The Nature Conservancy

Conservation by Design 2.0

Guidance Document

{Version 1.0, March 2016}

Table of contents

List of Figures

List of Tables

Introduction

This Guidance represents a significant evolution in the conservation approach of the Conservancy. The motivations for the evolution and the differences with previous approaches are elaborated upon in the 20th Anniversary Edition of Conservation by Design. This version of Conservation by Design, CbD 2.0, is centered on four key advances: 1) explicit consideration of linkages between people and nature, 2) design interventions focused on creating systemic change, 3) integration of spatial planning with the development of new conservation strategies, and 4) robustly drawing upon and building the evidence base for conservation.

This document supplements the 20th Anniversary Edition by providing more detailed instruction on implementing Conservation by Design 2.0. Our approach is based in the Open Standards for the Practice of Conservation and also is intended to reflect an evolution from it.

© Erika Nortemann/TNC

Overview of Conservation by Design 2.0

Conservation by Design 2.0 contains 14 steps grouped around five major phases (Figure 1). Here we describe what is accomplished in each step.

Figure 1: Five Major Phases of Conservation by Design 2.0

Identify Challenges & Goals

1. *Specify Planning Context*. Define the scope to ensure a focus on significant conservation problems and the relevant geographies where those challenges will be addressed.

2. *Conduct Situation Analysis*. In close collaboration with key stakeholders, analyze evidence to describe current and predicted future situations to identify conservation targets, directly related human interests, threats, drivers, risks, and opportunities for creating change.

3. *Draft Goal Statement*. Specify the minimum change needed to contribute to desired systemic change, both for nature and directly connected outcomes for human well-being.

4. *Share Advances in Knowledge Through Relevant Pathways*. Identify the key lessons you have learned in the process of identifying challenges and goals, determine who needs or will use that knowledge, then document and disseminate appropriately.

Map Strategies & Places

5. *Identify Candidate Strategies*. Articulate potential strategies to meet your goals, using insights gained in the situation analysis to consider both known and novel strategies and to seek strategies that lead to systemic change.

6. *Construct Results Chains*. Articulate the logic for why proposed actions will change an undesired state to a desired state. Articulate the assumptions necessary for this to happen, and synthesize evidence regarding these assumptions.

7. *Strategy and Opportunity Mapping*. Characterize the potential magnitude of the effect of different candidate strategies, enabling the evaluation of the contribution of each strategy toward stated goals. This allows an estimate of the conservation return on investment (ROI) for each strategy, which can inform the selection of which strategies to implement. Strategy and opportunity mapping also aids the implementation of selected strategies by identifying where each strategy can most effectively touch down in space

(Map Strategies & Places Continued)

8. *Select Strategy or Strategies*. Identify strategies that, if successfully pursued, at least meet the minimum goal, have relatively good conservation ROI, avoid negative impacts to vulnerable people, and have acceptable levels of financial and reputational risk.

9. *Share Advances in Knowledge Through Relevant Pathways*. Identify the key lessons you have learned in the process of mapping strategies and opportunities, determine who needs or will use that knowledge, then document and disseminate appropriately.

Finalize Outcomes & Develop Measures

10. *Articulate Theory of Change*. Convert draft minimum goal statements into specific outcomes based on insights gained in developing results chain and strategy maps. Articulate the problem, the solution, and why your organization or team is positioned to implement the solution, in a succinct way that colleagues, partners, stakeholders and funders can understand and support.

11. *Define Measures and Create a Monitoring and Evaluation Plan*. Explain how essential evidence gaps and monitoring needs will be filled to determine project success or failure, mitigate legal and reputational risk, avoid and mitigate negative impacts, influence others to replicate and leverage work, satisfy donor expectations, and adaptively use monitoring and evaluation information to manage the project.

Take Action

12. *Implement Strategy(ies) using Sound Project Management*. Provide clarity around roles and develop work plans and budgets. Implement monitoring and evaluation plan.

Evaluate and Adapt

13. *Evaluation*. Conduct analysis and evaluation to fill essential evidence gaps and satisfy monitoring needs.

14. *Adapt*. Use monitoring and evaluation to assess progress towards goals and outcomes and assess the need to adapt to changing conditions, unintended consequences, and new opportunities. Share lessons learned via relevant pathways.

These steps constitute the conservation process. Historically at the Conservancy, we completed comprehensive conservation plans, and more recently, conservation business plans, that described the results of every planning step in detail. Completing these plans required a significant upfront time commitment to planning before any actions were taken. However, in today's complex world, this approach is inefficient and often counter-productive. Increasingly our planning and implementation is much more integrated and iterative. We strongly encourage that approach when using the CbD 2.0 Guidance. Accordingly, we envision that the outputs from the 14-step conservation process could be captured in several independent documents generated at different times for different purposes. Please see Table 1 for outputs from each planning step and how these may be incorporated into different products/documents. Minimum standard questions are included in each step throughout the Guidance document. Please see Appendix A for a compiled list of the minimum standard questions that should be used to assess whether the different components of CbD 2.0 have been sufficiently addressed.

Table 1: Steps, outputs, and potential documents a team might create using the guidance provided in this document

Phase	Step	Output	Documents
Identify Challenges & Goals	1. Context	Scope, implementers	Business Plan
	2. Situation Analysis	Situation diagram, narrative, documentation	Business Plan
	3. Minimum Goal Statement	S.M.A.R.T Goal defining desired change threshold	Business Plan
	4. Share Advances	Process and lessons, diagrams, goals	Reports, Presentations, Webinars
Map Strategies & Places	5. Candidate strategies	List of candidate strategies	
	6. Results Chains	Results chains, initial outcomes, documentation	
	7. Strategy Mapping	Maps, quantification of impact, & ROI	
	8. Select Strategies	Final strategies, results chains & strategy maps	Business Plan
	9. Share Advances	Strategies, maps, reasoning, lessons	Reports, Presentations
Finalize Outcomes & Develop Measures	10. Theory of Change	Summary of problem and solutions, logic of chosen strategies, & outcomes	Business Plan
	11. Measures Plan	Outcome and impact measures, plans to evaluate progress, impacts, and fill essential evidence gaps	Business Plan Monitoring & Evaluation Plans
Implement	12. Implement	Clarify roles, capacity, deadlines, and budgets	Project Charter Workplan Budget
Evaluate & Adapt	13. Evaluate	Report on intermediate outcomes, impacts, and evidence developed	Whitepaper(s) Scientific report(s) Annual report
	14. Adapt	Theory of change & workplan re-assessed, document lessons learned	Annual Report

How to Use This Guidance

This Guidance document aims to help teams develop strategies to address the major conservation challenges of our day. These challenges require us to be bold and adapt our traditional ways of planning and implementing our work. To achieve our mission, we must move from strategies and projects that treat *symptoms* at a local scale to strategies and projects that address underlying *systemic causes* at a much broader regional and global scale. The four key advances of CbD 2.0 form the foundation for the approach described in this Guidance document, and are intended to help in the identification of strategies aimed at achieving systemic change.

This Guidance document outlines the approach used by The Nature Conservancy to develop, evaluate and strengthen strategies in support of the advances described in Conservation by Design 2.0. It is intended to describe leading practices for conservation which can readily be adapted and adopted by The Nature Conservancy and other organizations. It replaces the Conservancy's Conservation Business Planning guidance, although nearly every element from the business planning approach is included here. Other planning approaches and their planning material used by the Conservancy, such as Major Habitat Assessments, Ecoregional (and other regional) Assessments, and the Open Standards for the Practice of Conservation (the Conservancy's original Conservation Action Planning approach is now captured within Open Standards) may be useful for completing specific aspects of this guidance.

CbD 2.0 Guidance is relevant to all major business functions and scales of Conservancy work including place-based work, marketing, education and outreach, external affairs and corporate engagements. Given the increasingly global scale of the challenges we seek to address, and our intent to drive our work in ways that contribute to systemic change, CbD 2.0 is most appropriately applied sequentially from global to regional to whole system scales. This approach better ensures that work at smaller scales "adds up to more than the sum of the parts" in contributing to larger system-scale impact. For this reason, we strongly encourage practitioners of CbD 2.0 to include in their framing and scoping a consideration of conservation efforts that may be happening elsewhere and at higher levels, so that their proposed engagement can align with, contribute to, leverage and advance those larger scale strategies and initiatives. Conservancy staff who have questions about organizational expectations around CbD 2.0 implementation should refer to information provided on the CbD 2.0 page on the Conservancy's internal CONNECT portal.

When updating an existing plan, the best results will be obtained by going through the whole process, as the success of each step depends on the preceding step. This is because, as illustrated in Table 1 above, outputs from each step are used to inform subsequent steps. Therefore, we caution against skipping to the portion of your work that your team wants to update without considering the key advances of CbD 2.0 in previous steps. Furthermore, if new participants are brought in at intermediate steps, they need to be briefed about outputs from previous steps as well as issues discussed and decisions made to

ensure an effective process from start to finish and to secure buy-in from the whole team.

We note at multiple places throughout this Guidance that a trained facilitator can be very helpful for particular steps. The Conservancy has a rich history of peer 'coaching' via our Efroymson Coaches Network, which has since evolved into the Conservation Coaches Network (CCNet), a global community of practitioners who support the application of the Open Standards for the Practice of Conservation. Please see Appendix B for more information about CCNet as it relates to CbD 2.0.

How the Guidance is Organized

The CbD 2.0 Guidance is written as a linear sequence of steps but keep in mind the iterative nature of the conservation process as you read through them. We provide the following for each step of CbD 2.0: 1) purpose; 2) products; 3) overview of process; 4) recommended best practices and tips; 5) minimum standard questions (summarized in Appendix A); and 6) FAQs.

Before describing each of the 14 steps associated with the five phases, there are four special sections: People in Conservation, The Imperative for Systemic Change, Integrating Spatial and Strategic Planning, and Evidence Based Conservation. These four sections provide important context to understand the motivations behind the updated Guidance, and provide a conceptual framework for implementing CbD 2.0 Guidance. We consolidated the discussion of these issues up front because they permeate Conservation by Design 2.0, making it redundant to include this information at every place that it is relevant. Moreover, it is essential for teams to understand these advances if they are to effectively implement CbD 2.0. Indeed, we strongly encourage teams to discuss how these advances apply to their planning context *before* initiating the process, to make sure that the advances stay fully embedded throughout.

We note that CbD 2.0 Guidance is intended to be comprehensive enough to help practitioners identify successful strategies, choose the most effective areas to work, and avoid common pitfalls. However, it is by no means a detailed, step-by-step guide for each component. The conservation planning book by Groves and Game, is an excellent source for more detailed information and examples on some key elements of the CbD 2.0 process. Where relevant, more detailed exploration of each step is provided in appendices that provide links to external guidance, tools, and further discussion.

Finally, we use two case studies that recur throughout the document to facilitate understanding of how teams adjust their thinking when progressing through the steps of CbD 2.0 Guidance. Table 2 provides an overview of conclusions from relevant steps for each case study. Where useful, additional case studies are included for particular steps.

Table 2: Case studies used throughout this Guidance

Relevant CbD 2.0 Step	Wind Energy Development in the Central Great Plains	Grazing Management in Northern Kenya Community Conservancies
Context	• Central great plains whole system	• Northern Kenya grasslands in communal lands
Situation Analysis	• Habitat loss major threat • Wind energy one driver	• Degrading rangeland health from drought and unsustainable livestock grazing practices threatens wildlife and local pastoralist ivelihoods. • Grazing practices and livelihoods are linked • Improved human well-being is essential component of any strategy
Minimum Goals	• Wind development in Central Great Plains avoids all sensitive areas for key habitats with no more than a 5% reduction in wind power generation potential	• Rangeland productivity improved 25% in dry season and 50% in wet season • High conservation value species populations increase 10% • Local income stabilized annually, local families consume protein >1 time per week, cattle banditry reduced 30%
Candidate Strategies	• Work with 72 wind developers • Work with legislature to pass tightened regulations on wind siting • Work with utilities that are sourcing wind energy from this area	• Improve grazing management • Provide access to livestock markets • Launch soil carbon project
Results Chains	• Work with 72 wind developers • Work with utilities that are sourcing wind energy from this area	• Implement planned grazing in community conservancies • Provide access to livestock markets
Strategy Mapping	• Potential to avoid impacts to 236,000 acres of sensitive areas	• Potential to expand to 11 million acres of well managed communal lands
Select Strategies	• Utilities strategy selected	• Multiple integrated strategies selected
Theory of Change	• Utilities preferentially purchase power from well-sited wind energy, habitat conversion in key sensitive areas from wind development halted.	• Communities adopt and implement grazing plans, leading to improved rangeland productivity, wildlife and livestock health, increased and stabilized local income and improved local protein supplies
Measures Plan	• Evaluate utilities uptake • Evaluate habitat conversion rate in key sensitive areas	• Monitor abundance of high conservation value speices, rangeland productivity, livestock productivity, local income amount and stability, and family protein consumption

Key Advances of Conservation by Design 2.0

Increasingly, people and nature face connected challenges presented by larger human populations, higher consumption rates, larger-scale development projects, and diminishing and degrading natural resources, all intensified by a changing climate. In this context, conservation efforts have an opportunity to enhance the chances for nature to flourish by offering solutions to some of earth's greatest social and economic challenges. Capitalizing on these opportunities requires a robust, science-based conservation approach that draws on existing strengths, and expands to embrace new disciplines from economics to anthropology, from demography to health.

The Conservation by Design 2.0 conservation process builds off of the strong and widely adopted approach of adaptive management. Adaptive management is a structured, iterative process of systematically testing assumptions to learn, adapt and improve decision-making in the face of uncertainty. From previous, common applications of this approach in conservation, Conservation by Design 2.0 has evolved to incorporate four major advances: 1) explicitly consider linkages between people and nature, 2) design interventions focused on creating systemic change, 3) integrate spatial planning with the development of new conservation strategies, and 4) robustly draw upon and build the evidence base for conservation. We believe that these advances will lead to better conservation strategies and better conservation outcomes, for both nature and people. These four advances are interrelated and each is elaborated upon below.

Advance #1: People in Conservation

Today, there are no natural systems without some form of human influence, nor social systems without nature. We increasingly recognize that social and ecological systems and the challenges they face are not just linked, but truly interconnected and co-evolving across space and time. Scientists from many disciplines increasingly use the term 'socio-ecological system' to describe coupled human-environment systems. We offer the following specific definition to help practitioners better conceptualize what a socio-ecological system is: 1) a coherent system of biophysical and social factors that regularly interact, 2) a system that is defined at several spatial, temporal, and organizational scales which may be hierarchically linked, 3) a set of critical resources (natural, socioeconomic, and cultural) whose flow and use is regulated by a combination of ecological and social systems, and 4) a perpetually dynamic system with continuous adaptation.

Conservation success is most sustainable when it is the result of systemic change within a socio-ecological system, whereby people recognize

the benefits they receive from nature and how their decisions impact nature and its ability to provide these benefits. In turn, through this understanding, people are compelled to act to conserve nature, creating or reinforcing an enduring virtuous cycle. To create this kind of change, the conservation and natural resource management communities must broaden their approaches to explicitly consider the benefits of conservation for people, how alternative decisions will impact these benefit flows, and how to acquire the evidence required for societal recognition of these benefits and to assess tradeoffs. Additionally, in cases where the benefits provided by nature are already recognized by people, but their history of good land stewardship is threatened by an inability to meaningfully engage in management decisions for the lands on which they depend, the virtuous cycle is strengthened by empowering these actors.

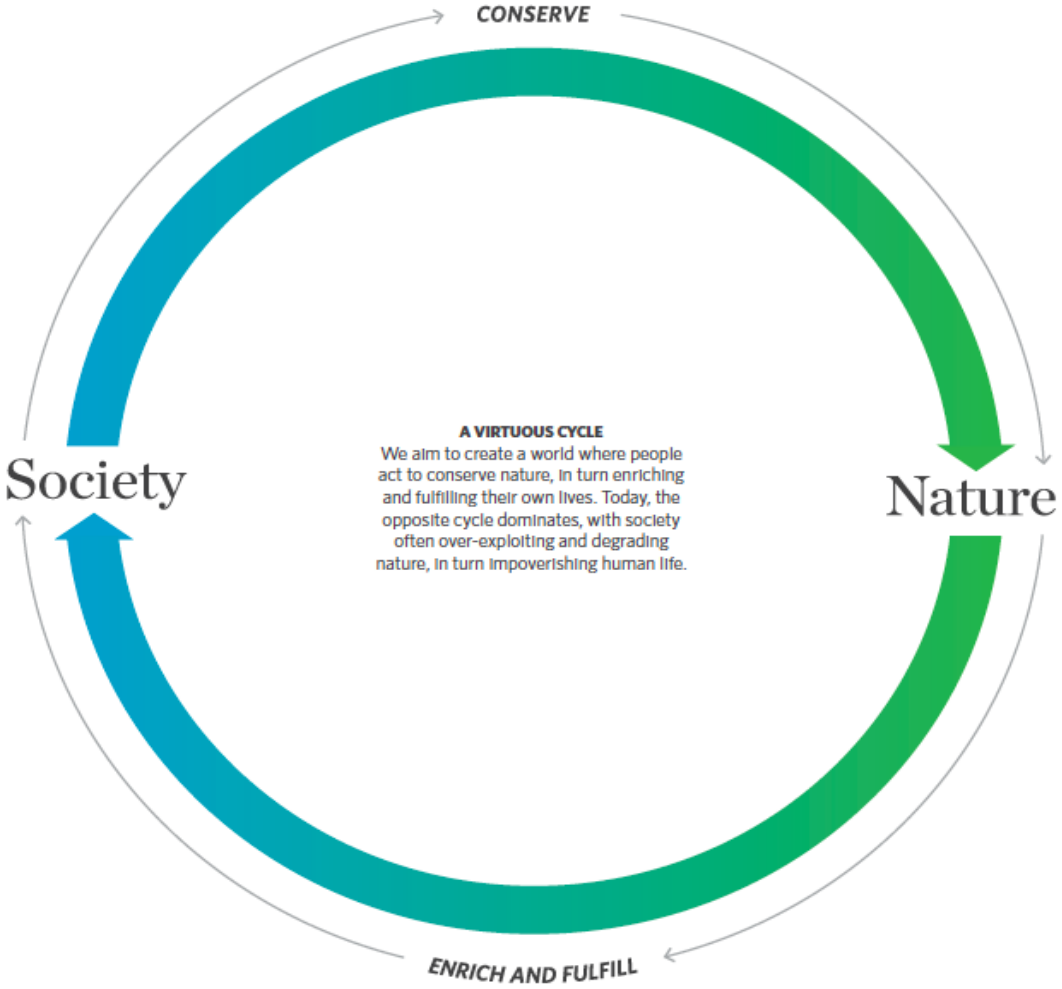
Accordingly, the entry point for Conservation by Design 2.0 is a socio-ecological system that provides the bounds for identifying significant problems facing people and nature. Importantly, the scale of a socio-ecological system can be the globe, a major region, a country, or a landscape, seascape, or watershed (e.g., whole system). In addition, for the Conservancy, these systems may be defined in combination with ecological (e.g., a river basin) and/or human (e.g., a city, agricultural system, geography covered by a policy) attributes. This approach requires us to consider the systems we are trying to conserve as a whole. To describe these systems, their trajectories of change, and our ability to influence them towards a more sustainable future, we define several core elements:

- Biodiversity is the variability within and among all living organisms and the ecological complexes in which they occur. Biodiversity includes ecosystem or community diversity, species diversity, genetic diversity and the ecological and evolutionary processes that sustain it.
- We increasingly recognize and understand ecosystem services: the many benefits that flow from biodiversity to people in ways that can sustain, enrich and fulfill our lives.
- Nature encompasses both biodiversity and ecosystem services, and the processes necessary to maintain them.
- Human well-being describes the state in which a person can act meaningfully to pursue chosen goals, enjoys a satisfactory quality of life, and has her or his needs met.

The conservation movement now must aim to transform and strengthen the recognition of the relationship between nature and human well-being. Today, as society struggles to meet growing needs for energy, food, water and other resources, solutions are often found at nature's expense. In turn, resources are depleted, habitats are degraded, and invaluable species are lost. Damaged nature can then exacerbate food, water and other resource shortages, making unhealthy living conditions and vulnerability to storms, floods and other risks worse. This 'vicious cycle' can be transformed into a virtuous one, where nature -- and the benefits it provides—is more broadly recognized as part of the solution to pressing human needs at local to global scales. The conservation approach detailed here is designed to reveal where and when we have opportunities to change or strengthen recognition of this relationship and help

create - or reinforce, in cases where they already exist, 'virtuous cycles,' through conservation actions.

Figure 2: Virtuous cycle: creating systemic change for nature and people



In the interest of transforming the relationship between people and nature to a more positive one, and to strengthen existing positive relationships, we aim to prioritize conservation solutions that both benefit nature and improve people's lives. However, in some cases the needs of people and nature will be in conflict. As such, there will still be times and places where we do conservation to protect nature for its intrinsic value, even when there is no obvious, immediate material or economic benefit to people. Further, human preferences and needs vary from person to person and group to group, increasing the likelihood that some individuals and groups may oppose particular projects or that projects will benefit some groups more than others, or put some at risk while others benefit. Such conditions do not necessarily mean that a project should not be undertaken. However, in all our work, we must ensure that vulnerable, disadvantaged, and marginalized people and communities (e.g., low-income communities, indigenous peoples, communities dependent on the local

environment, racial and ethnic minority groups, women, children, the elderly) are not harmed and we incorporate social safeguards into project planning and implementation.

We typically think of social safeguards when working with indigenous communities, or primarily in developing countries. These are important contexts for these safeguards as indigenous peoples have collective rights recognized under international law, but there are many others. Nearly all conservation work now engages people as key stakeholders, actors, beneficiaries or potentially negatively impacted individuals or groups, so a review of safeguards at the beginning of any project is worthwhile.

Requesting that teams formally consider social safeguards as part of our conservation process a new practice for the Conservancy, and so we list an abbreviated version of the 11 safeguard questions here. We provide the full list in Appendix C and refer back to the full set of safeguard questions in multiple places in the remainder of the Guidance. If, upon reviewing the safeguards, a team determines the project has the potential to negatively impact any marginalized group, Conservancy staff should seek advice from the Diversity Office about how to proceed. Project teams may want to consider contracting outside expertise if they do not have the capacity to answer the social safeguard questions. Please see Appendix D for additional guidance about working specifically with indigenous people on conservation projects and the further reading and resources section for links to social safeguards guidance of various agencies.

Social Safeguard Questions:

1. Has free, prior, and informed consent (FPIC) of primary stakeholders been obtained for activities affecting lands and other resources traditionally occupied and/or used by those stakeholders? Please see Appendix C for additional guidance about when staff may need to secure FPIC.
2. If applicable, does the project fully consider the dignity, human rights, traditional knowledge, and cultural heritage and practices of people affected by the project?
3. If the project contributes to sustainable economic and human development, is it done in a manner that is socially and culturally appropriate for the primary stakeholders?
4. Is full consideration given to how to share or distribute benefits from the project equitably, fairly, and transparently?
5. How does the project ensure that adverse effects from conservation programs are assessed, prevented and mitigated for affected groups?
6. Are all stakeholders being given the *opportunity* to meaningfully participate in the conservation process?
7. If applicable, does the project intentionally benefit gender equality, equity, and women's empowerment?

(Social Safeguard Questions Continued)

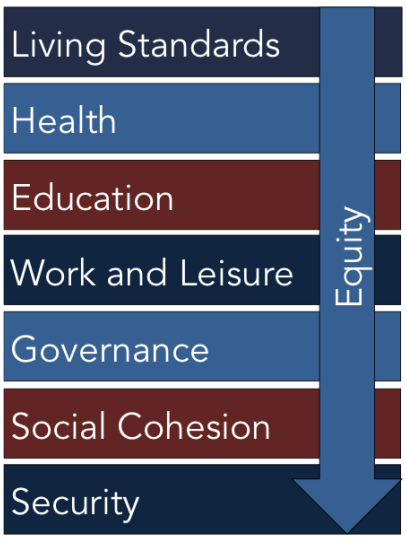
8. Does the project support transparency and accountability of natural resource conservation and good governance by consistently disclosing and sharing information about intervention plans and results with primary stakeholders in a culturally appropriate manner?
9. Does the project comply with applicable local and national laws, international treaties and conventions, and other relevant rules?
10. Is there an accountability system that is transparent and accessible for primary stakeholders to share concerns or file complaints about the conservation program?
11. If there is a significant risk of adverse impacts that directly threaten marginalized groups, or that threatened the project (e.g., through reputational, financial, or legal risk), is there a monitoring system in place to track adverse impacts?

We tangibly account for people in conservation in several ways in this Guidance. First, we emphasize how environmental changes affect all types of people, and in turn how conservation actions can positively or negatively influence people's relationship to nature. People can directly and indirectly engage to preserve or restore nature. People can also be affected through our conservation actions and outcomes, whether it is directly through a conservation intervention or through changes in the environment. These people can be wealthy urban residents, rural farmers, corporate leaders, indigenous communities, underserved or marginalized populations, commercial fishers or miners, low-income communities or any other social group. Second, we offer a human well-being framework (see below) to systematically identify how our conservation strategies directly and indirectly affect these groups of people to ensure that we consistently consider all aspects of human well-being and how they may or may not intersect with conservation. Finally, we provide social safeguards considerations (above). Taken together, our framing and tools allow us to articulate and develop plans to maximize opportunities to benefit human well-being and minimize or avoid risks to people caused by our conservation strategies, which helps to increase the impact and sustainability of our work. Throughout this Guidance, we expand on and refer back to these tools and frameworks to integrate people into our conservation work.

Because we have a focus on transforming the relationship between people and nature *through conservation*, rather than a sole focus on human development, we limit our work to the aspects of people's lives that are connected to nature. These aspects are not fixed globally, but vary from place to place based on people's livelihoods and preferences how the project's socio-ecological system currently functions. These aspects are also subject to change as political, technological, economic, cultural, and other factors shift in the future. The instructions in this Guidance will help practitioners identify which aspects of people's lives are connected to conservation in each case.

Human well-being is a complex concept. To ensure consistent treatment of human well-being, the Conservancy has developed a framework outlining a set of human well-being focal areas, which are broad aspects of life that collectively define human well-being (Figure 3). For some projects, it may be helpful to break the eight focal areas down into more specific components, such as literacy, employment, income, or nutritional health. Please see Appendix E for more detail (i.e., components within each focal area) and discussion about the Conservancy's human well-being focal areas and the further reading and resources section for links to other human well-being frameworks. The purpose of the human well-being framework is to aid in systematically considering how nature and conservation affect human well-being, extending our thinking beyond the most familiar facets of human life (e.g. jobs, income), to more clearly identify the aspects of life nature may influence (e.g. nutritional health rather than overall well-being).

Figure 3: Human well-being focal areas



Conservancy staff can learn more about integrating human well-being considerations into conservation programs via a series of half-hour webinars conducted in 2015 and now available on CONNECT, here. The Conservation Measure Partnership (CMP) also offers guidance on Addressing Social Results and Human Wellbeing Targets in Conservation Projects, and an updated version will be available by June of 2016.

General Best Practices for Incorporating Human Well-Being

Embedded in each stage of the conservation process, we provide specific recommendations for incorporating human well-being. In addition, several elements of best practice are relevant throughout the guidance:

Leading Practices
Tips from Practitioners

Systematically consider the full set of human well-being focal areas (Figure 3) when identifying relevant groups and considering how conservation and nature affect human well-being. Validate human well-being focal areas and components with stakeholders to ensure components are locally relevant. It can be tempting to focus on familiar aspects of human well-being. It can also be tempting to focus only on aspects of human well-being identified by stakeholders which conservation may have little or no power to affect. Finally, it can be tempting to look for available datasets and focus only on aspects of human well-being in those data. Not systematically considering all aspects of human well-being risks missing major human well-being benefits and risks.

- **Consider positive *and* negative human well-being impacts.** While it is important to highlight and quantify the benefits that conservation actions can provide to human well-being, it is just as critical to recognize the potential negative impacts. Negative impacts may not always be obvious during the planning stages, so it is important to continually engage with stakeholders and monitor whether and how conservation activities may negatively impact people. Some of the most commonly overlooked negative impacts include less tangible outcomes, such as disempowerment, exclusion of particular groups of people from the decision-making process, or unintentional distributional effects (providing benefits to one group but not another).

- **Explicitly consider how to minimize, mitigate, or avoid negative impacts to people during strategy development.** The Nature Conservancy requires preventing and mitigating negative impacts to vulnerable people from program activities. Not doing so can lead to mistrust, ill will, misunderstanding or even legal action from stakeholders, and decreases the likelihood that a conservation strategy will be successful and sustainable. It also increases institutional, reputational, and financial risks to the organization. The social safeguard questions summarized above and provided in Appendix C can help practitioners think through whether they are being inclusive, minimizing risk, and taking the right precautions throughout the conservation process.

Advance #2: The Imperative for Systemic Change

Explicit in Conservation by Design 2.0 is the expectation that conservationists increasingly seek to effect systemic change within the socio-ecological systems in which they work. Systemic change refers to creating, strengthening, or shifting the social, economic, political, and cultural systems that comprise and sustain a socio-ecological system.

© 2014 Carlton Ward for TNC

CbD 2.0 clarifies that the future of nature and the future of human civilization are interdependent. However, the major systems commonly used to describe the forces affecting that common future -- economic, political, and social -- do not adequately reflect this interdependence. In short, unless we act to address systemic causes, we are likely to fail in our mission. We are therefore compelled to develop strategies that improve these systems over time. Strategies that successfully strengthen these human elements of a socio-ecological system should ensure enduring conservation outcomes at scale.

Being skilled at systems thinking, a proven approach for developing innovative solutions to messy situations that often seem like intractable dilemmas, is

critical in order to be able to develop strategies aimed at achieving systemic change. Systems thinking has been applied to social-ecological systems, governance, and resource use (see Elinor Ostrom's paper, and how her Socio Ecological Systems framework was operationalized to assess sustainability in Baja California Sur); urban ecology (The Nature of Cities); organizations (Peter Senge); health care (WHO) and education (Waters Foundation). We acknowledge here that this field is a growth area for both the Conservancy and perhaps for the conservation community more broadly. You can learn more about systems thinking at systemswiki.org.

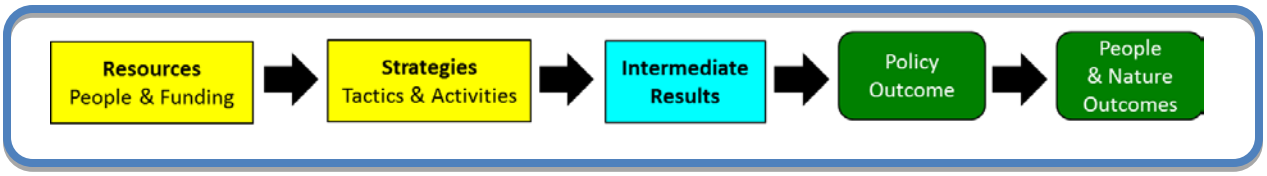
For our conservation work, systemic change can be achieved by, for example, incorporating conservation into economic systems, so that a conservation outcome is produced via new models of "business as usual". If consumers develop a preference for products that are sustainably harvested, they can incentivize producers to invest in those practices. If regulatory agencies embed conservation principles into their land use permitting process, a potential driver of threat to nature is harnessed to become a potential driver of conservation. By developing strategies to "mainstream" conservation into the everyday policies and practices of agencies, businesses, and communities, conservationists may be able to create far more wide-reaching and durable conservation outcomes that jointly benefit nature and people. By doing so, we seek to drive conservation actions that strategically broaden the constituency of people and organizations who do conservation work, whether they define it this way themselves or not.

CbD 2.0 requires teams to rigorously analyze the various relationships within a socio-ecological system, and think creatively about where there may be opportunities to advance conservation as a solution to major challenges facing society. Indeed, the larger and more recognized and important the "problem for people" is, the more potential impact a "conservation solution" may have – and the more secure the resulting conservation outcome will be. In other words, embedded in socio-ecological challenges may be opportunities to institute a systems-based solution that will also work for nature. The size of the problem may well correspond to the scale of the potential impact. Moreover, a conservation-compatible change in practice or policy can potentially serve as a model that can be replicated elsewhere, enabling conservationists to extend the impact of their investment well beyond the places they directly engage.

We also note that achieving systemic change may take longer, often significantly longer, than the duration considered by a typical conservation plan (e.g., 5-10 years). Consequently, outcomes intended to be met within the planning window will likely increasingly be written as policy, practice or behavior outcomes (e.g., in terms of changed human behavior and changing the sets of "rules" – formal and informal – that guide people's behavior). When this is the case, teams will be expected to clearly describe in results chains as well as the theory of change the relationship between achieving behavior change, policy, or practice outcomes and meeting the longer-term outcomes for nature and people. Figure 4 gives an example of such a results chain for a generic project that aims to create systemic change for nature and people through a policy outcome. The chain would be further specified in any given project case,

and similar chains could be created for projects aiming for systemic change through behavior change or altered corporate or management practices.

Figure 4: Generalized results chain aimed at achieving systemic change for people and nature through a policy outcome (adapted from Evans et al. 2015).



When teams are developing strategies that focus on changing the more formal rules (e.g. laws, regulations) that guide people's behavior, we encourage them to draw upon decades of research in the policy sciences on theories of change of how policy change happens. For example, ORS Impact and the Center for Evaluation Innovation have created practical practitioner-focused examples of common theories of change for how policy change happens in their joint report on 'Theories to Inform Advocacy and Policy Change Efforts'. Please see Appendix F for more guidance about how to think about human behavior-related strategies and for three common policy theories of change used in Conservancy projects. Finally, please see Evans et al. (2015) for an in-depth discussion of how to frame and measure policy outcomes.

Advance #3: Integrating Spatial Planning with Strategy Development and Selection


© 2015 Ami Vitale

The Conservancy and many other conservation organizations have a strong history in creating maps that identify critical ecological information such as where important biodiversity remains and which locations are likely to be more resilient to climate change. This information remains highly relevant as it provides foundational information for developing actionable plans. Achieving systemic change that benefits socio-ecological systems requires us to harness this spatially explicit information about biodiversity, along with additional types of spatially explicit data, including social, economic, and political data, to develop effective strategies that consider the many dimensions impacting conservation efforts. Conservation has also evolved from a largely protection-oriented practice to one where protection stands alongside many other strategies that may be deployed towards our mission. We now regularly invest in large land deals, the establishment of protected areas, watershed-scale investments in restoration, agriculture, forestry and fisheries best management practices, improving corporate practices, altering development siting, strengthening regulations and laws, and many other strategies, each of which will touch down for greatest impact in

different kinds of places. We need a conservation approach that considers these diverse options, their various footprints, and the full set of conditions that determine their likely impact.

In the CbD 2.0 Guidance document we focus on how spatial planning can be integrated with strategy development to tell us *what* actions are needed *where* to achieve systemic change. The resultant 'strategy and opportunity maps' can show where investments in specific strategies will be most effective. This ensures that investments are targeted to affect the places where they have the most benefit to the larger socio-ecological system and allows robust estimates of the magnitude of change possible with a given strategy. Such mapping also lends itself to comparisons amongst alternative strategies, including cost-benefit analyses.

Advance #4: Evidence Based Conservation

© Nick Hall for TNC

Accountability to evidence is a hallmark of "science-based" decisions and organizations. An explicit consideration of the quantity and quality of evidence supporting hypothesized conservation outcomes can lead to improved strategies and focused and reduced monitoring demands and can facilitate the identification and management of risks (ecological, financial, reputational, etc.). Conservation strategies aimed at achieving systemic change depend on influencing others to act, and evidence that is relevant and effectively communicated to key audiences can be a critical asset for generating that influence. If available evidence is insufficient to generate that influence or manage important risks, then research and monitoring can be directed to address priority evidence gaps.

Thus, CbD 2.0 emphasizes the generation, collection, synthesis, sharing and leveraging of evidence. We've increased this emphasis so much so that this aspect of our work is called out explicitly in three of the five phases (i.e., identify challenges and goals; map strategies and places; adapt). The ability to make robust decisions about investing limited conservation funds requires understanding – and bolstering where needed – the strength of the evidence underpinning a given theory of change.

Here, an evidence base refers to a body of knowledge about how socio-ecological systems behave. The evidence base includes knowledge ranging from scientific assessments to traditional knowledge and may exist in many forms including white papers, reports, peer reviewed literature, primary data, interviews, traditional oral accounts, government records, and social media content. At each stage of the Conservation by Design 2.0 process described below, teams will draw upon and contribute to an evidence base. While Conservation by Design has always included 'capture and share knowledge' as a relevant step within a cyclic and iterative adaptive management approach, by

integrating evidence use and capturing learning into each step we expect to foster an organizational culture that helps us learn and share knowledge more consistently and effectively. This Guidance document makes it clear that evidence is an essential input to – and output of – each step.

Over time, and with concerted effort, the conservation community will amass a conservation evidence base that, by virtue of its comprehensiveness and accessibility, will improve the effectiveness and efficiency of the conservation process. Although currently under-utilized, ConservationEvidence.com, Collaboration for Environmental Evidence, Conservation Gateway, and Miradi Share are existing efforts to compile certain types of conservation evidence. Potential benefits of evidence repositories include the more rapid spread of strategies that work in conservation – and ability to avoid repeating past mistakes. Conservation efforts will be less prone to reinventing wheels, or allocating limited resources to demonstrate already well established results. Designing projects so that they build off of best available science, identify and fill the most important information gaps, and disseminate lessons learned to others who may benefit from that experience is critical to increasing the pace and scale of conservation.

Note that the evidence base on its own will not sufficiently disseminate new knowledge about how to accomplish these strategies; we must also commit to proactively sharing what we learn. Conversely, sharing knowledge without a commitment to increasing the evidence is a lost opportunity, and is also insufficient on its own. Here we advocate for evidence coupled with knowledge sharing, as it is this combination of skills and commitments that is needed to truly advance conservation. For this reason, we distinguish the term "knowledge-sharing" from "evidence base", defined above.

"Knowledge sharing" refers to the spectrum of activities through which information, skills, and expertise are exchanged. Evidence can identify which strategies will work or not in a given set of circumstances, but if that evidence is inaccessible or unknown to others, it will not inform conservation practice broadly. Practitioners often learn about where to find the best evidence and how to apply it from their peers. Knowledge sharing can take many forms including communications at professional conferences or public meetings, online data portals, communities of practice, discussion forums, trainings and guidance, in-person trainings, mentoring, coaching, and workshops, or focused engagements across fields or disciplines as in visiting fellowships, secondments or extended stays with knowledge holding groups. We encourage the use of appropriate practices for evidence synthesis, interpretation, creation, and knowledge sharing throughout the conservation process.

Key Concepts for Building the Evidence Base

Evidence relevant to conservation comes from a wide variety of disciplines and sources. Conservation scientists are typically more familiar with evidence from the fields of conservation biology, ecology, evolution, and spatial planning, and may assume 'good' evidence is found only in peer-reviewed publications.

However, conservation now must draw from evidence produced by many more diverse fields including health, poverty alleviation, education, demography, psychology, economics, anthropology, and sociology, among others. In addition, much conservation knowledge exists as traditional knowledge held by local communities, stakeholder groups (e.g. farming coalitions, business roundtables, extension networks) or indigenous peoples. Teams should place equal effort on identifying relevant evidence across disciplines, sectors and knowledge sources, as appropriate.

Evidence base assessments should not perpetuate confirmation bias. The conservation community is prone to elevate successes and less frequently shares information about failures. Teams conducting evidence base assessments should aim to identify *all* relevant evidence relating to an assumption; including evidence that supports it and evidence that refutes it. Given the potential for hidden bias for affirmative results, we encourage conservation teams to intentionally seek out evidence that may counter leading assumptions of how strategies will create positive impacts for nature and people. This evidence may otherwise be overlooked, leading to false and misleading interpretations of existing knowledge.

An assessment of the evidence base creates *transparency*. It is critical to differentiate between proposed actions that are strongly supported by evidence, those where the knowledge base shows conflicting information (some showing the action's effectiveness and some showing failure), and those where no evidence exists. This transparency of status will allow conservation teams and managers to make informed investments, define monitoring needs, and make risk-related management decisions.

The emphasis on evidence should not limit innovation and creativity. Innovation is a key element of conservation success, and requires generation and testing of novel ideas. By definition, such new ideas will not have a full body of evidence supporting their effectiveness for conservation. Those novel strategies may nonetheless be worth investing in if the potential reward is great enough. A commitment to evidence must not stifle innovation. However, for projects with a limited evidence base, it is especially important to invest in building the evidence base through well designed and sufficiently funded research and monitoring.

Evidence must meet minimum standards to be considered evidence. To be considered evidence, the assumptions made by the conservation team must have been measured or observed. Opinions that something *should* work, even when contained in a conceptual peer-reviewed paper, do not count. For example, if sustainability standards are expected to change corporate behavior, conservation teams would look for evidence that sustainability standards had been shown to create change in corporate behavior in real world cases. Papers identifying a conceptual pathway through which such change could happen do not provide such evidence. Reports or agreements where corporate leaders have pledged to change behavior do not constitute evidence. Papers or reports that

show adoption of different practices as a result of sustainability standards do constitute evidence for this assumption.

Not all evidence is created equal. Evidence is strong when we have confidence that additional data will not reverse our conclusions. This is generally the case where there are consistent findings across multiple studies (e.g., meta-analysis) or where effects are far too large to be attributed to chance alone. Studies where rigorous experimental designs are used (including before-after comparisons as well as an appropriate control group) also generate confidence. Although there is not yet consensus among conservation practitioners around a standardized approach to evidence grading at this time, expert judgment should consider these factors when assessing strength of evidence. In this version of the Guidance, a basic method for characterizing evidence *quantity* using this minimum standard is presented (e.g., strength of evidence for results chains). Future Guidance versions will include methods for assessing evidence *quality*, an equally important element of evidence assessment.

The *required* quality of evidence will vary from case to case. The strength of evidence needed to provide confidence in a decision varies from decision to decision**.** Strong evidence is not equally important in all cases. For example, decisions that present high financial or reputational risks, or risks to vulnerable stakeholders, should be held to a higher evidence standard than those with relatively low risk. The way in which evidence is intended to be used in a strategy also will determine the strength and type of evidence required. Thus, a key consideration for conservation teams is whether the available evidence is "sufficient" for the assumption, decision or strategy it supports. Factors that determine sufficiency include organizational risk tolerance and the information requirements and risk tolerance of stakeholders.

A well-developed evidence base can reduce and focus monitoring needs and minimize costs. Given limited conservation resources, teams should focus research and monitoring efforts on high priority information gaps, with priority being determined by such things as the stakes of being wrong, and the information needed to influence key actors (see Monitoring section). As the evidence base for conservation builds, we will be able to continually shift investments towards filling key evidence gaps and away from measuring well-documented outcomes.

Leading Practices
Tips from Practitioners

General tips

- **Design a project to generate evidence.** Teams can accelerate the development of a Conservation Evidence Base by thinking about their conservation engagement as a "hypothesis", and building into it elements of good experimental design, such as: a clear understanding of the assumptions being made in the theory of change; a hypothesis of the change we propose to make through an intervention; identification of controls or counterfactuals for comparison with the project; adequate monitoring to detect change; analysis to determine effect; and, an investment in communication of results,

regardless of the project's "success." Sharing evidence of failures is just as important – if not more so- than sharing evidence of success.

- **Finding evidence and building an evidence base.** Sources of evidence are many, and may be difficult to locate. Some may be found via literature review using standard scientific search methods, while other evidence will be found in reports, public documents, white papers, data bases, oral histories, social surveys, and many other repositories. Teams should document the methods used (e.g., keywords, databases, key informants engaged, interviews conducted, social media searches) in building the evidence base for their project, and ensure that their synthesis is designed for accessibility and peer review. Because many conservation engagements aim to address similar systems and issues, early investment in comprehensive evidence review and synthesis on major themes would benefit many projects.

- **Understand the context for sufficiency of evidence.** The sufficiency of evidence depends on the context. What will the information be used for? There are five categories of use that should be considered: 1) reducing uncertainties in the theory of change and improving adaptive management; 2) avoiding and mitigating negative impacts; 3) managing legal or reputational risk; 4) reporting to funders and other philanthropic uses; and; 5) influencing others. The specific circumstances within each category should be considered. For example, who are you trying to influence? If you are trying to encourage engineering and insurance companies to alter premiums based on the presence of natural infrastructure for flood risk reduction, this will require rigorous evidence demonstrating a cause and effect relationship. In contrast, the testimony of constituents may be sufficient evidence for convincing politicians of the value of a particular conservation plan.

- **Experimental design principles are needed to provide evidence of causation.** In order to estimate the impact caused by an intervention, it is generally necessary to have data prior to and after the intervention, and to have the same data from a comparable control group that does not receive the intervention. Experimental design and statistical rigor is related to the required level of strength of evidence. Additional guidance on experimental design and rigor is provided in the Monitoring section and in Appendix G.

- **Capturing and sharing knowledge.** Knowledge management and transfer can be a highly leveraged conservation strategy – ensuring that the broader conservation community benefits from experience and investments regarding what works and what fails. Learning should occur in all phases of CbD 2.0. Conservation teams should be attentive to advances in knowledge that occur during their application of the process, and develop the systems and discipline to capture those advances. Documentation and dissemination of information may take a range of forms. Conservancy staff can find guidance and tools for knowledge management and sharing in the Organizational Learning Community on CONNECT, here.

Phase 1: Identify Challenges & Goals

Context:
Ultimately, planning should identify the most impactful potential solutions to significant conservation problems. The first phase sets the scope and direction for planning by identifying challenges and defining success at a high level. At the end of this phase, the conservation team will have defined the relevant challenge(s), geographies, conservation targets, and human well-being components to be addressed by the plan. This phase will also produce a situation analysis that evaluates key socio-ecological drivers and informs opportunities for affecting change. Finally, minimum goals that strategies should seek to meet will be identified.

Phase 1 Steps:

1. Specify Planning Context
2. Conduct a Situation Analysis
3. Draft Minimum Goal Statement
4. Share Advances in Knowledge Through Pathways

The entry point for conservation planning in the previous version of Conservation by Design was typically a geography, such as an ecoregion, with strategies that focused on conserving priority areas, or places, within the ecoregion. CbD 2.0 uses a socio-ecological system as the entry point, and these types of systems are often defined differently than an ecoregion, which is defined exclusively by ecological attributes. The globe, a food production system for a country or region, and a river basin are all examples of socio-ecological systems. In addition, our strategies aim for systemic change as we know that conservation work does not end with protection of a particular place. Our broad conservation goal, therefore, is to address the most significant challenges facing people and nature. Ideally, selected challenges are identified based on a global or regional situation analysis to ensure that the challenge/strategy that is being focused on is an important one for biodiversity as well as people. For example, the Conservancy is in early stages of developing an approach for completing a global-to-regional situation analysis that would help identify the most significant challenges to nature and people at these scales. Smaller whole-system scale efforts can then be informed by these larger scale analyses, and opportunities for these efforts to contribute to regional and global-scale systemic change can be explored using the approach described in this Guidance document (please see Appendix H for more details about the Conservancy's global-to-regional situation analysis approach).

1. Specify Planning Context

Purpose of this step

1. Articulate how the planning effort is intended to benefit the organization's and/or project team's mission.

2. Identify the scope of planning, so that it is clear what the plan covers and what it does not, and who is expected to use the plan to implement conservation strategies.

Products from this step

1. Statement of the scope of the planning effort
2. Statement of who is expected to implement the plan

Specifying Planning Context Overview

1. Specify audiences for planning process and products
2. Specify topical and geographic scope (e.g., challenges, habitats, landscape/seascape, political boundaries, production regions, issues)

Process and Best Practices

1. **Specify audiences for planning and products**. Planning is done to guide action by an organization, or a team within an organization, or across several organizations. Specify who the audience(s) is that is expected to use the plan to take action.

2. **Specify topical constraints and geographic scope**. The conservation process described in this document is most appropriately applied at global, national, or whole system (e.g. river basin, growing region) scales. This Guidance will be sub-optimal for conservation work implemented entirely within a local-scale site because of the focus on achieving systemic change, which is hard to achieve working only at a local scale. Topical constraints could include habitat type or realm (e.g. marine, coral reefs, or forests), or socio-economic topics, such as major sectors (energy sector, health sector) or challenges (e.g. food security, disaster risk reduction, transportation infrastructure expansion).

Best Practice

Ensure that planning focuses on significant conservation challenges. Global and regional applications of this science-based approach can help identify the most important challenges for the organization to confront (Appendix H). When this information is not known, it is critical to conduct the situation analysis (see next step) before constraining the scope too far. Starting into a planning exercise with pre-determined foci that were not chosen through a science-based process risks missing important challenges and opportunities for conservation within a socio-ecological system.

Consider a broad geographic scope. The socio-ecological system can be as large as the globe or focused on a predominantly ecologically or politically

defined area. Consider whole basins or areas where a particular conservation challenge is evidenced. The scale of the socio-ecological system should encourage the identification of major drivers change and opportunities to create systemic change, recognizing that the strategies ultimately selected for implementation may end up being focused on smaller subsets of places or specific actors.

Do a wall-to-wall analysis within your geographic scope. When the team is focused on a geography (e.g., Yangtze River Basin), they should start by considering the whole socio-ecological system, rather than a predetermined subset of places within it thought to be most important for biodiversity. This allows full consideration of working lands, ecosystem services, landscape processes, and drivers of processes in the situation analysis.

Minimum Standard Questions. *For the minimum standard to be met, the answer to ALL of the following questions must be "Yes"*

1. Have the target audience(s) that are expected to take action been identified, along with a draft list of the products each needs from the planning and implementation process?
2. Is the effort scoped to solve conservation challenges that will meaningfully benefit the organization's mission or project team's goals?
3. Were existing science-based organizational analyses considered when identifying the conservation challenges or socio-ecological system to focus on?
4. Is the geographic scope at the right scale to identify strategies that can achieve systemic change?
5. Is the effort scoped to solve conservation challenges that will meaningfully benefit nature?

FAQs

Q: *Why aren't conservation targets (species, systems, processes, services) selected as part of scoping?*
A: Specific conservation targets, which are also referred to by the more general term, primary interests, are identified as part of the subsequent situation analysis step, unless they are defined *a priori* as part of a science-based definition of the topical scope. Human well-being interests should also be identified during the situation analysis.

Q: *How are focal conservation challenges identified?*
A: Focal conservation challenges are identified as part of the situation analysis in the next step, where the interactions in the socio-ecological system are explored. Some planning processes will have an initial set of focal challenges identified—in this case the focal challenges should have been identified through application of a science-based approach at a larger scale. For example, a group may run a planning process to address the challenge of securing freshwater for nature and people in Africa. A broad challenge has been identified as a starting point, but the situation analysis, including

conversations with local communities and other key stakeholders, will help identify specific water-related challenges in the region of focus. Ideally, the selection of securing freshwater as a key challenge in Africa would have happened through a global or multi-regional science-based process that identified freshwater as a key challenge in Africa (see Appendix H for the Conservancy's approach to this type of analysis).

2. Conduct a Situation Analysis

Purpose:

1. Systematically assess the key factors affecting primary interests (i.e., both nature and human well-being) in a socio-ecological system.
2. Gain understanding of the drivers of conservation challenges and how they are connected to challenges for people.
3. Understand the underlying evidence for the key factors affecting the challenges and opportunities for conservation interventions.
4. Promote identification of novel conservation strategies aimed at systemic change.

Note: Upon completing the situation analysis the team should have clear answers to these questions: What are the key challenges to nature? What are the key challenges to people and society? Which are connected, and how? And where is there evidence for the strongest nature-people connections?

Products:

1. Situation analysis narrative and diagram. A situation analysis is an assessment that identifies and weighs the key challenges affecting primary interests in a place or associated with a problem, including the political, socioeconomic, institutional, and ecological factors driving change, and providing opportunities for conservation intervention.
2. Stakeholder analysis.
3. Documentation of evidence considered; documentation should be included with materials provided to peer-reviewers.
4. List of key conservation challenges and linked social or economic challenges

Conduct a Situation Analysis Overview

1. Assemble a diverse team, ideally including key stakeholders
2. Identify primary interests, including conservation targets and human (i.e., social, economic) interests
3. Diagram relationships between primary interests and drivers of change that create challenges, considering both current conditions as well as emerging trends that may have significant impacts in the foreseeable future
4. Review and synthesize evidence to ensure all major links have been represented; document evidence review methods and sources
5. Validate the situation analysis diagram with key stakeholders, including those who are not on the conservation team
6. Synthesize evidence to identify strongest intervention points for each primary interest
7. Elevate and summarize the biggest conservation challenges and linked human interests
8. Identify key additional partners needed for addressing the biggest challenges.

Process

1. **Assemble a diverse team.** Recruit a multidisciplinary and multifunctional team representing the relevant expertise and organizational functions (this might include managers, project staff with local knowledge, marketing professionals, government and corporate relations professionals, natural scientists, social scientists, and philanthropy staff). Include individuals from major stakeholder groups and partner organizations on the team especially if these partners will be needed to implement strategies. Expect to make some changes to team composition throughout the process, as different skillsets become more/less important for completing the work.

Consider engaging an experienced facilitator or coach for the situation analysis. An experienced facilitator or coach will increase the likelihood that situation analyses represent diverse perspectives about the challenges and opportunities for conservation interventions. If you use a facilitator or coach, make sure they are familiar with the approach described here so that the facilitation leads to sound answers to core conservation questions and agreed-upon decisions.

Engage key partners early. If working with partners is likely to be a component of a key strategy, then engaging them at an early stage is essential to gain buy-in and trust, especially if this is a new effort. When engaging partners, treat planning as a core strategy and joint priority-setting as an important step in implementing that strategy. The Conservation Partnership Center provides detailed guidance on negotiating and managing

partnerships. CCNet coaches and other experienced facilitators can help teams design and conduct participatory processes. Audubon's Tools of Engagement can also be a useful resource here and in several subsequent steps.

Develop a plan for stakeholder engagement. A full understanding of a socio-ecological system requires consultation with stakeholders that may have unique perspectives. Stakeholder engagement requires understanding the relevant situation, intra-stakeholder dynamics, and socio-cultural norms. It can be helpful to consider various approaches for engaging stakeholders, keeping in mind that engagement should be transparent and inclusive, and participation should be voluntary.

A stakeholder engagement plan will identify how stakeholders are involved at each stage of the conservation process. Engagement can range from consultations at a few key points to full leadership of the conservation process. For example, through an approach developed in Australia by CCNet coaches called Healthy Country Planning ("HCP"), Indigenous Australians drive the planning processes involving their lands. HCP adapts the Open Standards to guide Indigenous communities through the process of making a plan to look after their country, culture, and people, and to identify ways to develop livelihoods while managing their lands appropriately.

2. **Identify primary interests for both nature (e.g., conservation targets) and people (e.g, social, economic attributes). Primary interests** represent what the conservation organization, influential actors, and important stakeholders care about in the context of the socio-ecological system. For the Conservancy, primary interests begin with conservation targets (e.g. species of concern [endangered species], habitats, ecological processes [e.g.,water quality regulation, evolution, climate adaptation, etc.]). Conservancy staff should keep in mind the organizational orientation of aiming to achieve systemic change when selecting conservation targets as this will likely influence the number and types of targets chosen.

   At this stage the purpose is to identify *all* relevant interests for all involved. Primary interests of other organizations or stakeholder groups should also be included in terms provided by or accepted by these groups. These are likely to reflect a broad set of human interests (e.g. employment, income, food security, education, equality, access to resources, cultural sites, political instability/conflict/crime, urban growth, business opportunities). All identified as key primary interests should be included in the situation analysis. The point of the analysis is to identify which of these primary interests are strongly connected to conservation interests.

   Broadly defining primary interests early in the process allows representation of important values held by all key stakeholders that provide opportunities for identifying links or trade-offs between them.

Ensure that the primary interests of different groups, especially traditionally underrepresented or marginalized groups, have been considered. Identifying how the interests of underrepresented or other marginalized groups are part of the situation is essential. For instance, women are often at the forefront of natural resource management in developing countries, but are frequently excluded from decision-making processes. Low-income groups are often the most dependent on natural resources, and they may also face the brunt of environmental pollution, including in developed countries. Not including the interests of these groups can create an incomplete understanding of drivers, or root causes of conservation challenges and can create unintended consequences of well-intended conservation actions.

Stakeholders should be engaged in a way that respects their culture, resource and time constraints, and their preferred medium to ensure effective participation. However, sometimes marginalized groups may not be organized, and it can be challenging to find an effective way to engage with them. In these instances it may be helpful to focus on established community institutions, such as churches, schools or other civic institutions, as a first step to active engagement.

Make use of previously identified primary interests. Look for existing science-based or socially-inclusive priority- or goal-setting processes that have already identified primary interests. Priorities defined in separate processes may save both you and stakeholder's time and resources. For instance, non-profits, government planning processes, development organizations, scientific bodies, and industry groups may have produced ecoregional assessments, development goals, future trajectories, or priorities that may be relevant as primary interests.

Ecoregional assessments are a good source of potential primary interests for biodiversity. In many areas, ecoregional assessments have already been conducted that identify conservation primary interests (also called biodiversity targets; ecological systems and species) that are of conservation importance in an ecoregion. The Conservancy maintains a database of their ecoregional assessments here. When biodiversity primary interests cannot be identified from previous work, a threats analysis or a gap assessment can be used to identify representative biodiversity. Again, keep in mind the goal of achieving systemic change when identifying conservation primary interests. Additional guidance on selecting biodiversity targets can be found in the Open Standards, CCNet and Conservation Planning: Informed decisions for a healthier planet.

Use key informant interviews, focus groups, stakeholder analysis, and other tools to identify primary interests for people. When social or economic primary interests cannot be identified from previous work, common tools may be used to identify key stakeholders and their primary interests, or social and economic interests linked to biodiversity interests.

These include key informant interviews, focus groups, and formal stakeholder analysis (e.g. WWF Stakeholder Analysis or Wongbusarakum et al. 2014), as well as many other kinds of social or economic analyses and syntheses.

3. **Diagram relationships between primary interests and drivers of change that create challenges as well as opportunities**. Complex systems can have many links and so we recommend that your team capture these links visually rather than in narrative form alone. As you develop the situation analysis diagram, keep in mind the following:

   - The team should not make any decisions yet about which links are important or strong or can be altered, instead identify **all** links within a system that make it work the way it currently does. Do not consider any possible strategies yet. This step captures the world the way it is now, not how we'd like to change it.
   - Be sure to include relevant emerging factors. Demographic, economic, political, technological and environmental factors all may affect the situation analysis. Attempt to identify the emerging factors that could strongly influence the situation analysis, such as impacts from and responses to climate change, new energy and agricultural technologies that will affect land use, and population growth. Include these factors in the situation analysis diagram.
   - Not all primary interests will be connected to each other, and not all social or economic primary interests will be connected to conservation primary interests. The point of the situation analysis is to identify strong drivers of primary interests, and strong connections between social, economic and conservation primary interests.

   A situation analysis diagram visually captures the relationships between primary interests and their primary drivers of change. Any number of tools can be used for this exercise, including whiteboards, PowerPoint, sticky notes on a wall, and specialized software such as Miradi, Compendium, Visio, and cmap. Miradi is software that was designed specifically to support adaptive management. It is available for all Conservancy staff and you can see a video about how to set up Miradi on your computer here. Consider the audience you are engaging with when selecting tools. For example, participatory rural appraisal approaches with 3D participatory mapping and visioning exercises can be more useful than Miradi when engaging local communities (e.g., IFAD's guidance on participatory mapping).

   Follow these steps to create a situation analysis diagram. If you have not done a situation analysis before, or have largely done them in the past with a focus on conservation primary interests, these steps may be a helpful way to go through the process.
   - Start by listing the primary interests, both conservation and human interests.
   - Write all of the primary interests in a column in the middle of a whiteboard, or using sticky notes on a wall, or on a large piece of paper.

- From each primary interest as a starting point, draw links to the left reflecting specific direct drivers of current challenges to the primary interest.
- Further to the left, add in links to indirect drivers or contributing factor. Be as specific as possible. For example, instead of listing existing laws as a driver, state what about the law leads to the current undesirable situation (e.g. law not stringent enough, law not enforced)
- Return to the primary interests, and draw to the right any direct environmental, social or economic outcomes of the current state of primary interests. For example, if declining urban forest extent is a primary interest, it could be driving population declines of species of concern, contributing to local temperature increases (both direct environmental outcomes) and reducing opportunities for urban recreation (direct social outcome).
- Then add further to the right any indirect environmental, social or economic outcomes of the current state of primary interests. Continue these pathways until you have considered whether each may end in a social or economic outcome. It is likely that all will either through ecosystem service pathways or through intrinsic value. Continue drawing factors (drivers and opportunities) and links until your diagram includes all the relevant actors and stakeholders.
- You may find in this process that some primary interests are drivers or outcomes of others. This is the nature of complex socio-ecological systems, and these linkages help us see which conservation and human primary interests are connected. Primary interests may also be connected by shared drivers. Keep in mind that the purpose of this exercise is to start the exploration of the socio-ecological system, and the primary interests do not need to remain in any specific orientation through this process. Figure 5 is an illustrative situation analysis for wind energy development in the Central Great Plains that includes many of the attributes described above (e.g., primary interests, direct and indirect drivers).
- In Phase 2 of CbD 2.0 (map strategies and places) strategies are generated by considering intervention points and how the actions of actors could be altered to benefit the conservation and human well-being interests, so this step should include the current influence pathways of all the actors you may seek to engage with your strategies.

Include impacts from and responses to climate when relevant. Include any key links between climate, environment and people, especially where climate change threatens human well-being and conservation primary interests. Consider both how primary interests are currently or may be affected by climate change and whether there are opportunities for adaptation and mitigation.

Represent social and economic interests in terms of specific human populations. There is seldom a conservation activity that will affect all people, so it is important to specify the relevant groups for each human well-

being primary interest. Relevant groups are the people evidence suggests are connected (positively or negatively) to primary interests as drivers or recipients of outcomes. Being clear in the early stages of the planning process about which specific groups may be affected, and how groups differ as drivers of change or as recipients of ecosystem benefit or harm, is critical. Populations are diverse and people can be grouped in many different ways, such as gender, income level, ethnicity, race, representation (marginalized groups), age, political orientation, and economic sector (e.g. corporations, herders, fishers, agricultural producers). The point in identifying relevant groups is not to attempt to reflect all groups, but rather to explicitly identify which groups of people are likely to be affected or influential so they can be considered and engaged as appropriate in the conservation process.

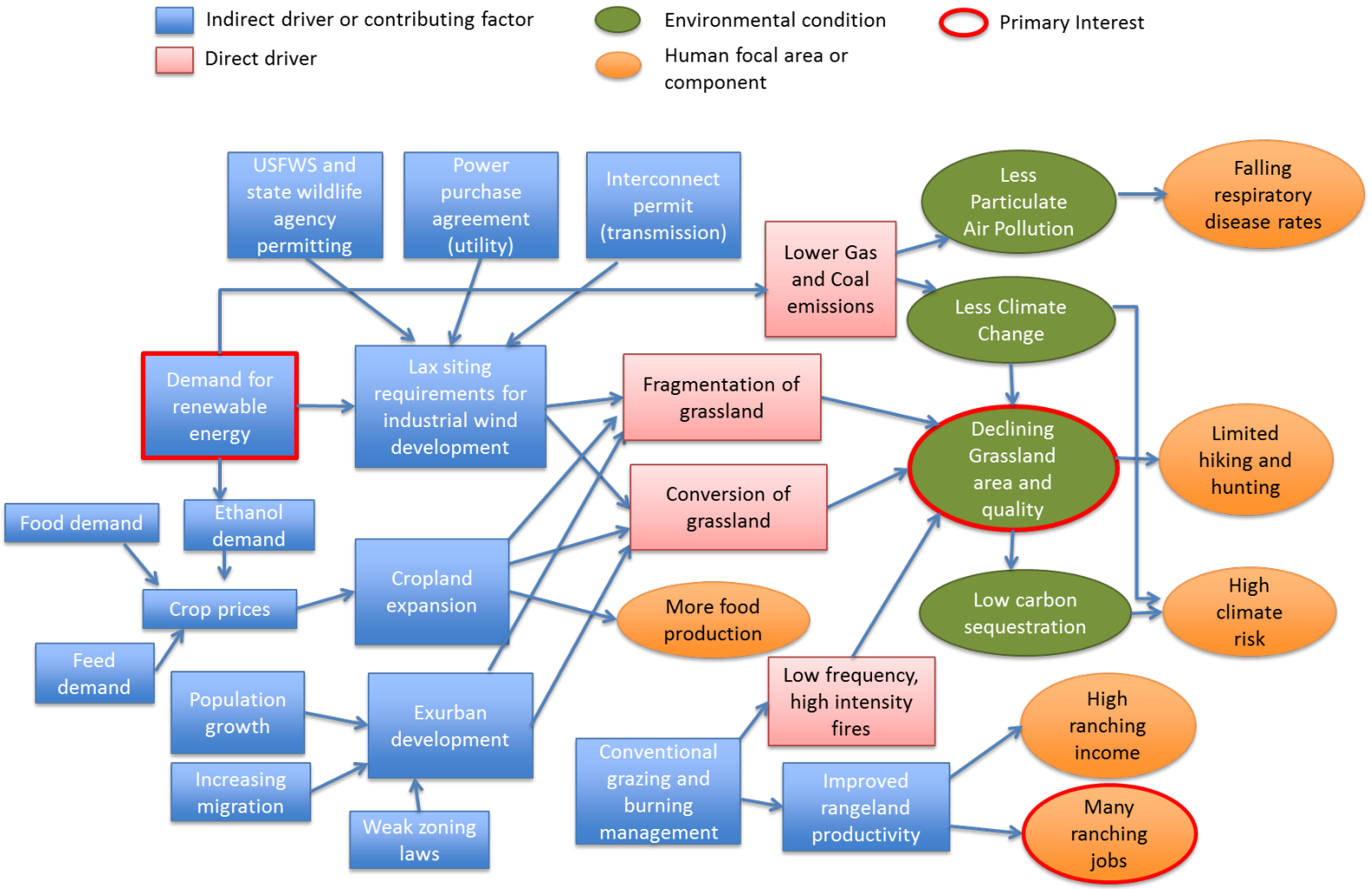
We provide several examples here where the relevant groups are identified in *italics*. In a river whole system, current water pollution may not affect all people in a watershed equally, but disproportionally impacts *downstream water users*. Land conversion can impact many groups of people. For example, in a developed country context, current land conversion for high end housing development may benefit *upper class residents* and create jobs for *construction workers*, but reduce public access to park land for *local residents*, and may especially block access for recreational or subsistence fishing by *low-income residents*. In a developing country context, illegal logging may be providing illicit income to *transient residents*, while lowering access to fuelwood and limiting income and resources for *local women*, and reducing access to medicinal plants for *local communities*. Being as specific as possible in this stage will help identify key stakeholder groups, and will help in the generation of strategies in the next step.

- **Represent impacts on people (i.e., human well-being interests) in terms of specific human well-being components.** It is impossible to draw defensible links between the environment and broad concepts of human well-being such as 'improved livelihoods' or 'healthy communities.' Refer instead to the Conservancy's suggested human well-being focal areas and their specific components to identify more specific human well-being interests. As much as possible, describe the primary interests of people in terms of specific components, and specify drivers and outcomes in as much detail as possible. For example, in Figure 5 specific human well-being components, e.g., income, insufficient governing rules [poor regulation], etc., are identified for an illustrative situation analysis for wind energy development.

- **Consider both positive and negative plausible linkages to primary interests.** Current negative connections between environmental conditions or drivers and human outcomes are critical to identify for later risk assessment and strategy generation where efforts can be made to avoid and mitigate risks.

Include all human well-being interests that are meaningfully linked to the environment, regardless of whether they were initially identified as a primary interest. For example, you may have identified intact forest ecosystems, spotted owls, reduced fire risk and improved water quality as primary interests. In diagramming the links, you realize that forest fire also creates smoke and increases people's risk of respiratory disease. This is a human well-being impact that is meaningfully linked to nature. Thus, respiratory health would be a new human well-being component to include that was not an initial primary interest.

Figure 5: Illustrative situation analysis for wind energy development in the Central Great Plains whole system



4. **Review and synthesize evidence to ensure all major links have been represented.**

Refine work based on evidence assessment. By reviewing existing evidence, the team may learn that a link is not supported, or that the connection is between more specific elements of the system. For example, an initial diagram may link urban trees with air quality. Assessing evidence may reveal that urban trees are only known to affect some components of air quality like particulate concentrations and ozone, and the diagram should be updated to reflect these specific links.

Consider diverse sources of evidence. At a minimum, these four sources of evidence should be explored:

1. Scientific literature, including peer reviewed journal articles as well as books and grey literature, as can be searched via online databases such as Google Scholar or other search engines that may be available through academic partners.
2. Internal staff expertise. Knowledgeable staff from within your organization should be consulted to identify evidence that they may be aware of, including unpublished reports or data. These staff should also help identify relevant external experts.
3. External expertise. It is always advisable to identify at least one external expert to ensure you have not missed any evidence, and it is essential when internal expertise is thin.
4. Local experts and stakeholders. Local knowledge includes traditional knowledge and the experience of those that work directly with natural resource management or extraction. As this knowledge may not yet be written down, interviews will often be required to obtain this information.

Tips for a speedy search for evidence. Searching scientific databases and consulting a handful of internal, external and local experts need not take an inordinate amount of time. Focusing only on relevant links and pathways can drastically reduce the time, effort, and quantity of evidence you will have to synthesize. Clarity on the question you are trying to answer will also speed your search for evidence. For each link in the situation analysis diagram, questions should be simple enough to answer with one or two sentences. For human well-being questions, identifying the relevant subpopulations (e.g., ranchers, indigenous communities, the urban poor) is good practice, and can speed your search for evidence.

5. **Validate the situation analysis diagram with key stakeholders and external experts.** Seek external review once the team is relatively confident that they have created a comprehensive view of the situation incorporating all primary interests and related drivers of change and outcomes. Both internal and external peer-review and stakeholder engagement should occur to ensure that the assumptions made, causal pathways identified, and

human well-being priorities identified are considered an acceptable representation of reality by the diverse set of stakeholders that are likely to be impacted by subsequent implementation. It can be helpful to consider the social safeguard questions before engaging with stakeholders.

- **Use culturally appropriate practices when soliciting input.** Some stakeholders may lack the time to review a comprehensive report, while others may lack the literacy skills to independently read these reports. When engaging stakeholders choose a location where they are comfortable and at ease, be respectful of their cultural traditions, and ask for feedback in their local language. Some historically marginalized groups, such as women or cultural minorities, may require extra considerations to ensure participation. For example, do not expect low-income residents to be able to attend or to fully speak up in a dominantly middle- or high-income resident city hall meeting, or women to provide contradictory views in the presence of male leaders in a strongly male-dominated culture.

6. **Synthesize evidence to identify strongest pathways of influence for each primary interest and narrow in on key challenges impacting the most primary interests.** Situation analysis diagrams often become large and messy. These are complex systems, after all! This is a critical step where the goal is to identify the strength of connections you have so far identified in your diagram, ensuring that the dominant drivers of the current condition are agreed upon and represented. It may be helpful to represent the strength of each pathway by changing the weight of arrows that connect them, using different colors or using some other means to emphasize the stronger pathways.

- **Synthesize available evidence to help ensure all major links in the system have been identified, and to indicate which are strongest.** Use any available information, from stakeholder knowledge to secondary data, peer reviewed publications, key informant interviews, power analysis, or other methods to understand the strength of each pathway of influence in the current situation. For example, fish populations may be influenced by climate conditions, habitat condition, predator abundance, artisanal fishing, commercial fishing and recreational fishing. These drivers are unlikely to be equally powerful in determining fish population size and stability, and evidence from local fishers, fishery stock assessments, landings data or other sources should help identify which driver or drivers are most important. The most important driver(s) will be captured as key challenges in the next step.

- **Consider applying tools that may be useful at this stage.** Tools such as "objective hierarchies" and "ends-means networks" can be used to evaluate and clarify relationships, synergies, and conflicts among primary interests. Social scientists, policy experts, and economists use additional tools, including "policy decision process flow charts," "commodity value chain

diagrams," "trade maps," and others. A number of analytical tools are available for free or at modest cost via the Internet.

- **Resist the urge to elevate challenges simply because they are familiar or already being addressed by ongoing projects.** Allow the evidence to guide challenge selection rather than preference or familiarity. Avoid focusing on challenges that are associated with many weak links in the system, as influencing these, even effectively, is unlikely to lead to systemic and create lasting change for conservation.

7. **Elevate and summarize the biggest conservation challenges and linked social or economic challenges to take forward.** Discuss within the conservation team, and externally with additional stakeholders as relevant, to narrow in on a few (we recommend 3-5) key challenges that will be taken forward into the next stage of planning. ***Key challenges are those that incorporate multiple conservation primary interests, their connected social or economic primary interests and their most powerful drivers of change in the current system***. The language used to describe key challenges may or may not include reference to specific primary interests that were identified to start the process. Key challenges are best stated as the connected set of current conditions that create current challenges for a majority of primary interests. Not all primary interests will be captured in key challenges. The situation analysis is a focusing exercise that allows the team to take forward the most critical challenges in the system, not all of them. At this point, *do not* eliminate significant challenges for which no strategies are apparent, as strategy development occurs in a subsequent step.

   There may be social or economic primary interests in the system that are not strongly connected to conservation primary interests. These should not be elevated as key conservation challenges, as they are not defensibly linked to conservation issues.

8. **Identify key additional partners.** Key challenges chosen to take forward may include strong links that lie outside the expertise of the planning team or existing partners. Evaluate whether the conservation team requires additional expertise or partners. Consider filling gaps through consultants, partnering or other collaborations.

Examples of Primary Interests	
• Endemic species nearing extinction • Declining wetland connectivity • Polluted drinking water supply • Corruption • Disconnected floodplains • Unsustainable corporate supply chains • Gender imbalance in education • Lack of representation in decision processes • Combined sewer overflow common • Insecure rights to land and natural resources • Increasing Type II diabetes • Crop nutrient retention threatening nutrition • High crime	• Air pollution in minority neighborhoods • Deforestation • Energy insecurity • Aquifer drawdown • High infrastructure damage from storms • Diminished local seafood for consumption • Illegal logging • Frequent large fires threaten homes • Declining population of species of concern • Disconnected habitats limit climate adaptation • Limited recreational hiking opportunities

Hypothetical Examples of Key Challenges	
• Fossil fuel-based energy development in China contributes significantly to CO2 emissions, driving climate change that threatens biodiversity globally, and driving air pollution in mega-cities, significantly elevating respiratory disease. • Poor management and globalization of Southwest Pacific fisheries endangers critical fish populations and lowers access to local food supply and income for local communities. • Limited supply chain control by large food companies hinders corporate sustainability and promotes deforestation and unsustainable agriculture practices that threaten the majority of terrestrial tropical species in decline.	• Poor access to sanitation in India contaminates rivers, driving threatened endemic species declines, contaminating drinking water supplies, and driving high child malnutrition rates. • Lax building codes in Washington DC promote high impervious surface area, high and contaminated stormwater runoff that contributes to combined sewer overflow and pollution of the Potomac River, damaging freshwater habitat and restricting recreational swimming and fishing use of the river. • Limited regulation on siting of renewable energy infrastructure in Eastern Africa drives habitat conversion in critical areas and takes key agricultural lands out of production, reducing local access to food and employment.

Minimum standard questions.

1. Do the planning team, partners, key stakeholders and relevant experts agree that the situation analysis diagram is a reasonable reflection of the current conditions and provides a common understanding?
2. Have the following vague terms been replaced with specific conservation primary interests or components of human well-being: health, community

well-being, human well-being, resilient communities, livelihoods, biodiversity, environmental health, thriving communities, social benefits, economic benefits, etc.?

3. If you have any human well-being endpoints that do not specify a relevant group, did you consider whether all people are equally affected?
4. Do at least some linkages in the situation analysis diagram reflect unexpected or newly identified connections in the system? (Even in systems we know well, it's very unlikely that we know everything important that's going on. If you learned about no new links from this process, your situation analysis was likely not broad enough and should be revisited).
5. Does evidence confirm that selected key challenges relate to strong linkages in the system? Don't throw out new linkages just because there isn't a strong evidence base – flag this for further exploration and evidence collection.
6. Does the diagram show how key challenges are connected both to nature and to some specific components of human well-being? (Even if human well-being is not a primary interest, it is highly unlikely that conservation primary interests are in no way connected to people. Revisit the diagram with additional experts if needed to ensure plausible pathways between nature and people have been fully explored).

FAQ

Q: *Should a situation analysis always have some links to people in it?*
A: Yes. There are literally no systems on earth where we may work towards our mission that are not impacted by people, and very few where people are not impacted in any way by the state of the environment. However, it is also true that there will seldom be connections within a system between nature and *all* components of human well-being. Care should be given to be clear about exactly how people and nature are connected both positively and negatively.

Q: *When should partners and stakeholders be included in developing the situation analysis?*
A: Collaborative development of the situation analysis with partners and stakeholders is encouraged if: 1) it has a clear strategic purpose, 2) they will be needed to implement the project, 3) it provides knowledge of the situation and landscape that could not otherwise be achieved, and/or 4) if certain vulnerable populations stand to be impacted, such as indigenous peoples and local place-based communities. Including more organizations and people absent a clear strategic purpose can be time-consuming and unproductive, as can including them without a clear objective and plan for their engagement. Partners and stakeholders should be included if, at a minimum:

- Time and resources can be provided for meaningful engagement.
- Joint planning and action is a clear priority for all parties
- Achieving outcomes depends on working closely with those partners and stakeholders

AND at least one of the following is true:

- You are jointly delivering results for an identified outcome

- Organizational budget decisions will impact partners or vice versa
- You are jointly fundraising
- You have MOUs, Teaming agreements and/or joint work plans in place
- There is a risk of negative impact to vulnerable stakeholders

3. Draft Minimum Goal Statement

Purpose:

1. Define what constitutes the lowest acceptable threshold for success, for nature and connected outcomes for human well-being.
2. Provide direction as to the magnitude of change needed, against which strategies can be compared.

Products:

1. A minimum goal statement that is specific, measurable, and time bound.
2. Description of strength of available evidence for the minimum goal statement.

Draft Minimum Goal Statement Overview

1. Review evidence to determine any socially or scientifically identified thresholds for improving identified challenges
2. Define acceptable threshold of change for each challenge that relevant stakeholders agree would constitute success
3. Describe evidence for the minimum goal statement

An important note about terminology: The terminology of CbD 2.0 that links actions and intended results (i.e., strategies to outcomes) is consistent with Open Standards goals and objectives guidance while also serving the Conservancy's organizational needs. The minimum goal statement generated during this component of CbD 2.0 will later be finalized into an outcome statement. Please see Appendix I for a crosswalk of commonly used terms to describe actions and intended results, including the terms used by the Conservancy in CbD 2.0.

Process and Best Practices

1. **Review evidence to determine any socially or scientifically identified thresholds for improving identified challenges.** The point of this step is to reach agreement on what a sufficient amount of change is in the key challenge(s) that constitutes a contribution to systemic change. This is different than identifying the final goal of the program (this happens later).

The idea here is to set a minimum bar that will be used to screen strategies, ensuring that any that go forward will be sufficiently impactful.

An alternative approach that chooses the most impactful strategy considered may fail to choose strategies that contribute to systemic change. For example, a key challenge may be that water pollution by pesticides is causing declines in endangered amphibian populations and driving high drinking water treatment costs. Previous research may have identified a pesticide contamination threshold below which the target amphibian species are no longer affected (say that threshold is 25 ppt of pesticides). Separately, water treatment costs usually follow a step function, where treatment costs do not decline linearly with contaminant concentrations, but rather are dramatically reduced below a concentration threshold (say the treatment cost threshold is 50 ppt). A minimum goal statement for this key challenge could be to reduce pesticide concentrations to 25ppt or below in key amphibian breeding areas and to 50ppt at drinking water withdrawal points. This minimum goal statement indicates that strategies that do not lower pesticide concentrations to at least these levels in these locations will not create sustainable systemic changes in the key challenge. Strategy mapping may reveal that some strategies will reduce pesticide concentrations even further, information that will inform the creation of the final objective statement in later steps. But any strategy that is not projected to at least achieve the minimum goal(s) will be deemed insufficient.

Evidence to inform the creation of minimum goal statements may be found in water quality standards specified by laws or identified by task forces, global or national goals for climate mitigation or human development goals, habitat conservation plans for endangered species, no net loss goals for mitigating development, sector-specific documents for economic or job growth, etc.

2. **Define acceptable threshold of change for each problem that all relevant stakeholders agree would constitute success.** When evidence is available, it should be used to guide the specification of minimum goal statements. There will be cases where no existing evidence can be found to support a specific, time bound, measurable minimum goal statement. In these cases, transparent and inclusive discussion should be used to reach agreement among key stakeholders on what amount of change would be seen by the group as a contribution to systemic change.

- **There must be a goal associated with one or more of the key conservation challenges in the situation analysis** (otherwise this is not a conservation project).

- **Consider the temporal scale of the project when setting goals.** For example, how long will it take to achieve systemic change that results in enduring improved conservation primary interest status and human well-being? It is possible that the minimum goal will be a 'means' statement aimed at a policy or practice change (i.e., water fund) that is achievable in 10

years. And that the health of the condition of the conservation primary interest (i.e., water quality) will be improved after policy/practice implementation (i.e., beyond 10 years). An understanding of what the ultimate goal or outcome the team is striving for might be useful, but then ask the team how much progress might be achieveable within the planning timeframe.

- **Minimum goals should be set for specific conservation outcomes,** not just conservation activities, but note the statement above about the temporal scale of projects aimed at achieving systemic change, and that in some cases the conservation outcome statement will be stated as a policy outcome. Teams also find it useful to have intermediate results or activity measures to be able to adapt and refine the project over time.

- **Minimum goals for people should be specific and connected to conservation.** Minimum goals related to people should specify which people (relevant groups, described above) and relate to key conservation challenges, not unassociated components of human well-being. For example, a stakeholder group may wish to cut employment in half in the focal system. If employment cannot be connected to any of the key challenges, then minimum goal statements should not include goals for employment.

- **Don't waste effort getting consensus on a perfect goal.** The purpose of planning is to come up with successful strategies. Minimum goals need to point planners in the right direction, and to identify a minimum threshold for success, but do not need to be perfect, especially at this step in the process.

- **The goal may reflect contributions from multiple actors** (i.e. it doesn't have to be entirely attributable to your organization). The point is to create a goal based on what is needed, rather than what you think is possible at this point in the planning process.

3. **Describe evidence for the goal statement**. The broader review of the evidence can now be narrowed to a synthesis that supports the stated goal.

Minimum Standard Questions

1. Does the minimum goal describe a vision for conservation success consistent with the long term viability of conservation targets and systemic improvement in connected elements of human well-being? Note that the minimum goal may be an important intermediate result that will enable the team to achieve the outcomes of the project over a time period that extends beyond the plan.
2. Do key stakeholders agree that the minimum goal is sufficient and representative of their interests at the intersection of conservation?

FAQs

Q: *How can we know what our organization should be held accountable for if the goal can include outcomes from the collective actions of partners?*
A: In step eight, the theory of change will explicitly identify who is responsible for completing the tasks required to achieve the outcome. You might also want to consider employing an approach called Outcome Mapping, which is compatible with the Theory of Change approach, and helps measure contributions to complex change processes. See the OM Practitioner Manual for guidance, and learn more about the approach at the OM website.

Q: *What if anticipated strategies can achieve more than the minimum threshold - should the goal reflect the maximum outcomes we hope to achieve?*
A: No. The point here is not to set the final goal you think you can achieve through a selected set of strategies, but to put a lower bound on how big of a change would be enough to warrant pursuing a strategy. This gives a reference point to compare strategies against, and ensures that any strategy (or set of strategies) selected has the potential to contribute to systemic change.

Q: *What are some examples of how to identify a minimum threshold?*
A: For some challenges we face, there are scientifically defensible ways to identify how much improvement is 'enough', or sufficient to meet a desirable state. For example, consider a key challenge where a fish species of high conservation value is in decline, placing that species at risk of extinction and limiting local participation in the fishery, reducing employment and ruling out that ability to choose a fishing way of life. Ecological research may have identified a value of lambda (or some other population viability measure) that reflects a viable population trajectory. This value could be used as the minimum goal for the conservation outcome. Separately, social research or stakeholder discussions may have identified how large fisheries landings need to be to support local community engagement in the fishery at a level they feel fosters sufficient employment and allows all those who chose a fishing way of life to be engaged in the fishery. This level of landings could be used as the minimum goal for the linked social outcome associated with the key challenge.

4. Share Advances in Knowledge through Relevant Pathways.

Purpose of this step

1. Contribute to the evidence base
2. Share what you have learned with relevant audiences so that they can benefit from your knowledge and experience

Products from this step

1. Documents such as reports, white papers and lessons learned
2. Your work-products, e.g., situation analysis diagram
3. Learning opportunities, e.g., webinars or presentations

Share Advances in Knowledge through Relevant Pathways Overview

1. Identify and consolidate what you have learned
2. Specify audiences for products and knowledge
3. Document what you have learned in a meaningful way
4. Disseminate what you have learned through appropriate channels

Process and Best Practices

1. **Identify and consolidate what you have learned.** Discuss within your team, and with key stakeholders as appropriate, the key lessons that you have learned in the process of identifying challenges and goals. Think about what kinds of evidence and knowledge will benefit the advancement of understanding and the work of others. Did your situation analysis reveal any surprises that might apply in other, similar situations? Did you create products during the course of your work, whether they were tools that you used to create analyses or the results of your analysis that might be useful to others? Did you conduct syntheses or collect new information that advance academic science?

2. **Specify audiences for knowledge products**. Different audiences need different kinds of information. Decision-makers might need evidence that natural infrastructure is a cost-effective response to the threat of floods and storms, whereas practitioners will need insight on how to effectively include decision-makers in the situation analysis.

3. **Document what you have learned**. Now that you have identified your key new evidence and lessons and the audience for that knowledge, it is time to document it. This may be in the form of a paper or report, a presentation, a webinar, a video, or a training. Different audiences look for the information they need in different formats. Scientists may opt for peer-reviewed papers; project managers may seek guidance from online resources or from workshops; decision-makers may require policy briefs. Consider your

audience as you determine how to document what you have learned. Conservancy staff can access a tool for identifying needs by audience here.

4. **Disseminate what you have learned through appropriate channels**. Just as different audiences turn to different kinds of materials, they also look for that material in different places. Some may turn to peer-reviewed journals or websites, some to conferences, some to Communities of Practice or discussion forums such as the CCNet Listserve for example, where practitioners ask questions, share experiences and tell others about interesting opportunities relating to their application of the Open Standards for the Practice of Conservation, and topics related to the practice of conservation and sustainable development.

Ensure that you are focusing on the most meaningful new evidence and insights. It is impossible to document everything that a team, organization, or partnership will have learned during this work. Ask yourselves what new information will be most useful to the evidence base, and what new insights will best help other practitioners move similar strategies forward.

Not all knowledge can be documented. Conservation know-how often comes from personal exchanges or co-learning as it is sometimes called. These exchanges can provide the most accessible opportunity to share struggles, novel process solutions, approaches to sensitive issues with others who can learn from it. Look for opportunities such as workshops, learning exchanges and webinars to tell the parts of your story that can't be documented.

Document your Lessons Learned. When you have undertaken a significant new initiative, especially if it's in relatively uncharted territory, a "Lessons Learned" document can help others navigate similar terrain in the future. This can be a considerable undertaking, so it's important to dedicate appropriate staff resources to the project -- and to ensure that the project is worth the effort. Conservancy staff can find guidance on writing a "Lessons Learned" document on CONNECT, here. In the book "Learning to Fly - Practical knowledge management from leading and learning organizations," Chris Collison and Geoff Parcell set out ten key steps to facilitating a "lessons learned" review.

Minimum Standard Questions

1. Are knowledge products and planned dissemination pathways tailored to specific, target audiences?
2. Has the team reviewed intangible lessons and shared ideas for communicating these through peer-learning opportunities?
3. If major process-based or knowledge advances were made through the effort, has a Lessons Learned or Case Study document been considered?

FAQs

Q: *Doesn't it take too much time to document what we have learned?*
A: The imperative to increase the pace and scale of conservation, and to maximize the conservation return on scarce conservation funds, demands that we capture and disseminate conservation knowledge more effectively. Some of the challenges we face if we do not adequately capture what we learn include:

- Mistakes are repeated, learning is ad hoc and incremental, and conservation improves at a slow pace.
- We cannot adequately convey to supporters why they should invest in conservation projects.
- Managers and decision-makers may not have the right information to inform ongoing management actions, and program and project investments.
- Partners may be less inclined to work with us in the future if they do not receive information on the results of a project in which they invested time and energy

.

Q: *Isn't it enough to publish or post what we have learned? Won't people find what they need online?*
A: The vast amount of information available online means that it is often difficult and time-consuming to find the best information to meet a particular need. The adage "we don't know what we don't know" applies here, and human learning is fundamentally social. Through interaction with peers, practitioners are more quickly directed to the most relevant resources, learn how to apply the evidence in their own context, are introduced to new ideas and approaches, and are encouraged and empowered to find appropriate solutions to the specific challenges they face by building on the insights and experiences of others. Additionally, some communications may need to happen in person. Take into account groups that may have limited access to other means of communication or who are more comfortable communicating face-to-face.

Phase 2: Map Strategies and Places

Context:
Developing robust strategies is the heart of conservation planning. This involves the generation of creative and defensible strategies, assessing the likely impact of those strategies against conservation goals, selecting strategies to pursue, and capturing the rationale for a strategy in a theory of change. Because the benefits of conservation strategies depend upon where they are implemented, an important component of assessing the benefits of a strategy is to map it. Mapping strategies has the additional benefit of being useful for implementing selected strategies.

Phase 2 Steps:

5. Identify candidate strategies
6. Construct results chains
7. Strategy and opportunity mapping
8. Select strategy or strategies
9. Share advances in knowledge through relevant pathways

The purpose of making results chains and strategy maps is to understand the likely outcome of a strategy, its costs and risks, and probability of success, so that you can intelligently select among possible strategies. Although we list results chains in the step prior to strategy mapping, we note that these can be done in either order. Specifically, it may be useful to do a 'back of the envelope' mapping effort to assess the potential of a strategy as a filter before developing a full results chain for a strategy.

5. Identify Candidate Strategies

Purpose:
1. Articulate multiple potential strategies to meet your minimum goals, considering both known and novel strategies.

Products:
1. List of candidate strategies

Identify Candidate Strategies Overview

1. Consult evidence base and situation analyses to identify potential strategies
2. Individual planning team members brainstorm lists of strategies
3. Group discussion and external vetting refines list of candidate strategies
4. Filter out strategies that have fundamental flaws
5. Consider prioritizing strategies for further consideration

Process and Best Practices

1. **Consult evidence base and situation analyses to identify potential strategies.** Consult literature and knowledgeable experts about potential strategies. Use the causal links identified in the situation analysis to identify intervention points and opportunities to influence key actors.

Seek strategies that create systemic change. This requires identifying whose behavior you are trying to change, and identifying opportunities to motivate this change.

2. **Individual planning team members brainstorm lists of strategies.** Providing opportunities for individuals to produce ideas prior to group discussion tends to result in a broader and more creative set of ideas as fodder for discussion.

Consider doing nothing. The 'do nothing' option is important because it asks teams to evaluate what would happen without the action you're considering. This *business as usual* case is what helps build a counterfactual, allowing us to understand the benefit of any proposed strategy action. It forces us to ask a challenging but important question – what will happen in the future if we don't take action?

Consider different levels of investment in an action or strategy as another approach to helping develop options.

3. **Group discussion and external vetting expands and refines list of candidate strategies.**

Build *space for alternative and opposing views* into the process by inviting input from diverse voices, especially those outside the immediate field. This is likely to be particularly important when thinking about alternatives in complex systems, which will be true for most conservation projects. Having a diverse planning and project team will also help in developing options. Conservancy staff should consult the many tools and resources for creating

diverse teams that are available on the Diversity and Inclusion page on CONNECT, here. Audubon's "Tools of Engagement" Toolkit, which is available to the public, includes a module on "Diversity and the Conservation Movement."

- **Avoid anchoring**. Anchoring is the psychological tendency to fixate on the strategies initially identified or the strategies that are most familiar to participants. This requires fighting significant psychological bias, but simply being conscious of this potential bias can help mitigate it. Having said this, it remains an important input to know the range of solutions that have been tried, either by paying attention to literature or having diverse experiences in the room. Participation in Communities of Practice relevant to the candidate strategies can help with this too.

- **Combine sets of actions into distinct options**. Alternatives can include a mix of actions, for example with some being on-the-ground conservation activities and others being advocacy for policy changes.

- **It is fine for alternative options to be at different spatial scales**, for example building a fence to keep cattle out of a particular stream versus changing fertilizer application rules for an entire state.

4. **Filter out strategies that have fundamental flaws.** Eliminate those strategies that fundamentally cannot work, or where reputational risk or risk to vulnerable people is unacceptably high, as developing these strategies further would be a waste of time.

- **Ensure that strategies respect social safeguards.** Strategies should incorporate social safeguards to avoid, minimize, or mitigate, risks and harms to people resulting from our conservation work. The social safeguard questions should be reviewed and strategies that pose unacceptable risk should be filtered out. In addition, consult stakeholders to ensure accurate evaluation of reputational risks and risk to vulnerable people.

- **Don't over-filter**. The default assumption should be that the option is feasible unless there is evidence to the contrary. If assessment of feasibility is made a transparent and participatory process, it frequently turns out that what seems infeasible to one person is eminently possible to another. In one example, a senior staffer by chance walked into a planning meeting and asked why the team hadn't considered the relocation of a port development project as an option. The team replied that no one considered it feasible. Because of his connections with the government, the senior staffer suggested this might actually be feasible, which it eventually was.

5. **Consider prioritizing strategies for further consideration.** You may have identified strategies that should only be considered further if a more promising strategy fails to deliver. These strategies should be considered 'low priority,' and results chains and strategy mapping need not be

conducted on them at this time. The Guidance explicitly re-considers these strategies following a first round of Results Chains and Strategy Mapping.

Minimum Standard Questions

1. Did your process produce multiple strategies for further consideration?
2. Did your process generate at least one novel strategy for consideration?
3. Did you consider, at a high level, all major negative and positive impacts of candidate strategies on stakeholders and vulnerable people?

Example: Brainstorming and discussing options for conservation
Conservation management and restoration options were developed to meet the following two outcomes for Noosa Estuary, Australia. (This example was conducted before the minimum goal approach was introduced, so these target outcomes are more vague than those we would elevate through the CbD 2.0 process):

1. Increase fish abundance
2. Increase diversity of aquatic species

A group of experts (deliberately drawn from diverse professional background and current roles) were asked to think broadly and freely about restoration and management options, initially as individuals then as a group during a workshop. To limit the risk that experts would prematurely discard potential options because of perceived socio-political feasibility issues, the experts were explicitly instructed not to consider the socio-political feasibility or desirability of potential options. Instead, experts were asked only to consider technical feasibility when proposing options. A total of 14 options were developed (**Table 3**), and in some cases were accompanied by maps that illustrated the location of the proposed actions. These options span a diverse, and sometimes unorthodox, set of actions. Identification of the most promising options was accomplished through a formal assessment of the predicted consequence of each option for the two fundamental outcomes.

Table 3: Restoration and management options developed for Noosa Estuary

Option	Key actions
Restoration options	
Restoration of seagrass	• Restore seagrass habitat through improved control and redesign (e.g., swing moorings) of boat moorings
Oyster reef restoration	• Create oyster reefs initially in Weyba Creek and Lake Weyba
Living shorelines	• Replace hardened shoreline protection with structures that incorporate mangroves and oyster reefs • Improve biological connectivity and extent of habitat mosaic between Noosa and Tewantin
Provide habitat/hard substrate stepping stones	• Install sub-tidal reef structures in the main channel between Noosa and Tewantin • Improve biological connectivity through increased hard substrate and habitat mosaics
Prawn restocking	• Restocking of prawns into the lakes and river
Restoration of Kin Kin catchment	• Assess current inputs and status of catchment • Improve land management practices
Habitat provision for Raptors	• Improve habitat availability for iconic raptor species by supplemental feeding • Local education campaign and initiative
Management options	
North Shore management/vehicle closure	• Create a "Restoration Zone" to restrict access • Provide a buffer between recreational and commercial activities • Ensure that any conservation zone includes terrestrial dunes, beach and near-shore areas
Wake management "between the lakes"	• Manage boat speed and wake • Improve commercial boat design
Estuary zoning (emphasis on recreational fishing)	• Reduce the recreational catch • Increase catch and release programs including training / education • Provide support for improved fish habitat • Permitting
Cessation of commercial prawn trawling	• Closure of fishing areas particularly between the lakes • Buyback of fishing licenses • Modified fishing practices • Decreased or limited catch (size or timing)
Better management of commercial mullet fishery	• Limit catch on Noosa North Shore • Provide pathways to increase product value • Modify fishing practices – education
Transform gill-net fishery to higher value fishery	• Transform gill net industry to high value line caught industry
Stormwater management	• Improve the quality of water runoff flowing into the estuary through wetlands and other design features such as flow restrictors and pollution traps

FAQs

Q. *How do I identify potential negative impacts of strategies to stakeholders and vulnerable peoples (especially those not represented on the project team)?*

A. First, identify different stakeholder and sub-stakeholder groups. Next, determine how they use the natural resources for their subsistence, income, cultural activities, etc. Then, determine how the conservation initiative will

change natural resources for all groups and how this may impact vulnerable groups or may favor already powerful groups exacerbating power imbalances. Finally, engage representatives from stakeholder groups to aid in identifying consequences that are not immediately apparent.

Q. *What do I do if a strategy is determined to have a potential negative impact on a stakeholder group or vulnerable peoples?*

A. Do not engage in strategies that you know will negatively impact vulnerable peoples. Such strategies should either be adjusted so that negative impact is no longer likely, or dropped if such adjustments cannot be made. If strategies are expected to have a negative impact on some target stakeholders that are not considered vulnerable, determine whether changes can be made to eliminate or minimize these impacts and if the conservation strategy is still justified given the negative impacts to these stakeholders. Exploration of these additional options may be best done in the results chain step where you can get more specific about the logical pathways through which negative impacts may occur, and explore additional strategy elements that may reduce such risks.

6. Construct Results Chains

Purpose:

1. Describe how a strategy will lead to conservation success.
2. Identify and articulate a team's assumptions about how strategies will change key drivers, leading to improvement in conservation challenges and linked human well-being challenges.
3. Evaluate the strength of evidence for a strategy's assumptions.
4. Evaluate which strategies to make strategy maps for.

Products:

1. Results chains describing the cause-and-effect logic of how strategies will result in desired changes for nature and people.
2. Bibliography and documentation of evidence assessment process

Construct Results Chains Overview

1. Construct an initial results chain for each strategy based on your conceptual model or situation analysis diagram
2. Complete the links in the results chain
3. Assess what evidence exists for assumptions at each link in the results chain
4. Verify that your results chain meets criteria of a good results chain
5. Document your work
6. Solicit review by experts/stakeholders for selected results chains

Process and Best Practices:

1. **Construct an initial results chain for each strategy based on your conceptual model or situation analysis diagram.** A results chain is a diagram that depicts the assumed causal linkage between an intervention and desired impacts through a series of expected intermediate results (Foundations of Success 2009, Margulis et al. 2013). We recommend starting results chains (on the left) with a statement of the undesirable state you wish to alter, and ending them (on the right) with a statement of the desirable state you wish to achieve. The description of the undesirable state can be a statement of a key challenge identified in previous steps. The results chain should set you up to assess whether a given strategy will likely achieve the minimum goal, so elements on the right leading to the desired state should reflect elements of your minimum goal statement. Including language defining the undesirable and desirable states also helps ensure results chains represent causal logic from conservation action all the way to outcome, rather than stopping short at implementation of actions or intermediate outcomes.

   The following example shows how the links in a situation analysis can be modified and expanded upon to show the change expected by the implementation of a strategy. The assistance of an unbiased and experienced facilitator or coach can be very valuable for constructing results chains.

Example. Converting situation analysis to a results chain. First identify the relevant components of the full situation analysis associated with a key challenge. This is shown in **Figure 6** where the relevant components of the wind energy situation analysis are shown in color and the remainder is grayed out. This helps focus on expected changes from implementing a strategy while clarifying additional drivers that may influence effectiveness of the strategy, or non-target changes that may present opportunities or risks. Then identify how the conservation strategy (action) will affect conservation and human well-being elements. This is shown in **Figure 7** where red text emphasizes expected changes in the system that may result from the conservation strategy. Each link reflected in the results chain should articulate a testable hypothesis about cause and effect. Results chains should depict changes in primary interests (in this case, grassland extent, connectivity and quality) as well as other expected changes (in *italics*; e.g. increased recreational opportunities, decreased respiratory disease).

Figure 6: Relevant aspects (shown in color) of situation analysis for wind energy development in the Central Great Plains whole system

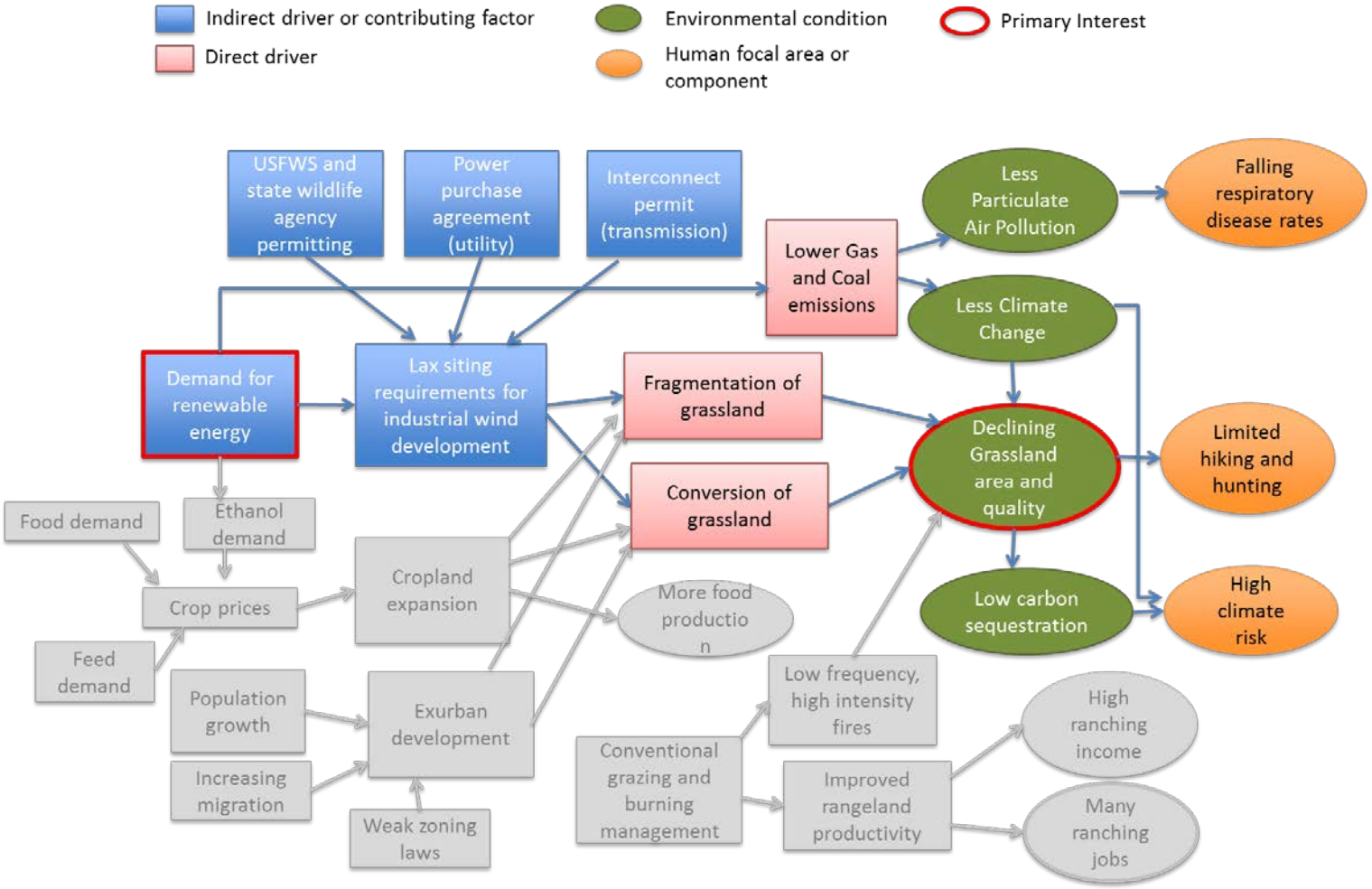
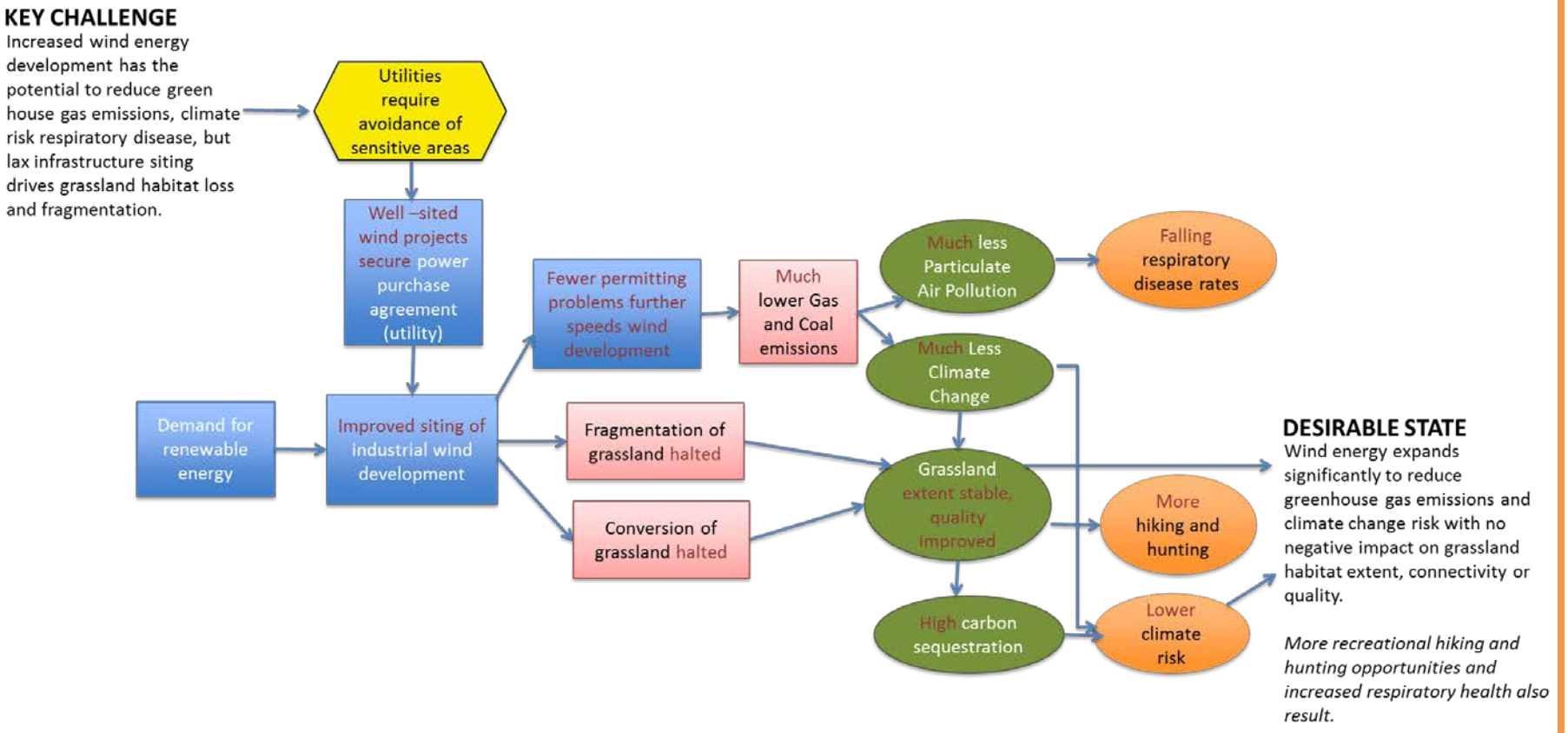
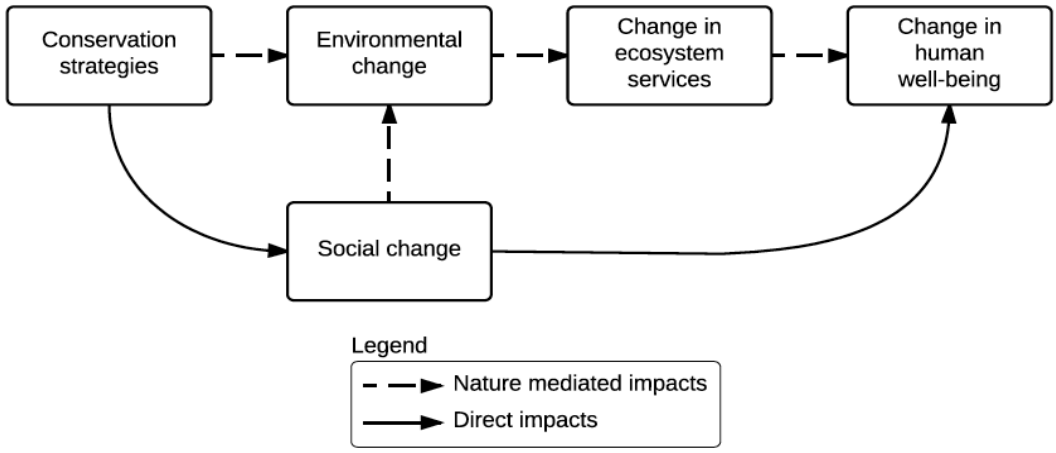


Figure 7: Results chain for wind energy development in the Central Great Plains whole system



Include both direct and indirect pathways from possible strategies to changes in conservation targets, and human well-being interests. **Direct impacts** on human well-being result from social changes caused directly by the conservation strategy (solid line in Figure 8). For example, if a protected area hires park guards, this has the direct effect of increasing jobs. No environmental change is required to create the jobs. *Nature-mediated impacts* result from a loss or gain in human well-being as a result of changes in the environment caused by a conservation program (dotted line in Figure 8). For example, improvement in household income from higher fish landings outside of a marine protected area is a nature-mediated impact, because the conservation strategy first has to impact the environment before the social change occurs. Conservation practitioners may be least familiar with the plausible direct impacts of strategies on human well-being, so additional attention should be given to ensuring their consideration. Consultation with external experts may be helpful.

Figure 8: Direct and nature-mediated pathways between conservation and human well-being in simplified results chain



Ensure that all connections and intermediate results from doing a strategy are directly captured in the results chain. Some strategies are done explicitly to build trust, establish your 'social license' to operate, gain access to a key stakeholder, or to achieve similar preliminary results that must occur before other strategies can move forward towards conservation outcomes. Since they lead to important intermediate results, they should be explicitly included in the results chain. Results chains from several strategies can be linked to show the interconnections and timing of strategies.

Results chains should capture both focal and additional outcomes from a proposed strategy. Most conservation strategies will cause many changes to a socio-ecological system, including those the strategy aims to change (focal) and many others (additional). Additional outcomes may be other environmental changes or social or economic changes, and they may be

either positive or negative. Full consideration of these additional changes should be made, and their potential reflected in the results chain. Additional changes represent opportunities and risks. When they reveal opportunities, managers can decide to elevate specific outcome statements associated with them, or identify them as plausible co-benefits. When risks are revealed, see the next point.

- **Any risks to vulnerable people identified through a results chain should be addressed**. Many potential risks can be eliminated or reduced by adding or altering a strategy element. For example, you may be considering 'hiring park guards' to increase protection of an existing national park that houses endangered species. Through creation of a results chain, the team realizes that hiring guards from only one local community presents the risk of creating inequality and conflict among communities. You could avoid this problem by changing the strategy to 'hiring park guards with equal representation from local communities', which mitigates the risk of creating inequality. In cases where risks to vulnerable people cannot be mitigated, the strategy should not be pursued. When a risk emerges that is potential, but acceptable to stakeholders, it should become the focus of intensive monitoring and adaptive management.

- **Results chains should be composed of assumptions that can be tested.** Clearly state assumptions so that the strength of evidence for each of the assumptions and linkages between assumed intermediate outcomes in your results chains can be assessed. For example, ask "*What has to be true in order for the proposed relationship between node A and node B to exist?*" In the wind energy example, the first link assumes that if utilities require avoidance in sensitive areas, then they will only buy power from companies that have avoided sensitive areas.

- **Use a tool**. Miradi Adaptive Management software or Cmap can assist with results chain construction including converting situation analysis diagrams to results chains.

- **Use consistent symbology for elements of situation analysis diagrams and results chains.** The above figure shows one commonly used symbology consistent with Miradi and the Open Standards.

- **Focus on achievement of results/impact** rather than execution of activities (i.e. a results chain vs. an implementation plan). Working towards a desirable state as the endpoint of a results chain will help with this.

2. **Complete the links in the results chain.** Identify any additional intermediate steps that are necessary precursors to achieving outcomes. In contrast to conservation and human well-being outcomes, intermediate results tend to be nearer-term and are preconditions for achieving an outcome (e.g., building a consortium to support a policy change; proving that a new sustainable finance mechanism functions as intended; developing a plan for

major additions to a national park system). Explicitly including intermediate results is important because they are used for: identifying indicators for monitoring, defining go/no-go decision-points, discerning risks, enabling early detection of necessary strategy changes, and articulating important early results for donors.

Necessary and sufficient intermediate results. When considering intermediate results for inclusion, ask whether each is absolutely necessary and if together they are sufficient to achieve desired outcomes.

Work 'forwards' and 'backwards' to identify steps. Articulate logic by starting with strategies and working through if/then linkages to desired outcomes, and working backwards from outcomes to a strategy, asking what other results (i.e., intermediate results) must be achieved along the way in order reach a particular outcome.

Look for gaps in logic. Look for "leaps of faith" or "then a miracle happens" gaps in logic. These are places where there may be intermediate steps or additional assumptions that have not yet been articulated, or where the language in the nodes needs to be more specific. For example, imagine the wind energy example showed 'fewer permitting problems speeds wind development' directly linked to 'much less particulate air pollution'. Is the logic clear for why fast wind development will reduce air pollution? No, because the link to emissions, which are the source of the air pollution problem, has not been made. Specifying the connection removes the 'leap of faith' element and makes clear the expected set of changes.

Example: Improving an initial results chain with relatively vague human well-being outcomes. The first results chain below (**Figure 9**) for the Northern Rangelands Trust includes terms like 'increase economic benefit' and 'increase social benefit' to initially describe human well-being outcomes. To improve upon this, the results chain was expanded to clarify the links between strategies and human well-being components. **Figure 10** is a sample of one of the expanded results chains, focusing on the livestock grazing management strategy.

This example emphasizes why specification of outcomes, including unintended (or additional) outcomes is critical. Income improvement is a primary interest of local communities engaged in the grazing programs. Detailing of the results chain showed that improved rangeland productivity is expected to improve livestock quality, but discussion with local stakeholders revealed that rangeland benefits may only accrue to cattle, not sheep and goats because of grazing practices. In many of these communities, men herd and sell cattle and women care for and sell sheep, goats and their products. As income is not openly shared in some households, improving forage for cattle, but not sheep and goats could create greater income inequality among genders—a negative unintended outcome for a vulnerable group. Another strategy not shown here aims to increase livelihood and income options for women, and may offset this potential risk. Because this is a risk to a vulnerable group, it is being monitored closely

Figure 9: Northern Rangelands Trust vague results chain for human well-being

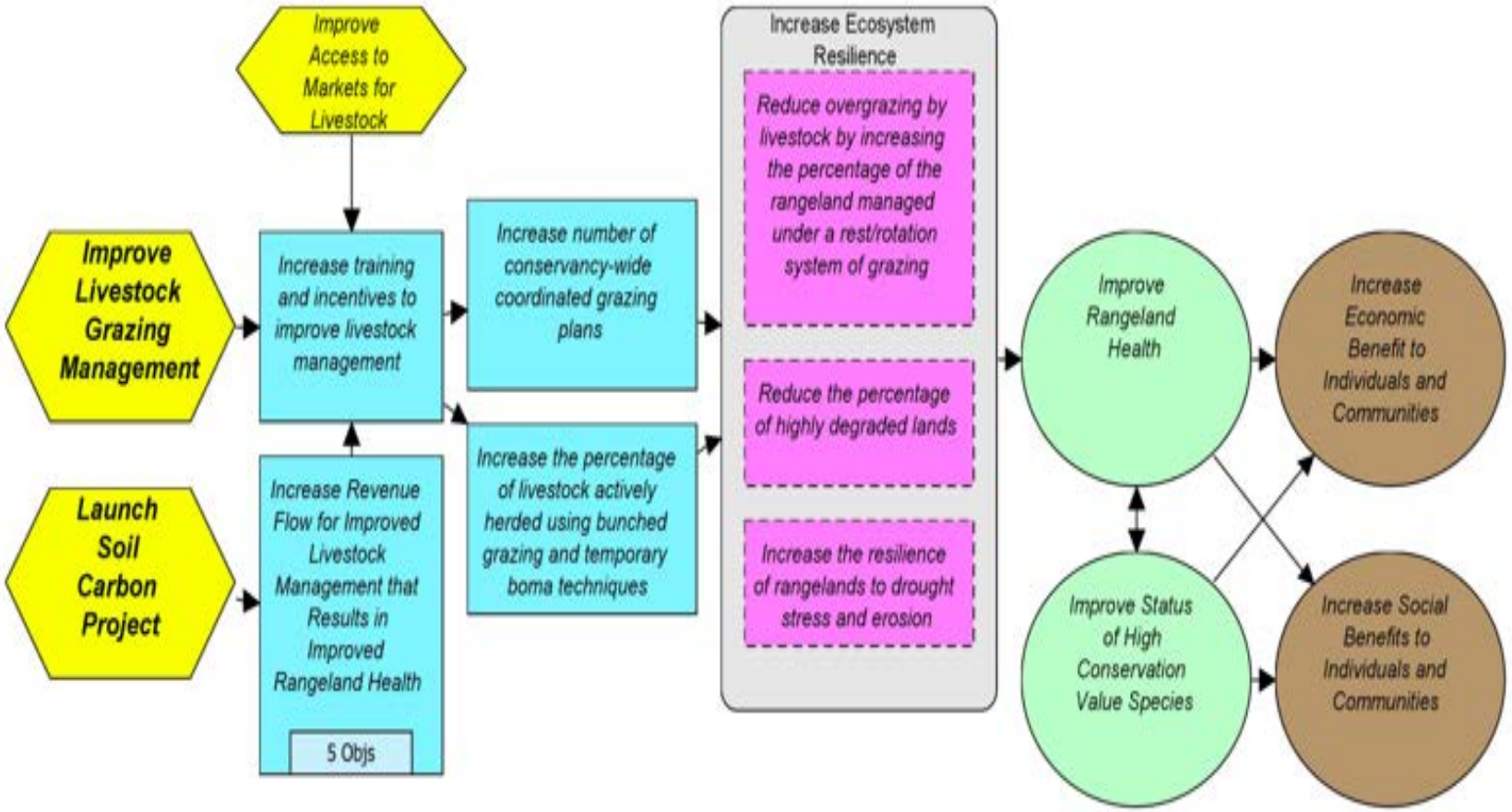
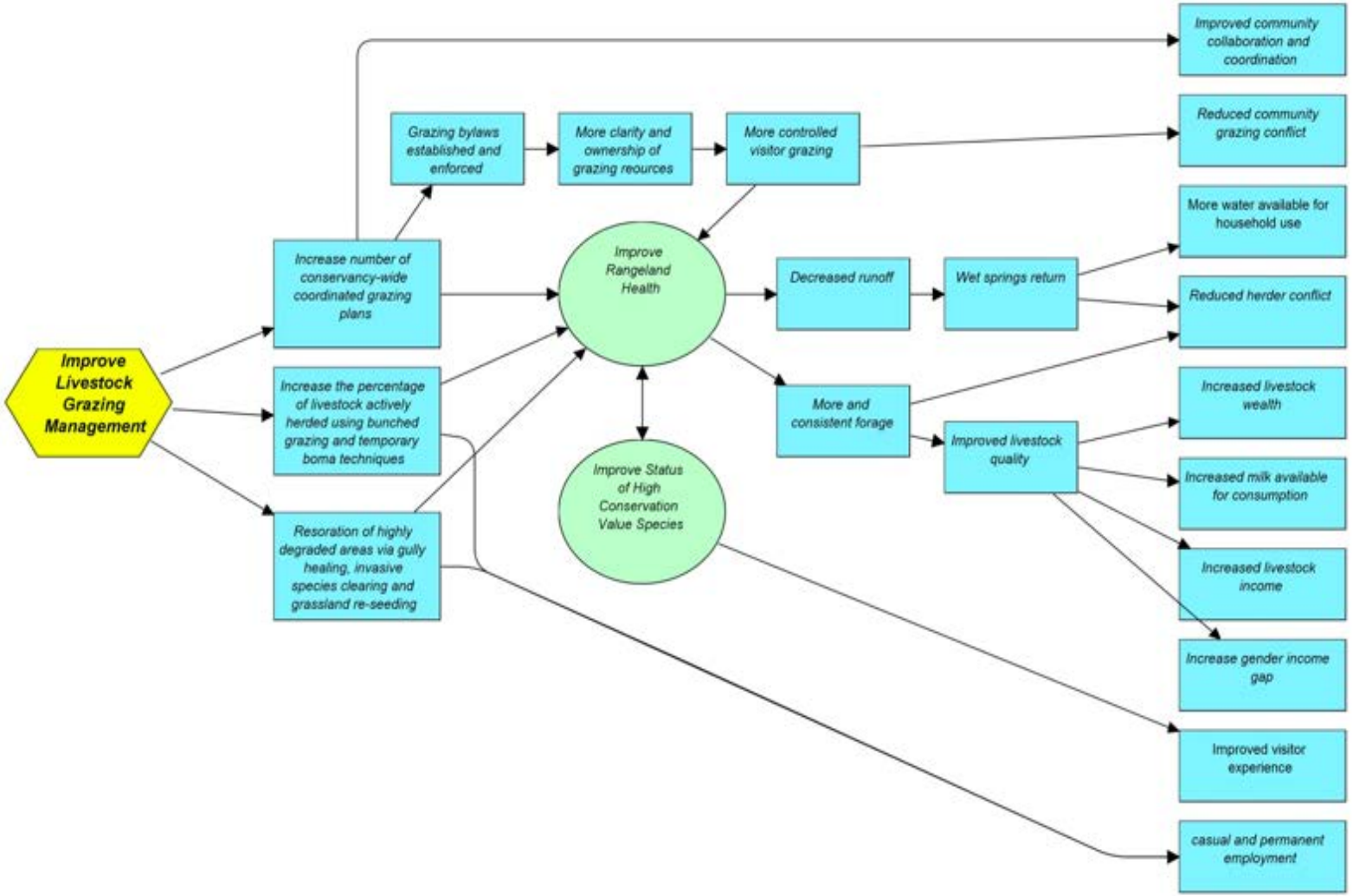
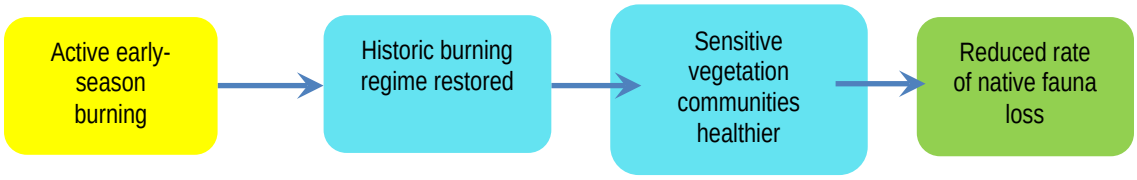


Figure 10: A sample of one of the expanded results chains for the Northern Rangelands Trust, focusing on the livestock grazing management strategy, with more explicit human well-being components.

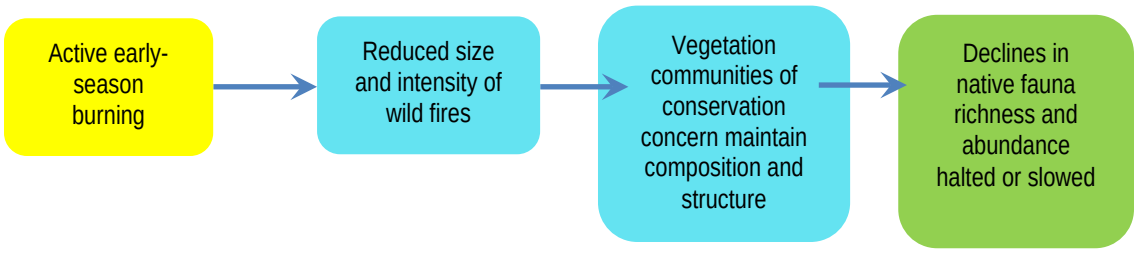


3. **Evaluate whether there is evidence for a strategy's assumptions.** Is there a quantitative or qualitative assessment that measures the specific assumption in the link? If yes, then there is evidence for this link. If no, there is not evidence for this link. The purpose of this step is to identify whether evidence exists for the actual assumption, not its potential. Evidence can come from quantitative meta-analysis, key informant interviews, traditional knowledge, or many other sources here as in other uses of evidence, but it must be used to assess the specific assumptions. For example, continue the wind results chain, and consider the first assumption that utility requirements for companies to avoid sensitive grassland areas lead to utilities purchasing power only from those companies that do so. Evidence for this assumption may come from utility power purchase records (quantitative), or from interviews with managers from wind power producers (may be quantitative or qualitative). If in manager interviews, managers say they think utilities will purchase more wind power from them in the future after they change practices because they have a good relationship with the utilities, this does not constitute evidence. If, however, managers say they have had higher sales to the utilities after improving siting practices, that qualitative information constitutes evidence for the assumption because it reflects a direct observation that the assumption is true.

   In the process of evaluating evidence, teams will likely find they need to hone the language in the results chain, to be more specific about assumptions and causal mechanisms of change that are implicit in the diagram. For example, consider the following example from northern Australia:



   Often, results chains are worded ambiguously. Thus, a first step in assessing the evidence for a results chain is to be re-word the results chain so that it is clear what evidence is required. The revised results chain below is more specific.



   Note that even a specific results chain will require definition of terms. In this example, it must be clear to readers what is meant by 'early season burning',

'vegetation communities of conservation concern' and 'native fauna'. Evidence searching will be easiest when results chains are highly specified.

- **Fully consider potential sources of evidence**. These may include peer reviewed literature, grey literature, the experience of practitioners, and traditional knowledge.

- **Evidence must meet minimum standards to be considered evidence.** To be considered evidence, the assumption/hypothesized relationship that you are seeking evidence for must have been *measured or observed*. Opinions that something *should* work, even when contained in a peer reviewed paper, do not count. For example, if sustainability standards are expected to change corporate behavior, then examples where sustainability standards were followed by widespread adoption across the industry would be required to constitute evidence. All knowledge sources have the potential to hold evidence for our assumptions - not just peer reviewed literature. The practitioner's job is to discern whether a quantitative or qualitative assessment from any source deals with an observation of the assumption being true or false (evidence) or states its potential (not evidence).

- **Not all evidence is created equal.** Evidence is strong when we have confidence that additional data will not reverse our conclusions. This is generally the case where there are consistent findings across multiple studies or where the magnitude of effects are very large. Studies where rigorous experimental designs are used (including before-comparisons as well as an appropriate control group) also generate confidence. Although there is not yet consensus among conservation practitioners around a particular formula for evidence grading at this time, expert judgment should consider these factors when assessing strength of evidence.

  For example, imagine a grazing strategy that aims to improve rangeland productivity and wildlife populations by incentivizing planned grazing with access to markets. An assumption in the results chain is that if livestock managers follow grazing plans, they will receive better market access. A search of the literature shows no studies of whether grazing compliance in similar programs leads to improved market access, so the team quickly conducts some key informant interviews with livestock managers in an existing, similar program. Some managers report receiving better market access after implementing grazing plans, and some report not receiving better access. You have evidence for this link - multiple people have observed whether or not the assumption is true. But, the evidence is weak because some supports the assumption while some refutes it.

- **Consider enabling conditions.** When we find evidence supporting a causal relationship, we have learned that 'it worked somewhere.' However, this does not necessarily mean that it will work in your planning context. Explicitly consider and document what enabling conditions are necessary for a causal relationship to hold. For example, community enforcement of

marine protected areas may reduce illegal fishing only if financial support for boat fuel is provided. It will often be the case that there is no direct evidence as to what are the enabling conditions. However, it is still essential to make an assessment of enabling conditions, as absence of enabling conditions is a major reason that projects fail. Ask yourself 'why' a causal relationship holds. Explicitly articulating this hypothesized mechanism can help you identify the conditions under which this mechanism holds.

The Learning Network for Capacity Development provides useful guidance on how to approach these questions.

Determine the *sufficiency* of the evidence. The sufficiency of evidence for a strategy depends on the level of risk that the organization/funders are willing to accept. For example, some uncertainty about a causal relationship may be acceptable to managers, because the cost of being wrong is perceived to be low. In contrast, uncertainty about other causal links may be unacceptable because a high degree of confidence is needed in order to manage reputational, legal, or financial risk, or risk to vulnerable people, or to persuade key stakeholders to change their policy or practice. Evaluating sufficiency requires both an understanding of the evidence and of your organization's appetite for risk in the specific context of your strategy.

If evidence is determined to be "insufficient" it can point to priorities for research or monitoring. A weak link in the results chain does not necessarily mean the strategy should not be advanced. Rather, it may illuminate where additional research or monitoring focus is needed. In many cases, such monitoring to build the evidence base will be essential to gain support for full implementation of a strategy and thus will be a key component of the strategy that should explicitly be included in the results chain.

4. **Verify that your results chain meets criteria of a good results chain.** A good results chain should meet the following criteria:
   - Starts with a key challenge and ends in a desirable state.
   - Articulates specific intended outcomes for conservation targets and human well-being interests.
   - Captures major additional outcomes (benefits and risks).
   - Contains links are based on clear causal connections.
   - Is clear about what is changing compared to current conditions as a result of the conservation action.
   - Contains sufficient intermediate results to construct logical connections toward the desired outcome, such that someone not familiar with the project could follow the logic.

Consider replication as a part of the strategy. If there is an expectation that others will replicate or otherwise leverage your work, then this should explicitly be included in the results chain.

5. **Document your work.** You can use software such as Miradi, Visio, Compendium, or Cmap to help you capture your results chains digitally.

Write a narrative summary of each results chain. Describe the chain in a few paragraphs, summarizing the logic of your assumptions. This text will help others who did not participate in the discussion to understand your results chain, and it will also serve the purpose of formally documenting group discussions and decisions.

Consider alternative formats, tailored to your audience. Depending on your audience, simplified results chains or other drawings that illustrate cause and effect should be considered. For some audiences, depicting strength of evidence graphically (e.g., using color coded arrows that indicate sufficiency of the evidence supporting the assumptions implicit in the arrow) will be a desirable product (e.g., to help accentuate to managers the overall risk associated with a given strategy and to identify the links within a strategy that most warrant monitoring investment.) For instance, many Conservancy staff and partners who work with Indigenous Peoples have devised alternative approaches such as Life Planning (in the Amazon), Participatory Mapping (in Melanesia), and Healthy Country Planning (in Australia), using maps and stories instead of results chains.

Create bibliography and summary of assessed evidence (including documentation of local knowledge or expert opinion).

6. **Seek peer review of the results chains.** Peer review can help ensure that the subsequent efforts in mapping strategies are based on robust understanding of the cause and effect relationships that we assume can lead to the desired outcome. Peer review also improves your ability to articulate your assumptions and logic behind the strategy.

Minimum Standard Questions

1. Do your results chains start with a key challenge and end with a desirable state?
2. Are your intermediate results necessary and sufficient to achieve your desired outcomes?
3. Does your results chain show the intended positive outcomes for conservation and any intended, linked positive outcomes for human well-being from the proposed conservation action?
4. Did you explicitly consider additional (unintentional) outcomes, including both positive and negative outcomes from the strategies considered?
5. Do all links in your chains reflect no more than one testable assumption (i.e. there are not "leaps of faith" or "then a miracle happens" gaps in logic)?
6. Have you evaluated and recorded the strength of evidence for each of your assumptions and linkages?

7. If your results chain outcomes are quantified, will they be sufficient to determine whether the strategy meets the minimum goal(s)?

FAQs

Q: *What is the difference between a conceptual model or situation analysis diagram and a results chain?*

A: The conceptual model or situation analysis diagram describes the situation today, helping us to illuminate potential points of intervention and identify strategies, whereas the results chain starts with proposed conservation actions and illustrates how they will cause changes that result in achieving your goal.

7. Strategy and Opportunity Mapping

Purpose:

1. Strategy and opportunity mapping defines the potential spatial extent of different candidate strategies, and evaluates the contribution of each strategy toward conservation goals, and informing the selection of which strategies to implement.
2. Strategy and opportunity mapping also aids the implementation of selected strategies by identifying *where* each strategy can most effectively be implemented.

Products:

1. Map of the potential impacts of the candidate strategies on nature and people.
2. Quantification of the potential impact of the candidate strategies on nature and people.

Strategy and Opportunity Mapping Overview

1. Articulate and document assumptions required for mapping
2. Map expected status of conservation and human goals without strategy
3. Map potential extent of each candidate strategy, considering enabling conditions and intermediate results for each candidate strategy
4. Refine potential extent to reflect organizational resources and capacity
5. Map and quantify expected change in status of conservation and human goals with each strategy
6. Calculate impact (i.e., change between step #2 and step #4) for nature and people
7. Estimate costs, calculate return on investment

1. **Articulate and document assumptions required for mapping.** For each strategy, there are assumptions about what changes the strategy will make, and these need to be specified. For example, you might have a strategy that aims to increase adoption of agricultural best management practices. To map the potential area where that strategy could work, you may need to further specify which kinds of agricultural lands you think the strategy will affect (e.g. row crops, specialty crops, ranchlands). Or you may have identified a minimum goal related to improving conditions for vulnerable communities. You may now need to specify how you are defining vulnerable communities (e.g. those classified by the US Census as below the poverty line, a specific First Nations group or indigenous tribe, people living within 5 km of the coast). Many of these assumptions will already be in the result chains (especially if you did them well!), but, often, additional assumptions are required to turn the results chain into a strategy map.

2. **Map expected status of conservation and human goals without any strategies.** The purpose of this step is to paint a picture of how the world would look if you did nothing. Too often, conservation targets and other primary interests are in decline. In these cases, a conservation strategy could be considered successful even if it only maintains current conditions as they are today. The most relevant comparison for understanding the benefit of a conservation strategy is in comparison with a "do nothing" world. In some contexts, this is referred to as a 'baseline scenario' or 'business as usual' abbreviated as BAU.

   Map the expected future distribution and status of each conservation (e.g. fish species diversity by river reach) and human well-being interest (e.g. drinking water quality, fire frequency near residential areas, air pollution in high population density areas) identified in your minimum goal statement. Also map the status of any elements identified in your results chains as potential risks (e.g. non-target species that may be negatively affected by restoration, low income neighborhoods that may be negatively affected by altered access to an urban park, non-engaged indigenous communities that may be harmed by engagement with other indigenous communities).

   This map(s) should be forward looking over the period of time you have identified in the scoping phase (e.g. if your minimum goals were set for a 5 year time horizon, this map should reflect how you think conditions will look in 5 years). Projections of some useful information may be for longer time periods, so you may choose to use a longer time frame for this analysis. But please note, you *must* use the same time frame for all data sets and all maps in this step of Cbd 2.0 (strategy and opportunity mapping) and have a means to adjust the impacts you estimate back to the timeframe of your minimum goal statement.

Many existing or feasible analyses can be helpful in this step including climate change projections, biodiversity threats analyses, existing sensitive species viability analyses, human population growth and migration projections, land use change projections, maps of sold or committed natural resource extraction permits or concessions, sector development plans or projections (e.g. energy sector expansion plans, transportation infrastructure plans, urban plans, agriculture sector plans or conversion projections) or other development plans or projections.

Consider the following three illustrative examples of minimum goal statements, and relevant elements that might be included to create 'business as usual' maps for them.

Example 1. Minimum Goal: By 2025, increase amount of coral and seagrass habitats under protection by 10%, stabilize grouper populations, and increase commercial fishery landings by 5%.		
Necessary Metrics to Map	**Strategy**	**Elements to consider in creating BAU map**
• Coral habitat extent under protection • Seagrass habitat extent under protection • Grouper population trajectory • Commercial fishery landings	• Achieve adoption of marine spatial planning in three of five coastal planning regions • Fishing ITQ buy back program and targeted engagement with Ministry of Environment on protected area establishment	Under projected government planning approaches in 2025: • 2025 commercial fishery projections • 2025 protected area extents by habitat • 2025 status of threats to grouper populations • 2025 grouper population density • 2025 climate change impacts on grouper, fish landings, seagrass and coral reef extents • 2025 coastal development impacts on seagrass and reef extents

Example 2. Minimum Goal: By 2021, reduce wind energy infrastructure siting in sensitive biodiversity areas by 175,000 acres with no reduction of wind energy production.		
Necessary Metrics to Map	**Strategy**	**Elements to consider in creating BAU map**
• Extent of biodiversity sensitive areas • Wind energy production	• Utilities require avoidance of sensitive areas • Work with 72 wind developers to improve siting • State regulation passed requiring improved siting	Under projected existing wind energy siting practices in 2021: • 2021 extent of wind development • 2021 development trajectories for other sectors (other sensitive area threats) • 2021 climate change impacts on sensitive areas, wind patterns

Example 3. Minimum Goal: By 2021, reduce nutrient runoff from row crop agriculture by 15% in key contributing watershed areas without reducing crop yields.		
Necessary Metrics to Map	**Strategy**	**Elements to consider in creating BAU map**
• Nutrient runoff in key contributing watershed areas • Crop yields in growing region	• Halt national fertilizer incentive program • Create farmer network to share fertilizer best management practices • Establish water funds in key contributing areas to incentivize adoption of best practices	Under projected agriculture management practices in 2021 • 2021 projections of all fertilizer management and subsidy programs • 2021 projected crop yields under BAU management • 2021 projected nutrient runoff in key watersheds • 2021 projections of other land uses that create nutrient inputs in key watersheds • 2021 projections of nutrient point sources in key watersheds • 2021 climate change impacts on crop yields • 2021 climate change impacts on precipitation patterns and nutrient runoff

Consider climate change. Projections of future conditions should include consideration of climate change impacts.

Document all data used in the mapping process, including scale, time period, level of certainty, any cutoffs or thresholds used and any other relevant information. In the case of more complex datasets (e.g. connectivity maps, species distribution models, vegetation index maps, etc.) the methodology used should be cited or described.

3. **Map potential extent of each candidate strategy, considering its enabling conditions and intermediate results.** This step identifies where each strategy can touch down in space and have the potential to meet the minimum goal(s). Creating this map can be aided by walking through the results chain for the strategy and asking what impact the intermediate steps are likely to have on the spatial footprint of key determinants of the strategy's impact.

   This process may be simple or complex. It may be as simple as mapping the political boundaries of an area that can be affected by a policy strategy. For example, consider a strategy that aims to reduce water use rates in a 10 county area by introducing a new graded water use fee that increases with water consumption volume. The new water use rates would affect all residents in the 10-county area, so the strategy map may simply show the 10 county boundaries. Or consider two different marketing strategies aimed at the same goal in the same state—getting in-stream environmental flows requirements set for the three largest reservoir/hydropower complexes. One strategy aims to increase voter turnout for the initiative through an advertising campaign targeted at recreational river users including high revenue kayaking and river rafting communities as well as city dwellers who visit the river to swim on weekends. A second campaign strategy would focus on gaining support from the business community, using hydropower industry spokespeople to reveal the positive aspects of the initiative for local businesses. Assume that recreational river users reside in the state's four largest cities, so the recreational campaign will be targeted to all the voting districts associated with these cities. Those voting districts become the strategy map. The business community is centered in three of the four largest cities, and in one additional mid-size city near one of the big hydropower facilities. The voting districts associated with these cities become the strategy map for this alternative strategy.

   For strategies that aim to find efficient spatial solutions for multiple goals, the process may be more complex. For example, in the wind energy example we have been using, consider the strategy to engage utilities in driving better wind infrastructure siting. In the first step of the results chain, utilities only purchase from providers doing good siting. Which producers do the utilities purchase from and where are they likely to expand wind infrastructure? These are the areas in which we can expect improved siting if the strategy

works. Then the chain notes that fewer permitting problems speed wind development. How much will the potential wind footprint grow because of this? If all this wind development is well sited, where will it be placed? Answering these questions will identify the potential wind footprint and the areas avoided. These questions could be answered simply by using existing projections or systematically collected expert opinion and local knowledge, and overlaying relevant data sets. Alternatively, they may be answered through complex modeling that includes spatial optimization of data identifying relative importance of many sensitive areas, energy generation potential, distance to transmission infrastructure and other factors that make wind development more or less profitable.

- **When mapping strategies, consider incorporating local knowledge**, such as indigenous and traditional communities' knowledge, key stakeholders such as low-income communities in cities, farmer networks in rural areas, fisher cooperatives or communities and others that have advanced knowledge about the landscape or seascape and their spatial interpretation of the landscape (e.g. SIGAP in Indonesia) as deemed permissible and appropriate by these communities or groups. Use tools and techniques that are participatory and easily understood, such as 3D participatory mapping.

- **Design maps with updates in mind.** It is useful to design your strategy map so that, once project implementation begins, it can be updated to reflect success (or lack thereof) in implementing intermediate steps.

- **Use continuous variables.** As much as possible, create maps where the information is not only presence or absence. Several results will not have a simple yes/no distribution, but can be based on the probability of occurrence or be described in terms of magnitude, density, etc. The more information included in relevant data layers, the more useful it will be for spatial targeting.

4. **Refine potential extent of each strategy to reflect organizational resources and capacity.** While a strategy may have the potential to affect a large amount of space or a large number of people, the organization may have limited capacity and resources to pursue it. At this stage, these considerations should be bought into play so that the impact estimated for each strategy accurately affects the program's ability to implement the strategy. If, for example, a strategy could affect multiple political units (e.g. counties or countries) but the organization only has well established and necessary political relationships in one political unit, the strategy map should be adjusted to represent that one unit. Or if a strategy could lead to adoption of a management practice by all people in a large area engaged in the practice, but we only have capacity to drive engagement in half of the population, the map should be adjusted accordingly.

- **Include the resources and capacity of partners.** Many strategies have a leverage element or in some way explicitly include the engagement of other

organizations or actors. If there are ample resources and capacity to be effective in that strategy element, then this step should consider the likely capacity and resources of partners or other actors as well. For example, if a corporate engagement strategy aims to influence a company's sourcing activities, the current or projected footprint of their supply chain should be mapped, not just the location of the one or two offices we may be working directly with. The assumption is that if the strategy works, the company will apply new practices to all of its supply chain, so that is the spatial extent of the potential strategy impact.

- **Create multiple maps if there is a lot of uncertainty in this step.** If there are key uncertainties that limit your ability to make a good estimate of how your capacity and resources will affect the extent of strategy impact, then create alternative maps that capture different versions of the area of uncertainty. For example, if there is a policy strategy that requires support from the ruling party, but there is a major election due 6 months into strategy implementation and we have stronger relationships with one party than the other, it may be difficult to represent how our capacity will affect strategy scope. In this case, you might create one map for the case when one party wins the election, and another map for the case where the other party wins. You could then see in the next step how much the outcome of the election would influence the strategy's overall impact, and decide if the risk was acceptable.

- **Seek peer, stakeholder and expert review.** This is a useful stage to share strategy maps (or the logic behind them) with key stakeholders and external experts to ensure you have accurately reflected the potential spatial extent of strategies. Stakeholders and holders of local and traditional knowledge often have critical information about where a strategy can or cannot be effectively deployed. For example, in an early Latin American water fund case, strategy maps were created and shared with stakeholders in the target watersheds. They noted that several key areas the team had identified as potential strategy areas were in active conflict zones, so not available for application of the strategy. The team was able to update the maps and provide more accurate information for later steps in the process.

5. **Map and quantify expected changes in status of conservation and human well-being goals with each strategy.** Combine the information compiled in the previous steps on assumptions about the impacts of the strategy on the *same minimum goal metrics* mapped in the "no strategy" (baseline, business as usual) maps. The previous step established *where* each strategy could touch down. This step calculates *how much impact* the strategy will have if enacted in those places. The timeframe used here for estimating change must be the same as that used for the business as usual/no strategy maps created previously.

   Creating these maps can be a simple overlay process where you ask how much the strategy extent maps (mapped in the previous step) overlap with

conservation goals (e.g. habitat to be protected) and people we intend to benefit. Alternatively, this can be as complicated as modeling non-linear responses of conservation targets to drivers, modeling multiple conservation, ecosystem service and social benefit flows, or exploring multiple climate scenarios to clearly reflect the range of possible benefits from the strategy for both nature and people.

Potential negative impacts of each strategy should also be estimated at this stage. If the results chains identified unintentional negative outcomes for other conservation elements or for people, these impacts should be quantified so strategies can be compared both on their strengths and their weaknesses.

Consider again two of our three examples of minimum goal statements from above, now with the relevant elements that might be included to create strategy impact maps for each strategy.

Example 1. Minimum Goal: By 2025, increase amount of coral and seagrass habitats under protection by 10%, stabilize grouper populations, and increase commercial fishery landings by 5%.	
Strategy	**Strategy Impact Map**
• Achieve adoption of marine spatial planning in three of five coastal planning regions	Reflects impact of altered planning zones and associated management restrictions on key metrics Considers: • Amount of increase or reduction in fishery landings that can be expected from changing location of zones and management practices • How effective enforcement of new protected areas is likely to be • How much changes to location and intensity of sector activities will affect grouper population trajectory
• Fishing ITQ buy back program and targeted engagement with Ministry of Environment on protected area establishment	Reflects impact of reduced fishing fleet size and single ministry engagement on key metrics. Considers: • How much reduction in fishing pressure can be expected from buyback program? • How much increased overall fishery landing can be expected from reduced fleet size and increase nursery habitat protection? • How much of the potential area the Ministry could protect is likely to be protected? • How much of new protected areas will be enforced? • How will continued impacts of major threats affect grouper populations? • How much will coastal development threats impact protected reefs and seagrasses?

Example 2. Minimum Goal: By 2021, reduce wind energy infrastructure siting in sensitive biodiversity areas by 175,000 acres with no reduction of wind energy production.	
Strategy	**Strategy Impact Map**
• Utilities require avoidance of sensitive areas • Work with 72 wind developers to improve siting	Reflects impact of utility pressure on wind power companies to improve siting. Considers: • Ability of wind power companies to change siting practices under existing policies • Level of compliance with good siting practices under purchaser pressure • Other development trajectories that make productive wind power areas unavailable
• State regulation passed requiring improved siting	Reflects impact of state regulation on improving wind power siting. Considers: • Level of compliance with state regulation • State's ability to enforce the regulation • Other development trajectories that make productive wind power areas unavailable

Consider climate change. In general, conservation investments should be targeted toward areas that are more likely to be resilient to climate change, while remaining representative of the range of landscape features (e.g. geology, soils, topography) necessary to protect the full suite of current and future biodiversity. Investments in areas whose conservation values are expected to be significantly eroded by climate change (e.g. purchasing lands expected to be submerged by rising sea level) should generally be avoided. If they are chosen, they require additional justification (e.g. a viable plan for inland migration of coastal habitat). Tools such as those provided by the Reef Resilience and Coastal Resilience networks provide guidance and resources to help managers and decision makers address the impacts of climate change, and Conserving Nature's Stage suggests an approach for identifying resilient and representative areas, designed to be applied at the scale of regional conservation planning.

Reconsider and map both positive co-benefits and negative impacts on people. You may have gained a better understanding at this stage of who will be affected by a given strategy and how they will be impacted. New issues that arise should be quantified here even if they were not explicit in the results chain initially; if this is the case go back and amend your results chain too to reflect new information. As you explore benefits and risks, refer to the Social Safeguards questions and resources referenced earlier in this document. Impacts to consider include:

- Will the strategy help mitigate or adapt to climate change, or worsen emissions or resilience in some way?
- Are there provisioning ecosystem services that may be affected, like hunting, fishing, ranching or harvesting areas that will have greater or limited access because of the strategy?
- Will water quality or supply be improved or limited for key uses like drinking water, irrigation, industrial use, energy production, transportation or recreational use?
- Will the strategy disproportionately impact or benefit vulnerable or under-represented groups of people?
- Will access to or condition of culturally important sites be improved or harmed in any way?

If risks are identified, determine if it is possible to adjust the strategy or mitigate these risks, and if so, develop a plan on how this might be achieved. In the case of indigenous peoples and other vulnerable communities that might be impacted, adjustments should be developed via a participatory process where these stakeholders are made aware of the potential for harm.

Consider using existing ecosystem service quantification tools (see list in Appendix J [strategy selection tools]).

Consider optimization methods when strategies are highly dependent on spatial context. Optimization methods can be beneficial when there are spatial dependencies, such that the selection of one place influences the value of including other areas. Optimization may also be useful when a conservation project has multiple goals and there are tradeoffs among the goals. Multiple-objective spatial planning is a rapidly evolving field, with approaches that vary widely in their complexity. Marxan, Consnet, and Zonation have been used successfully in conservation contexts. If a strategy is likely to have costs that also vary spatially, you may want to include this cost information (see step 6 below) before running an optimization.

6. **Estimate costs, calculate return on investment.** For strategy selection, the 'conservation return on investment' of a strategy (hereafter ROI) is an important consideration. The conservation ROI estimates the conservation benefit per dollar invested (not to be confused with the conventional definition of ROI as an estimate of financial returns). An estimate of costs is necessary to calculate ROI. Estimate the costs of implementing each strategy, and then calculate ROI by dividing the benefits estimated in the previous step by the strategy's cost. These ROI estimates will be used in the next CbD 2.0 step - Strategy Selection. When there is a simple minimum goal statement with only one clear element, divide the estimated strategy impact on the metric for that element by the strategy cost. If there is more than one element in the minimum goal statement (as in the marine example above), calculate an ROI for each impact metric by dividing each impact metric by the total strategy cost.

Ballpark it. At this point of the planning process a rough estimate of the total project costs is all that is required.

Consider whether costs vary spatially. Several costs can vary spatially and this can affect how and where a strategy is best deployed (considered in the previous step) and how we interpret ROI. For example, if high conservation impacts are expected in areas with low costs, we will see a higher overall ROI than if high conservation impacts occur in areas with high costs.

Calculate just your project costs, not societal costs, or the costs to partners. The cost estimates are designed to allow you to calculate ROI, which should reflect return on investment from your organization or team, independent of other funds that may be leveraged.

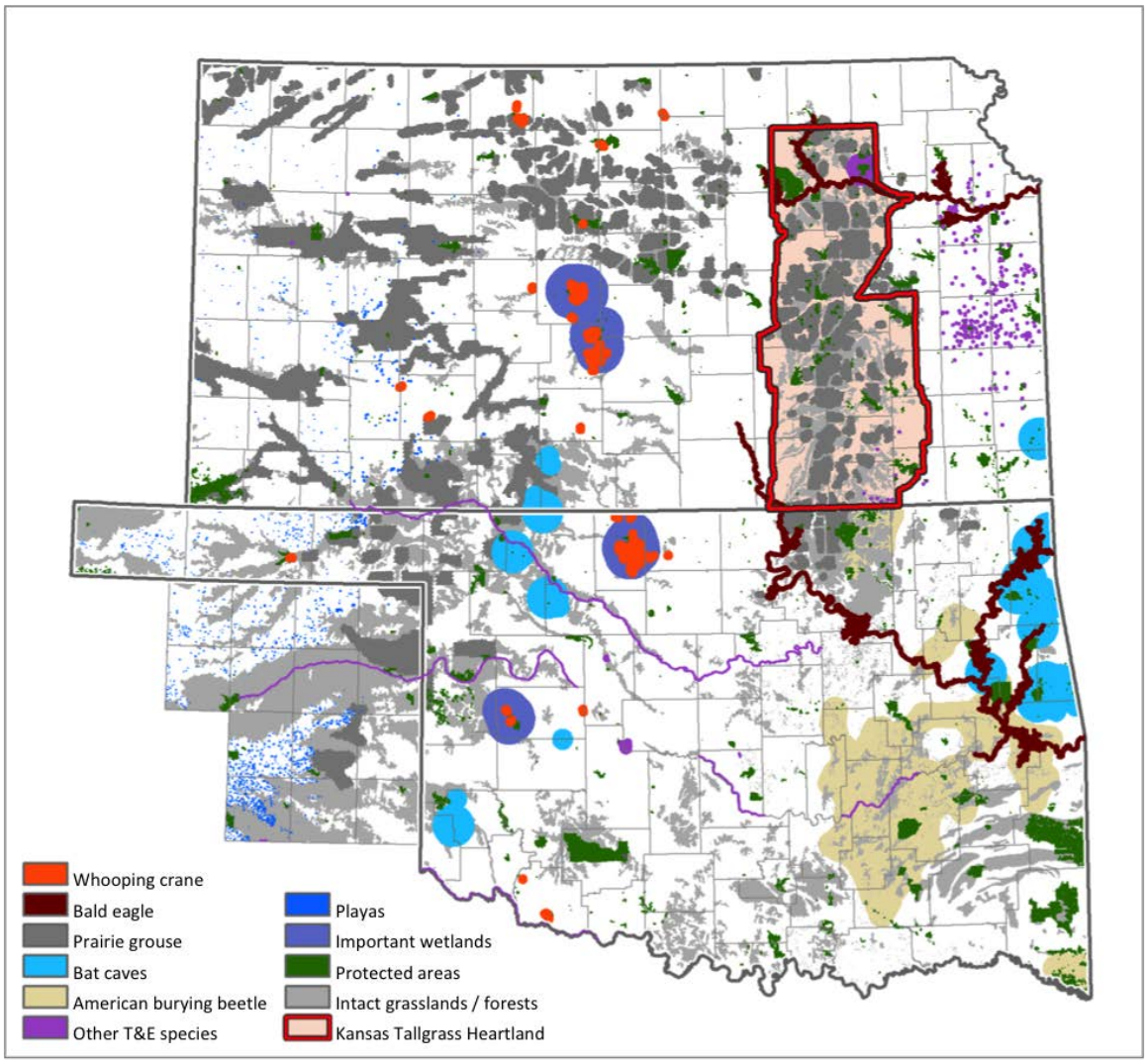
Consider costs of relevant non-conservation alternatives. For strategies that depend upon convincing others to invest in conservation rather than a traditional, non-conservation alternative, it may be useful to calculate ROI for competing, non-conservation alternatives (e.g. grey infrastructure vs natural infrastructure). Maps that identify where the conservation strategy is the economically preferred alternative can be very influential.

Consider costs of monitoring and evaluation. Although the costs of monitoring will not be fully quantified until the monitoring and evaluation plan is developed, it is useful to estimate monitoring costs for inclusion in calculating ROI. Consider monitoring and evaluation required for adaptive management, risk mitigation, regulatory compliance, and influencing others.

Strategy Mapping Example: Central Great Plains Wind Energy

To create a business as usual map (**Figure 11**), the team did an overlay exercise, asking where projected wind development is likely to occur if no new strategy is advanced, and where that development intersects with sensitive habitat areas. Ecologically sensitive areas were mapped for the study region (Oklahoma, Kansas, and a small portion of Texas). These included threatened and endangered species, species at particular risk from wind development (bats), rare habitat, and the most intact examples of 'matrix' habitat (grasslands). These are areas where wind development would compromise conservation goals through direct mortality of species, or impacts to habitat due to both direct habitat destruction and fragmentation and indirect effects such as species avoiding suitable habitat due to disturbance caused by energy development.

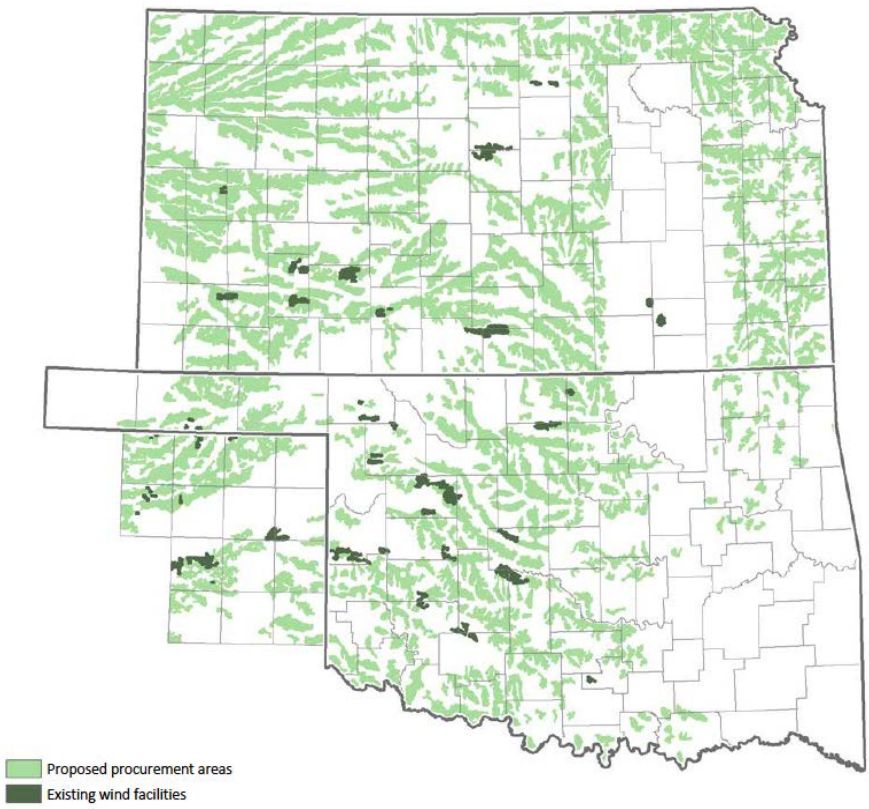
Figure 11: Business as Usual strategy map for central great plains wind energy



Strategy Mapping Example: Central Great Plains Wind Energy
The team then mapped how proposed wind facilities overlap with sensitive habitat areas. Analysis of proposed facilities (FAA 2015) indicates that 28% of anticipated wind development will occur in sensitive areas under business as usual. Based on projections of 10.4 GW of additional wind development in Oklahoma and Kansas by 2040 (USDOE 2015), this strategy could result in 235,866 acres of *avoided* development in sensitive areas.

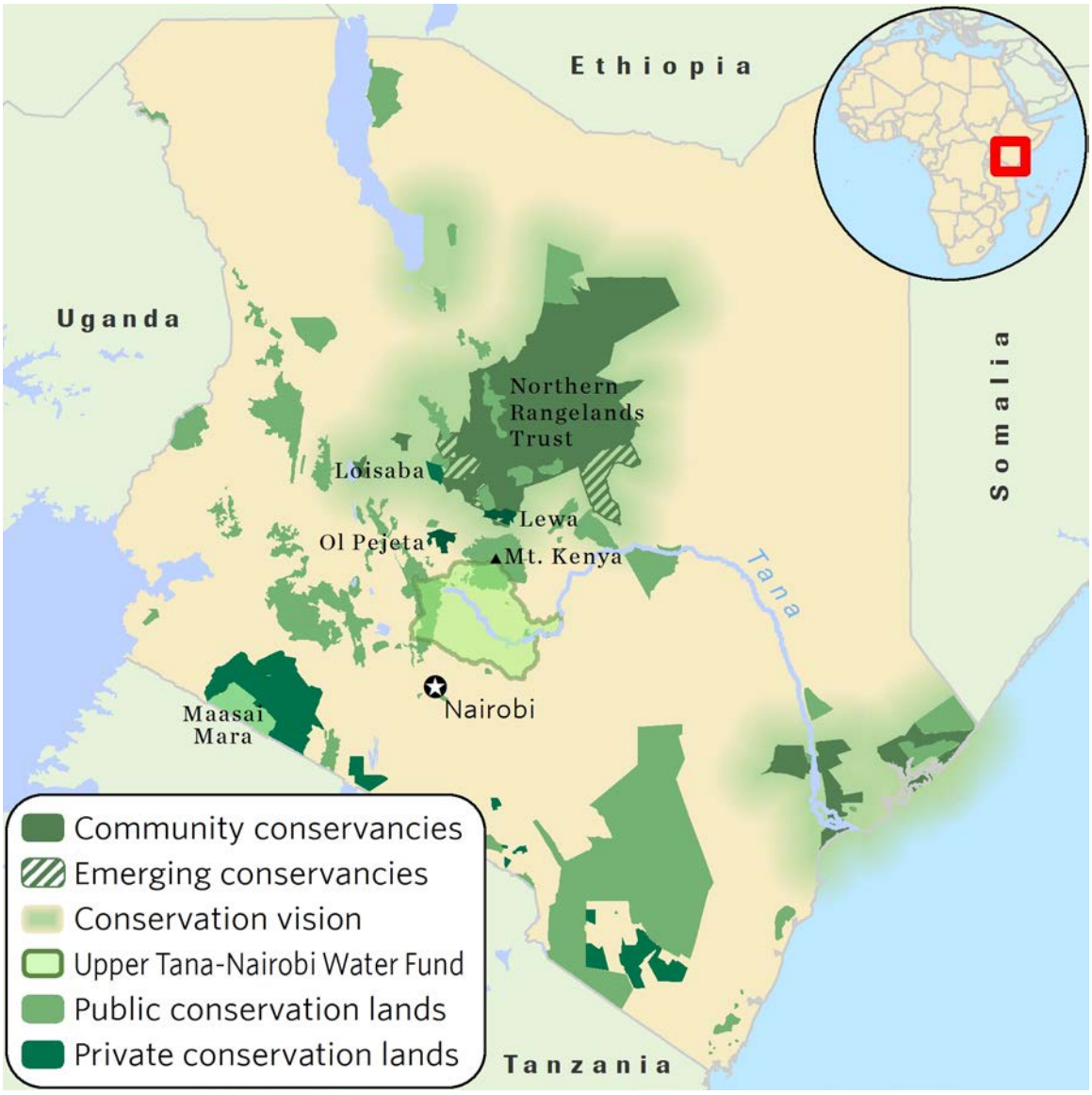
The candidate strategy aims to avoid development in sensitive areas without limiting the amount of wind energy produced. Energy availability and security is an important contributor to quality of life. Even more important for conservation, wind energy development is an important component of the transition to no-carbon energy that is necessary to address climate change. To confirm that it is still possible to achieve wind energy production goals while avoiding sensitive areas, the team identified "proposed procurement areas" outside of sensitive areas. The analysis accounted for wind speed, relative topography, distance to transmission, existing wind development, steep slopes, unsuitable land use, and ecologically sensitive areas. Proposed procurement areas could host 235 GW of wind, over 14 times the projected need for wind development in Oklahoma and Kansas by 2040 (**Figure 12**)

Figure 12: Candidate strategy map for central great plains wind energy (proposed procurement areas located outside of sensitive areas for conservation)



Strategy Mapping Example: Northern Rangelands Trust
The strategy of improved grazing in community conservancies applies to a broad area of pastoralist communities in Northern Kenya (**Figure 13**). Rangeland within existing and emerging conservancies covers 10 million acres. The long term conservation vision is to expand to other applicable areas, which could more than double the acreage benefitted by this strategy. As this example illustrates, strategy mapping need not be complicated. Even simple maps of anticipated geographic extent of a project are important because they facilitate the ability of stakeholders to weigh in on how a strategy may be affected by politics, climate, or other variables and to have a shared understanding of how large the impact of a strategy could be.

Figure 13: Strategy map of improved grazing in Northern Kenya achieved through the strategy of expanding community conservancies.



Minimum Standard Questions

1. Did you document the assumptions, sources and methodologies used in the process to map your strategies?
2. Does your analysis allow quantitative comparison of each strategy's impact on metrics of the elements in your minimum goal statement relative to the impacts of a 'business as usual' projection?
3. Do stakeholders and external experts understand and generally agree with your impact estimates?
4. If a strategy is pursued, will your analysis inform where to target implementation and where tangible conservation outcomes are expected to be achieved?
5. Do cost estimates allow comparison of the conservation ROI of alternative strategies? Have you included the costs of monitoring and evaluation?
6. Have the anticipated benefits of a strategy to people been quantified in a way that is relevant and defensible for stakeholders?

FAQs

Q: *Are there strategies where mapping is not required?*
A: Spatial analysis can be a powerful process and product for sharpening and implementing strategy. Teams are encouraged to be creative and resourceful in thinking about how even strategies that are often not spatially analyzed (e.g., policy or marketing strategies) might benefit from this mapping. Indeed, it is useful to assess the spatial impact of every strategy.

Q: *What if spatial data are not available?*
A: Do the best you can. There now exist global datasets for soils, land uses, populations, forest cover change, endangered species and many other elements of interest. Expert knowledge can be captured and made spatial with simple online tools. Even places initially assumed to lack data can be amenable to spatial analysis with a little creativity and effort.

Q: *How detailed (scale and accuracy) does the spatial information need to be for use in strategy mapping?*
A: Seek the best information available, but sometimes even this data is coarse. We should have in mind two main questions. Does the information quality allow us to make a better assessment of the strategy than we could without the information? Can the uncertainty in data make it misleading? It is important to document data quality and keep uncertainties in mind when evaluating the potential impacts of a strategy. Ask yourself how an analysis would change if a data layer were removed. This will reveal whether conclusions are dependent on a particular data layer. If your strategy is highly dependent on a data layer that you consider unreliable, then seek a different approach to map your strategy.

8. Select Strategy or Strategies

Purpose:

1. Identify strategies that, if successfully pursued, at least meet the minimum goal, and have the greatest ROI.

Products:

1. Selected strategy or strategies, with results chains, and defined expected outcomes.

Select Strategy or Strategies Overview

1. Evaluate potential contribution toward goal for each strategy
2. Avoid low 'conservation ROI' strategies
3. Analyze risk of failure, financial and reputational risk and likelihood of negative impacts on vulnerable people
4. Compare and select strategy or strategies

Steps and Best Practices

1. **Evaluate potential contribution toward goals for each strategy.** As quantified in the strategy mapping step, compile the anticipated benefits for each minimum goal element for each strategy. If any of these benefits were not quantified in the Strategy Mapping step, quantify them now. A categorical determination of impact is acceptable, but the categories should represent a specific numerical range (e.g. 1,000-5,000 acres of habitat) rather than qualitative categories (high, medium, low). Whatever approach is used, it should be consistent among strategies to facilitate comparison.

Make a table with a row for each strategy and a column for each conservation target and human well-being outcome that can be sorted to see the most impactful strategy for every outcome.

For example, this is a hypothetical table for the marine minimum goal statement used above. Strategy 1 underperformed on coral protection and fishery landing goals, while Strategy 2 met or exceeded all minimum goals.

	Minimum Goal Elements			
	Protected coral	Protected seagrass	Grouper lambda	Fishery landings
Minimum Goals	+ 10%	+ 10%	Stable (≥ 1)	+ 5%
Strategy 1	+ 8%	+ 15%	1.1	+3%
Strategy 2	+ 10%	+15%	1.3	+10

2. **Avoid low 'conservation ROI' strategies.** Conservation ROI is a relative measure, and should be evaluated relative to the other strategies under consideration rather than some absolute threshold. There is no threshold value for ROI that should be targeted. The purpose of considering ROI is to help further screen and prioritize strategies that meet the minimum goal requirements.

Expand your table to include columns for ROI estimates for each minimum goal element. Continuing the marine example - Strategy 2 has lower impact for grouper population viability and fishery landings when compared to its ROI for protected coral and seagrass, but the ROI of Strategy 2 overall is much higher than Strategy 1. This information can be taken into consideration with other elements in the next steps for strategy selection .

	Minimum Goal Elements				Return on Investment ($ in millions)			
	Prot. Coral	Prot. Seagr.	Grouper lambda	Fish. land.	% coral per $	% seagrass per $	Lambda per $	% landings per $
Min. Goals	+ 10%	+ 10%	Stable (≥ 1)	+ 5%				
Strat. 1	+ 8%	+ 15%	1.1	+3%	2.2	9	.3	2
Strat. 2	+15%	+15%	1.1	+5%	13.6	13.6	1	4.5

3. **Analyze risk of failure, financial and reputational risk and likelihood of negative impacts on vulnerable people.**

Conduct a "pre-mortem". Imagine that the strategy is implemented, but ultimately fails. What went wrong? Consider factors both within and outside of the control of the project proponents, including political, financial, unintended consequences, unexpected responses of natural systems, etc.

Assess the evidence that the strategy will work. Using the evaluation of the strength of evidence compiled in the results chain step, evaluate the cumulative probability that all required steps will work.

Pursue high impact/high risk strategies, with appropriate contingencies. If many links in a results chain have weak evidence, but the potential ROI and impact are high, consider risk mitigation efforts, and deploy the strategy adaptively with focused monitoring to learn about effectiveness. It is important to ensure, however, that the strategy is not posing a high risk of negative impacts to vulnerable people.

Assess whether required funds will be available, and the consequences of their lack of availability. Funding resources should have been considered during strategy mapping, but can become more specific in this step. Funding requirements that are not either in line with your previous track record of fundraising or based on committed funds are high risk.

Evaluate reputational risk of partnerships, especially with corporations. When considering engagement with partners that might pose a reputational risk, such as a corporation, the proposed engagement should advance conservation and have a defined, tangible conservation benefit, that will result in increased benefits to conservation with measurable results within 3-5 years. Conservancy staff should refer to the Corporate Engagement SOP for further guidance on working with corporations.

Eliminate strategies that have unacceptably high risk. Based on the above evaluations of risk, and any identified earlier in the process, eliminate from further consideration any strategies that have unacceptably high risk.

4. **Compare and select strategy or strategies.** A longer description of approaches of varying complexity that can be used to select strategies is presented in Appendix J.

Consider both ROI and achievement of minimum goal. First consider ROI, and identify those strategies that have relatively high ROI. Then ask whether those strategies can be scaled to achieve the stated minimum goal. If not, the high ROI strategy might still be pursued, but would need to be supplemented with additional strategies to achieve the minimum goal. For example, eliminating over-application of fertilizer could be a high ROI strategy for reducing nutrient pollution (e.g. by educating farmers to reduce inputs and increase their profits). However, this might only lead to a 10% reduction in nutrient pollution, short of the 40% minimum goal. In this case, consider supplementing the high ROI strategy with additional strategies.

Is any one strategy best against all goals? If so, select that strategy.

If there are tradeoffs among strategies, consider whether some goals are more important than others. Often there is a primary goal that should be given more weight than others. This can be formalized by assigning weights to each goal through Multi-Criteria Decision Analysis (see Appendix J) or you can simply use the minimum goals to select strategies that meet minimum goals for each goal.

Minimum Standard Questions

1. Will selected strategies, if successful, achieve the minimum conservation goals?
2. Are investments allocated to strategies with relatively high conservation ROI?
3. Do high-risk strategies have appropriately high reward if successful? Be sure to evaluate who is bearing the risk and who stands to benefit from the reward.

4. Are mitigation plans in place for dealing with risks associated with unintended consequences, e.g. reputational risk, and risk of impacts to indigenous peoples and vulnerable populations? Were the mitigation plans developed through a participatory process with the primary stakeholders who may be affected?

FAQs

Q: *What if no strategies can be identified that can achieve conservation or human well-being goals?*
A: Planners may either decide to invest resources toward trying to address other conservation challenges or may choose to pursue the best available strategy. The latter approach is only justifiable if additional strategies, including ones pursued by other organizations, are anticipated that could ultimately add up to achieve the goal.

Q: *What if negative impacts to vulnerable populations cannot be avoided or eliminated?*
A: While it is not possible to always eliminate all negative impacts to people, it should always be possible to mitigate negative impacts to people. A thorough situation analysis and results chain should highlight where there may be negative impacts. Whenever there are significant risks to vulnerable populations, implement a thorough monitoring and evaluation plan to track and evaluate whether and how much people are negatively impacted by the conservation strategy. It is important to ensure that our practices respect the human rights as stated in international law, such as the United Nations Declaration on the Rights of Indigenous Peoples.

9. Share Advances in Knowledge through Relevant Pathways

The process you have just gone through, of mapping and selecting your strategies, has been rich with new evidence, insights, and learning. This is one of the most important steps at which to consolidate, document, and share what you have learned. Follow the steps laid out in Phase 1, Identify Challenges and Goals, Step 4, Share Advances in Knowledge through Relevant Pathways, to ensure that you are contributing your new evidence to the evidence base and sharing your knowledge with others who will benefit.

Phase 3: Finalize Outcomes & Develop Measures

Context:
Once a strategy is selected, and before we take action, it is important to summarize the conclusions reached in the preceding steps in a format that others outside the planning process can understand. This summary comes in the form of a theory of change, which clearly articulates the conservation challenge your team is trying to solve, the strategies you will use to solve them, and the resulting outcomes. Outcomes should specify what improvements to conservation targets and connected human well-being will be achieved in a way that is geographically specific, measureable and time-bound. In addition, the theory of change should explain why your organization or team is the appropriate one to implement these strategies, and whether enabling conditions or external opportunities or threats motivate implementation of the strategy at the present time.

Phase 3 Steps:

10. Articulate Theory of Change
11. Define Measures and Create a Monitoring and Evaluation Plan

10. Articulate Theory of Change

Purpose:

1. Finalize outcome statement(s) based on insights gained in developing results chains and strategy maps.
2. Describe the conservation challenge, the solution, and why your organization and/or team is positioned to implement the solution in a succinct way that colleagues, partners, stakeholders and funders can understand and support.

Products:

1. A narrative theory of change.

Articulate Theory of Change Overview

1. Succinctly describe the conservation challenge
2. Articulate the solution, using the logic of the key steps from the results chain
3. Define desired outcomes for conservation targets and human well-being interests that strategy implementation will achieve
4. Explain why your organization or team is well suited to implement this strategy
5. Explain any specific enabling conditions, opportunities, or threats that make implementation of the strategy timely
6. Articulate the key assumptions that underpin the strategy.

1. **Succinctly state the conservation challenge** using information gathered from the situation analysis and results chains.

2. **Articulate the solution using the logic of the key steps from the results chain.**

Note where logic steps currently lack evidence. Refer back to the team's evaluation of strength of evidence for the specific steps in the results chain for the selected strategies. Treat any steps that lacked sufficient evidence as hypotheses to be tested as a part of the strategy.

3. **Define desired outcomes for conservation targets and human well being interests that strategy implementation will achieve.**

Final outcome statements should meet or exceed the minimum goal generated previously.

A complete outcome statement includes five parts:

- What we are trying to change described in specific terms, such as acres of habitat, or population size of particular targets, or meeting water quality thresholds for particular pollutants.
- The magnitude of change, expressed in measurable units (either absolute units or percent change against a specified baseline).
- Context for intended outcomes (e.g., geography where the change will occur)
- Timeframe within which the outcome or portion of an outcome is expected to occur
- Specific measurable indicator that will be used to assess achievement of the result (see further discussion of indicators in measures and monitoring section).

Outcomes are what we will manage progress of the strategy towards and hold ourselves accountable for delivering.

4. **Explain why your organization or team is well suited to implement this strategy.**

Evaluate your organization's niche, strengths and weaknesses relative to other actors.

5. **Explain any specific enabling conditions, opportunities, or threats that make implementation of the strategy timely.**

Create enabling conditions. If enabling conditions are currently not present, how will you create those conditions? If creation of enabling conditions is necessary, ensure that this is explicitly included as a part of the strategy. The Learning Network for Capacity Development provides guidance on the complex subject of assessing and addressing enabling conditions.

6. **Articulate any key assumptions that underpin the strategy**. These would be high level assumptions about the enabling conditions, timing, capacity, effectiveness, etc. that successful implementation of the strategy depends upon, but were not previously captured in development of the results chains.

Minimum Standard Questions

1. Is the logic describing why your strategies will lead to the stated outcomes clear, supported by strong results chains and evidence, and compelling to those reading your theory of change for the first time?

FAQs

Q: *What is the difference between a theory of change and a results chain?*
A: A theory of change should be a simplified description of the detailed logic of the results chains; it should briefly and clearly state the case for the proposed body of work. Importantly, the theory of change provides additional information that augments the logic of the results chains by making a strong case for why the strategies will work now and why your organization is the right one to implement the proposed solutions. Finally, it also provides context about the conservation challenge and your team's definition of success.

11. Define Measures and Create a Monitoring and Evaluation Plan

Purpose:

1. Develop monitoring and evaluation plans for selected indicators to track and assess strategy implementation, outcomes, and impacts to nature and people, inform adaptive management, influence key actors, mitigate risk, and contribute to the evidence base.

Product

1. List of indicators to be monitored
2. List of measures to be generated
3. Monitoring and evaluation plans

Define Measures and Create a Monitoring and Evaluation Plan Overview

1. Define monitoring and measures needs
2. Define indicators and measures
3. Evaluate needs and available human and data resources
4. Develop monitoring and evaluation plans for desired level of rigor and certainty

Process and Best Practices

1. Define monitoring and measures needs.

- **Define and prioritize information needs for mitigating legal risk (if applicable).** What legal guarantees, if any, are you responsible for? What evidence would be necessary to defend your organization in court?

- **Define and prioritize information needs for mitigating risk of negative impacts and other reputational risks.** Are there potential, credible negative impacts to nature and people? Are there public promises for which proof of delivering on these promises is required?

- **Define and prioritize information needs for reporting to funders or other philanthropic uses.** What, if any, are the funders' requirements? Is your project designed to be used as a 'proof of concept' to solicit additional funding? If so, what proof will likely be required? What are the requirements for reporting progress on activities and results such as tool development, analytical reports, etc.?

- **Define and prioritize information needs for influencing key actors, including building the evidence base for conservation.** Is there a group whose behavior you are hoping to change? What type of evidence do they require? The best way to assess this is generally to directly ask members of this group. Additionally, assessing how information has led to changes in behavior in the past can provide an understanding of the required quality and quantity of evidence. Note that one group of key actors is the conservation community. Evidence that a strategy works is important to influence broader adoption of the strategy by the conservation community.

- **Define and prioritize information needs for reporting impact of your project or program to your organization.** How is your organization tracking and summarizing impact across projects and programs? How do partners and others report impact? Is there a need for reporting in a common "currency" for area impacted, types of impacts, degrees of impacts?

- **Define and prioritize information needs for adaptive management**. Define milestones, specific key points in the results chain, and other information

needs that are critical to making management decisions. Be explicit with what information is needed for these points. For each information need, consider whether indicators are needed. Note that activities and outputs are generally more commonly measured and reported to donors and in management reviews, but intermediate results and impacts are the results that are necessary to measure to indicate conservation results.

- **Processes or activities** describe project actions, such as engaging in meetings, working with partners, conducting lobbying activities, etc. Indicators for these track activities and participation. They are generally qualitative in describing status, such as whether an activity is completed, ongoing and going well, has some issues, has major issues, or has not been started.
- **Outputs** describe the major products that are completed by the conservation activity. These may be reports, or tools that were developed. Indicators for these are qualitative and generally related to the completion and delivery of a product. Progress in completing outputs can be generated similarly to process or activity indicators.
- **Intermediate results** describe what we intend to accomplish that is a prerequisite for achieving conservation goals or outcomes. Intermediate results can be defined for several major steps in a sequence within a strategy. Intermediate results may relate to changes to or establishment of policy, governance, sustainable finance, partnership development, a social behavioral change, or implementation of management activities. Intermediate results are often referred to as "leading indicators" since their completion suggests that impacts will occur in the future.
- **Impacts** describe what changes to people and nature are ultimately being achieved as a result of the conservation strategy. Impacts are related to goals; specifically, our goals are to achieve a certain level of impact. Impacts can be described in terms of the scope of an impact (how many hectares and/or kilometers are protected, restored, improved, how many people benefited, etc.) and/or the degree of impact (increase in population size, changes in species diversity, changes in water quality, changes in income, life expectancy, etc.). Impacts are often referred to as "lagging indicators" since they can take time to be realized and/or monitored.

2. **Identify indicators and measures.** For each of the information needs identified above, identify an indicator. Indicators specify what needs to be measured. To learn more about selecting indicators, see Mayoux, L. (2002). *What do we want to know? Selecting Indicators.*

Consider the full range of information needs (outlined above). If an indicator or measure doesn't fill an information need, don't measure it. This would be a waste of limited resources. Instead, make sure that the indicators and measures are focused on priorities for fulfilling the needs identified in Step 1.

Considering novel indicators and monitoring approaches can save money. For instance, household surveys may be common when collecting socioeconomic data, but they can be expensive and require specialized knowledge. A less expensive option may be to use mobile phone-based survey methods, focus groups and key informant interviews, and participatory rural appraisal methods.

Adopting or adapting existing tools and indicators can save time and money. Consult the literature, specialists, or colleagues for survey templates or previous tools that have been employed in past projects. Be sure to check if survey templates or tools are context appropriate and will collect relevant information.

For all indicators, define the following:

- The information need it is addressing
- The audience for the information
- The activity, output, outcome or impact it is intended to measure progress toward (or risk it is intended to avoid or mitigate)
- The level or range of values that are triggers for action, and what that action would be.
- Necessary strength of inference – and where relevant define appropriate experimental design, resolution, precision, and accuracy (see below for discussion of certainty statements as well as Appendix G.
- Analytical or methodological approach for analyzing indicators
- The source of the data, including any relevant methods for how the information will be collected
- How often it should be measured
- How often it needs to be communicated to each audience, and in what format
- Costs and resources required for information collection, management, analysis, and reporting

Be explicit about how the indicator will be used. As stated above, the purpose of measuring each indicator should be specified, including the intended audience and use. In particular, it is useful to specify the status or quantitative values of the indicator that would signify adequate progress in activities, completing outputs, achieving intermediate results, leverage through generating influence and progress toward goals, or unacceptable impacts, or lack of progress that would trigger adaptive management or other decisions. If this cannot be done, consider whether you have selected the wrong indicator, or whether it would actually be useful to measure that indicator.

To learn more about different types of indicators, see this useful paper from UNDP.

Example indicators

Outcome: By 2040, property values increase by 5% more than comparable communities due to restoration activities.
Indicator: % increase in property values (US$)

Outcome: By 2020, tribal conflicts caused by resource constraints decreases within the conservancy
Indicator: # of tribal conflicts caused by resource constraints annually

Outcome: By 2030 and thereafter, fewer than 10 cases of water-borne diseases are recorded annually within the region.
Indicator: Perception of the prevalence of water-borne illnesses within the local community

Select indicators that inform multiple audience needs first. Doing so can save resources. Table 4 demonstrates that in some cases one indicator can provide relevant information to many audiences (i.e., for *Reduced conflict* and *Increased food security*), and in other cases, different audiences may need different information (i.e., multiple indicators are required to measure *Increased employment*).

Table 4: Indicators by outcome and audience for the Northern Rangeland Trust

General outcome	Audience		
	Conservancy managers & Board	NRT Managers	Donors & Partners
Increased employment	• Costs of employment/program • Pay level per program relative to local standard	• % community employed per program, disaggregated by county and gender	• Total # of people employed per conservancy
Reduced conflict	• Frequency of resource conflict • Frequency of theft • # of joint conservancy security and police or government response • Resident perception of conflict		
Increased food security	• Proportion of food from livestock, purchased or food programs • Frequency of meat and milk consumption		

Indicators, especially those related to human well-being should be drafted in consultation with, and be validated by, local stakeholders to ensure they accurately reflect their priorities and experiences. For more on social indicators and examples of case studies from the field, see Wongbusarakum, S., Myers Madeira, E. and Hartanto, H. 2014. *Strengthening the Social Impacts of Sustainable Landscapes Programs: A practitioner's guidebook to strengthen and monitor human well-being outcomes*. The Nature Conservancy. Arlington, VA. 2014.

Evaluate the indicators. If you have several indicators measuring the same concept, rate the indicators based on a set of criteria and only use the top rated indicators. The most well-known indicator criteria are SMART (for quantitative) and SPICED (for qualitative). For more on selecting SMART and SPICED criteria, see this guide from UNICEF.

SMART indicator criteria are:

- **S**pecific: Explicit enough and sensitive enough to measure changes in or results due to the action, intermediate outcome, or impact.
- **M**easurable: The proposed indicator should be quantitatively measurable (e.g., can be counted, observed) and able to be analyzed.
- **A**ctionable: The indicator should provide information required for known decision points.
- **R**ealistic: The indicator should be feasible to monitor, given available resources and publicly available data, or easily acquired data.
- **T**imebound: The indicator should be sensitive enough to indicate change within required reporting periods and within the project timeframe.

And

SPICED indicator criteria are:

- **S**ubjective: People providing the data (informants) have experience or are in a position to give unique insights.
- **P**articipatory: Outcomes, intermediate results and indicators are developed with primary stakeholders when appropriate.
- **I**nterpreted (and communicable): Indicators are adapted to local context and reporting needs..
- **C**ross-checked: where possible, information about an indicator reflects different sources to ensure there is a deeper understanding of a phenomenon.
- **E**mpowering: Indicator selection should provide ownership to local stakeholders and give each one a voice.
- **D**iverse and disaggregated: Indicators should be developed by engaging a diverse group of stakeholders, including women and men separately.

3. Evaluate needs and available human and data resources

The following are required for effective monitoring and evaluation. Staff must assess whether they have the expertise and capacity for each step.

- A research design (for impacts) should be developed or evaluated by a qualified professional.
- Data collection and sample analysis activities need to have assigned responsible parties that are qualified, and designated timeframes and schedules.
- Data management needs to have an assigned responsible party and a map of information flow and access.
- Data evaluation needs to have analytical approaches defined and experts designated to conduct the analysis prior to data collection.
- Communications staff to work with evaluation staff to figure out how to best present results for each audience.

Monitoring and evaluation plans should make use of data already being collected by governments, academics, industries, indigenous organizations, community organizations and and NGOs. This may include survey data, government statistics, model results, experimental results, and remotely sensed data. Consider partnerships with entities that have already invested in infrastructure to support monitoring and evaluation activities. However, it is important to assess the monitoring and evaluation design and information needs with data from existing efforts, and the probability that these efforts will or will not continue to provide needed information, before deciding to depend on others to supply data.

- Ask others involved in the strategy about existing sources of information. Partners and key actors often have familiarity with data sources useful to address information needs.
- Ask academics, agencies, partners and research entities about data they are acquiring and about availability. Some data are restricted, but in many cases data sharing agreements can be put in place.
- Conduct web searches for data sources that will continue to provide updated information. Many government agencies regularly collect high quality data. Explore local, state, and federal government agencies for data needs.

Consider hiring contractors to fill capacity gaps. Hiring contractors to design and implement data collection, evaluation, and/or measures reporting may be necessary. It can be difficult to evaluate the qualifications of contractors in areas where you lack expertise. Take special care in selecting the right contractor by reviewing the contractor's previous work, talking directly with their prior clients, and soliciting external expertise to vet contractors if necessary. Second, you will need to be explicit about the information needs of critical audiences: what information is truly needed, when information is necessary, and how it should be reported. The contract should specify the content, timing and format of products delivered by the

contractor. Finally, consider the importance of consistency in data collection and analysis. Is it possible to use the same contractor for the length of the project? And if not, will others be able to reliably duplicate their methods?

Consider community-based monitoring. Engaging local communities in monitoring can engender interest and support for the project and empower communities through participation, as well as providing necessary information.

Separately assess social science and ecological monitoring and evaluation capabilities. While some social science and ecological data collection and analyses can be combined, developing monitoring and evaluation plans require specialized knowledge. If critical audiences need statements with *high certainty* (i.e., the most rigorous monitoring and evaluation plans), significant research experience (i.e., PhD-level training) or certifications (i.e., analytical labs for certain monitoring needs) may be required.

4. **Develop monitoring and evaluation plans with appropriate research design.** Monitoring and evaluation plans should clearly articulate *who, what, when, how*, and *why* information should be collected, analyzed, and used. The monitoring and evaluation plan should specify:

    - Audiences
    - Indicators
    - Research design
    - Sources for data collected by others
    - Hypotheses that will be explored, and milestones or key points along a results chain where information is necessary (why)
    - Data collection activities and timeframes (who, when, how)
    - Data management plan and a map of information flow and access.
    - Data analysis and evaluation plan (who, when, how)
    - Format and timing of communications with key audiences
    - Estimated monitoring, analysis and evaluation, and communications costs and funding sources

The monitoring and evaluation plan should explicitly articulate information needs. Be clear when data are needed to inform key decisions. The monitoring and evaluation plan should clearly articulate the questions that should be answered through the monitoring and evaluation activities. More specifically:

- Identify the decisions/actions you want to influence. This defines the realm of issues that you want to affect and need to develop measures for.
- Identify information needs to inform decisions/actions and assess impact. This is what determines what you want to monitor and why.

The World Bank has provided this useful resource on designing M&E plans: *Ten steps to a results-based monitoring and evaluation system a handbook for development practitioners.*

Implement the social safeguards. Monitoring and evaluation plans should pass the 11 social safeguard questions. Conservancy staff can learn more about social safeguards and other elements of integrating human well-being into conservation via a series of half-hour webinars recorded in 2015, found here on CONNECT.

The communication component of monitoring and evaluation plans should consider the needs of indigenous and local communities. Specifically, all communication should consider the language, literacy levels, format, and other needs of these audiences.

Conduct peer review. Monitoring and evaluation plans are strengthened when they are reviewed by peers. Peer reviews can be useful for identifying issues with monitoring and evaluation plans, whether there are duplicated efforts by others (e.g., government agencies collecting similar data), or whether monitoring and evaluation activities are sufficiently rigorous or realistic given the available resources.

Baseline data is important. It is difficult to detect change when you don't know where you started. You can't go back in time to collect baseline data, so make sure that all relevant baseline data is collected.

Consider the timeframe of expected changes. If, even under the best circumstances, conservation outcomes and impacts will take years to become apparent, don't spend a lot of time and money monitoring to confirm the lack of change. Treat monitoring as a way to test for hypothesized changes. Design monitoring and evaluation plans that have realistic timeframes and geographic scales. Note that this mainly applies to ongoing monitoring activities that are required to detect subsequent change. Also note that the relevant timeframe for negative impacts may be different than the time frame relevant for desired change, and may require sooner or more frequent monitoring.

Use a qualified expert to help with the research design. Developing an appropriate research design - taking into account requirements for temporal and spatial sampling, replication, controls, and counterfactuals - before initiating data collection is critical, for several reasons. These include avoiding wasting resources on unnecessary monitoring and accurately budgeting for required monitoring. Further, research design should inform monitoring decisions (e.g. frequency, sample size and other methodological decisions). Have a qualified scientist and/or statistician develop or review the research design to ensure that it provides the necessary rigor to match the desired level of certainty.

Select a research design commensurate with the level of certainty required for your audience. It is often helpful to think about the **certainty statements** a program would like to make about its impact (Table 5). If a program is interested in attributing outcomes to program activities (*Certain*

statements), then a rigorous monitoring and evaluation plan should be implemented. This would likely require a greater level of investment than a plan that would attribute program impacts to anecdotal evidence (*Cautious* statements). Consider the types of statements the primary audience will need to be informed, or convinced, by a monitoring and evaluation plan. For instance, local stakeholders may be satisfied with anecdotes about a program's impact, while donors may require causal statements about a program's impact. Please see Appendix G for examples of research designs required to meet the three levels of certainty described below.

Table 5: Certainty statements

Certain (high rigor/counterfactual analysis)
• The Conservancy's work is providing clean water for 5 million people.
Somewhat certain (medium rigor/correlation)
• Water quality is improving for 5 million people, and the Conservancy has projects in key water source areas.
Cautious (low rigor/anecdotal)
• People in rural communities say their water quality is improving, and they think it is tied to the Conservancy's work.

Minimum standard questions

1. Will the monitoring and evaluation plan ensure that essential information gaps are filled?
2. Has the existing strength of evidence informed a conservation strategy's risk and leverage as it relates to the level of investment in monitoring and evaluation plans?
3. Are there indicators for both positive and potential negative outcomes for both people and nature, which were developed in partnership with potentially impacted stakeholders?
4. Does the monitoring and evaluation plan include collecting baseline data?
5. Has there been full exploration and consideration of secondary data from government, NGO, indigenous organizations, community organizations, and other firms or agencies for environmental and socioeconomic data to avoid duplicating data collection efforts and opportunities to fill gaps?
6. Have specific audiences, the intended use of information, and needed level of rigor been defined for each indicator?
7. Have plans been created that clearly define the design, collection, management, evaluation, and reporting procedures and responsibilities for data?

8. Do the monitoring and evaluation plans clearly articulate how the data will be analyzed, updated, and then shared to relevant audiences in culturally appropriate ways?
9. Do the monitoring and evaluation plans provide a realistic budget sufficient for monitoring over a long enough period of time to detect anticipated outcomes and impacts?
10. Will monitoring design and evaluation approaches (e.g. research design and statistical methods) and sampling be conducted by qualified professionals?

FAQ

Q: *If we can collect information with no defined user or purpose right now, but that might useful in the future, should we collect it?*
A: Given resource constraints, monitoring should be limited to data for which there is an identified purpose. Even where data collection is cheap, data management and analysis incur costs that are often overlooked. Rather than collecting data for which there is not an identified need, focus on more completely assessing information needs to ensure that the data that are collected are the right data.

Q: *If we have a step in a theory of change or results chain that has not been identified as having a measures or monitoring need, is that a problem?*
A: Not necessarily. Monitoring should be focused on filling information needs identified in step 1. In general, replication or leveraging a strategy will require building the evidence base to demonstrate the effectiveness of the strategy, and links for which evidence is lacking should be monitored. Some steps or links such as impacts resulting from intermediate outcomes are well known and documented already, and are rigorously inferred, and may not require monitoring.

Q. *What extra precautions are required for research involving human subjects?*
A. There is consensus in the research community about the ethics and appropriate protocols and standards for any research involving human subjects. Large universities have dedicated offices that provide this information for their academic community (e.g., Stanford University, University of Washington, University of Minnesota), and federally funded projects and grants that include research on human subjects require ethical approval. Conservancy staff should follow the Conservancy's Standard Operating Procedure (SOP) for research involving human subjects, which applies to all research involving human subjects sponsored by the Conservancy, whether conducted by Conservancy employees, volunteers or agents (such as a contractor), or by any third party using the Conservancy's facilities. The SOP includes specific guidance for researchers on research principles, permissible research and approval requirements, risk, informed consent, data security, and government funding.

Conservancy staff can learn more about measures by following the Measures Community on CONNECT, and the Measures Demystified training on ConservationTraining.org is available to anyone.

Phase 4: Take Action

Context:
Using proven project management processes and tools helps ensure successful project implementation.

Phase 4 Step:

12. Implement Strategy using Sound Project Management

12. Implement Strategy using Sound Project Management

Purpose:

1. Use project management best practices to implement strategy

Products:

1. Charter
2. Workplan
3. Budget
4. Stakeholder engagement plan

Implement Strategy Using Sound Project Management Overview

1. Draft charter
2. Draft workplan
3. Draft budget
4. Identify capacity
5. Determine when and how to engage stakeholders
6. Conduct monitoring

Process and Best Practices

1. **Draft charter.** The charter clarifies roles and responsibilities within the project team, including who has decision making authority. Where the project is being implemented via a partnership, the charter should include partners and their roles. Charters also have sponsors. Final authority for the direction of the project rests with the project sponsors. The Conservation Partnership Center provides guidance on negotiating and documenting roles and responsibilities. Conservancy staff can find additional resources about how to write charters, and many other aspects of project management at the Highly Effective Teams site on CONNECT.

2. **Draft workplan.** The workplan identifies tasks and estimates when they will be started and completed, and the level of effort required to complete them.

3. **Draft Budget.** Produce a realistic budget and fundraising expectation. The budget should include monitoring, evaluation, analysis, and outreach components, including those necessary to build the evidence base and mitigate risk.

Budget should be based in reality. Compare proposed budget with relevant actual historical funding rates.

Identify a 'plan B' approach if full funding does not come through (e.g. a partial or phased implementation of a strategy).

Identify no-go cutoff. This is the funding level below which strategy isn't viable and the project should be terminated or put on hold until adequate funding becomes available. This should be clearly articulated to partners and relevant stakeholders to avoid false expectations.

4. **Identify capacity**. Assess staff and partner capacity and needs.

Develop a summary of full staffing needs. Compare needs with available existing capacity and identify need for new hires. For each individual associated with the project, estimate the percent of their time that will be spent on the project. Identify any additional training that staff may require to effectively implement the project. Conservancy staff can search learn@tnc for relevant trainings and webinars; trainings on conservationtraining.org are open to everyone.

Identify non-staff expenses. these include equipment, supplies, travel, meetings, contracts, and other budget category needs necessary to fully implement the project.

Consider near-term and long-term costs. Estimate costs in two phases.
- For the first phase (1-3 years), provide a realistic estimate of costs and capacity needed to implement selected strategies.
- A later phase (2-5 years) can include more ambitious costs and capacity based on a realistic estimate of what it will actually take to achieve outcomes over the long term, which can inform fundraising efforts.

Consider building capacity with partners. Building local capacity can be essential for the long term sustainability of conservation efforts. Capacity building efforts themselves require significant capacity for engagement and training, which should be taken into account when considering staffing needs. Conservancy staff can find capacity building tools and resources in the Capacity Development Community on CONNECT, and the Learning Network on Capacity Development provides useful tools and guidance that are available to anyone.

5. **Determine when and how to engage stakeholders.** Stakeholder engagement can be important in all stages of project development, not just the planning stages. This is especially important when working with indigenous peoples and local communities, as consultation throughout the life cycle of a project is critical to ensuring social safeguards are being implemented; Free, Prior and Informed Consent is consistently being pursued; and local knowledge is respected and incorporated as appropriate. Determine how and when you with consult with and update stakeholders during the project's implementation.

6. **Conduct monitoring**. Implement the monitoring plan.

Minimum Standard Questions

1. Does your charter identify the roles required to implement the project and specify decision-making authorities?
2. Does your workplan include a timeline that specifies when conservation outcomes will be achieved?
3. Do you know where additional capacity is needed and have a plan to build or obtain capacity needs?
4. Do you know when and how you will engage and inform stakeholders during implementation?

Phase 5: Evaluate and Adapt

Context:
Practitioners may need to periodically adjust strategies and actions to account for changed conditions, address unforeseen obstacles or mitigate unintended consequences. We do this through evaluation and adaptive management. Evaluation is the analysis of data collected through monitoring and other sources. It should assess progress toward outcomes and intermediate results, using indicators identified in the monitoring and evaluation plan. Also as identified in the monitoring and evaluation plan, evaluation should produce results tailored to influence key audiences and identify risks or impacts that need to be further mitigated.

Phase 5 Steps:

13. Evaluation

14. Adapt

13. Evaluation

Purpose

1. Evaluate available data from monitoring and other sources to inform adaptive management, assess a strategy's impact, influence key actors, and contribute to the evidence base.

Products:

1. Evaluation analysis results
2. Communication products (white papers, scientific publications, annual reports)

Evaluation Overview

1. Evaluate data from monitoring and other sources
2. Generate communication products

Process and Best Practices

1. **Evaluate data from monitoring and other sources.** The monitoring and evaluation plan specifies indicators and threshold values that can be used to determine whether progress is on track, adaptive management thresholds are required, or there are unintended impacts to people.

The analyst matters. Ensure analyses are conducted by qualified experts.

Timeliness matters. When evaluations aren't conducted on schedule, they typically fail to inform adaptive management and miss opportunities to influence key audiences.

Look for the unexpected. Unexpected impacts may not have had an indicator identified. Look at raw data for outliers and unexpected results and consult the individuals directly involved in data collection about their observations. Such anecdotal evidence may indicate the need to update monitoring approaches based on unanticipated complications.

2. **Generate communication products.** Data were collected and analyzed to convey information to specific audiences. Ensure this information is communicated by creating communication products tailored to your audiences, recognizing that one communication product may work effectively with multiple audiences. White papers, one-page fact sheets, annual reports, and peer-reviewed publications are all legitimate communication products, depending on the audience. Be considerate of different languages and whether or not in-person meetings are needed.

Peer-reviewed publications are the gold standard. When the goal is to influence others, peer-reviewed publications generally provide the greatest credibility. Even for non-scientific audiences that may not be inclined to read a scientific publication, the fact that research has been peer-reviewed and published generates confidence in the expertise of your organization or team.

Don't overstate your case. The level of rigor of your monitoring design will determine the certainty of statements that can be supported by your analysis (Table 5). You can only attribute an outcome to your program activities if you implemented a rigorous monitoring and evaluation plan.

Minimum Standard Questions

1. Was the monitoring data that you collected evaluated by a qualified analyst in a timely manner?
2. Were communication products developed for key audiences?

14. Adapt

Purpose:

1. Ensure that strategies and workplans adapt based on results of monitoring and evaluation, unintended consequences, new opportunities, and other changes in conditions.
2. Share lessons learned via relevant pathways.

Products:

1. Affirmation or revision of workplan and theory of change

2. Annual report that explains progress to date and captures lessons learned

Adapt Overview

1. Review the Situation Analysis
2. Review progress against outcomes
3. Revise theory of change and workplan, as necessary

Process and Best Practices

1. **Review the Situation Analysis.**

Conduct review annually

Are there new challenges? Have new challenges to people and nature emerged? These should be added to the Situation Analysis.

Consider enabling conditions. Ask whether there have been substantive changes that would affect the enabling conditions or the potential impact of the strategy; if there have been substantive changes, consider re-initiating a Situation Analysis and the conservation planning process.

Consider changes in partner capacity, which is often an important enabling condition. You can use an Institutional Self-Assessment (ISA) to assess organizational capacity. Conservancy staff will find the ISA and related tools on CONNECT, here. The Packard Foundation's Organizational Effectiveness Program also provides a number of resources for evaluating capacity.

Identify and evaluate new opportunities. Have changes in policies, politics, technology, threats, natural resources, or other drivers occurred that present new opportunities for conservation? If these changes present opportunities for a more affordable, reliable or complete solution to conservation challenges, re-initiate the Situation Analysis and the conservation planning process to evaluate.

2. **Review progress against stated outcomes.** Use monitoring and evaluation results in comparison with intermediate results to ask whether the current set of strategies and tactics are being effective, and whether current allocations to them are appropriate.

3. **Revise theory of change and or workplan**.

Ask if the current Theory of Change is still credible and compelling.

Ask if the current workplan represents the highest and best allocation of resources to achieve the desired outcome.

4. **Share lessons learned.** Capturing and sharing evidence and knowledge is never more important than when strategies and results are assessed through evaluation, and adaptive changes are made. The process you have just gone through, of reviewing your progress and adapting your strategy, has been rich with new evidence, insights, and learning. This is one of the most important steps at which to consolidate, document, and share what you have learned. Follow the steps laid out in Phase 1, Identify Challenges and Goals, Step 4, Share Advances in Knowledge through Relevant Pathways, (link), to ensure that you are contributing your new evidence to the evidence base and sharing your knowledge with others who will benefit.

Any changes in strategy or implementation approach are worth sharing. Any change in internal or external conditions that necessitates a change in strategy or implementation, that may represent a milestone in adaptive implementation should be memorialized so others may be able to benefit from the thinking behind that change.

Minimum Standard Questions

1. Have you reviewed the results of monitoring, analyzed the data, and drawn conclusions about impacts and implications?
2. If anticipated progress is not being made, was workplan, or staffing capacity, or theory of change revised?
3. If the strategy currently being implemented is substantively different from what was initially planned, was it re-evaluated to ensure that it will still achieve goals, will incur acceptable risks and is supported by evidence?
4. Has the information been shared with stakeholders in a format appropriate to the particular audience?

Glossary

Adaptive Management: A structured, iterative process of systematically testing assumptions to learn, adapt and improve decision-making in the face of uncertainty. Adaptive management encompasses the design, management and monitoring of a strategy.

Biodiversity: the variability within and among all living organisms and the ecological complexes in which they occur. Biodiversity includes ecosystem or community diversity, species diversity, genetic diversity and the ecological and evolutionary processes that sustain it.

Community of Practice (CoP): As defined by Etienne Wenger, who coined the term, a CoP is a group "of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly…[reflecting] the fundamentally social nature of human learning." A CoP exists when a learning community shares a domain, a community and a practice. http://wenger-trayner.com/resources/what-is-a-community-of-practice/

Conceptual model: A conceptual model is a tool for visually depicting the context we want to change and, in particular, the major forces that are influencing nature and people within the scope analyzed. It is a diagram that uses a series of boxes and arrows to succinctly represent a set of causal relationships among factors that are believed to impact one or more conservation targets.

Conservation Action Planning (CAP): CAP is the precursor to the Open Standards for Conservation. CAP is a framework developed by The Nature Conservancy in the 1990s to help practitioners focus their conservation strategies on a limited number of biodiversity elements (conservation targets), articulate the threats to these conservation targets, and then measure and adaptively manage the resulting strategies over time. CAP was a foundational conservation planning approach for the Conservancy used extensively internally and by partners until the mid-2000s. Since the mid-2000s, the Open Standards (see below) has expanded and improved on CAP, and thus it is the more current methodology. Conservation by Design 2.0 and the Open Standards are intended to update and replace that workbook and we urge practitioners to use them instead of CAP.

Conservation Business Planning: this was the previous iteration of the Conservancy's conservation planning approach. CbD 2.0 Guidance replaces Conservation Business Planning (CBP). Note that the majority of CBP attributes were carried forward into this Guidance. The principle objective of conservation business planning was to clarify expectations and help managers and teams focus on what is most important and useful in planning, as well as produce brief,

useful and dynamic conservation business plans. Interested staff can find archived information about CBP here

Conservation Coaches Network (CCNet): A formal network of practitioners who have been trained in the Open Standards and in coaching others to use them. CCNet is global, with over 500 trained coaches from 60 countries. Please see Appendix B for more information about CCNet.

Conservation Target: is a type of primary interest that is directly associated with biodiversity. It is defined as entities, traits, processes or values we aim to conserve, it can include species, ecosystems and other aspects of biodiversity, as well as, environmental services or natural processes.

Driver: A generic term for an element of a conceptual model including direct and indirect threats, opportunities and stakeholders. Also known as a factor or root cause in Open Standards.

Ecosystem services: The benefits nature provides to people. Ecosystem services can provide material benefits (such as food, water and employment) or intangible benefits (such as spiritual values and intellectual satisfaction) and can contribute to any component of human well-being.

Evaluation: an assessment of a program's impact.

Evidence: the body of reported data and information that we draw from or build in the design and implementation of conservation strategies.

Free, Prior, and Informed Consent (FPIC): the principle that anyone has the right to give or withhold information or knowledge that they possess, and any community or individual has the right to give or withhold consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use. It implies the absence of coercion and outside pressure (Free), having sufficient time to allow for information-gathering and full discussion; including translations into traditional languages, before a project starts (Prior); having all the relevant information available reflecting all views and positions (Informed); and the demonstration of clear and compelling agreement, in keeping with the decision-making structures of the communities in question, including traditional consensus procedures (Consent). See Appendix C for more information

Goal, or Minimum Goal Statement: generated early on in the conservation process and describes the lowest acceptable threshold for success, for nature and connected human well-being interests. Minimum goals are converted to outcome statements when strategies are selected and the theory of change is articulated.

Healthy Country Planning ("HCP"): An approach used by Indigenous Australians, facilitated by conservation coaches, that adapts the Open Standards to guide Indigenous communities in making a plan to look after their country, culture, and people, and to identify ways to develop livelihoods while

managing their lands appropriately. HCP puts the decisions about the planning approach, the use of the planning tools, the planning content, and the strategic decisions that emerge from it, back in the hands of the people whose country it is. It is planning with people and place, not for people and place.

Human Well-Being: A state of being in which one's needs are met, one can act meaningfully to pursue chosen goals, and one enjoys a satisfactory quality of life. Human well-being is a complex state that can be defined by multiple components, including basic sustenance, health, education, work and leisure, governance, social cohesion, security, and equality.

Human well-being focal area: Broad aspects of life that broadly define human well-being. The Conservancy has developed a human well-being framework that includes eight focal areas. Please see Appendix E for more details.

Human well-being interest: a type of primary interest that deals specifically with people. It specifies the human well-being focal area or component that the Conservancy and other project partners care about. Typically the draft goal statement and final outcome statements are set for only a subset of identified human well-being interests.

Impact: The desired future state of a conservation target or human well-being.

Intermediate result: essential precursors to achieving outcomes. Intermediate results are often the near-term focus of strategies and evidence that the theory of change is playing out as expected.

Knowledge sharing: the spectrum of activities through which information, skills, and expertise are exchanged.

Measures: express the results of monitoring and analysis in the context of outcomes and management decisions.

Monitoring: the act of collecting information over time to provide data on a project's status.

Nature: Biodiversity and ecosystem services, as well as the processes necessary to maintain them.

Open Standards: A project of the Conservation Measures Partnership (CMP) to combine principles and best practices in adaptive management and results-based management from conservation and other fields to create the Open Standards for the Practice of Conservation. The Open Standards bring together common concepts, approaches, and terminology in conservation project design, management, and monitoring in order to help practitioners improve the practice of conservation.

Outcome: statement detailing desired impact of project, such as the desired future status of a conservation target or human well-being interest. An outcome

statement should be linked to conservation targets and/or connected human well-being interests, impact oriented, measurable, time limited and specific.

Outcome Mapping: "an approach to planning, monitoring and evaluation that puts people at the centre; defines outcomes as changes in behavior; and helps measure contribution to complex change processes." www.outcomemapping.ca

Primary interests: A general term for the topics that planning organizations, influential actors, and important stakeholders care about in the context of the socio-ecological system or problem, and their desires for conservation. There are two major types of primary interests: nature (i.e., biodiversity, conservation target) and people (i.e., human well-being interest). Typically draft goals and outcomes are set for only a subset of identified primary interests.

Relevant groups: the people that are affected - positively or negatively - by environmental change and conservation actions.

Results Chain: A results chain is a diagram that depicts the assumed causal linkage between an intervention and desired impacts through a series of expected intermediate results.

Return on Investment (ROI): A performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. In conservation strategies, return on investment assess the increase in the conservation outcomes per unit cost of the conservation action.

Situation analysis: an assessment that identifies and weighs the key challenges affecting primary interests in a place or problem, including the political, socioeconomic, institutional, and ecological factors creating impacts or threats, driving change, and providing opportunities for conservation intervention.

Social safeguards: are a means to ensure we uphold human rights and achieve long-term sustainable conservation outcomes in addition to being a risk assessment and mitigation tool.

Socio-Ecological System: defined by Singh et. al 2012 as: 1) a coherent system of biophysical and social factors that regularly interact, 2) a system that is defined at several spatial, temporal, and organizational scales, which may be hierarchically linked, 3) a set of critical resources (natural, socioeconomic, and cultural) whose flow and use is regulated by a combination of ecological and social systems, and 4) a perpetually dynamic system with continuous adaptation.

Stakeholder: Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

Strategy: The set of actions or interventions that a project implements in order to achieve a desired impact for nature and people.

Strategy Mapping: spatial representation of the impact of different candidate strategies, based on the distribution and status of conservation targets, human well-being targets and threats, and mapping of enabling conditions of intermediate results.

Systemic Change: refers to creating or strengthening the social, economic, political, and cultural systems that comprise and sustain a socio-ecological system.

Theory of Change: The description of a sequence of events that is expected to lead to a particular desired outcome. It shows a causal pathway from the current to the desired situation by specifying what is needed for goals to be achieved, articulating underlying assumptions which can be tested and measured.

Whole System: a term commonly used by the Conservancy to describe social-ecological systems, which have a recognizable, unifying ecological or physical feature. They are large enough to be resilient to significant disturbances and sustain ecosystem services that human communities rely on as well as key ecological processes. Whole systems are mosaics of high ecological integrity areas embedded in a matrix of lands and waters that vary in quality but are critical for providing habitat, increasing effectiveness of protected areas, and contributing to connectivity.

Further Reading and Resources

General

"Conservation Measures Partnership." *Conservation Coaches Network*. CCNet. Web. 04 Mar. 2016. http://www.conservationmeasures.org/

Groves, Craig, and Edward T. Game. *Conservation Planning: Informed Decisions for a Healthier Planet*. Arlington: Nature Conservancy, 2015. Print.http://www.roberts-publishers.com/biology/conservation-planning-informed-decisions-for-a-healthier-planet.html

"Home - Conservation Coaches Network." *Conservation Coaches Network*. CCNet. Web. 04 Mar. 2016. http://www.ccnetglobal.com/

"Home - The Open Standards for the Practice of Conservation." The Open Standards for the Practice of Conservation. Conservation Measures Partnership. Mar. 2016. http://cmp-openstandards.org/

Singh, S.J., Haberl, H., Chertow, M.R., Mirtl, M. and M. Schmid. *Long Term Socio-ecological Research: Studies in Society-nature Interactions across Spatial and Temporal Scales*. 2013 ed. New York: Springer, 2012.

Stachowiak, Sarah. "PATHWAYS TO CHANGE: 10 Theories to Inform Advocacy and Policy Change Efforts." *PATHWAYS TO CHANGE: 10 Theories to Inform Advocacy and Policy Change Efforts*. ORS IMPACT, Oct. 2013. Web. <http://orsimpact.com/wp-content/uploads/2013/11/Center_Pathways_FINAL.pdf>.

Working with People

Social safeguard guidance provided by other agencies:

- U.S. Environmental Protection Agency's Guidance on Environmental Justice in the National Environmental Policy Act,
- World Bank Environmental and Social Safeguard Policies,
- Asian Development Bank Safeguards,
- African Development Bank Safeguards,
- Inter-American Development Bank Safeguards.

Human well-being frameworks

- the Millennium Ecosystem Assessment's Ecosystem and Human well-being framework
- the World Bank's Attacking Poverty Framework.

Conservancy – internal portal that provides guidance for engaging with communities impacted by commercial development projects

In Support of the Five Phases of Conservation by Design 2.0

Identify Challenges & Goals

"Situation Analysis - Conservation Coaches Network." Situation Analysis. Conservation Coaches Network. Web. 11 Mar. 2016.

Map Strategies and Places

Foundations of Success. 2009. *Using results chains to improve strategy effectiveness: an FOS how-to guide.*Foundations of Success, Bethesda, Maryland, USA. [online] URL: http://www.fosonline.org/resource/using-results-chains

Margoluis, R., C. Stem, V. Swaminathan, M. Brown, A. Johnson, G. Placci, N. Salafsky, and I. Tilders. 2013. Results chains: a tool for conservation action design, management, and evaluation. *Ecology and Society* 18(3): 22.

"Results Chain - Conservation Coaches Network." Results Chain. Conservation Coaches Network. Web. 11 Mar. 2016.

Define Outcomes

Evans, Kirsten, Kristin Clay, Eleanor Morris, Beth Wheatley, Kimberly Holbrook, and Georgina Melendez. "Policy and Measures Working Group Observations and Recommendations." Policy Measures Working Group. The Nature Conservancy, Mar. 2015. Web. https://connect.tnc.org/practices/measures/policy/_layouts/15/WopiFrame.aspx?sourcedoc=/practices/measures/policy/Policy%20measures%20resources/Policy%20Measures%20Working%20Group%20Final%20Report.pdf&action=default

Take Action

Please see the Conservancy's Highly Effective Teams site for project management guidance and information

Monitor and Adapt

"A Primer for Monitoring Water Funds: GLOBAL FRESHWATER PROGRAM." Water Funds_Monitoring Primer. The Nature Conservancy, June 2013. Web. http://www.fondosdeagua.org/sites/default/files/Water%20Funds_Monitoring%20Primer_TNC_2013.pdf

Ambrose, Kaia, and Steff Deprez. "Outcome Mapping Practitioner Guide." Outcome Mapping Practitioner Guide. Outcome Mapping Learning Community. Web. 11 Mar. 2016.

Cottingham P., Quinn G., Norris R., King A., Chessman B. and Marshall C. (2005). Environmental Flows Monitoring and Assessment Framework. Technical report. CRC for Freshwater Ecology, Canberra.

Creswell, J., and Clark, V. (2010). *Designing and Conducting Mixed Methods Research*. Sage Publications. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1753-6405.2007.00097.x/full

Davies, R., and J. Dart. (2005). *The 'Most Significant Change' (MSC) Technique: A Guide to Its Use*. Vol. 1. London: CARE International. Web. Apr. 2005. http://www.mande.co.uk/docs/MSCGuide.pdf

Dunn, K. (2005). Interviewing. In L. Hay (Ed.), *Qualitative Research Methods in Human Geography* (Vol. 2nd, pp. 79–105). Oxford: Oxford University Press.

"How EPA Manages the Quality of Its Environmental Data." *How EPA Manages the Quality of Its Environmental Data*. US Environmental Protection Agency, 7 Jan. 2016. Web. 04 Mar. 2016. http://www.epa.gov/quality/qs-docs/g5s-final.pdf

Hurlburt, S. H. (1984). Pseudoreplication and the design of ecological field experiments. Ecological Monographs, 54(2), 187-211.

McDowell, L. (2010). Interviewing: Fear and Liking in the Field. In D. DeLyser, S. Herbert, S. Aitken, M. Crang, & L. McDowell (Eds.), *The SAGE Handbook of Qualitative Geography* (pp. 156–171). London: Sage Publications, Ltd.

Meals, D. W., Dressing, S.A., and Davenport, T. A. (2010). Lag time in water quality response to best management practices: A review. Journal of Environmental Quality, 39, 85–96. doi:10.2134/jeq2009.0108 http://ebookbrowse.com/gdoc.php?id=73575476&url=99e90aac15f6873643d06e46ae1234b4

"Measures Demystified Training." *Measures Demystified Training, Module 2: Measures Fundamentals, Module 3: Situation Analysis, and Module 5: Theory of Change and Logic Models.* The Nature Conservancy, 2013. Web.

15 Mar. 2016. <http://www.conservationgateway.org/ExternalLinks/Pages/measures-demystified-trai.aspx>.

Montambault, J.R. and Groves, C.R. (2009). Improving conservation practice by investing in monitoring strategy effectiveness. Conservation Measures Working Paper 2. The Nature Conservancy, Arlington, Virginia, U.S.A.

Morgan, S. L. and Winship, C. (2007). Counterfactuals and causal inference: Methods and principles for social research. Cambridge, United Kingdom: Cambridge University Press.http://ebooks.cambridge.org/ebook.jsf?bid=CBO9780511804564

National Water Quality Handbook. Washington, DC: US Department of Agriculture, 2003. US Department of Agriculture, Sept. 2003. Web. (Part 614, Chapter 3: Objectives and Part 615, Chapter 6: Hypothesis Testing) http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044775.pdf

"Natural Resources Conservation Service." *Conservation Effects Assessment Project (CEAP)*. US Department of Agriculture. Web. 04 Mar. 2016. http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap

"Participatory Survey Methods for Gathering Information." *Participatory Survey Methods for Gathering Information*. Food and Agriculture Organization of the United Nations. Web. 04 Mar. 2016.http://www.fao.org/docrep/W8016E/w8016e01.htm#knowledge,%20attitude%20and%2practice%20surveys.

Quinn, G. P., and Keough, M.J. (2002). Experimental design and analysis for biologists. Cambridge, U.K.: Cambridge University Press.

Sayer, A. R. (2000). *Realism and Social Science*. London: Sage Publications.

Sokal, R.R., and Rohlf, F.J. (1995). Biometry: The principles and practice of statistics in biological research (3rd ed.). New York: W.H. Freeman.

Wilder, L., and M. Walpole (2008). Measuring social impacts in conservation: experience of using the Most Significant Change method. Oryx, 42, pp 529-538. doi:10.1017/S0030605307000671. http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=2450648http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=2450648

Williams, B.F., R.C. Szaro, and C.D. Shapiro. Adaptive Management: The U.S. Department of the Interior Technical Guide. 2nd ed. Washington, DC: US

Department of Interior, 2009. US Department of Interior, 2009. Web. https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/TechGuide.pdf

Wood, L. (2011). Global marine protection targets: How S.M.A.R.T are they? *Environmental Management*, 47*(4)*, pp. 525-535. http://link.springer.com/article/10.1007%2Fs00267-011-9668-6?LI=true

Zar, J.H. (2009). Biostatistical Analysis (5th ed.). Upper Saddle River, N.J.: Prentice Hall.

Additional Citations

The clipart used throughout the document is attributed to the following sources:

 ©Martin Lebtreton/Noun Project,  ©Peter D/Noun Project,

 © AnsteyDesign/Noun Project

APPENDICES

APPENDIX A: Summary of Minimum Standards Questions for Each Step of CbD 2.0

1. Specify Planning Context:
   a) Have the target audience(s) that are expected to take action been identified, along with a draft list of the products each needs from the planning and implementation process?
   b) Is the effort scoped to solve conservation challenges that will meaningfully benefit the organization's mission or project team's goals?
   c) Were existing science-based organizational analyses considered when identifying the conservation challenges or socio-ecological system to focus on?
   d) Is the geographic scope at the right scale to identify strategies that can achieve systemic change?
   e) Is the effort scoped to solve conservation challenges that will meaningfully benefit nature?

2. Conduct a Situation Analysis
   a) Do the planning team, partners, key stakeholders and relevant experts agree that the situation analysis diagram is a reasonable reflection of the current conditions and provides a common understanding?
   b) Have the following vague terms been replaced with specific conservation primary interests or components of human well-being: health, community well-being, human well-being, resilient communities, livelihoods, biodiversity, environmental health, thriving communities, social benefits, economic benefits, etc.?
   c) If you have any human well-being endpoints that do not specify a relevant group, did you consider whether all people are equally affected?
   d) Do at least some linkages in the situation analysis diagram reflect unexpected or newly identified connections in the system? (Even in systems we know well, it's very unlikely that we know everything important that's going on. If you learned about no new links from this process, your situation analysis was likely not broad enough and should be revisited).
   e) Does evidence confirm that selected key challenges relate to strong linkages in the system? Don't throw out new linkages just because there isn't a strong evidence base – flag this for further exploration and evidence collection.
   f) Does the diagram show how key challenges are connected both to nature and to some specific components of human well-being? (Even if human well-being is not a primary interest, it is highly unlikely that conservation primary interests are in no way connected to people. Revisit the diagram

with additional experts if needed to ensure plausible pathways between nature and people have been fully explored).

3. Draft Goal Statement
   a) Does the minimum goal describe a vision for conservation success consistent with the long term viability of conservation targets and systemic improvement in connected elements of human well-being? Note that the minimum goal may be an important intermediate result that will enable the team to achieve the outcomes of the project over a time period that extends beyond the plan.
   b) Do key stakeholders agree that the minimum goal is sufficient and representative of their interests at the intersection of conservation?

4. Share Advances in Knowledge Through Relevant Pathways
   a) Are knowledge products and planned dissemination pathways tailored to specific, target audiences?
   b) Has the team reviewed intangible lessons and shared ideas for communicating these through peer-learning opportunities?
   c) If major process-based or knowledge advances were made through the effort, has a Lessons Learned or Case Study document been considered?

5. Identify Candidate Strategies
   a) Did your process produce multiple strategies for further consideration?
   b) Did your process generate at least one novel strategy for consideration?
   c) Did you consider, at a high level, all major negative and positive impacts of candidate strategies on stakeholders and vulnerable people?

6. Construct Results Chains
   a) Do your results chains start with a key challenge and end with a desirable state?
   b) Are your intermediate results necessary and sufficient to achieve your desired outcomes?
   c) Does your results chain show the intended positive outcomes for conservation and any intended, linked positive outcomes for human well-being from the proposed conservation action?
   d) Did you explicitly consider additional (unintentional) outcomes, including both positive and negative outcomes from the strategies considered?
   e) Do all links in your chains reflect no more than one testable assumption (i.e. there are not “leaps of faith” or “then a miracle happens” gaps in logic)?
   f) Have you evaluated and recorded the strength of evidence for each of your assumptions and linkages?
   g) If your results chain outcomes are quantified, will they be sufficient to determine whether the strategy meets the minimum goal(s)?

7. Strategy and Opportunity Mapping
   a) Did you document the assumptions, sources and methodologies used in the process to map your strategies?

b) Does your analysis allow quantitative comparison of each strategy's impact on metrics of the elements in your minimum goal statement relative to the impacts of a 'business as usual' projection?
c) Do stakeholders and external experts understand and generally agree with your impact estimates?
d) If a strategy is pursued, will your analysis inform where to target implementation and where tangible conservation outcomes are expected to be achieved?
e) Do cost estimates allow comparison of the conservation ROI of alternative strategies? Have you included the costs of monitoring and evaluation?
f) Have the anticipated benefits of a strategy to people been quantified in a way that is relevant and defensible for stakeholders?

8. Select Strategy or Strategies
   a) Will selected strategies, if successful, achieve the minimum conservation goals?
   b) Are investments allocated to strategies with relatively high conservation ROI?
   c) Do high-risk strategies have appropriately high reward if successful? Be sure to evaluate who is bearing the risk and who stands to benefit from the reward.
   d) Are mitigation plans in place for dealing with risks associated with unintended consequences, e.g. reputational risk, and risk of impacts to indigenous peoples and vulnerable populations? Were the mitigation plans developed through a participatory process with the primary stakeholders who may be affected?

9. Share Advances in Knowledge Through Relevant Pathways
   a) Will selected strategies, if successful, achieve the minimum conservation goals?
   b) Are investments allocated to strategies with relatively high conservation ROI?
   c) Do high-risk strategies have appropriately high reward if successful? Be sure to evaluate who is bearing the risk and who stands to benefit from the reward.
   d) Are mitigation plans in place for dealing with risks associated with unintended consequences, e.g. reputational risk, and risk of impacts to indigenous peoples and vulnerable populations? Were the mitigation plans developed through a participatory process with the primary stakeholders who may be affected?

10. Articulate Theory of Change
    a) Is the logic describing why your strategies will lead to the stated outcomes clear, supported by strong results chains and evidence, and compelling to those reading your theory of change for the first time?

11. Define Measures and Create a Monitoring and Evaluation Plan
    a) Will the monitoring and evaluation plan ensure that essential information gaps are filled?
    b) Has the existing strength of evidence informed a conservation strategy's risk and leverage as it relates to the level of investment in monitoring and evaluation plans?
    c) Are there indicators for both positive and potential negative outcomes for both people and nature, which were developed in partnership with potentially impacted stakeholders?
    d) Does the monitoring and evaluation plan include collecting baseline data?
    e) Has there been full exploration and consideration of secondary data from government, NGO, indigenous organizations, community organizations, and other firms or agencies for environmental and socioeconomic data to avoid duplicating data collection efforts and opportunities to fill gaps?
    f) Have specific audiences, the intended use of information, and needed level of rigor been defined for each indicator?
    g) Have plans been created that clearly define the design, collection, management, evaluation, and reporting procedures and responsibilities for data?
    h) Do the monitoring and evaluation plans clearly articulate how the data will be analyzed, updated, and then shared to relevant audiences in culturally appropriate ways?
    i) Do the monitoring and evaluation plans provide a realistic budget sufficient for monitoring over a long enough period of time to detect anticipated outcomes and impacts?
    j) Will monitoring design and evaluation approaches (e.g. research design and statistical methods) and sampling be conducted by qualified professionals?

12. Implement Strategy(ies) Using Sound Project Management
    a) Does your charter identify the roles required to implement the project and specify decision-making authorities?
    b) Does your workplan include a timeline that specifies when conservation outcomes will be achieved?
    c) Do you know where additional capacity is needed and have a plan to build or obtain capacity needs?
    d) Do you know when and how you will engage and inform stakeholders during implementation?

13. Evaluation
    a) Was the monitoring data that you collected evaluated by a qualified analyst in a timely manner?
    b) Were communication products developed for key audiences?

14. Adapt
    a) Have you reviewed the results of monitoring, analyzed the data, and drawn conclusions about impacts and implications?
    b) If anticipated progress is not being made, was workplan, or staffing capacity, or theory of change revised?
    c) If the strategy currently being implemented is substantively different from what was initially planned, was it re-evaluated to ensure that it will still achieve goals, will incur acceptable risks and is supported by evidence?
    d) Has the information been shared with stakeholders in a format appropriate to the particular audience?

APPENDIX B: The Conservation Coaches Network

CCNet evolved from The Nature Conservancy's Efroymson Coaches Network and was chartered in 2009 by the Conservancy, WWF, Greening Australia and Foundations of Success to help meet the growing need to train and support coaches of the Open Standards. CCNet aims to improve conservation by empowering people to develop, implement, evaluate, adapt and share effective strategies that achieve tangible conservation results benefitting both people and nature all over the world. As of 2016 CCNet includes over 500 trained coaches from 60 countries, six continents and more than 160 organizations. Formal franchises cover North America, Europe, Australia, China, Mongolia, Indonesia & Malaysia, South Asia, Pacific Islands, Africa, MesoAmerica, and South America. In addition, a "Teaching Adaptive Management" group helps organize the teaching of the Open Standards in universities around the world. Coaches not only teach practitioners and teams the basic principles of the Open Standards; they also help teams identify strategies, develop measures, explicitly articulate and capture their uncertainties, and encourage on-going assessment and continuity of effort. Coaches link practitioners with other support services and identify peer projects where project leaders can find additional review and support for similar challenges. In this way, coaches have supported thousands of conservation projects.

In addition to providing coach trainings around the World, CCNet keeps a Listserve where practitioners interact virtually; produces a bi-annual edition of CCNet News where coaches share news in their own words; maintains content on a website; and hosts an in-person global community gathering every two years called the CCNet Rally where peers teach peers and where adaptations and method improvements are shared.

While CbD 2.0 is new to everyone, and departs in some important ways from the Open Standards, CCNet offers access to coaches within and beyond the Conservancy who can teach practitioners and teams the basic principles of applicable aspects of the Open Standards. A list of CCNet coaches can be found here.

APPENDIX C: Social Safeguard Questions and FPIC

1. Has free, prior, and informed consent (FPIC) of primary stakeholders been obtained for activities affecting lands and other resources traditionally occupied and/or used by those stakeholders? Is there a plan for ongoing engagement with stakeholder groups to ensure FPIC as the program evolves? More information about the applicability of FPIC to Conservancy projects is provided at the end of this appendix.
2. If applicable, does the project fully consider the dignity, human rights, traditional knowledge, and cultural heritage and practices of people affected by the project? What actions or considerations account for these aspects? Special consideration should be given to understanding who holds customary and formal rights and access to land and natural resources vital to livelihoods, and socio-cultural and human development. One resource for identifying lands with legal or customary rights and uses claimed by indigenous peoples can be found here. Note that customary rights or legal tenure also apply in many other contexts (e.g., water use [Western US water rights], land use in politically contended areas [e.g. small plot farming in Colombian Andes], recreational access [e.g. use of county easements for river access by minority groups for swimming or fishing]), etc.
3. If the project contributes to sustainable economic and human development, is it done in a manner that is socially and culturally appropriate for the primary stakeholders?
4. Is full consideration given to how to share or distribute benefits (e.g. recreational access, media attention, market access, representation in decision processes, increased income) from the project equitably, fairly, and transparently?
5. How does the project ensure that adverse effects from conservation programs are assessed, prevented and mitigated for affected groups?
6. Are all stakeholders being given the *opportunity* to meaningfully participate in the conservation planning and implementation process? How does the project ensure full and effective participation throughout the project cycle? Has consideration been given to the most vulnerable, disadvantaged, and marginalized groups, or those who lack voice and decision-making power who may be affected (positively or negatively) by the project? These groups may include indigenous peoples, communities dependent on the local environment, racial and ethnic minority groups, women, children, and the elderly.
7. If applicable, does the project intentionally benefit gender equality, equity, and women's empowerment?
8. Does the project support transparency and accountability of natural resource conservation and good governance by consistently disclosing and sharing information about intervention plans with primary stakeholders in a culturally appropriate manner?
9. Does the project comply with applicable local and national laws, international treaties and conventions, and other relevant rules?

10. Is there an accountability system that is transparent and accessible for primary stakeholders to share concerns or file complaints about the conservation program? Accountability systems should ensure timely responses to stakeholders, and also monitor the effectiveness of the corrective actions.
11. If there is a significant risk of adverse impacts that directly threaten marginalized groups, or that threaten the project (e.g., through reputational, financial, or legal risk), is there a monitoring system in place to track adverse impacts?

Understanding when FPIC (Free, prior and informed consent) is needed

FPIC is the principle that anyone has the right to give or withhold information or knowledge that they possess, and any community or individual has the right to give or withhold consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use.

FPIC has two general applications in conservation work:

1) FPIC is required for any project work that will affect lands or resources owned, managed, occupied or used by others. For example, when you ask permission to enter a privately owned parcel of land in the U.S., that permission is a version of FPIC. We follow the same practices for all types of lands – privately owned, communally owned, or traditionally occupied lands, or other resources affected by our projects.

2) FPIC applies whenever you are collecting information from an individual or group of people. In this case, they have the right to understand what you plan to do with the information, and then with that understanding, decide whether or not they want to answer your questions, and how they wish the information they share to be used. When a reporter asks someone they are interviewing if they are willing to go 'on the record', that is a form of securing FPIC. The person being interviewed knows who the reporter works for, can ask any questions about the use of the information they share, and knows that if they speak on the record, anything they say can be used publicly. Choosing to speak 'off the record' is a choice the individual can make that limits the way the information they share can be used.

For both applications described above, FPIC is commonly secured via simple verbal consent – please see this guidance on informed consent scripts and elements. It is important to follow this FPIC protocol to ensure transparency, the right of the individual to choose to share or withhold information, the appropriate and expected use of shared information, and to limit legal risk.

Finally, when the intent of gathering information from people is to provide generalizable knowledge, a stricter form of FPIC is required as the Conservancy has an SOP that covers research involving human subjects. Please visit the CONNECT page maintained by the Office of the Chief Scientist for more information and resources about Conservancy staff conducting human subject research.

APPENDIX D: Consideration of Human Rights in Conservation Projects: The Nature Conservancy's Approach

With 18 percent of the world's land formally designated for indigenous and local communities, and with their lands containing 20 percent of global forest carbon, and much of the world's biodiversity, indigenous peoples are important partners. The Nature Conservancy has two primary documents guiding our work with indigenous peoples. First is the Conservancy's guidance, that is currently in development, for working with indigenous peoples. Second is the Conservation Initiative on Human Rights (CIHR) framework. The Nature Conservancy is a founding member and signatory of CIHR, committing to support and promote the protection and realization of human rights within the scope of our conservation programs throughout all stages, including the design, implementation and monitoring. The CIHR outlines the following guidelines:

- **Respect human rights.** Respect internationally proclaimed human rights, and make sure that we do not contribute to infringements of human rights while pursuing our mission.
- **Promote human rights within conservation programmes.** Support and promote the protection and realization of human rights within the scope of our conservation programmes.
- **Protect the vulnerable.** Make special efforts to avoid harm to those who are vulnerable to infringements of their rights and to support the protection and fulfillment of their rights within the scope of our conservation programmes.
- **Encourage good governance.** Support the improvement of governance systems that can secure the rights of Indigenous Peoples and local communities in the context of our work on conservation and sustainable natural resource use, including elements such as legal, policy and institutional frameworks, and procedures for equitable participation and accountability.
- **Address conservation-human rights links in the design, implementation and monitoring of our programmes.** This can be done by:
    - Undertaking impact assessment and consultation in advance of conservation interventions.
    - Conducting prior evaluation of the scope of proposed conservation policies, programmes, projects and activities, so that the links between human rights and conservation are identified. Further, it is important to ensure potentially affected persons are informed, properly consulted, and able to participate in decision making about relevant interventions. This includes respect for the right of Indigenous Peoples and local communities with customary rights to lands and resources to free, prior, informed consent to interventions directly affecting their lands, territories or resources. One resource for identifying lands with legal or customary rights and uses can be found here.

    - Reflecting local concerns in design and implementation. Ensure that the design and implementation of conservation interventions reflect prior evaluation and participatory decisions.
    - Monitoring and adapting. Monitor and evaluate interventions and their implications for human rights, as a basis for ongoing improvement.
- **Establish accountability measures.** Establish processes to monitor and evaluate compliance with our policies and principles on a regular basis. Include effective, accessible, and transparent procedures to receive and resolve complaints.
- **Apply the policies and principles in agreements with subcontracting organizations and implementing partners.** Include appropriate provisions on compliance with these policies and principles in subcontracts, partnership agreements and capacity-building activities with other implementing organizations.

In addition, the Conservancy recommends the following guidance on social safeguards for when teams are working with indigenous peoples.

- Free and Prior Informed Consent (FPIC) is a specific right for indigenous peoples as recognized by the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). When working on projects with indigenous peoples, FPIC should be sought at the earliest stage possible (and throughout the lifecycle of the project or program, if it proceeds), to understand the indigenous peoples' priorities, concerns and perspectives, and to share information about all aspects of the project. Remember that consent is not an "end point," but an on-going process rooted in relationship management, accountability, and transparency. As it arises from a human rights framework, the principle of FPIC does not define consent as a simple "yes" to a predetermined decision, or as a means to validate a program or activity that may disadvantage affected indigenous peoples. Consent must be given freely, justly, and on an informed basis that protects indigenous peoples' rights. Ensure the meaningful participation of indigenous peoples, and do not carry out a project or activity where they have refused to engage or give their consent.
- Indigenous communities should define for themselves their own intellectual and cultural property, and requirements for its protection.
- The conservation project should respect the rights of indigenous peoples to pursue their own development priorities for their lands and territories.
- Address and work to avoid any imbalances of power that may arise between the Conservancy and indigenous peoples, as well as potentially marginalized subgroups, in the case where the parties' interests are not shared. Has engagement with indigenous peoples been carried out via their own representative institutions and in adherence with their culture and traditions?
- Indigenous women often face double discrimination as indigenous persons and as women. It is important to pay particular attention to the potential impacts of conservation projects on indigenous women during each stage of the project, while respecting indigenous peoples' own laws and institutions.

- Provide access to redress through grievance mechanisms that are: accessible, predictable, transparent, effective, rights-based, respectful, appropriate, and responsive.
- Is a formal agreement in place with the impacted communities? This may be a helpful tool for clarifying roles, responsibilities, and expectations; ensuring transparency and accountability; and protecting the community's rights. In any agreement with indigenous peoples, include, as appropriate, specific terms to safeguard and promote indigenous peoples' exercise of their rights, mitigate any adverse impacts, ensure fair compensation and benefit-sharing, and provide for meaningful indigenous participation in managing the project.

APPENDIX E: Detailed Explanation of the Conservancy's Human Well-Being Focal Areas and Associated Components.

This appendix provides a more detailed description of the eight focal areas in Conservation by Design 2.0 human well-being framework. Focal areas provide a starting point for systematically considering how human well-being is directly and indirectly affected by nature and conservation actions. They are purposefully broad, and are meant to be intuitive to lay audiences yet specific enough to lend themselves to study. Because human well-being is context-dependent and often locally defined, it is important to engage early with stakeholders to explore if there are any missing focal areas or components. It is also important to work in partnership with stakeholders determine the specific desired components of each focal area. For example, a project proponent may assume women in a village want to walk less distance to get water, while the women actually prefer to walk a greater distance, as this may be their only opportunity to leave the house and bond with each other. In other villages, walking to get water may be one of the most dangerous activities for women, and walking less distance to get water may be an urgent matter of personal safety. In all these situations it is important to seek out the particular stakeholders involved and engage in a time, location and language that is comfortable for them, to ensure that these focal areas and components are well-understood to those involved in designing and carrying out the project.

Note that equity is a crosscutting focal area that touches on the distribution of the other seven focal areas. For instance, a conservation strategy aiming to decrease heat island effects in urban areas may only benefit wealthier areas of the city. Here the benefits may be decreased household energy costs via decreases in air conditioning use. The benefits are unequally distributed, further exacerbating the disparity between advantaged and disadvantaged populations. The impact of conservation programs is unlikely to be the same across the population, and it is important to pay particular attention to how risks and benefits vary by subpopulation (e.g., women, children, the elderly, low income, indigenous groups). Using stakeholder analysis and engaging early on and throughout the project life-cycle with subpopulations can provide insight into the potential negative impacts from a conservation strategy. It is important to consider not just overall negative impacts (e.g., jobs decrease as a result of a protected area), but the distribution of any negative impacts (e.g., job losses particularly high among indigenous groups). Special attention should be paid to historically disadvantaged groups or groups that may lack voice and agency (see Risks below). Depending on the context, this can include groups such as women, indigenous groups, and children.

Table 6: Focal area definition with example components

Focal Area: Living standards
This captures the material needs of basic life including income, wealth, material goods, and necessities. Common components include income (or poverty), shelter, access to clean water, belongings (bike, television, car), and material wealth (savings, assets). Conservation may *directly* affect living standards through activities such as lending programs (microfinance), policies that increase or limit access to natural resources (protected areas or no-take zones that reduce or increase harvest rates or income), subsidies or incentives including payments (income), or materials (fencing, housing materials, water infrastructure). Other strategies may *indirectly* affect living standards by improving environmental conditions that support the provision of basic needs. This can include water filtration by healthy watersheds, wood availability for charcoal or home construction, sustainable forage productions in cultures where livestock are used for income and/or as assets, sustainable harvest of environmental products sold for income (fish, rattan, bushmeat, timber), or opportunities for recreational activities that generate income. **Example components for living standards:** Income, shelter, assets
Focal Area: Health
Health relates to any component of people's mental or physical condition. Health captures everything from nutrition to cognitive function, prevalence of vector-borne diseases, to life expectancy. Conservation projects may invest directly in improving health to enable greater participation in conservation, as the Conservancy did for maternal health in Lake Tanganyika. Changes in the environment can also affect health indirectly through nutrition by altering the availability of food (protected areas, sustainable harvest, agricultural intensification, pollination, pest control), through respiratory health by expanding forests that can filter particulates from the air, stopping unplanned forest fires whose smoke can cause pneumonia or lower child birth weight, or by providing places for contemplation and exercise that alter attention and mood (mental health). **Example components for health :** Nutrition, cognitive function, vector-borne disease, mental health
Focal Area: Education
Education includes any transfer of knowledge, either through formal or informal means. For example, education captures learning new skills from neighbors, school attendance, traditional knowledge passed down from elders to youth, or technical trainings, among other modes. Conservation often has *direct* impacts on education, as many conservation strategies include training, capacity and education programs in concert with other interventions like protected area establishment, payments for ecosystem services, alternative livelihoods programs, or scientific tool development. Much outreach and communication is directly targeted towards education, while some efforts may also have *indirect* impacts on education. For example, recent research

suggests increasing nature in ambient environments can enhance a person's focus, mood, and ability to learn.

Example components for health: Technical training, school attendance, and literacy

Focal Area: Work and leisure

The most popular component of work and leisure is employment, but this focal area also includes time use, family life, and personal activities beyond work. Conservation can alter employment *directly* by creating or reducing the availability of jobs through strategies such as hiring park guards, buying out fishing quotas, and creating alternative livelihood options. Many conservation strategies are likely to alter time use *indirectly* by making resources more available such that people have to spend less time acquiring them. For example, sustainable grazing projects may increase forage enough so that herders have to spend less time taking livestock to graze, watershed investments may increase water supply or quality such that women and children have to spend less time walking to a clean water source, sustainable fishing practices may increase fish stocks so fishermen can stay closer to home and bring in a catch. Alternatively, marine protected areas may result in increased leisure and decreased employment by decreasing the area available for fishing.

Example components for work and leisure: Employment, labor market opportunities, freedom of choice over time, family life, personal life, personal activities

Focal Area: Governance

Governance is fundamentally about power, relationships, and accountability. In other words, who has influence and decision-making authority, and how are people or institutions held accountable? This focal area broadly captures components across local, national, and global scales, and in formal (laws) and informal (norms and taboos) forms. Conservation strategies commonly affect governance *directly*. This may be through processes like ensuring representative participation in a decision process, encouraging transparency, establishing benefits-sharing mechanisms, developing stakeholder groups and processes, establishing decision-making bodies (like water fund boards and sustainable grazing coalitions), and influencing policies (creation of protected areas, formalizing land tenure, establishing management zones, mitigation laws, agricultural subsidies). Incomplete or inappropriate engagement with stakeholders in any of these processes can negatively affect governance.

Example components for governance: Laws, norms, and taboos, rules, enforcement, corruption

Focal Area: Social cohesion

Social cohesion captures social capital, community connectedness, trust, and spiritual or cultural opportunity. Culture is broadly defined, and captures values familiar to conservationists such as aesthetic values and existence value (the interest in knowing a certain species of place exists, even if it is

never visited or seen). Conservation work can *directly* affect social cohesion when processes, laws, or regulations change group interactions (reducing conflict, increasing cultural exchanges, knowledge sharing) or alter access to places or resources that are spiritually, culturally, or communally important (re-establishing traditional harvest areas, securing access to culturally important species or places, restricting access to spiritual sites).

Example components for social cohesion: Intergroup cohesion, cultural and spiritual opportunity, trust, social network density

Focal Area: Security

This focal area captures not only physical security, but also other aspects of security including those critical to stable livelihoods such as economic, political, legal, and food security. Conservation may alter security *directly* by creating or enforcing conflict-related institutions (doing joint park patrols with government enforcers, creating peace discussion groups, establishing international trade bans), providing programs that diversify and/or stabilize income (alternative livelihoods, connecting to markets, job training), or helping to secure rights (land tenure, communal harvest rights, water access rights, management rights). Conservation may *indirectly* affect security by changing environmental conditions that drive conflict (increasing water supply, forage or crop production, timber growth, regulating or containing crop raiding wildlife), or improving or diversifying food sources.

Example components for security: Safety, income stability, food security

Focal Area: Equity

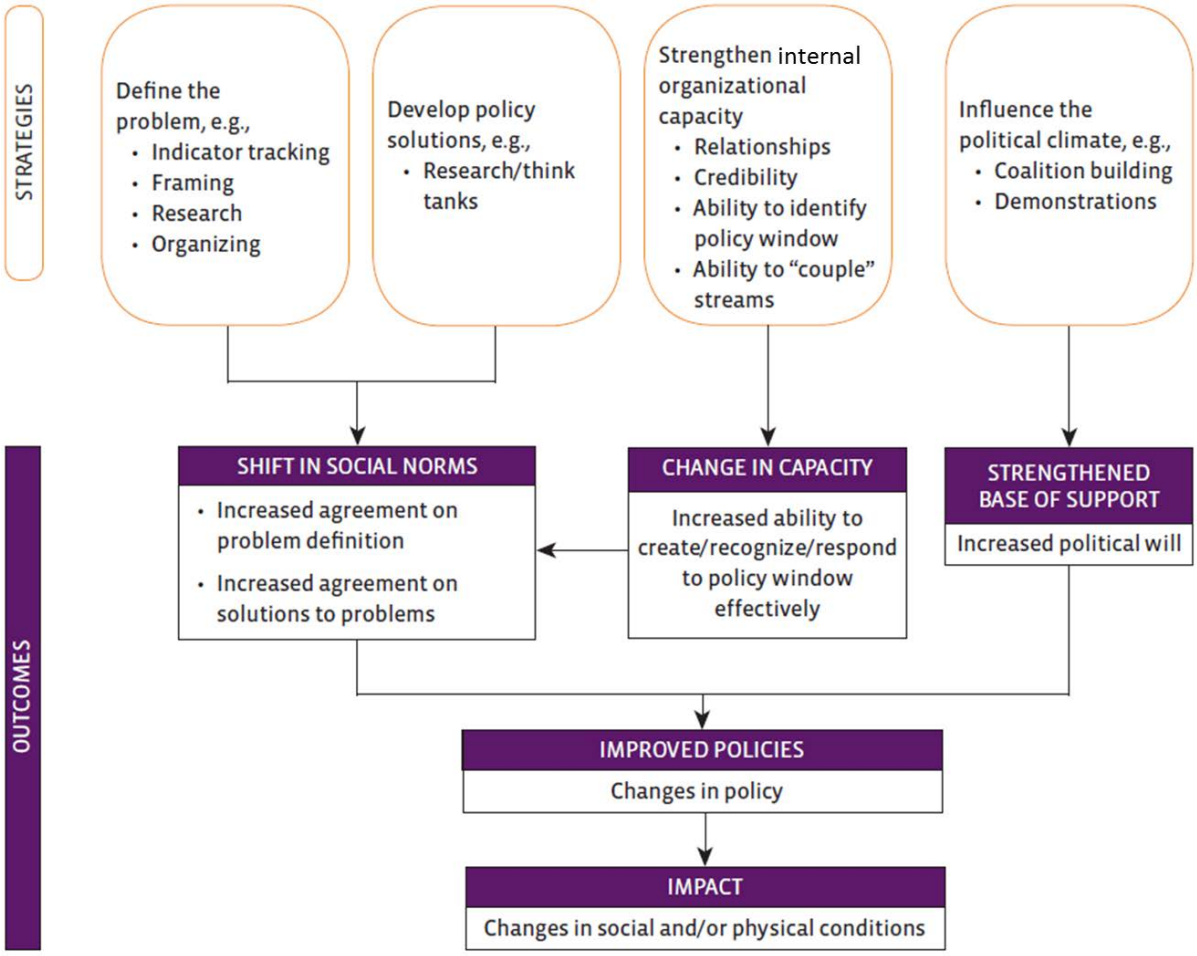
Equity refers to the fair distribution of benefits among people. This is very much a crosscutting focal area and should be considered in reference to every other focal area. There can be inequity in the distribution of food sources, pollution, income, educational opportunities, legal rights, jobs, housing, spiritual opportunities, and so on. Whenever human well-being is being considered, specific groups of people who may be affected differently should be identified, and attention should be paid to how impacts will accrue across these groups. As with all other focal areas, conservation has the potential to have both positive and negative impacts on equity. Our work will very often set up the potential for tradeoffs among groups (lost income to large corporate actors vs. gains in local employment), and clear identification of possible inequities can help design strategies that avoid them (see Social Safeguard guidance questions in DESIGN: Risks). Conservation can improve equity by providing benefits to vulnerable and underrepresented groups when possible.

Example components for equity: Gender income equity, age employment equity, representation in decision making

APPENDIX F: Guidance on Developing Policy Strategies and Theories of Change.

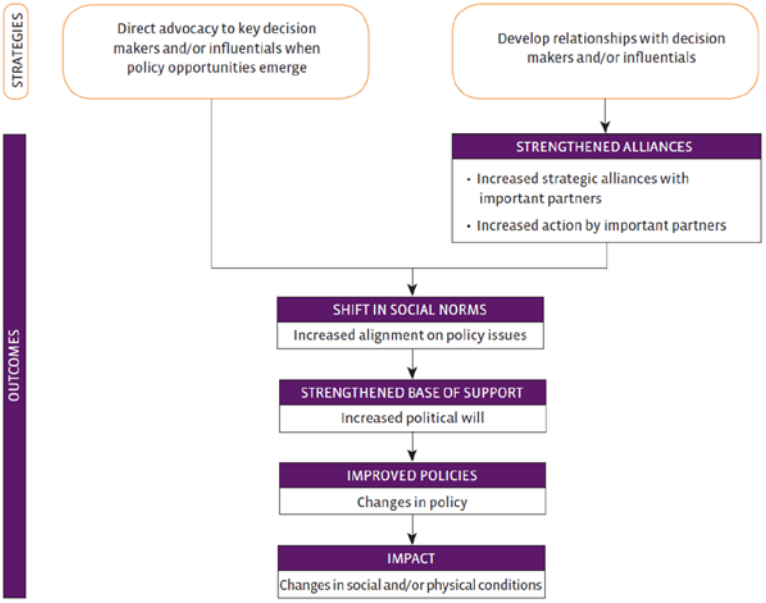
Below we offer three Theories of Change that have been commonly used by the Conservancy

"Policy Window" Theory of Change

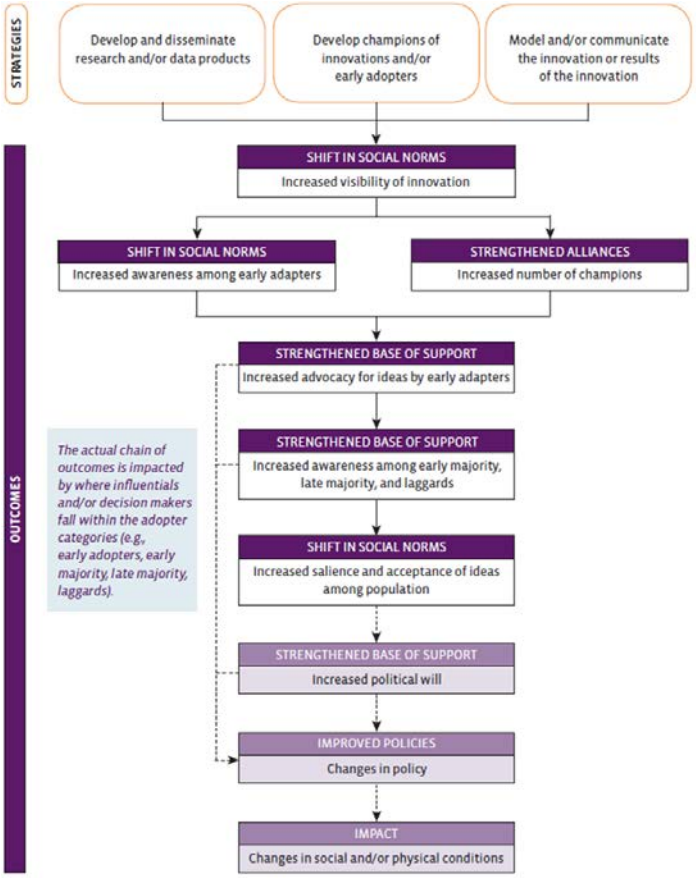


Source:
http://orsimpact.com/wp-content/uploads/2013/11/Center_Pathways_FINAL.pdf, internal citation

"Power Politics" Theory of Change



"Diffusion" Theory of Change



Source: http://orsimpact.com/wp-content/uploads/2013/11/Center_Pathways_FINAL.pdf, internal citation

Thinking beyond formal policy to change human behavior.

In most cases, achieving our goals for people and nature outcomes requires changing the behavior of key groups of people within the socio-ecological system(s) of interest. How we think about strategies that seek to change people's behavior on large scales is evolving. In the past we often focused on changing formal/government policy (international agreements, laws, regulations, funding), and increasingly on changing corporate policies as well. In the context of systems change, it may be more useful to think about policy more broadly than formal government policies and from a systems perspective as well. Instead, think of policy as a set of rules that guide people's behavior within the socio-ecological system of interest. Some of the rules are "written rules", like laws, regulations, or corporate policy. Other rules emerge from the structures and mechanisms we create to implement laws and policies, such as enforcement. Then there are the "unwritten or cultural rules" that guide people's behavior, such as the values, behavioral norms and mental maps that shape how people deal with and understand an issue. All of these "rules" – which may occur at different scales (global market forces, national laws, local regulations, local norms and beliefs) together guide people's behavior toward the conservation targets of interest. Framing/thinking about policy in this way may open up a much greater range of strategy alternatives than formal written policy and may in the end be more effective. For more on this concept of policy, see the Policy Working Group report (Evans et. al 2015).

APPENDIX G: Additional Instruction for Monitoring Design.

Monitoring can be designed to make a variety of comparisons, resulting in different analytical strengths. Cottingham et al. (2005) provide eight alternative monitoring frameworks to evaluate environmental responses to environmental flow management, listed in increasing strength of inference. These designs are applicable to a broad range of monitoring needs.

Cautious (low rigor/anecdotal)

1. Impact-only design. An activity has already been implemented (no before-activity data exist) and there are no spatial controls or reference sites, watersheds or groups being used for comparison; monitoring is limited to the site, watershed, or group where activities have been implemented. These responses can be evaluated against specific predictions based on the conceptual model. Causal links between temporal changes in responses are difficult if not impossible to determine because the changes might have occurred without the activities being implemented.

2. Reference-Impact design. A modification of (1) above, where there are no before-activity implementation data but the same parameters are monitored through time in a reference and impact site, watershed, or group, which represents the desired direction of change for the impact. This design provides slightly better evidence for a causal link between temporal change in response, because natural changes through time can be measured at reference sites as well. It is also possible to assess whether the trend of change at the impact location is towards the refer-ence condition, if that is desired.

3. Control-Impact design. Similar to (2) above except that comparison is with a control site, watershed, or group. This design provides stronger inference about causality because comparison with the spatial control reduces the likelihood that effects from activities are statistically confounded with natural change.

Somewhat certain (medium rigor/correlation)

4. Control-Reference-Impact design. This is a combination of (2) and (3) above. Statistical analyses test for divergence in temporal trends between the impact and the control, and for convergence in temporal trends between the impact and the reference site, watershed, or group. This design provides causal strength similar to (3), with the added advantage of assessing whether the trends are moving toward reference conditions, if that is desired.

5. Before-After-Impact design. This is a standard "impact analysis" design comparing parameter values before versus after activities have been implemented. The "before" data provide baseline or temporal control conditions. Evidence for causal links is limited by lack of spatial controls, therefore it is unclear whether or not the change would have occurred

independently of the activities being implemented. This design is also difficult to use if activities are implemented gradually, if there is a long lag-time for impacts to occur, or if the difference that occurs is not large.

6. Before–After, Reference–Impact (BARI) design. This is similar to (5) but with a spatial compo-nent –a reference site, watershed or group that provides some measure of whether natural changes coincide with changes seen in the impact site. This design also allows assessment of whether the trend of a response is towards the reference condition. The test of interest is whether any before-after difference at the impact location is the same as at the reference location. The causal inference associated with this design is limited because the reference and impact sites, watersheds, or groups have different conditions prior to activity implementation. This makes it difficult to rule out a response to other factors coinciding with the start of the implementation of the activity.

7. Before–After Control–Impact (BACI) design. Similar to (6), but using a spatial control instead of a reference. This design provides strong inference about causality because comparisons with spatial and temporal controls reduce the likelihood of confounding effects with natural spatial and temporal changes.

Certain (high rigor/counterfactual analysis)

8. Before–After Control–Reference– Impact (BACRI) design. A combination of (6) and (7) that provides strong evidence for causal links between activity and response, and also measures whether the change is towards reference condition, if that is desired.

Note that for all of these designs, inclusion of replicates improves the validity of control–impact contrasts. If you want to learn more about impact evaluation, consider this useful series of video lectures from the International Initiative for Impact Evaluation.

APPENDIX H: The Nature Conservancy's Approach for the Global-to-Regional Situation Analysis to help identify the most significant challenges to nature and people.

Context

Increasingly, people and nature face connected challenges presented by larger human populations, higher consumption rates, and diminishing and degrading natural resources, all intensified by a changing climate. While efforts by society to provide food, water, energy, and other resources for people have too often come at the expense of nature, there is a growing understanding that this 'vicious cycle' can be transformed into a 'virtuous' one, where nature – and the benefits it provides – are seen as part of the solution to pressing human needs at local to global scales.

In this context, Conservation by Design 2.0 advances a new vision statement for the Conservancy: We envision a world where the diversity of life thrives, and people act to conserve nature for its own sake and its ability to fulfill our needs and enrich our lives.

This vision statement raises an important question: What are the key challenges affecting nature and people that the conservation movement, and the Conservancy in particular, should focus on to make the greatest difference for the future of all life on Earth?

The global-to-regional situation analysis will take an important first step towards answering this question by providing an evidence-based framework to identify the major linked nature-people challenges that need to be addressed, given current conditions and projected future trends, to move towards a sustainable future. The global-to-regional situation analysis therefore supports our commitment to driving systemic change through strategic and coordinated conservation actions at local, regional, and global scales.

This work is being advanced by a technical team sponsored by the Chief Conservation Office and the Office of the Chief Scientist, in partnership with staff from the global programs (Lands, Water, Oceans, Cities, Climate) and all four regions (Africa, Asia Pacific, Latin America, North America). The analysis will be completed and released in 2016 to inform organizational priorities and to contribute to the dialogue in the broader conservation movement.

Approach

Appropriately, the global-to-regional approach uses the situation analysis approach described in is a Phase 1 of CbD 2.0. The entry point for this work is the socio-ecological system represented by the entire planet, both at a global

scale and sub-global scales represented by the regions where the Conservancy works (Africa, Asia Pacific, Latin America, North America).

The core questions being addressed by the global-to-regional situation analysis are as follows:

1. What are the key challenges to nature?
2. What are the key challenges to people and society?
3. Which are connected, and how? And where is there evidence for the strongest nature-people connections?

The answers to these questions inform the identification of significant conservation challenges that need to be addressed. This then lays the foundation for continued analysis, integrating and building on the many organizational conversations already underway, about strategies to address these challenges – with CbD 2.0 Guidance providing a structure for this analysis through results chains, strategy and opportunity mapping, theory of change, and other steps.

In conducting this work, we will leverage the substantial advances on science and strategies that have been developed recently by global programs, regions, and other business units that provide important organizational context.

Process

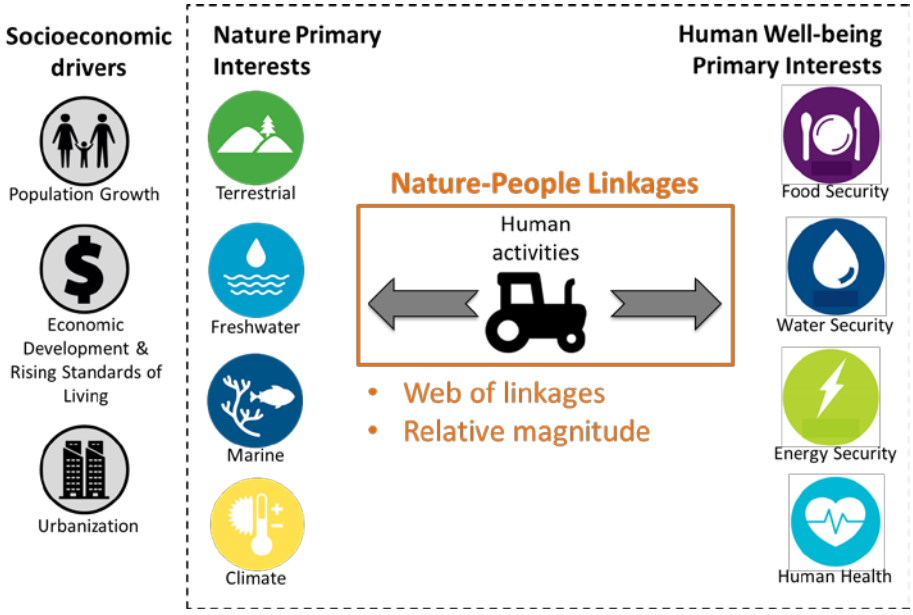
The analysis will begin with identifying the key challenges and connections at the global scale and then disaggregate and differentiate these challenges and connections for each of the major regions. Importantly, this approach will facilitate understanding of where major global and regional challenges are most strongly aligned to help focus efforts towards systemic change.

The general steps in the situation analysis are as follows, informed by the core questions stated above and the guidance for conducting a situation analysis:

- Identify primary interests that represent major focal points for nature (e.g., terrestrial, freshwater, and marine biodiversity) and society (e.g., food security, water security, energy security, human health). These primary interests are meant to be relevant internally for the Conservancy as well as externally to the diverse groups working on conservation and development issues globally.
- Identify and review key scientific literature pertinent to the primary interests, including peer-reviewed literature, technical reports and databases from major global and regional bodies (e.g., IUCN, World Health Organization, Food and Agricultural Organization), science from Conservancy programs, and other sources as relevant. Complement information from the literature with information developed by the global and regional programs.
- From the literature and discussions with global and regional staff, identify and synthesize challenges to the primary interests, and the social, economic, and ecological drivers of these challenges, including where challenges connect to nature and people interests.

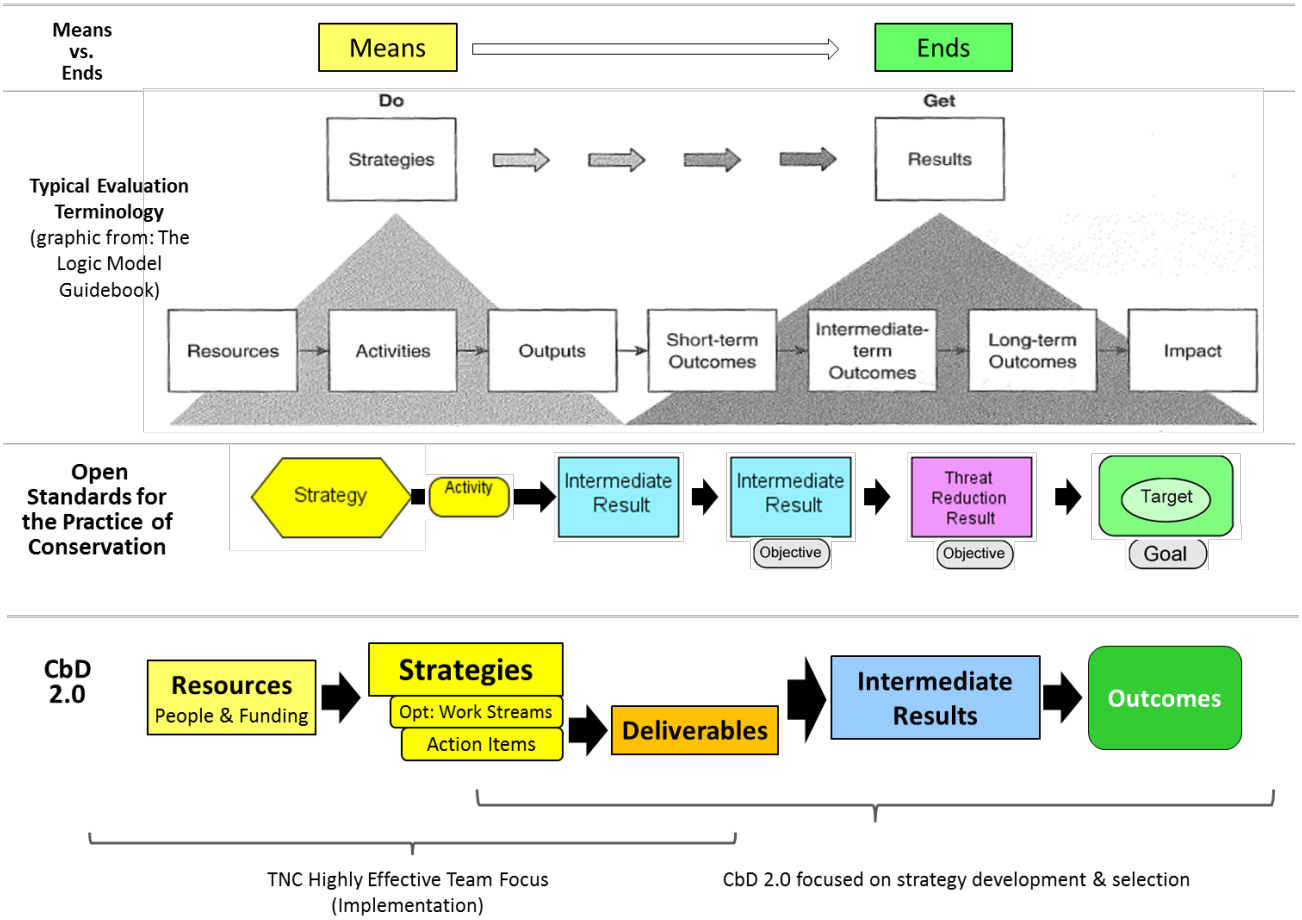
- Create an integrated conceptual diagram to represent the major drivers and challenges to nature, to people, and nature-people linkages.
- Review and synthesize evidence to quantify the strength of linkages between nature and people drivers, challenges, and primary interests. From this analysis, and supported by the global and regional programs, identify the most critical linkages at regional and global scales.
- Conduct iterative rounds of review and incorporate feedback to strengthen the analysis and generate final products.

Figure 14: Conceptual framework for the global and regional situation analyses. The framework focuses on using evidence to identify the strongest linkages between nature and people that relate to human activities. For nature, the analysis defines primary interests including: terrestrial, freshwater, and marine ecosystems, and the climate. For human well-being, the analysis defines primary interests including: food security, water security, energy security, and human health. Furthermore, the analysis considers current conditions and projected future drivers related to key socioeconomic factors such as population growth, economic development, rising standards of living, and urbanization.



<u>Contribution of the Global-to-Regional Situation Analysis</u>
Through completing the global-to-regional situation analysis, we will advance a uniform framework for identifying major global and regional challenges, linking those challenges to the work of the global and regional programs, and identifying potential gaps where strong nature-people linkages could be addressed by new strategies. As such, this systematic approach aims to provide a common point of reference for understanding how the Conservancy selects major organizational priorities and the science that supports those decisions.

APPENDIX I: Crosswalk of Commonly Used Terms for Actions and Intended Results.



APPENDIX J: Strategy Selection Tools

Consequence tables

In many cases, good solutions can be found without fancy software or analysis, simply by looking carefully at the estimated consequences of the options being considered. A consequence table has the options being considered listed down one side and the objectives listed across the top, and the estimated consequence of each option on each objective populating the cells. Establishing a consequence table is also the perfect platform from which to use the next two types of methods we cover; *multicriteria decision analysis* and *return-on-investment.*

Remove options that are inferior for every dimension. An option is inferior if there is another option that performs at least as well against all objectives and better than it for at least one objective. If such a situation exists, there is no rational reason for choosing the inferior option so it can be disregarded as an option.

Remove options that are largely inferior for every dimension. Some options may be roughly equivalent for most objectives but significantly inferior in others. These also can be discarded.

If someone disagrees with removing an inferior option, consider whether this is because it met an additional objective that was not considered in the consequence table. If so, this might require going back and adding another objective.

Multicriteria Decision Analysis (MCDA)

Consequence tables. Multicriteria Decision Analysis (MCDA) is a broad term that encompasses a range of methods for incorporating multiple objectives into the evaluation of alternative options. Equivalent terms include multicriteria decision making (MCDM) and multicriteria analysis (MCA). Criteria should include all those considerations by which the performance of a strategy should be evaluated (but lists of criteria are no replacement for clear identification of objectives). The basic elements of a MCDA, are:

a. A set of criteria against which the desirability of strategies are to be judged.
b. Assign weights to criteria. Weights reflect the importance of criteria in determining the outcome. Weights might be assigned individually or as consensus amongst a group.
c. Combine an assessment of the performance of each strategy for each criteria with the weight for that criteria.
d. Aggregate scores for each strategy across all criteria to give an overall assessment of performance or *utility*.

Although there are many ways that criteria weights and performance scores can be combined to calculate utility, by far the most common is known as a linear additive benefit function or model:

$$U_j = \sum_{i=1}^{n} W_i V_{ij}$$

where U_j is the overall benefit or utility of strategy j, W_i is the weight given to criterion i and V_{ij} is the value of option j for criterion i. In simple terms this means that for each strategy, the performance score for criteria 1 is multiplied by the weight given to criteria 1; the same calculation is made for each additional criteria, and then these are all added together. The result is an overall score for each strategy.

Normalizing data. Criteria can be measured on very different scales. In order to calculate utility using a linear additive function, it is necessary that the performance values of strategies for different criteria are measured on the same scale; otherwise those criteria measured on scales with larger numbers will be unintentionally weighted more heavily. The process of converting data to the same scale is known as *normalizing*.

There are different procedures for normalizing data but one that is considered robust for use in MCDA[6] is given by the formula:

$$V'_{ij} = \frac{V_{ij} - min[V_i]}{max[V_i] - min[V_i]}$$

where V_{ij} is the performance of strategy *j* for criterion *i*, and $min[V_i]$ and $max[V_i]$ are the minimum and maximum possible values for criterion *i*. The prime mark after *V* on the left hand side of the equation is standard notation that indicates the parameter is a transformation of another parameter.

Weighting criteria. Criteria are very unlikely to all be of equal importance in determining which strategy is best. Weighting is intended to help ensure that the calculation of utility actually reflects the perceived importance of the different criteria. The weighting given to criteria can significantly change the outcome of an MCDA, and therefore it is really the systematic and transparent weighting of criteria that is the substance of an MCDA. An important and under-appreciated point about weights is that they are only meaningful with reference to the observed range of outcomes for each criterion. In other words, the importance of a criterion in influencing a decision depends both on its inherent importance to the objectives, and on how well or poorly the strategies under consideration perform for that criteria. For example, a stakeholder group might value recreation opportunities over biodiversity conservation, but if the options strategies being considered differ little and are all satisfactory in their consequences on recreation opportunities, then it does not make sense to assign the

recreation criterion a relatively greater weight. Giving greater weights to criteria that do not vary much has the effect of making strategies seem more similar in utility value, which is not informative for decision making. This means that it is premature to weight criteria before knowing the expected performance of strategies against these criteria (hence the importance of some form of consequence table).

Use a defensible approach to develop criteria weights. Weights of criteria in an MCDA embed the value judgements of those doing the weighting. As such, weights should not be seen as objective assessments of the relationships between criteria, and might benefit from including several perspectives prior to final selection of weights. It also means that it is important to assign weights through a process that makes these value judgments clear. Good approaches to establishing weights include *Swing Weighting* and the *Analytic Hierarchy Process*.

Return on Investment (ROI)

In the field of conservation, return-on-investment (ROI) has come to be a rather general term for prioritization approaches that explicitly consider the cost of the strategies being considered. Conservation ROI analysis belongs to a general class of economic analysis known as cost-effectiveness analysis. Economists consider something to be a cost-effectiveness analysis rather than a cost-benefit analysis when the outcome or return side of the equation is not monetized (for example, expressed as a dollar value). The basic notion behind ROI or cost-effectiveness is that the expected return or outcome from a conservation action should be balanced against the cost of achieving that outcome. Although they are not always recognised as such, the Conservancy's Ecoregional Assessments were often a sort of ROI analysis, particularly when they are implemented using optimization software such as Marxan.

The cost-effectiveness, *CE*, of taking action *i* in place *j* can be given by the general equation:

$$CE_{ij} = \frac{B_{ij} \,.\, \mathrm{Pr}_{ij}}{C_{ij}}$$

where B_{ij} is the benefit of taking action i in place j, Cij is the cost of taking that action, and Prij is the probability that if taken, the action will deliver the expected benefit. This last term is not strictly necessary but is good practice, easy to do, and increasingly expected. Again, it is worth emphasizing that neither the benefit nor the cost portions of this equation need to be explicitly stated in financial terms.

- **Knowing bad ROI is more important than knowing good ROI.** In our experience, there is generally enough uncertainty around the costs of different strategies that minor differences in the relative ROI of alternatives should be interpreted with caution, especially as cost-effectiveness is not the only consideration in selecting an action. In some ways the most relevant information contained in an ROI analysis is at the bottom-end, that is, those options which appear to deliver a poor ROI. The the selection of a strategy relatively poor cost-effectiveness would require carefully justification.

- **Link ROI to strategy and opportunity mapping**. ROI analysis can also be used to select strategies in a way that considers both action and location simultaneously, essentially answering the question, "what should we do where?" The strategy and opportunity mapping described earlier in this Guidance is a strong platform for ROI analysis.

Trade-off analysis

Trade-off analysis is a general approach to evaluating strategies when there are multiple objectives. Trade-offs are naturally presented as consequential relationships between things we care about, and they exist when achievement of one objective comes at the expense of the achievement of another objective. For instance, when planning the allocation of a landscape to different activities there is likely to be a trade-off between food production (the amount of food able to be produced) and biodiversity conservation (the number of species conserved). The more land we use to grow food, the fewer the species likely to survive, and similarly, the more land we dedicate to conservation, the less food we can produce from that landscape (assuming the same level of productivity). By identifying different combinations and extent of land-use placement, and plotting the expected food production and biodiversity conserved for each, we are able to see the consequence of improving one of these objectives in terms of loss for the other .In these cases the best solution only be decided through exploring actual trade-offs in predicted outcomes. For instance, in the food versus biodiversity example above, the weight local stakeholders give to biodiversity objectives relative to food production objectives will depend on the consequence of biodiversity conservation for food production: if the trade-off is small they might weight biodiversity conservation strongly, but if conservation requires giving up substantial food production, they are likely to weight biodiversity much lower.

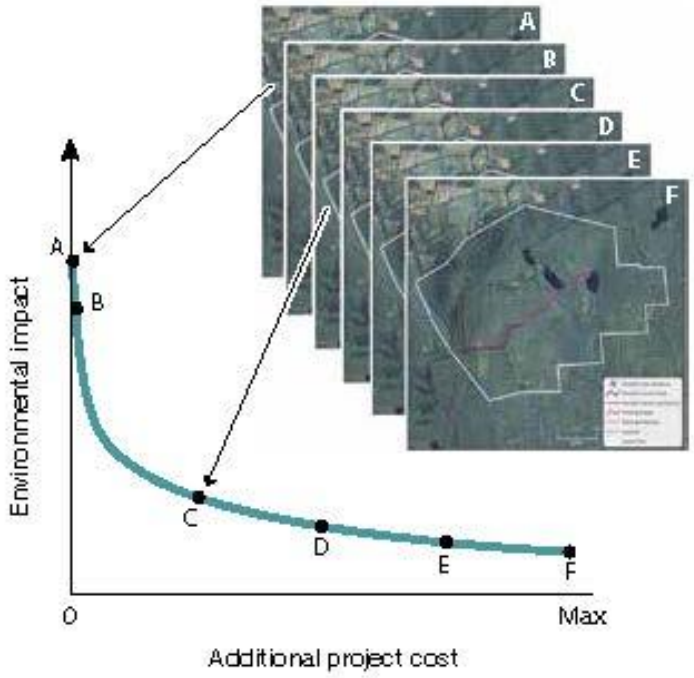
For pragmatic reasons, trade-off analyses typically emphasize trade-off between two objectives. Fortunately there are many conservation planning problems that while not two dimensional, can be usefully summarised in terms of two dimensions. All analytical tools ultimately involve simplification of highly complex social-ecological systems and we believe that illustrating trade-offs can be a useful conservation planning tool, especially for problems involving two major considerations, say food and carbon, or carbon and biodiversity. Illustrating trade-offs between a couple of dimensions can be a strong advocacy

tool through promoting constructive deliberation about unavoidable trade-offs, and provide a powerful basis for strategy selection.

- **Making sure strategies are as efficient as possible**. One of the functions for which economists use trade-off analysis is to check that strategies are as efficient as possible, or in their language, Pareto optimal. A strategy is Pareto optimal when no improvement in one objective can be made without simultaneously diminishing the achievement of at least one other objective. Strategies that are not Pareto optimal are inefficient because they involve unnecessarily sacrificing achievement of one or more objective, whereas strategies along the efficiency frontier represent trade-offs that cannot be avoided.

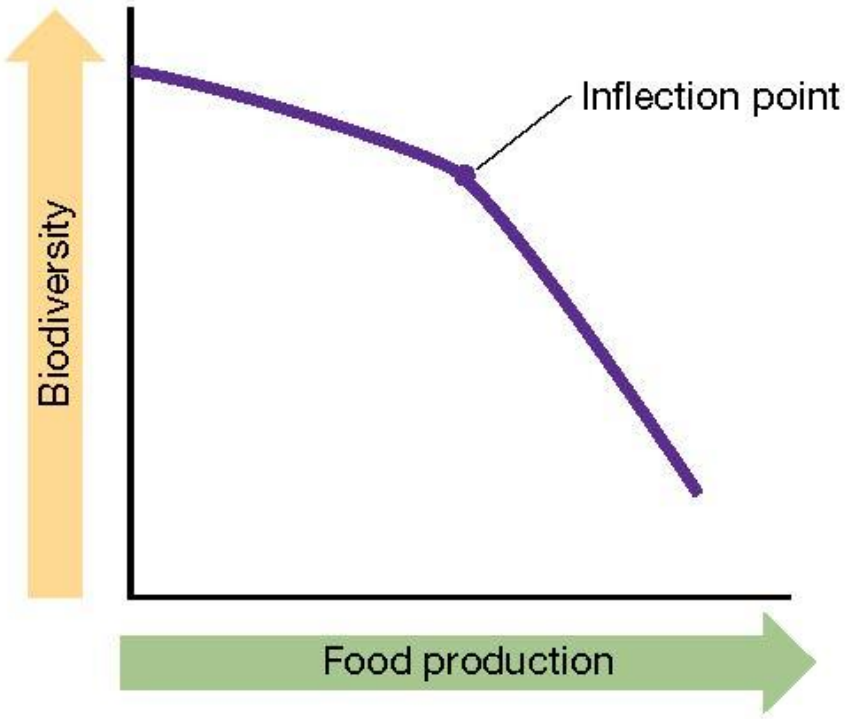
Efficiency frontiers are easy to construct in theory but often difficult in practice. The standard approach is to take one objective, and across its entire range of potential values, find the best you can do on another objective. This is typically accomplished through optimization. Doing this optimization can be a serious computational task in its own right. A useful and more easily accomplished starting point is to simply plot the consequence for the two or three objectives of each of the alternatives being considered. Or alternatively develop a hypothetical set of alternatives that favour one or the other objective to varying degrees. For example, The Nature Conservancy and the University of Tennessee collaborated to develop a tool that helps propose a series of alternative infrastructure patterns for shale gas development and then site these along an efficiency frontier of project cost and environmental impact (Figure 15).

Figure 15: Environmental Impact vs. Additional Project Cost



Moving from illustration to strategy selection Arguably a more difficult task than illustrating trade-offs between strategies is actually deciding on the best option. In theory (and if we were truly passive objective observers, which of course we are not), all solutions located on the efficiency frontier are equally good. In practice this is where the influence of other objectives comes into play (either consciously or unconsciously). For example, in addition to the landscape scale trade-off between food production and biodiversity, a land allocation decision might be influenced by the economic interests of particular individuals. There are, however, ways to look at trade-offs to identify points which might be desirable. Trade-off curves often exhibit points where the rate of decrease in one objective increases rapidly as the other objective increase. These are referred to as points of inflection (Figure 16). Such points are not always obvious and there is no guarantee that these represent a desirable solution. However, they are often valuable to identify because they represent the point at which losses for each objective are minimized. With increasing distance from an inflection point, small improvements in one objective represent significant losses in another objective, and decision makers have to increasingly favour one objective over another.

Figure 16: Biodiversity vs. Food Production



Is it appropriate to frame something as a trade-off? Just because a trade-off can be illustrated as part of an analysis does not mean these things can actually be traded off. For example, some stakeholders might feel that things

such as cultural heritage or the right to make a living off the land cannot be traded-off at all. Another way to think about this is that stakeholder's assessment of consequence for a particular objective may have a clear threshold rather than being a continuous function, for example, cultural heritage can either be protected or not, there is no partial delivery of this objective. Wilderness advocates often hold similar attitudes. Great care must be taken to avoid trade-off analysis that appears callous because in many cases it is not some generalized commodity but actually people who will be affected by the trade-off. Similarly, from a political and communication point of view, formal trade-off analysis can present a challenge because it involves acknowledging the possibility that an action or policy may have negative consequences for values that people care about. It is not appropriate to frame something in this manner when the trade-off stands to negatively impact a vulnerable population.

Scenario analysis

Imagine that an effective global carbon market is in place and all nations have agreed to strict emissions caps that keep the price of CO2 offsets at $20 a ton or above. This guarantees a vast and sustainable flow of revenue to landholders, communities and governments who protect forests and peat bogs, virtually eliminating deforestation globally. This is a scenario, albeit an optimistic one. Scenarios such as this are not intended to be predictions, nor are they a choice that someone in charge of a conservation project could make, but rather they are learning tools. What would it mean for our potential strategies if the scenario above became reality? Analysing scenarios can help us understand how different strategies might fare in the inevitably uncertain future. Scenario analysis can therefore be a useful strategy selection tool where uncertainty is high.

All strategies have uncertainty associated with their outcomes because we cannot perfectly predict the future; scenarios describe some of this uncertainty through intentional manipulations of imagined futures. The basic premise of scenario analysis is to develop a small set of possible future scenarios that describe how some of the main uncertainties – such as demographic trends, policies, markets, budgets, degree of climate change or stakeholder support – might behave. Some of the most globally recognisable scenarios are the different emissions scenarios developed by the Inter-governmental Panel on Climate Change (IPCC) to explore uncertainties in national policies and social behaviour and the impact on climate change. The set of strategies being considered are then imagined to be occurring on the back-drop of these different scenarios with the aim of learning about how they would be expected to perform. For example, we might assess the performance of coastal adaptation strategies under each of the different IPCC scenarios or using sea level rise models with different assumptions. Sometimes scenarios might yield parameters that can be used in a formal predictive model (like the extent of sea level rise expected under each of the IPCC scenarios), but scenario analysis can equally be accomplished simply by describing how we think a strategy might perform under a set of future conditions. The aim of scenario analysis is to see how robust a strategy is to a range of possible futures, and therefore how much

confidence we should have selecting it. This information can also be used to refine strategies to make them more robust.

As a straightforward example of evaluating strategies for conservation of urban ecosystems in and around Stockholm, Ulla Mortberg and colleagues (2012) explored the consequence of two possible urban growth scenarios. The first scenario they termed "Compact" in which urban growth policies emphasized energy efficiency and minimizing transport distances and costs. The second scenario they termed "Urban Nature" in which urban growth policies emphasized protection of urban green spaces and planned but distributed development. Mortberg and colleagues speculated that the first scenario would likely result in the loss of urban biodiversity and ecosystem values, which would subsequently diminish the engagement and support of urban communities with conservation. Some of the consequences may be offset, however, by reduced loss of biodiversity in the peri-urban area because of a reduction in urban sprawl. The second scenario, they suggested, maintained urban biodiversity and ecosystems, but required greater ongoing budgets for transport infrastructure and energy availability because of a growth in low density housing, some of which was likely to come at the expense of peri-urban areas. Even using these two scenarios highlighted the consequence for urban biodiversity projects under different policy environments, and made obvious the need to seek greater clarity around the biodiversity and ecosystem service value of urban ecosystems.

Once the performance of strategies has been evaluated under different scenarios, this information needs to be analysed in order to help select the best strategy. One of the most useful approaches is to combine scenario analysis with multicriteria decisions analysis.

- **When is scenario analysis appropriate?** Scenarios are best suited to exploring situations where uncertainty is high and controllability is low. For example, climate change and global governance are largely beyond the control of conservation decision makers, even in a large region. In these situations, scenarios can help to illuminate the consequences of these global drivers of change and to formulate robust local responses.

- **How do you design scenarios?** A generalized approach to scenario development would include the following process:
  - Identify the three to five most important drivers of change,
  - For each of these drivers, identify possible future trends with a small number of categories (for example, remain the same, small increase, big increase), or bifurcating decisions (for example, a policy is implemented or not),
  - Create a framework by grouping these trends along two to three axes of uncertainty,
  - Develop a set of coherent storylines (a narrative about what may happen in the future) that draw on the possible trends and cover as much of the space in the framework as possible.

There is a good deal of debate in the scenario analysis community about how 'plausible' each scenario and its storyline need to be. Part of the point of scenario analysis is explicitly not to focus on what is likely; extreme, low-probability scenarios can still be very useful in scenario analysis. It is critical, however, that scenarios are coherent; a scenario must encapsulate a coherent story about the future world. For instance, a scenario in which suburban areas, farmland and intact habitat all increased is unlikely to be a coherent story as development of suburban areas will generally occur at the expense of farmland or intact habitat.

References

Mörtberg, U., Haas, J., Zetterberg, A., Franklin, J. P., Jonsson, D., and B. Deal. 20012. Urban ecosystems and sustainable urban development—analysing and assessing interacting systems in the Stockholm region. Urban Ecosystems, 2012:1-20.