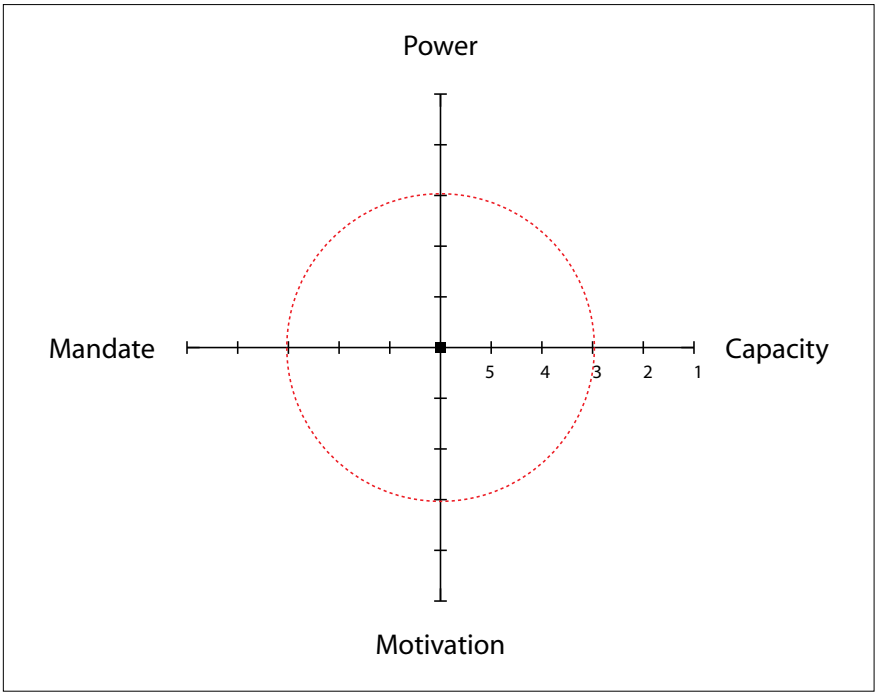
Although significant areas of the Kaa-Iya landscape have been designated as 'protected', there are still important conservation steps yet to take. Specifically: (1) legal conservation status must be defined, (2) surveys and land titles should be completed, and (3) appropriate management plans need to be completed and implemented.

CABI, the political organization representing the Isoseño-Guarani people, maintains traditional structures of government over a vast territory. Given its potential influence over much of the landscape, CABI was clearly the key actor to engage for conservation. Towards this end, in 1991, CABI and WCS established a strategic partnership, providing the basis for creating the national park, supporting it through careful management structures and regimes, and building constituencies for conservation.

Target	Maintain the integrity of the Kaa-Iya National Park and its connectivity with other ecosystems (Isoso TCO)
Ecological attributes	Mixed productivity, slow recovery, ecosystems and species at risk, vast regional scale
Use/User attributes	**Direct threats:** Mega-projects threaten connectivity with neighboring ecosystems; conversion and degradation of habitat; sport and commercial hunting by urban-based hunters; subsistence use of natural resources by indigenous communities and rural residents; contamination of hydrological systems from agricultural and ranching activities. **Indirect threats:** Regional development induced by mega-projects (e.g. gas pipeline); lack of information to make decisions; lack of knowledge of management strategies; lack of control and enforcement; deficiencies in the organization to manage resources; deficiencies in legislation and regulation; lack of knowledge of habitat dynamics.
Management regime	**Multiple management statuses:** national protected area; indigenous territory; private properties; gas pipeline right-of-way; Ramsar sites; species management plans. **Multiple management regimes** (within each management status): strict protection, extensive use, intensive use based on internal zoning and management plan.

Priority role	High ranked axes to fulfill role
Creation, promotion, and enforcement of standards: Focused on integrating international and national norms with cultural and customary standards	**Power:** policy-making, inter-institutional frameworks **Motivation:** promote understanding, balance cultural and social values **Mandate:** balance legal jurisdictions, and ownership rights
Coordination, execution, building capacities: Integrated management of protected area and indigenous territory	**Capacity:** address indirect impacts, explicit capacity-building process **Mandate:** link CABI with jurisdictions and competencies to manage a national protected area that incorporates a multi-actor framework.
Building constituency: Alliances among indigenous peoples, government, and private and social actors converted into effective frameworks for conservation	**Power:** innovative institutional frameworks that insert governance as sharing power among key actors

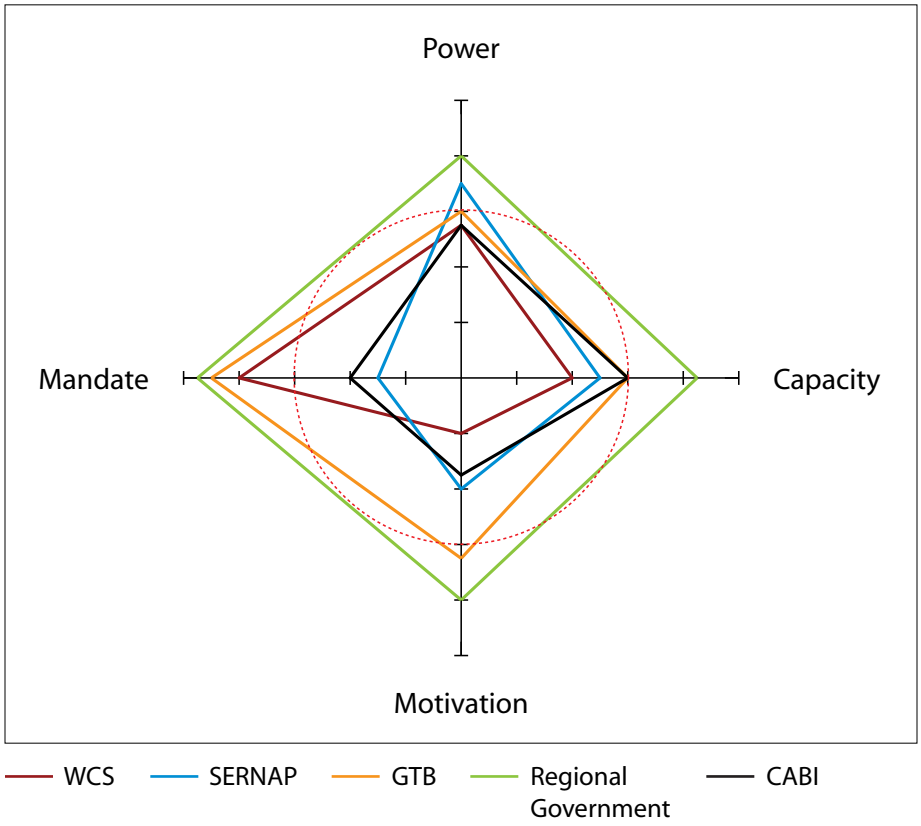
Figure 1: The following radar diagrams show break-even points on each axis (the dotted circle) where an actor's net contribution to conservation is neutral. Positive contributions are made by actors marked inside this circle (values of 3 or above) on one or more axes. Values below 3 suggest either weak contributions by a particular actor (the actor does not fulfill its designated role) or that negative impacts by the actor exceed its positive impacts.



The conservation target promoted by WCS is to maintain the integrity of the enormous Kaa-Iya National Park and its full complement of biodiversity across a vast landscape. At this scale, and at this site specifically, indirect threats are much more significant than direct threats. CABI's principal interest in conservation is as a tool to consolidate territory, not necessarily for direct use, but to pre-empt its occupation by other users who tend to use resources and land much more intensively and more destructively in comparison to the indigenous communities. Therefore, WCS and CABI shared a common interest to conserve the landscape.

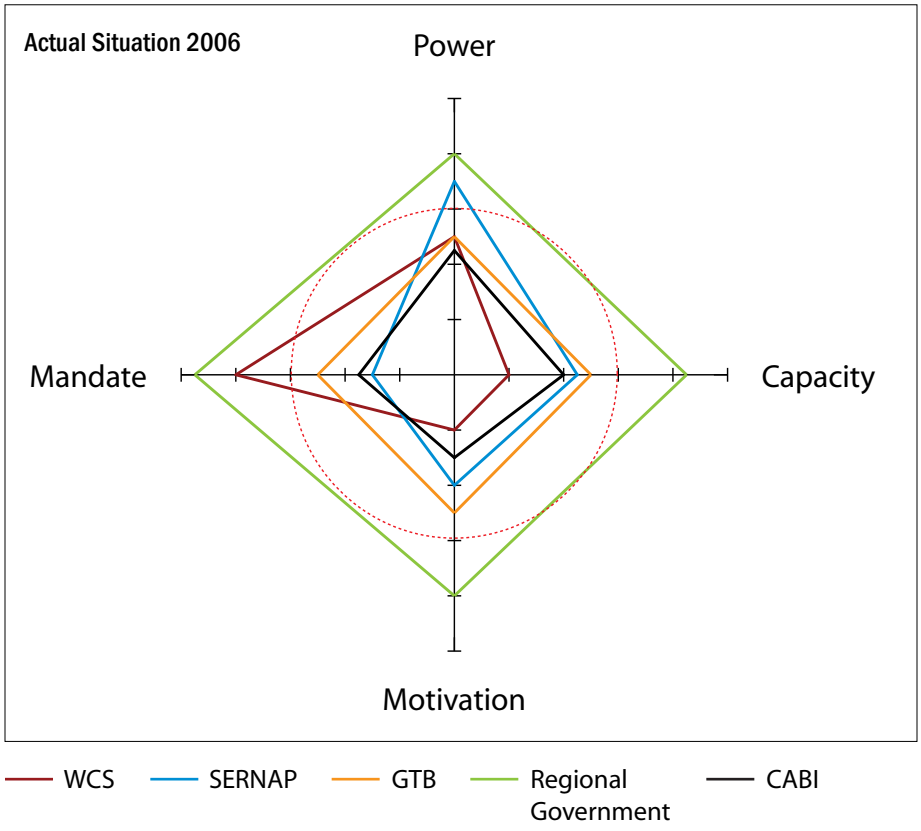
At baseline in 1997, CABI had relative strengths in motivation (emphasizing cultural values), a potential strength in mandate, but was less strong in power of influence and conservation capacity. The baseline alliance for conservation in the landscape was between CABI and WCS, with support from MDSP initially, and SERNAP which was created later (Figure 2).

Figure 2: In the beginning, CABI, WCS and MDSP (later renamed SERNAP) were the alliance for conservation in the Kaa-Iya Landscape. CABI and SERNAP were both motivated to promote conservation and they had the authority to do so, so they were WCS's best choices for conservation partners.



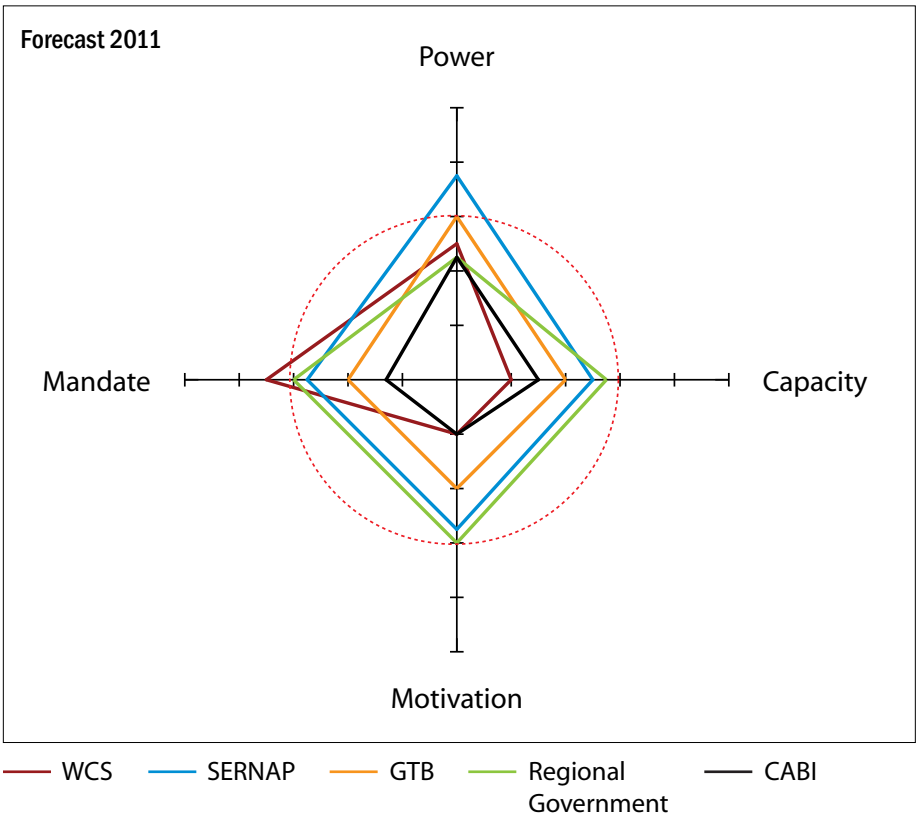
In the 1997-2006 period, CABI improved its mandate as a protected area administrator, indigenous territory manager, and indigenous municipal section. It increased its capacity dramatically, and its relative motivation and power through alliances and constituency-building. WCS has also increased capacity, mandate (through the strategic alliance with CABI), and power (policy influence). In the same period, supported by the CABI-WCS alliance, the following actors have been integrated into conservation activities: SERNAP as representative of national government, regional government, and GTB representing the private sector. The latter demonstrates strengths in all four axes, leveraged through management plans addressing impacts of the gas pipeline (Figure 3).

Figure 3: Between 1997 and 2006, CABI gained authority (mandate) to manage the protected areas and the indigenous territory. A strategic alliance between CABI and WCS increased the motivation and capacity of CABI while improving the mandate and power of WCS. SERNAP and GTB became more involved over this time period as well.



Within the next five years, additional NGOs, private sector institutions, and alliances may appear and be integrated into regional conservation. However, the 5 key actors present in 2006 will remain the most significant. We expect that CABI, GTB, and WCS will continue their growth in capacity, mandate, and motivation; however, growth in power will be difficult in a national political landscape where conservation is not a priority. Ownership conflicts over property and tenure, including demands over protected areas, will predominate. We foresee that SERNAP is likely to weaken in all four attributes, as the National government emphasizes land distribution and increased access to natural resources over protected areas and conservation. As a direct political response, in seeking to establish regional control over land and natural resources, the Departmental government through its newly-created Environment Unit will assert itself as a key actor with increasing strength in all four attributes. The Departmental government is already assuming a stronger role in the Kaa-Iya National Park management committee, and in direct alliances with CABI and WCS, to design and implement conservation and natural resource management activities (Figure 4).

Figure 4: In the future, CABI and GTB are projected to continue to increase their levels of capacity, motivation, and mandate. SERNAP will potentially become less involved if government trends continue to increase access to natural resources in the protected areas. However, the Departmental Government's Environmental Unit will most likely become a key player, gaining in strength in all four attributes needed to effect conservation at this site. Additional actors will most likely become involved as well, either directly or through alliances with current players, although their identities are not known at this time.



When local and/or indigenous groups or communities possess broad legal tenure and political mandate, they can successfully fulfill many of the key roles in a conservation effort – either on their own or in alliance with governments, private sector actors and NGOs. In this case, CABI was already motivated and in possession of mandate. Their standing has since been significantly enhanced through their alliance with WCS and others, an evolution that is good for them and good for conservation.

Case Study 2: Adirondack Park, USA

Site Name:	Adirondack Park
Location:	United States of America
Project Goal:	Maintain and improve the ecological integrity, wild character, and healthy human communities of the Adirondacks.

The Adirondack Park in northern New York is a 24,000 km^2 mosaic of roughly half public and half private lands. The landscape consists of vast forests, ancient mountains and more than 2,500 lakes and ponds. These resources have provided for almost two centuries of hunting, logging and seasonal influxes of tourists and part-time residents. These activities and uses have been facilitated and supported by over 100 local municipalities and approximately 130,000 year-round residents. While the population has remained relatively constant over the last century, the amount of developed land has increased dramatically. Since 1990, the area has seen between 800 and 1000 new buildings or seasonal to year-round residential conversions each year.

While nearly 12,000km^2 of Adirondack Park enjoy constitutional protection from New York State, the checkerboard pattern of public and private lands places a higher-than-usual conservation value on the habitat quality of private lands. In fact, private lands are critical for conservation as they provide much-needed connectivity among many small protected parcels. On the other hand, activities on private lands (including development, timber management, gardening, and feeding wildlife) can result in barriers to connectivity and contribute to a decline in flora, fauna and habitat diversity.

The Park and its constitutional protection of State-owned lands were established in 1892. In the early 1970s, the Adirondack Park Agency was created by the State of New York to oversee land use and development on the private lands; prior to that, activities on private lands within the park were unregulated. For many local landowners the increase in restrictions on development led to heightened animosity toward the State and toward 'outsiders' wanting to protect open spaces for their own interests. Today, the Adirondack Park Agency continues to oversee much of the private development; *some* authority has been transferred to local governments, but most municipalities lack a land use plan or the ability to design and implement one.

While the Adirondack Park Agency and some local governments regulate activities on private lands, few consider the specific needs of wildlife. In many cases, there is insufficient information to appropriately design regulations for minimizing impacts on wildlife. The ability of WCS to contribute to the biotic

integrity of private lands requires the fulfillment of three key roles: building knowledge about the effects of low density development on wildlife; creating norms for developing and managing private lands; and ensuring that preferred management activities are executed successfully.

Target	Maintain biotic integrity on private lands in the Park.
Ecological attributes	The range of intactness and habitat quality varies, but proximity to core protected areas makes private lands exceedingly important to functionality in this landscape.
Use/User attributes	Primary users include private land owners; most are individuals, and some forestry or development groups have larger holdings. Continued ad hoc development and management activities on private lands will lead to declines in biotic integrity. Use is driven by social, cultural, and economic values.
Management regime	A zoning system prevails, with regulation over intensity and type of use.

Priority role	High ranked axes to fulfill role
Executing management activities	Authority, Capacity
Creating rules/norms	Authority, Power, Capacity, Motivation
Building Capacity	Capacity, Motivation

The present mix of actors and institutions necessary to effect conservation in the Adirondack landscape is based on the characteristics of wildlife, the threats to them, and the current management regime. While most species in the Adirondacks are not globally threatened or endangered, some species, namely forest interior birds, are declining in overall abundance and thus are of special concern. Given the historic and current friction among the Adirondack Agency, local governments, and local landowners, WCS can work deliberately with local landowners to take steps toward effecting conservation in a substantial way. As habitat fragmentation is a key long term threat to wildlife in the Adirondacks working with local landowners to manage the land they own could have strong positive effects on conservation. Similarly, increasing demand for residential housing and other developments requires engaging the Adirondack Park Agency and local town governments to encourage their incorporation of wildlife-friendly practices in the everyday regulations which determine where and what types of development activities should occur on the landscape.

Given this context, the qualifications of the actors in relation to the various roles are depicted in the radar diagrams below (Figures 1, 2, and 3). Currently, private land conservation depends primarily on the interests, expertise and capacity of state and local governments. WCS fills the role of building knowledge and capacity about wildlife on private lands (Figure 1). We are working to cultivate regionally-based organizations (a new actor not present on the

diagrams) to improve knowledge of low-density developmental impacts on wildlife within the Adirondack landscape. The APA and the local government have the mandate to influence the creation of rules and norms but perhaps lack the motivation to create rules and norms that effect wildlife conservation (Figure 2). Though the APA and local governments are mandated by New York legislation to create and enforce settlement density norms, it is only individual landowners who have the right to determine how natural resources are used on their property. Given the power and mandate that private landowners have in relation to the disposition of natural resources on their property, WCS is working hard to engage and motivate them so that in the future their activities will play key conservation roles in the Park (Figure 3). So ultimately, conservationists hope that local landowners will become the primary actors motivated to minimize negative impacts on wildlife. In the meantime, WCS is working with the Adirondack Park Agency to incorporate data on development impacts on wildlife into the permitting process for new construction.

Table 1: This table illustrates the prioritization process of the required roles and their attributes for maintaining biotic integrity on private lands.

	Attributes			
Roles	**Power**	**Capacity**	**Motivation**	**Mandate**
Create standards				
Enforce standards				
Monitor				
Build constituency				
Build capacity				
Execute Management Activities				

High Priority
Medium Priority
Low Priority

Figure 1: The motivation, ability and authority to build knowledge about wildlife conservation issues in the Park lies mainly with WCS. Our main objective, then, is to engage and motivate private landowners (who have power and mandate over their lands), so that they become motivated to play a larger role in the future of conservation on the privately-held parcels.

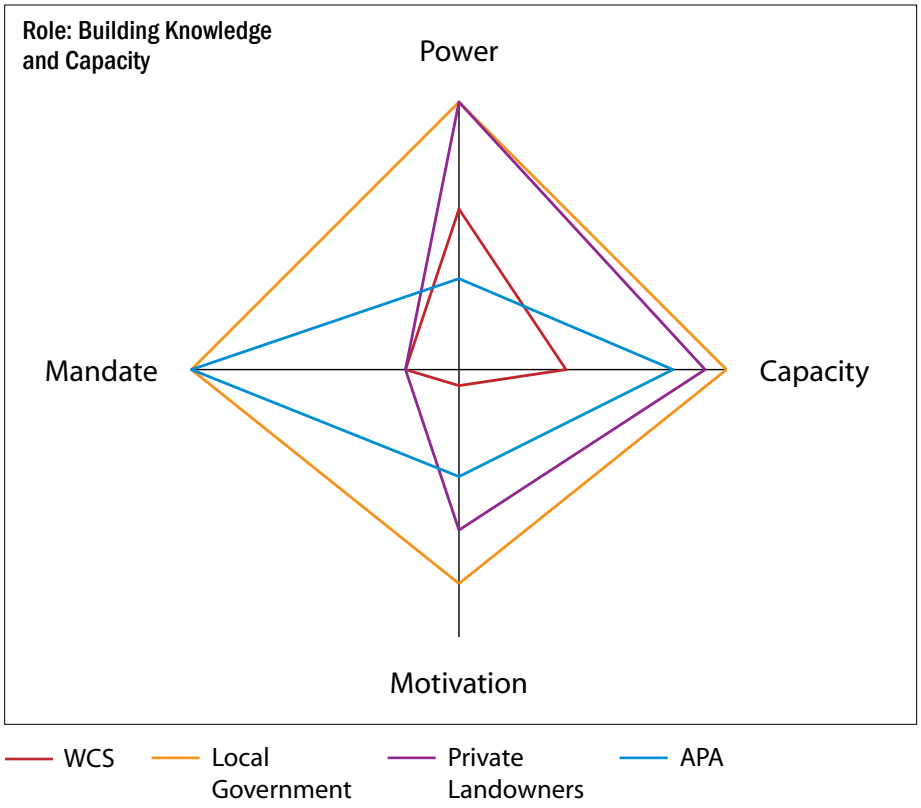


Figure 2: The actors involved in creating rules and norms relating to conservation within the Adirondack Park. WCS is motivated to work with the private landowners, who have the mandate to determine norms on their privately-held lands. Meanwhile, the APA and local governments are best able to create new laws regarding land-use in and around the park, but are not always motivated to create laws which consider the specific needs of wildlife. WCS therefore works to inform these actors as well.

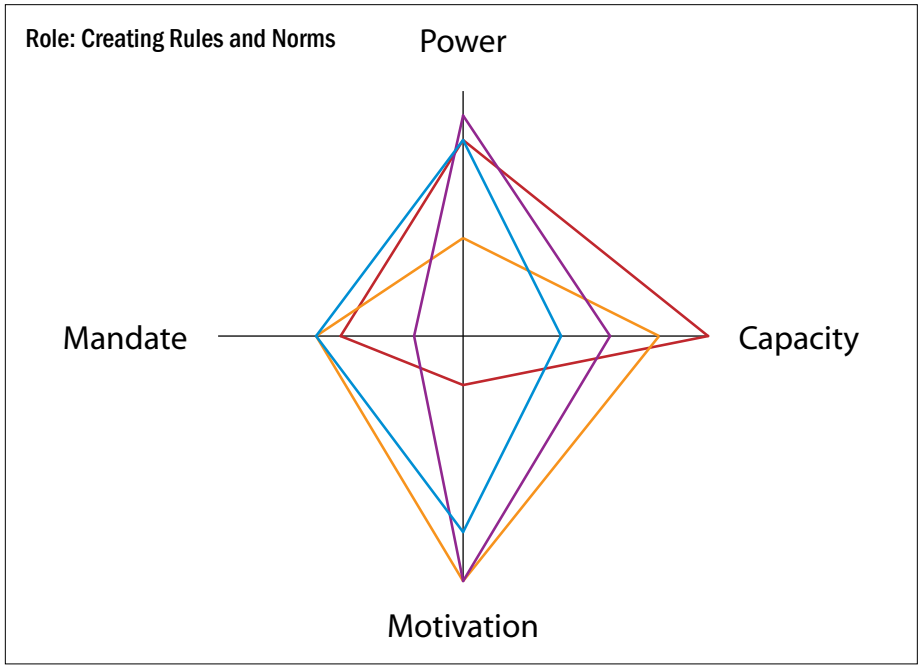
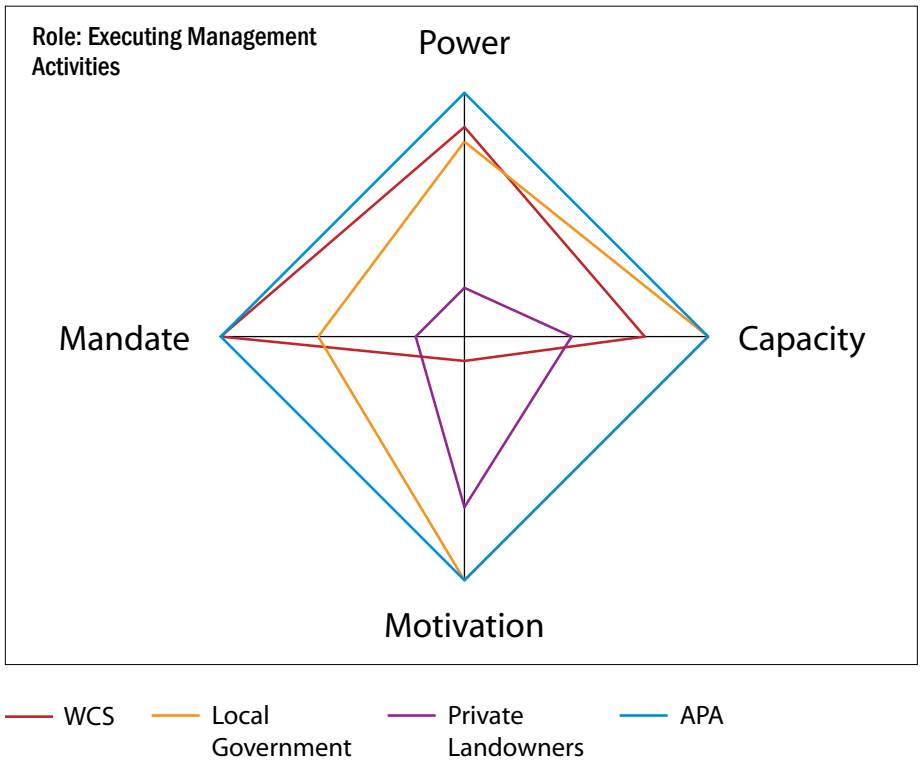


Figure 3: Landowners possess the most power, capacity and authority (mandate) to either positively or negatively affect conservation on their own land. WCS is thus highly motivated to educate and empower them to make the best possible conservation decisions.



The Adirondack Park is a huge and heterogeneous mosaic of public and private lands. All lands fall under the jurisdiction of the Adirondack Park Agency and local governments. Yet it is the aggregate impact of the land-use decisions of thousands of private land owners that, in the long-term, will determine whether the Park is able to retain its wild features. So although the present mix of actors and institutions best able to effect conservation relies primarily on the interests, expertise, and capacity of state and local governments, WCS is working hard to engage and motivate private landowners so that in the future they are able to play key conservation roles in the Park.

Case Study 3: Mamirauá-Amanã Reserves, Brazil

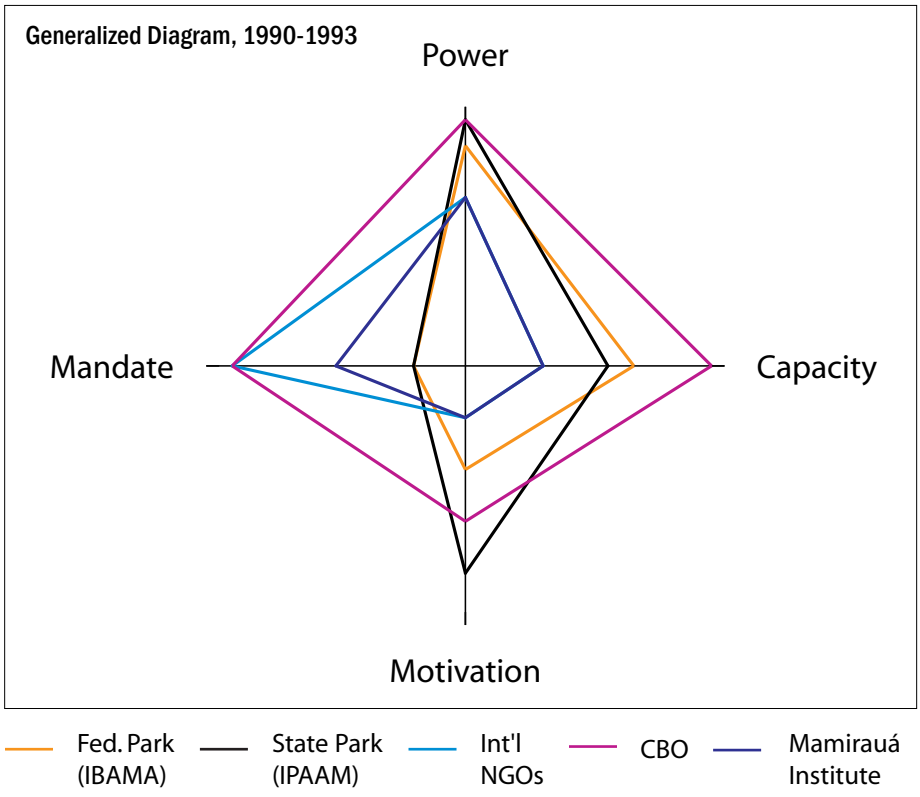
Site Name:	Mamirauá-Amanã Reserves
Location:	Amazon, Brazil
Project Goal:	Conserve the landscape and biodiversity components of the Mamirauá-Amanã Reserves.

More than ten years ago, alliances formed between numerous social actors during the implementation of Mamirauá and Amanã Reserves (Central Amazon, Brazil). This was long before WCS articulated a methodology for engaging appropriate actors and institutions on behalf of conservation, so decisions were based on social and anthropological research in the area as well as inter- and cross-organizational discussions.

The actors that came together as partners to conserve the Mamirauá and Amanã Reserves together had the ability to fulfill the roles considered important at that time (Figure 1). These included:

- Building constituencies and providing legitimacy (local residents, users and private sector actors – mainly operating illegally)
- Providing political influence (churches with local NGOs usually linked to these churches);
- Providing governance (local governmental organizations, agencies and elected councilors)
- Providing legal mandate (state and federal government, secretariats, ministries, etc.)
- Delivering knowledge (universities, research institutes, invited scientists, foreign development agencies)
- Offering financial support (international NGOs, the World Bank, national foundations, governmental agencies).

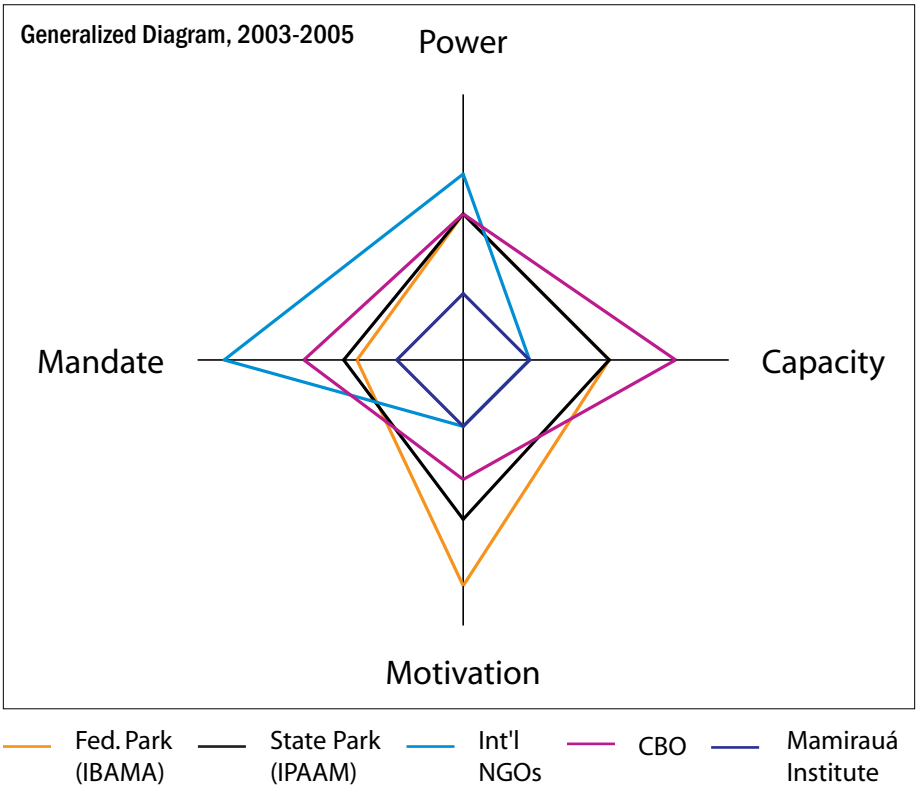
Figure 1: The situation at the Mamirauá-Amanã Reserves in the past. The Mamirauá Institute and NGOs were the most motivated players to effect conservation, while the state and federal park authorities held the mandate in the area.



That said, the *current* mix of actors is more restricted in terms of the number of actors and the number of roles (Figure 2). Years of experience and consolidation have resulted in a more streamlined mix of key conservation actors, including:

- Management partners in rule making, enforcement and legitimacy (local communities and community organizations, their traditional supporters like churches, and other local users)
- Governance, political influence and legal mandate providers (state and federal government; international multilateral organizations)
- Technical and scientific supporters (research institutes, Brazilian system of science and technology, universities, international NGOs.)
- Enforcement (IBAMA - Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis – Brazilian Institute of Environment and Renewable Natural Resources – the enforcement agency of the federal Ministry of Environment) and environmental authorities at the federal and state levels)
- Financial support (Brazilian government, private sector, international foundations, bilateral and multilateral agencies, international NGOs).

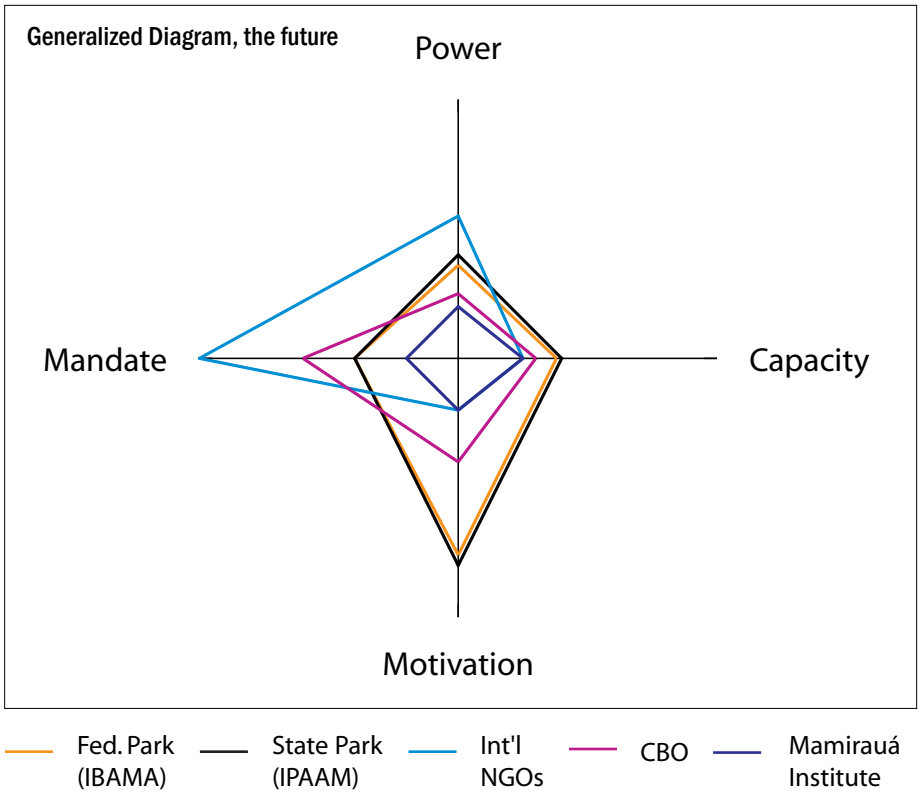
Figure 2: The situation at the Mamirauá-Amanã Reserves at the present time. The Mamirauá Institute and International NGOs remain the most motivated and capable players to effect conservation, and the Institute has gained more power and authority within the Reserve. Governance and enforcement roles fall mainly to IBAMA with the support of state and federal authorities. Community Based Organizations have also become more empowered to contribute to rule-making and enforcement within the reserves.



The most appropriate mix of actors in the future will be different still (Figure 3). The roles will be mostly unchanged but engaged actors will be even fewer. The role played by the WCS-supported Mamirauá Institute will more specifically focus to creating norms and regulations, building and operating a monitoring system, and building capacity in other groups, reserves, areas and organizations. The mix would also include:

- Management partners, providers of legitimacy and political influence (local community associations)
- Governance and legal mandate providers (State and federal government)
- Technical and scientific support (research institutes, Brazilian system of science and technology, universities, international NGOs)
- Enforcement (IBAMA, IPAAM – Instituto de Proteção Ambiental do Amazonas - Institute for Environmental Protection of Amazonia – and local organizations)
- Financial support (Brazilian government, private sector, international foundations, international NGOs).

Figure 3: The projected mix of actors involved in conservation at the reserves in the future. Mamirauá Institute will be mainly involved in the creation of regulations and in monitoring the progress of conservation efforts, while the enforcement of laws within the reserves will be the responsibility of park authorities. NGOs will provide financial and scientific support, while the CBO will become a management partner with some political influence.



The three radar diagrams above illustrate the most important actors in the past, present and future in respect to their key attributes.

Target 1	Maintenance of the high abundances of pirarucus (*Arapaima gigas*).
Ecological attributes	Still abundant, but under high risk of overfishing; rare elsewhere in the Amazon; vulnerable; low productivity, slow growth and late sexual maturation; low recruitment rate; top aquatic predator with high ecological value; low replaceability; no substitutes or ecological analogs.
Use/User attributes	Unsustainable use; animals exploited before achieving maturation; high demand, high market value and high cultural value. Used locally and exported. Very effective flagship species.
Management regime	Zoning System (zones for total preservation and zones for sustainable use); access restricted to local fishermen associations; fishing season restricted to three months p. a.; suggested rotation of fishing grounds; tackle limited to harpoons and gillnets; annual quotas; licensing and tracking; monthly monitoring of illegal fishing.

Priority role	**High ranked axes to fulfill role**
Regulation and rules creation	Capacity, Power, Mandate
Enforcement	Mandate, Power, Capacity
Monitoring and Control	Capacity, Power
Capacity building	Capacity
Finance, political support	Capacity

Three radar diagrams below (Figures 4a-c) depict the key roles in relation to specific actors and their attributes.

Figure 4a: The Mamirauá Institute and the mix of University and NGO players are the most motivated to create rules affecting the conservation of pirarucu within the park. CBO has power and mandate in the area, and thus it is vital to engage them in the process and increase their motivation to conserve.

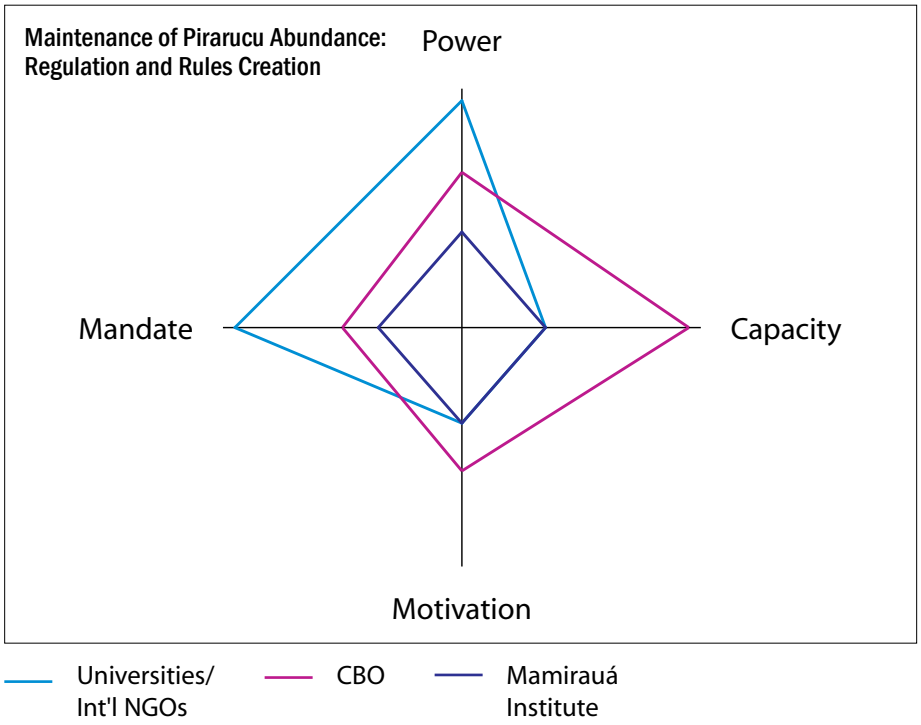


Figure 4b: Rules enforcement falls to a mix of actors: the Mamirauá Institute, the Park Services, and community groups.

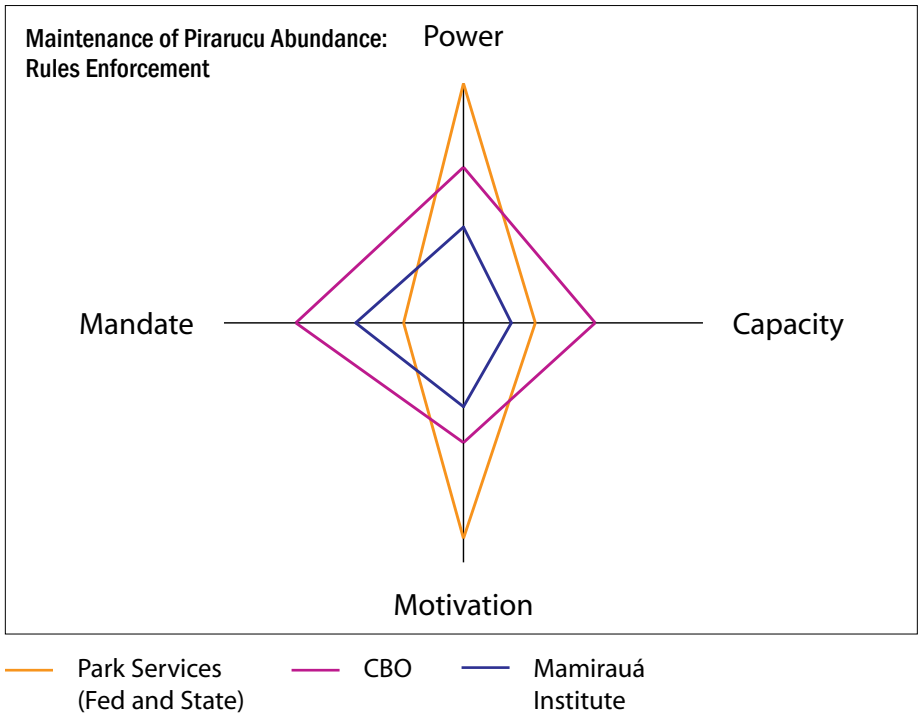
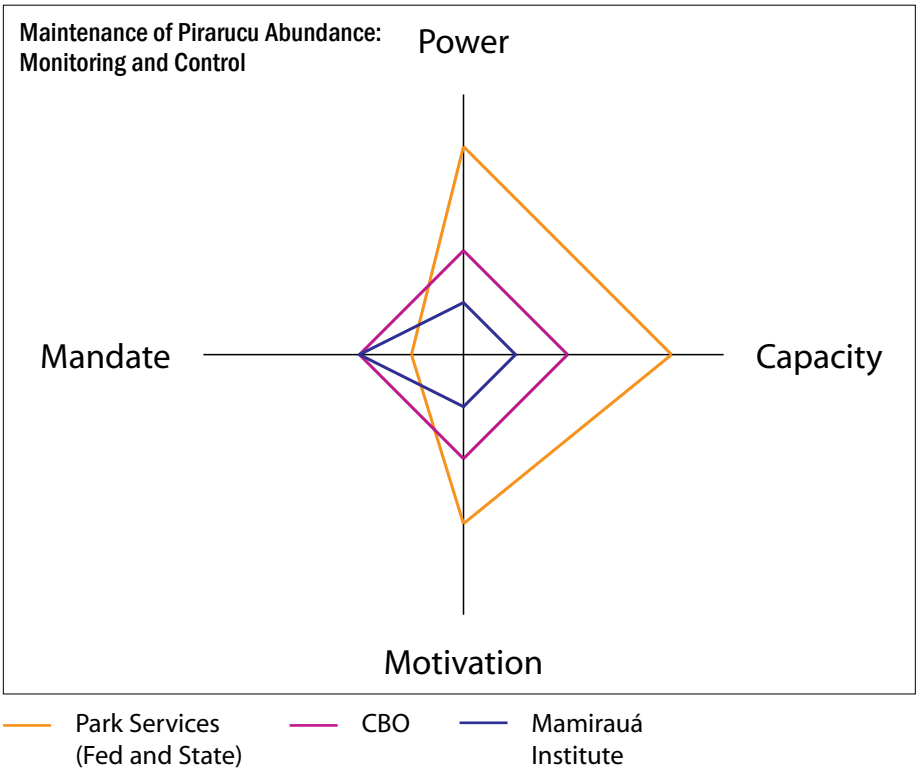


Figure 4c: While the Park Services have the authority to monitor the abundance of pirarucu within the reserves, they are not as motivated to do so as are other players.



Target 2	Maintenance of 10 timber species; recovery of 5 overharvested timber species.
Ecological attributes	Some species still fairly abundant; others under risk of depletion; rare in other parts of the Amazonian forests; low productivity, slow growth and low regeneration rate; some species also important as food for threatened vertebrates.
Use/User attributes	Unsustainable; trees cut before reaching reproductive maturation; government regulations ignored high demand and high market value.
Management regime	Zoning System (zones for forestry management and timber extraction) for each community association involved in conservation action and in sustainable use of the resource; access restricted to local, resident, community associations; rotation of parcels; optimization of timber volume; minimum diameter (age) of trees; annual planning for extraction and licensing.

Priority role	**High ranked axes to fulfill role**
Regulation and rules creation	Capacity, Mandate, Power
Enforcement, Monitoring and Control	Mandate, Power, Capacity
Capacity building	Capacity
Finance, political support	Capacity

Three additional radar diagrams depict the key roles in relation to specific actors and their attributes for the second target (Figures 5a-c).

Figure 5a: Creating the regulations necessary to conserve tree species requires the cooperation of the research institutes, universities and the Mamirauá Institute.

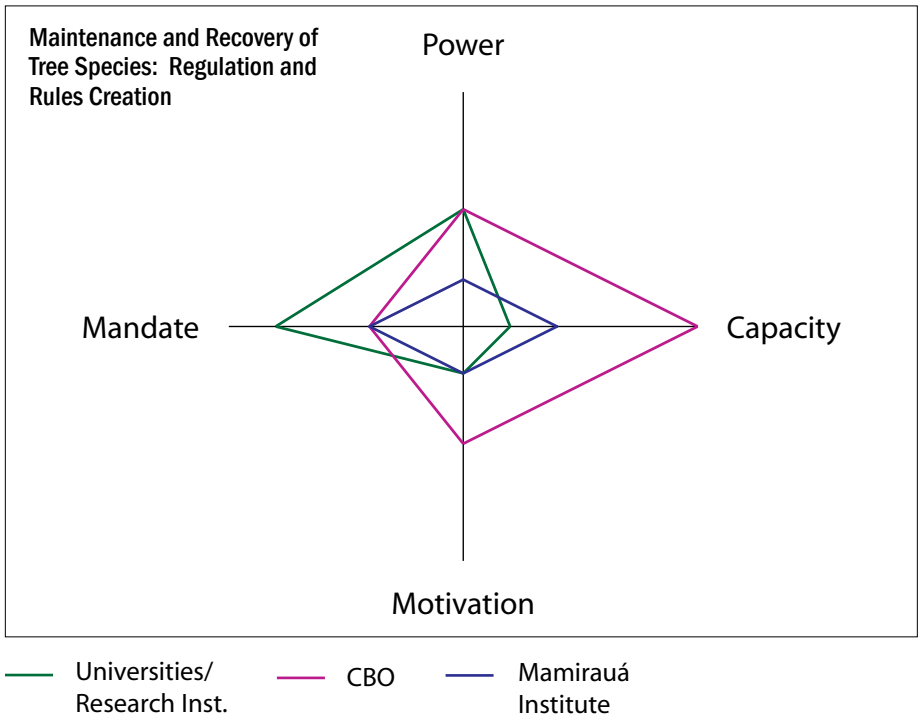


Figure 5b: Enforcement of the rules created by those institutions is the responsibility of the Mamirauá Institute and the Park Services, in cooperation with community groups.

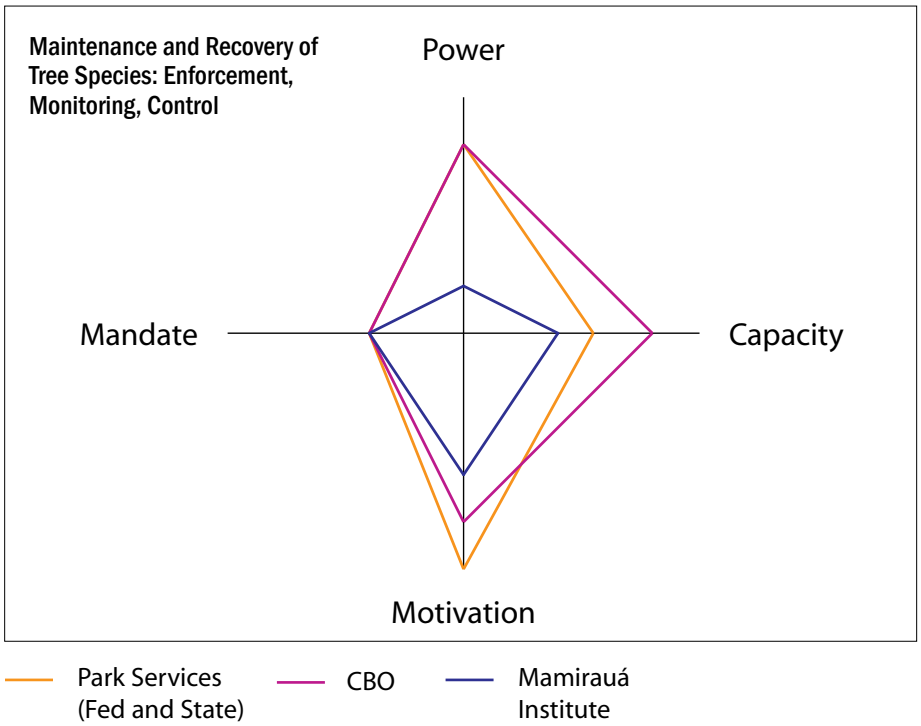
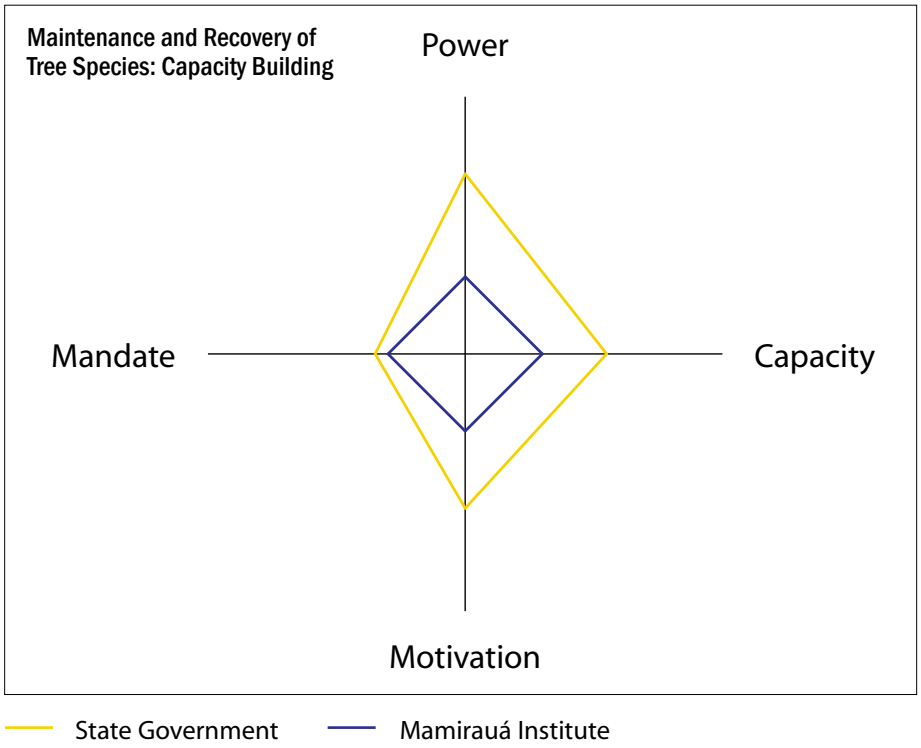


Figure 5c: Building capacity among other groups falls mainly to the Institute with the assistance of the state government.



Before the Mamirauá and Amanã Sustainable Development Reserves were established, there was little political support for the idea and even less belief that local communities should be managers of protected areas. As a result, when Márcio Ayres first conceived of the idea he cast for a large, inclusive mix of actors to get as build as broad a political base as possible. Over time, as the rationale for and success of the Sustainable Development Reserves have become more well known, the numbers of actors needed to effect conservation has gradually declined and has focused on fewer and fewer groups capable of providing the needed management, governance, technical, enforcement and financial support.

Case Study 4: The Southern Mondulkiri Conservation Landscape, Cambodia

Site Name:	Southern Mondulkiri Conservation Landscape
Location:	Cambodia
Project Goal:	To secure the conservation future of the forests and wildlife of the southern Mondulkiri landscape

Target	Black-shanked Douc Langur
Ecological attributes	Previously abundant, productive but population sizes have been artificially depressed through hunting; Globally Endangered
Use/User attributes	Primarily opportunistic (military/police) and professional (local community) hunters, with some limited subsistence hunting (primarily with guns). Presently hunting levels are low, but until recently were very high.
Management regime	Strict controls on outside influences while maintaining traditional use systems; moving toward implementation of strict no-gun and no-hunting policy throughout.

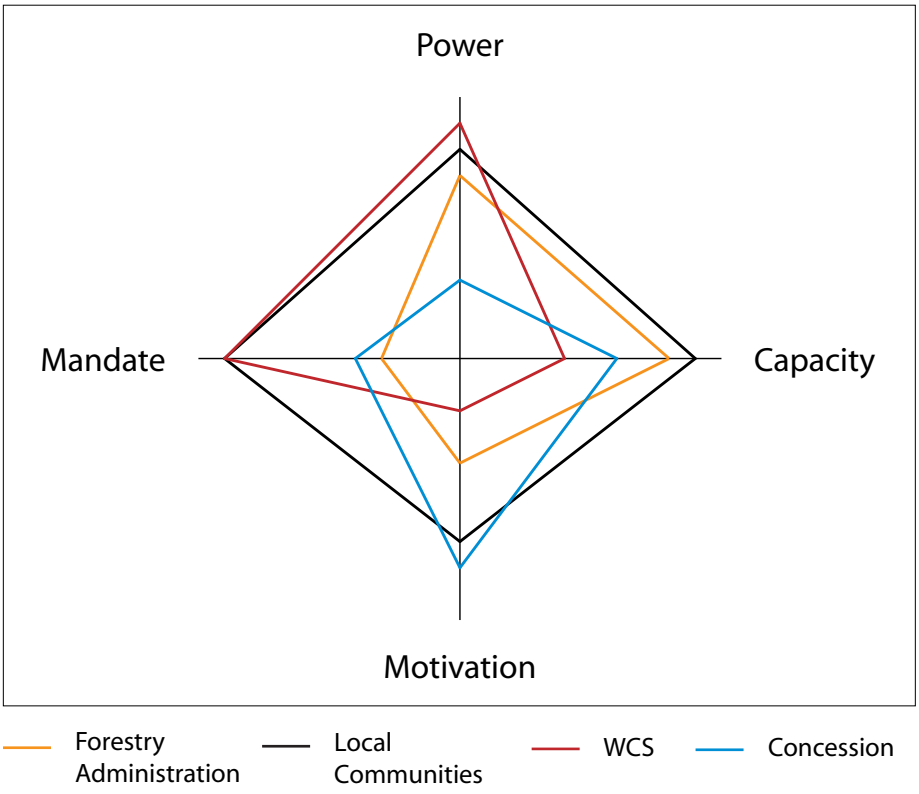
Priority role	**High ranked axes to fulfill role**
Create Standards	Power, Capacity, Motivation
Coordination	Power, Capacity
Enforce Standards	Power, Capacity, Motivation, Mandate

The Black-shanked Douc Langur *Pygathrix nigripes* is a Globally Endangered primate limited entirely to the more evergreen patches of Annamitic forest in southern Indochina. Within its range states – Laos, Vietnam and Cambodia – only the latter has large areas of habitat remaining. However, even in Cambodia, decades of conflict, political insecurity and a preponderance of firearms left populations highly depressed and, in many areas, locally extinct.

In 2000, the **Southern Mondulkiri Conservation Landscape** (SMCL) was an active, Malaysian-operated 400,000 ha logging concession. A WCS survey found significant populations of douc as well as a number of other globally threatened species persisting in the area, possibly *because of*, rather than in spite of, the presence of the concession. In Cambodia generally at the time, there were weak systems of community management and an absence of formal government. Instead, factions of the military, border military, military police, police and Vietnamese cross-border interests competed for illegal control of the timber resources. Wildlife was also seen as a commercially viable target to complement logging, and was actively harvested using military hardware (guns, landmines and vehicles) and manpower from local communities. In southern Mondulkiri the concession acted as a deterrent to the worst excesses of this lawlessness. WCS therefore focused on more immediate problems of law enforcement and stability before making longer-term investments in community-based activities.

Although the concession was not motivated by wildlife conservation it was necessarily committed (for its own profit) to improving rule of law, reducing illegal logging (and, thus, habitat loss) and building management capacity -- all, fortuitously, crucial roles of good conservation management. These roles complemented those that WCS played at the time, such as the building of technical capacity for wildlife conservation, monitoring and constituency building. Given the need for strong legal enforcement of conservation of the douc population, a combination of power and mandate were seen as essential in the mix of actors at the outset.

Figure 1: A pictorial representation of the roles and attributes of the various actors at the site in 2000. Although WCS was strongly motivated to conserve douc langurs, they lacked strength in the essential attributes of power and mandate. Thus, the logging concession and Forestry Administration were crucial actors at that point. Interestingly, although the concession was not committed to conservation per se, it was strongly motivated to decrease illegal logging and uphold the law, which indirectly benefited conservation in the area.

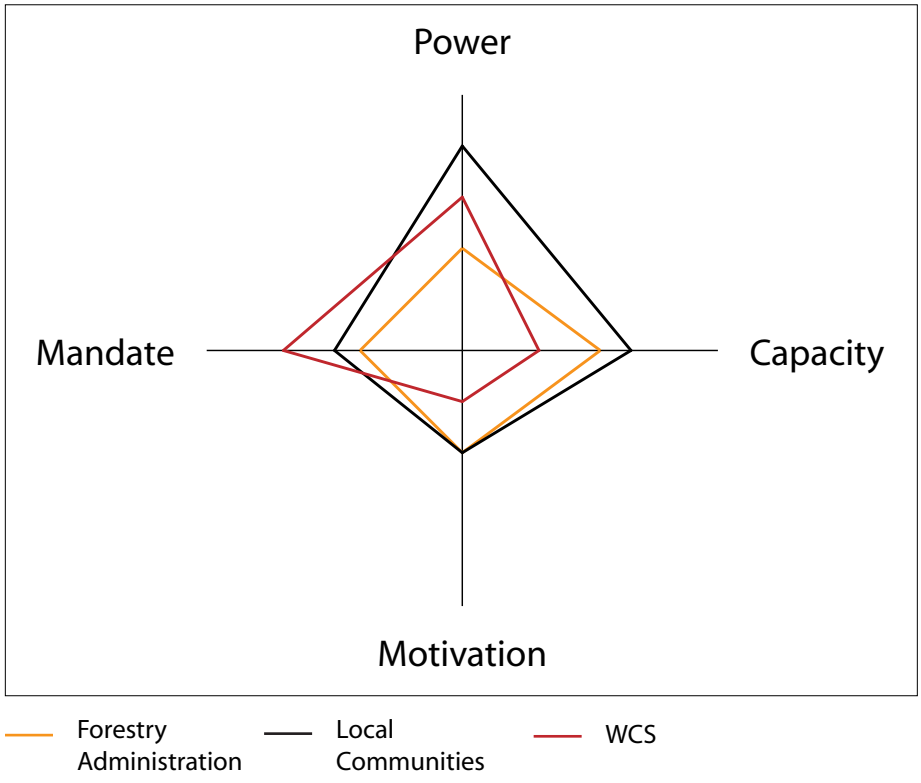


From this starting point (Figure 1), we targeted our efforts at increasing the motivation of the concession so we would have an effective assembly of actors. Their lesser capacity for conservation was offset by WCS's capacity and therefore was not a target for change.

The radar diagram also illustrates that local communities were not effective conservation partners at this time, due mainly to their disenfranchisement from their land and resources. Our immediate focus was therefore not on communities, but they remained target actors – groups we hoped to empower as effective conservation actors.

Two years after the initial surveys, the concession abruptly stopped operations due to an impasse with the Government over royalty rates. This fundamentally shifted the nature of the project, its actors, their roles and our prioritization of their individual attributes (Figure 2). While the mandate/tenure attribute was met within the Forestry Administration, our government partner, we were left with a major power and capacity vacuum. Our options were to pull out or take on the responsibility for the abandoned roles ourselves. While WCS had no mandate or motivation to play a law enforcement role, the project would have failed without it, and the conservation target (the doucs) would have been lost. We therefore decided to concentrate on building the capacity and power of the Forestry Administration, as they had strong mandate and were reasonably well motivated.

Figure 2: After the concession left the area, WCS focused on increasing the capacity and power of the Forestry Administration, since the Administration already had the mandate to play a role in rules enforcement while WCS lacked both the mandate and the power to do so. Note that the local communities were also gaining strength in their various attributes at this point.



This shift required significantly more resources, to replace the concessionaire's investments, but the Forestry Administration did become responsible for enforcement, a crucial role that could not be practically filled by any other actor. Plus, with increased law enforcement leading to a reduction in logging, hunting and general lawlessness, we were able to shift the WCS focus to monitoring, the building of a conservation constituency, and offering support to communities.

Table 1: The prioritization of roles and actor attributes that we considered necessary at the beginning of the project in 2000.

	Attributes			
Roles	Power	Capacity	Motivation	Mandate
Create standards				
Enforce standards				
Monitor				
Build constituency				
Build capacity				
Coordinate				

High Priority
Medium Priority
Low Priority

The roles of enforcing standards and coordination were seen to be most important. We envisioned the relative strength of potential actors' attributes at that time, respective to these roles, as pictured in Figures 3 and 4 below:

Figure 3: The ability of various actors to enforce the standards of conservation at this site required a strong mix of all four attributes, but in particular power, capacity, and motivation. Thus, in the beginning, the involvement of the concession was indispensable. However, WCS and the Forestry Administration were also essentially involved due to their strong motivation to conserve the douc langurs.

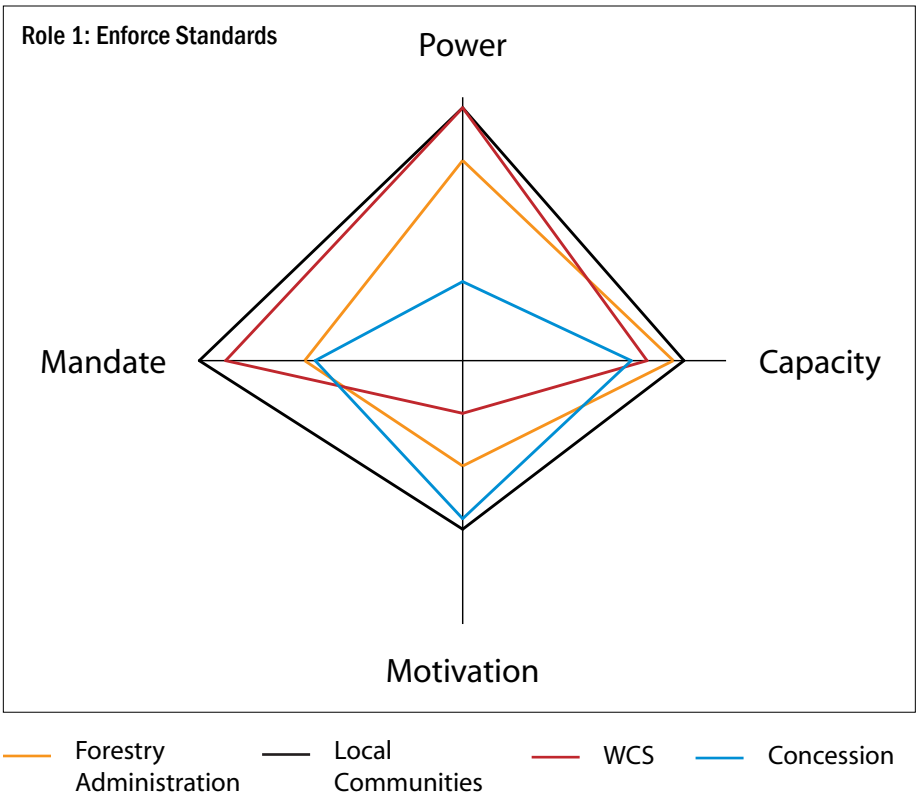


Figure 4: The ability of various actors to coordinate conservation relied mainly on the attributes of power and capacity. Once again, the concession was a major player at this early stage due to their strengths in these areas; but involvement by both WCS and the Forestry Administration was also needed.

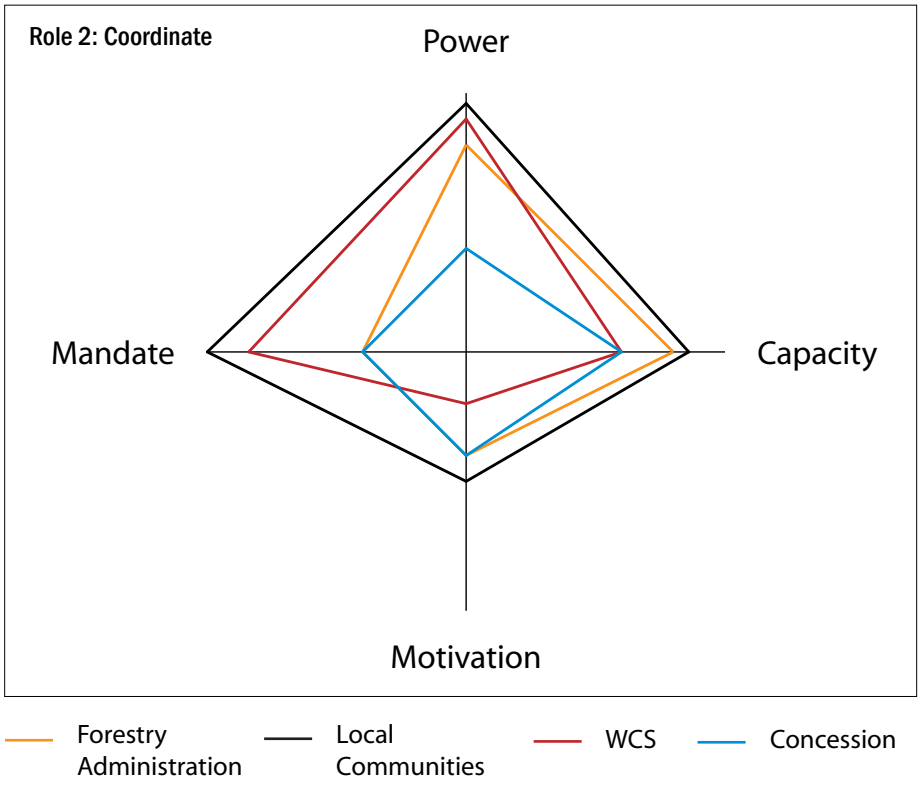


Table 2: Those actors who were seen to fulfill the needs of key roles are noted below.

	Attributes			
Roles	Power	Capacity	Motivation	Mandate
Create standards				
Enforce standards	C	C, W	W	C, F
Monitor				
Build constituency				
Build capacity				
Coordinate	C	C, W	W	C, F

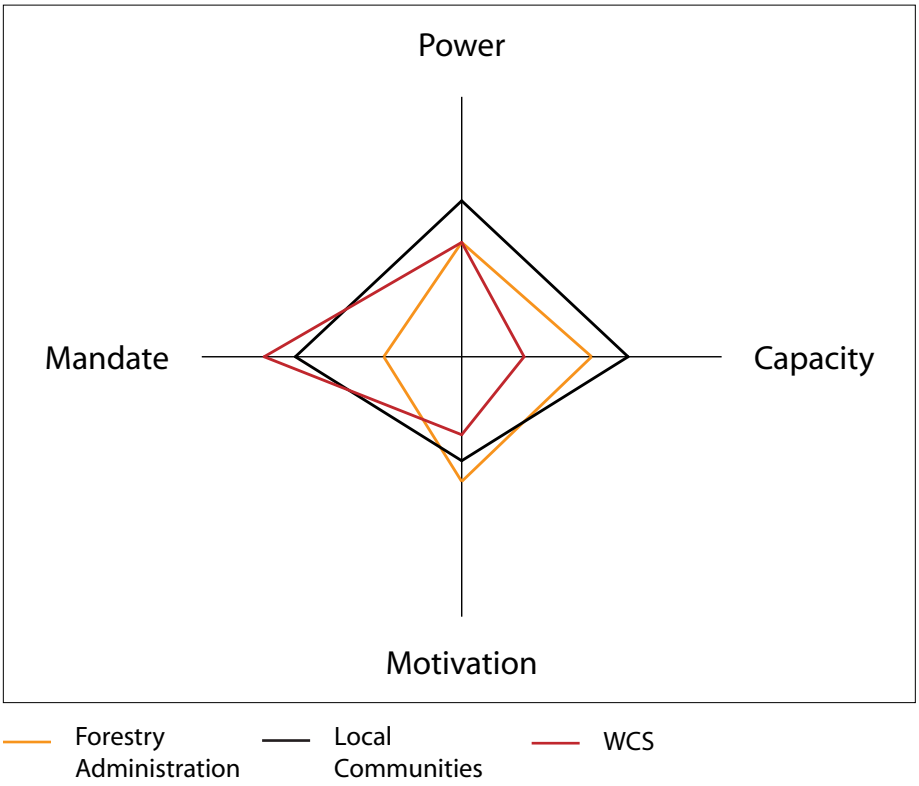
High Priority
Medium Priority
Low Priority

C = Concession company, W = WCS, L = Local Communities, F = Forestry Administration

Table 2 illustrates that, at the beginning of the project, the mix of key actors included only the logging concession and WCS, with the Forestry Administration serving a peripheral role. The absence of local communities was not due to a perceived lack of legitimacy, but rather that they did not have the required attributes to effect conservation for an endangered species under pressure at that time.

Today, improved enforcement standards and better coordination have led to an evolved prioritization of roles and attributes. Staffing and resources have been re-focused on constituency building and capacity building. The formal authority is now empowered to step into many of the roles left vacant by the concession and, at the same time, the attributes of local communities have been strengthened so that they can become effective and positive actors in the mix (Figure 5).

Figure 5: Today, the Forestry Administration has been able to fill many of the roles left vacant when the logging concession disappeared from the area and the local people have been empowered to allow them to contribute to the process of conservation. The new mix of actors at this site was accomplished due to the constituency- and capacity-building work done by WCS, the actor which still possesses the highest motivation to conserve the doucs at this site.



Initially the international logging company that held the concession rights was the most appropriate actor to partner with, and WCS encouraged them to halt illegal logging, to adopt more wildlife friendly practices and to help to enforce national wildlife laws in the absence of government capacity to do so. With their departure and the return of the area to state control, WCS has started to work with a mix of government agencies and local communities to find new ways to conserve wildlife and wildlife habitat within what was once a logging concession. In Mondulkiri, the appropriate mix of actors and institutions to effect conservation has had to change dramatically in response to changing land use and management authority. Today, the government agency that was once neither willing nor able to implement conservation activities has both the capacity and the motivation to do so.

Case Study 5: Greater Madidi Landscape, Bolivia

Site Name:	Tacana Indigenous Territory or TCO (Tierra Comunitaria de Origen)
Location:	Northwestern Bolivia
Project Goal:	Conserve the biodiversity and natural integrity of the Greater Madidi Landscape

The Tacana Indigenous Territory (TCO) is part of the binational Greater Madidi Landscape Conservation Area in the northwestern Bolivian and southeastern Peruvian Andes – documented as one of the most species-rich regions of the world. Spectacled bears, white-lipped peccaries, jaguars, and Andean condors and their habitats are partially protected by five protected areas, one of which is the Madidi National Park and Natural Area of Integrated Management. The Tacana TCO, 372,000 hectares, borders a large portion of the Madidi protected area.

Target	White-lipped Peccaries
Ecological attributes	Abundant, medium productivity
Use/User attributes	Largely subsistence hunters, also harvesting timber and non-timber forest products with management plans
Management regime	Indigenous territory for sustainable use and management of natural resources

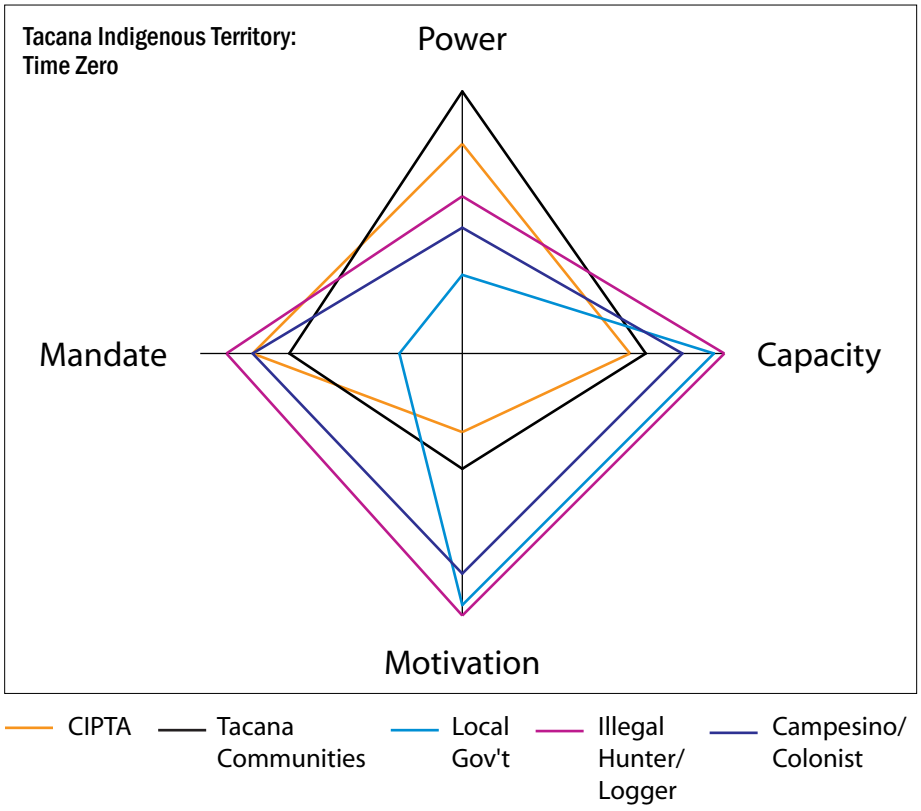
Priority role	**High ranked axes to fulfill role**
Create, teach and enforce rules	Mandate, Motivation, Capacity, Power
Technical management support	Motivation, Capacity
Monitoring	Mandate, Motivation, Capacity

In order to increase the area available for jaguars, white-lipped peccaries and other wildlife species (thereby increasing population viability in the lowlands of the Madidi protected area), we chose to work in the buffer areas of the park. This was critical since competing land uses such as subsistence agriculture, mechanized agriculture, and intensive livestock management loomed on the horizon. A large portion of the buffer area and even portions of the protected area were under formal claim for the creation of an indigenous territory. There was also a movement toward gradual colonization due to uncertain land tenure in the general region.

Taking a closer look at our evolving work on behalf of the white-lipped peccary can help elucidate the efforts involved in promoting an appropriate management regime and engaging the best-suited actors for the cause. In this case, existing actors included the Tacana indigenous communities; CIPTA (Consejo Indigena del Pueblo Tacana) – the representative grass-roots organization for the Tacana people; the local municipal government; illegal loggers and hunters; and, in a simplistic version of reality, a combined representation of the campesino and colonist communities present or arriving in the region.

Upon our arrival, the Tacana and their representative organization (CIPTA) did not have clear legal title to land ownership nor, as such, management authority, but a legal process toward recognition of ownership had begun. The Tacana had relatively low levels of formal management capacity and wielded very little power to influence conservation in the region, but they *were* relatively motivated toward conservation goals compared to other actors in the region (Figure 1). Colonization in the region had not benefited the Tacana. The Tacana want economic benefits, but they are also interested in the long term sustainability of the TCO, in halting the current trend of colonization into the region, and in promoting sustainable natural resource use activities such as tourism, cacao production, and selective logging. Given their relatively high motivation for sound wildlife management and proposed formal land claims, and given that the wildlife resource in question (white-lipped peccary) is locally abundant and relatively productive – and could therefore sustain less strictly-controlled use in the interim, the Tacana were the most appropriate actors with the potential to become strong managers of the landscape.

Figure 1: At the outset, the Tacana had neither the mandate nor the power necessary to effect conservation at this site. However, they were the most motivated actors in the region, and so WCS partnered with them to increase their authority.

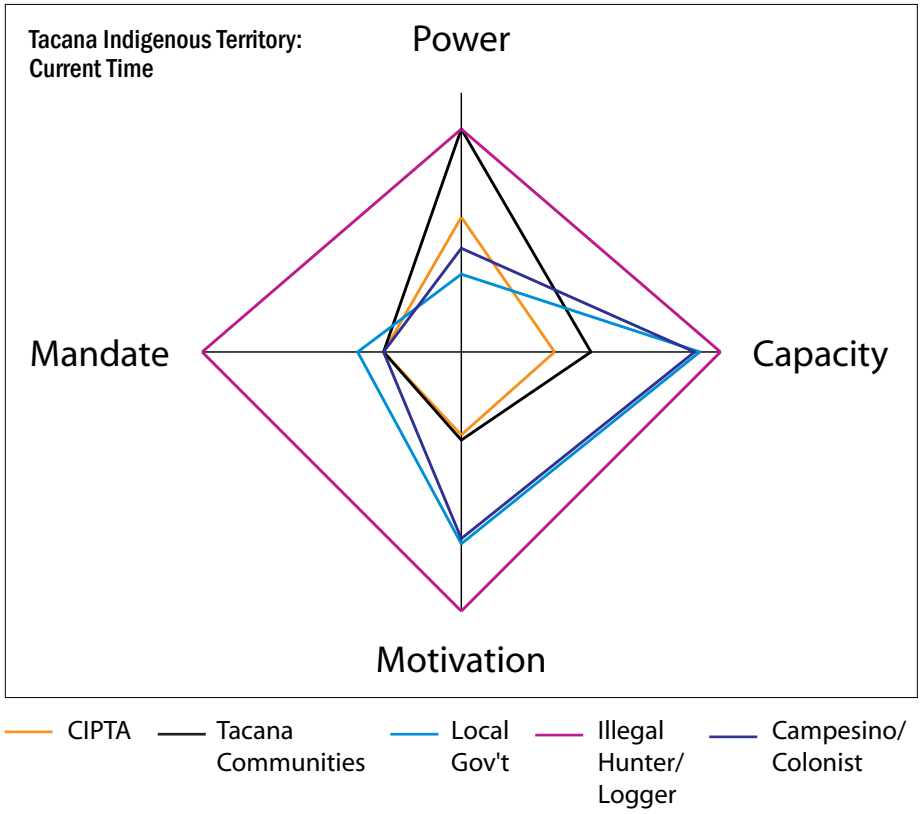


WCS' partnership with CIPTA and the Tacana took a three-pronged approach.

- Financial and technical support for CIPTA, ensuring Tacana participation in the legal process toward the establishment of the Tacana Indigenous Territory
- Development support for a CIPTA-led strategy for the sustainable management of natural resources (including wildlife) within the Tacana Indigenous Territory
- The creation of natural resource management projects within Tacana communities, including the sustainability of subsistence hunting.

Six years after the beginning of the partnership between WCS, CIPTA and the Tacana, the situation has changed (Figure 2). CIPTA and the Tacana communities now own 372,000 hectares – over nine tenths of the total agreed to be awarded – and have increased their capacity for general management and sustainable management of subsistence hunting and other natural resources. These successes have reinforced their motivation for conservation and have positively affected their relative power in the system at large.

Figure 2: After a 6-year partnership with WCS, the Tacana (and their representative organization, CIPTA) had gained both the mandate and the capacity necessary to allow them to manage natural resources in the area sustainably, thereby also increasing their relative power.



Our support to CIPTA has resulted in the legal consolidation of an indigenous territory, thus halting colonization. WCS will continue to support CIPTA and the Tacana in their effort to secure complete ownership and mandate of their two indigenous territory demands in the landscape, and will also continue to build their capacity to fully assume their roles as managers and policy makers in the landscape.

Site Name:	Madidi National Park and Natural Area for Integrated Management & Apolobamba Natural Area for Integrated Management
Location:	Northwestern Bolivia
Project Goal:	Conserve the biodiversity and natural integrity of the Greater Madidi Landscape

Site Name:	Ixiamas Municipal Tourism Reserve
Location:	Northwestern Bolivia
Project Goal:	Conserve the biodiversity and natural integrity of the Greater Madidi Landscape

Target	Giant Otters
Ecological attributes	Rare, low productivity
Use/User attributes	Threatened by habitat destruction & degradation
Management regime	Municipal Tourism Reserve

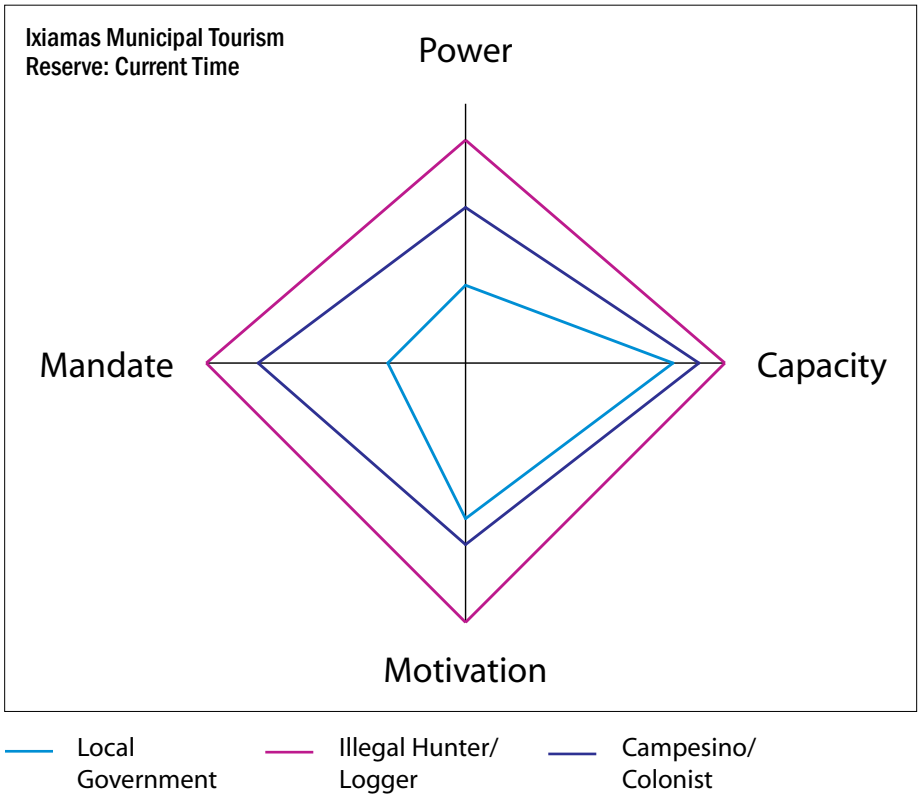
Priority role	**High ranked axes to fulfill role**
Create, teach and enforce rules	Power, Mandate, Motivation, Capacity
Technical management support	Motivation, Capacity
Monitoring	Motivation, Capacity

Representing one of the few sites where giant otters occur in the Greater Madidi Landscape, the Alto Madidi site also has a high density of jaguars and other wildlife. Having identified the Upper Madidi River region as a local wildlife 'hotspot', and concluding that the management regime must ensure full protection of such rare, significant, and low-producing species, WCS and Madidi protected area authorities approached the Ixiamas Municipality regarding the possibility of protecting 'their side' of the Madidi River.

Although extending the Madidi protected area had been proposed in a recent Management Plan process, there was no political will to support this. The area was still designated as fiscal or formally established state owned land and was threatened by approaching colonists and logging activities. WCS thus chose to target the municipality as the most appropriate actor on the landscape as they had the mandate over the immediate area.

In response to the threat of encroaching colonists, and the incentive development of a high-end eco-tourism lodge in the area (therefore motivation), the Municipal Authorities moved to protect a 23,000 hectare Municipal Tourism Reserve on their side of the Madidi River. The challenge now is to build management capacity of the Ixiamas municipal authorities in conjunction with the Madidi protected area experience, especially given the size, wilderness qualities and strategic conservation importance of the municipality. WCS is also working to increase their motivation for conservation, with the aim to improve and secure municipal authorities as effective conservation actors in the landscape (Figure 3).

Figure 3: The local government possesses both the mandate to govern the area and the incentive (motivation) to conserve the local environment due to the development of an eco-tourism lodge in the area. Using the lessons learned at the Madidi protected area, WCS has targeted the municipality with the intention of building their capacity for conservation.



When local communities have the mandate and are organized– with the potential to increase power – they serve as powerful (and powerfully motivated) partners. (In this case, the Tacana and the municipality with mandate over a critical area bordering the Madidi River).

Case Study 6: Rungwa-Ruaha Conservation Landscape, Tanzania

Site Name:	Rungwa-Ruaha
Location:	Central Tanzania
Project Goal:	To conserve the ecological integrity (including composition and function) and wildland value of the Rungwa-Ruaha Landscape

The Rungwa-Ruaha Landscape is a large (41,000km^2), very wild and likely intact (compositionally) savanna ecosystem in Central Tanzania. Rainfall is low (200-450mm) so water is a critical resource, and the Great Ruaha River serves as a critical dry season source. Water is diverted from the upper catchment areas of the Great Ruaha for rice cultivation. Illegal 'satellite' farms have proliferated adjacent to legal, industrial-scale rice schemes, as the former can tap into water flowing back to the river through earthen return canals maintained by the latter. Irrigated rice can be harvested and sold asynchronous to rain-fed rice. By selling when rice is scare in the markets, farmers of irrigated rice can capture a 500-700 percent price premium. Satellite irrigated farms are rarely leveled and water, rather than standing as it does in the industrial farms, drains constantly and wastefully away. As a result, in the dry season of 1993, the Great Ruaha stopped flowing for the first time in living memory, and its period of non-flow has increased steadily each year since.

Target 1	Hippopotamus (an umbrella for water-dependent species and riverine/riparian communities)
Ecological attributes	**Hippopotamus:** ecologically significant, wholly water dependent, and with fluid seasonal distribution, which makes them highly vulnerable, especially given their low productivity. **River ecosystems:** huge economic and social significance via ecosystem services.
Use/User attributes	**Hippopotamus:** Little specialized use, though conflicts and some illegal killing for meat constitute significant sources of mortality; also management issues regarding water. **River ecosystems:** ~30-50,000 ha of legal and illegal rice cultivation which diverts water from the Great Ruaha River. Weak linkage between ecological effects and pricing or regulation.
Management regime	*de jure:* regulated access with fee for use *de facto:* open access [NB: The management system described here relates to water, the critical resource that hippos need, rather than hippos themselves. If water is successfully managed, hippos will benefit as well.]

Priority role	**High ranked axes to fulfill role**
Enforcement of Norms	Motivation and Capacity for direct logistical support and knowledge-building

Water is managed by basin-level authorities in Tanzania; the Rufiji Basin Water Office (RBWO) has jurisdiction over water in the Great Ruaha River. Their authority – to set water prices, and oversee enforcement – is defined by Tanzania's water policy, but the act of enforcement falls to Water Use Groups at the village (or irrigation scheme) level. Water Use Groups have little incentive (i.e., motivation) to manage the resource because there are minimal local costs associated with misuse of water. The costs are borne downstream by wildlife (habitat loss of around 60% for water-dependent species like the hippo), the Tourism Industry & National Parks (overall losses of up to US $1,400,000 per year, through the loss of dry-season game viewing habitat), fisheries (losses of ~US $500,000 per year), the Tanzania Electric Supply Company (TANESCO) (~US $200,000 per day in lost power revenue), and industries that depend on electricity (lost productivity due to shutdowns estimated at ~US $2,000,000 per day). The users themselves don't perceive a problem since these effects are not apparent locally.

Figure 1: This radar diagram demonstrates the mismatch between enforcement authority (which rests with RBWO) and responsibility for implementation, which rests with smallholder user groups. Therefore, a central issue is to motivate local water user groups to conduct enforcement. User groups also require greater capacity to manage, particularly monitoring infrastructure and knowledge, because managers lack a sound understanding of the hydrological flow and timing required for biodiversity (*inter alia*: hippo, riverine woodlands, fisheries and ecosystem services).

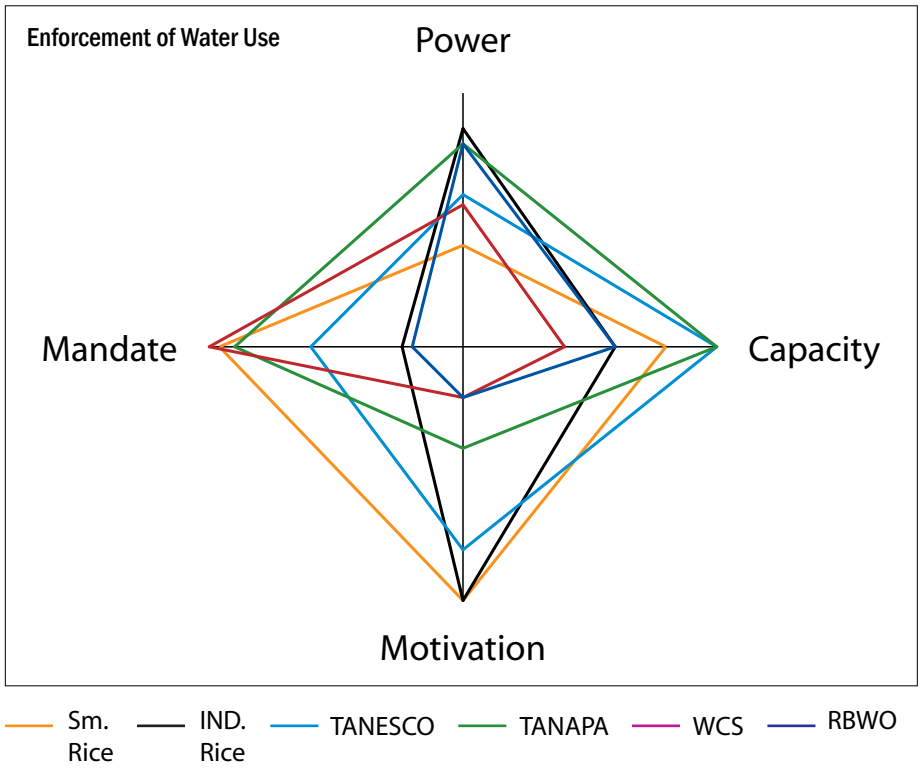


Table 1: This table indicates the prioritization of the roles that various actors play in the enforcement of water use at Rungwa-Ruaha, and the relative importance of each of their associated attributes.

	Power	Capacity	Motivation	Mandate
RBWO	2	3	5	5
WCS	3.2	4	5	1
TANAPA	2	1	4	1.5
TANESCO	3	1	2	3
IND. Rice	1.7	3	1	4.8
Sm. Rice	4	2	1	1.2

imperative
important
lower priority

In summary, WCS and RBWO are working with smallholders to increase both their capacity and motivation to manage (see Table 1 and Figure 1). RBWO already has clear legal mandate, so the goal is to create incentives for other actors (Smallholder Water User Groups) to fulfill their critical management roles. WCS is also working to engender management knowledge within other stakeholder groups, such that they can learn to set informed hydrological targets for river restoration in order to meet the needs of wildlife and restore the ecosystem functions of the Great Ruaha River.

The Lunda-Mkwambi Wildlife Management Area provides a contrasting case from within the same landscape. Here, a different set of resources is targeted and, taken together with the actors and system of use, necessitate a different management regime. In this case, communities have been the long-term stewards of wildlife and have paid the costs of wildlife conservation, both because of their resettlement from the protected area and through conflicts with wildlife (particularly elephant and large carnivores). That said, despite the tremendous value of wildlife in Tanzania (for photographic tourism and sport hunting), the communities of Lunda-Mkwambi have not captured these benefits. Not surprisingly then, illegal hunting and encroachment are increasing and there has been a decrease in local support for wildlife on village lands. Because these lands abut the Great Ruaha River and Ruaha National Park, land management and hunting by local people have far-reaching impacts on wildlife throughout the landscape.

Target 2:	Lunda-Mkwambi Wildland (Wildlife community and wild area)
Ecological attributes	Productive (at the ecological community level)
Use/User attributes	Unsustainable Low-value resident hunting provides meager income but prevents villages from entering more lucrative and sustainable enterprises like photographic tourism and sport hunting.
Management regime	Strictly Protected Area, with regulation of both access and use.

Priority role	High ranked axes to fulfill role
Create norms	Mandate
Enforce norms	Capacity

To date, wildlife-related revenues in Lunda-Mkwambi have come from low-value resident hunting (conducted by the Iringa Wildlife Conservation Association [IWCA], and the Hunter's Association of Tanzania [HAT]). New legislation allows the establishment of a Wildlife Management Area (WMA) which will, for the first time, enable the local people by granting them the authority to manage wildlife and wildlife-associated revenue. This Wildlife Management Area will be managed by an association of 21 villages, called MBOMIPA (*Matumizi Bora ya Malihai Idodi na Pawaga*, or "Best Use of Natural Resources in Idodi and Pawaga").

At the moment, MBOMIPA has no legal authority, but is operating with *de facto* authority, granted informally by the Ministry of Natural Resources and Tourism (MNRT) and the Village Governments (Figure 2). This is apparent in the radar diagram, which shows that all management authority rests with the MNRT, but because they do not have a presence in the area, their capacity is essentially zero. WCS's primary activity in the area is to assist MBOMIPA in securing the legal mandate to manage the area through the WMA law (Table 1). Once MBOMIPA is established as an "Authorized Association," WCS's emphasis will shift to the capacity axis: to assist in the long process of building the human, technical and infrastructural resources necessary to manage the area and its wildlife.

Figure 2: Currently, although management authority rests with the MNRT, they have essentially no capacity due to their lack of local presence. Thus, the focus of WCS's efforts in the area is to assist the village association (MBOMIPA) in securing the legal mandate to manage the area, so that WCS can then focus on building local capacity to manage the area and its wildlife.

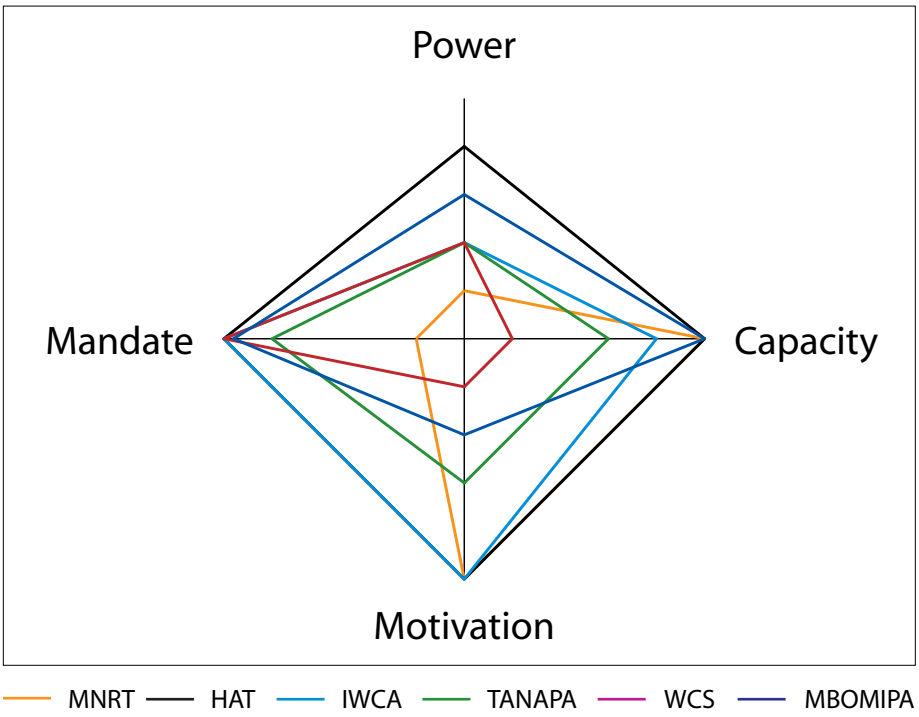


Table 2: The prioritization of roles required for the enforcement of hunting regulations at the Lunda-Mkwambi Wildlife Management Area.

	MBOMIPA	WCS	TANAPA	IWCA	HAT	MNRT
Power	3	4	4	4	2	5
Capacity	1	5	3	2	1	1
Motivation	4	5	3	1	1	1
Mandate	1.2	1	2	1	1	5

imperative
important
lower priority

The status of MBOMIPA and the WMA illustrates a few important issues in terms of actor engagement. First, in contrast to the water situation, WCS chose to engage with an 'owner' of the resource- the village association (MBOMIPA)- rather than the direct user of the resource (IWCA and HAT). This was the appropriate strategy because the local hunters' associations were essentially tied to a less lucrative strategy of resident hunting, even though the stated goal of all users was wildlife conservation. Establishing MBOMIPA's mandate to manage the area effectively creates an opportunity to encourage the replacement of resident hunting with a more lucrative and sustainable use. Toward this end, all of the highest priority activities today are focused on MBOMIPA.

Another contrast to the water situation described earlier in this case study is that the direct actors here were well aware of the problem at hand, since the resource (the wild area) and the principal actor were in the same area. The water case requires a more significant (and contentious!) documentation phase, first demonstrating that a problem exists, and then establishing its cause.

Even within a landscape there are often dramatically different conservation challenges mediated through disparate ecological and human use factors. To conserve the Ruaha River system and all its dependent wildlife, WCS works with the Rufiji Basin Water Office that has legal jurisdiction over the water, and with small scale rice farmers whose agricultural practices are the principal threat to the system. In the Lunda-Mkwambi Wildland, wildlife are presently owned by the state, and local communities see little value in keeping them in the landscape. WCS is using a new national law to help 21 communities to legally own natural resources in their traditional territory so that they can begin to capture the true economic value of wildlife. In the overall Rungwa-Ruaha landscape, WCS must work with two very different mixes of actors and institutions to best effect conservation.

Case Study 7: Eastern Maya Biosphere Reserve, Guatemala

Site Name:	Eastern Maya Biosphere Reserve (MBR)
Location:	Department of Petén, Guatemala
Project Goal:	Maintain the ecological integrity of the eastern MBR

The Maya Biosphere Reserve is the largest protected area complex in Central America. Its 2,112,940 hectares of subtropical moist forest, savanna, and wetlands account for more than one-seventh of the surface area of Guatemala and form the core of a tri-national system of protected areas in Guatemala, Belize, and Mexico. Together, these areas comprise the largest contiguous block of tropical forest north of the Amazon. Consequently, wide-ranging species which were exterminated in many parts of Central America, such as the jaguar, puma, white-lipped peccary, Baird's tapir, and scarlet macaw, still thrive in the reserve. Conservation approaches used by WCS across the reserve reflect the widely divergent conditions across the landscape. More specifically, western national parks Sierra del Lacandón and Laguna del Tigre face enormous and immediate threats and have been increasingly degraded, while the eastern part of the reserve – containing both national parks and multiple-use areas – remains largely intact. Major threats on the western landscape include colonization, deforestation and fire instigated by migrants and "outsiders". In the east the primary threat is weak capacity of local communities to secure their resource access and use rights from outsiders. As a result, the management regimes, the priority roles required for successful conservation, and the mix of actors differ radically between the Uaxactún community forest concession in the less threatened part of the reserve and the scarlet macaw nesting areas of Laguna del Tigre.

Target	Natural Forest Cover of the Uaxactún Community Forest Concession
Ecological characteristics	Abundant within area; medium productivity; medium resilience; high diversity
Use/User characteristics	Valuable as a source of economic and subsistence resources including timber, xate, chicle, and allspice; long-term threat of colonization and agricultural expansion.
Management regime	Multiple-use zone forest concession managed by a community-based organization with 25-year usufruct rights to above-ground natural resources. Communities are responsible for controlling access and ensuring resource use is sustainable, and socially equitable.

Priority role	High ranked axes to fulfill role
Build Constituencies	Capacity, Motivation, Mandate
Local Management	Capacity, Mandate, Motivation

At 83,558 hectares, the Uaxactún community forest concession is the largest forest concession in the Maya Biosphere. Though secure today, the existence of this community reserve was uncertain as recently as 1996. Prior to this, the community of Uaxactún repeatedly rejected government offers of a 45,000 hectare area because they argued that their long extractive history conferred legitimate prior claims to a far larger area. By 1997, WCS and other groups began providing technical support to help village leaders estimate the amount of area required for current and future non-timber extractive industries. WCS also provided economic support to legally register the village cooperative, Organizacíon Manejo y Conservación, (OMYC), because as the legitimate "owners" of the resources in the area, the Uaxactún community logically should play a principal role in sustainable management of "their" natural resources. However, in 1998, the community barely existed as a political and management entity. The following year (nine years after the establishment of the Maya Biosphere), OMYC had the legal authority to begin developing their capacity to manage timber and other economically important natural resources including xate palm fronds, allspice, and chicle.

Not surprisingly, OMYC leaders encountered significant obstacles to their initial management efforts because few villagers had received technical training, investment capital was scarce, and the interests of individuals predominated over the interests of the community. Though the Guatemalan national park service (CONAP) had a strong mandate in the area (Figure 1), CONAP workers were more motivated to avoid conflict than to apply the law. Extractive industries allied with powerful local leaders also held a reasonable amount of power, yet remained unmotivated to support sustainable management. In short, conservation management was largely absent and only very modest economic benefits returned to the inhabitants of Uaxactún.

Figure 1: The groups involved with management of the Uaxactún community forest concession, relative to their various attributes. This is the situation as it stood in 1998.

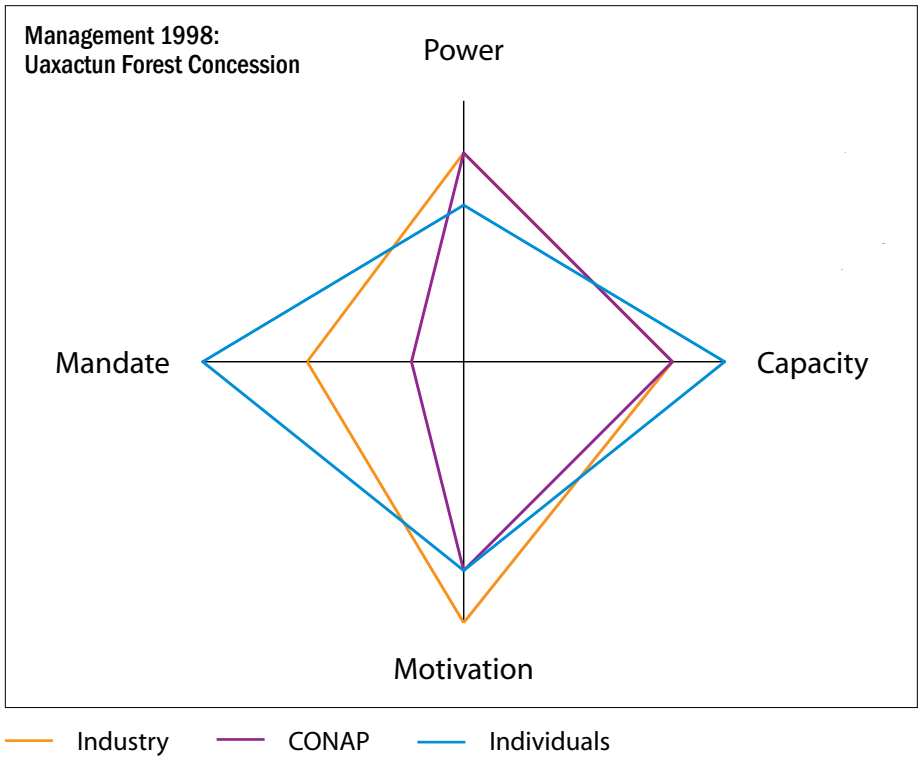
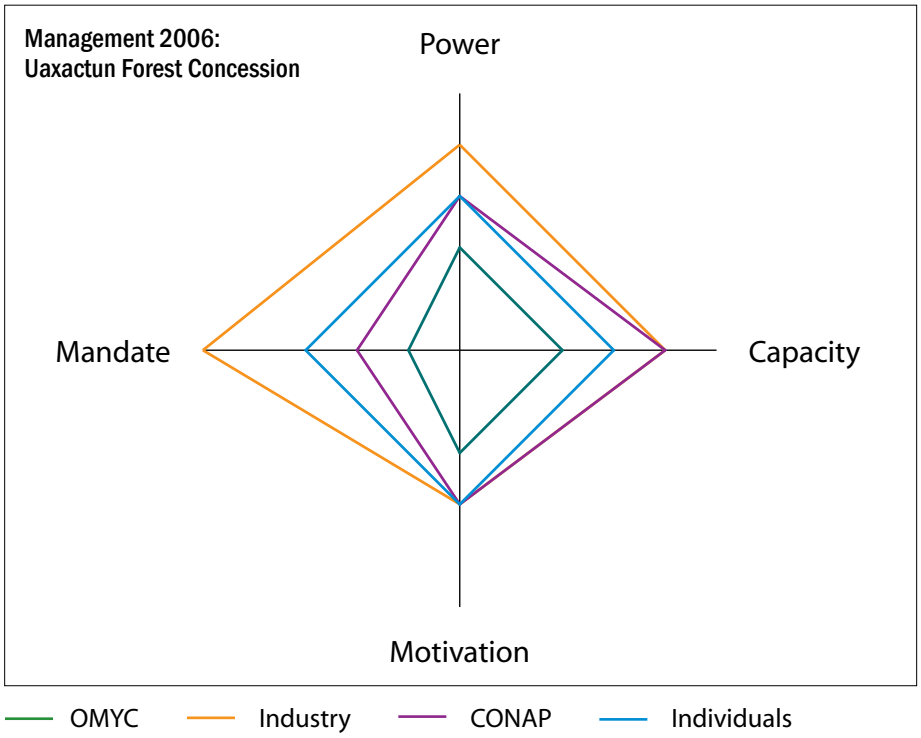


Figure 2: This radar diagram which depicts the evolution of management in the Uaxactún community forest concession, shows that the OMYC village cooperative became the primary guardians of forest resources by the year 2006.



By 2000, WCS had encouraged a broad mix of actors (including national government, local and international NGO's, private industry, and donors) to join forces to support OMYC's management efforts in the hope of conserving the forests of Uaxactún and strengthening local peoples' incentives to become forest guardians. Local management capacity for timber was increased, as was that for other productive activities such as xate, allspice, breadnut and chicle. Stakeholder alliances developed new 'products' including ocellated turkey sport hunting and corn dolls made by women's groups. Local people were trained to manage finances and add value to timber. Uaxactún also maintained the only high school within these remote parts of the reserve. Over-flights were enormously useful in providing local people with a regional view of the threats facing the reserve, and increasing motivation to seek ways to secure their land. As the present mix of actors progressively succeeds in helping build local resource management capacity, the Uaxactún community will gradually fulfill more and more key management roles in the future (Figure 2).

In 2002, the Equator Initiative recognized our efforts to strengthen the mandate, power and capacity of legitimate actors by declaring the project one of the 27 most innovative community-based conservation and development projects in the tropics.

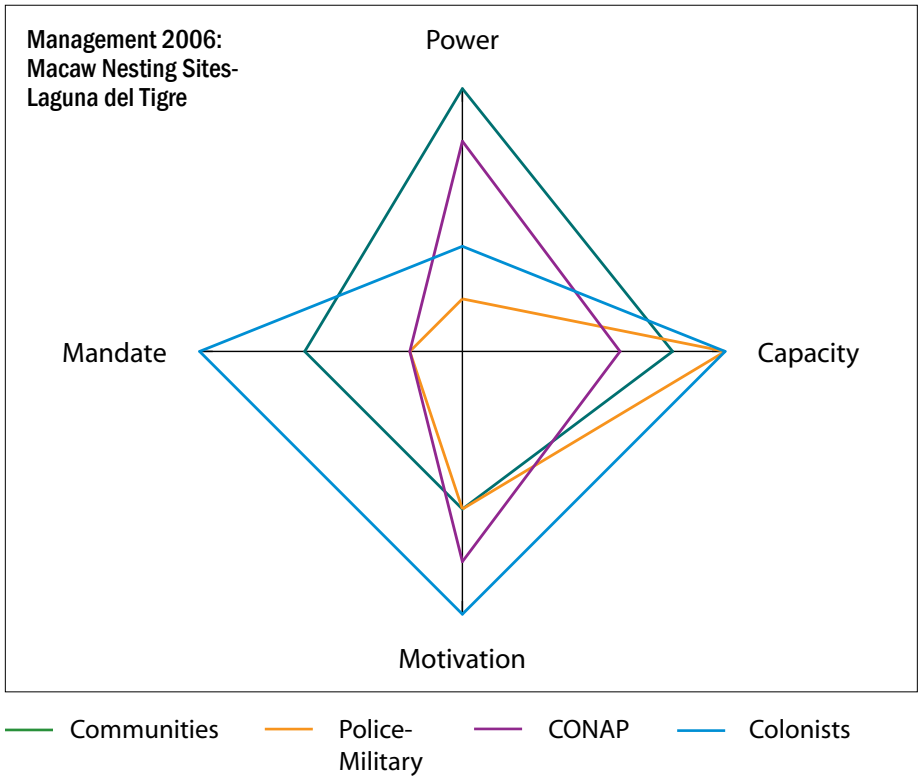
Target	Scarlet Macaw in Laguna del Tigre
Ecological characteristics	Facing local extinction and under serious threat; low productivity; low resilience;
Use/User characteristics	Eco-tourism and cultural value; economic value to poachers; habitat under serious threat due to land conversion
Management regime	Combination of National Park and Multiple Use Zone facing severe threats due to *de facto* open access

Priority role	**High ranked axes to fulfill role**
Create Norms	Mandate, Power, Capacity
Build Constituencies	Capacity, Mandate, Motivation
Management	Motivation, Capacity, Mandate
Monitor	Capacity, Motivation

With only about 300 scarlet macaws remaining in the Petén, this once-abundant parrot is one of the most threatened birds in Guatemala. WCS has identified and monitored 65 nesting trees across the reserve, with some 35-40 of them being active in any one year. Unfortunately for the macaw, this last nesting stronghold is located within the Laguna del Tigre ecosystem, a forest-wetland matrix extremely high in biodiversity, but well-suited for agriculture and cattle ranching. Illegal colonists and land speculators backed by powerful *terratenientes* (landowners) and, on some occasions, narcotics traffickers, make for an often dangerous demographic threatening the area and the macaws. Specific threats include habitat conversion for agriculture and ranching, forest fires, and

macaw chick poaching for the live bird trade. Given the scale and intensity of the threats and the imminent risk of complete loss of all scarlet macaw nesting sites, only the police, military and CONAP have, at present, the authority and law enforcement power sufficient to conserve macaws (Figure 3).

Figure 3: The management of scarlet macaws in Laguna del Tigre requires a powerful mix of actors due to the intensity of the threats that they face, such as habitat loss and poaching. Currently, only the military, the police and CONAP have both the power and authority to effectively conserve macaws at this site.



Engaging this mix of actors resulted in passage by the Guatemalan Congress of the "*Emergency Law for the Restoration, Protection, and Conservation of Laguna del Tigre National Park*" in 2005. The law increased the budget to CONAP for protection of the area, and provided a strong mandate for the natural resource police and the military to protect the park. It also eliminated the airstrips and drop zones used by drug traffickers. Since then, WCS has continued to work with this unusual mix of actors to increase their capacity for conservation management by coordinating field patrols and outreach campaigns.

Today, protection activities have begun to yield solid results; colonization is waning and arrests of illegal colonists and resource poachers have dropped. Looking ahead, there is hope that local communities can eventually step into the roles now played by CONAP and the police and military. To this end, in 2005,

WCS initiated a community-based protection program at the macaw nesting site of Peñon de Buena Vista, adjacent to the village of Paso Caballos. Villager members were employed seasonally to develop infrastructure and prevent forest fires, as well as to guard the nesting trees at Buena Vista. Since then, additional collaborations in Paso Caballos resulted in the development of a cooperative store run by women, as well as a popular children's outreach program that motivates students at the village school to monitor active macaw nests within their land holdings in the park.

Within the Maya Biosphere Reserve, the source and severity of threats to wildlife and wildlife habit vary enormously as do the management regimes in place. As a result, WCS is working with two very different mixes and arrangements of actors and institutions to effect conservation. In the east, the Laguna del Tigre national park is the last bastion for nesting sites of the nationally endangered scarlet macaw, and is severely threatened by illegal colonization and chick poaching for the exotic-bird trade. As colonization is financed by powerful terratenientes and narcotics traffickers, only the national parks authority, the police and the military have the jurisdiction and law enforcement power to abate the threats. In the west, the greatest threats are the inability of the resident community in Uaxactún to legally or physically exclude non-residents from their traditional territory or to curb over-harvesting of a few resources by a few community members. In this case, the most appropriate mix of actors is the legitimate "owners" of the land, the Uaxactún community (with the technical aid of WCS), as well as CONAP, private sector logging companies and others.

Case Study 8: Nouabalé-Ndoki National Park - Lac Télé Community Reserve Landscape, Republic of Congo

Site Name:	NNNP (Nouabalé Ndoki National Park)
Location:	Republic of Congo
Project Goal:	Conservation of the full complement of biodiversity and endangered species in the NNNP

The Nouabalé Ndoki National Park (NNNP) covers an area of just over 4,200 km^2 and is home to important populations of several endangered species, such as forest elephants, western lowland gorillas and chimpanzees. The park boasts over 300 bird species and over 1,000 plant and tree species, including a rich diversity of old growth mahoganies. NNNP is also completely uninhabited by people. With the goal of preserving the nearly undisturbed forest ecosystem while simultaneously generating tourist revenue, the Government of Congo converted the unlogged Nouabalé-Ndoki timber concession into a national park in 1993.

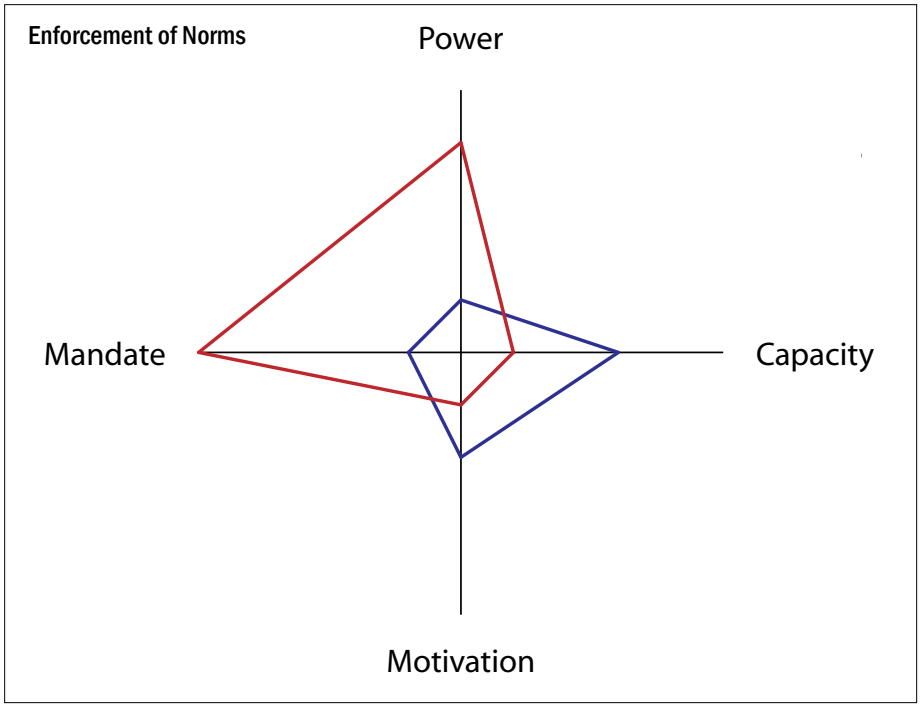
Target 1	Elephant
Ecological attributes	Globally threatened, low productivity, population numbers within park are relatively high
Use/User attributes	Semi-nomadic indigenous population: few in number. Occasionally enter the park to collect non-timber forest products. Immigrant population: Poachers, predominately from Central African Republic, occasionally enter the park, using military weapons to hunt elephants.
Management regime	Closed access. Total ban on the hunting of elephants (and all endangered species).

Priority role	High ranked axes to fulfill role
Enforcement of complete ban on hunting elephants	Mandate to manage, Capacity to act
Communication of regulations	Capacity to act, Motivation for conservation

The national park is protected by a cadre of ecoguards who operate under the direct supervision of the Ministry of Forestry Economy and the Environment (MEFE). They patrol the park and enforce wildlife laws, thereby ensuring that the park remains free of illegal human activities such as poaching. WCS serves a support role to protection efforts with financial and logistic assistance to protection teams.

In Congo, the MEFE has the sole official mandate to establish protected areas, set and enforce access regulations. National-level government is also the sole authority for enforcing transboundary transgressions (e.g., citizens from the Central African Republic crossing into Congo). This state authority, coupled with the absence of human settlements within 30 km of the park, is significant in that, unlike most protected areas, there are no issues of competing ownership/mandates among stakeholders. Thus, MEFE holds the predominant management role for this protected area. However, as depicted in the radar-diagram, MEFE officials lack the capacity to manage the park's law enforcement teams alone (e.g. lack sufficient funds and technical skills to plan and monitor enforcement efforts). WCS, on the other hand, has strong technical skills (high capacity) as well as access to the financial resources required to support protection teams. As partner actors, WCS's technical and financial support balances the MEFE's weaknesses, resulting in effective protection of elephants in the park (Figure 1).

Figure 1: Enforcement of norms is the priority management role for the closed access management regime intended to protect elephants in NNNP. There are no communities living within park borders and no other NGO's working in the area. Therefore, the appropriate mix of actors to enforce the complete ban on elephant hunting within NNNP is MEFE and WCS.



Site Name:	**PROGEPP (Projet Gestion des Ecosystèmes Périphériques au Parc National Nouabalé-Ndoki [Project for the Management of Ecosystems Adjacent to the Nouabalé-Ndoki National Park])**
Location:	**Republic of Congo**
Project Goal:	**Develop and implement legal hunting and wildlife management systems to protect endangered species and biodiversity while assuring a long-term wildlife resource base for indigenous forest people**

The Kabo, Pokola, Loundougou, and Toukoulaka forestry concessions surround the Nouabalé-Ndoki National Park (NNNP). These concessions extend over approximately 18,000 km^2 and are selectively logged by a single timber company. Like the park, these concessions are home to some of the continent's most endangered species: forest elephants, western lowland gorillas, chimpanzees and bongo. PROGEPP is a collaborative project between WCS, the Government of Congo, the timber company CIB (Congolaise Industrièlle des Bois), and local communities. The PROGEPP project implements two different types of management regimes: 1) a closed access system to protect endangered species, and 2) a restricted access system to conserve populations of legally hunted species.

In the following section, we use two conservation targets – maintenance of elephant populations and populations of sustainably harvestable species – to demonstrate that the characteristics of the target and the users determine the required management regime. The management regime consequently determines the roles of actors. We then describe how differences among attributes of potential actors determine who is best suited to adopt the responsibilities associated with each priority management role.

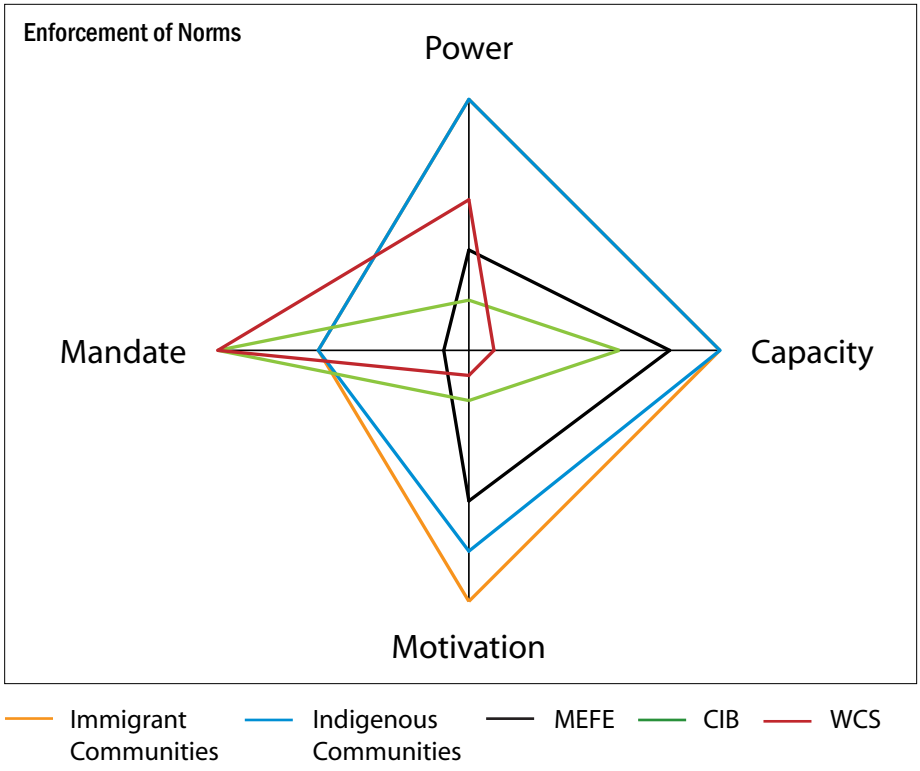
Target 1	Elephant population maintained at current levels across CIB logging concessions
Ecological attributes	Globally threatened, low productivity, populations within concessions relatively still high but pressure on this target species increasing with population growth and road construction
Use/User attributes	Total population in concessions: approximately 28,000. Indigenous Bantu population and semi-nomadic indigenous communities, from 13 ethnic groups. The semi-nomad population is about 5000 people. Most traditional and cultural mechanisms for management of wildlife resources have largely dissolved over the years. Occasionally people hunt elephants for cultural reasons (right of passage to manhood), or as a source of protein and income from meat and ivory. Immigrant populations (from 54 different ethnic groups) comprise ~50% of the population. Well organized through workers' unions despite difference in ethnicity. Near logging towns up to 70% of population is immigrant. Increasing in number with the expansion of logging operations. Most have a source of cash income (CIB or independent business owners). Some purchase guns and pay local hunters to hunt illegally, supplementing their income through the sale of ivory or the commercial bushmeat trade. Logging company: CIB is one of the largest employers in Congo. Seeking FSC certification and thus highly motivated to support protection of endangered species.
Management regime	Total ban on elephant hunting

Priority role	High ranked axes to fulfill role
Enforcement of complete hunting ban on elephants	Mandate to manage, Capacity to act, Power to influence and Motivation to act
Communication of regulations	Capacity to act, Motivation for conservation

Despite their protected status, elephants and other endangered species experienced high levels of illegal hunting as logging expanded in Congo. Specifically, road construction and an influx of immigrants seeking employment led to greater access to and use of forests previously only accessible to indigenous populations. As a result, elephant poaching intensified, supplying a thriving ivory trade. Though elephant populations were protected within NNNP, their wide-ranging movements exposed the same elephants to the risk of poaching outside the park borders.

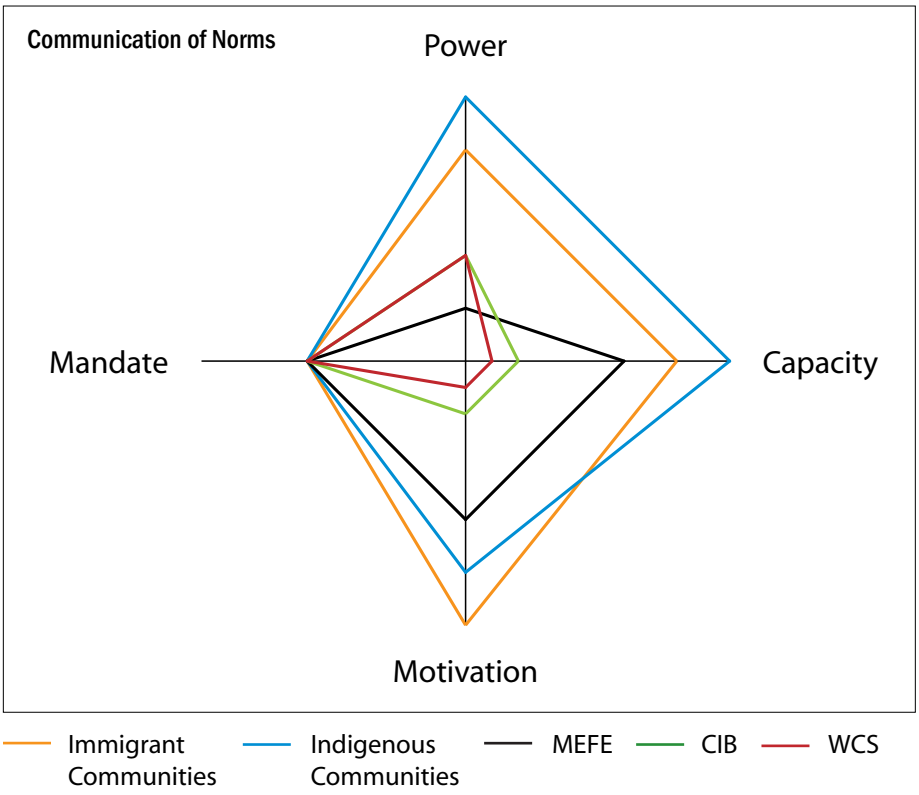
Due to the extensive pressure on elephant populations, and the spatial extent over which logging roads facilitate movement of poachers, elephant protection efforts in concessions demand greater capacity (logistical, technical and financial) and motivation to succeed than is required in the NNNP, where pressure on the resource was relatively limited. Similar to the management situation of NNNP, however, the sole actor with the legal mandate to enforce the hunting ban, MEFE, lacks the capacity and motivation to do so effectively. Thus, to protect elephants outside park borders, MEFE's weaknesses had to be strengthened by an actor with strong capacity and motivation to act – WCS. In addition, because prior to project conception the ivory trade was directly facilitated by logging truck drivers willing to transport tusks and meat to markets, protection efforts in concessions largely depends on CIB's willingness to fire employees implicated in the trade and to allow their vehicles to be searched. CIB is seeking certification of their concessions, which requires that measures be taken to conserve threatened species. Therefore, CIB is highly motivated to assist in conservation efforts and has adopting internal regulations prohibiting the transport of guns and ivory on logging trucks. Through the threat of disciplinary action and job loss, CIB wields the necessary power to alter the behavior of the truck drivers (who could determine whether elephant products are transported to offsite traders). When united, CIB's power and motivation to influence employee behavior coupled with MEFE's legal mandate and WCS's technical capacity ensure the successful protection of elephants in the forestry concessions (Figure 2).

Figure 2: Enforcement of norms is the priority management role for the closed access management regime intended to protect elephants both inside and outside park borders. The appropriate mix of actors to enforce the ban on elephant hunting is MEFE, WCS, and CIB.



The weakness in this conservation strategy and management regime, however, lies in the fact that, unlike in the park, indigenous populations living within the concessions traditionally hunted elephants as a cultural "right of passage" and as a source of income and favored protein source. By Congo wildlife law, the protected status of elephants negates non-formal traditional mandates to hunt elephants, even within traditional territories, yet most communities are ignorant of the law. Though raising awareness that hunting elephants is prohibited under Congolese law will not bring an immediate halt to poaching and illegal trade, it serves as an important step toward building support for conservation and increasing compliance to the hunting ban. As depicted in the accompanying radar-diagram, WCS possesses the strongest combination of attributes to facilitate this communication process (Figure 3).

Figure 3: Communication of norms to protect elephants from hunting to indigenous populations is a second priority management role for the closed access management regime. In populated areas, compliance with hunting regulations requires that people understand the laws protecting elephants and how those laws are enforced. Capacity and motivation to plan, implement and finance awareness-raising activities are the priority attributes of appropriate actors to fill this role. Among potential actors to fulfill this role, WCS has by far the strongest technical capacity.



Target 2	Maintain populations of sustainably harvestable wildlife species (e.g., duikers)
Ecological attributes	Local abundance medium to high where not heavily hunted; productivity medium
Use/User attributes	Total population in concessions: approximately 28,000 Indigenous Bantu and semi-nomadic indigenous communities (from 13 ethnic groups): about 50% of population. Semi-nomad population is about 5000 people. Bantu populations historically depended on subsistence fishing, hunting, and small-scale agriculture for food and income. Semi-nomadic communities were historically hunter-gatherers. Both groups are rapidly replacing traditional hunting techniques (nets, crossbows, etc.) with cables and shotguns. Shotguns are often provided by logging company employees for whom they hunt in exchange for a portion of the meat. Immigrant populations (from 54 different ethnic groups): approximately 50% of the population. Lack of well-developed agriculture or imported meat products has resulted in high demand for fish and bushmeat. Many individuals purchase guns and pay indigenous hunters to hunt, supplementing their income with large-scale commercialization and export of bushmeat to population centers. Logging company: Through the certification process CIB is highly invested in assuring that logging does not indirectly deplete wildlife in the concessions.
Management regime	Controlled access through establishment of hunting zones and enforcement of zones with ecoguards

Priority role	**High ranked axes to fulfill role**
Building constituency of support for conservation of legally hunted species	**Power** to influence, **Motivation** for conservation, and **Capacity** to act
Creation of norms	**Mandate**, **Power** to influence, **Capacity** to make informed policy on information
Enforcement of norms	**Mandate** to manage, **Capacity** to act

In situations where human population densities are low, hunting is restricted to mostly subsistence use, and wildlife populations are productive and renewable, people can typically hunt wild game without drawing down wildlife populations to the point of collapse, even in open-access systems. However, as populations increase in size, and the consumption of wildlife resources shifts away from subsistence to commercial use, over-hunting often becomes the primary cause of species loss. As wildlife populations decline, so does the availability of wild meat for local consumption. Thus, over-hunting adversely influences the livelihoods of local populations.

Therefore, in contrast to the closed access management regime required to conserve elephants (with low population numbers, low productivity, and high level of threat), the management regime required to conserve populations of legally hunted species can be less restrictive and may vary according to the characteristics of the users and the intensity of pressures on the resource base. Here, we examine two projects working to assure sustainable populations of harvestable species in northern Congo (PROGEPP and Lac Télé Community Reserve). We focus particular attention on differences between the two sites in the characteristics of local users and how these differences determine the appropriate mix of actors to conserve the resource.

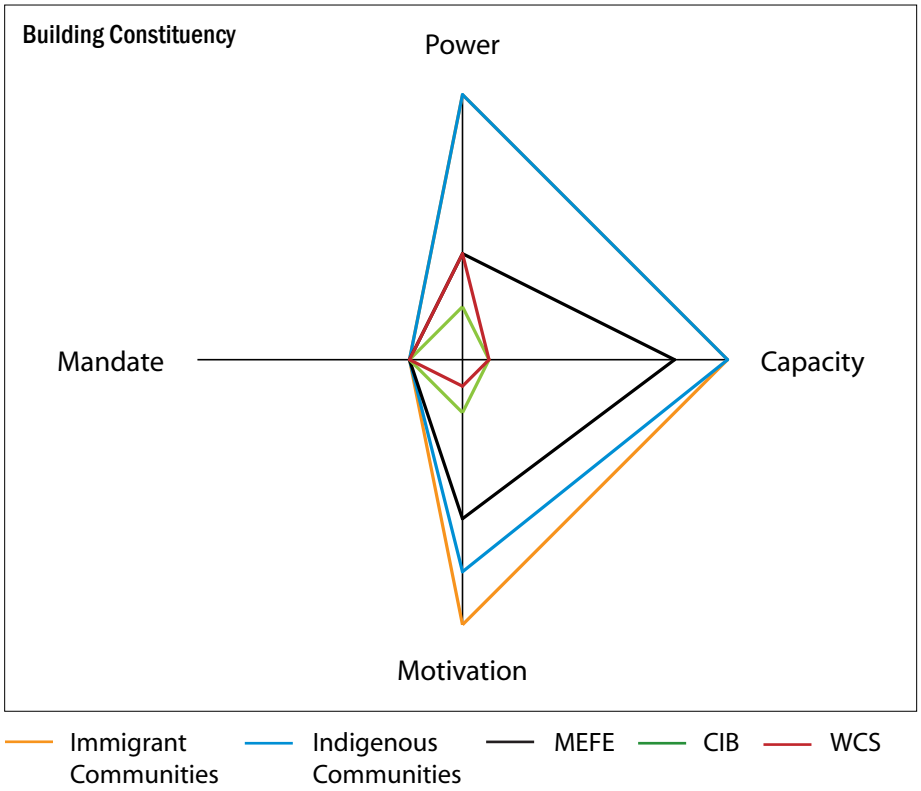
The Kabo-Pokola-Loundougou-Toukoulaka forest concessions (PROGEPP project):

While the access structure of timber resources and endangered species within Congo's forestry concessions is well defined, non-endangered "harvestable" wildlife generally remains an open access resource with little or no limits to exploitation. Prior to the arrival of logging companies in the 1970's, no roads existed and the majority of residents were indigenous Bantu and Yakaka pygmies, principally the Mbenzélé. However, with the arrival of the logging industry, and subsequent immigration of workers and family members, the "local" population increased dramatically. In response, patterns of wildlife use changed, with the commercialization of the bushmeat trade providing economic incentives for greater harvest of forest animals than before. Indigenous hunters capitalized on this new source of revenue and shifted hunting techniques from traditional methods to more efficient methods such as shotguns and cable snares. At the same time, logging roads opened the interior of previously inaccessible forest to increased numbers of hunters. Logging trucks provide transportation of carcasses to markets, reducing the production costs of the hunter and increasing labor efficiency. Slowly, traditional systems of resource management broke down and indigenous populations became marginalized from management decisions as the needs and desires of logging company workers were given priority over those of indigenous peoples.

To prevent the depletion of legally hunted wildlife resources, a controlled access management regime that limits who is allowed to hunt and establishes the quota per hunter was required. The establishment of such a system for legally hunted species first required both a constituency of support and the cooperation of local populations, most of whom had little understanding of the long-term consequences of their altered patterns of resource use. After a constituency of supporters was established, local users were engaged in the creation of norms to determine who had access to the resource base.

The ability of actors to build a constituency of support for the conservation of sustainable populations of legally hunted species was strongly dependant upon their motivation and power to influence different groups of local users. At project conception, local users (both indigenous and immigrant) were experiencing short-term financial rewards of over-hunting while not yet experiencing species declines serious enough to alter their perception that wildlife was an unlimited resource. Therefore, they lacked the motivation to serve as constituency builders for the conservation of wildlife. Because CIB employed much of the immigrant population, it possessed the power to influence immigrant communities through work-related incentives. WCS, on the other hand, could influence indigenous populations because a high proportion of WCS staff originated in the Sangha province and could identify and communicate with indigenous groups. WCS staff had also previously conducted social surveys and initiated awareness-raising campaigns. Both CIB and WCS exhibited reasonably strong technical and logistical capacity as well as strong motivation to fulfill a constituency building role, although the source of motivation for these two actors differed greatly. Thus, WCS and CIB worked together to build a constituency for the conservation of legally harvested species in the Kabo, Pokola, Toukoulaka and Loundoungou logging concessions (Figure 4).

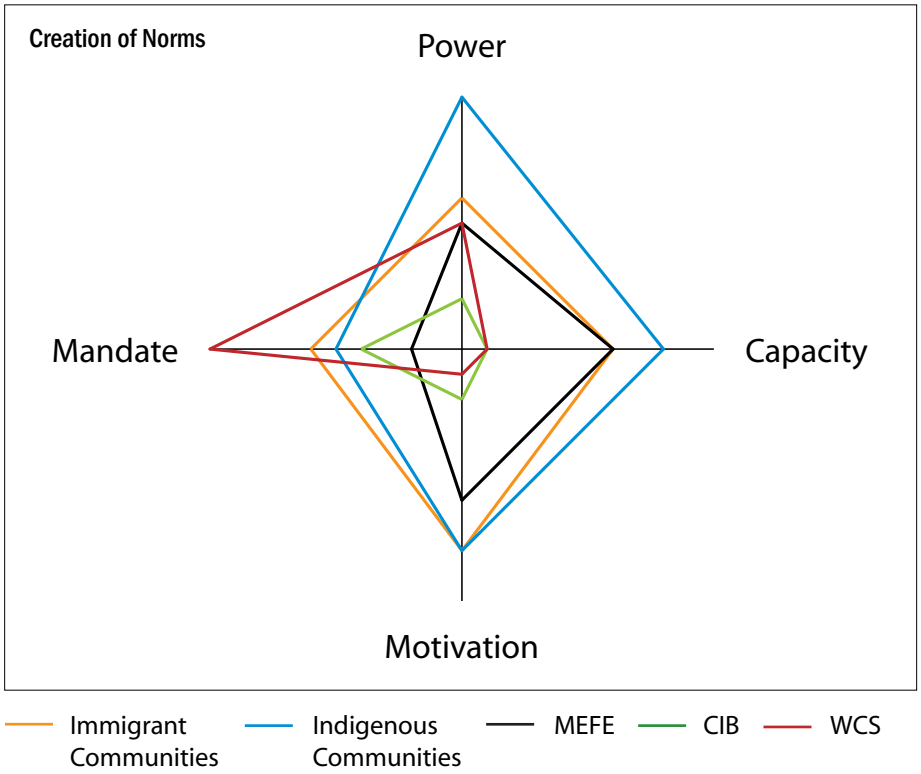
Figure 4: Building a local constituency of support is a priority management role for the restricted access management regime required to conserve sustainable populations of legally hunted species in logging concessions. Among potential actors, WCS has long been the most motivated and dedicated to the cause of conservation and sustainable resource use. CIB is required by law (and the certification process) to develop management plans that outline strategies to assure the sustainable use of all biological resources within their concession. They are thus motivated by external sources to build a constituency of support in favor of these efforts. In contrast, villagers do not yet see the negative consequences of over-hunting but profit from the short-term financial gain of these practices. CIB, through their private TV and radio stations and political connections also have a strong capacity and power to influence people and thereby to build support for conservation activities. However, they lack the technical knowledge (capacity) and internal motivation (although they possess strong external motivation). Though CIB superficially appears to be the most appropriate leading actor to build a constituency of support for the conservation of legally hunted species within the concessions, the appropriate combination of actors is the partnering of CIB and WCS to assure the success of this management role.



In the second phase, the priority role required to assure sustainable populations of legally harvested species was to create norms for a restricted access system that both controls access and determines a hunting quota. It is widely believed that in villages like those found in central Africa, the level of dependence on wildlife may have created a situation where hunters curb their own use, and that village institutions provide mechanisms to govern resource exploitation. The effectiveness of these mechanisms, however, depends on strong village institutions and inter-personal relationships, both of which often fail when large numbers of outsiders immigrate into an area or when hunting becomes a commercial activity rather than a subsistence activity. In addition to population increase, immigrants are disproportionately influential in the management of wildlife resources because they work for the logging company, and thus have wealth, prestige, and are well organized compared to non-workers. Indigenous populations, on the other hand, are poorly organized, have limited access to information, and have limited understanding of company policy. Thus, the development of a controlled access system to establish hunting zones and regulations in the concessions required a mix of actors that could assure that the zoning system did not give priority to workers over indigenous peoples.

In Congo, wildlife laws require that industry make food available for their workers. CIB has a strong legal mandate to set regulations to decrease consumptive pressures on wildlife by immigrant workers. Given that CIB has the mandate, power, motivation and capacity to create norms to control immigrant resource use, it is the strongest actor to prevent over-harvest. It was necessary to assure that indigenous people had a voice in the creation of hunting zones, and that the zones that were established reflected traditional land-use patterns. Because WCS is an independent NGO with a strong technical capacity to work with communities (e.g they employed a strong team of socio-economic researchers from the region), and MEFE represented the required government authorization for any proposed zonation system, these two actors emerged as the appropriate mix to facilitate discussions with local communities, CIB workers and logging company officials. Through this process, the relatively powerless indigenous population, previously disengaged from decision making regarding resource use, gained a voice in the development of a controlled access system. Thus, the creation of norms to manage legally hunted game species depended upon strong collaboration between MEFE, CIB, WCS and the indigenous communities (Figure 5). The hunting zones also partially rectified the unequal power structure between indigenous and immigrant local communities by prioritizing the hunting rights of indigenous communities through the creation of hunting zones for specific villages.

Figure 5: Creation of norms for a restricted access system that limits hunting, both spatially and by establishing harvest quotas, was the second phase priority role necessary to assure sustainable populations of legally harvested species in CIB concessions. The attributes of potential actors needed to effectively fill the role included mandate, power to influence and the capacity to make informed policy decisions. Thus, all four actors emerged as the correct mix to create a system of norms to regulate access to legally harvested wildlife resources in CIB concessions.

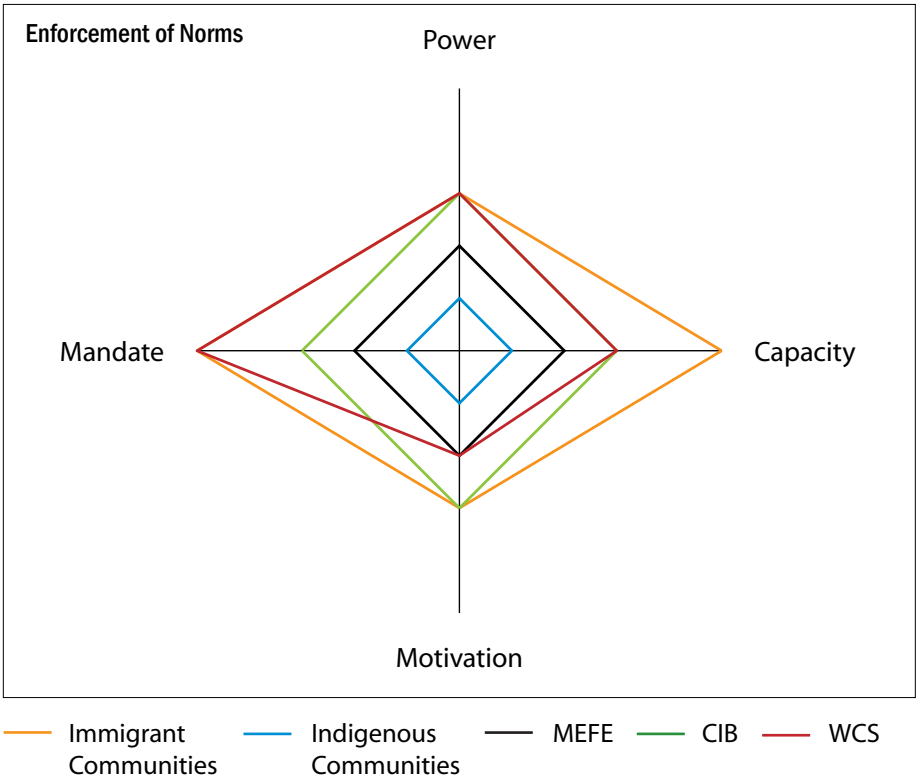


Following the adoption of a mutually acceptable controlled access system, a third priority role to assure sustainable populations of legally hunted species is the enforcement of the adopted norms. Because much of the pressure on wildlife is related to immigrant populations that have no long-term interest in the resource, compliance with the restricted access system is often low. The government law enforcement units that protect endangered species also work to help CIB enforce company wildlife rules and the controlled access system. To some degree, government and CIB enforcement systems will always be required to control wildlife harvest in parts of the concession that are actively exploited for timber (similar to the situation depicted in Figure 2).

However, informal "peer pressure" enforcement mechanisms have the potential to be extremely effective at controlling compliance with hunting regulations at the village level. The ability of local populations to effectively enforce norms depends largely on the existence of traditional enforcement mechanisms. As previously mentioned, within CIB logging concessions, many of the traditional enforcement mechanisms have dissolved, and traditional leaders do not possess the power to control resource use that they did in the past. An important goal of PROGEPP is to reinforce the traditional management systems and evolve towards a locally-managed solution where sufficient incentives and capacity

exist for indigenous people to work towards the sustainable management of wildlife. By incorporating indigenous communities into the development of the restricted access system, and by strengthening the authority of these communities to manage resources within their hunting zones, law enforcement by ecoguards could eventually take a backseat to village-based management mechanisms. At the request of the communities, ecoguards could reinforce village efforts when local mechanisms to control illegal hunting in their zone fail (e.g. help control "outsiders" hunting with military weapons etc.) (Figure 6).

Figure 6. Enforcement of norms is the third priority management role for the restricted access system intended to conserve sustainable populations of legally harvestable species. This diagram represents the ideal future situation in which indigenous populations restrict wildlife use within their zones of access. The priority attributes required to enforce these norms include the mandate and power to enforce norms as well as the motivation for conservation and the capacity to act. In this idealized radar diagram, the reinforcement of traditional wildlife management mechanisms would position indigenous communities as the best-equipped actor for each priority attribute. When enforcement issues surpassed the ability of locals to manage, state mandated authorities could assist communities with more formal enforcement efforts.



Site Name:	Lac Télé Community Reserve
Location:	Republic of Congo
Project Goal:	To assure sustainable harvest of resources and the conservation of biodiversity by facilitating the development of community management systems for traditional hunting and fishing territories.

The Lac Télé Community Reserve (LTCR) in the Likouala Department of northern Congo covers nearly 4,500 km^2 of wetland habitat, and boasts over 300 species of birds as well as important populations of large mammals, including high densities of western lowland gorillas. Twenty-seven villages are located in or around the reserve, and the villagers depend heavily on its biological resources for fish, agriculture, construction materials, and medicines.

Target	Maintain sustainable populations of harvestable wildlife species
Ecological attributes	Local abundance where not heavily hunted; medium productivity
Use/User attributes	13,400 individuals: over 90% are Bomitaba. Subsistence fishing, hunting and small scale agriculture provide the most important sources of food and income.
Management regime	Controlled access through the formalization and re-invigoration of traditional management systems.

Priority role	High ranked axes to fulfill role
Creation of norms	Mandate, Power to influence, Capacity to make informed policy on information
Enforcement of norms	Mandate to manage, Power to influence, Capacity to act
Monitoring	Capacity to act, Motivation

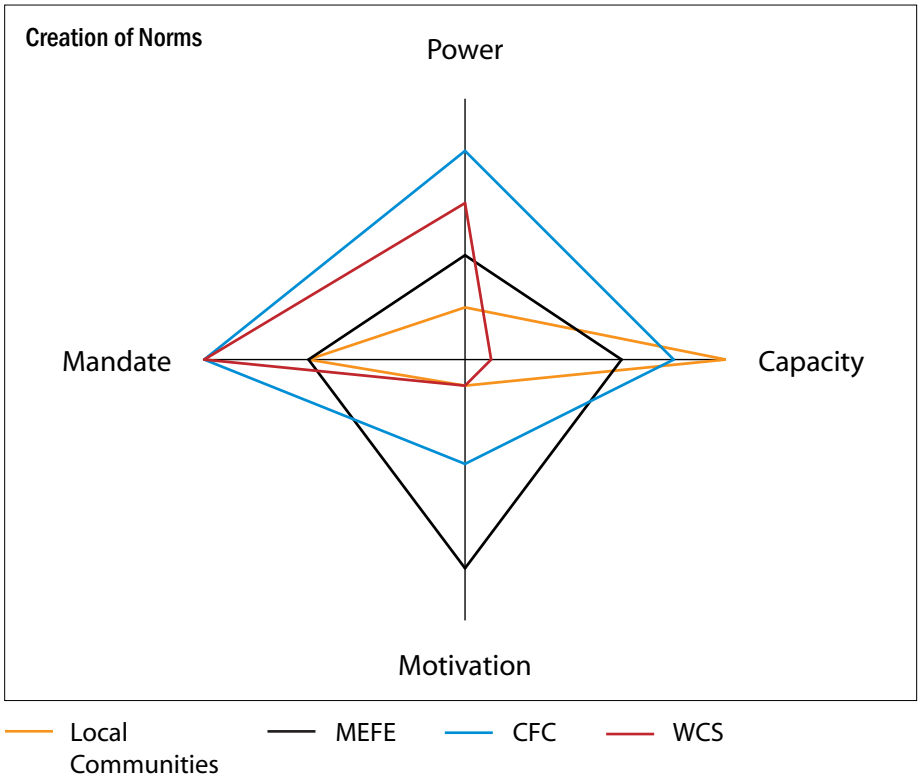
Both PROGEPP and LTCR have the same conservation target– to maintain sustainable populations of harvestable wildlife species. However, the roles required to effectively achieve this target differ between the two sites. Specifically, the constituency building role, though always of some importance in conservation initiatives, is of decreased necessity at LTCR because resource users are already highly motivated to manage resources and do so with non-formal traditional mechanisms. Specifically, Bomitaba villages have well-defined hunting and fishing territories. These territories are generally respected among neighboring communities. Within territories, villagers have strong traditional systems of rights and "regulations" governed by traditional leaders and village councils. Though these traditional mechanisms do not enjoy the influence they once held, they are still functional and serve as mechanisms for establishing village norms and resolving village conflicts. In contrast to villagers in the PROGEPP region, LTCR villagers have demonstrated a strong potential to rejuvenate traditional forms of natural resource management, and have the social and organizational characteristics necessary to participate in conservation initiatives.

Thus, the priority management roles required to assure sustainable populations of legally harvested wildlife resources include: 1) creation or formalization of norms by which community members agree to abide, particularly determin-

ing the quota of a given species that can be harvested, 2) enforcement of those norms, and 3) monitoring of wildlife populations to provide feedback to managers regarding the effectiveness of conservation efforts.

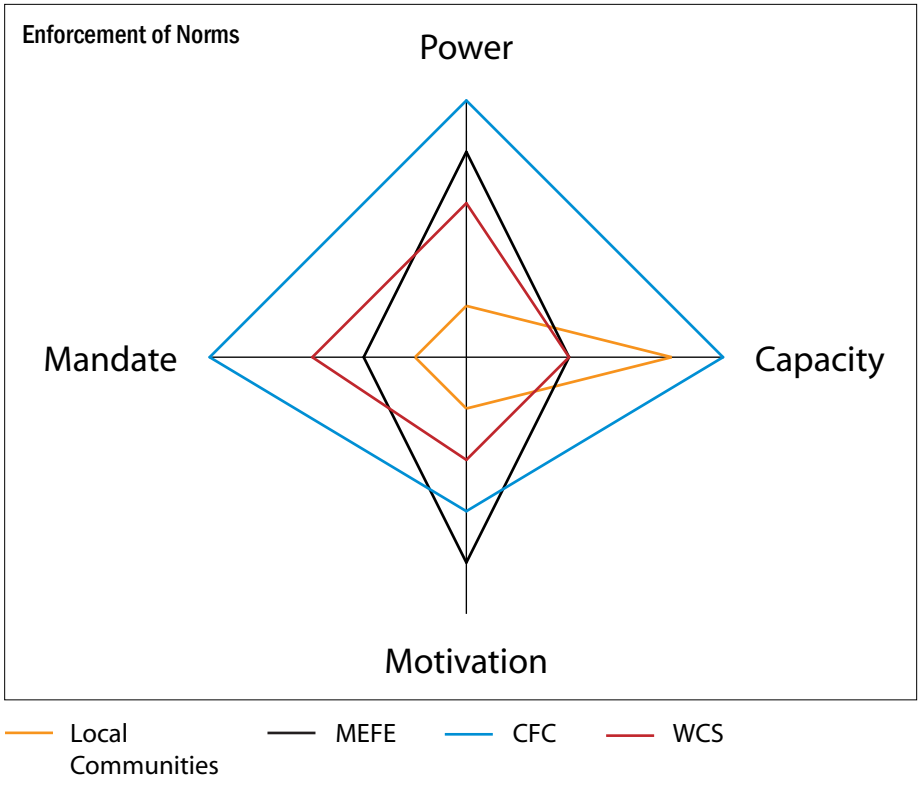
LTCR villagers are very well-positioned to successfully create wildlife management regulations (Figure 7). Villages have a strong traditional mandate to create norms, the village "notables" generally have sufficient power to influence the decision making process, and villagers and traditional leaders have demonstrated motivation and interest in working to better manage natural resources within village territories. Therefore, in theory, they should be the best actors to create norms to govern the management of legally harvested species within their territories. However, LTCR villagers lack much of the technical information required to make informed decisions regarding sustainable levels of hunting within their territories. WCS, on the other hand, is strong in this capacity, and serves to reinforce the efforts of local villagers with technical advice. With time, these skills can be transferred to village committees. MEFE officials, who have a legal mandate to create wildlife regulations at a national level, lag behind LTCR communities in motivation and power. However, to assure all established village norms fall within the existing national legal structures, partnership with MEFE is extremely important. Local villages, MEFE and WCS emerge as the appropriate mix of actors to create norms that limit offtake levels of legally harvested species in traditional territories of LTCR villagers.

Figure 7: The creation of norms is the priority management role at LTCR. These norms must extend existing traditional management mechanisms (which already restrict those who have access to resources) to include the reinforcement of regulations regarding a sustainable level of resource use at LTCR.



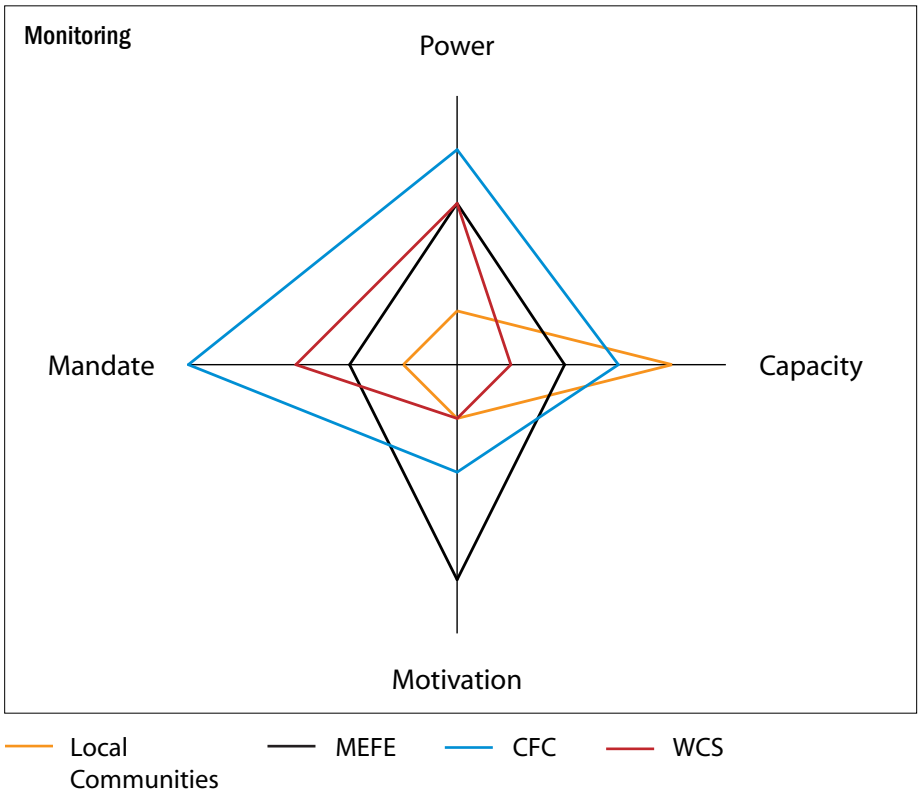
Just as the existence of strong traditional mechanisms means villages are ideally suited for the creation of norms, so too do they indicate that villagers can be strong enforcers of these norms. Traditional governing mechanisms provide the mandate, motivation and power to enforce norms in most situations. However, some of the recent threats to wildlife surpass the enforcement capacity of villages; for example, military weapons left over from the civil war are abundant in the region and war refugees have immigrated from the Democratic Republic of Congo. The small numbers of immigrants and/or rebellious locals who possess these weapons do not respect traditional structures of enforcement. In these situations, village notables and councils lack both the power to control hunter behavior and the capacity and mandate to resolve the conflict. Thus, on occasion they have asked MEFE and WCS to assist them in the protection of their village territories from such threats. Because the use of military weapons for hunting is illegal by Congolese wildlife laws, MEFE has a clear mandate to assist in these efforts. Similarly, both MEFE and local communities are considered moderate in their capacity to act, as organized law enforcement requires more organization and financial support than traditional mechanisms. In complement, WCS possesses both the financial and logistical means to facilitate this type of enforcement effort, though they lack official mandate to do so. Thus, three complementary actors emerge from this radar diagram as the best mix to effectively enforce wildlife norms in LTCR (Figure 8).

Figure 8: The enforcement of norms is the second priority role to assure sustainable populations of legally harvestable wildlife in LTCR.



To assure that management regulations adopted by communities result in sustainable populations of wildlife, it is essential to monitor local consumptive and hunting activities, compliance with village regulations, and species response to management activities. Effective monitoring requires the technical skills to act (capacity). Currently, WCS has the greatest capacity for monitoring, as well as possessing the strongest motivation, and is thus in the process of developing a monitoring program. However, though WCS will likely participate in monitoring activities for some time, they are currently working to identify other actors to which these skills can be transferred. This is a situation in which the motivation axis should be heavily weighted. CFC, a local NGO, is a self-organized group of Bomitaba who have dedicated themselves to working with other LTCR villages to manage local resources. CFC members are highly motivated and have, with IUCN funding, conducted some simple village surveys and education activities in the past. And so, although CFC currently lacks the funding and technical capacity to engage in monitoring activities, it is an excellent candidate for capacity building to fill this role (Figure 9).

Figure 9: Establishing a monitoring system by which to evaluate the effectiveness of adopted norms is the third priority management role required at LTCR. The priority attributes required to fill this role include capacity and motivation. Local communities, WCS, and CFC are all highly motivated, but only WCS currently has sufficient technical capacity to plan, conduct, and analyze data for monitoring. Although in the short term WCS emerges as the sole actor to fill this role, the high motivation of CFC and local communities indicate that WCS should focus on building the capacity of these groups to increase their future roles in conservation.



The role of enforcement takes precedence in a closed access system where national and international laws that pertain to the management of resources must be enforced. However, for legally hunted species, the roles of building constituency of support and motivation are paramount to ensure buy-in and compliance to norms by stakeholders living in close proximity to the resource. Thus the strategies used, and the appropriate mix of actors required, for effective conservation can vary greatly from site to site, even within the same large landscape.

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