

Conservation planning for a widespread, threatened species: WWF and the African elephant *Loxodonta africana*

PETER J. STEPHENSON and YAA NTIAMOA-BAIDU

Abstract In a case study of conservation planning by a conservation organization working at a continental scale we examine how WWF identified and prioritized its African elephant *Loxodonta africana* conservation activities. We (1) review lessons learnt from previous work, (2) identify priority landscapes using biological criteria (e.g. population size and viability) and institutional criteria (e.g. feasibility, sustainability and cost-effectiveness of WWF interventions), and (3) conduct a threat analysis and review of national and subregional action plans. We suggest that species action plans should use priority-setting criteria that focus on conserving the largest and most viable populations at the subspecies level. Clear definition of geographical priorities helps an organization focus its resources and assists monitoring. Species action plans should also take account of plans developed by governments and other stakeholders. Conservation agencies wishing to select which landscapes to invest in for a given species or subspecies could then consider institutional prioritization criteria, such as those used by WWF for the African elephant. This would allow them to invest pragmatically in conservation that has a higher chance of success than work planned solely through scientific analysis. Ultimately, however, no species action plan will succeed unless it has the resources necessary for implementation and the key stakeholders work together in partnership.

Keywords African elephant, conservation organizations, flagship species, *Loxodonta africana*, priority setting, WWF

Introduction

The range of the African elephant *Loxodonta africana* has been declining for hundreds of years and elephants now have less room to live in than at any previous time (Parker & Graham, 1989; Stephenson, 2004). Nonetheless, the species occurs in 37 African states and the total continental population numbers at least 472,000 individuals, and is probably nearer 555,000 (Blanc et al., 2007). Some

African elephant populations are small, isolated and in danger of extirpation but others are growing (Blanc et al., 2005, 2007). Such a widespread continental species, with populations varying in size and viability, poses a dilemma: where should conservationists' efforts for the species be focused? This reflects a broader necessity for the conservation community to decide how best to distribute limited resources (Wilson et al., 2007).

WWF is one of the largest conservation organizations and invests more in Africa than any other non-governmental conservation organization (Scholfield & Brockington, 2008). The African elephant is one of the organization's flagship species and WWF has supported elephant conservation since the organization was established in 1961.

To develop a strong, coherent and focused programme in Africa in light of the ongoing threats to elephants and the issues discussed at African elephant range states' dialogues, WWF developed a continent-wide conservation strategy for the species. The WWF African Elephant Programme was thus established in 2000 and the programme document (WWF, 2001) represented the action plan for the first phase (2000–2006). The plan defined four objectives, focusing on protection and management, capacity building within range states, human–elephant conflict mitigation and reducing illegal trade. Many of the outputs of the first plan were realized but, in 2006, after a programme review, it was decided that the next 5-year plan needed to be more focused, with both geographical and threat-based priorities. WWF therefore undertook a priority-setting exercise to identify how it could focus its investments in African elephant conservation for 2007–2011.

Although there have been previous attempts to prioritize elephant conservation across Africa (Cumming et al., 1990; Thouless, 1999) the WWF species action plan is one of the first comprehensive planning exercises by a large conservation agency on a widespread threatened species. The WWF plan differs from other action plans as it does not outline all actions necessary to conserve elephants but instead focuses on what WWF's specific contributions to elephant conservation will be. As examining threats alone would make it difficult to identify clearly WWF's priorities for such a widespread species, the plan took into account institutional as well as biological factors.

Here we present a case study in conservation planning by a conservation agency working at a continental scale. We examine how WWF identified and prioritized its African

PETER J. STEPHENSON (Corresponding author) and YAA NTIAMOA-BAIDU*
WWF International, Avenue du Mont Blanc, CH-1196 Gland, Switzerland.
E-mail pjstephenson@wwfint.org

*Current address: Centre for African Wetlands, University of Ghana, Legon, Accra, Ghana

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elephant conservation activities to focus finite resources, and review the strengths and weaknesses of the process. We conclude by discussing the applicability of this planning approach to other flagship species and potential lessons for other conservation agencies facing similar dilemmas.

Methods for priority setting

To identify the key elements of its action plan for African elephants, WWF used three main methods to provide the focus for its goals, objectives and activities: (1) building on lessons learnt from previous conservation efforts for elephants, (2) assessing elephant populations against biological and institutional criteria, and (3) an analysis of threats, including a review of national and regional elephant action plans.

Building on lessons learnt

In 2005 WWF reviewed the implementation of its first African elephant plan (WWF, 2001) to assess progress and to identify constraints and areas for improvement. This represents one of the few reviews of a species action plan (see below). The review team conducted an assessment of reports and other documentation, held key informant interviews and conducted questionnaire surveys and field visits. This external evaluation (Environment & Development Group, 2006) identified a number of lessons and recommendations pertinent for development of the next WWF action plan.

Assessing populations against biological and institutional criteria

Most subregional and national elephant management strategies (see below) have taken a threat-based approach to planning and do not consider landscape or population priorities. Therefore, to take account of the multitude of factors affecting choice of populations, sites and activities for conservation, WWF developed a set of criteria that took account of biological and institutional/political elements (Table 1). The biological criteria included threats and population levels. The institutional and political criteria assessed the feasibility and sustainability of actions, their potential conservation impacts and catalytic role, synergies with other WWF strategic priorities, the potential use of elephants as flagship species and return on investment.

Potential landscapes for consideration were identified from the African Elephant Database (Blanc et al., 2007) based on: subregional importance (for elephant populations and broader biodiversity) and representation, known conservation needs, range state management plans, and WWF's strategic interests and priorities. Emphasis was also placed on identifying landscapes that protect historically isolated lineages (or evolutionarily significant units) because these

cannot be recovered, and conservation of heterogeneous landscapes and viable populations (Moritz, 2002).

Two sets of prioritization criteria were identified: Criteria A determined whether or not a landscape would be considered, and Criteria B assessed the relative importance of a given landscape (Table 1). Each potential landscape was first subjected to six Criteria A questions. If the landscape received no to any question, the landscape was rejected. For example, the Comoé landscape in west Africa was rejected because the political and social climate was not suitable for conservation, WWF was not planning to operate there in the next 2–5 years and WWF did not have the capacity to implement work in the landscape. Had there been only one elephant population left in West Africa or in any other subregion, WWF would have needed to act regardless of the existing socio-political situation and whether or not it already had a presence in country because the conservation issues alone would have dictated its priority.

Each landscape that passed the Criteria A questions was scored against 14 Criteria B questions (Table 1). The answer to each question was a score of 0, 1 or 2 in ascending order of relevance; this figure was then multiplied by the relative weighting of the question (1, 2 or 3) to provide a total score for each landscape. If some landscapes had equal scores, priority was given to, firstly, the landscape with the highest score before the weighting system was applied and, secondly (if still equal), the landscape with the largest elephant population. For example, in Central Africa, the TRIDOM and Sangha landscapes scored 26 points on the Criteria B questions. The weighted scores were both 55 and thus TRIDOM was ranked first as it had a larger elephant population. In such instances the larger population is usually in the larger landscape. Size of landscape may affect certain prioritization scores and thus the choice of landscape boundaries may influence the analysis. Subdividing landscapes for this analysis would have been difficult without more information on herd movements and threats. However, when conservation projects are established the landscapes can be demarcated into smaller geographical units if necessary to take account of locally identified conservation needs.

Overall, therefore, WWF took a combination of scientific and pragmatic approaches to identifying priority elephant populations. The prioritization process favoured large, threatened elephant populations in large landscapes in range states where WWF was well established, had active partnerships with stakeholders and was able to deliver conservation more effectively with greater cost-efficiency.

Analysing threats and identifying synergies with other action plans

From a literature review and from input received from field project staff WWF conducted an analysis to identify threats to elephants and the root causes or drivers of those threats.

TABLE 1 Summary of WWF African elephant *Loxodonta africana* landscape assessment criteria. A landscape is considered to be an area of land in elephant range that is currently inhabited by an interconnected population of elephants.

Criterion	Assessment question(s)
Category A Used to decide if a landscape would be considered or not. An answer of no to any of the questions rules out the landscape for consideration	
A1 <i>Identified threat</i> WWF will only act to address a specific identified threat or management issue affecting an elephant population. Threats to be addressed include habitat loss or deterioration, poaching & human–elephant conflict. Issues include community-based natural resource management & policy development.	Is there an identified threat or management issue facing this elephant population that WWF would be able to help address?
A2 <i>Population viability</i> Support will only be provided to elephant populations considered viable (i.e. likely to survive in the landscape for at least three generations if the major threats are reduced or removed). Conservation will not be supported for elephant populations considered too small or too unstable to be viable nor for those that occur in habitats not expected to survive even with conservation efforts (e.g. because of planned logging).	Is the elephant population in the landscape viable for the long term (at least three elephant generations) if the main threats are reduced or removed? Are conservation measures likely to ensure the survival of adequate elephant habitat in the landscape?
A3 <i>Feasibility & sustainability</i> Interventions will not be supported if they are deemed infeasible, unsustainable or where the political & social climate means conservation action is unlikely to be successful. The political & social climate will be gauged as unfavourable if there has been, for example, ongoing civil conflict or strife that has rendered conservation projects unviable. The political climate is also measured by the broader wildlife & environment policy arena (see B2).	Is the political & social climate suitable for conservation in this landscape? Does WWF operate in this landscape or plan to operate in this landscape in the next 2–5 years? Does WWF have the capacity to implement elephant conservation in the landscape?
Category B The following criteria & assessment questions are used to decide the relative importance of a given landscape to WWF. The relative weighting of each question is in parentheses	
B1 <i>Population size, range & representativeness</i> For a given subregion, biome or ecoregion, larger elephant populations will generally be given priority over smaller populations. Adequate range must be available, with core areas of suitable elephant habitat. The African Elephant Programme (AEP) will aim to conserve representative populations of each subspecies (forest & savannah elephants) & populations in representative habitat types (forest, woodland, savannah, desert) in all four subregions (Central, East, Southern & West Africa). This approach aims to ensure that the genetic & behavioural diversity within elephant populations is conserved & they maintain their keystone role in representative habitats across the continent.	Is the population an appropriate size for the intervention? (i.e. is the population large enough to make an intervention worthwhile?) (3) Is adequate range & habitat available or potentially available following habitat restoration or range expansion? (3) Is the population ecologically, geographically or taxonomically significant for the subspecies or its habitat? (3)
B2 <i>Conservation impact</i> AEP interventions must have a high likelihood of producing conservation impact. Factors used to determine potential impact are sustainability, demonstrated political will of the relevant national government(s), & the strength of the existing or planned WWF capacity to deliver. Sustainability issues are crucial; it must be clear that conservation in a given landscape will have a chance of having an impact, through ongoing work by partners, which will last beyond the life of the intervention. Political will can be demonstrated by a government's willingness to engage in partnership with WWF, the national policy environment (including presence of appropriate elephant management strategies), the country's history of signing, ratifying & implementing key international conventions & the level of investment in wildlife conservation. WWF capacity relates to issues such as WWF's presence (e.g. projects, offices, staff) & available technical expertise within the network. WWF will not work at sites where other agencies & NGOs are coping with the threats & where WWF would not add any extra value. At the same time as considering these factors, creativity & innovation will be fostered as WWF strives for new strategic solutions to long-standing problems (see below).	How strong is the political will to conserve the landscape? (1) Does WWF have strong capacity to operate (ourselves or through partners) & support elephant conservation in this landscape (because of its current or expected presence)? (3) Is WWF's involvement necessary to conserve elephants in the landscape (i.e. will we add value)? (1) Are appropriate partnerships with NGOs &/or government agencies &/or local people likely to develop or expand in this landscape? (2) Overall, is WWF liable to make a conservation impact on elephants in this landscape, i.e. can threats to elephants be reduced or removed? (3)

TABLE 1 (Continued)

Criterion	Assessment question(s)
B3 <i>Synergies with priority ecoregions & other WWF strategic priorities</i> Priority will be given to landscapes that overlap with WWF's identified priorities for habitat conservation (especially forests but also freshwater) & other priority or flagship species groups, such as African great apes or African rhinos. In this way, the project will have more impact by addressing several WWF conservation targets for a given investment of funds.	Is the landscape also important for WWF biome priorities? (2) Is there an overlap with WWF priorities for other priority species? (2)
B4 <i>Elephants as flagship species</i> Interventions will be favoured in landscapes where there is strong potential to maximize the use of the elephant as a potential flagship species in terms of providing opportunities for communication, education, awareness & fundraising, & having a knock-on effect of helping conserve other species.	Is the elephant a suitable flagship species for broader conservation issues in the landscape? (2) Will other species of fauna & flora benefit from the project? (1)
B5 <i>Innovation & catalytic role</i> WWF encourages innovative programmes that test new approaches to elephant conservation & can act as models that provide lessons for other programmes. They should produce a multiplier effect wherever possible, leveraging further support from other agencies. This can be demonstrated through the intervention's role in generating action, policy & partnerships at all levels.	Is WWF's work in this landscape likely to have a multiplier effect, leveraging further support or other initiatives? (1)
B6 <i>Cost-benefit assessment</i> Any WWF intervention must maximize the conservation impact for the given budget & provide value for money. If the elephant conservation required in a landscape is going to be very expensive for relatively small impact, it should not be supported. Issues of scale & logistical feasibility will be relevant in this assessment.	Is WWF support for elephant conservation in this landscape likely to be cost effective? (2)

These formed the basis of the action plan's objectives and key activities within priority populations. The structure of the objectives, and the activities developed to address them, also took into account elephant management strategies developed at the subregional (IUCN, 2003, 2005) and national level (Wildlife Division, 2000; Ministère des Eaux et Forêts, 2004; Ministère de l'Agriculture, de l'Élevage et de la Pêche, 2005), thus ensuring that WWF's work reflected the identified priorities of the stakeholders in the range states.

Results

Lessons from the implementation of WWF's first elephant action plan that were pertinent for development of the 2007–2011 plan (EDG, 2006) included: (1) Targeted interventions clustered in the same geographical area are more effective than working towards the same range of objectives in several different places. (2) The approach of working closely with partner programmes and organizations possessing specialist and complementary expertise and skills should be continued and strengthened. (3) Concentration on WWF's proven strengths (e.g. protected area management, human–elephant conflict mitigation) and on key ongoing and emerging threats should continue. (4) Increased emphasis is required on managed elephant range, seeking coexistence between people and elephants and the ecosystems and biodiversity they share.

Thirty-three elephant landscapes were scored against WWF's Category A prioritization criteria and 26 were then

ranked against Category B criteria. The top five ranked landscapes in each subregion were selected as the focus of WWF's future elephant conservation (Table 2, Fig. 2). These 20 priority landscapes encompass 24 range states and 10 landscapes are transboundary.

The main direct threats to African elephants were identified as poaching for ivory and meat, loss of habitat (including habitat degradation and fragmentation) and human–elephant conflict (Fig. 1; see Stephenson, 2007, for a more thorough discussion of threats). Drivers of illegal killing of elephants include the demand for ivory. This demand often comes from outside elephant range states; many countries without elephants or with few elephants are implicated in the illegal ivory trade (Courouble et al., 2003). The planning exercise therefore established that to tackle the illegal ivory trade additional work beyond priority landscapes needs to be supported. WWF decided this work should be conducted in African and Asian countries identified as priority markets by the Elephant Trade Information System (Milliken et al., 2004).

From the priority-setting exercise WWF developed a vision, a goal and a set of hierarchical objectives (Table 3) that formed the basis of its species action plan for 2007–2011 (Stephenson, 2007). The plan also presents key activities under each objective, and indicators for measuring progress. The aim is for the plan to guide teams working in the region to develop projects with local stakeholders, using consultative and spatial planning methodologies (Conservation Measures Partnership, 2007;

TABLE 2 WWF priority landscapes for African elephant conservation (numbers refer to locations in Fig. 2), by subregion, with examples of proposed or required conservation activities. Many other elephant populations merit conservation action; this list reflects the areas where WWF will primarily invest its resources in elephant conservation in 2007–2011. Boundaries of priority landscapes will be considered labile until they can be finalized with input from partners and other stakeholders.

Rank	Priority landscapes (range states)	Proposed or required conservation activities
West Africa		
1	1, Tai–Grebo (Côte d'Ivoire, Liberia)	Policy, law enforcement, MIKE (monitoring the illegal killing of elephants), awareness, protected area management, habitat protection
2	2, Park W–Eastern Burkina Reserves–Pendjari Park–northern Togo Reserves (Burkina Faso, Benin, Niger, Togo)	Policy, habitat protection, HEC (human–elephant conflict) mitigation, anti-poaching, monitoring
3	3, Nazinga–Kabore Tambi National Park–Red Volta–Doungh (Burkina Faso, Ghana, Togo)	Policy, HEC mitigation, habitat protection & sustainable forest management, awareness, protected area management
4	4, Gourma–Sahel (Mali, Burkina Faso)	Policy, HEC mitigation, CBNRM (community-based natural resource management), protection, awareness
5	5, Bia–Goaso–Djambarakrou (Ghana, Côte d'Ivoire)	Policy, habitat protection & management, HEC mitigation, law enforcement, monitoring, sustainable agriculture
Central Africa		
1	6, Trinationnal Park of Dja, Odzala, Minkebe (Cameroon, Republic of Congo, Gabon)	MIKE, HEC mitigation, corridor management, protected area/transfrontier conservation areas (TFCA) management, law enforcement, mitigating impacts of mining development
2	7, Sangha Trinationnal (Cameroon, Central African Republic, Republic of Congo)	MIKE, monitoring & data management, HEC mitigation, corridor management, protected area/TFCA management, law enforcement
3	8, Gamba complex (Gabon)	Monitoring, HEC mitigation, law enforcement, mitigation of oil & gas impacts
4	9, Salonga (Democratic Republic of Congo)	MIKE, HEC mitigation, corridor management, protected area management, diversifying community income-generating activities, law enforcement (stopping military poaching)
5	10, Maiko–Kahuzi–Biega (Democratic Republic of Congo)	MIKE, HEC mitigation, corridor management, protected area management
East Africa		
1	11, Selous (Tanzania)	HEC mitigation, monitoring, MIKE, law enforcement, wildlife management area development
2	12, Mara–Serengeti (Kenya, Tanzania)	HEC mitigation, protected area & corridor management
3	13, Ruaha–Rungwa (Tanzania)	Protected area management, law enforcement
4	14, Tarangire–Lake Manyara (Tanzania)	HEC mitigation, corridor management
5	15, Shimba Hills (Kenya)	HEC mitigation, local overpopulation, community development/conservation
Southern Africa		
1	16, Northern Mozambique (Mozambique)	Policy, capacity building, HEC mitigation, law enforcement, awareness raising, sustainable agriculture, corridor management
2	17, North-west Namibia (Namibia)	Monitoring, HEC mitigation, CBNRM
3	18, Kavango–Zambezi (Angola, Namibia, Botswana, Zimbabwe, Zambia)	Complement TFCA work to expand elephant range, protected area management, HEC mitigation
4	19, Luangwa Valley (Zambia)	HEC mitigation, CBNRM, protected area management
5	20, Greater Limpopo (South Africa, Zimbabwe, Mozambique)	TFCA management

Henson et al., 2009; Morrison et al., 2009) to address specific issues within each priority landscape.

Discussion

African elephant conservation

The main issues and threats identified by this planning exercise are similar to those identified in earlier assessments

(Cumming et al., 1990; WWF, 1997; Thouless, 1999), suggesting that the drivers of habitat loss, illegal hunting and trade in elephant products have not been tackled adequately in the past 2 decades. However, mitigating human–elephant conflict and dealing with the sensitive issue of local overpopulation appear to be gaining increasing importance. It is also now imperative to develop conservation strategies that take into account subregional differences in elephant status and threats to elephants and

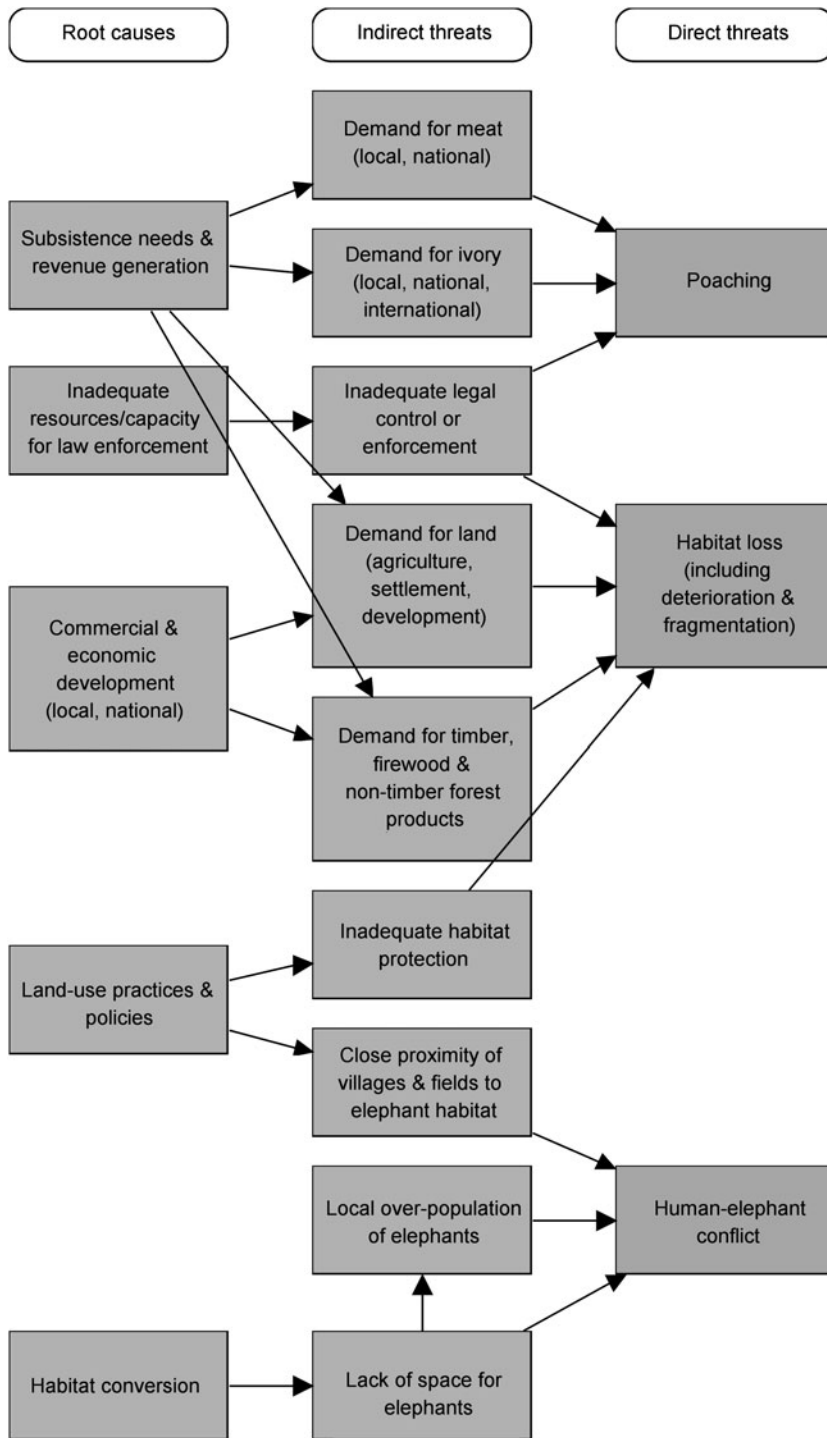


FIG. 1 Root cause analysis: threats and indirect threats facing African elephants *Loxodonta africana*. In addition to the threats and root causes indicated, climate change is both an indirect threat to elephant habitat and a driver of habitat conversion and land-use policies and practices.

apply approaches and methods best suited to the local context.

Emerging issues to take into account include taxonomic differences and climate change. Questions about genetic diversity and taxonomy within the African elephant (Eggert et al., 2002) need to be resolved because failure to recognize genetic diversity when considering conservation action may lead to inadvertent loss of diversity (Garner et al., 2005). This is why the WWF African elephant species action plan targets pop-

ulations in all African subregions to maintain both savannah and forest subspecies and to conserve genetic diversity in the continental population. The potential impacts of climate change mean we can no longer assume that all of a species' historical range remains suitable (Hannah et al., 2002); many protected areas may not be able to fulfil the conservation objectives they were established to address (Mansourian et al., 2009). The WWF African elephant plan advocates vulnerability assessments for elephant populations and the development

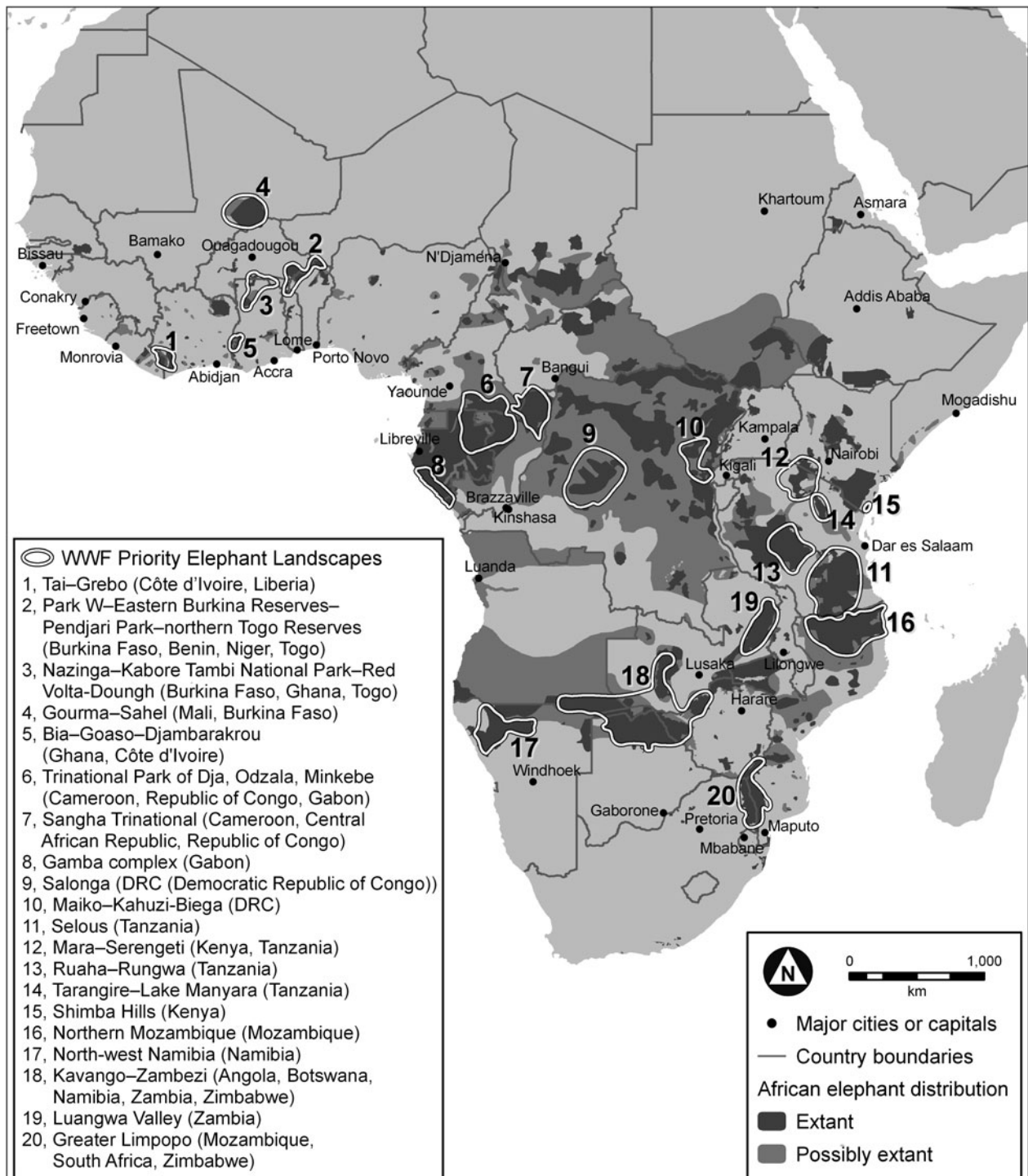


FIG. 2 WWF’s priority African elephant landscapes. For details of the 20 numbered areas, see Table 2. African elephant distribution data from IUCN (2008). Map courtesy of Charles Huang, Conservation Science Programme, WWF-US.

and implementation of climate change adaptation strategies for elephant landscapes identified as being at high risk.

Approaches used in species action plans

A range of mechanisms, criteria, models and tools have been proposed to help set priorities for biodiversity conservation

based on, for example, level of threat (Mace, 1995), centres of diversity and endemism (Olson & Dinerstein, 1998), phylogenetic uniqueness (Isaac et al., 2007) and return on investment (Murdoch et al., 2007; Underwood et al., 2008). Most priority-setting models are aimed at choosing which species and places to invest in; few lend themselves easily to prioritizing conservation for a single species. Some of the

TABLE 3 Vision, goal and objective of WWF's species action plan for African elephants for 2007–2011. Each objective is grouped under a Category of Objective; these are standard for all WWF species action plans. By showing how work on each objective for elephants relates to these higher level objectives, it helps WWF roll up results from its field programmes on all flagship species to demonstrate its global impact.

Vision In 25 years' time, forest & savannah elephants continue to roam across Africa in landscapes where people and wildlife flourish alongside each other

Goal By 2017 elephant populations & their habitat cover are stable or increasing in 20 landscapes

Category of Objective 1 To further relevant policy & legislation in all sectors & at all levels

Objective 1.1 Development & application of policies & legislation that create an enabling environment for elephant conservation facilitated in 13 range states by 2011

Target range states Burkina Faso, Cameroon, CAR (Central African Republic), Congo, Côte d'Ivoire, DRC (Democratic Republic of Congo), Gabon, Kenya, Mozambique, South Africa, Tanzania, Zambia, Zimbabwe

Category of Objective 2 To ensure the necessary extent, integrity & functioning of critical habitats (quantity, quality, management)

Objective 2.1 Elephant habitat effectively conserved to increase range & enhance connectivity between populations (including transboundary populations) in 14 landscapes by 2011

Target landscapes Trinational Park of Dja, Odzala, Minkebe, Sangha, Gamba, Salonga, Maiko, Selous, Mara, Ruaha, N Mozambique, Kavango-Zambezi, Greater Limpopo, Tai, Park W, Nazinga

Category of Objective 3 To ensure adequate protection & biological management of populations

Objective 3.1 Illegal killing of elephants reduced by at least 30% in 12 landscapes by 2011

Target landscapes Trinational Park of Dja, Odzala, Minkebe, Sangha, Gamba, Salonga, Maiko, Selous, Ruaha, N Mozambique, Luangwa, Tai, Park W, Nazinga

Objective 3.2 Illegal trade in major elephant product markets reduced by at least 50% in nine African states & two Asian states by 2011

Target states Angola, Cameroon, CAR, China, Côte d'Ivoire, DRC, Japan, Mozambique, Nigeria, Senegal, Sudan

Category of Objective 4 To generate mutually beneficial incentives for the coexistence of people and species

Objective 4.1 Human–elephant conflict reduced by at least 40% in pilot sites in 18 landscapes by 2011

Target landscapes Trinational Park of Dja, Odzala, Minkebe, Sangha, Gamba, Selous, Mara, Ruaha, Tarangire, Shimba, N Mozambique, NW Namibia, Kavango-Zambezi, Luangwa, Greater Limpopo, Tai, Park W, Nazinga, Gourma, Bia

Objective 4.2 Livelihoods of people living alongside elephants are improved through economic development activities linked to wildlife conservation in 20 landscapes by 2011

Target landscapes Trinational Park of Dja, Odzala, Minkebe, Sangha, Gamba, Salonga, Maiko, Selous, Mara, Ruaha, Tarangire, Shimba, N Mozambique, NW Namibia, Kavango-Zambezi, Luangwa, Greater Limpopo, Tai, Park W, Nazinga, Gourma, Bia

Category of Objective 5 To create awareness & influence adverse attitudes and behaviour

Objective 5.1 Public support for, & participation in, elephant conservation increased in 20 landscapes by 2011 through increased awareness of policies, laws, options & benefits

Target landscapes Trinational Park of Dja, Odzala, Minkebe, Sangha, Gamba, Salonga, Maiko, Selous, Mara, Ruaha, Tarangire, Shimba, N Mozambique, NW Namibia, Kavango-Zambezi, Luangwa, Greater Limpopo, Tai, Park W, Nazinga, Gourma, Bia

new return on investment models and decision theory approaches (McDonald-Madden et al., 2008; Joseph et al., 2009) could be worth considering for future prioritization across populations, assuming the approaches can be adapted and the cost of conservation across the species range can be assessed.

To conserve viable representative populations of African elephants WWF decided that the most appropriate approach was to consider the largest populations in each subregion, looked at through a filter of where the organization has the strategic interest and capacity to operate. This prioritization method may be relevant to other NGOs considering where to invest their resources. The strength of the approach is that it focuses WWF's effort where it is best placed to conserve populations. The advantages are that it maximizes use of current resources and avoids, as much as possible, the costs of starting up activities in new range states or areas where conservation effort is unlikely to be viable. Return on investment is substantially improved by

incorporating management costs, benefits and likelihood of management success into species planning (Joseph et al., 2009). Although the WWF process did not compare actual values for the cost of working in each landscape, the objective assessment of its capacity to operate provided a pragmatic alternative. However, ultimately there needs to be a suitable balance and trade-off between planning criteria based on long-term goals. For WWF biological importance overrides the cost of conservation as a criterion in priority setting as focusing on those sites that are merely the cheapest to conserve would have favoured smaller, less viable populations.

A potential disadvantage of the WWF planning approach is that there may be key elephant conservation issues to address in places where WWF is not currently active. In some cases it could be more appropriate to identify conservation priorities first and then identify the best means of building up the organization's capacity to work there. However, the fact that WWF is active in many

African countries (21 African elephant range states in 2007) gives the organization the scope to act on the critical conservation problems identified within each subregion.

One of the institutional criteria gave priority to elephant landscapes that overlap with WWF's other habitat and species conservation priorities. This may allow the organization to maximize its broader conservation impact for a given investment. However, there is a risk that a less viable elephant population could be favoured if it occurred in a higher priority habitat or was sympatric with one or more other priority species (e.g. western gorilla *Gorilla gorilla* or black rhino *Diceros bicornis*). This was a strategic decision by WWF that favours broader biodiversity conservation over single-species concerns.

We need to assess if conservationists can, or should, replicate for other species the same priority-setting approach used by WWF for elephants. Ultimately, only a full evaluation at the end of the implementation of the WWF action plan in 2011 and an assessment of its monitoring data will demonstrate if the priority-setting method has worked. In the meantime, we can draw some preliminary conclusions about how it compares with planning approaches used for other species.

The IUCN Species Survival Commission has produced > 60 species action plans since 1987, with > 75% on mammals (Fuller et al., 2003; Kormos, 2008). Most plans address the status and conservation needs of multiple species or higher taxa (Nicoll & Rathbun, 1990; Nowell & Jackson, 1996; Sillero-Zubiri et al., 2004), although some target one or two related species (Emslie & Brooks, 1999; Tutin et al., 2005). Most of the IUCN plans focus on country-by-country planning or on threat-based planning; most have no clear landscape priorities. Where certain populations are identified as more important than others, prioritization criteria are sometimes not clear (East, 1989). Cumming et al. (1990) prioritized African rhino populations using primarily biological criteria (population size, genetic rarity and ecosystem diversity) but a more recent rhino action plan did not specify geographical or population priorities (Emslie & Brooks, 1999). For central chimpanzees *Pan troglodytes troglodytes* and western lowland gorillas *Gorilla gorilla gorilla*, 14 priority areas were identified using three criteria: population size, area of site and the importance of conservation for broader biodiversity values (Tutin et al., 2005). If a conservation agency wanted to choose which of these areas to work in, application of criteria similar to those used by WWF for elephants could be of help.

BirdLife International has produced action plans for individual bird species (Thompson et al., 2004; Shimelis et al., 2005) that follow a standard methodology (Sande et al., 2004); this involves assessing threats, distribution, breeding sites and protected areas and setting out conservation strategies for the target species in all its range states. National-level plans are also advocated. The action plans

are partly aimed as a guide to BirdLife International activities. They do not factor in institutional criteria but they do assign responsibility for action to stakeholders involved in the planning. However, there is little attempt to focus on geographical priorities regardless of how widespread the species are.

There could be a number of reasons why most species action plans avoid examination of geographical priorities:

- For many rare species precise data on distribution and abundance are difficult to obtain, making it difficult to determine the key populations or landscapes
- For species with small populations and/or restricted range there is no need to choose between a limited number of sites
- In planning for widespread species it may be difficult for some stakeholders to be objective; linked to this, singling out some countries as higher priorities than others could have political repercussions, especially if resources will be distributed based on the plan
- Threat-based planning without specifying target places or populations allows more flexibility and perhaps provides more opportunities for, and chances of, success. It also allows more flexibility when dealing with unpredictable political situations and unreliable or unpredictable funding levels.

The problems with not specifying geographical priorities include difficulties in monitoring impact and the risk of spreading resources too thinly across many populations and landscapes.

Implementation of plans

Ultimately the greatest challenge for conservation organizations is to move beyond planning to implementation and to find the necessary resources. 'An action plan that is not, or cannot be, implemented is, at most, an interesting academic exercise and not a real action plan' (Gimenez-Dixon & Stuart, 1993). Of the few plans that have been reviewed there have been mixed and equivocal levels of success; some have had less than half of their proposed actions implemented whereas others have shown more success (Gimenez-Dixon & Stuart, 1993; Species Survival Commission, 2002; Fuller et al., 2003; Kormos, 2008). Species action plans have been criticized for a lack of consistency and for advocating too much research (Species Survival Commission, 2002). There is also the need for more political support and leadership (Kormos, 2008) and greater monitoring and evaluation of conservation programmes (Stem et al., 2005). Plans that are threat-based and do not specify where their actions will be implemented make monitoring harder to conduct.

For conservation to be successful in the 21st century governments and NGOs need to reach out to, and work

with, partners that are beyond their traditional list of stakeholders. Species action plans will continue to rely on scientists to provide the data required for priority setting but effective conservation action needs to involve local people living alongside the species, as well as agriculture, business and industry bodies who can help mitigate key threats and root causes of biodiversity loss. With the African elephant WWF's approach is to consider stakeholder input at the start of planning (through national and subregional planning) and then again at the end, when local stakeholders in each landscape are brought into consultative planning processes to define priorities and roles at a landscape level.

Conclusions

The absence of geographical priority setting in many species action plans and the resultant lack of information on priority sites, landscapes or populations means it is sometimes difficult for conservation agencies to identify priority projects for investment, resulting in resources being spread too thinly and to less effect. It also hinders our ability to monitor the impacts of the plans. Threat-based plans are useful but we advocate the identification of priority populations and their landscapes. Based on our experiences with elephants in Africa, it is appropriate to use priority-setting criteria that focus primarily on conserving the largest and most viable populations at the subspecies level. Additional criteria could consider broader biodiversity values for the species' habitat. All plans should take into account national-level plans developed by governments and other stakeholders. Conservation agencies wishing to select which priority landscapes to invest in for a given species or subspecies could then consider institutional factors, such as those used by WWF for the African elephant, so that they invest in conservation that has a high chance of success. Although return on investment models may be applicable to some species we believe that more pragmatic planning, involving objective assessment of biological as well as institutional and political criteria, is likely to lead to more effective conservation delivery than plans developed solely from a scientific perspective.

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Biographical sketches

PETER J. STEPHENSON is interested in how scientific data are used to plan and monitor conservation programmes. From 2001 to 2007 he coordinated WWF's African Elephant Programme but his species conservation experience ranges from great apes to tenrecs. At WWF he is currently responsible for developing global conservation strategy, planning large-scale conservation programmes and performance monitoring. YAA NTIAMOA-Baidu researches wildlife ecology, with a particular focus on wetlands and waterbirds. From 1998 to 2008 she was the director of the WWF Africa and Madagascar Programme, where she initiated new programmes for African elephants, great apes and bushmeat.