CHAPTER 9
ONGOING DEVELOPMENT OF ELEPHANT MANAGEMENT PLANS FOR SOUTH AFRICAN NATIONAL PARKS

SANParks has explicitly chosen an adaptive management approach to managing ecosystems within South Africa's national parks. Elephant management is but one component of a broader ecosystem management process that focuses on maintaining ecological processes, flux and diversity. A locally derived form of Adaptive Management termed Strategic Adaptive Management (SAM)[38] has been developed through an interactive 'action research' process with national and provincial conservation agencies. The various locations and management challenges that SAM has been applied to, not least of all the last 12 years of ecosystem management planning in KNP, have refined and improved its component principles and processes, and exposed a wide range of people to its concepts. SAM has also been accepted by DEAT as the basis for management of all National Protected Areas[39].

The Strategic Adaptive Management cycle

The SAM cycle (Figure 7) begins with the definition of a desired future state based on stakeholder values and incorporating the inputs of science, management and society. A broad vision for the long-term future of a Park is gradually broken down into achievable ecological outcomes. This state must reflect the flux of nature by maintaining or restoring natural variation and patchiness, and in so doing, conserve biodiversity. Potential impacts of elephants are considered in the management process as one set of factors that can help or hinder the achievement of this desired state.

Management actions are considered and evaluated on the basis of their ability to achieve the desired state, their potential to generate learning, and the acceptability of their consequences to stakeholders. A management plan is designed to include both implementation of interventions and ongoing monitoring of ecosystem response to management and natural events. The results of monitoring are used to evaluate the success of management actions. A process of careful review and reflection strives to incorporate the learning from previous management actions and outcomes into the next round of management planning. This can also involve changes to the objectives representing the desired state.

It is now recognised that to conserve biodiversity we cannot aim to achieve specific and unchanging ecosystem conditions, but rather to maintain natural variation and processes. But some changes may be undesirable if they form part of a long-term trend moving the ecosystem away from the desired state. Over time this trend may become irreversible. Within the SAM process the desired outcomes of management are therefore expressed as limits of acceptable change termed Thresholds of Potential Concern (TPCs) – the upper and lower levels along a continuum of change in selected indicators. TPCs act as 'red flags' to alert managers to changes in ecosystem properties that may be cause for concern. If TPCs are exceeded it is likely that the desired state will not be maintained or will not be able to be achieved into the future. When a TPC is breached – or modelling predicts that it will be breached – it prompts managers to

investigate the cause, and then to decide on this basis whether management action is needed to moderate this change (Figure 8). TPCs are set based on the best available knowledge and expert opinion at the time, which is used to develop hypotheses of acceptable change in ecosystem structure, function and composition. As hypotheses TPCs are open to challenge – the management and monitoring process, as well as independent research, will over time enable us to update the knowledge on which TPCs are based.

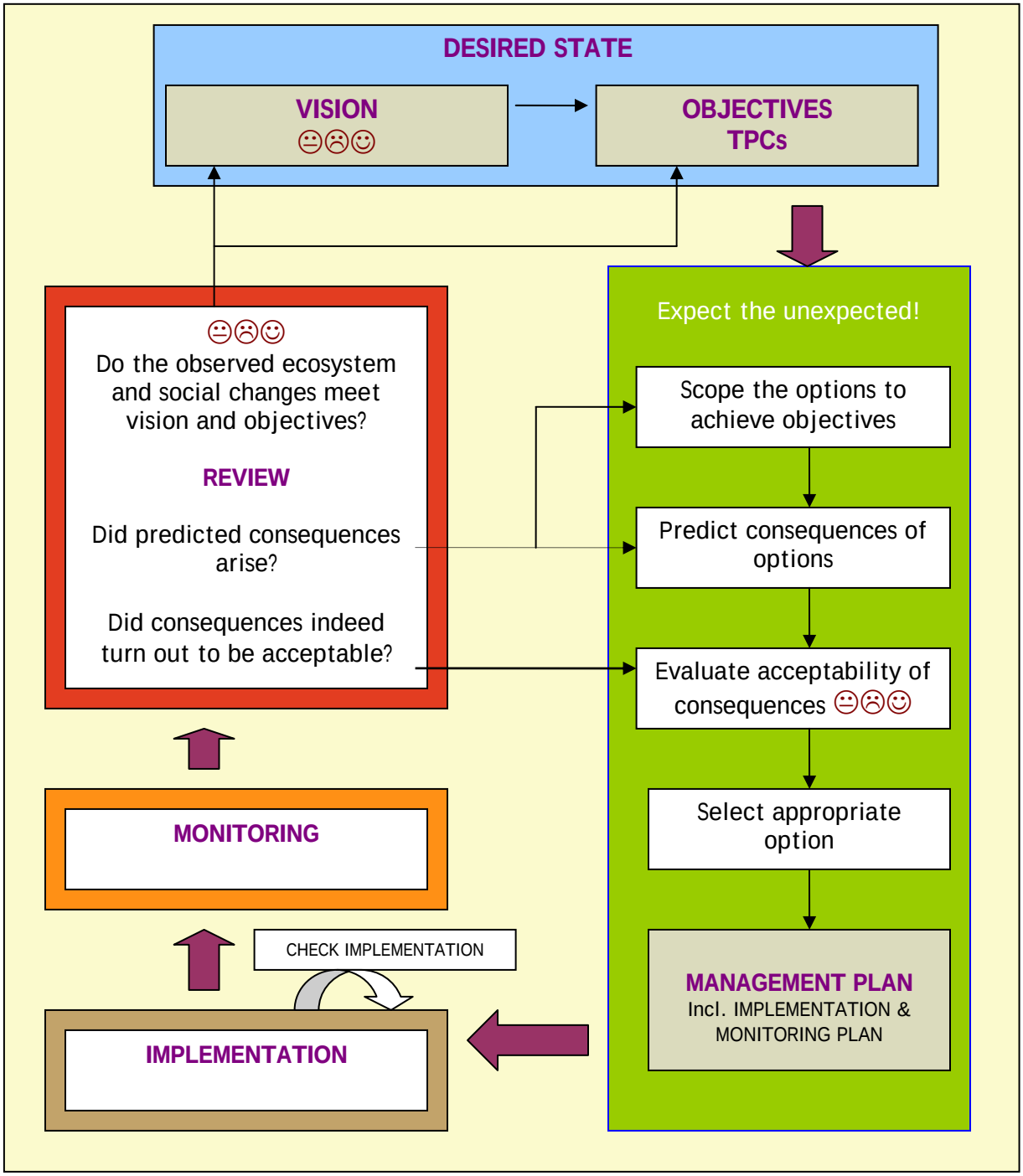

Figure 7: The Strategic Adaptive Management (SAM) process

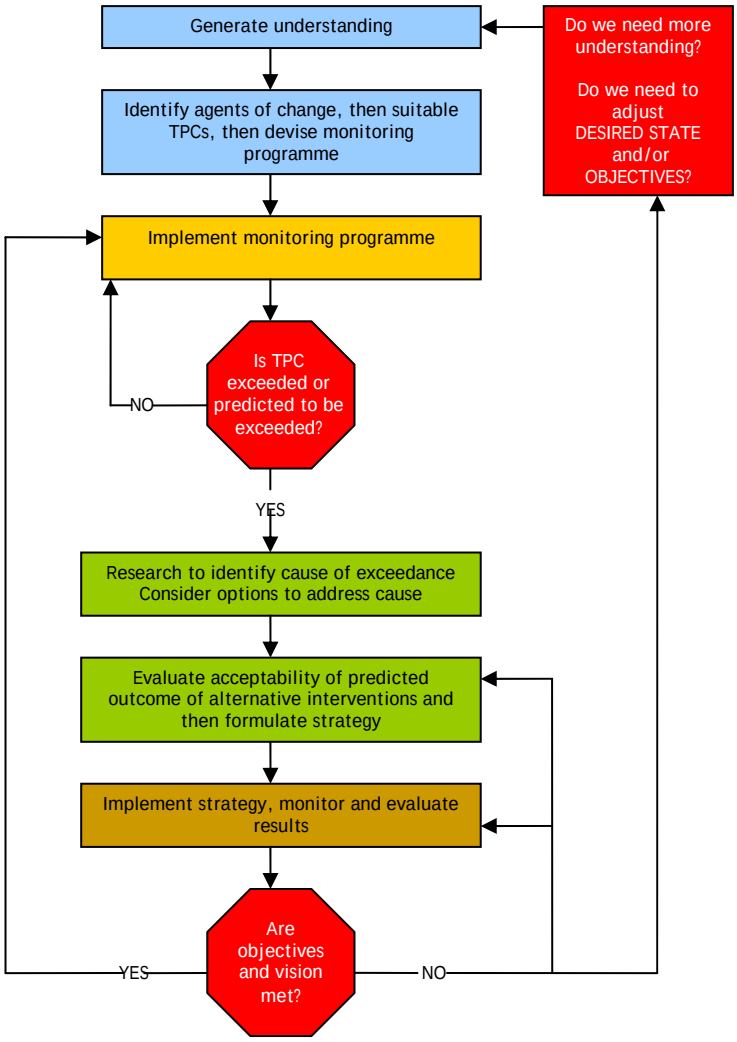

Figure 8: A management decision support system based on TPCs

A long-term research programme for elephant management in South Africa

Successful Strategic Adaptive Management is dependent on a reliable flow of new knowledge that can be integrated into decision making and future planning. A valuable outcome of the policy review was a wide commitment to more cooperative and collaborative research efforts

amongst southern Africa's elephant scientists and ecologists. At the final Elephant Science Round Table Minister van Schalkwyk agreed to fund a long-term research programme to support this commitment. The intention is not to replace existing research but to enhance it by achieving greater coordination and synergy. An integrative approach is needed to develop a national strategy for reducing key risks and uncertainties of various elephant management strategies. The programme will be based on an active adaptive management policy and rests on four pillars[40]:

- Periodically-repeated **scientific assessment** to transfer knowledge between the science, and policy domains;
- **Modelling** to attain reliable predictions of complex systems;
- New i**nvestigations** from planned and unplanned experiments, including s**ocial, political and economic research**;
- The **building of** c**apacity** in decision-makers, managers and researchers, as well as in institutions and technology.

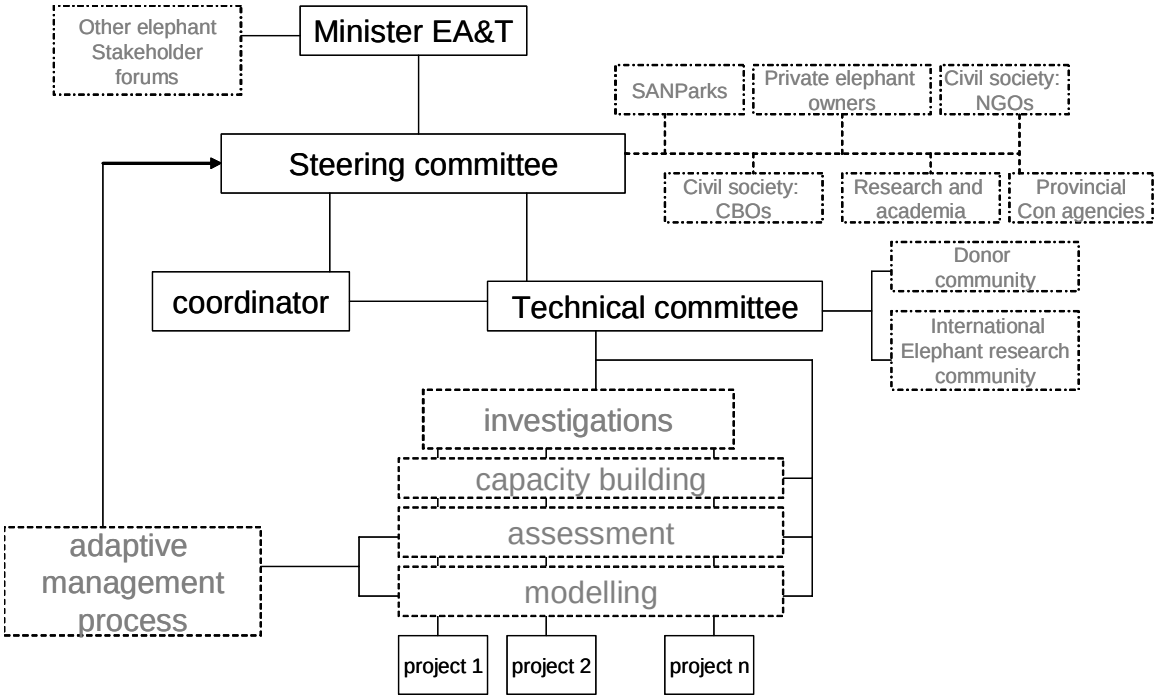

Figure 9: A proposed long-term research programme for elephant management in South Africa

The foundations of the programme have already been laid. The "Assessment of Elephant Management in South Africa" began in 2007 and was published in February 2008[41]. The purpose of the assessment was to:

- Document what is known, unknown and disputed about elephant-ecosystem-human interactions in South Africa.
- Synthesise and communicate the above information to facilitate decision-making and the reaching of social consensus about elephant management.

The assessment did not generate new primary knowledge but used expert judgment to add value to, and evaluate, the state of existing knowledge. It was conducted to the same exacting standards as the international Millennium Ecosystem Assessment. The final report was vetted by a Guiding Committee, open to public scrutiny before finalization, and reviewed by a wide range of experts. The Assessment does not constitute policy on any level but is intended to inform policy and management decision-making processes.

A modelling network, the second pillar of the research programme, has also been established to stimulate and support the development, testing and application of predictive models of elephant-ecosystem interactions in South Africa. The modelling will not only guide management, but test TPCs, generate questions for investigation, and synthesise data to reveal the degree of certainty, or uncertainty, that we have about particular outcomes. An 'elephant modelling workshop' was held at Skukuza in January 2007 and followed by a meeting of interested parties at the Kruger Network Meeting in April 2007. The approach is currently to encourage multiple modelling groups to focus on a small set of common questions, within a defined location and time period, using shared databases for driving and testing the models.

The next steps in the research programme are to: (1) initiate new research, particularly in the neglected fields of social, economic and political issues that play a role in elephant management and (2) integrate the new advances into adaptive decision making processes, not only in Kruger but across the country.

At the Luiperdskloof meeting of scientists there was some concern that the zoning of Kruger into elephant management zones (Figure 7) was not sufficiently based on scientific knowledge. A new zoning map was designed to reflect the protection of areas with specific biodiversity elements, by incorporating the potential impact of all ecosystem drivers including fire, elephants and other herbivores.

The selection of zones was based on several data sources:

- The South African National Biodiversity Institute (SANBI) map[42] that includes the conservation status, environmental descriptors, special features and economic value of vegetation in South Africa. The IUCN Red List Categories and Criteria[43] were also used to provide an objective framework for the classification of vegetation types according to their extinction risk.
- The distribution and density patterns of elephants defined from 20 years of annual censuses were used to demarcate areas subjected to consistently high elephant densities in winter.
- A Landscape Sensitivity Index was developed for each of KNP's thirty-five landscapes.
- The distribution of rare and endangered plant species of which 90 are IUCN red-listed and 93 are rare in the KNP.
- The distribution of rare vertebrate species, for which detail is limited, was mapped on a broad scale which was used as a layer in the final analysis.
- Identification of human-elephant conflict/benefit zones and areas of limited access as dictated by wilderness areas.

The final product of the zonation exercise (Figure 11) has been circulated to scientists and has been accepted by the Conservation Services Management Committee of SANParks for inclusion in the KNP management plan.

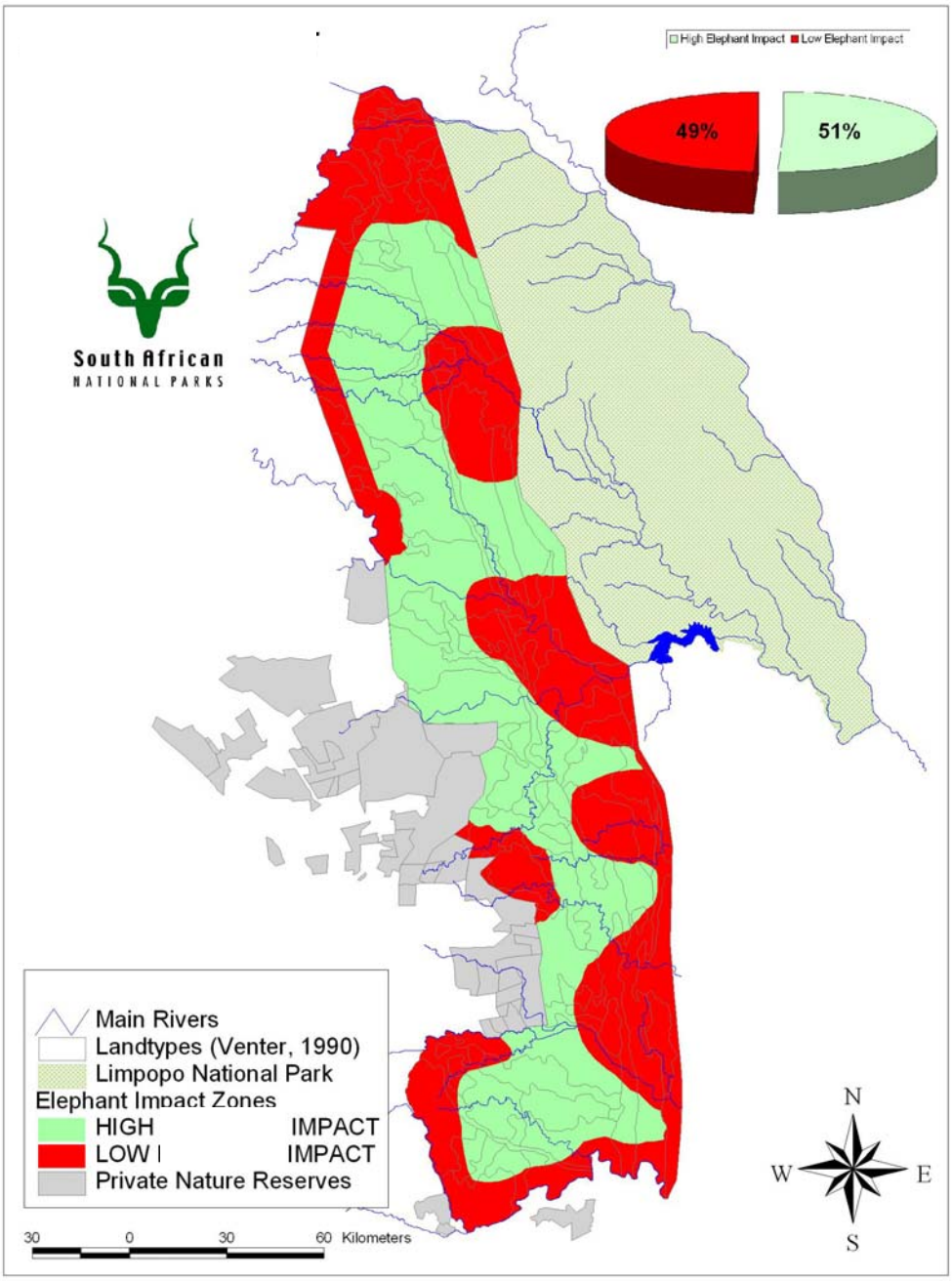

Figure 10: Proposed biodiversity impact zones for KNP