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SCAPES PARTNERS

A REVIEW OF FIELD BASED COMMON GROUND ON ADAPTATION

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A REVIEW OF FIELD BASED COMMON GROUND ON ADAPTATION

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PREFACE

BACKGROUND

This report has been completed as part of the USAID-funded SCAPES Climate Change Adaptation Learning Initiative, which is focused on mainstreaming climate adaptation practices for the conservation sector that integrates biodiversity, ecosystems and livelihoods. This activity is intended to be foundation work for a larger learning activity which will foster better understanding of adaptation approaches and tools that can be applied at local, landscape and national levels and addresses both ecosystems and people.

The initiative currently involves three parts:

1. *A review of existing climate adaptation case studies involving ecosystems and biodiversity, and human adaptation that integrates ecosystem approaches;*
2. *Documentation of adaptation work and lessons by SCAPES partners to date; and*
3. *A review of existing adaptation frameworks and recommendations for harmonization.*

OBJECTIVE AND METHOD

This document outlines adaptation work and lessons coming from SCAPES partners to date.

SCAPES Partners were surveyed for inputs related to their adaptation work (see Annex A for survey questions). Information was also gathered from a recent Africa Biodiversity Collaborative Group's (ABCG) survey¹, which covered adaptation work by some of the same partners, and complemented by interviews with SCAPES partners' representatives. Supplemental information for this report came from partner organizations' websites and publications. Feedback was also received during the SCAPES Annual Meeting held in December 2011.

¹ Seimon, A., et. al. 2011. A Review of Climate Change Adaptation Initiatives within the Africa Biodiversity Collaborative Group Members.

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SCAPES Partners provided the substance for this report and also gave feedback once drafted. Among those who contributed:

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- Robert Munroe, Melanie Heath (BirdLife)
- Esther Bertram, Liesje Birchenough, Maria Karlstetter (FFI)
- Paul Cowles, Shari Bush (Pact)
- James Watson, David Wilkie (WCS)
- Kimberley Marchant, Shaun Martin (WWF-US)

ABBREVIATIONS

AWF	African Wildlife Foundation
CATIE	El Centro Agronómico Tropical de Investigación y Enseñanza (The Tropical Agricultural Research and Education Center)
CEM	Commission on Ecosystem Management
CI	Conservation International
CIFOR	Center for International Forestry Research
CVCA	Climate Vulnerability and Capacity Assessment
Cristal	Community Based Risk Screening Tool
ELAN	Ecosystems Livelihoods Adaptation Network
FFI	Fauna & Flora International
GCM	Global Climate Model
IDB	Inter-American Development Bank
IGCP	International Gorilla Conservation Program
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
NAPA	National Adaptation Program of Action
SCAPES	Sustainable Conservation Approaches in Priority Ecosystems
SDM	Species Distribution Models
TNC	The Nature Conservancy
WCS	Wildlife Conservation Society
WWF	World Wildlife Fund

INTRODUCTION: THE SCAPES PARTNERS

SUSTAINABLE CONSERVATION APPROACHES IN PRIORITY ECOSYSTEMS (SCAPES)

SCAPES is USAID's largest global conservation initiative. The program works across nine partner activities in 19 countries to address conservation through a variety of landscape scale approaches. Implementing partners engage in field activities and learning initiatives, helping to complement and inform the Agency's portfolio of national and regional biodiversity programs.²

Profiles of each partner organization are provided below.

AFRICAN WILDLIFE FOUNDATION

Mission: The African Wildlife Foundation works together with the people of Africa to ensure that the wildlife and wild lands of Africa will endure forever.

AWF's premise is that protecting Africa's wildlife and wild landscapes is the key to the future prosperity of Africa and its people – and for over 50 years, has made it its work to help ensure that Africa's wild resources endure. AWF works at “landscape level” implementing a variety of conservation and livelihood improvement actions that conserve land, protect species and empower people. Its ‘Heartlands Program’ currently covers nine landscapes across 14 countries where interventions include various forms of climate adaptation related strategies led by a climate change specialist supported by a conservation geography / spatial analysis team.

PACT CONSORTIUM

Mission: Pact works to build empowered communities, effective government and responsible private institutions to collectively address development challenges and strengthen the resilience of communities and institutions.

Pact addresses the drivers of biodiversity loss through holistic, integrated approaches that strengthen the social, economic and governance systems that are the cornerstone of successful biodiversity conservation. Pact's consortium partners include Fauna & Flora International, BirdLife International and ACDI/VOCA. Through diverse and complementary expertise, the Pact consortium brings a cross-sectoral approach to landscape/seascape level conservation that is grounded in science and practice, helping to drive the ecological, social, institutional and economic changes that are needed to reverse, mitigate, and adapt to threats to biodiversity.

- **Pact** as the leader of the consortium brings long experience in the successful management of complex activities in multiple countries and contexts. Successfully linking conservation and development, Pact is recognized as a global leader in capacity building and network strengthening, community mobilization, learning and knowledge management, participatory planning, advocacy, building better governance, conflict mitigation and peace building. **Fauna & Flora International (FFI)** brings scientific, social, economic and institutional expertise to bear on achieving landscape conservation in over 40 countries around the world, together with an extensive network of partnerships that are actively conserving biological diversity. FFI is a leader in the development of environmental markets for ecosystem services and ensuring that market mechanisms sustain, rather than disenfranchise, local stakeholders.

² For more information on the SCAPES program, please visit http://transition.usaid.gov/our_work/environment/biodiversity/SCAPES/index.html

- **BirdLife International** brings conservation science, both for prioritizing and monitoring conservation targets and contributing to policy initiatives, at all levels of intervention. The BirdLife Partnership of 117 national conservation organizations around the world connects the local, national and international, bringing extensive expertise in mobilizing civil society, engaging and empowering local communities, and working to support and consolidate the conservation efforts of Governments.
- **ACDI/VOCA** works to enhance incomes and promote broad-based economic growth in rural communities. ACDI/VOCA helps to develop and promote sustainable livelihood opportunities that are consistent with landscape conservation objectives.

WILDLIFE CONSERVATION SOCIETY

Mission: The Wildlife Conservation Society works to save wildlife and wild places across the globe.

WCS does this through science, global conservation, education and the management of the world's largest system of urban wildlife parks, led by the flagship Bronx Zoo. Together these activities change attitudes towards nature and help people imagine wildlife and humans living in harmony.

In 2010, WCS established a team dedicated to climate change adaptation from within the Global Conservation Program. The team provides technical expertise around understanding the needs of ecosystems, wildlife and human communities in a time of climate change; planning techniques that capture the changes that are predicted; and, with partners in government and communities, develop and promote successful climate adaptation actions and policies that reduce risk. They work throughout WCS's landscape, seascape, and species conservation programs in Africa, South America, Oceania, Asia and North America. The team also works with governments, multilateral institutions and private landholders to help promote the conservation of natural ecosystems as a cost-effective and practical means of addressing the impacts of climate change on humans and wildlife (ecosystem-based adaptation).

WORLD WILDLIFE FUND

Mission: The World Wildlife Fund works to conserve nature and reduce the most pressing threats to the diversity of life on Earth.

WWF works in 100 countries and is supported by 1.2 million members in the United States and close to 5 million globally. WWF's unique way of working combines global reach with a foundation in science, involves action at every level from local to global, and ensures the delivery of innovative solutions that meet the needs of both people and nature.

CHAPTER ONE: COMMON GROUND FOR ADAPTATION

ADAPTIVE APPROACHES

The SCAPES program applies a holistic and adaptive approach to addressing conservation challenges. Over the life of the program (2010-2014), all partner activities: (1) take a threats-based approach to address conservation issues; (2) aim to achieve financial, social, and ecological sustainability; (3) apply adaptive management and be responsive to changing situations, information, and enabling conditions; and (4) scale-up knowledge and impact to increase conservation success at sites, across the partnership, and among the global conservation community. SCAPES Partners are working toward common goals, which must also take into account the impacts of climate change. Additionally, partners have all stated in various ways that addressing the linkages between conservation and human adaptation is critical for success.

SCOPE OF ADAPTATION WORK FOR SCAPES PARTNERS

The scope of each partner's adaptation work varies, and this provides an opportunity to cross-compare good practices and lessons learned, while also working to address commonly identified challenges. Understanding the adaptation work across the SCAPES partners' wide range of experiences can eventually help SCAPES partners in understanding various approaches to adaptation and in mainstreaming adaptation in their own conservation and development activities. Highlights of adaptation experience from each partner are featured below.

I. AFRICAN WILDLIFE FOUNDATION—LINKING ADAPTATION TO LONG-TERM CONSERVATION WORK

From a broad perspective, much of what AWF has done in the past for adaptation in the landscapes addressed '*coping strategies*' by communities to meet mostly short term needs, but without necessarily looking at broader medium to long-term adaptation. This approach is driven by the reality on the ground where 'shocks' that threaten survival from extreme weather events happen. Moving forward, AWF recognizes the essence of gathering these somewhat *ad hoc* interventions and scale up to more holistic and longer-term adaptation actions.

Thus, the AWF is now moving forward to implement more holistic and longer-term adaptation actions as an integral part of its conservation program, rather than addressing adaptation as a separate issue. In this respect, AWF now deliberately aligns local community coping strategies with all conservation actions across its landscapes.

AWF has a formal program on climate change adaptation designed on the basis of a climate change policy developed in 2009. This is led from the AWF headquarters in Nairobi by the Climate Change Director. The program focuses on conducting vulnerability assessments and application of ecosystem-based approaches (EbA), particularly with regard to safeguarding ecosystem services for local communities and species/habitat adaptation (focused on securing wildlife movement corridors) and increasing the resilience of water and agriculture systems. The evolution of climate change response plans as part of AWF's programs will be informed by stepped up monitoring of site and target-specific variables.

The AWF initiatives are multifaceted and include engage vertical and horizontal processes from the local to landscape level, with supportive engagement at national and regional policy levels.

AWF RECENT ADAPTATION HIGHLIGHTS:

The Mountain Gorilla Climate Change Vulnerability Assessment is AWF's pilot and reference adaptation highlight. With funding from the MacArthur Foundation, AWF conducted a vulnerability assessment for the Virunga Mountain Gorilla across Rwanda, Uganda, Democratic Republic of Congo, and has begun implementing some of the recommended actions. For instance, through IGCP which is the implementing partner on the ground, AWF has installed a network of weather stations in the landscape which was a major monitoring gap identified by the VA, as well as surveyed an area within the landscape to assess its potential to serve as a viable wildlife corridor for gorilla movement and habitat expansion. Through GIS spatial analysis, the IGCP prepared a mountain gorilla vulnerability assessment that identifies potential mountain gorilla ranges under several future IPCC climate scenarios.³

Through this project, AWF addressed multiple types of adaptation objectives:

- Species adaptation;
- Landscape adaptation;
- Ecosystem-based adaptation;
- Integrated ecosystem and community approaches to adaptation;
- Community-based adaptation, and
- Protected area adaptation.

On the basis of this work and experience, AWF laid the foundation for vulnerability assessments for Grevy's Zebra and elephants in the Samburu landscape in Kenya and has several proposals to apply vulnerability assessments in several other landscapes.

AWF is exploring the impact of climate change on species (and ideally on habitat-variables) using species distribution models generated with software such as *Maxent* that incorporate a range of climate scenarios and spatial data inputs for species habitat modeling. Monitoring approaches specific to climate change include:

- Establishment of long-term vegetation plots along a gradient transect to track shifts in vegetation distribution and phenology as related to habitat resources (Virunga landscape).
- Deployment of weather stations to fill gaps in meteorological coverage (in many landscapes relatively remote conservation areas are neglected) and in the Virunga landscape to track micro-climatic shifts.
- Expanded emphasis on monitoring of the water resource distribution, seasonal availability and access (by humans, wildlife populations).⁴

II. PACT—BUILDING RESILIENT COMMUNITIES AND ENHANCING WHAT WE KNOW FOR ADAPTATION

Pact's participatory and multi-stakeholder approach focuses on building empowered and resilient communities and institutions while strengthening their capacity to adapt to changing

³ Belfiore, N.M., (ed.) 2010. The Implications of Global Climate Change for Mountain Gorilla Conservation. African Wildlife Foundation, the International Gorilla Conservation Programme, and EcoAdapt.

⁴ Seimon, A., et. al. 2011. A Review of Climate Change Adaptation Initiatives within the Africa Biodiversity Collaborative Group Members.

conditions. The Pact Consortium approach emphasizes the critical linkages and interdependencies between people and nature. Our efforts encourage ecological resiliency, improved and stable governance and market-led economic development compatible with landscape level conservation. Adaptation measures need to be holistic, recognizing the interplay between climatic, ecological, social, economic and political forces. Pact sees the integration of ecosystem-based and community-based adaptation as the key to successful adaptation at the landscape level.

PACT CONSORTIUM RECENT ADAPTATION HIGHLIGHTS:

Pact runs the Southeast Asia Community of Practice for Monitoring and Evaluation of Climate Change Interventions (SEA Change) with funding from the Rockefeller Foundation. SEA Change seeks to assist both practitioners and funders in leveraging knowledge and the power of networking to improve organizational performance in both climate change adaptation and mitigation. The goals of the community of practice (CoP) are:

- Fostering partnerships and building member capacity for strengthening discourses and practices on M&E in climate change;
- Sharing best practices, lessons learned, guidelines, approaches, methods, tools and innovations to improve M&E practices, particularly in relation to M&E of adaptive responses to climate change; and
- Influencing policy and practice around the M&E of adaptive responses to climate change interventions.

Activities focus on identifying and operationalizing a core set of characteristics that drive high performance in learning networks, with the long-term aim of developing user-friendly tools that foster deeper understanding of how to create and sustain these networks. The SEA Change website (seachangecop.org) serves as a virtual learning space to improve access to relevant information and to facilitate networking between individuals and institutions engaged in climate change interventions.

Fauna & Flora international has developed and is piloting an adaptation planning process for assessing the likely management planning needed at its project sites in the face of climate change. The pilot stage of this adaptation planning process involved project leaders and local teams testing out the planning tool using a desk based approach. This process was undertaken by project leaders from a number of projects within our portfolio including two sites in Tanzania, the Tibetan Plateau, and Brazil. The next stage was to involve key stakeholders to ensure that key learning and ground based knowledge was incorporated into this planning.

In Uzbekistan on the Ustyurt Plateau FFI, as part of the Pact Consortium, undertook this next stage of planning through a climate change scenario planning workshop including key stakeholders who studied current climate change predictions, specific vulnerabilities and threats to habitats, species and local communities and explored potential responses. The workshop was intended to increase the understanding amongst the project team of the climate threats in vulnerable areas and how the project area is or will be affected. Following an assessment of potential impacts, suggested initial responses included: increased research and monitoring; targeted actions around livestock; diversification of livelihoods; strengthening partnerships and collaboration; and raising awareness and capacity among stakeholders.

FFI is now taking a wider agricultural landscape approach to adaptation planning with additional funding from British American Tobacco (BAT), acknowledging that agricultural landscapes are going to be impacted by climate change and this is likely to have serious impacts on people dependent on agriculture and adjacent areas of biodiversity.

Through this project, a range of resources have been developed for project teams. Select resources include:

- Information on methods to increase resilience and adaptive capacity within agricultural systems, for both crops and livestock management;
- Approaches to understanding the adaptive capacity amongst local communities living within or beside our project sites; and
- A series of planned workshops with associated facilitation information to lead teams through the planning process laid out within our existing adaptation planning tool.

The first stage of planning has already taken place in Kyrgyzstan, Tajikistan, Nicaragua, the Philippines and Liberia. Similar first stage planning work will occur in China and Kazakhstan (the latter in the frame of the SCAPES project) in the near future. This has included planning workshops with key stakeholders in all five countries. These workshops identified the key threats, exposure and susceptibility already associated with the sites and then tracked how these would be compounded by climate change. The second planning stage, in the coming year, will be to work with these key stakeholders and communities again to look for the most appropriate solutions for these sites. **BirdLife** has been involved in multiple knowledge products related to climate change, in particular linking climate change adaptation work to ecosystem-based approaches. For example, BirdLife co-authored “Principles and Guidelines for Integrating Ecosystem-based Approaches to Adaptation in Project and Policy Design: A Discussion Document.”⁵ This document serves as an initialization of an open process to develop ‘principles’ for considering ecosystem-based approaches for adaptation into policy making and planning, and guidelines (with indication of useful tools and information sources), building on already existing more generic adaptation guidelines/guidance, for designing ecosystem-based approaches for adaptation projects.⁶

BirdLife (and SCAPES) has also collaborated recently to critically review the evidence for the effectiveness of ecosystem-based approaches to adaptation. In collaboration with the Cambridge Conservation Initiative (CCI), the SCAPES learning initiative contributed by reviewing a sample of the current grey literature-based evidence for the effectiveness of ecosystem-based approaches to adaptation⁷ using an assessment framework developed by the CCI team to facilitate standard review.

Additionally, **BirdLife** has conducted a review of Uganda, Rwanda and Burundi NAPAs (and other relevant documents) for consideration of adaptation needs of biodiversity and ecosystems and their positive role in human adaptation. The intention was to identify the extent to which current policy documents in the three countries consider ecosystems and adaptation, appropriateness of and opportunities for including biodiversity conservation adaptation

⁵ Andrade, A., et al. 2011. Draft Principles and Guidelines for Integrating Ecosystem-based Approaches to Adaptation in Project and Policy Design: A Discussion Document. IUCN- CEM, CATIE. Turrialba, Costa Rica. Available online at: http://cmsdata.iucn.org/downloads/draft_guidelines_eba_final_7_12.pdf

⁶ This work contributed to the working document developed by Travers, A., et al. for UNEP [Ecosystem-Based Adaptation Guidance: Moving from Principles to Practice](#).

⁷ Definition of ecosystem-based approaches to adaptation: the use of biodiversity and ecosystem services to help people to adapt to the adverse effects of climate change – this may include sustainable management, conservation and restoration of ecosystems, as part of an overall adaptation strategy that takes into account the multiple social, economic and cultural co-benefits for local communities. Secretariat of the Convention on Biological Diversity: *Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change*. Technical Series: No. 41, 126 pages. Montreal; and Convention on Biological Diversity: X/33 Biodiversity and climate change, Decision Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Tenth Meeting; UNEP/CBD/COP/DEC/x/33; 29 October 2010, Nagoya, Japan; Secretariat of Convention on Biological Diversity.

measures, and use of biodiversity and ecosystem services for human adaptation in key policy documents (NAPA, PRSPs, NBSAPs). This work complements BirdLife's continued active involvement in the UNFCCC adaptation negotiations advocating for the importance of recognizing ecosystem-based approaches for human adaptation, and ensuring that environmental safeguards are built into all adaptation responses. Together with the partnership's active engagement with national governments, efforts ensure that these issues are considered in national adaptation and biodiversity plans and strategies.

This collective experience will be applied in a UK Government Darwin Initiative project in Burundi, Kenya, Rwanda and Uganda that will raise awareness and build capacity on the role of ecosystems in adaptation in government and civil society. This work is also being used to contribute to a UNEP-WCMC-led project to develop biodiversity criteria for project selection and review for the German Government's International Climate Initiative.

Regarding, biodiversity conservation adaptation, BirdLife has worked with Durham University and Conservation International to model projected climate-induced range changes of birds based within sub-Saharan Africa, Indochina and Nepal's Important Bird Areas (IBAs). Such work is being used to develop adaptive management approaches for sites, looking at site expansion and connectivity, management of core refuges, maximizing populations, minimizing other drivers threatening species and their habitats, and restoring degraded habitats within and surrounding IBAs. Furthermore, BirdLife is working with the respective governments to ensure actions needed to enhance resilience of biodiversity to climate change are included in protected area plans and policies and national biodiversity strategies.

III. WILDLIFE CONSERVATION SOCIETY—LINKING INFORMATION TO ACTION

In the WCS strategic plan (2007-2016), adapting to climate change was identified as a key challenge to be addressed throughout the global network of WCS conservation sites across more than 50 countries worldwide. The WCS Climate Change Adaptation Program was formally established in August 2010 within the Conservation Challenges, a new crosscutting program within the Global Conservation Program, and has developed its strategic plan late in 2010. This strategic plan is now guiding the work of the WCS climate adaptation team. Under the current WCS-wide strategic plan, climate change adaptation is to be incorporated into country and project-level planning.

WCS RECENT ADAPTATION HIGHLIGHTS

Albertine Rift Climate Assessment Project. The WCS Albertine Rift Climate Change Assessment is a comprehensive program aimed at understanding the potential impacts of anthropogenic climate change on wildlife conservation and protected area management in one of Africa's principal biodiversity hotspots. In its first phase (2007-09), the project examined the baseline climatological conditions within protected areas; used downscaled IPCC model output to quantify predictions of regional climate change across the Albertine Rift; assessed possible future impacts; and developed products that aid in estimating future distributions of biodiversity in the Albertine Rift.

The project has since been developing and applying these findings in partnership with the wider biodiversity conservation community. Through the utilization of dynamic vegetation and crop models, the modeling approach was designed to generate a suite of products that now offers guidance on the potential impacts of anthropogenic climate change on wildlife habitat, key cultivars and carbon budgets throughout the Albertine Rift region. An additional output included detailed climatological analysis within Albertine Rift protected areas, shedding light on previously unrecognized phenomena such as intra-seasonal climatic variability, helping to ascertain baseline conditions for assessing climatic changes within protected areas. A second

phase of the Climate Assessment project is currently focused on implementing long-term monitoring for climate change principally through climatological observations and vegetation and species monitoring within protected areas. A third phase on stakeholder consultation and output dissemination is being conducted concurrently. Taken together, the multi-step approach developed for the Albertine Rift provides a comprehensive strategy designed to build knowledge and capacity to adapt conservation management effectively for climate change in data-poor regions of conservation concern.

The WCS approach developed in the Albertine Rift has as principal targets for engagement key national level stakeholders and protected area managers. As an organization concerned with on the ground conservation and protected area management, WCS recognizes the need to work with both of these key constituencies to foster the enabling environment at high governmental levels needed by the conservation managers in the field. Partnerships with in-country partners are fundamental to WCS's activities. In Uganda WCS works closely with the Institute for Tropical Forest Conservation (ITFC); Uganda Wildlife Authority (UWA) and Uganda Ministry for Water and Environment (MWE). In Rwanda the WCS country program and the climate change team work in close partnership with the Rwanda Development Authority (RDB).

The Albertine Rift project is concerned with both biodiversity and human adaptation to climate change through evaluation of agricultural yield changes under climate change and consideration of human livelihoods and settlement in conservation corridor evaluations. The first phase of the program covered modeling, established baselines, and developed a data portal. The second phase is implementing a monitoring program for climate change and will be completed in 2012. The third phase on stakeholder consultation is partially complete, with a major conference convened and report now in preparation. Several outputs have been published and others are in preparation.

WCS and AWF in their respective work in the Albertine Rift are among the few organizations actively establishing monitoring stations to collect information on both climate variables and the response of species.⁸

Western Indian Ocean Coral Reef Conservation Program. WCS's institutional expertise in both global-scale coral reef research and on the ground coral reef conservation is unique in the conservation and academic communities. These two core areas and scales of expertise allow WCS to develop, test and refine management approaches in the field that are supported by sophisticated research models and empirical field studies. Consequently, conservation science and its application at WCS allows for comparisons of findings across sites distributed throughout the tropics. This research provides the basis for promoting good science-based conservation at field sites and provides generality that is useful to the larger tropical fishing community dependent on coral reefs, and governments and NGOs that assist the management of reefs. Findings have also provided an especially strong foundation for the WCS program on climate change adaptation across the Western Indian Ocean region.

Project work involves developing guidelines for policy-makers and a tool for marine resource managers to understand the management approaches that will be most effective given a particular site's reef ecology, exposure to climate change disturbances, and socioeconomic or human context and governance. This tool is being developed with data collected from countries

⁸ Seimon, A., et. al. 2011. A Review of Climate Change Adaptation Initiatives within the Africa Biodiversity Collaborative Group Members.

and territories in the Western Indian Ocean (Kenya, Tanzania, Mozambique, Madagascar, Comoros, Mauritius, and Seychelles). It is also being refined through data collected at WCS program sites further afield in Papua New Guinea, Fiji, Indonesia and Belize. The tool involves three sources of information – oceanographic and environmental data available from satellite sources and ecological and socio-economic from field surveys undertaken by the WCS field staff. With these sources of information it is possible to develop recommendations that are specific to the local social, ecological and management needs. Recommendations are based on what is most likely to succeed in a particular site rather than decisions based a limited understanding of context.

Adaptation to climate change in Papua New Guinea. A joint WCS and Oxfam International and Research and Conservation Foundation of PNG (RCF) program addresses the need to reinforce ecological resilience through effective resource management and to strengthen capacity within local social systems. The goal of the program is to better enable communities in the rural island province of Manus, PNG, to adapt to the impacts of climate change. The project is funded by AusAID and runs for 24 months.

The project objectives are to develop tools and information to augment existing resource management programs, thereby helping communities prepare for and adapt to climate change. Another objective promotes a learning-by-doing approach to increase capacity for government and local communities to adapt to climate change. Objectives will be achieved by targeted activities in the following areas:

1. Information on climate change for decision-making;
2. Education and knowledge exchange with local people on climate change; and
3. Integration of climate change adaptation into local-level planning and activities.

Climate change-informed conservation across North America. WCS staff are raising awareness on the effects of climate change on wildlife and wild lands throughout North America and implementing adaptive management strategies. For example, in Arctic Alaska WCS scientists have been investigating potential climate change impacts to breeding birds at long-term monitoring sites on the coastal plain and on muskox in the western Arctic through on-the-ground research activities. Using this data, WCS is working with key stakeholders and collaborators (including USFWS, BLM, conservation NGOs, and academic scientists) to better understand where and how to support wildlife conservation in the Alaskan Arctic with respect to climate change through the development of conservation strategies and adaptive planning.

Building on previous experience, WCS has developed the ‘Climate Change Adaptation for Conservation Targets’ or ‘ACT’ Framework for incorporating climate change into conservation decision-making⁹. The ACT Framework is designed for collaborative application in a given landscape or seascape by a multidisciplinary group of natural resource managers, conservation practitioners, scientists, and local stakeholders. Working with these stakeholders, WCS is using the ACT Framework to identify and implement priority wildlife conservation and management strategies across twelve landscapes in North America. The framework draws on collective knowledge to translate climate change projections into a portfolio of adaptation actions. These actions can then be evaluated in the social, political, regulatory, and economic contexts that

⁹ Cross, M. S., et al, (in revision). Adaptation for Conservation Targets (ACT) Framework: A tool for incorporating climate change into natural resource conservation and management.

motivate and constrain management goals and policies.

Ecosystem-based Management as a climate adaptation strategy in Fiji. WCS field programs are implementing climate adaptation across globally important coral reef sites. For example, since 2005 WCS has been working to help the communities adapt the protected area network and strengthen the management plan to make them both more "climate-ready" in Kubulau District, Fiji based on the principles of ecosystem-based management. Efforts have resulted in the establishment of a protected area network that includes 17 small, periodically harvested coastal and nearshore marine protected areas (MPAs), three large permanently closed MPAs, one island nature reserve, and one proposed forest reserve. WCS has helped the Kubulau communities develop Fiji's first ridge-to-reef management plan to regulate human activities and resource use within the protected area network and adjacent lands and waters of the district.

To strengthen social resilience in Kubulau, WCS, the Coral Reef Alliance (CORAL) and SeaWeb are currently piloting a new communications tool, the Community Educators Network, to help the Kubulau Resource Management Committee (KRMC) deliver conservation and management messages to their constituents. Through tailored workshops, the KRMC learn how to draw upon traditional ecological knowledge as well as scientific information to empower them to communicate effectively in the village setting, particularly to target groups who have been previously under-represented in past management planning workshops, such as women and youth. To date, the training has resulted in increased enthusiasm for coral reef conservation, increased community organization, and improved awareness of how to mitigate threats to reefs, particularly from climate disturbance. The improved communication through social networks also needs to be coupled with improved communications infrastructure. WCS, in partnership CORAL, is seeking funding from a local communications network provider for assistance to finance a new network tower and solar chargers in order to address the compliance and enforcement challenges as well as improve capacity to mobilize communities during climate crises.

As management structures and plans are strengthened in Kubulau, WCS is beginning to work in adjacent districts, thus building management capacity to respond to environmental and climate change across the broader Vatu-i-Ra Seascape. With existing funding from the David and Lucile Packard Foundation, John D. and Catherine T. MacArthur Foundation and the National Oceanic and Atmospheric Administration (NOAA), WCS has begun to replicate this model in four other districts adjacent to Kubulau within the Vatu-i-Ra Seascape.

Incorporation of climate change adaptation into conservation planning in the Colombian Andes. WCS is helping Colombia address climate change threats to mountain biodiversity and critically important ecosystems. By utilizing new high-resolution climate change scenarios, the program is able to run models to generate predictions on where adaptation measures are most critically needed. The results will guide the placement of wildlife corridors to protect those species deemed most threatened by changes in climate by giving them options for relocating to intact ecosystems at a higher altitude, as theirs becomes unsuitable. Using these high resolution scenarios, the WCS team will also be better equipped to evaluate the impact of climate change on important ecosystem services upon which local communities depend, including water supply in the surrounding watersheds. The program has collected detailed biological information which can be combined with several decades of historical land cover and climate change prediction models to devise strategies for human adaptation in the landscapes as well.

WCS is also committed to saving some of the most critically endangered vertebrate groups in

the region, and has worked on amphibians which are particularly vulnerable to climate change. WCS is implementing a conservation strategy based on a comprehensive approach that involves both in situ and ex situ activities. Scientists working with the program have collected some of the first baseline data on the population status of amphibian communities along altitudinal gradients in Colombia, and of other critically endangered species. At the same time, WCS is also supporting and guiding captive breeding programs for these endangered species at the Cali Zoo. Conducting studies and capacity-building activities on emergent wildlife diseases, some of which threaten human health, is also at the core of the wildlife health program of WCS in Colombia. The impact of some of these diseases is expected to increase under climate change scenarios, thus monitoring and modeling their potential distribution in the future, and devising strategies to address these threats with local stakeholders is essential. Moreover, the results from these activities have been incorporated into adaptive management strategies that WCS is developing with the National Park Service for Colombia's current National System of Protected Areas.

IV. WORLD WILDLIFE FUND—ADAPTATION AS AN INTEGRAL PART OF ALL WORK

WWF recognizes the importance of building capacity to help people and the ecosystem services they rely upon adapt to climate change. Moving beyond adaptation as a single facet of its work, WWF-US aims to mainstream climate change adaptation into all of its work over the next three years, putting itself on the path to become a truly “climate-smart” conservation organization.

Around the globe WWF is working with local communities, governments and others to help people and nature and successfully adapt to a warmer world. Some examples include:

- Helping communities in the Eastern Himalayas **adapt to water scarcity** by collecting rainwater and promoting drought-resistant crops;
- Restoring **mangrove forests** in Coastal East Africa to buffer shorelines from storm erosion;
- Protecting **coral reefs** in the Coral Triangle to build their resilience against bleaching events; and
- Identifying remaining areas where Arctic sea ice will persist the longest to provide **polar bears** for a home in the future.

WWF's adaptation team is developing tools and methodologies, providing training and technical support, and facilitating the adaptation mainstreaming process for conservation programs. Across the organization, many programs are at various stages of integration. Many have conducted vulnerability assessments and are conducting pilot projects. Some have begun to “retro-fit” their existing conservation plans to incorporate climate-change related threats and adaptation strategies. Over the next few years, projects and programs will be developed with climate change and adaptation fully integrated with their plans from the start, all incorporating the best available science as well as learning from earlier adaptation activities.

WWF RECENT ADAPTATION HIGHLIGHTS:

Adaptation workshops and training. WWF-US has developed a successful adaptation fundamentals workshop for its staff and partners that lays the foundation for successful climate-smart conservation and development work. While employing easy to understand explanations of key adaptation concepts that are often misunderstood and misapplied, the workshop encourages participants to develop solutions that no longer use the past as a model, but that anticipate future change and uncertainty. To date, the workshop has been conducted 17 times on 5 continents collectively training over 900 people from WWF, partner organizations such as

CARE and TNC, local and national government officials, as well as representatives from USAID, the World Bank, and UNEP. In October 2012, WWF will conduct a train the trainers course for Africans from 7 countries to adapt and deliver this workshop for local audiences.

Learning for Adaptation. Adaptation is an-going ‘learning by doing’ process of decision-making in the context of change, complexity and uncertainty. WWF has developed and is implementing a program to build the capacity of decision makers (e.g., staff, communities, government officials) to develop the critical thinking and learning skills required for learning by doing. Through intensive workshops that create space for participants to reflect and inquire together incremental improvements to practice (single loop learning) are identified and participants are supported to appreciate and deepen the reframing of their conservation and development practice (through double and triple loop learning). The learning journeys of participants are captured and communicated supporting the dissemination of contextual and generic learning. The collaborative inquiry approach builds trust and skills for social learning (i.e., interactive learning that enables people/stakeholders to take concerted action towards shared goals, including by supporting interdisciplinary practice and participation of indigenous and local people). This leverages the capacity of civil society organizations to create spaces for dialogue and partnerships between stakeholder groups operating at different levels of governance in order to build resilience and enhance adaptive capacity.

Climate Vulnerability and Capacity Assessment under the SCAPES program. WWF is working with CARE in three landscapes – the Ruvuma, the Sacred Himalayas, and Eastern Cordillera Real – to pilot integrated ecosystem-livelihood adaptation approaches. Together with landscape level ecosystem-based methods, WWF is partnering with CARE to apply their Climate Vulnerability and Capacity Assessment (CVCA) and Community Based Risk Screening Tool (Cristal) to assess community vulnerability, bringing local voices and concerns to higher levels and at the same time integrating ecosystem aspects into community based adaptation to reduce the risk of maladaptation.

Flowing Forward (see also under “Useful Tools” section). The Flowing Forward vulnerability assessment methodology is used to assess the impact of climate change from an ecosystem perspective and while originally created for freshwater systems it has been adapted to assess general ecosystem vulnerability. It is flexible and well suited to a wide variety of contexts. Additionally, this method allows for the combination of science knowledge of climate and development scenarios with local knowledge and concerns. Because all final conclusions on risk and adaptation priorities are based on stakeholder consultation, this is also a very useful tool for consensus building amongst a diverse audience. The development of the Flowing Forward tool is a highly iterative process that is based on implementation in multiple sites. Every time the process is carried out it is informed by reports from previous iterations. Thus, we are able to document and improve or modify based on lessons learned. Given the complementary skill sets of CARE and WWF, this partnership is testing the implementation of the Flowing Forward approach incorporating CARE’s CVCA in order to better respond to the needs of communities and vulnerable populations.

Adaptive Institutions. A key challenge for successful climate change adaptation is the development of institutions that can respond more effectively to an uncertain climate future. Because water is the main medium through which we are likely to experience climate change, institutions that play a role in water resources management have a particular need to become more adaptive in their operations and interactions. WWF-US developed and published *Shifting Course: Adaptation for Water Management Institutions*, a report that identifies a set of principles for climate-adaptive institutions. The report includes five case studies from around the world that

highlight different institutional responses to climate change and related challenges. Available at <http://adaptiveinstitutions.org/>.

WWF Standards of Conservation Project and Program Management. Based on the Open Standards, WWF has mainstreamed climate adaptation into the organization's project and program management methodology. It built on initial work that The Nature Conservancy (TNC) did in this field, and refined it to meet institutional needs. This methodology is available to all WWF staff and to other organizations in the hope that it can result in better adaptation practice and help to improve resilience building and adaptation for both biodiversity and vulnerable people. WWF has conducted climate adaptation training including the climate adaptation integrated WWF Standards in Argentina, Malaysia, Vietnam, Mexico, Thailand, and Kenya, among other countries. WWF is also using and testing the methods from programmatic work as well as learning lessons from the SCAPES climate adaptation activities, the integrated ecosystems and livelihoods adaptation work with CARE, and through existing guidance from other organizations like TNC.¹⁰

GEF-funded WWF mangrove project in Tanzania, Cameroon, and Fiji. This Project helped to better understand the threats of climate change to mangrove ecosystems and to protect mangrove areas of high biodiversity. The project built the capacity of natural resource managers to (1) assess the vulnerability of mangroves and associated coastal ecosystems to expected climate change impacts, and (2) developed and promoted adaptation strategies that respond to these impacts. A set of tools and methods for understanding the vulnerability of mangrove ecosystems to sea level rise was developed and published in April 2012 and is available for use globally.

¹⁰ The climate adaptation guides can be found at: www.panda.org/standards/climate_adaptation and www.panda.org/standards/climate_adaptation_abridged

CHAPTER TWO: USEFUL TOOLS & GOOD PRACTICES

I. AFRICAN WILDLIFE FOUNDATION

The AWF, in addition to utilizing technological and analytical tools, has found success in using methodological tools as well. Some examples of these successful practices and tools are listed below.

- *Partnerships focus* — Recognizing the limited internal capacity and experience in performing vulnerability assessments (VA) and developing adaptation strategies, AWF turned to the partners below for specific needs:
 - WCS's climatological modeling;
 - EcoAdapt's Climate Camp expertise in adaptation project facilitation and design;
 - University of California Davis's species distribution model; and
- *Workshops* (as a tool) — Bringing people together through workshops has been a key component to success in the AWF-IGCP mountain gorilla program.
- *Pairing global data with local data* — AWF works to fill in the gaps in compiling historical data on field projects by complementing 'off the shelf' global data products such as *WorldClim* with locally available data. This helps to develop a more accurate picture of on the ground realities.¹¹

II. PACT CONSORTIUM USEFUL TOOLS / GOOD PRACTICES

Pact's participatory approaches focus on building empowered and resilient communities and institutions while addressing the underlying causes of vulnerability. Pact's suite of tools and methodologies lead to improved resilience and adaptability to changing conditions across public, private, formal and informal institutions. These tools include:

- *Organizational Capacity Assessment (OCA) tool: examines governmental or non-governmental organizations' ability to govern themselves, achieve their targets, manage their finances and sustain activities and services. Efforts have shown that applying this tool along with organizational planning activities produces organizations that are more adaptable to changing conditions, more democratic, more likely to work in partnership with other organizations, and more likely to share benefits equitably.*
- *Organizational Networks Assessment (ONA) tool: helps users better understand and visualize inter-relationships and information flow within and between individuals or organizations in a network. Interventions help stakeholders to develop functional networks that encourage knowledge flow, collaboration and advocacy.*

To prepare for climate changes that may occur at project sites, **FFI** under the Pact Consortium, has been working to develop tools and resources to enable teams to work through a process of

¹¹ Seimon, A., et. al. 2011. A Review of Climate Change Adaptation Initiatives within the Africa Biodiversity Collaborative Group Members.

planning for likely change at sites and to look to the types of activities that could be carried out to ensure the resilience of these sites in a changing climate. A tool was developed in 2009 and has since then gone through a process of integration into existing site planning processes. The tool was developed using information from existing adaptation planning tools in the public domain including the well know CRiSTAL toolkit (which focuses particularly on local livelihoods) and has tried to integrate both livelihood and biodiversity elements into one single planning approach, relevant to FFI sites.

With BAT funding, the FFI tool has since been developed to take account of the wider agricultural landscape surrounding our sites and is currently being tested in Kyrgyzstan, Tajikistan, Nicaragua, the Philippines and Liberia, and will be tested in China and Kazakhstan (the latter under the SCAPES project) in the coming year. The field test will take a wider agricultural landscape approach to biodiversity management, acknowledging that agricultural landscapes are going to be impacted by climate change and this is likely to have implications for adjacent areas of biodiversity.

As part of its UK Government Darwin Initiative project on ecosystems and adaptation in Burundi, Kenya, Rwanda and Uganda, **BirdLife** is developing training materials and regional and national guidance on ecosystem-based approaches for adaptation to climate change to build capacity amongst governments and civil society. Training and guidance materials will draw on best practice guidance including the 'Principles and Guidelines for Integrating Ecosystem-based Approaches to Adaptation in Project and Policy Design: A Discussion Document' (mentioned in Chapter One of this document) and Travers et al.'s *Ecosystem-based Adaptation Guidance: Moving from Principles to Practice*¹². The national guidance (for each country) will include information on measuring and evaluating potential ecosystem-based approaches for adaptation costs and benefits, and will be applied at site-level with local communities. Lessons from this application will be used to inform local-experience-based guides on ecosystem-based approaches for adaptation.

III. WILDLIFE CONSERVATION SOCIETY

The development of a suite of sophisticated new tools tailored for conservation needs, including climate change, is central to the WCS coral reef conservation program. Multi-year time series of a range of oceanic parameters are also used to establish baseline conditions and variability characteristics through the spatial ecology efforts of the marine program. Global satellite data on many environmental factors are constantly being analyzed and tested with field data to develop models that effectively model environmental stress and impacts on vulnerable species and ecosystems. In terrestrial programs in Africa, the WCS approach on climate change adaptation places emphasis on knowledge of climatological baselines and variability as being fundamental components of efforts to anticipate the impacts of predicted climatic changes upon humanity, ecosystems and biodiversity.

For the Albertine Rift project considerable efforts were made to **uncover climatological records from research stations and national parks authorities** for developing site-specific climatological baselines. At present, site-specific climate change vulnerability assessments are generally not available for WCS conservation sites in Africa. There are NAPA reports available for the Albertine Rift countries, but these mostly focus on socioeconomic development and

¹² Travers, A., et al. 2012. Ecosystem-Based Adaptation Guidance: Moving from Principles to Practice. UNEP. Available online at: http://www.unep.org/climatechange/adaptation/Portals/133/documents/Ecosystem-Based%20Adaptation/Decision%20Support%20Framework/EBA%20Guidance_WORKING%20DOCUMENT%2030032012.pdf

hazards rather than biodiversity. A macro-scale (sub-Saharan Africa) vulnerability atlas from the Regional Climate Change Program in South Africa has recently become available (James van Hasselt et al., pers. comm.), but is of limited value at the scale of individual protected area.

Numerical modeling of environmental conditions of the recent past and future is an important component of project activities. For the Albertine Rift effort, WCS outsourced dynamic vegetation modeling and agricultural output modeling to outside academic consultants at the University of Edinburgh and International Livestock Research Institute, respectively. The modeling approach utilized downscaled IPCC General Circulation Model output under different greenhouse gas emissions scenarios as inputs to the Lund-Potsdam-Jena (LPJ) dynamic vegetation model and the Decision Support System for Agrotechnology Transfer (DSSAT) crop yield model; these model outputs were then applied further through spatial modeling.

Environmental and biodiversity monitoring is another central component in both the Albertine Rift and Indian Ocean projects. The Albertine Rift project identified the need to emplace climate and biodiversity monitoring methods and protocols where none presently exist, or are performed without systematic data collection. This has involved the establishment of new monitoring networks for climate (by installing automatic weather stations within key protected areas), vegetation (plots across ecotones, phenological monitoring and long-term ecological monitoring GLORIA sites; <http://www.gloria.ac.at>) and climatically sensitive species (amphibians and chameleons).

To test management solutions in a variety of contexts, WCS is **developing and improving a coral reef ecosystem fisheries simulation modeling tool** that examines the consequences of management actions. The tool will be used to run potential scenarios of coral reef management options, including various restrictions on levels of effort, types of gear, and species selection that will have the greatest benefits to people while minimizing detrimental or irreversible impacts to the coral reef ecosystem and fisheries. Based on these results, WCS work will map the most effective management responses for climate adaptation and will overlay this with the maps of coral reef vulnerability. Then, these factors can be combined and used to develop a set of priorities for management across the tropical coral reefs of the world. These outputs will be released in a working toolkit to assist in the development of site-based adaptation strategies for the Western Indian Ocean, Coral Triangle and Caribbean.

IV. WWF

WWF utilizes several adaptation tools and approaches in their programs. Select examples of useful tools/good practices include the following listed below, which were also discussed under the “Recent Adaptation highlights” sections previously.

- *Climascope*: Climascope is a web portal for obtaining downscaled Global Climate Model (GCM) output (similar to Climate Wizard). Products available include projections of potential future local/regional climate changes and impacts for a range of emission scenarios and socioeconomic futures.
- *The Wallace Initiative*: The Wallace Initiative links downscaled climate projections to Maxent based bioclimatic modeling. Globally the initiative has 50,000 species in its database, including 50 major crop types and 1,000 commercial marine species. It is currently being utilized to identify potential refugia for wild crop types and eco-crops, terrestrial species, and selected commercially important marine species, and to aid in the design of protected areas. It is also being used to identify areas of concern, which are particularly vulnerable to climate change.

- *Climate Vulnerability and Capacity Assessment (CVCA)*: WWF is partnering with CARE in SCAPES landscapes and beyond to apply their Climate Vulnerability and Capacity Assessment (CVCA) tool to assess community vulnerability. Working with CARE brings local voices and concerns to higher levels and integrates ecosystem aspects into community based adaptation to reduce the risk of maladaptation.
- *Shifting Course: Adaptation for Water Management Institutions* report – This study includes a set of principles for climate-adaptive institutions along with five case studies that feature different institutional responses to climate change and related challenges.

CHAPTER THREE: COMMON CHALLENGES

CHALLENGE ONE: ACCURATE BASELINE INFORMATION LACKING

- Accurate local climate predictions for specific sites are little known and often contradictory.
- Site-specific climate change vulnerability assessments are generally not available for conservation sites in Africa.

Solution: More collaborative work needs to be prioritized for collecting baseline information and setting up effective ways to monitor change. Linking across projects and sharing information (and possibly funding) can help achieve a greater spread to baseline information. Greater information flow can also crosscheck quality of data.

WCS and AWF in their respective work in the Albertine Rift are among the few organizations actively establishing monitoring stations to collect information on both climate variables and the response of species. BirdLife's Important Bird Area monitoring work is also helping to detect trends in the response of species to climate change.

CHALLENGE TWO: INTERPRETATION OF MODELS / INFORMATION

- Selection and weighting of identified drivers of change in model simulations (for ex. the modeling component of the WWF Mangrove project—is it sea-level rise? Changed precipitation? Increase in air temperature?)
- How to interpret and use modeling products for conservation.

Solution: Adaptation planning often has to be flexible enough to take account of general, rather than specific change. Although this presents a real challenge, building resilience to a range of sometimes unspecified change is absolutely crucial. To help interpret these somewhat complex drivers of change, conservation groups have experimented with scenario-building exercises. These exercises can be conducted with a variety of stakeholders in specific setting to explore different combinations of drivers and propose responses to climate change. Modeled outputs will likely be highly divergent. As such, expert consultation for evaluating which model outputs might be more plausible than others is critically important.¹³

CHALLENGE THREE: IMPLEMENTATION GAP

Many adaptation projects complete vulnerability assessments that serve to identify problems early on. The challenge lies in taking the output of the assessments to try to address implementation gaps.

Solution: Projects can forge strong partnerships with key local stakeholders and work jointly to deliver necessary actions identified in assessments.

¹³ Seimon, A., et. al, 2011: ABCG Climate Change Adaptation Re Seimon, A., et. al. 2011. A Review of Climate Change Adaptation Initiatives within the Africa Biodiversity Collaborative Group Members.

CHAPTER FOUR: BRINGING TOGETHER THE LESSONS

COMMONLY IDENTIFIED LESSONS

- ✓ Focus on local solutions and local ownership of the process by keeping local stakeholders fully engaged.
- ✓ Integrate women, youth, indigenous peoples and marginalized groups fully into planning and implementation, recognizing the differential impacts of and responses to climate change on different social groups.
- ✓ Use the best available knowledge (scientific and indigenous) to inform decisions in a structured and transparent manner,
- ✓ Use results to guide improved practice (adaptive management) and engage stakeholders in participatory learning processes that inform future activities.
- ✓ Recognize that vulnerabilities are often exacerbated and even caused by weak or ineffective socio-economic and governance systems.
- ✓ Emphasize knowledge of climatological baselines and variability as a fundamental component of efforts to anticipate the impacts of predicted climatic changes upon humanity, ecosystems and biodiversity.
- ✓ Concentrate on building resilience to more general, rather than specific, change.
- ✓ Utilize numerical modeling of environmental conditions of the recent past and future as an important component of project activities.
- ✓ Invest in environmental and biodiversity monitoring as another central component.
- ✓ Leverage partnerships to implement adaptation solutions.
- ✓ Engage key local stakeholders living in and around sites of biodiversity importance to both understand the day to day implications of current climate change as well as learn from the adaptive strategies already being undertaken by these groups.

DIRECTION MOVING FORWARD

Knowing a site's environmental exposure, ecological susceptibility and social adaptive capacity allows resource managers to recommend specific adaptation strategies. The impacts of climate change on the ecosystem will be determined by the exposure and susceptibility and, in the case of coral reefs, climate-induced bleaching, coral mortality and consequent effects on fish and fisheries. Social adaptive capacity reflects a society's potential to cope or not with environmental and other perturbations. Societies can either falter or fail when they lack appropriate adaptive capacity or they can take advantage of new opportunities, whether due to climate impacts, conservation interventions, or other changes to the socio-ecological system. Each of the three factors are influenced by multiple and highly complex natural and social variables, making it difficult for managers to make informed decisions and understand the full ramifications of the

choices they make without this information. This approach is expected to reduce the trial and error approach and lead to successful adaptation sooner and more often.

Identifying where sites lie within the context of these variables and how these human and natural ecosystems depend on each other will provide decision-makers with more powerful tools for making scientifically sound natural resource management decisions in the face of climate change. Depending on the relative vulnerability of a site, appropriate conservation actions will require some combination of: (1) large-scale protection of ecosystems; (2) actively transforming and adapting socio-ecological systems; (3) building the capacity of communities to cope with change; and (4) government assistance focused on de-coupling communities from dependence on natural resources. All of these may be required but the priorities will differ based on the social-ecological context.

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SOURCES FOR MORE INFORMATION

Adaptive Institutions Program

www.adaptiveinstitutions.org

Climate Adaptation Guides

www.panda.org/standards/climate_adaptation and
www.panda.org/standards/climate_adaptation_abridged

Climate Prep Blog

www.climateprep.org

WWF website – Adaptation

www.worldwildlife.org/climate/adapting-to-climate-change

Adaptation toolkits

CRISTAL The Community-based Risk Screening Tool – Adaptation and Livelihoods. This is designed to help project planners and managers integrate climate change adaptation and risk reduction into community-level projects. <http://www.iisd.org/cristaltool/>

Monitoring and Evaluation of adaptation

AdaptME toolkit: <http://www.ukcip.org.uk/adaptme-toolkit/>

SCR Learning to ADAPT: M&E approaches in climate change adaptation:
<http://community.eldis.org/.5a093c0d>

WRI report on M&E of adaptation *Making Adaptation Count: Concepts and Options for Monitoring and Evaluation of Climate Change Adaptation* <http://www.wri.org/publication/making-adaptation-count>

Role of ecosystem services in adaptation

CBD AHTEG Report: *Connecting Biodiversity and Climate Change Mitigation and Adaptation:* Good one stop shop on role of ecosystem services in adaptation and includes examples on building resilience of biodiversity to climate impacts: <http://www.cbd.int/doc/publications/cbd-ts-41-en.pdf>

ANNEX A: SURVEY

SCAPES partners were surveyed in November 2011 to collect inputs related to the their respective organization's work in the area of climate change adaptation. A list of survey questions follows.

BACKGROUND AND SCOPE OF ADAPTATION WORK:

1. How does your organization's work link to adaptation?
 - What are the viewpoints on linkages and strategies overall to address climate change?
 - How/when has adaptation been integrated into your organization's work? (Have things changed over time?)
 - Please provide key examples (as many as you like) of adaptation projects, initiatives, etc. with details on the timeframe, purpose, partners, and outcomes (if available)

USFUL TOOLS AND GOOD PRACTICES/STORIES:

2. Please indicate which adaptation strategies, projects, initiatives, tools, etc. (that were listed above) you would consider "success stories."
 - What makes them successful for adaptation?
 - Have you been able to document best practices and shape future programming based on these initiatives?
 - How did partnerships contribute to the success?

CHALLENGES:

3. Please list any overall challenges--or initiative-specific challenges-- experienced through your organization's adaptation work.
 - Any solutions already identified?