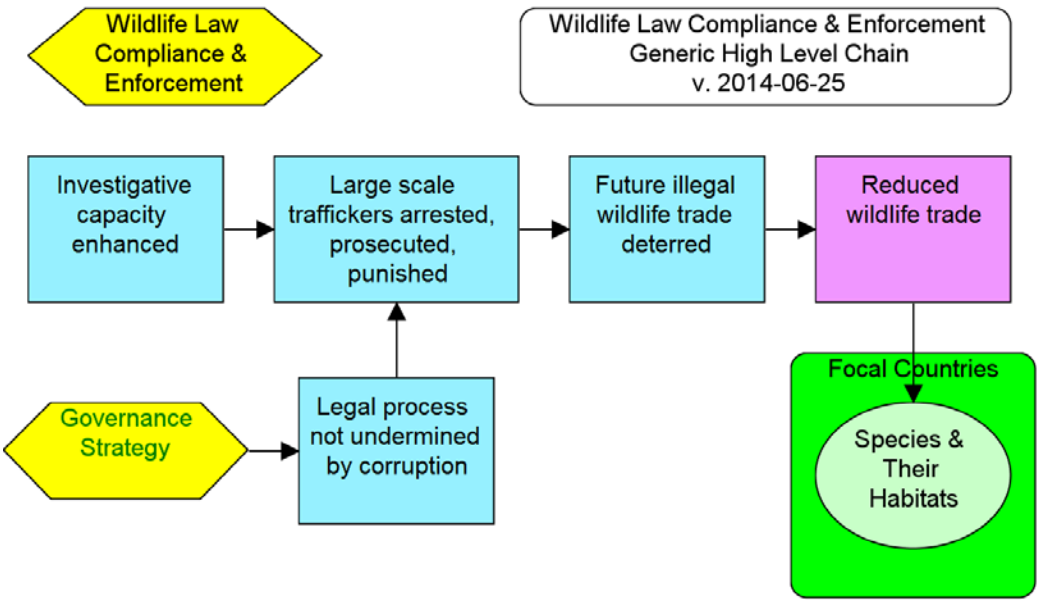
US Fish and Wildlife Service

Standard Measures of Effectiveness and Threats for Wildlife Conservation in Central Africa

Guidance for USFWS Applicants



Version 1.0 - October 2014

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About this Document

This document was developed and written by Matt Muir and Dirck Byler of the US Fish and Wildlife Service and Caroline Stem and Nick Salafsky of Foundations of Success under contract F13PX01418. The USFWS reserves the right to change or update this information without notice as it evolves. We welcome feedback from anyone reading or using this report. Please provide feedback at http://tinyurl.com/fws-indicators.

Executive Summary

Since 2006, on behalf of the American public and via Congressional legislation, the United States Fish and Wildlife Service (USFWS) has invested approximately $3.5 million annually in grants supporting specific actions to conserve elephants, sea turtles and great apes in Central Africa. USFWS and its partners need to monitor the progress of increasing investments to the region to understand the degree to which desired results are achieved by USFWS grants programs and to learn, communicate and share evidence about what works, what does not work, and why. This monitoring will be greatly enhanced if all involved parties use similar monitoring indicators so that data can easily be aggregated and compared.

To this end, USFWS is proposing standard indicators for wildlife conservation in Central Africa to guide data collection by the USFWS, grantees, and other key partners working in the region. To develop these indicators, USFWS staff used a theory of change approach to link a specific action to expected intermediate results, threat reduction results, and the improvement of species and their habitats. Through this approach, USFWS staff identified key results and associated objectives, indicators, and monitoring questions. USFWS vetted these products, along with potential indicators and methods to assess longer-term threat reduction. This report shares these products and serves as draft guidelines for how to measure the effectiveness of commonly-funded actions and how to assess the status of common threats across the region. The following table includes the actions and threats addressed in this report.

Commonly-Funded Actions	Common Threats
1. Set up and manage patrols	1. Commercial bushmeat hunting
2. Training and capacity development	2. Elephant poaching
3. Partner engagement	3. Incompatible extractive industry practices
4. Wildlife law compliance & enforcement	4. Road construction in sensitive areas
5. Protected area designation	5. Agricultural encroachment
6. Public campaigns	6. Wildlife disease
7. Applied conservation research	7. Sea turtle harvesting & bycatch
8. Promote BMPs for extractive industries	8. Removal of animals from the wild for the pet trade

This effort focused on developing guidance for measuring the effectiveness of actions and the status of key threats. USFWS endeavors to measure shorter-term, more immediate effects, as well as longer-term impacts, to be able assess if an action is on the path to effectiveness, if adjustments are needed, and if the action is contributing to meaningful threat reduction.

The use of the standard indicators presented in this document has the potential to improve conservation by helping USFWS and its grantees and partners to: monitor, assess and report on performance; collect, share and aggregate comparable data; and learn and improve from others implementing similar actions.

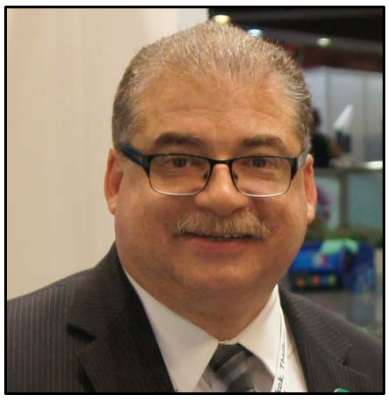
We consider this report to be Version 1.0 and hope that USFWS partners and the conservation community will not only adopt them, but also continue to refine and improve them over time. More importantly, we hope these indicators will help practitioners more effectively learn about what works, what does not work, and why and to apply this learning to future actions.

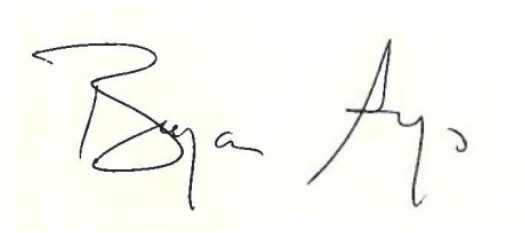
Foreword: A Better Evidence Base for Conservation

For too long, we in the conservation community have let the difficulties of measuring our impact prevent us from undertaking systematic monitoring and evaluation. We know that changes in wildlife populations, and the links between their cause and effect, can take decades to detect, disentangle and understand. This is particularly true for the long-lived, slowly-reproducing species that are the conservation legacy of those of us working in Central Africa-- majestic forest elephants, ancient sea turtles, and gorillas crawling through lush jungles.

And yet we don't have decades. Elephants are being slaughtered for the illegal trade in ivory. Sea turtles are drowning in nets and running gauntlets of poachers on beaches. Great apes and all kinds of other forest wildlife are vacuumed up for the commercial bushmeat market. There is an urgent need to understand which conservation projects are working in Central Africa, and which need corrective action. This need is not only expressed in the accountability demanded by the U.S. taxpayer, Office of Management and Budget, and Congress, but also in our mandate and moral responsibility to help foreign countries protect wildlife from extinction.

As a strategic decision, USFWS has made a conscious effort to focus on the most important direct threats to the species that we endeavor to conserve, and the effectiveness of the actions most frequently undertaken to address those threats. By moving beyond reports, workshops, and other outputs as our measures of success, USFWS is seeking a better evidence base for conservation success in Central Africa. We thank all the partners who helped get us here -- from our grantees who work tirelessly and under great discomfort and personal risk in the field to all other contributors of this technical report. It represents a start, not a finish, and we welcome all partners to help us assess and improve how we measure conservation impact.





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US Fish and Wildlife Service

Standard Measures of Effectiveness and Threats for Wildlife Conservation in Central Africa, v 1.0

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1. Introduction

1.1 Wildlife in Central Africa Facing Increasing Threats

Central Africa is home to some of the world's most iconic wildlife, including forest elephants, great apes, and sea turtles. These species, and thousands of others in Central African ecosystems, face threats that are growing both in number and intensity. These threats include illegal bushmeat hunting, poaching of high value species such as elephants, conversion of forest into agricultural lands, mining, logging and other forms of research extraction, and the development of roads and settlements. These threats are in turn driven by political instability, growing human populations, and a host of other institutional, social, economic, and political factors. Unless the world takes effective action to counter these threats in both the short and long-term, we run the risk of having these species vanish from the wild.

1.2 A Need for Standard Indicators to Assess USFWS Investments

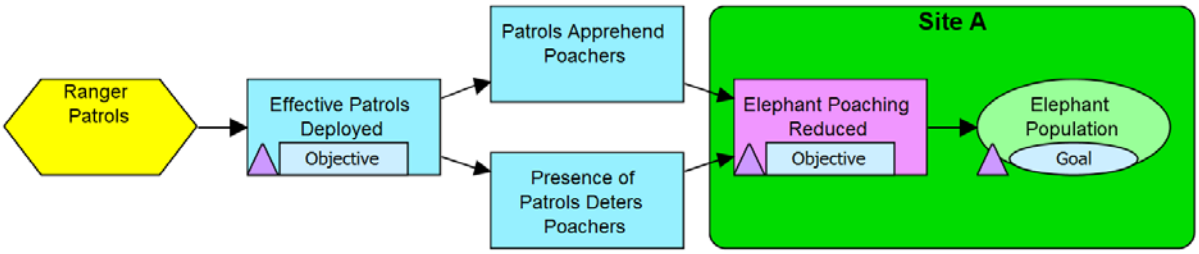
Since 2006, on behalf of the American public and via Congressional legislation, the United States Fish and Wildlife Service (USFWS) has invested approximately $3.5 million annually in grants supporting specific actions to conserve elephants, sea turtles and great apes in Central Africa. In 2011, the amount increased to $6 million and was broadened to conserve all wildlife, including okapi, rare amphibians, and manatees. From 2012 to 2014, USFWS support to the region increased again to more than $9 million per year and focused on increasing the standards of protected area management, building capacity for conservation activities, and improving the effectiveness of law enforcement and anti-poaching efforts. In 2015, USFWS is poised to award more than $14 million in support of actions to protect wildlife in Central Africa.

USFWS and its partners (grantees, African government agencies, conservation organizations, other US government agencies, OMB, and Congress) need to monitor progress of these increasing investments, to both understand the degree to which desired results are achieved by USFWS grants programs, and to learn, communicate and share evidence about what works, what does not work, and why. This monitoring will be greatly enhanced if all involved parties use similar monitoring indicators so that data can easily be aggregated and compared. To this end, USFWS set out to develop standard indicators for wildlife conservation in Central Africa that can be used to guide data collection by the USFWS, grantees, and other key partners working in the region on these issues.

1.3 Why Focus on Indicators for Actions and Threats?

Figure 1 presents a simple example of a conservation action. The project team is undertaking an *action* of ranger patrols (yellow hexagon). This action leads to the achievement of several *intermediate results* (blue boxes). These in turn lead to the achievement of a key *threat reduction result* (purple box), which leads to improvement in our *conservation target,* elephant population.

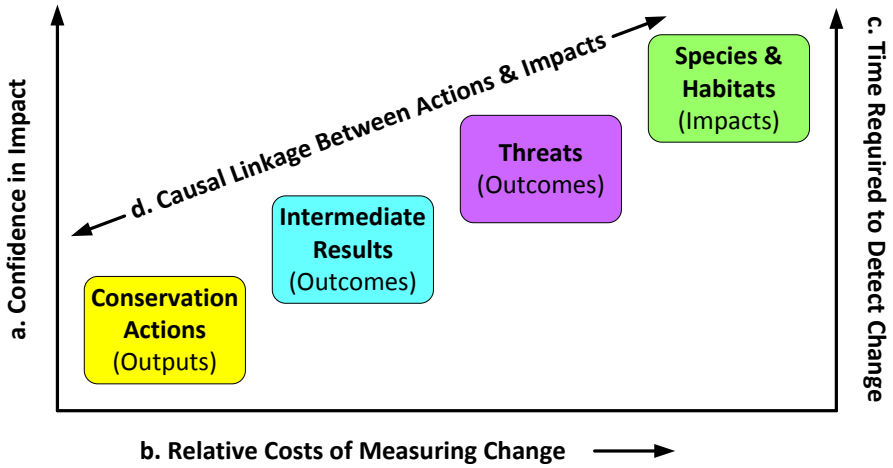
Figure 1. A Simple Example of a Conservation Action



Measuring the effectiveness of a conservation action requires more than counting short-term outputs, such as dollars spent or the number of patrol teams given equipment. Since our ultimate goal in this example is related to the conservation of the elephant population in Site A, we clearly need an indicator to measure how the elephant population is doing over time. These types of species and habitat impact indicators historically have been the main focus of monitoring efforts, and there are many efforts to standardize them.

Paradoxically, however, we also cannot rely solely on indicators of the ultimate impacts – the status of the species and habitats of interest – to measure the effectiveness of our actions. If all we monitor is our outputs and our ultimate goal (the endpoints of the chain in Figure 1), we are missing several key pieces of information in the middle of the chain. As shown in Figure 2, there is often a substantial time lag between the implementation of an action and any perceptible change in the conservation target. Furthermore, measuring species and habitats with any accuracy is often a difficult and expensive proposition. By contrast, measuring intermediate and threat reduction results is often more technically and economically feasible. Finally, there may

Figure 2. Measuring Effectiveness Requires Linking Conservation Actions to Impacts



Source: Adapted from CMP 2008 and AFWA 2011.

be many actions and other factors affecting the conservation target, making it difficult to parse out the contributions of any one action. To this end, we chose to focus our standard indicator development work on assessing the effectiveness of specific conservation actions and documenting the changes in critical threats to species and ecosystems.

To develop these indicators, USFWS staff worked in partnership with the not-for-profit Foundations of Success (FOS) using the framework and tools from the Conservation Measures Partnership's *Open Standards for the Practice of Conservation* and the Conservation Actions and Measures Library (CAML) (Box 1). This work also involved extensive peer review and input from other FWS staff, grantees, and experts in this field through workshops, email and phone consultations, and formal review of draft documents. More detail about the specific methodology to develop each type of indicator is provided in the introductions to Section 2 and Section 3.

Box 1. Developing Indicators in the Context of a Standard Project Cycle

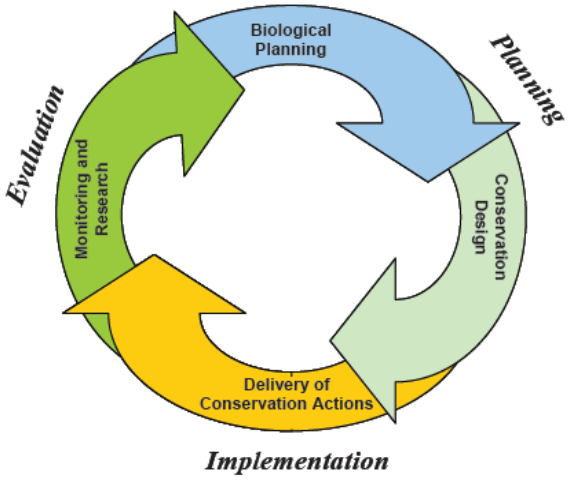
A key premise behind the indicator frameworks proposed in this report is that monitoring and performance reporting are not additional activities added on top of existing project management responsibilities. Instead, as shown in the following diagrams, they should be integrated into the basic project management cycle. The diagram on the left shows the *Open Standards* cycle developed by the Conservation Measures Partnership, a forum of key conservation NGOs, funders, and agencies. The cycle on the right shows the *Strategic Habitat Conservation* cycle developed by USFWS. Although the two cycles use different terms, the basic adaptive management process of planning, implementation, and monitoring in an iterative cyclical fashion are largely equivalent.

Key advantages of the *Open Standards* include that they provide USFWS and its grantees:

- **A Framework for Targeted Indicator Development** – Monitoring and evaluation can be expensive and time consuming. The *Open Standards* provide a framework to determine the most critical indicators to enable effective adaptive management.
- **A Common, Neutral Language** – The *Open Standards* are being used by a rapidly increasing number of conservation implementing organizations (including many USFWS grantees), agencies, and funders, and thus provide a common and neutral language for sharing and coordinating work across organizations.
- **Collaborative Tools** – Key *Open Standards* tools like Miradi Software and the Conservation Actions and Measures Library (CAML) can be used to capture results in a common format and to share them electronically over the wires across the project team and with stakeholders. All effectiveness measures developed by USFWS and partners are published open source on CAML.

Open Standards for the Practice of Conservation

Strategic Habitat Conservation



1.4 How These Indicators Are Meant to Be Used

This document provides a set of indicators that are currently recommended for use by USFWS grantees. In some cases, USFWS will require these indicators to be used for cooperative agreements. As outlined in greater detail in Section 4, these standard indicators are designed to enable the USFWS and its grantees and partners to:

- **Monitor, Assess and Report on Performance** – Use of key indicators enables USFWS, grantees, and other partners to track progress of conservation actions and to report on performance, both in terms of intermediate impacts as well as ultimate threat reduction.

  Example: *If a USFWS grantee is using a public awareness campaign to raise awareness about bushmeat hunting and its impact on wildlife populations, the grantee can use these standard indicators to determine what data they should collect to monitor the performance of this campaign. For instance, the grantee might collect data to understand the degree to which the campaign is leading to changes in knowledge, attitudes, and practices, as well as shifts in societal norms that could then contribute to reductions in bushmeat hunting. This data would be useful for the grantee to understand whether they are being effective, as well as to the USFWS to track how effective this investment has been.*

- **Collect, Share and Aggregate Comparable Data** – Use of standard and common indicators enables USFWS to bring data together from individual grants to create larger and more robust data sets.

  Example: *If USFWS is supporting 10 grants across 4 countries to conduct patrols to reduce elephant poaching, the grantees and USFWS would be able to use these standard indicators to aggregate data and understand across the portfolio of efforts how many poachers were apprehended, whether that number represents a significant proportion of the poachers, and the degree to which elephant poaching is decreasing across the 4 countries. If these data are only examined at a site or country level, USFWS and partners could miss important trends. For instance, a decrease in poaching in Country X may appear to be a success. But, if we analyze trends more broadly, we may discover that poachers from Country X have migrated to Country Y to take advantage of civil unrest and, as such, poaching in Country Y has increased, and poaching overall has remained steady.*

- **Learn and Improve** – Finally, use of these standard indicators helps provide the basis for true adaptive management by allowing USFWS and partners to compare data and conditions across projects and sites to understand the conditions under which different actions are effective or not in reducing threats and why. This type of learning is most effective when both the funder and the grantee agree that it is important to report not just successes, but also challenges and failures without penalty.

  Example: *Using the previous example, standard indicators about patrol effectiveness across 10 areas could allow USFWS and partners to understand the conditions under which patrols are an effective strategy to reduce elephant poaching. One potential lesson is that it may not make sense to invest in patrols in areas experiencing civil unrest, but rather focus greater efforts on border areas in neighboring countries, where there is a high threat, but still sufficient rule of law to enable patrols to function.*

1.5 A User's Guide to Applying this Guidance to USFWS Proposal Writing

This document is meant to guide applicants as they prepare their proposals for USFWS grants programs. It describes the information the applicant should include in the proposal's *Statement of Need* and *Project Monitoring and Evaluation* sections and recommends indicators that will help grantees and USFWS staff better assess and communicate results. The document also identifies common threats to wildlife in Central Africa and recommends indicators to measure how the status of these threats changes over time.

Chapter 1 provides an introduction to the document.

Chapter 2 describes application questions and standard effectiveness measures for eight conservation actions most frequently funded by USFWS in Central Africa. Each section includes:

- A **definition** for the action.
- A **high-level theory of change** (also known as a *results chain*) that illustrates a model of how the conservation action is intended to reduce threats and improve the status of Central African wildlife. Applicants are not required to submit a theory of change in their application. They, however, are encouraged to consider how the high-level theory of change fits their specific project context and to adapt their project design as necessary. Additional guidance on developing theories of changes is available at: http://cmp-openstandards.org/.
- One or more **enabling conditions** that identify the circumstances that USFWS considers most necessary for the action to succeed. When writing a proposal for USFWS, the applicant should acknowledge the presence (or absence) of these enabling conditions in the proposal's *Statement of Need* for each action. If the conditions do not exist, the

applicant should provide an explanation about how this is anticipated to influence their specific project.

- **Monitoring questions and indicators** that applicants should include in their proposal and reporting to USFWS.
    - **Application questions** include questions that the applicant should answer in the proposal's *Statement of Need* for each action for which funds are being requested.
    - **Recommended indicators** provide short- and medium-term measures of performance. Applicants are encouraged to include recommended indicators in the proposal's *Project Monitoring and Evaluation* section. USFWS grantees should use these indicators to learn the degree to which their projects are functioning as intended and adapt their projects (and future proposals submitted to USFWS) as necessary. Grantees should report on the indicators in the mid-term and final reports to USFWS.

Chapter 3 describes the eight most common direct threats to wildlife in Central Africa, as identified in USFWS grants. Each section includes:

- A **definition** of the threat, **units of analysis,** and **core information needs**.
- **Recommended indicators** that provide medium- and long-term measures of performance. Applicants with multi-year grants are encouraged to include recommended threat indicators in the proposal's *Project Monitoring and Evaluation* section. USFWS grantees should use these indicators to learn the degree to which their projects are functioning as intended and adapt their projects (and future proposals submitted to USFWS) as necessary. Grantees should report on the indicators in the mid-term and final reports to USFWS.

Chapter 4 provides an overview of the next steps anticipated by USFWS. Applicants should note that this is Version 1.0 of USFWS guidance for standard action and threat indicators for wildlife conservation in Central Africa. As such, we encourage applicants to contact USFWS to refine and improve recommended indicators for later versions. Please provide feedback at http://tinyurl.com/fws-indicators.

2. Standard Effectiveness Measures for Key Conservation Actions

Conservation actions are the basic unit of conservation work; they are the interventions teams take to reach project objectives and longer-term conservation goals. In many ways, actions are best represented not just by the conservation activity itself, but rather the entire results chain or "theory of change" linking the activity to the desired impact on threats and the conservation target(s). The specific action needed depends on local conditions, including the type of conservation target, the threat being addressed, the capacity of the project team, and many other potential contributing factors. As such, every conservation action is unique in its details, making it difficult to track, assess, and compare their performance.

Some conservation actions, however, have inherent similarities to one another. As a simple example shown in the top two diagrams in Figure 3, consider one project deploying armed rangers to deter elephant poaching in a forested national park, and a second project recruiting local villagers to protect sea turtle nests from egg collection during the critical nesting season. Even though these two actions occur in different ecosystems and have different conservation targets, threats, implementation steps, and implementing teams, the underlying theory of change is basically the same – deploy trained patrols or guards to both apprehend and deter poachers from illegally harvesting wildlife. We can thus create a standard or generic theory of change for this "direct protection through patrols and guards" action as shown in the bottom diagram in Figure 3.

Furthermore, we can use the logic in this theory of change to develop generic objectives and indicators that can be used to roll up results across these projects and compare the effectiveness of the two actions to one another. These objectives and indicators can be linked to different factors in the chain that include:

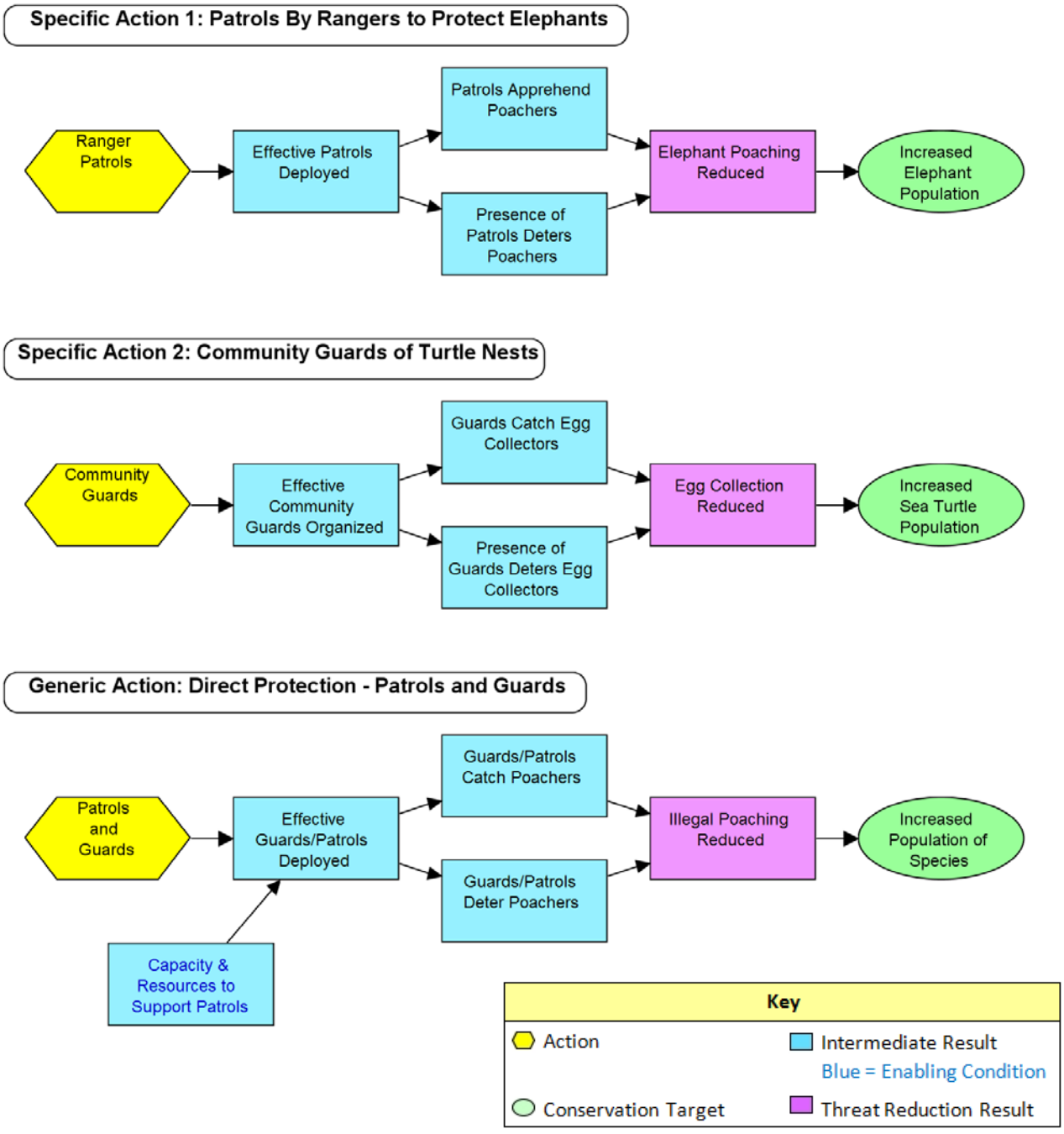
- ***Enabling Conditions***[1] – Circumstances or conditions that are necessary for the action to be successful and that can help USFWS determine the utility of funding a proposed action (in the example, the box with the blue text showing that the implementing agency needs to have capacity and resources to support patrols).
- ***Intermediate Results*** – Results that show progress toward expected outcomes and that can be used as the basis for taking corrective management steps and building accountability.
- ***Threat Reduction Results*** – The outcomes that the action is trying achieve in terms of reducing critical threats (see Section 3 of this document).
- ***Conservation Targets*** – The ultimate impacts that the action is trying achieve in terms of the status of focal conservation species and their habitats.

Finally, we can use these generic objectives and indicators to develop specific monitoring questions that can be integrated into USFWS grant application and reporting forms and that will enable USFWS to collect more useful standard information from each project.

[1] In most instances, USFWS grants are not intended to establish these enabling conditions. Rather, the presence of these conditions (or lack thereof) will be considered during the proposal review process.

In a similar fashion to the patrols example, we could develop standard actions and performance indicators for creating protected areas, raising stakeholder awareness, or indeed any type of conservation action. These standards are the equivalent of the type specimens in the Linnaean classification system of living things, or the generic patterns used by dressmakers or computer programmers that encapsulate existing knowledge to inspire the creation of specific products. These standards also enable us to collect standard indicators about each type of action so that we can learn more efficiently about their effectiveness and return on investment in varying conditions.

Figure 3. Specific Conservation Actions Can Be Used to Create a Generic Theory of Change



Drawing upon this concept of generic theories of change, we reviewed existing USFWS grants in Central Africa to determine the most common types of actions funded under this program – and, therefore, actions for which it would make sense to develop generic theories of change. These include:

1. Set Up and Manage Patrols
2. Training and Capacity Development
3. Partner Engagement
4. Wildlife Law Compliance & Enforcement
5. Protected Area Designation
6. Public Campaigns
7. Applied Conservation Research
8. Promote BMPs for Extractive Industries

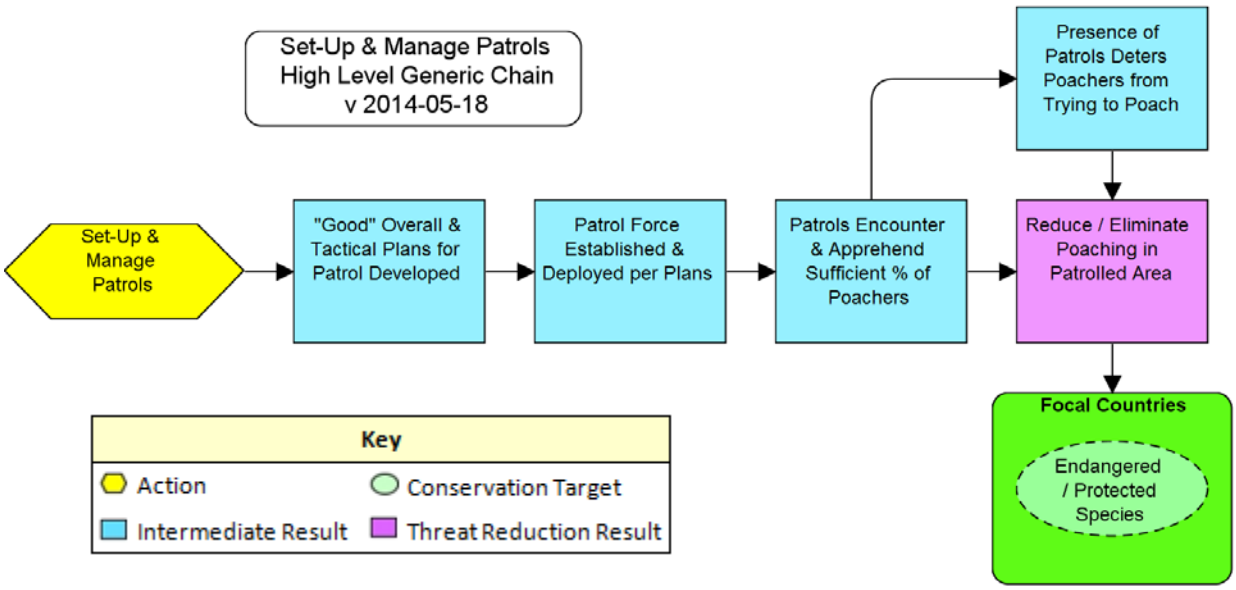
We then developed a draft theory of change and associated performance objectives and indicators for each of these actions, as well as a series of proposed monitoring questions to obtain data from prospective and current grantees. We then submitted these drafts to two stages of peer review and revised them based on feedback. High-level summaries of each of these generic actions and monitoring questions are presented in the following sections; more detailed versions are in Annex 1.

Note that the theories of change and indicators presented in this document were developed using Miradi Software, a desktop program designed to support implementation of the CMP *Open Standards*. All information presented in this section is available online as part of the Conservation Actions and Measures Library (CAML). We welcome feedback from anyone reading or using the effectiveness measures, theories of change, and other elements of this section. Please provide feedback at http://tinyurl.com/fws-indicators.

ACTION 1. Set Up and Manage Patrols

Definition: Scheduled field surveillance of protected areas to protect wildlife and to deter illegal activities.

High Level Theory of Change: As illustrated in the diagram below, USFWS experience to date indicates that, to be successful, a patrol action starts with developing "good" overall and tactical plans for patrols. This includes in particular, a realistic assessment of who the poachers are and the potential for patrols to counter them. The next steps involve establishing, equipping, and training patrol staff and ultimately deploying the patrols so that they operate as scheduled. If the patrols operate as planned, then the theory is that patrol staff encounters and apprehends most/all poachers so that they are then prosecuted and punished and removed from poaching activity. The theory of change also states that the presence of patrols deters poachers from trying to poach. Finally, if poachers are removed or deterred, then this will reduce or eliminate the threat of poaching, which in turn leads to maintenance or growth of populations of key target species. It is important to note that there are many kinds of poaching including poaching by armed militias, commercial poaching, subsistence poaching, and hunting outside legal limits. Different kinds of patrols may be needed to counter each of these types. For example, unarmed community groups are unlikely to be able to stop poaching by armed militias.



Enabling Conditions: Political will to support establishment of patrols; disciplined patrols with sufficient oversight to manage and address corruption; and a network of informers to guide tactical deployment of patrols.

Monitoring Questions and Indicators

The following are questions and indicators that USFWS grantees should answer when applying for funding or when reporting on the effectiveness of patrol actions. They are derived from the performance indicators articulated in greater detail in Annex 1.

Application Questions: All applicants who are requesting USFWS funds are encouraged to clearly state and then answer the following questions in the proposal:

"Good" Overall & Tactical Plans for Patrol Developed

- Who is doing the poaching? Applicants should justify how the type of poachers involved at the site can be realistically deterred by proposed patrols.
- Have you created a plan for the patrols that covers: (a) number of staff required, skills and equipment needed, training to provide those skills, realistic budgets for equipment and personnel; (b) coverage of key access points and transport routes; and (c) and an element of unpredictability for when/where patrols will happen? Please justify response.
- Does your plan have patrols at sufficient frequency to encounter most/all of poaching activity? Please justify response.
- Does your plan have realistic budgets for equipment and person power? Please justify response.

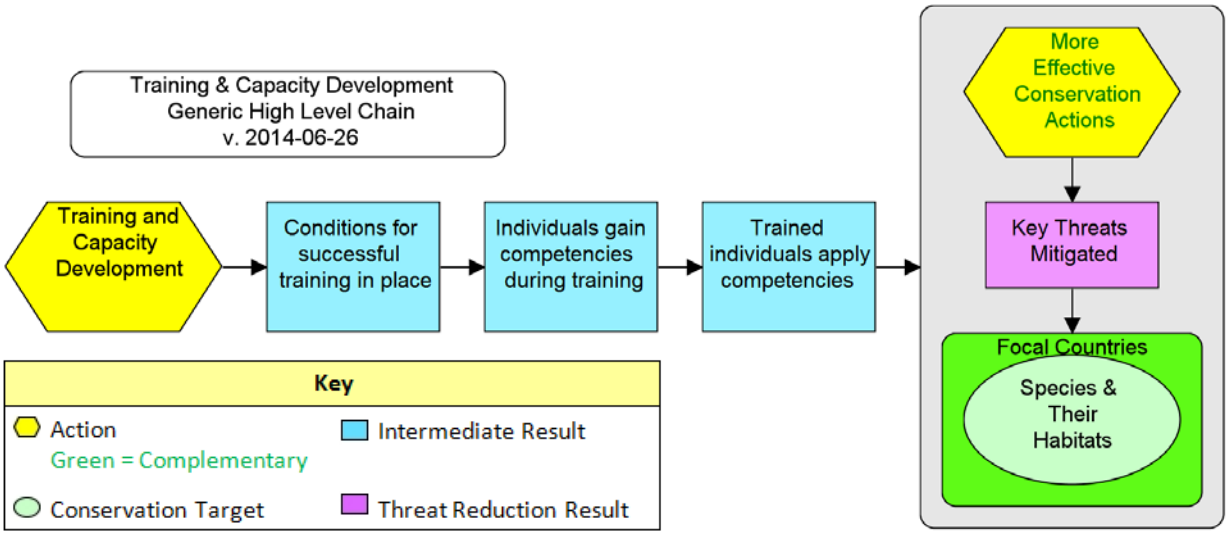
Recommended Indicators: All grantees who are awarded USFWS funds to deploy patrols are encouraged to monitor the following indicators and be able to respond to the associated questions when reporting on performance (see Annex 1 for complete list):

- **% of patrols adequately trained and equipped**
  - What % of your patrols are adequately trained and equipped? How did you calculate this response?
- **% of patrols operating as scheduled**
  - How many patrols have you sent out (per week / month / year)?
  - What % of the patrols in your plan operated as scheduled? If <90%, why?
- **Encounter rate of suspected poachers**
  - How many poachers did you encounter over the last assessment period? How many did you apprehend?
  - What % of total poachers in the area do you think this is?
  - What data did you use to make this assessment (e.g., encounter rate, evidence of camps, # of snares/ traps detected)?
  - Have your patrol encounter rates changed over time? To what do you attribute these changes?
- **# of incidents of poaching detected in field**
  - To what degree have poaching incidents changed since you started the patrols?
- **# of individuals of targeted wildlife species at key sale or transport points**
  - To what degree have poached items in sale or transport points changed since you started the patrols?
- **Change in species population**
  - How have populations of key species changed since patrols were implemented?

ACTION 2. Training and Capacity Development

Definition: Planned learning for professionals, key stakeholders or others to improve abilities to carry out conservation management activities and techniques.

High Level Theory of Change: As illustrated in the diagram below, USFWS and partner experience to date indicates that, to be successful, Training and Capacity Development requires that the conditions for a successful training are in place (e.g., priority competencies are identified; effective trainers and curriculum are in place; and high-potential participants are recruited). With these conditions in place, it is expected that individuals will gain the competencies[2] needed to carry out the desired conservation activities or techniques, and then apply those competencies in the work place. If the trained individuals apply these new competencies, then they will be in a better position to effectively implement conservation actions (which could include a broad range of actions, depending on the training and the types of participants). These actions would have their own more detailed theory of change, leading ultimately to the reduction of threats and the improved status of species and ecosystems.



Enabling Condition: Trainees have the opportunity to apply training within their organization, including the necessary authority, time, resources, respect, and cultural acceptance.

Monitoring Questions and Indicators

The following are questions and indicators that USFWS grantees should answer when applying for funding or when reporting on the effectiveness of training. They are derived from the performance indicators articulated in greater detail in Annex 1.

Application Questions: All applicants who are requesting USFWS funds are encouraged to clearly state and then answer the following questions in the proposal:

Knowledge, Skills, Attitudes, Practices Identified

- Who are you targeting with this training/capacity building? How will you select the people

[2] USFWS considers competencies to be knowledge, skills, attitudes, and practices combined.

for training?
- What knowledge, skills, and attitudes does this audience need?
- Why are these knowledge, skills, and attitudes needed? Please justify your assessment.
- What specific conservation actions (practices) do you expect or need the individuals to take to reduce threats? Why are these actions needed? How many people need to be trained to implement the desired conservation action? Please justify your assessment.

Training Environment, Curriculum, and Trainer
- To what degree do you have needed supplies and equipment?
- If you do not have all supplies and equipment, what provisions have you made?
- What delivery method will you use for your training, including the curriculum you will use, if appropriate? Describe the rationale for selecting this delivery method.
- Who is the trainer? Please describe their qualifications for this training.
- How do you expect any shortfalls will affect the ability of trainees to apply competencies?

Recommended Indicators: All grantees who are awarded USFWS funds for training are encouraged to monitor the following indicators, and be able to respond to the associated questions, when reporting on performance (see Annex 1 for complete list):

- **# and % of individuals selected that complete training**
    - How did you select the people for training? Why did you choose these people?
    - Do you expect a conservation action to be carried out as a result of this training? If "yes," what action do you expect? And if you expect a conservation action, how many people need to be trained to implement the desired conservation action?
    - How many people participated in the training relative to number needed? How many of those completed the training? If there is a shortfall between the number completing training and the number needed to adequately implement desired conservation action, how are you going to address that?

- **# and % of trainees that demonstrate desired knowledge, skills, and attitudes**
    - What % of trainees demonstrate desired: a. knowledge b. skills c. attitudes? How did you make this assessment?
    - What were the barriers preventing trainees from demonstrating the desired knowledge, skills, and/or attitudes?

- **# and % of trainees successfully carrying out desired practices at least once to appropriate problems**
    - Approximately what % of trainees have the necessary conditions to be able to successful apply acquired competencies?
    - Of these, approximately what % do successfully apply acquired competences?
    - Please explain why some are not able to apply them correctly

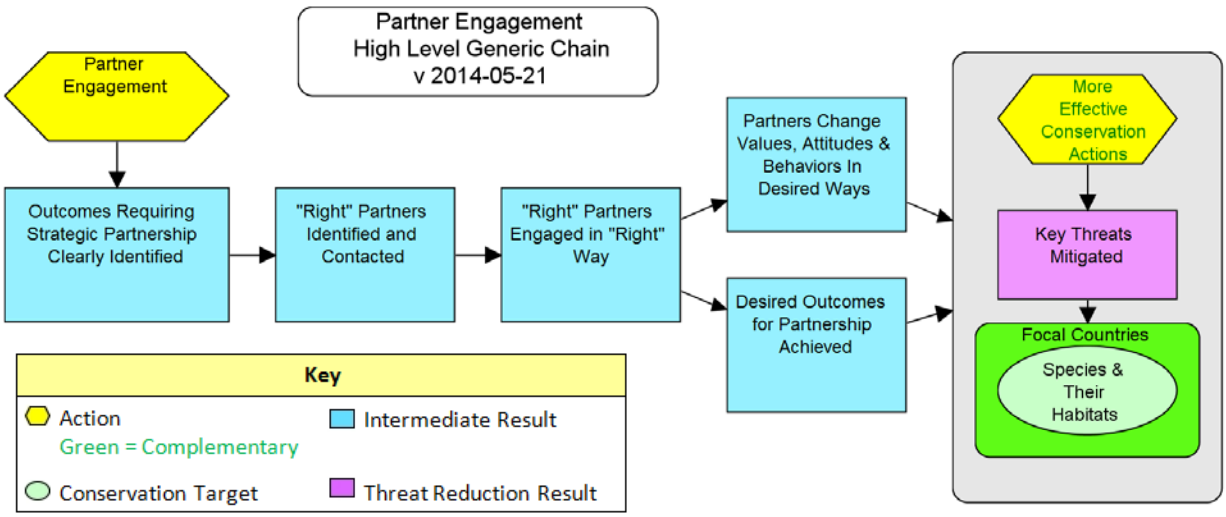
- **Evidence of threat reduced [indicator will vary depending on threat]**
    - Do you have evidence that this training and capacity building action is leading toward reduction of key threats? Please describe.

ACTION 3. Partner Engagement

Definition: Engaging selected stakeholders, including government authorities, local communities, NGO representatives, and other partners to achieve shared objectives and broader coordination across overlapping areas.

High Level Theory of Change: As illustrated in the diagram below, USFWS and partner experience to date indicates that, to be successful, Partner Engagement requires as a starting point to ensure that clear outcomes requiring strategic partnerships have been identified and that the project team has a sense of who the "right" partners might be. The next step involves identifying, reaching out to, and then engaging with the "right" partners in appropriate ways. If the partner(s) have been engaged, then the next step is to undertake desired activities and get the desired outcomes. In some cases, the engagement may also involve having partners change their values, attitudes, and behaviors in desired ways. Finally, the engagement is intended to lead to more effective conservation actions.

Note that "partners" (people and organizations with whom you actively work to implement activities) are a subset of the wider group of "stakeholders" (people and organizations with a vested interest in the results of your work) in any given project. In many cases, it may be necessary to engage with the wider group of stakeholders either in addition to, or instead of engaging with partners.



Monitoring Questions and Indicators

The following are questions and indicators that USFWS grantees should answer when applying for funding or when reporting on the effectiveness of partner engagement. They are derived from the performance indicators articulated in greater detail in Annex 1.

Application Questions: All applicants who are requesting USFWS funds are encouraged to clearly state and then answer the following questions in the proposal:

Outcomes Requiring Strategic Partnership Clearly Identified

- What are you trying to achieve that requires partnerships?

"Right" Partners Identified and Contacted

- Who are the partners you need to engage to help you achieve your objectives or help you successfully implement your conservation actions?
- Why are these the "right" partners for your work?

Recommended Indicators: All grantees who are awarded USFWS funds for partner engagement are encouraged to monitor the following indicators, and be able to respond to the associated questions, when reporting on performance (see Annex 1 for complete list):

- **Evidence of engagement in "right" way**
  - To what degree are project staff engaged and committed to the project?
  - To what degree are partnership meetings successful (i.e., productive, focused, effective)?
  - To what degree is the partnership operating in a healthy manner?
  - What unintended outcomes are occurring?
  - If partners are not engaging, what are the barriers?

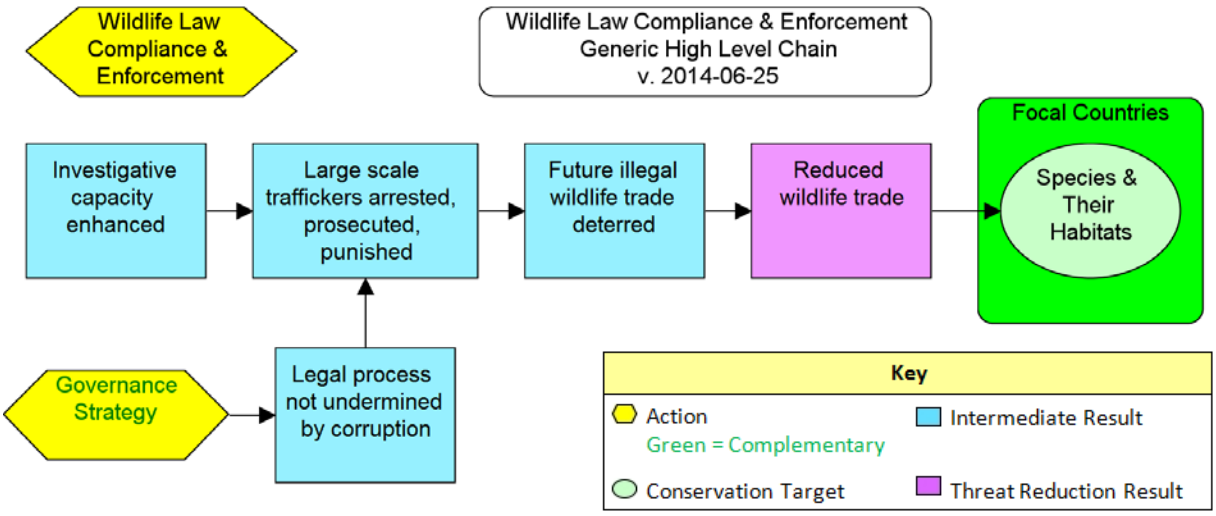
- **Degree to which desired outcomes were achieved**
  - Which desired outcomes identified in the proposal were achieved through the partnership? For those outcomes partially achieved, explain to what degree they were achieved and the prospects for full achievement.
  - Has the partnership contributed to the achievement of the desired outcomes? If not, where are the barriers?

- **Evidence of actions as a result of the partnership**
  - What conservation actions occurred as a result of this partnership?

ACTION 4. Wildlife Law Compliance and Enforcement

Definition: Monitoring and enforcing compliance with wildlife conservation-related laws, policies and regulations, and standards and codes in the judiciary system.

High Level Theory of Change: As illustrated in the diagram below, USFWS and partner experience to date indicates that, to be successful, Wildlife Law Compliance and Enforcement actions start by helping to create or enhance the investigative capacity of local organizations, which can then provide the information and solid evidence needed to successfully arrest large-scale wildlife traffickers and prosecute them with appropriate sentences. For this to happen, the chain clarifies that the legal process cannot be undermined by corruption and, therefore, will likely require the support of complementary strategies that promote good governance. If the traffickers are successfully arrested, prosecuted, and punished, then the logic holds that there will be fewer existing or future traders, which will then reduce wildlife trade and improve the status and health of species threatened by wildlife trade, as well as other species and habitats dependent on them.



Enabling Conditions: Adequate wildlife policy and law in place.

Monitoring Questions and Indicators

The following are questions and indicators that USFWS grantees should answer when applying for funding or when reporting on the effectiveness of wildlife law compliance and enforcement. They are derived from the performance indicators articulated in greater detail in Annex 1.

Application Questions: All applicants who are requesting USFWS funds are encouraged to clearly state and then answer the following questions in the proposal:

- How adequate are the wildlife policy and laws in place? If the policy and/or law are not adequate, please describe how you believe this will affect your law enforcement action and whether you have plans to address any inadequacies.
- To what degree has corruption been an undermining force in applying the law in the past? How do you plan to address corruption, if at all?
- How supportive is the general public of wildlife law enforcement? How do you think this

support (or lack thereof) is likely to influence your wildlife law enforcement action? Please describe any plans you have to generate greater public support.

Recommended Indicators: All grantees who are awarded USFWS funds for wildlife law compliance and enforcement are encouraged to monitor the following indicators, and be able to respond to the associated questions, when reporting on performance (see Annex 1 for complete list):

- **Evidence that a "good" system is in place to identify large-scale traffickers**
  - Since the start of this grant, describe how your capacity has developed/changed/ improved to identify wildlife traffickers, in particular the worst offenders?
  - List the challenges you still face in identifying high-volume traffickers.

- **Evidence of large-scale wildlife trafficking admitted for court use**
  - Please indicate the number of court cases for which you could produce evidence.
  - Since the start of this grant, describe how your capacity has developed, changed, or improved to produce evidence for courts.
  - Please list the challenges you still face in producing evidence. Please rate each for their ability to affect/hinder successful use of evidence in court.

- **# of arrests of large-scale wildlife traffickers resulting from project's investigations and/or operations support**
  - Please list the number of large-scale traders identified. If possible, estimate the % of the total number of large-scale traders this number represents.
  - Please provide a table of the arrests of wildlife traffickers that have occurred since the start of this grant including: date; short description of arrest; any evidence of trafficking magnitude; media coverage of case (y/n).

- **# and % of wildlife traffickers who have been arrested that are successfully prosecuted, appropriately sentenced, and serve or complete jail terms and/or pay fines**
  - For each case in the above table, was the trafficker prosecuted? In your judgment, how appropriate was the sentence?
  - Did the sentenced trafficker serve their full jail term and/or pay their fines?

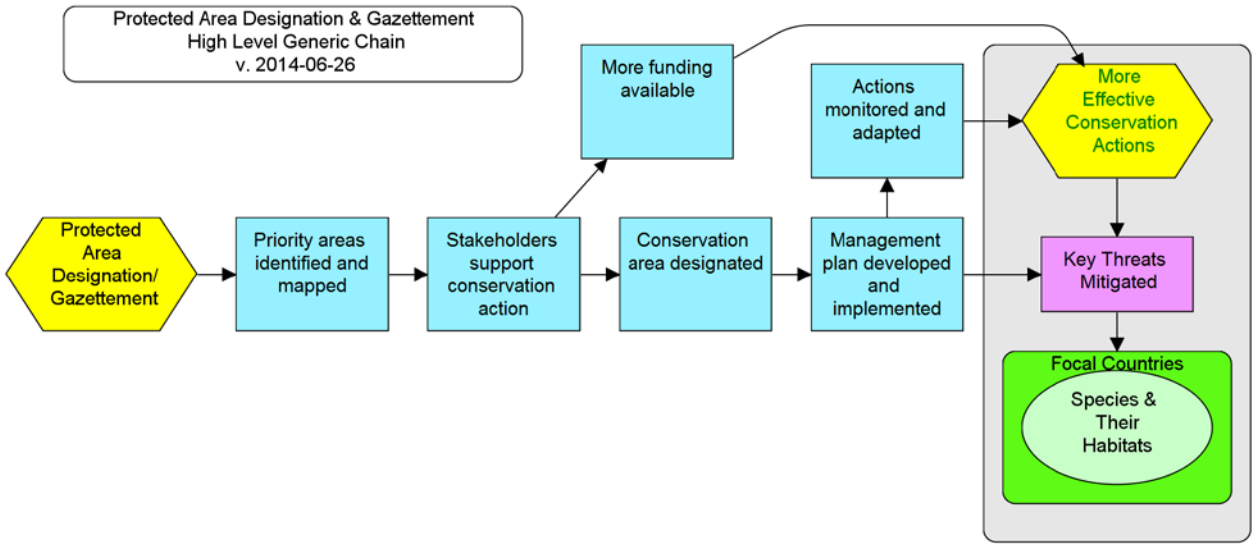
- **% change in wildlife trade in project area**
  - Since the start of the grant, how has wildlife trade changed?
  - To what degree would you attribute this trend to wildlife crime enforcement and compliance efforts? Please provide evidence supporting this claim. If relevant, describe other factors that have an impact (positive or negative) on this trend.

- **# and % of legal efforts undermined by corruption**
  - For each legal effort, was there evidence of corruption?
  - Were there sanctions against corrupt officials?
  - Please describe whether and how corruption has influence or hindered court proceedings (including arrests, prosecution, and/or sentences).

ACTION 5. Protected Area Designation

Definition: Designation or gazettement (with legal protections or policy instrument) of a site or landscape as having important value to wildlife.

High Level Theory of Change: As illustrated in the diagram below, USFWS and partner experience to date indicates that, to be successful, Protected Area Designation actions need to ensure that priority areas are identified and mapped and that key stakeholders are supportive of conservation action. This support creates the base for getting the legal designation of the conservation area, as well as for garnering financial resources that will support conservation actions within the area. If the conservation area is designated, then experience shows that a flexible, responsive management plan should be developed and implemented, affecting how humans use the area and leading to reduced threats and the improved status of species and habitats. The chain below also illustrates an assumption that, in order for the management plan to be flexible and responsive, the actions implemented should be monitored and adapted based on what is learned from monitoring.



Enabling Conditions: Legal framework and mandate for protected area creation; supportive protected area agency; political will and leadership to overcome obstacles; civil society and/or local community support; and adequate funding to establish some level of protection presence.

Monitoring Questions and Indicators

The following are questions and indicators that USFWS grantees should answer when applying for funding or when reporting on the effectiveness of protected area designation. They are derived from the performance indicators articulated in greater detail in Annex 1.

Application Questions: All applicants who are requesting USFWS funds are encouraged to clearly state and then answer the following questions in the proposal:

Priority Areas Mapped & Funding Available

- Please provide the name and location for all areas you are working to formally protect.
- If you have a map or image file with priority conservation areas and habitat elements identified, please provide it as an attachment or provide a link to it.

- Do the projects or actions in this conservation area have enough funds to establish a protection presence? Please clarify your evidence or the basis for this assessment.

Recommended Indicators: All grantees who are awarded USFWS funds for protected area designation are encouraged to monitor the following indicators, and be able to respond to the associated questions, when reporting on performance (see Annex 1 for complete list):

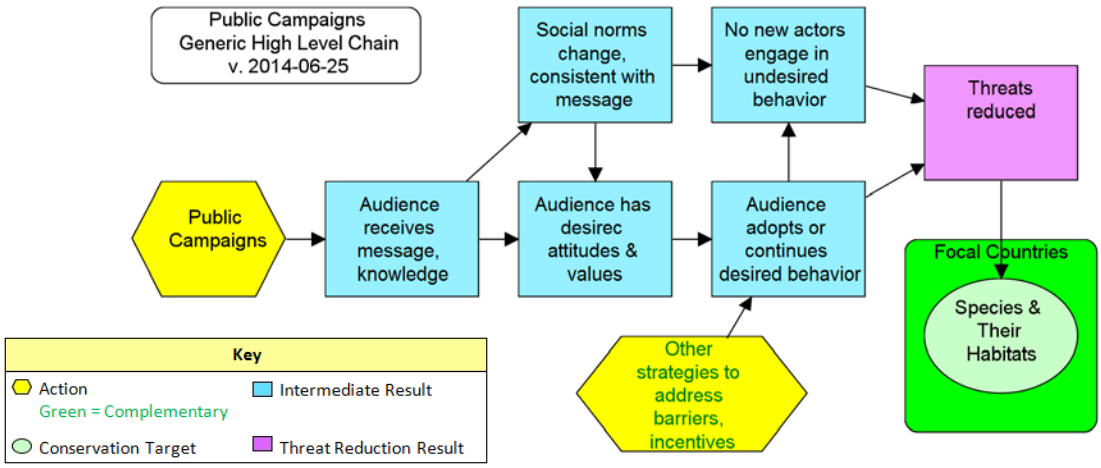
- **Evidence that projects or actions are receiving enough funds to establish a protected area protection presence**
    - To what degree has funding to the conservation area changed since the proposal was submitted?
- **Evidence that site(s) is declared a protected area(s)**
    - Has the site(s) received official, legal declaration as a protected area?
    - If no, please indicate the status, including stage of review by appropriate authorities and stakeholders, likelihood and expected timeline of legal designation, or explain if the site is unlikely to receive legal declaration.
- **% of protected area boundary that is appropriately marked or delineated**
    - Approximately what proportion of the protected area boundary is appropriately marked? If existing boundary markings are not sufficient, what plans or opportunities are there to improve them?
- **Presence of a flexible, responsive management plan approved and in place**
    - Has a management plan been developed?
    - Has it been approved by the relevant legal authorities? By desired stakeholders?
    - To what degree does the plan accommodate decreases or increases in funding?
- **Evidence that illegal activities causing key threats at site have declined or stabilized**

  For each illegal activity that is a threat to wildlife:
    - How has the threat changed since the designation of the protected area?
    - Please explain any major differences, especially where the threat has increased.
- **% of priority actions identified in management plan that are being implemented**
    - Please identify the (high-level) priority actions in the management plan.
    - To what degree is the action being implemented?
    - Please explain cases where high-priority actions are not being implemented as planned, or remain unfunded.
- **Trend in # and quality of conservation actions at site**
    - Since the protected area designation, to what degree have the conservation actions at the site increased or decreased? To what degree has the implementation of conservation actions improved or declined?
- **Evidence of threat reduced [indicator will vary depending on threat]**
    - Do you have evidence that this training and capacity building action is leading toward reduction of key threats? Please describe.

ACTION 6. Public Campaigns

Definition: Raising environmental awareness and sharing information to change values and behavior through media or other mechanisms of public campaigns.

High Level Theory of Change: As illustrated in the diagram below, USFWS and partner experience to date indicates that, to be successful, Public Campaigns should pay close attention to identifying the campaign's target audience and how behavioral change is expected to occur. The target audience needs to both receive the campaign's message and retain the intended knowledge. If this happens, then it is expected that they will have the desired attitudes and values and, accordingly, adopt or continue the desired behavior. This in turn leads to threats being reduced and species and habitats conserved. This is the direct set of expected results. However, an important outcome of public campaigns is their contribution to changing social norms and to ensuring that the desired behavior is reinforced in the broader society. This is illustrated in the top branch of the chain below. Finally, for public campaigns to lead to behavior changes, they often need other strategies that address barriers and create incentives.



Enabling Conditions: Barriers to behavioral change and motivations of undesired behavior identified and understood.

Monitoring Questions and Indicators

The following are questions and indicators that USFWS grantees should answer when applying for funding or when reporting on the effectiveness of public campaigns. They are derived from the performance indicators articulated in greater detail in Annex 1.

Application Questions: All applicants who are requesting USFWS funds are encouraged to clearly state and then answer the following questions in the proposal:

Target Audience and Expectations

- Who is the audience for this campaign?
- What is the desired behavior that the campaign is intended to encourage?
- What are the campaign's message(s)? Through what media will you deliver the message?

Your proposal will be strengthened if you explain why you chose that media over other alternatives to deliver the message.

- For each target audience, approximately how many individuals or entities do you expect to reach with this effort? How many do you expect to gain the desired knowledge? To change behavior?

Barriers and Motivations

- What barriers are there for your target audience to adopt or continue the desired behavior? How do you expect those barriers will be addressed?
- To what degree can this campaign be successful if the barriers are not addressed?
- What motivates the behavior you want to change?
- Are there or will there be incentives to encourage behavior change? To what degree can this campaign be successful if incentives are not provided?

Recommended Indicators: All grantees who are awarded USFWS funds for public campaigns are encouraged to monitor the following indicators, and be able to respond to the associated questions, when reporting on performance (see Annex 1 for complete list):

- **% of target audience that receives message**
  - For each target audience, how many individuals or what proportion were you were able to reach with this effort?

- **% of target audience with desired knowledge**
  - What proportion of your target audience has the desired knowledge?
  - What evidence did you use to document or detect knowledge gained?
  - If you partially met or did not meet your expectations, indicate why your campaign effort did not lead to the gain in knowledge you expected.

- **% of target audience that adopts or continues behavior**
  - For each target audience, identify approximately how many individuals or the proportion that (a) had the desired behavior before the campaign; (b) express intent to continue or adopt the desired behavior following the campaign; and (c) actually adopted the behavior after the campaign.
  - What evidence did you use to document or detect intent and behaviors?
  - If you partially met or did not meet your expectations, indicate why your campaign effort did not lead to the changes in behaviors you had hoped.

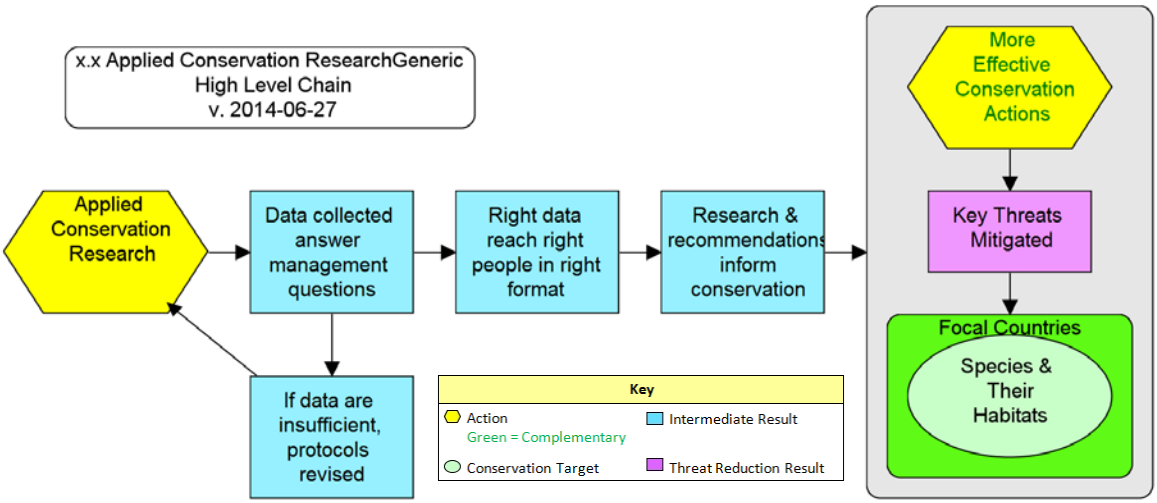
- **Evidence that social norms are consistent with the campaign's message**
  - Have social norms changed since the start of the campaign? If yes, how has that changed?

- **Evidence of threat reduction**
  - Do you have evidence of this public campaign leading toward reduction of key threats? Please describe.

ACTION 7. Applied Conservation Research

Definition: Research undertaken to answer management questions, including measuring the status of species, habitats, or threats to conservation targets and understanding how threats affect species and habitats. It does not include routine monitoring that should happen as part of a project to determine the effectiveness of actions taken.

High Level Theory of Change: As illustrated in the diagram below, USFWS experience to date indicates that, to be successful, Applied Conservation Research actions should clearly identify who will use the information and what decisions they need to make. It is not sufficient, however, to simply collect data that answer important management questions; those data need to reach the right people and be in a format that they can understand and easily use. If that happens, then the chain holds that the research effort and associated recommendations will inform conservation, leading to more conservation actions that are more effective. These conservation actions would have their own specific chains, ultimately leading to a reduction in direct threats and the improved status of species and ecosystems. Finally, the chain below shows that in cases where the data collected are not sufficient, then there is a feedback loop to revise the protocols to improve current and future conservation research efforts.



Enabling Condition: Identified stakeholders will use information generated by the research.

Monitoring Questions and Indicators

The following are questions and indicators that USFWS grantees should answer when applying for funding or when reporting on the effectiveness of applied conservation research. They are derived from the performance indicators articulated in greater detail in Annex 1.

Application Questions: All applicants who are requesting USFWS funds are encouraged to clearly state and then answer the following questions in the proposal:

Relevant Information Identified

- Who do you expect will use the research results? If multiple users, please list them.
- How do you expect them to use the results? If multiple users, answer for each user.

Justification of How Information Will Be Used

- Please clearly list your main research questions or hypotheses.
- Why is it necessary to answer these questions or test these hypotheses? If relevant, please explain how a lack of information has limited conservation action to reduce threats in the past.
- Who else has done this sort of work? How does your proposed research build upon or differ from previous work?
- Please provide any other information to justify why this research is needed.

Recommended Indicators: All grantees who are awarded USFWS funds for applied conservation research are encouraged to monitor the following indicators, and be able to respond to the associated questions, when reporting on performance (see Annex 1 for complete list):

- **Evidence that the identified research question(s) was answered**
  Reviewing the research questions you identified in the application, please answer the following for each research question:
  - To what degree were you able to clearly answer your research question(s)? If "partially" or "unable," please clarify what prohibited you from answering the research question?
  - If gaps remain, how critical is it to fill those gaps in order to be able to make good management decisions? If "somewhat" or "critical," what provisions have you made to address these gaps?

- **Evidence that appropriate audiences accessed the research results and recommendations**
  Reviewing the audiences/users you identified in the application, please answer the following for each audience/user:
  - Have identified audience accessed your research results and recommendations? On what are you basing this assessment?
  - What format have you used to share your results and recommendations with this audience? Why did you choose this format?
  - If your audience has not accessed your results and recommendations, please explain why this is the case and what you intend to do to address this issue.

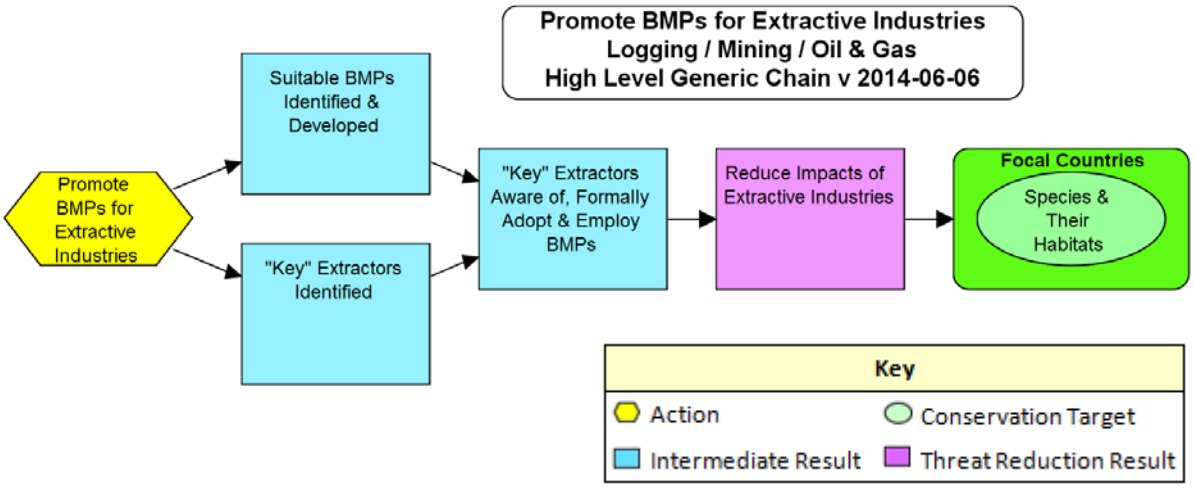
- **Evidence that data or data-based recommendations are being used to inform conservation action**
  - Has the research led to any of the following? (Revision of existing action; Maintenance of existing action (because action was deemed effective); Termination of existing action. Initiation of new action).
  - Please explain why actions were taken/modified/stopped.

- **Evidence of threat reduction**
  - Do you have evidence of this applied conservation research leading toward reduction of key threats? Please describe.

ACTION 8. Promote BMPs for Extractive Industries

Definition: Setting, implementing, changing, influencing, or providing input into voluntary standards and professional codes that promote better management practices (BMPs) for extractive industries, including logging, fishing, mining, and oil and gas exploration/production.

High Level Theory of Change: As illustrated in the diagram below, USFWS and partner experience to date indicates that, to be successful, Promoting BMPs for Extractive Industries starts by identifying the companies and other groups involved in a given industry as well as the desired better management practices. These BMPs need to put into all relevant contracts and leases along with an appropriate compliance monitoring and enforcement system. The core of this strategy has the key extractors go through a process of becoming aware of the BMPs, formally adopting BMPs, and then employing the BMPs in their work. By adopting and employing these BMPs, extractive industries will reduce their impacts. For example, extractive industries could minimize habitat destruction and degradation by creating appropriate road networks, limiting road access, and discouraging industry workers from hunting. This in turn will lead to beneficial effects on the ecosystems and key species.



Enabling Conditions: Political will and awareness within relevant government institutions to set policies and frameworks for BMPs; grantee understanding of existing certification processes or institutions operating within the region of proposed work.

Monitoring Questions and Indicators

The following are questions and indicators that USFWS grantees should answer when applying for funding or when reporting on the effectiveness of promoting BMPs. They are derived from the performance indicators articulated in greater detail in Annex 1.

Application Questions: All applicants who are requesting USFWS funds are encouraged to clearly state and then answer the following questions in the proposal:

Suitable BMPs Identified & Developed

- What BMPs are being proposed?
- What impact would implementing these BMPs have on conservation?

"Key" Extractors and Government Institutions Identified

- To what degree are key government institutions aware of BMPs? Do you have evidence of their willingness to set policies and frameworks to mandate BMPs?
- Please describe existing certification processes or institutions operating within the region in which you propose to work. If processes or institutions do not exist, please describe how your project can be successful without them.
- With which companies do you propose to work?
- What opportunities do you see for market or moral pressure to influence support or pressure for BMPs?

Recommended Indicators: All grantees who are awarded USFWS fund to promote BMPs are encouraged to monitor the following indicators, and be able to respond to the associated questions, when reporting on performance (see Annex 1 for complete list):

- **#/% new and/or renewed extraction contracts that mandate appropriate BMPs**
  - What % of relevant contracts/leases mandate appropriate BMPs?
- **Degree to which contract/policies reflect BMPs**
  - For each relevant contract, do they include all, many, some or few/no relevant BMPs?
- **Degree to which contract/policies have good enforcement provisions**
  - For each relevant contract, to what degree does it have clear enforcement mechanisms and penalties for BMP use?
- **% of key extractors that have adopted and are using BMPs**
  - What % of key extractors have adopted BMPs? What % are using BMPs?
- **Number of contract or policy violations in enforcement reports**
  - How many instances of contract or policy violations occurred? Please describe if/how you are sure that you are detecting all relevant violations.
- **% of concessions adhering to BMPs related to (a) habitat conversion, (b) road construction rules, and (c) bushmeat?**
  - What % of concessions are adhering to habitat conversion rules?
  - What is the change in the total hectares of concessions that are appropriately managed?
  - How has the road network for all relevant concessions changed? How has the road management changed?
  - How has the availability of alternatives to bushmeat for workers and their families changed at all relevant concessions?
  - What is the change in % of workers hunting at all relevant concessions?

3. Standard Threat Assessment Indicators

Although conservation practitioners are ultimately interested in protecting or restoring biodiversity, much of the day-to-day work of conservation involves taking action to counter ***direct threats*** *or* ***pressures*** – the human activities that negatively impact an ecosystem and/or species of concern (e.g., unsustainable logging, fishing, and agricultural expansion).

Understanding threats is a critical step in many stages of the conservation process, such as determining the conservation status of a given species population or site, setting priorities as to where to work, developing strategies to address threats and their drivers, assessing whether a project or program is achieving its desired results, and analyzing and comparing results to promote learning. More specifically, as shown in Figures 4a and 4b, threat indicators are used both to assess the status of a given species population or site (regardless of any actions being taken) as well as to provide a penultimate indicator of the effectiveness of a given action.

Figure 4a. Threat Assessments Used to Assess Status of Populations / Sites
In this case, the threat indicators (purple triangles) are used to assess the relative threat status of each population/site shown by the red, yellow, and green status indicator boxes.

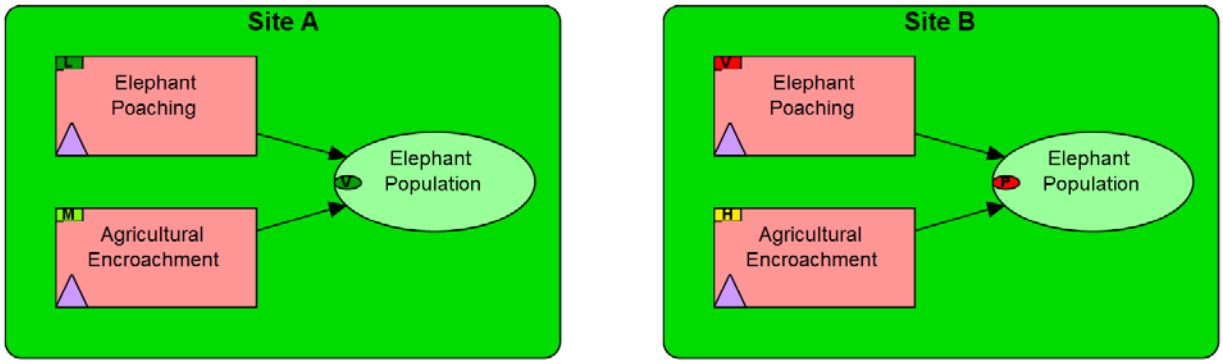
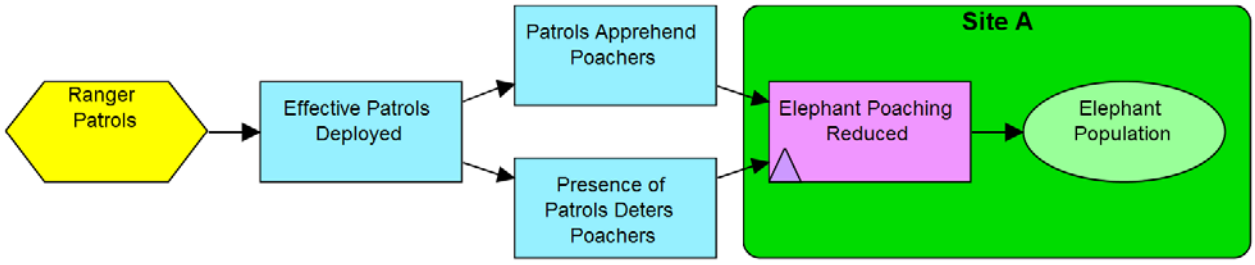


Figure 4b. Threat Assessments Used to Assess Action Effectiveness
In this case, the threat indicator (purple triangle) is used as a penultimate indicator of the effectiveness of a conservation action.



All of these critical tasks are greatly facilitated if all stakeholders can do them together, using common threat metrics. To this end, we developed standard indicators for some of the most common threats facing wildlife in Central Africa. We identified a subset of threats to Central African wildlife in a portfolio analysis of USFWS grants (and affirmed by partner meetings in 2010 and 2011) that include:

1. Commercial bushmeat hunting
2. Elephant poaching
3. Incompatible extractive industry practices (including logging, mining, oil, and fishing)
4. Road construction in sensitive areas
5. Agricultural encroachment
6. Wildlife disease
7. Sea turtle harvesting & bycatch
8. Removal of animals from the wild for the pet trade

As shown in the following excerpted example in Figure 5, for each key threat, we first determined the appropriate unit(s) of analysis and core information needs. We then identified candidate indicators and associated potential data sources and collection methods. We then rated each indicator and method in terms of three criteria:

- **Indicator Utility** – The degree to which the indicator will address stated core information needs (independent of feasibility and cost). Elements of utility include that the indicator directly addresses the question(s) asked, requires little or no interpretation, is widely accepted as a valid indicator to assess the question(s) and/or has been published in the scientific literature, and has been used by relevant policy and decision makers.
- **Method Reliability & Technical Feasibility** – How accurate, reliable, and technically feasible it is to implement the method used to collect the indicator. This assessment is independent of the cost of the method. In rating, it is important to consider issues like corruption or capacity, which are likely to influence how well the method can be implemented and how accurate and reliable the data gathered will be. A method's reliability ultimately determines the confidence level in the measurements being made.
- **Cost for Average Grantee to Collect Data** – The cost of implementing the method. Cost is generally relative to the scale at which data collection will take place. For example, a small-scale project may be able to implement a labor-intensive method without spending a lot of money, but this same method may not be cost-effective at larger scales.

We then put our selected indicators and methods and the ratings through two stages of peer review and used this feedback to select a final portfolio of indicators to recommend for monitoring purposes, marked with an asterisk. High level summaries of these recommendations are presented in the following sections; more detailed versions that show all the indicators we considered and our ratings are presented in Annex 2.

Each of the recommended indicators has benefits and drawbacks. For example, some indicators may do a good job of measuring the core information need, but they may be prohibitively expensive or difficult for a project team to measure. Other indicators may be more technically feasible to measure but not sufficiently informative, or produce assessments with lower

Figure 5. Example of Criteria Used to Rate Threat Indicators & Methods

Candidate Indicator for ELEPHANT POACHING	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings		
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data
* Proportion of Illegally Killed Elephants (PIKE) - # of illegally killed elephants divided by the total number of carcasses encountered per year for site	Analyze existing patrol reports/ logs	4	2.5 Data hard to gather; may be vulnerable to corruption	$-$$
	Conduct field surveys/ transects		3	$$
	Conduct aerial surveys		2	$$$
Weight of ivory confiscated at key transit points	Analyze existing seizure records	2 - 2.5	1.5 Data hard to gather; may be very vulnerable to corruption	$
	Conduct trade surveillance		1.5 Data hard to gather; may be very vulnerable to corruption	$$
* Elephant pop size (ideally stratified by age and gender)	Analyze existing aerial elephant surveys	4	Savanna: 3 Forest: 1	$$$
	Conduct dung surveys		Forest: 3	$$
* Signs of poaching detected in field (eg # poachers, # camps, amount of spent ammunition)	Analyze SMART records		2 Data hard to gather; may be vulnerable to corruption	$$-$$$
Attitudes of households/ indiividuals towards poaching	Conduct household surveys, key poacher surveys	1	3 easy, but difficult to do well	$-$$
Change in elephant behavior	Record flight distance (vehicle and pedestrian)	2	2	$$-$$$
	Analyze physiological indicators of stress (streaming, vocalization, increased stress hormones in dung)		2	$$$

Candidate indicators | Methods | Ratings against criteria

confidence levels. As such, project teams need to select the indicators best suited for the context of their project and geographic area(s) of concern; the recommended indicators are not mandatory for USFWS grantees to collect unless specified in grant awards and/or cooperative agreements.

Finally, please keep in mind that the indicators below are designed to measure the direct threat itself. Project teams are expected to report on intermediate results of actions designed to address these threats using the effectiveness measures described in Section 2. For example, greater awareness of and support for restrictions on bushmeat hunting are covered through effectiveness measures, while actual hunting incidents or evidence of these incidents are covered through direct threats indicators.

We welcome feedback from anyone reading or using the threat indicators. Please provide feedback at http://tinyurl.com/fws-indicators.

THREAT 1. Commercial Bushmeat Hunting

Definition: Hunting of wildlife for commercial sale.

Photo Credit: USFWS (Matt Muir)

Photo Credit: USFWS (Richard Ruggiero)

Units of Analysis / Core Information Needs:

For a given management area or geographic region:

- What species are targeted by commercial bushmeat hunting?
- How are hunting pressures changing over time generally and for each species?
- To what degree are USFWS-funded actions helping to stop bushmeat hunting?

Recommended Indicators *(see Annex 2 for complete list of all considered):*

- **# of individuals by species at key sale or transport points**
  Pros: Fairly good indicator of threat, could be part of regular patrol reports
  Cons: Depends on openness of markets (less effective if black markets) and representativeness of the sample
  Other Comments: Presence/absence of species in samples a cheaper alternative
- **# of incidents of poaching detected in field**
  Pros: Fairly good indicator of threat, could be part of regular patrol reports
  Cons: Survey/transect method is more costly; analysis of patrol reports method depends on quality of patrols and is vulnerable to corruption
  Other Comments: Depends on level of effort, so requires careful interpretation
- **Targeted species abundance**
  Pros: Direct indicator of ultimate threat impact, relatively less expensive
  Cons: Need people to collect and analyze the data; may be less reliable
  Other Comments: Depends on level of effort, so requires careful interpretation

THREAT 2. Elephant Poaching

Definition: Illegal killing of elephants, primarily for ivory.

Photo Credit: USFWS (Richard Ruggiero)

Units of Analysis / Core Information Needs:

For a given elephant population, management area, or geographic region:

- How many elephants are being killed by poachers?
- Who is doing the poaching (e.g. local communities vs. professional poachers)?
- To what degree are USFWS-funded actions helping to stop elephant poaching?

Recommended Indicators *(see Annex 2 for complete list of all indicators considered):*

- **Proportion of Illegally Killed Elephants (PIKE)**
  Pros: Is a good indicator of the threat; data generally fairly cheap to collect as part of patrol reports or through surveys
  Cons: Patrol reports vulnerable to corruption; not a great indicator if low numbers of elephants being poached (1 out of 2 = 50% but may not be truly high)
  Other Comments: Could perhaps adjust PIKE for low numbers
- **Elephant population size (ideally stratified by age and gender)**
  Pros: Is a good indicator of the threat, especially for MIKE sites
  Cons: Can be challenging to count elephants, especially in forests
- **Signs of poaching detected in field**
  Pros: Is a reasonably good indicator of the threat; data generally fairly cheap to collect as part of patrol reports or through surveys
  Cons: Patrol reports vulnerable to corruption

THREAT 3. Incompatible Extractive Industry Practices

Definition: Natural resource extraction such as logging, mining, or fishing. In particular, incompatible extractive industry practices taking place outside of authorized concessions and/or that violate standards for ecologically-appropriate management practices.

Photo Credit: USFWS (Dirck Byler)

Units of Analysis / Core Information Needs:

For a given management area, buffer zone, or geographic region:

- What is the extent of natural resource extraction?
- How much extraction is taking place legally (e.g. authorized concessions) vs illegally?
- How much of the extraction is being conducted according to standards for ecologically-appropriate management practices?
- To what degree are USFWS-funded actions helping to reduce incompatible extractive industry practices?

Recommended Indicators *(see Annex 2 for complete list of all indicators considered):*

- **Total ha / % of management area with extraction taking place**
  Pros: Relatively feasible at least on a smaller scale
  Cons: Does not assess intensity of extraction; harder if impact not visible
  Other Comments: Could also assess land inside and outside concession areas
- **% of resource being extracted in relation to legal limits / appropriate standards**
  Pros: Gets at intensity of extraction
  Cons: Depends on strength of laws and standards; if depend on company records, then vulnerable to corruption

THREAT 4. Road Construction in Sensitive Areas

Definition: Construction of roads in ecologically-sensitive areas leading to habitat destruction/fragmentation and increased hunting pressure.

Photo Credit: USFWS (Richard Ruggiero)

Units of Analysis / Core Information Needs:

For a given management area, buffer zone, or geographic region:

- How many km of new roads have been constructed in ecologically sensitive areas?
- Are these roads contributing to increased hunting pressure?
- To what degree are USFWS-funded actions helping to mitigate road construction in ecologically sensitive areas?

Recommended Indicators *(see Annex 2 for complete list of all indicators considered):*

- **Road density in ecologically sensitive areas (km/sq km by road type)**
  Pros: Is a reasonably good indicator of the threat; relatively cheap if maps exist
  Cons: More expensive if good maps don't exist
- **# km of new roads under construction or built with last 3 years in sensitive areas**
  Pros: Is a reasonably good indicator of the threat; relatively cheap if maps exist
  Cons: More expensive if good maps don't exist
- **Average travel time to key resource markets (bushmeat, timber, etc.)**
  Pros: Interesting indicator of effect of road on resource extraction
  Cons: Need to account for weather and or seasonality

THREAT 5. Agricultural Encroachment

Definition: Loss of wildlife habitat from expansion of agricultural areas and human settlements.

Photo Credit: USFWS (Richard Ruggiero)

Units of Analysis / Core Information Needs:

For a given management area, buffer zone, or geographic region:

- How much wildlife habitat is being lost to expansion of agricultural areas / settlements?
- How much of this expansion is driven by other government agency policies?
- To what degree are USFWS-funded actions helping to reduce habitat loss / degradation?

Recommended Indicators *(see Annex 2 for complete list of all indicators considered):*

- **Total ha / % of management area encroached, ideally by type of encroachment**
  Pros: Relatively direct indicator of the threat
  Cons: Can be more expensive depending on what data exist and accuracy needed

THREAT 6. Wildlife Disease

Definition: Increased prevalence and/or severity of disease in wild animal populations due to contact with humans and/or domesticated animals. This threat can be brought on or exacerbated by habitat disturbance, contamination, and other human-induced threats.

Units of Analysis / Core Information Needs:
For a given management area, geographic region or species population:

- What is the prevalence/potential risk of human-linked disease in key wildlife populations?
- To what degree are USFWS-funded actions helping to minimize the effects of human-linked disease on wildlife populations?

Recommended Indicators *(see Annex 2 for complete list of all considered):*

- **Prevalence of pathogen(s) in wildlife population**
  Pros: Fairly good indicator of threat
  Cons: Fairly costly
  Other Comments: If the concern is disease transmitted directly from humans and domestic animals, disease prevalence (or incidence) will be much more informative if/when the suspected source (human or domestic animal) is also measured; presence/absence of disease or pathogen is cheaper alternative

- **# of new cases within population divided by total population**
  Pros: Very good indicator of threat, especially for pops tracked by individual (eg gorillas)
  Cons: Fairly costly; need to know total population in order to calculate incidence; Also need to be able to reliably identify the pathogen's presence based on symptoms

- **Mortality rate of species due to the pathogen**
  Pros: Gets at critical information need
  Cons: Can be expensive to measure in field; estimates from literature cheaper

THREAT 7. Sea Turtle Harvesting & Bycatch

Definition: Collection of sea turtles for eggs and meat on nesting beaches and in open water either intentionally, or as bycatch while fishing for other species.

Photo Credit: Renatura

Photo Credit: Renatura

Units of Analysis / Core Information Needs:

For a given management area, geographic region or species population:

- How many sea turtles are being harvested?
- To what degree are USFWS-funded actions helping to stop sea turtle harvesting?

Recommended Indicators *(see Annex 2 for complete list of all indicators considered):*

- **# and % of poached nests (by species)**
  Pros: Direct indicator of threat; relatively feasible
  Cons: Requires some training and oversight to be credible
- **# and % of adult females harvested for meat on beaches (by species)**
  Pros: Direct indicator of threat; relatively feasible
  Cons: More challenging to monitor than nests
- **# of sea turtles caught as bycatch (by species)**
  Pros: Reasonably good indicator of threat
  Cons: Vulnerable to observer or reporting bias
  Other Comments: # of sea turtle carcasses encountered on beach can be cheaper proxy

THREAT 8. Removal of Animals from the Wild for the Pet Trade

Definition: Capture of wild animals for sale as pets.

Photo Credit: USFWS (Richard Ruggiero)

Units of Analysis / Core Information Needs:

For a given management area, geographic region or species population:

- How many animals of each species are being captured?
- To what degree are USFWS-funded actions helping to stop the removal of animals from the wild for the pet trade?

Recommended Indicators *(see Annex 2 for complete list of all indicators considered):*

- **# of individuals (by species) confiscated / observed in pet trade**
  Pros: Is relatively direct indicator of pet trade threat
  Cons: Depends on degree to which sampling is biased
- **Qualitative assessment of degree of openness / ease of trade**
  Pros: Relatively cheaper to collect
  Cons: Less direct indicator

4. Next Steps

4.1 Use of these Indicators by USFWS and the Wider Community

At the start of this document, we stated that the threat and effectiveness indicators developed through this work are currently provided as guidance for grantees unless formally requested or required by USFWS in grant awards and/or cooperative agreements. As shown in the "Swim Lane" diagrams in Figure 6, the USFWS will use these indicators in the application process for competitive grants and cooperative agreements, as well as in performance reporting. As first stated in Section 1.4, use of the standard indicators presented in this document has the potential to improve conservation by helping USFWS and its grantees and partners to:

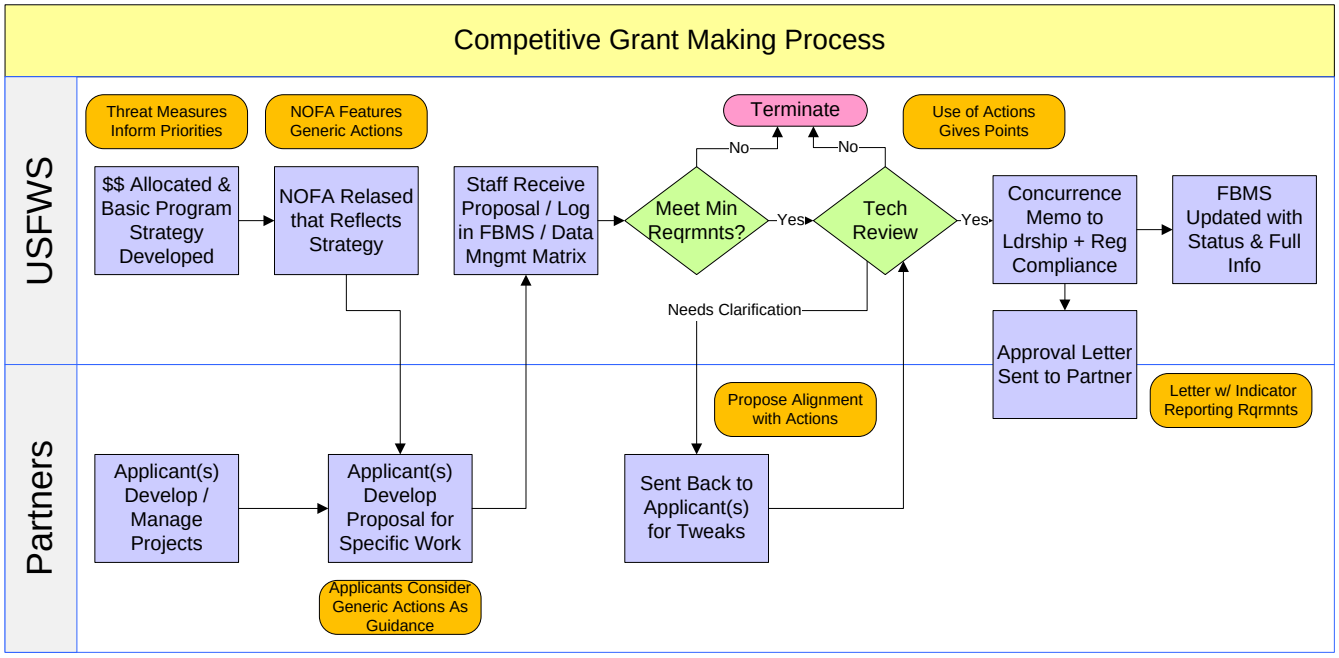
- **Monitor, Assess and Report on Performance** – Use of key indicators enables USFWS, grantees, and other partners to track progress of conservation actions and to report on performance, both in terms of intermediate impacts as well as ultimate threat reduction.
- **Collect, Share and Aggregate Comparable Data** – Use of standard and common indicators enables USFWS to bring data together from individual grants to create larger and more robust data sets.
- **Learn and Improve** – Finally, use of these standard indicators helps provide the basis for true adaptive management by allowing USFWS and partners to compare data and conditions across projects and sites to understand the conditions under which different actions are effective or not in reducing threats and why. This type of learning is most effective when both the funder and the grantee agree that it is important to report not just successes, but also challenges and failures without penalty.

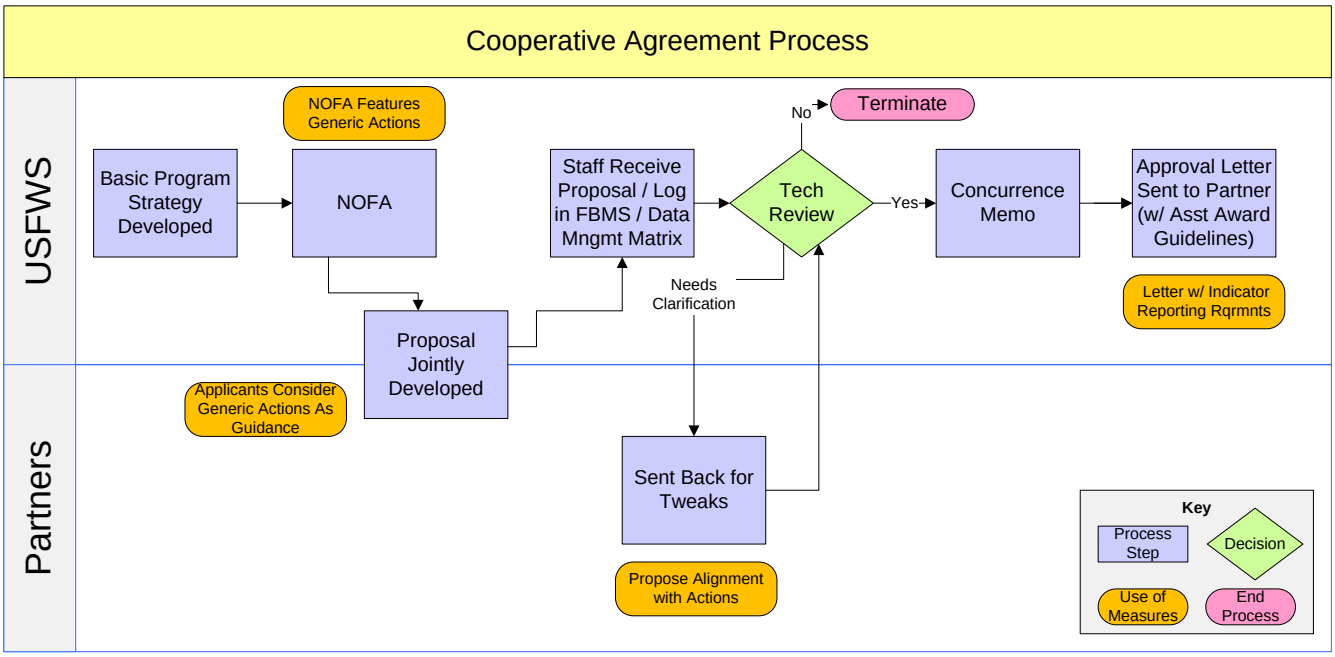
There are, however, some differences between the threat and effectiveness indicators in terms of their implementation and use:

- **Effectiveness Measures:** Here, each organization or agency implementing a given action will likely need to collect its own data about the proximate results of its interventions. For example, USFWS-funded Projects A, B, and C all need to collect data about anti-poaching patrol actions that they are each taking. However, if teams collect these data in a common format, then it is possible to pool and compare the data across projects and organizations. This enables the USFWS to report on the aggregate impacts of their funding program. It also provides a true foundation for cross-project learning about the conditions under which this patrol action works.
- **Threat Status Indicators:** As is the case with most ultimate or penultimate status measures, these indicators generally only need to be collected once on behalf of all interested parties assuming that the data are sufficiently reliable and accessible. For example, one organization might take responsibility for collecting all threat information in the area surrounding a particular national park or protected area. Likewise, one organization might try to compile all information about a specific type of threat such as road construction or clearing of land for agriculture on behalf of the wider conservation community. If reliable sources of data exist, then individual projects do not need to waste scarce resources in duplicitous data collection efforts. USFWS welcomes suggestions from its grantees and partners on how to monitor the status of threats in a collaborative, meaningful and cost-effective manner.

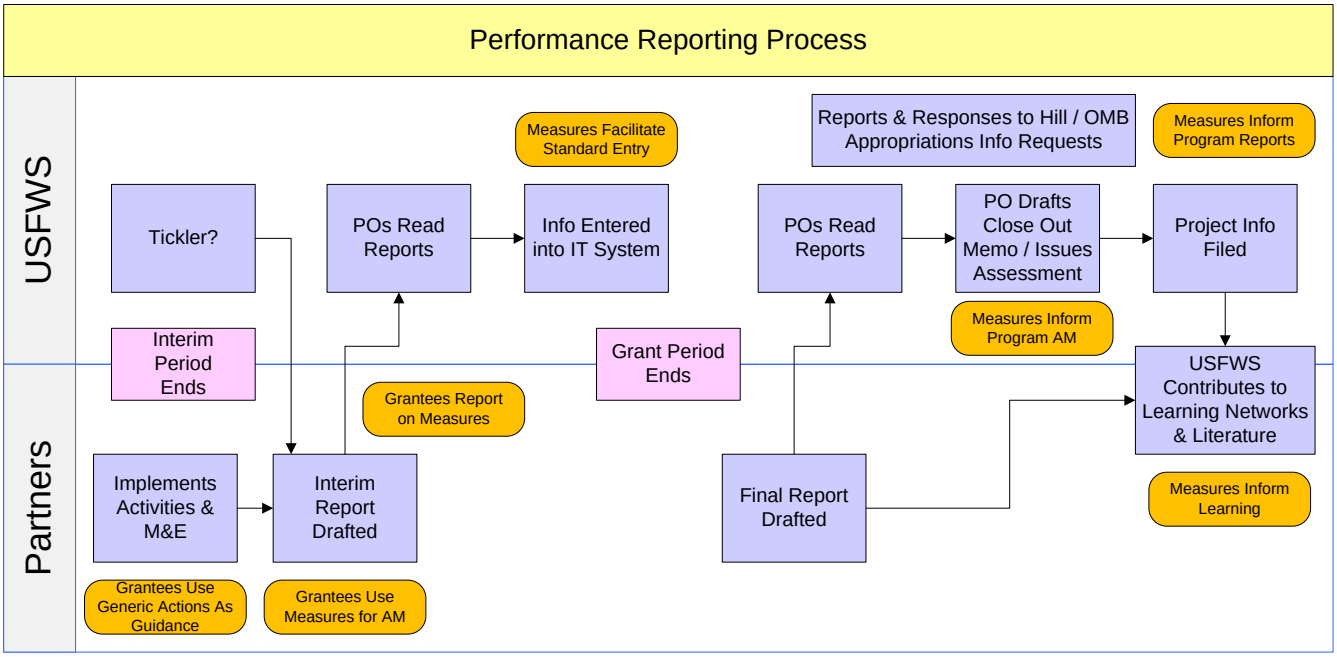
Figure 6. Swim Lane Diagrams Showing How USFWS Will Use These Indicators

These three diagrams show the basic processes by which the USFWS a) awards competitive grants, b) develops cooperative agreements, and c) handles performance reporting. Each horizontal "lane" shows the work done by the USFWS and by partners during the process. The purple boxes represent specific steps in the process; the orange ovals are where the standard threat and/or effectiveness indicators come into the process.





(Fig 6. continued)



4.2 Ongoing Indicator Development

Although we have put extensive effort into developing and peer reviewing the standard indicators in this document, we consider this Version 1.0. By making this work available to USFWS partners and the broader conservation community, we hope that people will not only adopt them, but also continue to refine and improve them over time. Please provide feedback at http://tinyurl.com/fws-indicators.

As mentioned above, the effectiveness measures in this report are publically available in the CMP's Conservation Actions and Measures Library (CAML). This library will ultimately house standard results chains and measures for all common conservation actions, following the common report format and standards used in this report.

We also hope to develop a similar library of threat indicators in the near future. The format for this library remains to be worked out, but the material in this document hopefully provides a good starting point for this effort. We could also potentially start to develop a standard set of metrics to assess threat magnitude based on these indicators.

The *Open Standards for the Practice of Conservation* operationally define threat magnitude as a combination of the **scope** of a threat on a given target and the **severity** of the threat. These dimensions are operationalized in the Simple Threat Rating method used by Miradi Software as follows:

Scope - Most commonly defined spatially as the proportion of the target that can reasonably be expected to be affected by the threat within ten years given the continuation of current circumstances and trends. For ecosystems, measured as the proportion of the target's occurrence. For species, measured as the proportion of the target's population.

- **Very High:** The threat is likely to be pervasive in its scope, affecting the target across all or most (71-100%) of its occurrence/population.
- **High:** The threat is likely to be widespread in its scope, affecting the target across much (31-70%) of its occurrence/population.
- **Medium:** The threat is likely to be restricted in its scope, affecting the target across some (11-30%) of its occurrence/population.
- **Low:** The threat is likely to be very narrow in its scope, affecting the target across a small proportion (1-10%) of its occurrence/population.

Severity - Within the scope, the level of damage to the target from the threat that can reasonably be expected given the continuation of current circumstances and trends. For ecosystems, typically measured as the degree of destruction or degradation of the target within the scope. For species, usually measured as the degree of reduction of the target population within the scope.

- **Very High:** Within the scope, the threat is likely to destroy or eliminate the target, or reduce its population by 71-100% within ten years or three generations.
- **High:** Within the scope, the threat is likely to seriously degrade/reduce the target or reduce its population by 31-70% within ten years or three generations.
- **Medium:** Within the scope, the threat is likely to moderately degrade/reduce the target or reduce its population by 11-30% within ten years or three generations.
- **Low:** Within the scope, the threat is likely to only slightly degrade/reduce the target or reduce its population by 1-10% within ten years or three generations.

As a general rule, while the thresholds used to define the scope categories (e.g. the 10% boundary between low and medium scope) are fairly easy to conceptually understand and apply, the equivalent thresholds for the severity category are much more nebulous and difficult to use. To this end, it could be useful to use the threat indicators developed in this report as a jumping-off point to develop better assessments of threat severity for each type of threat.

As one example in Figure 7, we might use the Proportion of Illegally Killed Elephants (PIKE) indicator to determine thresholds for the severity of the threat of elephant poaching as shown in the following table (the adjustment for low numbers is needed because if 1 of 2 killings is illegal, then PIKE = 50%). We could even take this a step further and add additional dimensions to this calculation based on additional indicators; in this example, the proximity of signs of poaching to the management area indicates that there is a future threat of poaching even it is not yet happening locally. We would also, of course, need to develop specific roll-up rules to combine multiple dimensions into one overall threat severity and ultimately a threat magnitude assessment. This system could then be used to show the comparative status of different management units for any given threat in a much more systematic fashion – imagine, for example, a GIS layer in a map showing the threat ratings for different protected areas as a series of color-coded polygons.

Figure 7. Example of Threat Indicators Used to Define Threat Severity

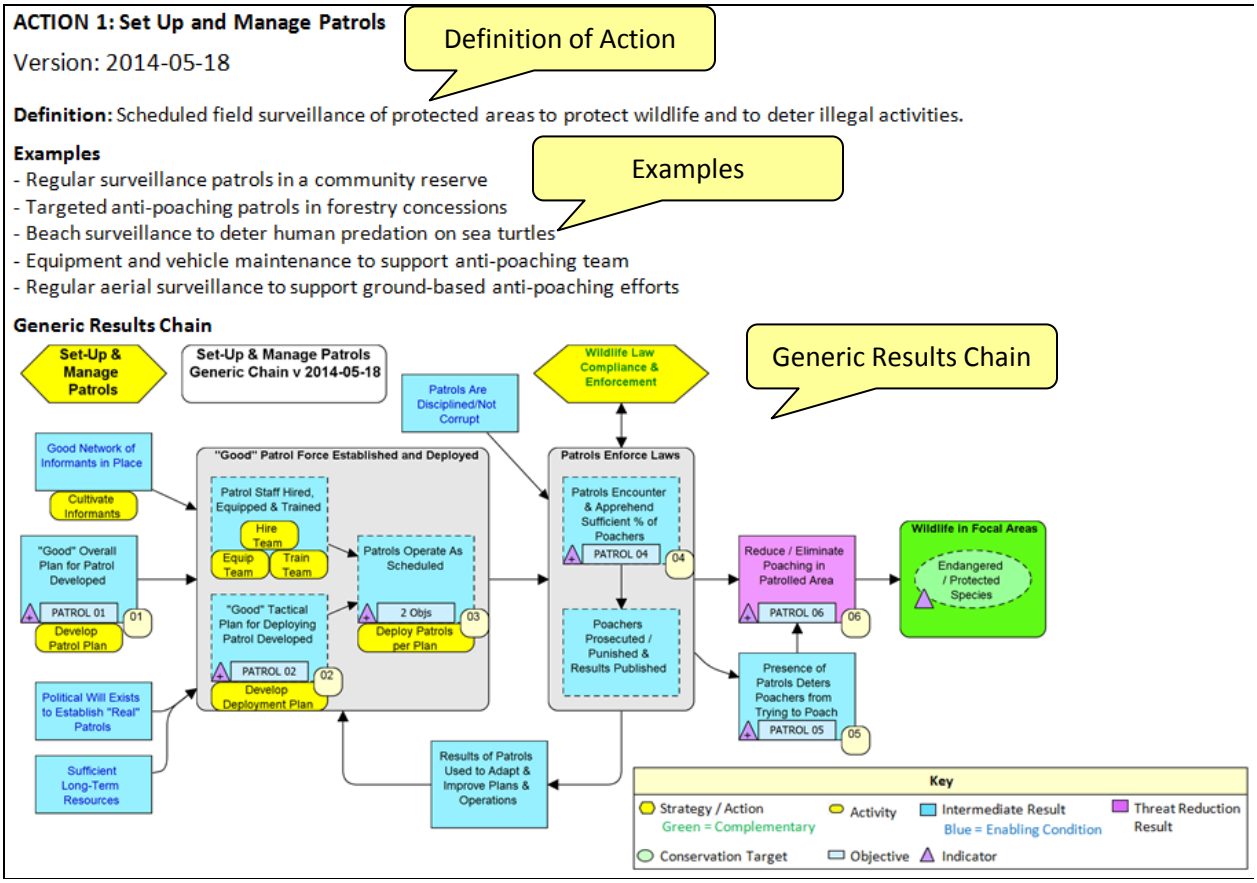
Severity Dimensions:	Low	Med	High	Very High
PIKE (adjusted for low numbers)	0	1-4%	5-10%	> 10%
signs of poaching	none in country	none in region	some in area	lots in area

Annex 1. Details of Effectiveness Measures

This annex contains the raw material for the results chains, objectives, and effectiveness indicators for each of the following nine generic actions:

1. Set Up and Manage Patrols
2. Training and Capacity Development
3. Partner Engagement
4. Wildlife Law Compliance & Enforcement
5. Protected Area Designation
6. Public Campaigns
7. Applied Conservation Research
8. Promote BMPs for Extractive Industries

As shown in the following images, the tables for each results chain provide a series of objectives and application and reporting questions US FWS grantees should be prepared to answer in order to provide the data needed for the effectiveness measures for these objectives. We welcome feedback from anyone reading or using these measures of effectiveness. Please provide feedback at http://tinyurl.com/fws-indicators.



Objectives & Indicators for Generic RC

Objectives / Indicators	Questions to Measure Indicators
PATROL 01. "Good" Overall Plan for A "good" overall plan for patrolling is dev[illegible] prior to the start of this work. "Good" = - Realistic assessment of poachers and ability of patrols to counter them - Numbers of s[illegible] - Skills needed - Training to pr[illegible] - Equip[illegible] PATROL 01. Qualitative Assessment of Plan Against a Priori Criteria PATROL 01R. % of Patrol Efforts that Have a "Good" Plan	a. Who is doing the poaching? Applicants should justify how the type of poachers involved at the site can be realistically deterred by proposed patrols b. Have you created a plan for the patrols that covers: - Numbers of staff required - Skills needed - Training to provide those sk[illegible] - Equipment needed - Realistic budgets for equipm[illegible]
PATROL 02. "Good" Tactical Plan for Deploying Patrol Developed Prior to patrols going in field, a "good" tactical plan for deploying the patrols has been developed. "Good" = - Comprehensively and yet strategically covers the spatial territory (focuses on access points, watering holes etc) - Sufficient frequency to catch 90% of poachers - Element of randomness or unpredictability (1 = completely set published schedule, 4 = totally unpredictable schedule) - Sets specific targets for number of days, minimum area covered, etc. - Realistic budgets for equipment and person power PATROL 02. Assessment of Tactical Plan Against a Priori Criteria See questions for scales for assessing criteria PATROL 02R. % of actions with "good" tactical plan	a. Have you created a plan for deployi[illegible]trols that covers territory focusing on key access points, watering hole[illegible]ransport routes, etc? (1=covers only small fraction of key points, 2=covers about half of key points, 3=covers all key points, 4 =covers all key points + most territory) Please justify response. b. Does your plan have patrols at sufficient frequency to cover: (1=90% of poachers) Please justify response. c. Does your plan have an element of randomness/unpredictability? (1 = completely set published schedule, 4 = totally unpredictable schedule) d. Does your plan have realistic budgets for equipment and person power? Please justify response. e. Is there a network of informers that can provide information to guide tactical deployment of patrols?
PATROL 03-1. Patrols Properly Staffed & Equipped Within xx months of starting project, 90% of patrols have "adequately" trained and equipped staff members as outlined in the deployment plan. "Adequate" training = xxxxxx "Adequate" equipment = yyyyy. PATROL 03-1. % of Patrols Adequately Trained and Equipped PATROL 03-1R. # / % of Projects Adequately Trained and Equipped	a. What % of your patrols are adequately trained and equipped? How did you calculate this response?

Generic Objectives

Indicators for Site and Roll-up Levels (R)

Application and Reporting Questions to Provide Data for Indicators

ACTION 1: Set Up and Manage Patrols

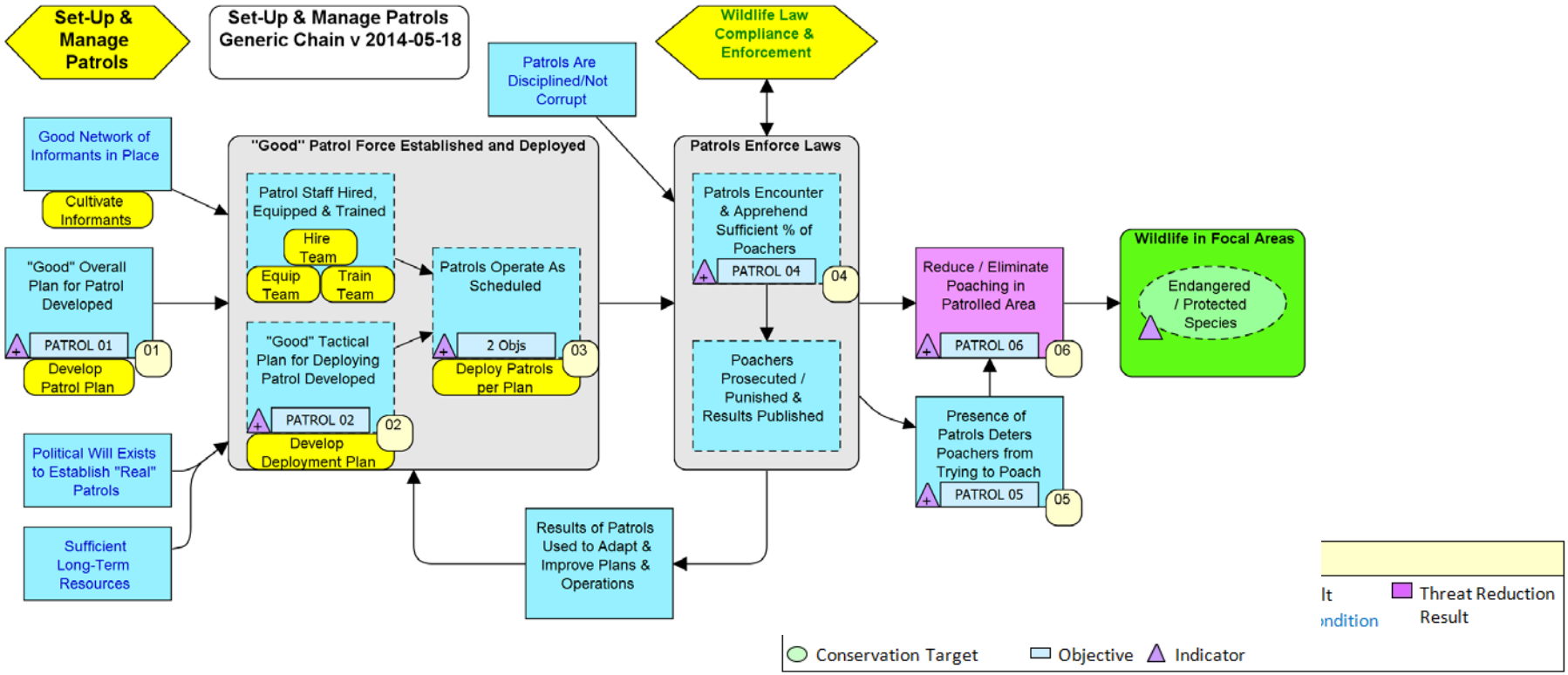
Version: 2014-05-18

Definition: Scheduled field surveillance of protected areas to protect wildlife and to deter illegal activities.

Examples

- Regular surveillance patrols in a community reserve
- Targeted anti-poaching patrols in forestry concessions
- Beach surveillance to deter human predation on sea turtles
- Equipment and vehicle maintenance to support anti-poaching team
- Regular aerial surveillance to support ground-based anti-poaching efforts

Generic Results Chain (Theory of Change)



Narrative Description of Results Chain (Theory of Change)

Set Up and Manage Patrols starts with (01) developing a "good" plan for the patrol. This includes in particular, a realistic assessment of who the poachers are and the potential for patrols to counter them. The next steps involve hiring, equipping, and training patrol staff and (02) developing a good tactical plan for deploying the patrol. These steps require the political will to establish “real” patrols and sufficient long-term resources as enabling conditions. The key step is then (03) that the patrols operate as scheduled. If the patrols operate, then the theory is that they (04) encounter most/all poachers and apprehend them so that they are then prosecuted and punished. This will require that patrols are disciplined and not corrupt. It may also require additional support through a wildlife law compliance and enforcement strategy. The theory of change also states that (05) that the presence of patrols deters poachers from trying to poach. Finally, if poachers are deterred, then this will (06) reduce or eliminate poaching, which in turn lead to maintenance or growth of populations of key target species. Good patrolling also requires that the results of the patrols are used to adaptive manage and improve the patrolling plans and operations in response to new information and changing conditions. It is important to note that there are many kinds of poaching including by armed militias, commercial poaching, subsistence poaching and hunting outside legal limits. Different kinds of patrols may be needed to counter each of these threats. For example, unarmed community groups are unlikely to be able to stop poaching by armed militias.

Objectives & Indicators for Generic Results Chain

Objectives / Indicators	Questions to Measure Indicators
Enabling Conditions in Place	**Application Questions:** a. Does the political will exist to establish “real” patrols? b. Are there sufficient long-term resources to support patrols? c. Will patrols be disciplined and not corrupt? d. Is there a network of informers to guide tactical deployment of patrols?
PATROL 01. "Good" Overall Plan for Patrol Developed A “good” overall plan for patrolling is developed prior to the start of this work. ("Good" = Realistic assessment of poachers and ability of patrols to counter them; # of staff required; skills needed; training to provide those skills; equipment needed; realistic budgets for equipment and personnel) PATROL 01. Qualitative Assessment of Plan Against a Priori Criteria PATROL 01R. % of Patrol Efforts that Have a "Good" Plan	**Application Questions:** a. Who is doing the poaching? Applicants should justify how the type of poachers involved at the site can be realistically deterred by proposed patrols b. Have you created a plan for the patrols that covers: (a) number of staff required, skills and equipment needed, training to provide those skills, realistic budgets for equipment and personnel. Please justify response.
PATROL 02. "Good" Tactical Plan for Deploying Patrol Developed Prior to patrols going in field, a "good" tactical plan for deploying the patrols has been developed. "Good" = Comprehensively and yet strategically covers the spatial territory (focuses on access points, watering holes etc.; Sufficient frequency to catch 90% of poachers; Element of randomness or unpredictability; Sets specific targets for number of days, minimum area covered, etc.; Realistic budgets for equipment and person power	**Application Questions:** a. Have you created a plan for the patrols that covers: (b) coverage of key access points and transport routes; and (c) and an element of unpredictability for when/where patrols will happen? Please justify response. b. Does your plan have patrols at sufficient frequency to cover: (1=90% of poachers) Please justify response. c. Does your plan have realistic budgets for equipment and person power? Please justify response.

Objectives / Indicators	Questions to Measure Indicators
PATROL 02. Assessment of Tactical Plan Against a Priori Criteria See questions for scales for assessing criteria PATROL 02R. % of actions with "good" tactical plan	
PATROL 03-1. Patrols Properly Staffed & Equipped Within xx months of starting project, 90% of patrols have "adequately" trained and equipped staff members as outlined in the deployment plan. "Adequate" training = xxxxxx "Adequate" equipment = yyyyy. PATROL 03-1. % of Patrols Adequately Trained and Equipped PATROL 03-1R. # / % of Projects Adequately Trained and Equipped	**Reporting Questions:** a. What % of your patrols are adequately trained and equipped? How did you calculate this response?
PATROL 03-2. Patrols Operate as Scheduled Within xx months of starting project, > 90% of planned patrols are taking place PATROL 03-2. % of Patrols Operating as Scheduled PATROL 03-2R. # / % of Projects that have Patrols Operating as Scheduled	**Reporting Questions:** b. How many patrols have you sent out (per week / month / year) c. What % of your patrols in your plan operated as scheduled? If less than 90%, why?
PATROL 04. Patrols Apprehend Sufficient % of Poachers Once patrols start, > xx% of poachers entering the patrolled area are encountered and apprehended (sufficient to both reduce poaching and deter others) PATROL 04a. Encounter Rate of Suspected Poachers Patrols themselves generate indicator data if we are smart. Analogous problem to encounter rates for animal survey (W). One issue is that in the short-term patrolling will spike up the indicator if they are working. A second issue is that longer-term, a decrease in the indicator could be success -- or it could be a sign of ineffective patrols! PATROL 04b. Encounter Rate of Poacher Activity This indicator draws on systematic sampling of evidence of poaching (camps, shot-gun shells, tire tracks, dead animals, etc) to determine poaching rates PATROL 04c. Key Informant Estimates of Poaching Rates This depends on asking key informants for changes in poaching rates. Tends to be less expensive, but many factors affect reliability PATROL 04R. Average Reduction in Encounters / Activity	**Reporting Questions:** a. How many poachers did you encounter over the last assessment period? How many did you apprehend? b. What % of total poachers in the area do you think this is? c. What data did you use to make this assessment (e.g., encounter rate, evidence of camps, # of snares/ traps detected)? d. Have your patrol encounter rates changed over time? To what do you attribute these changes?

Objectives / Indicators	Questions to Measure Indicators
PATROL 05. Presence of Patrols Deters Poachers from Trying Within X months of the start of patrols, patrol logs show fewer encounters with non-permitted individuals (ie suspected poachers) PATROL 05. # of encounters with non-permitted individuals / patrol Look at % change per unit effort. Potentially vulnerable to bad patrolling (no encounters) PATROL 05R. Average / total change in encounters Calculate the average change as well as an estimate of the total number of poachers "deterred"	**Reporting Questions:** a. To what degree have encounters with non-permitted individuals changed since you started the patrols?
PATROL 06.Threats Reduced: Reduce / Eliminate Poaching in Patrolled Areas Within 1 year of deploying patrols, poaching has been reduced by xx%. (Note that it may be important to distinguish different kinds of poaching such as by armed militias, commercial bushmeat poaching, or subsistence poaching. It may also be important to distinguish between poaching protected species versus illegally overharvesting species that can be legally hunted within limits.) PATROL 06-2a. # of Incidents of Poaching Detected in Field PATROL 06-2b. # of Individuals by Species at Key Sale or Transport Points PATROL 06-2R. Average Reduction in Poaching	**Reporting Questions:** a. To what degree have poaching incidents changed since you started the patrols? b. To what degree have poached items in sale or transport points changed since you started the patrols?
PATROL 07-2. Change in Species Population	**Reporting Questions:** a. How have populations of key species changed since patrols were implemented?

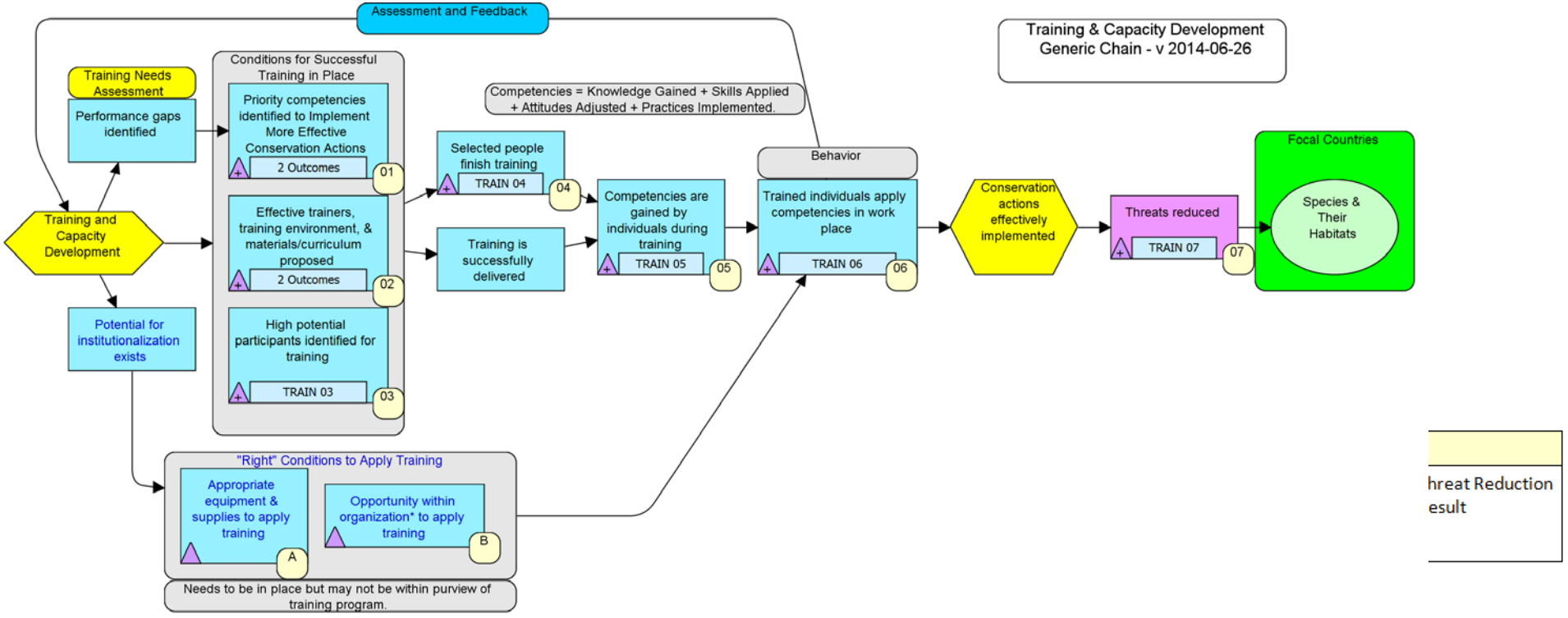
ACTION 2: Training and Capacity Development

Version: 2014-06-26

Definition: Planned learning for professionals, key stakeholders or others to improve abilities to carry out conservation management activities and techniques

Examples:
- Train park staff in protected area management and law enforcement techniques
- Conduct a capacity building course on conflict resolution for protected area personnel
- Provide mentoring and technical support to park managers to develop and implement conservation plans
- Train research staff in monitoring and data analysis techniques
- A 10-week training course for survey team staff
- Government agents and logging company staff trained in wildlife monitoring/management methods

Generic Results Chain (Theory of Change)



Narrative Description of Results Chain (Theory of Change):

This chain follows one main pathway and starts by clarifying the assumed conditions that should be in place for a training and capacity development action to be successful. Following the lowermost path, there needs to be the potential for the training to be institutionalized or, at a minimum, for the conditions to be in place for anyone who is trained to be able to apply their training. This includes appropriate equipment and/or supplies (Label A in the figure) and the opportunity (and support) within the organization (B). The definition of "opportunity" will vary by context, but it is likely to include institutional support, authority and respect to act, resources available, and cultural acceptance of the expected action. In addition, teams need a clear understanding of why they are doing the training and what needs they are trying to address. This includes: identifying performance gaps, priority competencies needed (01); effective trainers, curriculum, and training environment (02); and high potential participants (03). With these elements in place, the theory of change holds that the training will be successfully delivered and that those selected for training will finish the training (04). If that is the case, then competencies will be gained by individuals during the training (05). These competencies include knowledge, skills, and attitudes. If the individuals have these competencies and the right conditions to apply the training (as mentioned earlier), then the chain assumes that the trained individuals will apply the competencies in the work place (06). If they apply those competencies, then conservation actions will be effectively implemented. These actions vary widely and could include, for example, direct restoration of a species or ecosystem, patrolling of a protected area, monitoring the status of a species or ecosystem, or developing environmental education programs and campaigns – just to name a few. Because the actions vary widely, it is not possible to be more specific about the impacts of training and capacity development at a general level. In this high-level chain, we assume that threats will be reduced (07) through more effective conservation action and that the status of species and their habitats will improve. Depending on the specific case, a team could potentially provide more detail about the expected results further to the right in the chain.

Objectives & Indicators for Generic Results Chain

Objectives / Indicators	Questions to Measure Indicators
Enabling Conditions in Place TRAIN A. Enabling Condition: Evidence that "Right" Equipment & Supplies will be available to Apply Competencies Roll up: N/A (application questions)	**Application Questions:** - Please describe the equipment and supplies that are needed - To what degree do you have the needed supplies and equipment? (4 point Likert - Have all, have most, have some, have little/none) - If you do not have all supplies and equipment, what provisions have you made? - How do you expect any shortfalls will affect the ability of trainees to apply competencies? (4 point Likert)
Enabling Conditions in Place TRAIN B. Enabling Condition: Evidence that trainee has "Right" Opportunity within Organization* to Apply Training Roll up: N/A (application questions)	**Application Questions:** - How likely are the trainees to have the opportunities (e.g., authority, time, resources, respect, cultural acceptance) within their organization to apply the training? (4 point Likert - may need to mix proportion of trainees with likelihood - e.g., Most/all trainees will have the necessary opportunities; Most trainees will have limited opportunities) - If your trainees are unlikely to have the necessary opportunities, what provisions have been made? - How do you expect any shortfalls will affect the ability of trainees to apply

Objectives / Indicators	Questions to Measure Indicators
	competencies? (4 point Likert)
TRAIN 01-1. Knowledge, skills, & attitudes identified to implement more effective conservation actions A compelling argument is laid out for specific knowledge, skills, & attitudes needed by targeted individuals who will take action to reduce threats TRAIN 01-1. Evidence of a compelling argument for appropriate knowledge, skills, & attitudes identified Roll up: N/A (application questions)	**Application Questions:** Matrix by audience type (audience as rows, desired knowledge, skills, attitudes as columns - fill out for as many audiences as relevant) - Who are you targeting with this training/capacity building? How will you select the people for training? - What knowledge, skills, and attitudes does this audience need? [List 3 separately] - Why are these knowledge, skills, and attitudes needed? [Can ask generally] - Please provide any justification or explanation for your assessment of why the knowledge, skills, and attitudes are needed.
TRAIN 01-2. Necessary practices identified to implement more effective conservation actions A compelling argument is laid out for the specific conservation actions (practices) that targeted individuals need to take to reduce threats TRAIN 01-2. Evidence of a compelling argument for specific conservation actions (practices) that targeted individuals need to take to reduce threats Roll up: N/A (application questions)	**Application Questions:** Matrix by audience type (additional column in matrix mentioned for TRAIN 01-1) - What specific conservation actions (practices) do you expect or need the individuals to take to reduce threats? Why are these actions needed? How many people need to be trained to implement the desired conservation action? Please justify your assessment.
TRAIN 02-1. Effective training environment and materials/curriculum Appropriate delivery method is proposed for the audience's learning style (including location, timing, and materials/curriculum) TRAIN 02-1. Evidence (qualitative assessment) of "appropriate" delivery method TRAIN 02-1R. % of projects that show evidence of "appropriate" delivery methods "Appropriate" = for audience learning style including curriculum (if appropriate), location, timing, and materials/curriculum.	**Application Questions:** - What delivery method will you use for your training, including the curriculum you will use, if appropriate? Describe the rationale for selecting this delivery method.
TRAIN 02-2. Effective trainers Appropriate trainers are proposed. Appropriate = with relevant skills, teaching competence, cultural competence TRAIN 02-2. Evidence (qualitative assessment) of "appropriate" trainers selected Roll up: N/A (application questions) TRAIN 02-2R. % of projects that show evidence of "appropriate" trainers selected	**Application Questions:** - Who is the trainer? Please describe their qualifications for this training.
TRAIN 03. High potential participants identified for training The people identified for training show promise to be able to implement desired conservation action or practice TRAIN 03. Evidence that people selected for training show promise to implement desired action or practice	**Reporting Questions:** - How did you select the people for training? Why did you choose these people? - Do you expect a conservation action to be carried out as a result of this training? Y/N. If "yes," what action do you expect?

Objectives / Indicators	Questions to Measure Indicators
TRAIN 03R. % of projects that show evidence that people selected for training show promise to implement desired action or practice	
TRAIN 04. Selected people finish training At least X% of those selected finish the training TRAIN 04. % of individuals selected who completed training TRAIN 04R. % of projects that meet their "selected participants finish training" objective Alternative wording for objective: At the end of the training period, enough people have completed the training to be able to implement desired conservation action or practice Ideally, number of people needed to complete training is known in order to be able to implement desired conservation action or practice	**Reporting Questions:** [Could be a matrix] - If you expect a conservation action, how many people need to be trained to implement the desired conservation action (Should be answered in application but may be worth repeating for reporting) - How many people participated in the training relative to number needed? - How many of those completed the training? - If there is a shortfall between the number that completed training and the number needed to adequately implement the desired conservation action, how are you going to address that?
TRAIN 05. Competencies are gained by individuals during training At the end of the training, at least X% of trainees demonstrate the desired knowledge, skills, and attitudes TRAIN 05. #/% of trainees that demonstrate desired knowledge, skills, and attitudes TRAIN 05R. #/% of targeted trainees that demonstrate desired knowledge, skills, and attitudes;% of projects that meet their competencies gained objective If a majority of trainees fail, it may be that you failed to ID the right target audience and/or the modality for that audience was wrong -- failure earlier in the chain	**Reporting Questions:** - What % of trainees demonstrate desired: a. knowledge b. skills c. attitudes? How did you make this assessment? - What were the barriers preventing trainees from demonstrating the desired knowledge, skills, and/or attitudes?
TRAIN 06. Trained individuals apply competencies in work place Within x months of the training, X% of trainees successfully carry out desired practices at least once to appropriate problems TRAIN 06. # / % of trainees successfully carrying out desired practices at least once to appropriate problems TRAIN 06R. # / % of trainees successfully carrying out desired practices at least once to appropriate problems ; % of projects that meet their competencies applied objective	**Reporting Questions**: - Approximately what % of trainees have the necessary conditions to be able to successful apply acquired competencies? (4 point Likert or estimated %) - Of these, approximately what % do successfully apply acquired competences? (4 point Likert ore estimated %) - Please explain why some are not able to apply them correctly
TRAIN 07. Threats Reduced Within X years of the start of the action, the desired threat reduction is seen TRAIN 07. Evidence of threats reduced TRAIN 07R. % of projects that show a reduction in key threats being addressed by training and capacity building efforts	**Reporting Questions**: - Do you have evidence that this training and capacity building action is leading towards reductions in any key threats? Y/N; Please describe

ACTION 3: Partner Engagement

Version: 2014-05-21

Definition: Engaging selected stakeholders, including government authorities, local communities, NGO representatives, and other partners to achieve shared objectives and broader coordination across overlapping areas.

Examples

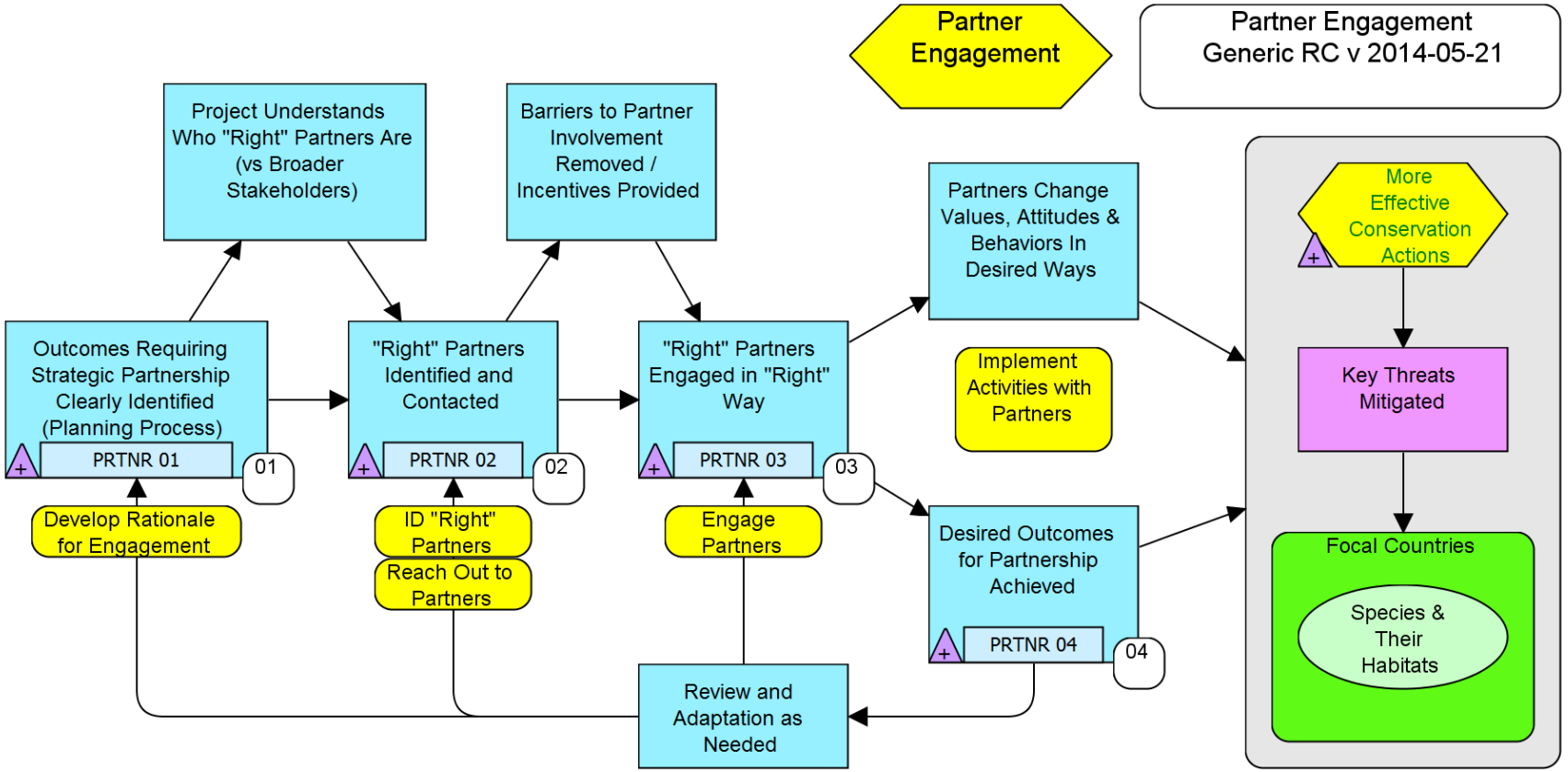
- Conduct participatory mapping with local communities and establish local Community Management Committees
- Work with government authorities to validate and endorse the wildlife trade law enforcement plan by the Central African Heads of State in 2010
- Support section on Great Apes of the IUCN/SSC Primate Specialist Group to facilitate the exchange of information among primatologists and the professional conservation community (IUCN/SSC status survey and conservation action plans and workshops)
- Engage communities living within great ape habitat to serve as critical members of a wildlife surveillance network (Maintain critically important hunter-based wildlife disease surveillance network and early-warning system)
- An annual partners planning meeting will be held. The meeting will alternate between Nigeria and Cameroon and participation will be limited to those partners actively (or planning on) implementing activities that impact the Cross-River gorilla in each country

Narrative Description of Results Chain (Theory of Change) *(shown on next page)*

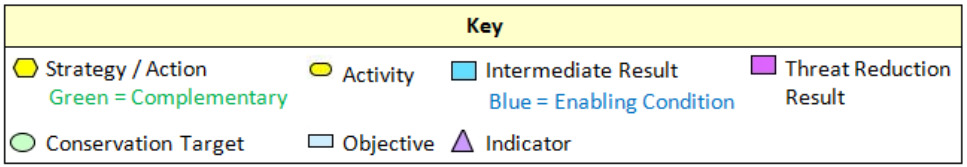
Partner engagement is a classic enabling condition strategy. The first major step is (01) to ensure that clear outcomes requiring strategic partnerships have been identified and that the project team develops a sense of who the “right” partners might be. The next step (02) involves identifying, reaching out to, and then engaging with the “right” partners in appropriate ways. Once the partner(s) have been engaged, then the next step (03) is to undertake desired activities and get (04) the desired outcomes. In some cases, the engagement may also involve having partners change their values, attitudes, and behaviors in desired ways. Finally, the engagement will hopefully lead to more effective conservation actions.

Note that "partners" (people and organizations you actively work with to implement activities) are a subset of the wider group of "stakeholders" (people and organizations who have a vested interest in the results of your work) in any given project. In many cases, it may be necessary to engage with the wider group of stakeholders either in addition to, or instead of engaging with partners.

Generic Results Chain (Theory of Change)



Reference: TNC Conservation Partnership Center: Step 5 Measuring Partnerships
http://www.conservationgateway.org/ConservationPlanning/partnering/cpc/Pages/step5.aspx



Objectives & Indicators for Generic Results Chain

Objectives / Indicators	Questions to Measure Indicators
PRTNR 01. Outcomes Requiring Partnership Clearly Identified The proposal clearly identifies the desired outcomes that require partnership to achieve PRTNR 01. Assessment of Desired Outcomes Proposal Review Committee approval of identification of desired outcomes PRTNR 01R. % of Actions Meeting this Indicator	**Application Questions:** a. What are you trying to achieve that requires partnerships?
PRTNR 02. "Right" Partners Identified and Invited A compelling justification for who are the "right" partners to achieve the desired outcomes provided. "Right Partners" = needed to accomplish overall project objectives. Note that in many cases, these may be existing rather than new partners. Note also that partners are a subset of broader stakeholders. PRTNR 02. Evidence of "Right" Partners Identified and Contacted List of partners needed to achieve desired outcomes PRTNR 02R. % of Actions Meeting this Indicator	**Application Questions:** a. Who are the partners you need to engage to help you achieve your objectives or help you successfully implement your conservation actions? b. Why are these the "right" partners for your work?
PRTNR 03. "Right" Partners Engaged in "Right" Way Partnership agreement developed and documented. During the grant period, targeted partners participate in convened meetings or other appropriate activities. "Right Way" = Engaged in a way that maximizes likelihood of engagement PRTNR 03. Evidence of Engagement in "Right" Way PRTNR 03R. % of Actions Meeting this Indicator	**Reporting Questions:** a. To what degree are project staff engaged and committed to the project? b. To what degree are partnership meetings successful (i.e., productive, focused, effective)? c. To what degree is the partnership operating in a healthy manner? d. What unintended outcomes are occurring? e. If partners are not engaging, what are the barriers?
PRTNR 04. Desired Outcomes for Partnership Achieved By grant expiry, at least 75% of the desired outcomes that require partnership have been achieved PRTNR 04a. Degree to Which Desired Outcomes were Achieved PRTNR 04aR. % of Projects Meeting Objectives PRTNR 04b. Evidence of Actions as a Result of Partnership PRTNR 04bR. % of Projects Undertaking Meaningful Actions	**Reporting Questions:** a. Which desired outcomes identified in the proposal were achieved through the partnership? For those outcomes partially achieved, explain to what degree they were achieved and the prospects for full achievement. b. Has the partnership contributed to the achievement of the desired outcomes? If not, where are the barriers? c. What conservation actions occurred as a result of this partnership?

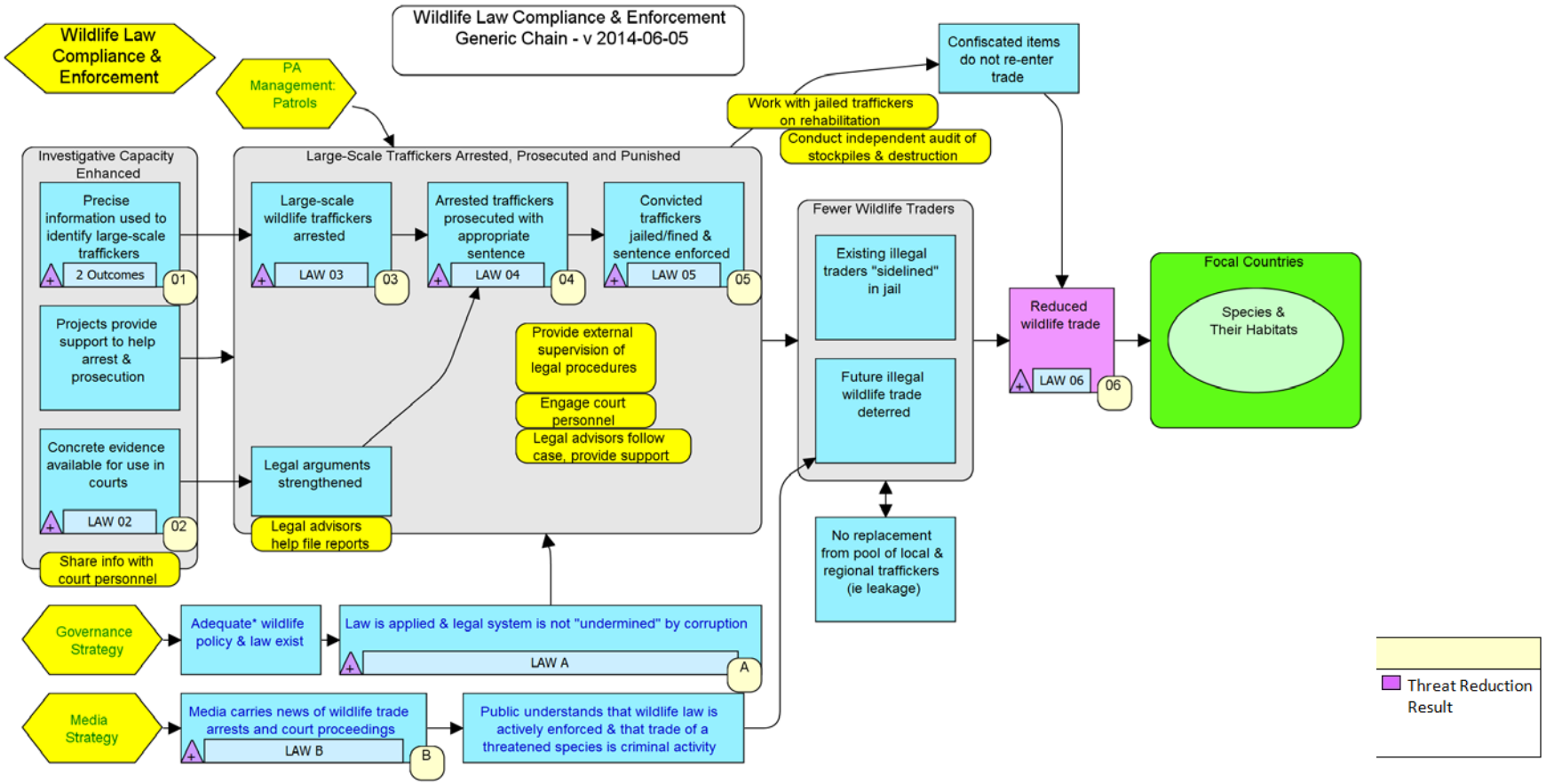
ACTION 4: Wildlife Law Compliance and Enforcement

Version: 2014-06-25

Definition: Monitoring and enforcing compliance with wildlife conservation-related laws, policies and regulations, and standards and codes in the judiciary system.

Examples:
- Efforts to identify perpetrators and provide evidence for prosecution.
- Efforts to ensure the arrest of perpetrators whilst engaged in the criminal act
- Efforts to ensure that convictions are achieved and sentences served

Generic Results Chain (Theory of Change)



Narrative Description of Results Chain (Theory of Change)

Wildlife Law Compliance and Enforcement's theory of change starts with improving or supporting the investigative capacity of key agencies and organizations to obtain the information needed to identify key large-scale wildlife traffickers (Result 01 in the previous figure), and obtain good evidence that can be used to prosecute these traffickers in court (02). If investigative capacity is enhanced and the projects are able to provide support to help arrest and prosecution, then the theory of change assumes that large-scale traffickers will be arrested, prosecuted, and punished. More specifically, it is expected that large-scale wildlife traffickers will be arrested (03) prosecuted with the appropriate sentence (04) and jailed and/or fined (05). The set of results around arrest, prosecution, and punishment are aided by other actions (many supported with FWS funding). These include: Protected Area Management Patrols, which has its own set of more detailed results; Governance Strengthening to help ensure that the legal system is not undermined by corruption (Result A); and Media Promotion to help ensure that the media carries news related to wildlife trafficking (B) and the public understands that the wildlife law is enforced. The theory of change then assumes that if the legal system works, then existing illegal traders are "sidelined" in jail, other potential traders are deterred from taking their place, and confiscated items do not re-enter the trade system. Finally, these results collectively contribute to reduced wildlife trade (06) and the improved health of species.

Objectives & Indicators for Generic Results Chain

Objectives / Indicators	Questions to Measure Indicators
Enabling Conditions in Place	**Application Questions:** - How adequate are the wildlife policy and laws in place? If the policy and/or law are not adequate, describe how you believe this will affect your law enforcement action and whether you have plans to address any inadequacies. - To what degree has corruption been an undermining force in applying the law in the past? How do you plan to address corruption, if at all? - How supportive is the general public of wildlife law enforcement? How do you think this support (or lack thereof) is likely to influence your wildlife law enforcement action? Please describe any plans you have to generate greater public support.
LAW 01-1. Precise information to identify large-scale traffickers in place By X date, "good" system in place to identify large-scale traffickers "Good" = system can reliably link wildlife crimes to specific traffickers LAW 01-1. Evidence that a "good" system is in place to identify large-scale traffickers LAW 01-1R. % of projects with "good" system is in place to identify large-scale traffickers	**Reporting Questions:** - Since the start of this grant, how often are you able to successfully identify the person(s) responsible for high-volume trafficking - Since the start of this grant, describe how your capacity has developed / changed / improved to identify wildlife traffickers, in particular the worst offenders - Please list the challenges you still face to identify high-volume traffickers. Rate each challenge for its ability to hinder identification of traffickers
LAW 01-2. Large-scale traffickers identified By Y date, most/all large-scale wildlife traffickers in the region identified LAW 01-2. # / % of large scale traders identified LAW 01-2R. % of projects able to identify wildlife traffickers	**Reporting Questions:** - Please list the number of large scale traders identified - If possible, estimate the % of the total number of large scale traders this represents. Please indicate how you calculated this %
LAW 02. Concrete evidence available for use in courts	**Reporting Questions:** - Since the start of this grant, how often have you been able to produce evidence that

Objectives / Indicators	Questions to Measure Indicators
By X date, the project team is able to investigate wildlife trade at a sufficiently high level to provide evidence that is useable in courts LAW 02. Evidence of large-scale wildlife trafficking admitted for court use LAW 02R. % of projects that can produce "good" evidence % of projects in the overall program that have the capacity to produce "good" evidence	is useable in courts? (4 pt Likert) - If available, indicate the exact # of court cases for which you could produce evidence - Since the start of this grant, describe (in 200 or fewer words) how your capacity has developed/changed/improved to produce evidence for courts. - Please list the challenges you still face in producing evidence. Please rate each for their ability to affect/hinder successful use of evidence in court
LAW 03. Large-scale wildlife traffickers arrested By X date, the project team's investigations and operations support have led to the arrest of at least one large-scale wildlife trafficker LAW 03. # of arrests of large-scale wildlife traffickers resulting from project's investigations and/or operations support LAW 03R. Total # of arrests of large-scale wildlife traffickers resulting from all projects' investigations and operations support	**Reporting Questions:** - Please list the arrests of large-scale wildlife traffickers that have occurred since the start of this grant. If possible, estimate the % of the total number of large-scale traders this number represents - For each arrest, please provide: a. date, b. short description of arrest, c. any evidence of trafficking magnitude, d. media coverage (y/n) - Was your support needed for the arrest?. If yes, please describe what support you provided and, if relevant, what support you were not able to provide (and why).
LAW 04. Arrested traffickers prosecuted with "appropriate" sentence Most/all wildlife traffickers that have been arrested are successfully prosecuted and appropriately sentenced "Appropriate" = punishment fits the crime LAW 04. # / % of wildlife traffickers that have been arrested that are successfully prosecuted and "appropriately" sentenced LAW 04R. Total # / % of prosecutions with "appropriate" sentences (all projects)	**Reporting Questions:** - Was the trafficker prosecuted? (Y/N/DK). - In your judgment, how appropriate was the sentence (4 point Likert)\ - Was your support needed for the prosecution? (Y/N). If yes, please describe. If relevant, please describe what support you were not able to provide (and why).
LAW 05. Convicted traffickers serve jail term and/or pay fines Most/all wildlife traders successfully prosecuted serving full jail term and/or paying fines LAW 05. # / % of sentenced traffickers serving/completed jail terms and/or paid fines LAW 05R. Total # / % of sentenced traffickers that are serving or have served jail terms and/or have fully paid fines	**Reporting Questions:** - Did the sentenced trafficker serve their full jail term and/or pay their fines? (Y/N/too early to know) - Was your support needed to ensure appropriate penalties were applied? (Y/N). If yes, please describe what sort of support you provided and, if relevant, what support you were not able to provide (and why).
LAW 06. Reduced wildlife trade By X date, wildlife trade has decreased (by at least X%*) as compared to year XX *Ideally, grantee could provide reduction %, but if that's not possible, we want to at least be able to report on downward trend LAW 06. % change in wildlife trade in project area LAW 06R. Total % change in wildlife crime across program area	**Reporting Questions:** - Since the start of the grant, how has wildlife trade changed? - To what degree would you attribute this trend to wildlife crime enforcement and compliance efforts? (4 point Likert). Please provide evidence supporting this claim. - If relevant, please describe other factors that are having a significant impact (positive or negative) on this trend. Need to establish appropriate baseline comparison

Objectives / Indicators	Questions to Measure Indicators
LAW A. Legal system not "undermined" by corruption All stages of the legal system (arrest, prosecution, punishment) are not "undermined" by corruption LAW A. # / % of legal efforts "undermined" by corruption Legal effort = arrests, prosecutions and punishments LAW AR. Total # / % of arrests, prosecutions and punishments "undermined" by corruption	**Reporting Questions:** - For each legal effort, was there evidence of corruption? (Y/N/DK) (Ideally, do this case by case to get total # cases. Alternative to do it more generally as a 4 point Likert - e.g., No evidence of corruption across cases, Evidence of minor corruption, Evidence of significant corruption, Evidence of widespread, major corruption) - Were there sanctions against corrupt officials? (Y/N/DK) If yes, to what degree were these sanctions made public? (4 point Likert) - Please describe whether and how corruption has influenced or hindered court proceedings (including arrests, prosecution, and/or sentences).
LAW B. National media carries news of court proceedings & arrests By X date, all wildlife trafficking arrests, court proceedings, and sentences are carried in national media LAW B-1. % of wildlife tracking arrests, court proceedings and sentences that are covered by at least one national media LAW B-2. # of national media pieces on wildlife trafficking LAW BR. Total # of national media pieces on wildlife trafficking; % of wildlife crime enforcement initiatives that have met their media coverage objectives	**Reporting Questions:** - Was there national media coverage for this case? (Y/N/DK - if yes, how many pieces?) [As for Law A, ideal to do this case by case but could do as Likert - If possible, please share links to or copies of any coverage that was particularly interesting or exceptional. - How many national media pieces were there on wildlife trafficking in general? If possible, please clarify potential duplicate reporting between this number and the number of pieces on specific cases.

ACTION 5: Protected Area Designation

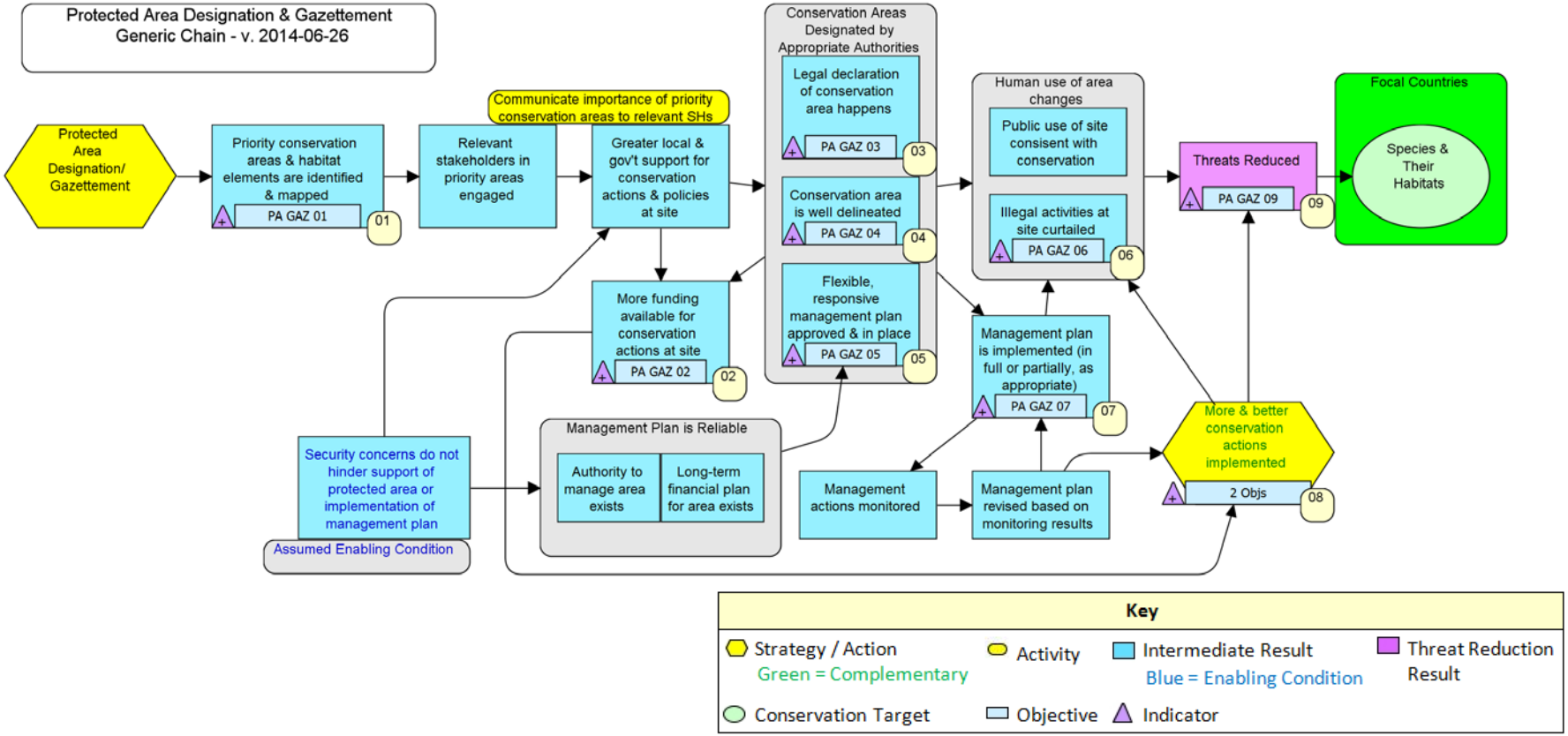
Version: 2014-06-26

Definition: Designation or gazettement (with legal protections or policy instrument) of a site or landscape as having important value to wildlife.

Examples

- Achieve formal protection status and gazettement of the Lyondji Community Bonobo Reserve
- Identify potential zones for protection, including integral, buffer, sustainable use, and corridors
- Demarcating borders of new Itombwe Nature Reserve through participatory process of communities (including tribal)

Generic Results Chain (Theory of Change)



Narrative Description of Results Chain (Theory of Change)

In order to get Protected Area Designation/ Gazettement to happen successfully, this theory of change holds that teams must first identify and map priority conservation areas and elements (Result 01 in previous figure). If they do that and also engage relevant stakeholder in those areas, then the theory holds that there will be greater local and government support for conservation actions and policies. It is assumed this will then lead to more funding for conservation actions at the site (02), which will in turn contribute to more and better conservation actions (08). Greater support is also assumed to encourage authorities to designate conservation areas. This includes the legal declaration (03), delineation of the area (04), and the development and approval of a flexible, responsive management plan (05). This management plan also needs to be reliable, with clear authority and a long-term financial plan. It is also assumed that the management plan will be implemented (07), with actions monitored and adaptations made to the plan as needed. If the area is designated and delineated and has a good management plan, then the theory of change holds that public use of the site will be consistent with conservation aims and that illegal activities at the site will be curtailed (06). This, along with the expected increase and improvement in conservation actions (08) will collectively help to reduce threats at the site (09) and conserve species and habitats. Finally, the theory of change assumes there is an important enabling condition in place – security concerns do not hinder the support of the protected area designation or management plan implementation.

Objectives & Indicators for Generic Results Chain

Objectives / Indicators	Questions to Measure Indicators
Enabling Conditions in Place	**Application Questions:** a. Will security concerns hinder the support of the protected area?
PA GAZ 01. Priority conservation areas are identified & mapped By X date, priority conservation areas and habitat elements are identified and mapped. PA GAZ 01. Evidence of map or map file of priority conservation areas and habitat elements PA GAZ 01R. % of initiatives with evidence of a map or map file of priority conservation areas & habitat elements	**Application Questions:** For each area, please answer all of the following questions in this table - Please provide the name and location for all areas you are working to formally protect - If you have a map or image file with priority conservation areas and habitat elements identified, please provide it as an attachment or provide a link to it.
PA GAZ 02. More funding available for conservation actions at site By X, the projects or actions in the conservation area are receiving enough funds to establish a protection presence PA GAZ 02. Evidence that projects or actions are receiving enough funds to establish a protection presence PA GAZ 02R. % of initiatives with evidence that projects or actions are receiving enough funds to establish a protection presence	**Application Questions:** - Do the projects or actions in this conservation area have enough funds to establish a protection presence? Y/N/DK (Or 3 point Likert: Mostly/Completely, Some, Greatly lacking). Please clarify your evidence or the basis for this assessment. - To what degree has the funding to the conservation area changed over the last X years? (4 point Likert Increased a lot; increased somewhat; No change; Decreased somewhat; Decreased a lot)

Objectives / Indicators	Questions to Measure Indicators
PA GAZ 03. Legal declaration of conservation area happens By X date, the site(s) identified as a priority for conservation action is declared a protected area(s) PA GAZ 03. Evidence that site(s) is declared a protected area(s) PA GAZ 03R. % of initiatives where site(s) have been declared protected areas	**Reporting Questions:** - Has the site(s) received official, legal declaration as a protected area? (Y/N) - If no, please indicate which of the following are true: (Site is under review and likely to receive legal designation within the next year; Site is under review and likely to receive legal declaration within the next 3 years; Site is under review but unlikely to receive legal declaration within the next 3 years; Site is unlikely to receive legal declaration) - If possible, please provide evidence of the legal declaration (e.g., copy of the signed law, link to government website, link to media story)
PA GAZ 04. Conservation area is well delineated BY X date, conservation area is well delineated with appropriate boundary markers PA GAZ 04a. % of PA boundary that is appropriately marked PA GAZ 04aR. Not relevant for roll-up PA GAZ 04b. Evidence conservation area is well delineated with appropriate boundary markers PA GAZ 04bR. % of conservation areas that are well-delineated with appropriate markers	**Reporting Questions (04a):** - Approximately what proportion of the protected area boundary is appropriately (clearly) marked? (actual % or 4 point Likert - All, Most, Some, Little / none) **Reporting Questions (04b):** - In your opinion, are the existing boundary markings sufficient for people to know where the boundaries are? (Y/N/DK or 3 point Likert - Completely sufficient, Mostly sufficient, Not sufficient) - If they are not sufficient, what plans or opportunities are there to improve them? (Is it possible to improve them?)
PA GAZ 05. Flexible, responsive management plan approved & in place By X date, the conservation area has a flexible, responsive* management plan that is approved by the relevant legal authorities and desired stakeholders *A management plan that is consciously designed to stay viable with decreases in funding and stay efficient with expanded capacity due to increased funding PA GAZ 05. Presence of a flexible, responsive management plan that approved and in place PA GAZ 05R. % of conservation areas with a flexible, responsive management plan approved and in place	**Reporting Questions:** - Has a management plan been developed? - Has it been approved by the relevant legal authorities? by desired stakeholders? (Y/N/under review) - To what degree does the plan accommodate decreases or increases in funding? (4 Point Likert). Please explain your response.
PA GAZ 06. Illegal activities at site curtailed By X date after legal designation of protected area, illegal activities causing key threats at site have declined or stabilized PA GAZ 06. Evidence that illegal activities causing key threats at site have declined or stabilized PA GAZ 06R. % of conservation areas with evidence that illegal activities causing key threats at site have declined or stabilized; % of illegal activities that show a decline	**Reporting Questions:** [Set up as a matrix with threats as rows] - Please list the main threats you are trying to address through protected area designation/ gazettement. For each threat, please indicate - How has the threat changed since the designation of the protected area (5 point Likert - Decreased substantially, Decreased somewhat, Stayed the same, Increased somewhat, Increased substantially - Please explain any major differences, especially where the threat has increased
PA GAZ 07. Management plan is implemented	**Reporting Questions:** [Set up as a matrix with priority actions as rows]

Objectives / Indicators	Questions to Measure Indicators
By X date after management plan has been approved, at least X% of priority actions identified in the management plan are being implemented ▲ PA GAZ 07. % of priority actions identified in the management plan that are being implemented ▲ PA GAZ 07R. % of initiatives that have met their management plan implementation objective	Please identify the priority actions in the management plan (do not list all actions - just include the high-level priority actions). - To what degree is the action being implemented (3 point - Full implementation, Partial implementation, Not being implemented; N/A - too early to start) (Alternatively, this could be a Y/N response) - Please explain cases where actions are not being implemented as planned
PA GAZ 08-1. More & better conservation actions implemented By X, more conservation actions are being effectively implemented in the conservation areas ▲ PA GAZ 08-1a. Trend in # of conservation actions at site ▲ PA GAZ 08-1aR. % of projects showing an upward trend in # of conservation actions at site ▲ PA GAZ 08-1b. Evidence that implementation of actions has improved ▲ PA GAZ 08-1bR. % of initiatives with evidence that implementation of actions has improved	**Reporting Questions (08-1a):** - Since the protected area designation, to what degree have the conservation actions at the site increased or decreased? (5 point Likert: Increased a lot, Increased somewhat, Stayed same, Decreased somewhat, Decreased a lot) **Reporting Questions (08-1b):** - In general, to what degree has the implementation of conservation actions improved or declined? (5 point Likert: Improved a lot, Improved somewhat, Stayed same, Declined somewhat, Declined a lot). Please explain.
PA GAZ 08-2. Few priority actions remain unfunded or not implemented By X, few high priority actions remain unfunded or not implemented ▲ PA GAZ 08-2. Proportion of high priority actions unfunded or not implemented ▲ PA GAZ 08-2R. % of initiatives that have few (<30%??) of high priority actions unfunded or not implemented	**Reporting Questions:** - Are there high priority actions that remain unfunded? (3 or 4 point Likert: All/most high priority actions are funded, Several priority actions are funded, Few high priority actions are funded, No high priority actions are funded)
PA GAZ 09. Threats Reduced Within X years of the start of the action, the desired threat reduction is seen ▲ PA GAZ 09. Evidence of threats reduced ▲ PA GAZ 09R. % of projects that show a reduction in key threats being addressed by protected area designation efforts	**Reporting Questions:** - Do you have evidence of this Protected Area Designation action leading towards reductions in any key threats? Y/N; Please describe.

ACTION 6: Public Campaigns

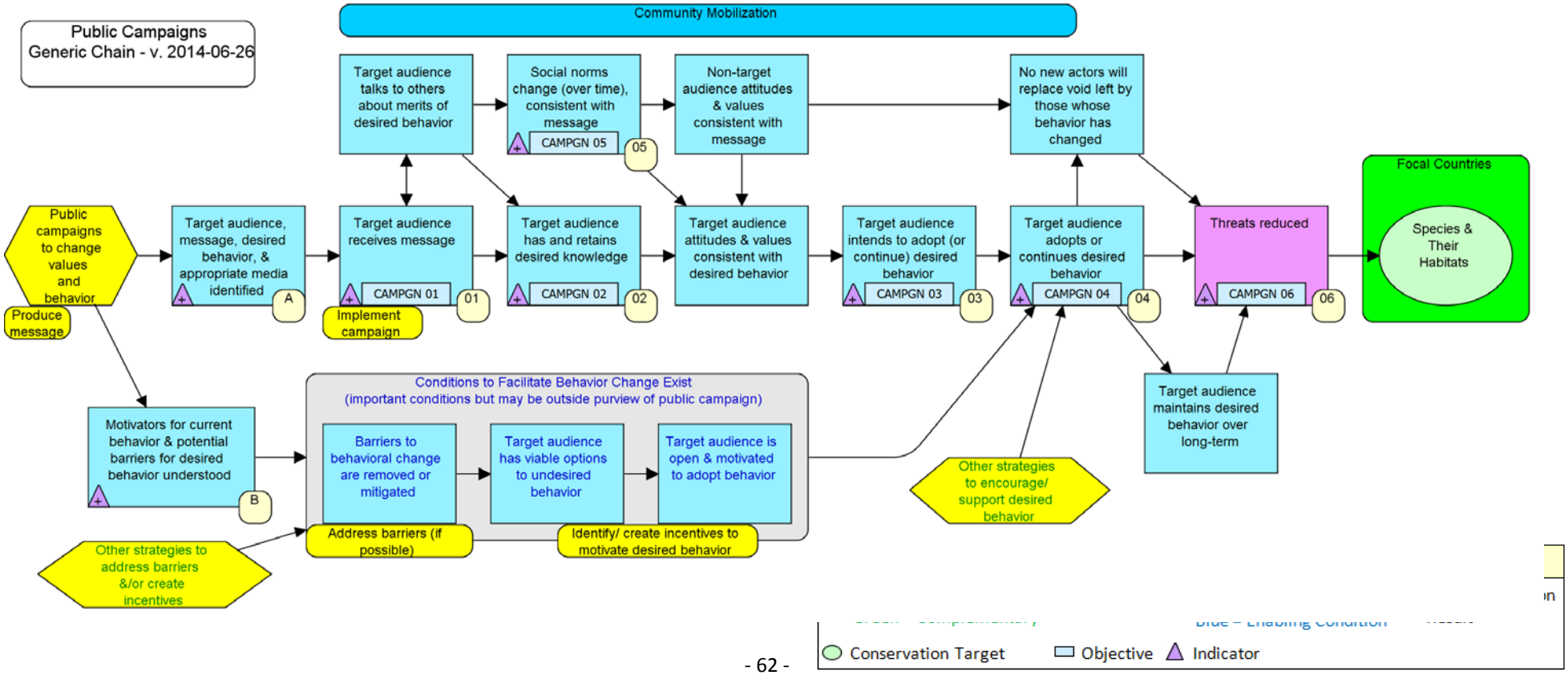
Version: 2014-06-26

Definition: Raising environmental awareness and sharing information to change values and behavior through media or other mechanisms of public campaigns.

Examples

- Dissemination of locally produced video to national media outlets, including all broadcast outlets and community radio, highlighting major issues negatively impacting great apes
- Outreach & education: websites, newsletter, and national press to disseminate results + community outreach about human health + school visits
- Engagement of representative case study villages across EG. Reaching out to villages to explain the purpose of the project and introduce alternative livelihoods to bushmeat.

Generic Results Chain (Theory of Change)



Narrative Description of Results Chain (Theory of Change)

This chain includes three pathways. The middle path shows the main theory of change, while the upper path illustrates the ripple effects achieved via community mobilization, and the bottom path identifies conditions that facilitate behavior change. Following the middle path, the first expected result of a public campaign effort is that the team has identified the target audience, message, desired behavior, and the best media through which to reach to the target audience (Label A in the figure). If these elements are in place, then the assumption is that the target audience receives the message (01), acquires and retains the desired knowledge (02), and then develops or maintains desired attitudes. If the target audience has the desired attitudes, then it is assumed that they will have the intent to act (03) and will follow through on that intent (04). In other words, they will adopt or continue the desired behavior (over the short and long term), which then leads to threat reduction (06) and the improved condition of species and their habitats. In the upper branch, the chain illustrates that a public campaign does not affect solely the direct recipients of the message. Once the target audience receives the campaign message, then they often talk to others about the campaign message, which contributes to the development and refinement of social norms (05). These norms reinforce the results in the main pathway, as well as influence the attitudes of those who did not directly receive the message. The social norms and collective attitudes of those within and outside of the target audience help ensure that no new actors replace the void left by those who have changed to the desired behavior. The bottom portion of the results chain acknowledges that adoption of behaviors requires an understanding of motivators for existing behaviors and barriers to desired behaviors (B) so that the conditions to facilitate behavior can be in place. These conditions might be a direct result of the public campaign effort, or they might be conditions that the team assumes or verifies are in place. These "enabling conditions" include removal/ mitigation of barriers to behavior change, viable options for the target audience to abandon the undesired behavior, and the willingness of the target audience to adopt the behavior. Finally, the chain recognizes that public campaigns usually cannot achieve significant threat reduction on their own. They require other strategies to address barriers, create incentives, and/or support the desired behavior.

Objectives & Indicators for Generic Results Chain

Objectives / Indicators	Questions to Measure Indicators
Enabling Conditions in Place CAMPGN A. Evidence that target audience, message, desired behavior, & appropriate media identified CAMPGN AR. % of projects with evidence that target audience, message, desired behavior, & appropriate media identified	**Application Questions:** - Who is the audience for this campaign? - What is the desired behavior that the campaign is intended to encourage? - What are the campaign's message(s)? - Through what media will you deliver the message? Your proposal will be strengthened if you explain why you chose that media over other alternatives to deliver the message to the target audience. - For each target audience, approximately how many individuals or entities do you expect to reach with this effort? How many do you expect to gain the desired knowledge? To change behavior?

Objectives / Indicators	Questions to Measure Indicators
Enabling Conditions in Place CAMPGN B. Evidence that motivators for current behavior & potential barriers for desired behavior understood CAMPGN BR. % of projects with evidence that motivators for current behavior & potential barriers for desired behavior understood	**Application Questions:** - What barriers are there for your target audience to adopt or continue the desired behavior? How do you expect those barriers will be addressed? - To what degree can this campaign be successful if the barriers are not addressed? - What motivates the behavior you want to change? - Are there or will there be incentives to encourage behavior change? - To what degree can this campaign be successful if incentives are not provided?
CAMPGN 01. Target audience receives message Within X months/years of campaign, at least Y% of target audience receives the message CAMPGN 01. % of target audience that receives message CAMPGN 01R. % of outreach actions where target audience "reach" objectives were met	**Reporting Questions:** - Identify your target audiences for this outreach effort, the desired behavior, and the message you wished to communicate - For each target audience, identify the primary media used to reach the audience - For each target audience, identify how many individuals or entities you: a. Wanted to reach with this effort b. Were able to reach - If Somewhat or Did not meet: a. Indicate why your outreach effort did not reach as many individuals or entities as hoped. b. Describe what you learned and whether you would (or did) do anything differently based on what you learned.
CAMPGN 02. Target audience has desired knowledge Within X months of campaign and thereafter, at least Y% of the target audience has the desired knowledge CAMPGN 02. % of target audience with desired knowledge CAMPGN 02R. % of public campaigns where target audience "desired knowledge" objectives were met	**Reporting Questions:** - What proportion of your target audience has the knowledge the campaign aimed to share? (estimate % or use 4 point Likert) - What evidence did you use to document or detect knowledge gained? - Based on the above, to what degree do you feel you met your Knowledge Gained Objective (4 point scale) - If you partially met or did not meet your objective, indicate why your campaign effort did not lead to the gain in knowledge you expected.
CAMPGN 03. Target audience intends to adopt (or continue) desired behavior Within X months/years of start of campaign, at least Y% of target audience expresses intent to adopt (or continue) desired behavior CAMPGN 03. % of target audience that expresses intent to adopt (or continue) desired behavior CAMPGN 03R. % of public campaigns where target audience "desired behavior" objectives were met	**Reporting Questions:** (Covers CAMPGN 03 and 04) - For each target audience, identify approximately how many individuals a. Had the desired behavior before your campaign b. You wanted with the desired behavior after the campaign c. Expressed intent to continue or adopt the desired behavior c. Actually adopted the desired behavior after your campaign. - What evidence did you use to document or detect intent and behaviors? - Based on the above, to what degree do you feel you met your: a. Behavior intent objective (4 point scale) b. Behavior change objective (4 point scale) - If you partially met or did not meet your objectives, indicate why your campaign effort did not lead to the changes in behaviors you had hoped.

Objectives / Indicators	Questions to Measure Indicators
CAMPGN 04. Target audience adopts or continues desired behavior Within X months/years of start of campaign and thereafter, at least Y% of target audience has adopted or continued the desired behavior CAMPGN 04. % of target audience that adopts or continues desired behavior CAMPGN 04R. Rolled-up Indicator: % of outreach actions where target audience behavior objectives were met	See questions in CAMPGN 03
CAMPGN 05. Social norms change (over time), consistent with message Within X months of campaign and thereafter, social norms are consistent with the campaign's message CAMPGN 05. Evidence that social norms are consistent with the campaign's message CAMPGN 05R. % of projects with evidence that social norms are consistent with the campaign's message	**Reporting Questions:** - Have social norms changed since the start of the campaign? If yes, how has that changed?
CAMPGN 06. Threats Reduced Within X years of the start of the action, the desired threat reduction is seen CAMPGN 06. Evidence of threats reduced CAMPGN 06R. Roll-up: % of initiatives that show a reduction in key threats being addressed by public campaign efforts	**Reporting Questions:** - Do you have evidence of this public campaign action leading toward reduction of key threats? Y/N; Please describe

ACTION 7: Applied Conservation Research

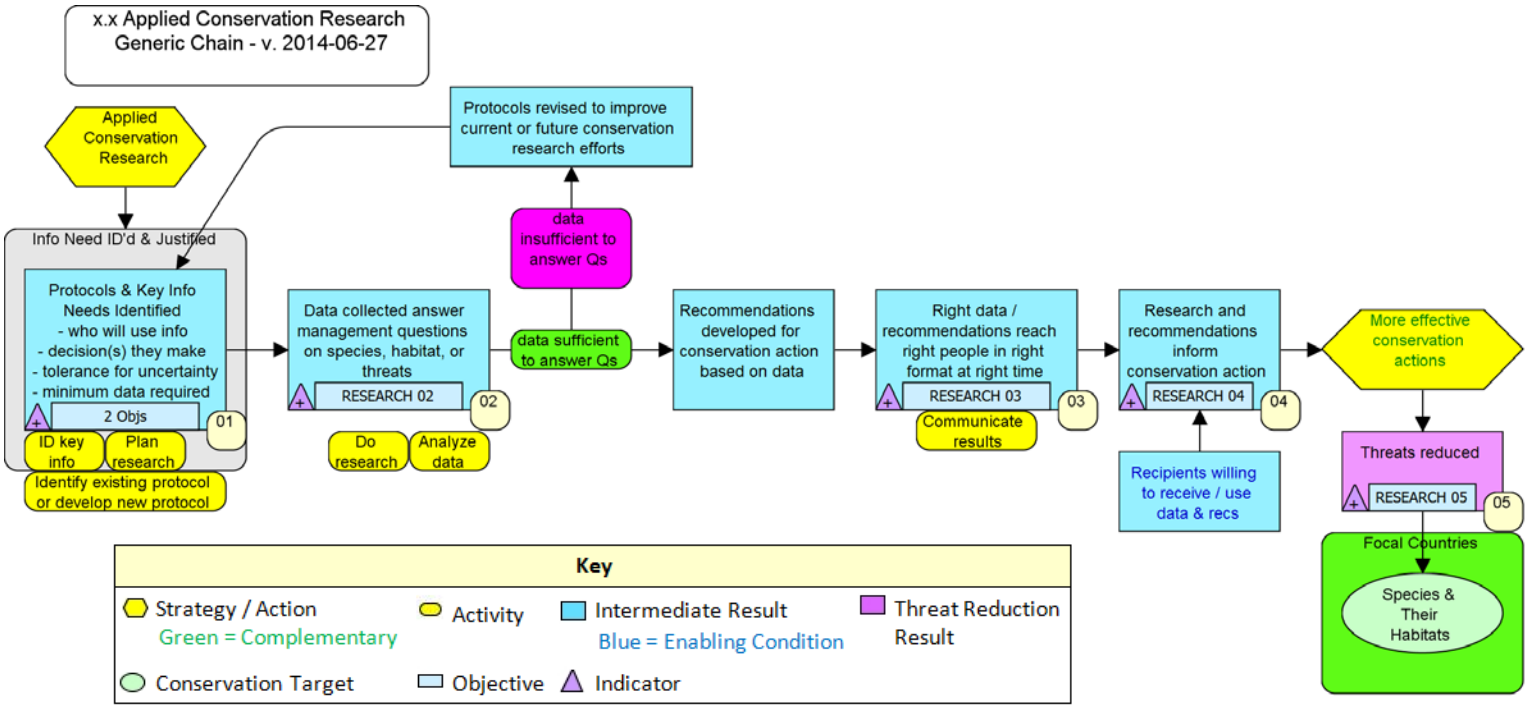
Version: 2014-06-27

Definition: Research undertaken to answer management questions. This includes measuring the status of species, habitats, or threats to conservation targets and understanding how threats affect species and habitats. It does not include monitoring that should happen as part of a project to determine the effectiveness of actions taken.

Examples

- Determine the geographic provenance of elephants & ivory using mitochondrial DNA markers in monitoring & enforcement of ivory trade laws
- Demographic analysis to estimate the sensitivity and elasticity of the population to various threats: ebola, poaching
- Establishing MIST database & monitoring system for Law Enforcement Monitoring (LEM)
- Researching the impacts of tourism on beaches and dunes and turtle nesting areas to establish guidelines and restrictions for visitation

Generic Results Chain (Theory of Change)



Narrative Description of Results Chain (Theory of Change)

In order for Applied Conservation Research to be relevant, the theory of change holds that the researchers must first identify the research protocols and key information needs (Result 01 in previous figure). This includes being clear about who will use the information (i.e., who is the audience?), what decisions are expected of them, what tolerance for uncertainty exists, and what are the minimum data needed. If those information needs are identified and justified, then theory of change assumes that the data collected will answer relevant management questions (02). At this point, the theory of change branches. If the data are not sufficient to answer the management questions (pink decision node), then there is a feedback loop to revise the protocols to improve current and future conservation research efforts. If the data are sufficient (green decision node), then recommendations will be developed for conservation action based on the data, and the right data or recommendations will reach the right people in the right format, and at the right time (03). This is a critical result. Often, applied conservation research or data collection efforts fail because they do not present the information to audiences in a format that is relevant for them and that helps them to make decisions and take action. By involving these audiences earlier in the development of research questions, the research team stands a better chance of ensuring that they communicate the data in a relevant fashion. If the research results are communicated well, then it is assumed that the research and recommendations will inform conservation action (04). This result is more easily achieved if recipients are willing to receive and use the data and recommendations (enabling condition, noted in blue). If the research informs conservation action, then the theory holds that there will be more effective conservation actions, threats will be reduced (05), and the status of species and their habitats will improve. This last set of results is left very general because Applied Conservation Research could be used to inform any number of conservation actions – which will each have their own more specific theories of change, threat reduction results, and target species or habitats.

Objectives & Indicators for Generic Results Chain

Objectives / Indicators	Questions to Measure Indicators
Enabling Conditions in Place	**Application Questions:** - Are recipients willing to receive and use data from the research?
RESEARCH 01-1. Relevant info consumers & users identified The proposal clearly identifies who will be consuming or using the results RESEARCH 01-1. Evidence that data consumers and users have been identified Roll-up not relevant (application question)	**Application Questions:** - Who do you expect will use the research results (who is the audience)? If there are multiple users, please list them. - How do you expect them to use the results? If there are multiple users, please answer this question for each user.
RESEARCH 01-2. Compelling justification of info need & how info intended to be used The proposal includes a compelling justification of information need and how the information is intended to be used. RESEARCH 01-2. Proposal Review Committee approval of evidence and compelling justification of information need & intended application Roll-up not relevant (application question)	**Application Questions:** Please provide a justification of why this research is needed: - Please clearly list your main research questions or hypotheses. - Why is it necessary to answer these questions or test these hypotheses? If relevant, please explain how a lack of information has limited conservation action in the past - Who else has done this sort of work? - How does your proposed research build upon or differ from previous work? - Please provide any other information to justify why this research is needed

Objectives / Indicators	Questions to Measure Indicators
RESEARCH 02. Data collected answer questions on species, habitat, or threats By the final performance report, the grantee clearly provides answer(s) to the identified research question(s) ▲ RESEARCH 02. Evidence that the grantee clearly provides answer(s) to the identified research question(s) ▲ RESEARCH 02R. % of projects in which grantee/ researcher has clearly answered identified research questions	**Reporting Questions:** Reviewing the research questions you identified in the application, please answer the following for each research question: - To what degree were you able to clearly answer your research question(s)? (Completely answered question, Mostly answered question but some gaps remain, Partially answered question but many gaps remain, Unable to answer the question) - If "partially" or "unable," please clarify what prohibited you from answering. - If gaps remain, how critical is it to fill those gaps in order to be able to make good management decisions? (3 point Likert: Not at all critical, Somewhat critical, Critical) - If "somewhat" or "critical," what provisions have you made to address these gaps?
RESEARCH 03. Right data reach right people in right format Within X months/years of start of research, appropriate audiences are accessing results and recommendations ▲ RESEARCH 03. Evidence that appropriate audiences are accessing results and recommendations ▲ RESEARCH 03R. % of projects with evidence that (most) audiences are accessing results and recommendations	**Reporting Questions:** For each audience/user identified in the application: - Have identified audiences accessed research results and recommendations? - On what are you basing this assessment (e.g., website hits, requests for documents, meetings where information is shared)? - What format have you used to share your results and recommendations with this audience? Why did you choose this format? - Please indicate how effective this format has been for your audience. (4 point Likert: Very effective, Somewhat effective, Less effective, Not all effective) - On what are you basing this assessment? (e.g., audience feedback, best guess, etc.) - If your audience has not accessed your results and recommendations, please explain why this is the case and what you intend to do to address this issue.
RESEARCH 04. Data or recommendations inform conservation action Within X months of end of data collection activities, the results or recommendations have informed conservation action ▲ RESEARCH 04. Evidence data or data-based recommendations are being used to inform conservation actions ▲ RESEARCH 04R. % of projects with evidence that data or data-based recommendations are being used to inform conservation actions	**Reporting Questions:** - Has the research led to any of the following? (check all that apply) a) Revision of existing action b) Maintenance of existing action (because action was deemed effective) c) Termination of existing action d) Initiation of new action - Please explain why actions were taken/modified/stopped....
RESEARCH 05. Threats Reduced Within X years of the start of the action, the desired threat reduction is seen ▲ RESEARCH 05. Evidence of threats reduced ▲ RESEARCH 05R. % of initiatives that show a reduction in key threats being addressed	**Reporting Questions:** - Do you have evidence of this applied conservation research action leading toward reduction of key threats? Y/N; Please describe

ACTION 8: Promote BMPs for Extractive Industries

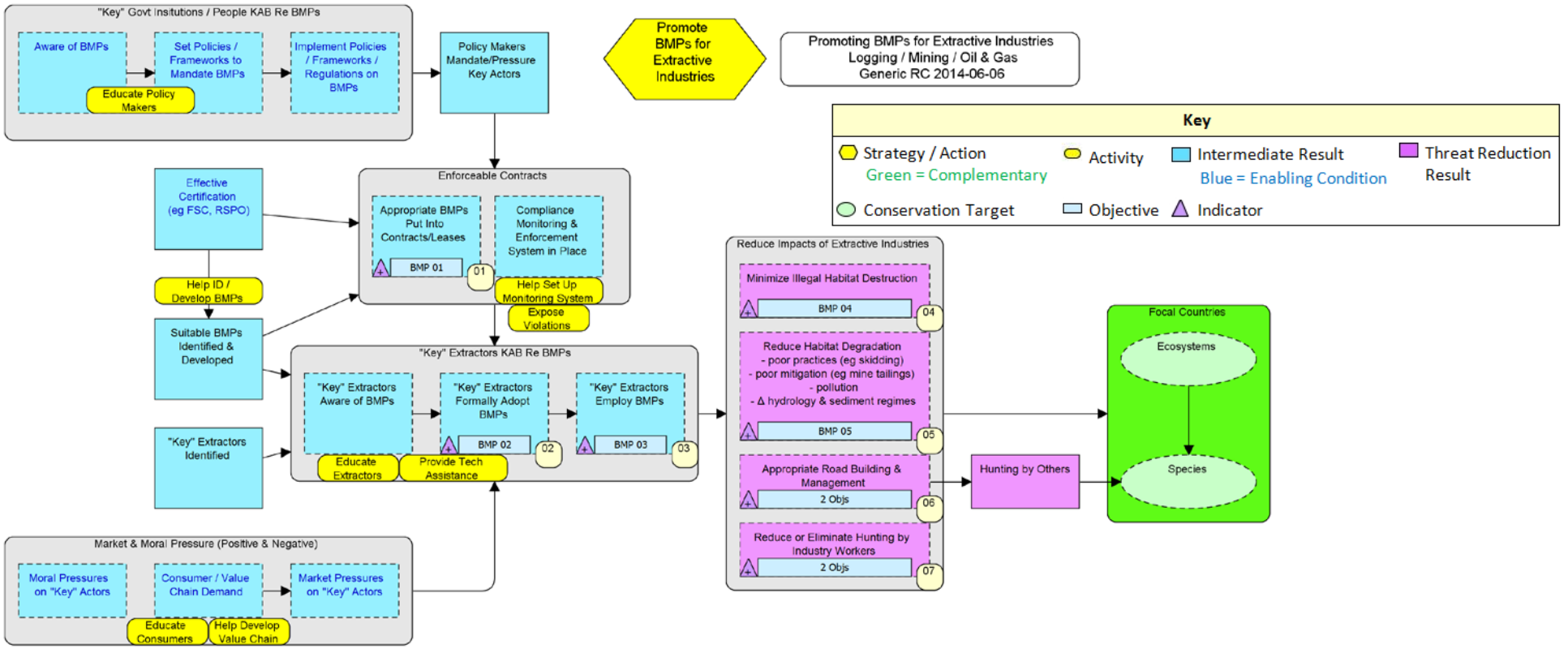
Version: 2014-06-06

Definition: Setting, implementing, changing, influencing, or providing input into voluntary standards and professional codes that govern practices of extractive industries, including logging, fishing, mining, and oil and gas exploration/production.

Examples

- Working with forestry concessionaires to change extractive industry practices
- Providing input and influencing timber certification practices that incorporate well thought-out indicators into certification standards and to propose efficient field-tested recommendations to foresters to ensure the preservation of great apes in certified timber production forests

Generic Results Chain (Theory of Change)



Narrative Description of Results Chain (Theory of Change)

This action involves promoting better management practices (BMPs) for extractive industries such as logging, mining, or oil & gas concessions. The challenge involves overcoming both the effects of the resource extraction as well as the effect that hunting by extraction industry workers and other folks using the road networks created by the industries have on wildlife populations. The action starts by identifying the companies and other groups involved in a given industry as well as the desired better management practices. These BMPs (01) need to put into all relevant contracts and leases along with an appropriate compliance monitoring and enforcement system. This often requires developing awareness among key government institutions so that they set and then implement appropriate policies. A second stream of pressure on the extractive industries comes from market and moral forces. The core of this strategy has the key extractors go through a process of becoming aware of the BMPs, 02) formally adopting BMPs, and then (03) employing the BMPs in their work. Use of these BMPs will then reduce the impacts of extractive industries including (04) minimizing illegal habitat destruction, (05) reducing habitat degradation, (06) creating appropriate road networks and managing the roads by gating them or otherwise limiting access to unauthorized individuals, and (07) reducing or eliminating hunting by industry workers. This in turn will lead to beneficial effects on the ecosystems and key species.

Objectives & Indicators for Generic Results Chain

Objectives / Indicators	Questions to Measure Indicators
Enabling Conditions in Place	**Application Questions:** a. To what degree are key government institutions aware of BMPs? Do you have evidence of their willingness to set policies and frameworks to mandate BMPs? b. Please describe existing certification processes or institutions operating within the region in which you propose to work. If processes or institutions do not exist, please describe how your project can be successful without them. c. With which companies do you propose to work? d. What opportunities do you see for market or moral pressure to influence support or pressure for BMPs?
BMP 01. Appropriate BMPs Put Into Contracts/Leases Within x years, all new and/or renewed extraction contracts mandate appropriate BMPs per relevant regulations and/or standards BMP 01. #/% new and/or renewed extraction contracts that mandate appropriate BMPs BMP 01R. % of Projects with Good Contracts/Leases	**Application Questions:** a. What BMPs are being proposed? b. What impact would implementing these BMPs have on conservation? c. With which companies do you propose to work? **Reporting Questions:** a. What % of relevant contracts/leases mandate appropriate BMPs?
BMP 02. "Key" Extractors Formally Adopt BMPs Signed final contract / concession agreements and/or extraction company internal policies formally incorporate all relevant BMPs BMP 02a. Degree to Which Contract/Policies Reflect BMPs Qualitative Assessment: VG = All key BMPs strongly included; G = Many key BMPs included; F = Some key BMPs included; P = Few or no BMPs included	**Reporting Questions:** a. For each relevant contract, do they include all, many, some or few/no relevant BMPs? b. For each relevant contract, does it have clear enforcement mechanisms and penalties for BMP use? c. What % of key extractors have adopted BMPs?

Objectives / Indicators	Questions to Measure Indicators
BMP 02b. Degree to Which Contract/Policies Have Good Enforcement Provisions Qualitative Assessment: VG = Clear enforcement mechanisms and penalties; P = No enforcement mechanisms or penalties BMP 02c. % of key extractors that have adopted and are using BMPs BMP 02bR. # / % of Contracts with Enforceable BMPs BMP 02cR. % initiatives meeting their key extractor adoption objectives	
BMP 03. "Key" Extractors Employ BMPs Company fully employs all relevant BMPs when extraction activities begin (or ASAP if ongoing operations) BMP 03. Number of contract or policy violations BMP 03R. Total # and Average % of Targeted Extractors Meeting Objective	**Reporting Questions:** a. What % are using BMPs? b. How many instances of contract or policy violations occurred? c. Please describe if/how you are sure that you are detecting all relevant violations.
BMP 04. Threat Reduction: Minimize Illegal Habitat Destruction All concessions adhere to legal habitat conversion rules BMP 04. % of concessions adhering to BMPs related to habitat conversion BMP 04R. Total #/% of concessions adhering to BMP reuls related to habitat conversion	**Reporting Questions:** a. Please describe the % of concessions that are adhering to habitat conversion rules.
BMP 05. Threat Reduction: Reduce Habitat Degradation Within x months of implementing BMPs, habitat degradation is appropriately reduced BMP 05. # of ha of concession appropriately managed Network of skidding trails; Replacement of mine tailings; Water pollution or sediment levels etc.... BMP 05R. Total #/% Hectares of Land Appropriately Managed	**Reporting Questions:** a. What is the change in the total hectares of concessions that are appropriately managed?
BMP 06-1. Threat Reduction: Road Building Road building policies follow BMP guidelines BMP 06-1. % of concessions adhering to BMPs related to road building BMP 06-1R. Total #/% of concessions adhering to BMP reuls related to road building	**Reporting Questions:** a. How has the road network for all relevant concessions changed?
BMP 06-2. Threat Reduction: Road Management Roads built for extractive industries have appropriate controls to manage unauthorized access BMP 06-2. % of concessions adhering to BMPs related to road management BMP 06-2R. Total #/% of concessions adhering to BMP reuls related to road	a. Please describe how the road management for all relevant concessions has changed based on this work.

Objectives / Indicators	Questions to Measure Indicators
management	
BMP 07-1. Alternative Food Source Within x months of implementing the policy, workers and their families have suitable alternative food sources BMP 07-1. Availability of Alternative Food Source Presence of suitable alternative food for entire population of workers/families Cost of alternative food to workers Interviews with workers BMP 07-1R. Change in Number of Sites with Alternative Food	**Reporting Questions:** a. Please describe how availability of alternatives to bush meat have been provided to workers and their families based on this work at all relevant concessions.
BMP 07-2. Threat Reduction: Reduce or Eliminate Hunting by Workers Within x months of implementing the policy, there are few or no incidents of workers and their families doing illegal or inappropriate hunting BMP 07-2a. # incidents of workers hunting BMP 07-2b. #/% of workers hunting BMP 07-2R. # Sites with Workers Inappropriately Hunting	**Reporting Questions:** a. How many incidents have there been of works or their families illegally hunting? b. Please describe the change in % of workers hunting at all relevant concessions

Annex 2. Details of Threat Indicators and Methods

This annex contains the raw material for the threat indicators for each of the following eight direct threats:

1. Commercial Bushmeat Hunting
2. Elephant Poaching
3. Incompatible Extractive Industry Practices (including logging, mining, oil, and fishing)
4. Road Construction in Sensitive Areas
5. Agricultural Encroachment
6. Wildlife Disease
7. Sea Turtle Harvesting & Bycatch
8. Removal of Animals from the Wild for the Pet Trade

Click here for full tables with reviewer comments. We welcome feedback from anyone reading or using these threat indicators. Please provide feedback at http://tinyurl.com/fws-indicators.

Each threat contains a series of indicators that were considered and vetted according to the following criteria:

Criterion / Scale	Definitions & Guidelines for Assessing Criteria
(1) Indicator Utility	This criterion applies to the indicator itself. It assesses the degree to which the indicator will address stated core information needs (assuming that data can be collected and analyzed -- independently of feasibility and cost). Elements of utility include that the indicator directly addresses the question(s) asked, requires little or no interpretation, is widely accepted as a valid answer to the question(s) and/or has been published in the scientific literature, and has been used by relevant policy and decision makers.
4 = Very high utility	Meets most or all elements of utility.
3 = High utility	Meets most elements of utility, but may not be published or widely accepted.
2 = Medium utility	Meets some elements of utility, but requires interpretation and may not be published or widely accepted
1 = Low utility	Does not directly answer question(s) asked and/or is not widely accepted as a good measure.
(2) Method Reliability & Technical Feasibility	This criterion assesses how accurate, reliable, and technically feasible it is to implement the method used to collect the indicator. It is independent of the cost of the method (aka if money were not a factor, how easy would it be to use the method?). In rating, it is important to consider issues like corruption or capacity, which are likely to influence how well the method is likely to be implemented and how accurate and reliable the data gathered are likely to be.
4 = No issues	Method has established protocols tested by scientific community, is relatively low-tech, can be carried out without significant training or oversight, and yields data that can be analyzed by non-experts.
3 = Few issues	Only one of the following things is true: Method is untested or contentious, requires sophisticated or difficult to acquire equipment and tools, requires significant training and oversight to be carried out, and yields data that require sophisticated analysis or correction.
2 = Some issues	Exactly two of the following things are true: Method is untested or contentious, requires sophisticated or difficult to acquire equipment and tools, requires significant training and oversight to be carried out, and yields data that require sophisticated analysis or correction.
1 = Many issues	At least three of the following things are true: Method is untested or contentious, requires sophisticated or difficult to acquire equipment and tools, requires significant training and oversight to be carried out, and yields data that require sophisticated analysis or correction.

Criterion / Scale	Definitions & Guidelines for Assessing Criteria
(3) Cost For Avg to Grantee Collect Data	This criterion assesses the cost of implementing the method. Cost is generally relative to the scale at which data collection will take place. For example, a small-scale project may be able to implemented a labor-intensive method without spending a lot of money, but this same method may not be cost-effective at larger scales. The suggested $ values are provided in terms of 'orders of magnitude for a "typical" FWS project.
$	Requires thousands of $/year to collect data for a typical project.
$$	Requires tens of thousands of $/year to collect data for a typical project.
$$$	Requires hundreds of thousands of $/year to collect data for a typical project.
$$$$	Requires millions of $/year to collect data for a typical project.

As shown in the following image, we considered a variety of indicators and rated them and their associated methods according to the above criteria. We also identified indicators we felt had greater potential, based on the ratings.

As shown in the following image, the tables for each threat provide a list of candidate indicators to measure the threat and specific methods that can be used for each indicator. We then rate the indicator and methods across three assessment criteria defined in more detail in Section 3. Recommended indicators are marked with an asterisk.

Candidate indicators to measure threat

Candidate Indicator for ELEPHANT POACHING	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings		
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data
* Proportion of Illegally Killed Elephants (PIKE) - # of illegally killed elephants divided by the total number of carcasses encountered per year for site	Analyze existing patrol reports/ logs	4	2.5 Data hard to gather; may be vulnerable to corruption	$-$$
	Conduct field surveys/ transects		3	$$
	Conduct aerial surveys		2	$$$
Weight of ivory confiscated at key transit points	Analyze existing seizure records	2 - 2.5	1.5 Data hard to gather; may be very vulnerable to corruption	$
	Conduct trade surveillance		1.5 Data hard to gather; may be very vulnerable to corruption	$$
* Elephant pop size (ideally stratified by age and gender)	Analyze existing aerial elephant surveys	4	Savanna: 3 Forest: 1	$$$
	Conduct dung surveys		Forest: 3	$$
* Signs of poaching detected in eld (eg # poachers, # camps, nount of spent ammunition)	Analyze SMART records		2 Data hard to gather; may be vulnerable to corruption	$$-$$$
tudes of households/ viduals towards poaching	Conduct household surveys, key poacher surveys	1	3 easy, but difficult to do well	$-$$
Change in elephant behavior	Record flight distance (vehicle and pedestrian)	2	2	$$-$$$
	Analyze physiological indicators of stress (streaming, vocalization, increased stress hormones in dung)		2	$$$

Recommended indicators marked with asterisk

Methods to collect data to measure indicator

Utility criterion applies to indicator

Method reliability and cost criteria apply to methods

THREAT 1. Commercial Bushmeat Hunting

Definition: Hunting of wildlife for commercial sale.

Units of Analysis / Core Information Needs: For a given management area or geographic region. What species are targeted by commercial bushmeat hunting? How are hunting pressures changing over time generally and for each species? To what degree are USFWS-funded actions helping to stop bushmeat hunting?

Candidate Indicator for COMMERCIAL HUNTING FOR BUSHMEAT	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
* # of individuals by species at key sale or transport points (e. g., bushmeat markets, checkpoints)	Conduct surveys/ assessments at key sales or transport points	2-3	2	$$	Easiest to collect but least useful among recommended indicators; Need to specify where assessments made (e. g., markets. checkpoints). Reviewer comment: Most urban centres have just a few principal access points where bushmeat enters, and at this point in the chain there are fewer options for hiding items and biasing the data. Once it reaches the city, you can no longer control what proportion is sold openly in the market vs hidden vs sold directly to consumers/restaurants from the home
Presence/absence by species at key sale or transport points (e. g., bushmeat markets, checkpoints)	Conduct surveys/ assessments at key sales or transport points	2	2-3	$-$$	Simpler/cheaper version of above
Total weight by species at key sale or transport points (e.g., bushmeat markets, checkpoints)	Conduct surveys/ assessments at key sales or transport points	2-3	2	$$	Differing opinions on utility of this indicator and value added over others
* # incidents of poaching detected in field (poachers, camps, spent ammunition, snares)	Conduct field surveys/transects	3	2-3	$$-$$$	Presumably easier to find camps, poachers, signs of poachers - could be part of regular patrols Reviewer general comment: frequency of encountering poaching sign is a direct result of "effort", and so need to be careful how results are interpreted.
	Analyze existing patrol reports/ logs		2-3	$	Vulnerable to corruption
	Conduct aerial survey		1-2	$$$	What could you really see in an aerial survey in a forested area?
	Conduct survey of poachers		1-2	$-$$	Ask poachers or friends how many times they poached in a certain period of time; Subject to reporting issues
* Species abundance for species targeted by bushmeat trade	Conduct field surveys/transects	4	2	$$-$$$	Indirect sign often used as measure of abundance - has its own assumptions and issues. Must be systematic with trained monitors.
	Review camera trap data		2	$$	Camera trapping becoming more & more used, more reliable. Main cost is in equipment. Someone to collect data, then data entry (programs for analysis)
	Conduct survey of/ consult with locals		1-2	$$-$$$	test their perceptions over increase or decrease of a certain species

Candidate Indicator for COMMERCIAL HUNTING FOR BUSHMEAT	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings 4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility (1) Indicator Utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues (2) Method Reliability & Technical Feasibility	$ $$ $$$ $$$$ (3) Cost For Avg to Grantee Collect Data	Notes
Wildlife Picture Index (proxy for community* diversity) (*community = species targeted by bushmeat trade)	Review camera trap data (+ index calculation)	2-3	2	$$-$$$	
Catch per unit effort	Conduct survey of hunters	2	2	$-$$	
Household consumption of purchased bushmeat	Conduct household surveys	3	2	$$-$$$	
Cost ratio of bushmeat:alt protein $/kilo	Conduct market surveys	2	4	$-$$	
Awareness of wildlife law	Conduct surveys of key audiences (e.g., HHs, vendors, legal officials)	1	3	$$-$$$	
Consumer diet/protein preference	Conduct household surveys	1-2	2	$$-$$$	
Confiscations of bushmeat	Analyze grantee law enforcement reports	2	2, corruption potential issue	$$	Could potentially be split into consfiscations (a) in the field, (b) at key transit points, or (c) at the market. To be useful, requires constant level of enforcement Reviewer comment: Also there could be an issue that "small players" get confiscated while big players less so.
	~~Analyze external law enforcement reports~~		2, corruption potential issue	$	
	Interview law enforcers (e.g., at road blocks)		2, corruption potential issue	$$	
Purchase availability of illegal bushmeat species (e.g., readily available in mkts vs. having to go "underground" to get desired species)	Conduct market surveys	2	2-3	$-$$	Could be qualitative or quantitative. Need to define qualitative scale
	Conduct household surveys		3	$$-$$$	

THREAT 2. Elephant Poaching

Definition: Illegal killing of elephants, primarily for ivory.

Units of Analysis / Core Information Needs: For a given elephant population, management area, or geographic region. How many elephants are being killed by poachers? Who is doing the poaching (e.g. local communities vs. professional poachers)? To what degree are USFWS-funded actions helping to stop elephant poaching?

Candidate Indicator for ELEPHANT POACHING	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
* Proportion of Illegally Killed Elephants (PIKE) - # of illegally killed elephants divided by the total number of carcasses encountered per year for site	Analyze existing patrol reports/ logs	4	2.5 Data hard to gather; may be vulnerable to corruption	$-$$	could work for MIKE sites; maybe can determine type of poacher? Note that % can be "artificially" high if low numbers of elephants killed (eg 1 poached out of 2 carcasses found = 50%)
	Conduct field surveys/ transects		3	$$	
	Conduct aerial surveys		2	$$$	
Weight of ivory confiscated at key transit points	Analyze existing seizure records	2 - 2.5	1.5 Data hard to gather; may be very vulnerable to corruption	$	depends on relationship of transit point to catchment area
	Conduct trade surveillance		1.5 Data hard to gather; may be very vulnerable to corruption	$$	
* Elephant pop size (ideally stratified by age and gender)	Analyze existing aerial elephant surveys	4	Savanna: 3 Forest: 1	$$$	could work for MIKE sites
	Conduct dung surveys		Forest: 3	$$	could work for MIKE sites; does not give data about subpopulation
* Signs of poaching detected in field (eg # poachers, # camps, amount of spent ammunition)	Analyze SMART records		2 Data hard to gather; may be vulnerable to corruption	$$-$$$	could work for MIST/SMART sites; can also determine type of poacher; need to pick the specific indicator to track within this class
Attitudes of households/ indiividuals towards poaching	Conduct household surveys, key poacher surveys	1	3 easy, but difficult to do well	$-$$	
Change in elephant behavior	Record flight distance (vehicle and pedestrian)	2	2	$$-$$$	
	Analyze physiological indicators of stress (streaming, vocalization, increased stress hormones in dung)		2	$$$	

THREAT 3. Incompatible Extractive Industry Practices

Definition: Natural resource extraction such as logging, mining, or fishing. In particular, incompatible extractive industry practices taking place outside of authorized concessions and/or that violate standards for ecologically-appropriate management practices.

Units of Analysis / Core Information Needs: For a given management area or geographic region. What is the extent of natural resource extraction? How much extraction is taking place legally (e.g. authorized concessions) vs illegally? How much of the extraction is being conducted according to standards for ecologically-appropriate management practices? To what degree are USFWS-funded actions helping to reduce incompatible extractive industry practices?

Candidate Indicator for INCOMPATIBLE EXTRACTIVE INDUSTRIES	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
* Total ha / % land area with extraction taking place (e.g., logging, fishing, mining) both inside and outside concession area	Conduct remote sensing in relation to concession map	2 (esp for degradation)	3	if unanalyzed data exist - $$ if no data - $$$	Easier the more visible the impact (clear logging > selective > fishing)
	Conduct field surveys / transects to groundtruth w image or concession map		2-3 (depends on spatial scale)	$$ - small-med areas	
	Create/ update a hand map		2	$	may involve sampling / transect
* % of resrouce being extracted in relation to legal limits or appropriate standards. Ideally results in a map showing status of each extraction "parcel"	Conduct field surveys / transects to groundtruth w image or concession map	3	2-3 (depends on spatial scale)	$$-$$$	Need to define practices or impacts allowed by the most ecologically relevant laws or standards; if only practices and not impacts defined, this gets much harder; depends on strength of laws and standards
	Review government assessment records		2	$-$$	vulnerable to corruption etc
	Review company assessment records		1	$-$$	vulnerable to corruption etc
Description of character of exploiter	Conduct (Internet) research to identify size of company and nationality of company holders doing the extraction	1	4	$	

THREAT 4. Road Construction in Sensitive Areas

Definition: Construction of roads in ecologically-sensitive areas leading to habitat destruction/fragmentation and increased hunting pressure.

Units of Analysis / Core Information Needs: For a given management area, buffer zone, or geographic region. How many km of new roads have been constructed in ecologically sensitive areas? Are these roads contributing to increased hunting pressure? To what degree are USFWS-funded actions helping to mitigate road construction in ecologically sensitive areas?

Candidate Indicator for ROADS	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
Preventing Road Construction in Ecologically Sensitive Areas (less concern about road footprint, more concerned about fragmentation and new roads)					
* Road density in defined ecologically sensitive areas (km/sq km by road type)	Remote sensing; aerial surveys	3	3	$$$	Indicator utility more direct if you can compare road density from year to year
	Conduct field surveys/ groundtruthing		2-3 (depends on spatial scale)	$$-$$$	
	Analyze existing maps		2	$-$$	
* # km of new roads under construction or built within last 3 years within defined Ecologically Sensitive Area	Remote sensing; aerial surveys	4	3	$$$	
	Conduct field surveys/ groundtruthing		2-3 (depends on spatial scale)	$$-$$$	
	Consult external records		2	$-$$	
Network structure score (?) within defined Ecologically Sensitive Area	Remote sensing (network structure analysis)	3	3	$$$	Reviewer comment: Not clear how network structure is an indicator. Is there a network score? # of nodes and segments?
	Conduct field surveys/ groundtruthing (network structure analysis)		2	$$-$$$	
Mitigation of Road Impacts					
Road-effect zone size within defined Ecologically Sensitive Area - distance (km) from road in which defined ecological effects occur AND total area (km2) of zone	Conduct ecological and/or ecotoxicological field surveys	2-3	1	$$-$$$	definition from Forman 1998: "The road-effect zone is the area over which significant ecological effects extend outward from a road and typically is many times wider than the road surface plus roadside"
# of roadkilled individuals (report by species)	Count roadkill	2	2	$-$$	"Roadkills are a premier mortality source, but except for local spots, rates rarely limit population size." Reviewer: are roadkills harvested and eaten?
% annual mortality due to roadkill (report by species)	Conduct mortality analysis - requires telemetry and tracking of individuals over time? (need roadkill counts for this method)	4	1	$$$	"Roadkills are a premier mortality source, but except for local spots, rates rarely limit population size." Reviewer: are roadkills harvested and eaten?

Candidate Indicator for ROADS	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
Road avoidance reported by species (alternatively: Species densities by distance to nearrest road)	Conduct satellite telemetry & behavioral analysis	3	2	$$-$$$	Feasiblity depends on how indicator is defined; Reviewer: Teasing apart whether it is a road effect or some other factor such as hunting or even disease is an important next step. Perhaps having grantees look at different "disturbance levels" of varying human impacts in a given area will help improve our understanding of road impacts.
	Review literature for relevant species behavior		2	$	
# of migration routes bisected by road	Conduct satellite telemetry	2	2	$$-$$$	Roads as barriers to animal movement; Reviewer: the road is often not the problem - fencing is or # of vehicles per 24hr period. Critters cross roads (except for obligate canopy dwellers)
	Conduct surveys/ interviews with locals		2	$$	
Stress level (reported by species) (% change in hormone levels??)	Conduct hormone analysis	2	2	$$$-$$$$	Roads as contributors to stress levels and behavioral changes of select species. Are roads really the stressor? How would you know?
Deposition rates of sediments in stream channels	Conduct sediment deposition analysis	2	3	$$	Sedimentation, erosion, chemicals could be due to other practices - e.g., ag, forestry, etc. Changes to Hydrology & Water Quality - Erosion & Sediment Transport -
Erosion rates	Conduct erosion analysis	2	3	$$	Sedimentation, erosion, chemicals could be due to other practices - e.g., ag, forestry, etc. Changes to Hydrology & Water Quality - Erosion & Sediment Transport -
Chemical concentrations in soil or water (by chemical)	Conduct ecotoxocoligcal analysis	2	3	$$	Sedimentation, erosion, chemicals could be due to other practices - e.g., ag, forestry, etc. Changes to Hydrology & Water Quality- >Introduction of Chemical Pollutants->
Peak flow	Conduct flow analysis	2	3	$$	Peak flow could be affected by ag, forestry, non-road barriers, etc. Hydrologic & Erosion effects
* Average travel time to key resrouce markets (bushmeat, timber, etc.)	Travel roads to time trips	3	3	$$	Reviewer comment: it would be interesting but expensive to motorcycle/drive main roads each 1 or 5 years to measure travel times between key markets and source locations. A travel time map would be much more useful than a road map. It may depend on weather and/or season.

THREAT 5. Agricultural Encroachment

Definition: Loss of wildlife habitat from expansion of agricultural areas and human settlements.

Units of Analysis / Core Information Needs: For a given management area, buffer zone, or geographic region. How much wildlife habitat is being lost to expansion of agricultural areas / settlements? How much of this expansion is driven by other government agency policies? To what degree are USFWS-funded actions helping to reduce habitat loss / degradation?

Candidate Indicator for AGRICULTURAL ENCROACHMENT	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
Number of incursions within unit of concern (e.g., PAs, buffer zone)	Conduct remote sensing (or analyze existing data)	2 (number does not necessarily correspond to area)	3	analyzed data exist-$ raw data exist-$$ no data-$$$	
	Conduct perimeter walks		4	$$	new roads could be leading indicator of deforestation to come
	Conduct aerial survailance		2	$$$	
* Total ha / % of management area encroached, ideally by type of encroachment	Conduct remote sensing (or analyze existing data)	3	3	analyzed data exist-$ raw data exist-$$ no data-$$$	assessment: annual loss and cumulative loss
	Ground truth with image map		3	$$ - small-med areas	
	Create / update a hand map		3	$	may involve sampling / transect

THREAT 6. Wildlife Disease

Definition: Increased prevalence and/or severity of disease in wild animal populations due to contact with humans and/or domesticated animals. This threat can be brought on or exacerbated by habitat disturbance, contamination, and other human-induced threats.

Units of Analysis / Core Information Needs: For a given management area, geographic region or species population. What is the prevalence/potential risk of human-linked disease in key wildlife populations? To what degree are USFWS-funded actions helping to minimize the effects of human-linked disease on wildlife populations?

Candidate Indicator for WILDLIFE DISEASE	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
* Prevalence of pathogen(s) in wildlife population	Conduct prevalence survey	2-3	3	$$-$$$	If understanding of morbidity and mortality rates for specific disease not established, then utility is closer to 2 If the concern is disease transmitted directly from humans and domestic animals, wildlife prevalence (or incidence) will be much more informative if/when the suspected source (human or dom animal) is also measured (however, that can be tricky b/c of informed consent) Reviewer: We cannot treat disease in wild animals why do we need to know this?
* # of new cases within population divided by total population (Incidence proportion)	Conduct health survey of wild population; Syndromic surveillance (if symptoms clearly linked to pathogen presence)	4	2	$$$	need to know total population and be able to identify pathogen
Presence/absence of disease or pathogen in wildlife population	Conduct health survey of wild population; Syndromic surveillance	2	3	$$	
Morbidity rate of species (where possible, due to the pathogen)	Conduct health survey of wild population; Syndromic surveillance	4	2	$$$	More appropriate for populations of habituated or marked animals such as great apes, lions, elephants, etc. where individuals are known and monitored
	~~Review existing literature~~		3	$	~~Lit review, if known disease~~
Mortality rate of species due to the pathogen	Conduct health survey of wild population	4	2	$$-$$$	Dead animals can be harder to track b/c predation or may die b/c behavior changes (e.g., may be more likely to NOT avoid roads)
	Review existing literature		3	$	Could be OK method if you know the prevalence of disease within your population (e.g., if you know mortality rate due to ebola is 80%, and 10 apes are infected, you can estimate mortality at 8 apes)
Seroprevalence by pathogen in human population (+ possibly domestic animals and wildlife reservoir speceis)	Conduct prevalence survey	2	2	$$-$$$	

THREAT 7. Sea Turtle Harvesting & Bycatch

Definition: Collection of sea turtles for eggs and meat on nesting beaches and in open water either intentionally, or as bycatch while fishing for other species.

Units of Analysis / Core Information Needs: For a given management area, geographic region or species population. How many sea turtles are being harvested? To what degree are USFWS-funded actions helping to stop sea turtle harvesting?

Candidate Indicator for SEA TURTLE HARVESTING & BYCATCH	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
Poaching on beach					
* # and % of poached nests (report by species)	Conduct beach patrols	4	4	$$	Beach patrols requires some training and oversight for the data to be credible, but in general the method is feasible.
* # and % of adult females harvested for meat on beaches	Conduct beach patrols	4	3	$$	More challenging to comprehensively monitor harvested adults than poached nests; Reviewer: Less straigthforward than patrols, but feasilbity of 3 is right
Bycatch					
% adult mortality due to fishing bycatch in defined population unit	Conduct mortality analysis of adults - requires telemetry and tracking of adults over time?	4	1	$$$	Requires sophisticated methods & analysis; Reviewers: Difficult to estimate total population size.
* # of sea turtles caught in bycatch	Conduct boat observations	4	2	$$-$$$	Vulnerable to bias; Reviewer: Cost depends on whether observers are deployed with artisinal fisheries vs commercial. Observers of commercial fisheries requires much longer trips = more money. Quality of data influenced by training of observers. 2 sounds about right for method reliability.
	Interview fishers (self report)		2	$-$$	Vulnerable to bias; Reviewer: Self-reporting is useful as a good start, can be a positive for community engagement. Quality of data can vary
% of sea turtles caught and released alive	Conduct boat observations	3	2	$$-$$$	Vulnerable to bias; Reviewer: Cost depends on whether observers are deployed with artisinal fisheries vs commercial. Observers of commercial fisheries requires much longer trips = more money. Quality of data influenced by training of observers. 2 sounds about right for method reliability.
	Interview fishers (self report)		2	$-$$	Vulnerable to bias; Reviewer: Self-reporting is useful as a good start, can be a positive for community engagement. Quality of data can vary
# of sea turtle carcasses encountered on beach (reported by species)	Conduct systematic stranding surveys	2-3	4	$$	

THREAT 8. Removal of Animals from the Wild for the Pet Trade

Definition: Capture of wild animals for sale as pets.

Units of Analysis / Core Information Needs: For a given management area, geographic region or species population. How many animals of each species are being captured? To what degree are USFWS-funded actions helping to stop the removal of animals from the wild for the pet trade?

Candidate Indicator for PET TRADE	Grantee Data Collection Method	Assessment Criteria: See key for detailed description of ratings			Notes
		4 = Very high utility 3 = High utility 2 = Medium utility 1 = Low utility	4 = No issues 3 = Few issues 2 = Some issues 1 = Many issues	$ $$ $$$ $$$$	
		(1) Indicator Utility	(2) Method Reliability & Technical Feasibility	(3) Cost For Avg to Grantee Collect Data	
* # individuals (by species) confiscated / observed in pet trade	Monitor known trade points	3	3	$$	Don't know how much effort put into confiscation, corruption issues, may not confiscate individuals if no sanctuaries into which to put them; sample surveys of hotspots could include ex. expat hangouts (embassies, expat-run restaurants, etc) where animals are often taken for sale; also we are seeing them show up in grocery stores.
	Consult with intelligence network & law enforcement		2	$-$$	
	Check news / consult law enforcement partners		2	$	
# of new individuals arriving at sanctuaries from pet trade (include those that may be turned away b/c of space)	Consult with sanctuaries	3	2	$	Represents subset of animals captured for pet trade
# individuals and % population removed from wild population for pet trade	Conduct field surveys and trade surveillance	4	1	$$$	
* Qualitative assessmentof degree of openness/ ease of trade	Conduct market surveys	2	3	$-$$	Need to define measurable scale (e.g., Can buy regularly in local market; Can buy through connections; Impossible to find)
	Conduct attitudinal surveys (household, individuals)		3	$-$$	Can help identify perceptions of prevalence and ease of trade + knowledge of wild animals for sale or kept as pets. MM: maybe commission PASA or another group to develop measures that track the degree of openness across network
Demand for wild pets	Review advertisements	2	2	$	
	Conduct attitudinal surveys (household,		3	$-$$	

Annex 3. Individuals Consulted in this Work

We consulted with a variety of partners and stakeholders through several in-person meetings and web-based outreach efforts. In addition, we also shared our progress and consulted with our colleagues and partners in the USAID Central Africa Regional Program for the Environment (CARPE) who were embarking on a similar process. Although we endeavored to track reviewers carefully, it is almost inevitable that we have omitted some key contributors in this table.

Person	Affiliation
Adam Phillipson	ARCUS Foundation
Allard Blom	WWF
Amielle DeWan	Rare (now IFAW)
Andy Tobiason	US Agency for International Development
Anne Ntongho	WWF
Bethan Morgan	ZZSD
Carina Schmid	PCI Media Impact
Charly Facheux	African Wildlife Foundation
Chris Whittier	Smithsonian
Christine Bailey	PCI Media Impact
Craig Hoover	USFWS Division of Management Authority
Cynthia Moses	INCEF
David Greer	WWF
David Morgan	Washington U
David Wilkie	Wildlife Conservation Society
Derek Litchfield	USFWS Division of International Conservation
Dianne Russell	US Agency for International Development
Emma Stokes	Wildlife Conservation Society
Francis Tarla	Garoua Wildlife College
Guy Foulks	USFWS Neotropical Migratory Bird Conservation Program
Heather Eves	VA Tech
Heidi Ruffler	USFWS Division of International Conservation
Hilde Van Leeuwe	Wildlife Conservation Society
Jason Ko	USFS
JoJo Head	ARCUS (consultant for)
Julie Sherman	PASA
Katie Bartels	PCI Media Impact
Ken Creighton	US Agency for International Development
Luc Mathot	Conservation Justice
Marj Nelson	USFWS Endangered Species Program
Mark Humpert	Association of Fish & Wildlife Agencies
Martin Andimile	UC Davis / BEAN
Matt Steil	Global Forest Watch

Person	Affiliation
Matthew Cassetta	US State Department
Matthew Edwardsen	ARD
Michelle Wieland	Wildlife Conservation Society
Nancy Gelman	USFWS Division of International Conservation
Ofir Drori	LAGA
Rich Bergl	NC Zoo
Richard Ruggiero	USFWS Division of International Conservation
Rob Parry-Jones	
Rollie White	USFWS
Ron Essig	USFWS Wildlife and Sport Fish Restoration Program
Sadie Stevens	USFWS Wildlife and Sport Fish Restoration Program
Scott Covington	USFWS
Sean Southey	PCI Media Impact
Terese Hart	Lukuru Foundation
Tim Resch	US Agency for International Development
Tomer Hasson	Office of Management and Budget
Veronica Caceres	Inter-American Sea Turtle Convention

Annex 4. Glossary & Definition of Acronyms Used in This Report[3]

Glossary

Term	Definition
Action	An intervention a team takes to reach project objectives and longer-term conservation goals
Effectiveness Measures	Indicators and associated questions tied to intermediate results that measure proximate effects of actions. Also called performance indicators.
Conservation Target	An element of biodiversity at a project site, which can be a species, habitat, or ecological system that a project has chosen to focus on.
Direct Threat	Usually a human action that immediately degrades one or more conservation targets (e.g., unsustainable logging or fishing). Typically tied to one or more stakeholders. Sometimes referred to as a pressure, source of stress, and/or source of limiting factors.
Enabling Conditions	Circumstances or conditions that need to exist for the action to be successful and that can help determine the utility of funding a proposed action (e.g., the legal or policy framework within a country)
Impact	The desired future state of a conservation target. Sometimes referred to as a goal.
Indicator	A measurable entity related to a specific information need such as the status of a target/factor, change in a threat, or progress toward an objective. A good indicator meets the criteria of being: *measurable, precise, consistent,* and *sensitive*.
Intermediate Result	Effects or results that show progress toward expected outcomes and that can be used as the basis for taking corrective management steps and building accountability. Also called outcome.
Method	A specific technique used to collect data to measure an indicator
Miradi	Desktop software designed to support implementation of the CMP *Open Standards for the Practice of Conservation*
Monitoring Questions	Questions that project implementers would answer in order to collect the data needed for indicators
Objective	A formal statement detailing a desired outcome of a project such as reducing a critical threat. A good objective meets the criteria of being: *results oriented, measurable, time limited, specific,* and *practical.*
Outcome	The desired future state of a threat or opportunity factor. See also

[3] Definitions provided represent how the terms have been used in this document and in the USFWS International Conservation NOFA. They are not necessarily representative of how terms are defined and used by FOS, CMP, or other USFWS programs.

Term	Definition
	intermediate result and threat reduction result.
Output	Immediate results expected from an action. Outputs are the results statement of a specific task or activity (e.g., people trained, meetings conducted).
Results Chain	A graphical depiction of a project's theory of change - its core assumption and the logical sequence linking project actions to one or more targets. In scientific terms, it lays out hypothesized relationships. See theory of change.
Theory of Change	The hypothesized relationships connecting an action to threat reduction and the achievement of conservation goals. Typically stated or depicted as if-then relationships. A results chain is a graphical depiction of a theory of change.
Threat Reduction Result	The effects that a team is trying achieve in terms of reducing critical threats. Also called outcome.
Status Indicators	Indicators used to assess the status of a direct threat or an ecosystem or species (regardless of any actions taken). Status indicators also serve as the ultimate indicator of the effectiveness of a given action

Acronyms Used in This Report

BMP	Best Management Practice
CAML	Conservation Actions and Measures Library
CMP	Conservation Measures Partnership
FOS	Foundations of Success
NGO	Non-governmental organization
NOFA	Notice of Funding Availability
OMB	Office of Management and Budget
USFWS (FWS)	United States Fish and Wildlife Service

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