6. A STEP-BY-STEP PROTECTED AREA MANAGEMENT PLANNING PROCESS

In this chapter guidelines and descriptions are presented for particular phases in the management planning process, in particular the:

- Desired State Objectives Hierarchy process
- TPC decision support system
- Park zoning and expansion plans
- Review and reflection

6.1 Developing a vision for a desired future state and translating it into achievable objectives

The park ecosystem desired state is based on a collectively developed vision of a set of desired future conditions (that are necessarily varying), integrating ecological, socio-economic, technological, political and institutional perspectives within a geographical framework. The imperative to maintain variation in ecosystems is articulated in the SANParks biodiversity conservation values which accept that change in a system is ongoing and desirable, although some types of change are more desirable than others.

The desired state process and tool is the focus and essence of the Protected Area Management Planning framework. The outcome of this process both inspires and constrains the content of all future management actions. Having a clearly articulated and consensually developed vision and objectives gives Protected Area management **defendable purpose, clear focus and auditable actions.** A vision for a desired future state in the form of measurable ecological end-points enables the design of adaptive management interventions to test hypotheses about ecosystem structure, function and response.

The desired future state protocol ultimately produces what is termed an "objectives hierarchy". The hierarchy begins at the broadest level with the organisation's "vision" for management. The protocol provides a step-by-step process for decomposing the vision into a series of "objectives" of increasing focus, rigour and achievability. The finest level of the hierarchy is defined by achievable objectives.

Note that the whole objectives hierarchy represents the desired state of the protected area because the desired state is given with increasing level of detail as one moves down the hierarchy. The hierarchy also represents a record of the rationale for the decisions one takes on what are the important objectives. In this sense it is a very useful, even mandatory, tool for defending decisions in the future and ensuring accountability to the management plan.

The following protocol provides a step-by step process for developing a desired state in the form of an objectives hierarchy (Figure 6.1). Procedural tips are given in text boxes for each step. This protocol should be implemented in a workshop environment with stakeholders and the assistance of a facilitator who is familiar with the process.

Extracts from the management plan for Marakele National Park provide an example of the contents and presentation of the desired state aspects of a management plan (Appendix 1).

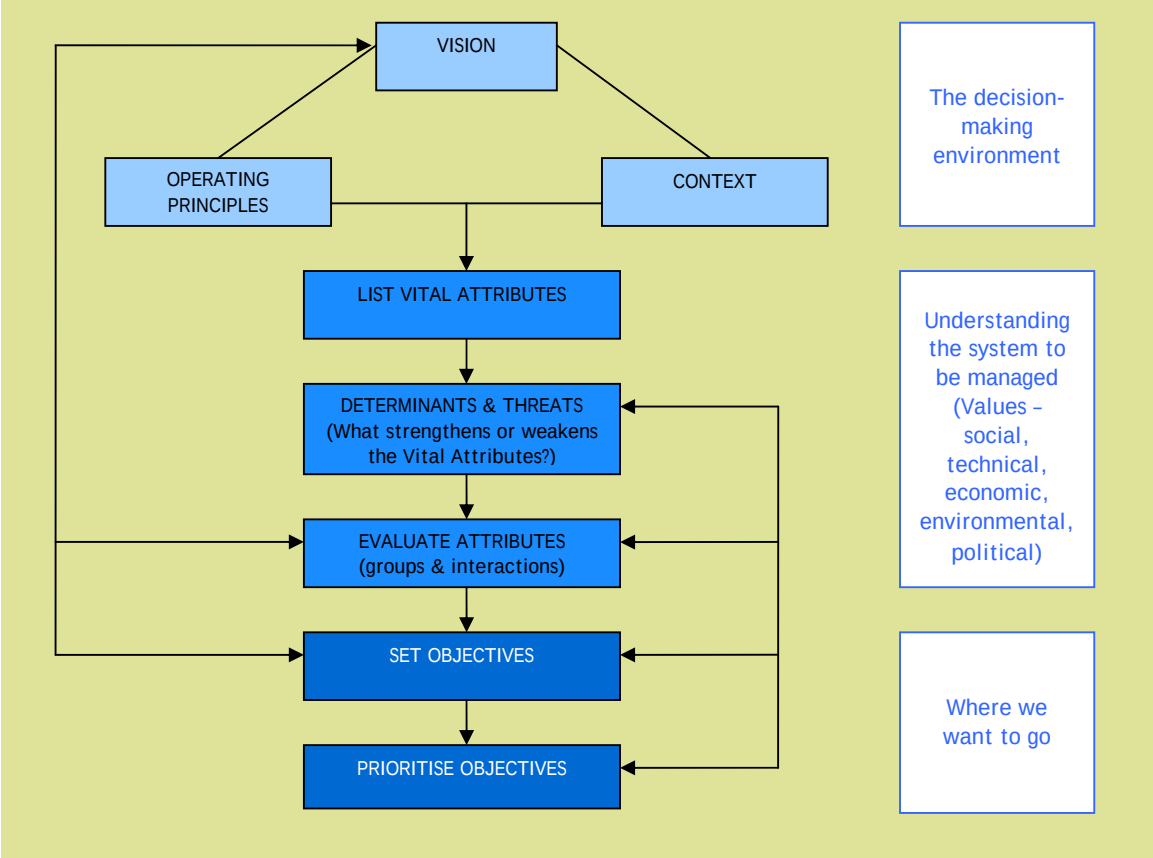


Figure 6.1: Process of developing a desired future state represented by an objectives hierarchy

Step 1: Reach consensus on the vision and operating principles

A vision is a concise statement describing the core business and philosophy of management, whereas a statement of the operating principles describes the core values that circumscribe decision making. SANParks biodiversity and corporate values have been set but they may need to be supplemented by operating principles that meet the specific needs of an individual National Park.

This is one step at which value and needs-based negotiation (See Chapter 3 - building cooperation) is essential. Identify the key elements of the vision and develop operating principles for each.

Since the operating principles describe core institutional values they bound decision making and should be used as checks and balances at each step of the protocol.

Before any other management action can be taken the vision and operating principles need to be fully accepted to prevent subsequent procedural breakdown. Development of a sound information base to provide the full context (Step 2) for management will greatly assist this process.

Step 2: Provide the context for setting the objectives

This step requires considerable brainstorming, knowledge of the literature, local conditions and policies, governmental policies and international agreements. It is important to involve all stakeholders in building this context to ensure common understanding as a base for future negotiations.

Describe the context of the managed system at local, regional, national and international levels and considering social, technical, ecological, economic and political aspects and values (VSTEEP). The SANParks Corporate Strategic Framework as well as the Balanced Scorecard also provide higher level context to park planning.

Step 3: Document the vital attributes of the system to be managed

List **all** the known and perceived, current and future vital attributes of the system. Vital attributes are the most important characteristics/properties (biodiversity, heritage, geographic, touristic, etc.) of the system to be managed - which make the system unique and which are valued by various stakeholders.

Current attributes may be determined from inventory type lists of V-STEEP characteristics of the system, e.g. species diversity and landscape types, social and cultural attributes, the role in the local economy. Scenario modelling may be useful for identifying future attributes.

The next step is to discuss and evaluate these lists to reduce them to the essential elements compatible with the vision.

This is an important step in the objective setting process as it identifies the fundamental purpose(s) of conservation management for a particular Park.

It is essential that everyone's perceptions of the strengths/vital attributes are aired. This is a step that brings participants mental models of the system to the surface. Sometimes it exposes hidden agendas. Careful facilitation and much tact are needed in this phase. Encourage participants to put their "cards on the table" to produce a provisional list of their perceptions of the vital attributes, without debating their merits. Then reduce the list by eliminating those incompatible with each other, or the vision.

Step 4: Evaluate and consolidate the attributes

Matrices are a useful tool in exploring which attributes appear to be complementary and those that are conflicting. Attributes can be sifted, grouped together and condensed. The end product of this process will be a concise list of vital attributes for which the Park can be managed.

Table 6.1: An example of a matrix used in the initial evaluation of the strengths (O - complementary, X - conflicting, ? - unknown).

Strength	1	2	3	4	5	6	7
1	-	O	O	O	O	O	O
2		-	?	O	X	?	O
3			-	O	O	O	O
4				-	O	O	O
5					-	O	X
6						-	?
7							-

Personal values play an important role in this step as long held assumptions about what is "vital" in a Park need to be discussed and supporting evidence found. Look for common ground to rationalise the list of attributes to ensure compatibility with the vision and operating principles.

This can be a complex task. Techniques such as ordination, overlapping, congruency, optimization, linkage and interaction may be used to investigate compatibility and trade-offs between vital attributes if round table discussion does not resolve the issues.

Step 5: Record all the determinants of, and constraints and threats to, the vital attributes

A major purpose of management is to ensure the maintenance of the determinants of the vital attributes. List all the determinants of, and the constraints and threats to, the condensed list of vital attributes. Determinants are those factors or processes that determine, strengthen or ensure persistence while threats are those factors or processes that threaten, erode or inhibit these

Expert opinion is needed for this important step but do not let it be constrained by the lack of site specific knowledge. Use experts across the V-STEEP spectrum where you can.

Develop hypotheses of determinants if they are not known. This is invoking an adaptive approach to management which will test their importance over time.

attributes or their determinants. Threats can also be factors within, or outside, a partnership that undermine its values and inhibit the pursuit of the mission or future desired state. Knowledge of the environmental and cultural "goods and services" the system has the potential to deliver is essential to this step. A matrix can be set up to facilitate the process of assigning determinants, threats and constraints to the particular strengths.

Table 6.2: An example of a section of the matrix used in assigning determinants, threats and constraints to the particular vital attributes of Nylsvley Nature Reserve.

Vital Attribute	Determinant	Threat	Constraint
A good information base.	History of involvement: academic, research, management.	Lack of support from funding agencies.	Reserve is a very small part of floodplain and catchment; lack of understanding of the system as a whole. Information is not in a user friendly format. Management does not have clear goals, and therefore does not demonstrate their information requirements.
It is an excellent breeding and staging site for nomadic aquatic birds.	Hydrological regime drives wetland processes, water quantity and quality. Grazing and fire regime on reserve influences breeding and other life history strategies.	Water resources development in catchment is a threat to the hydrological regime (water is scarce) - extraction is a high risk. Exotic plants in the catchment - alter water quantity (reduce runoff) and quality.	Management does not know how to, and have not, explicitly managed for birds.

Step 6: Formulate the high level objectives

Objectives are set to:

- Ensure the maintenance of the identified vital attributes and/or their determinants of the system being managed, and
- Overcome the constraints and threats to meeting the vision.
- Align with the corporate Balanced Scorecard (BSC). (This process is not dealt with in this manual.)

A hierarchical approach should be adopted to formulate a set of nested objectives of increasing rigour and achievability. Note that this is an iterative process of identifying,

Repeatedly cross reference the vision, principles, context and vital attributes with constraints and threats to set up statements of intent to ensure strengths are maintained by overcoming threats and constraints.

When eliciting objectives from more than one person ask each one to provide a written list of objectives, then move onto group discussion. This promotes thinking from every individual. If general discussion began immediately it would be easy for members to anchor on the first ideas.

Several devices, other than those mentioned above, can help stimulate formulation of objectives:
1. Drawing up a wish list.
2. Use of alternatives.
3. Identifying problems and shortcomings - articulate reasons for concern.
4. Identify consequences of existing objectives and management actions.
5. Use of different perspectives.

structuring and analysing objectives, and understanding how they relate to each other.

It is important to recognise that objectives at different levels in the objectives hierarchy would probably be used to direct operations at different levels in the institutional hierarchy.

Step 7: Prioritize the high level objectives

Prioritising objectives is both difficult and subtle. Use the vision, strengths, principles and context as a basis to prioritize the objectives. They provide the checks and balances. It is important to note that the priority may change according to the level of management personnel involved so try to involve a wide range. Do not use financial resources or manpower capacity to prioritise at this stage – otherwise you will lose the value of using the future desired state to take you forward. Only use these restraints when you have the whole hierarchy to evaluate.

Negotiation is an important tool. Not all the objectives will stand up to this process and there will be many perceptions of what is most important.

The preceding steps of the protocol have set a good foundation though. Use this information to give the checks and balances needed to rationally prioritize the objectives. Do not do it by vote as this often reduces decisions to gut feel or personal agendas.

One of the most useful devices for prioritising is simply to ask WHY? Why is A preferred to B? and to relate the answer to the vision, principles and vital attributes.

NOTE: This is the end point of the first stakeholder planning meeting. Beyond this point setting objectives becomes very technical. It is best for staff to take the product of the first workshop and develop a full objectives hierarchy. Management will present this to stakeholders as described in Box 4 of Chapter 5.

Step 8: Set lower level objectives

Construct an objectives hierarchy (Figure 6.2) by decomposing the higher level objectives set into component objectives ("sub-objectives") of increasing focus, rigour and achievability. The final level represents acceptable, achievable and measurable objectives.

There is also a need to **prioritise these lower level objectives**. Different degrees of rigour can be given to the time frame of different priorities. An objective may have a low priority because other objectives have to be achieved first, not because it is less important. Future objectives may have low priority now, but will be given a time frame in which they will be revisited. One of the reasons for prioritising is to check for redundancy between objectives. Quite often one lower objective serves two higher level objectives, or needs minor modification to do so. The more these can be identified, the more duplication, or waste of effort, can be eliminated.

Use the same procedure as for formulating objectives (Step 6) to sub-divide objectives into smaller and smaller, more circumscribed units until the statement ceases to describe an intent and becomes one of "what must be done". You have set the final objectives when clear statements of the temporal, spatial and resource limits have been identified and they are unequivocally achievable.

The most difficult task is to ensure that the smallest number of objectives is set to achieve a particular high level objective. Again, ask WHY? Why is this needed, why is it the best option? Remember, the purpose is to maintain vital attributes by overcoming constraints and threats. Also remember that one reason why you are conducting this exercise is to focus management on priority, achievable and measurable objectives. Therefore repeatedly check that the resources needed a re available or potentially available.

Separate the objectives into Tourism, Building Cooperation, Biodiversity Conservation, Operations and Corporate Support (the 5 core components of park management). Make sure the biodiversity objectives are clearly stated in terms of biodiversity or ecosystem characteristics. Examples could be the desired species mix and population structure of plant or animal communities. A stated fire regime, for example, is not a biodiversity objective but a tool to achieve biodiversity objectives. It may therefore be more appropriately labelled an operations objective. An implemented fire regime is an "output" while the species mix or grass production it achieves is a biodiversity "outcome".

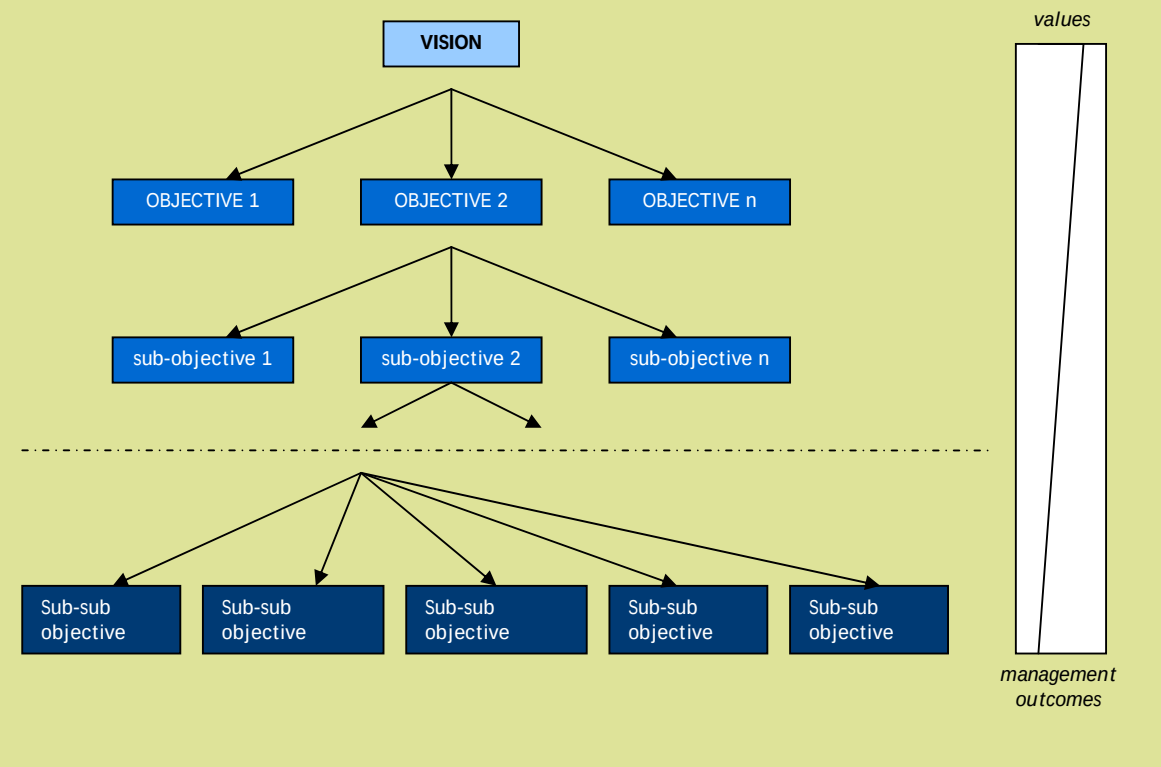


Figure 6.2: Hierarchy of objectives

Step 9: Setting TPCs as a decision support system

Once a desired state has been described in terms of a set of objectives, TPCs are set to mark the boundaries of this desired set of future conditions, in the form of limits of acceptable variation in particular indicators thought to best reflect the objectives, vital attributes and vision. TPCs are set based on the best available knowledge and expert opinion at the time. The management and monitoring process, as well as independent research, will over time enable us to update the knowledge on which TPCs are based.

Monitoring is based on the TPCs, which tell us what indicators to monitor, when and how often. Predictive modeling is also used to forecast potential future TPC breaches. When a TPC is breached, it prompts managers to investigate the cause, and then to decide on this basis if, and what, management action is needed (Figure 6.3).

To ensure that management action is taken when a TPC is about to be exceeded it is essential to define the management options in advance so as not to be caught off-guard. A common option would be to intensify research to try to understand the reasons for the exceedence,

however other options should be listed beforehand. This step must be included with each TPC definition.

The set of TPCs should be refined over time to the minimum set of thresholds needed to adequately reflect the desired state and the likely threats to the desired state over time. For example, the following TPCs are tabled for the biophysical objectives of Kruger National Park.:

- TPCs related to plant-animal dynamics – a suite of TPCs at different scales, relating to either compositional or structural and functional biodiversity elements for vegetation and herbivores separately.
- Fire TPCs – specified for fire intensity and fire scar pattern to provide wide variation over time, space and scale to the belief being that this will lead to a range of fire types, intensities and effects over space and time and that this will most likely best maintain biodiversity.
- TPCs for species of conservation concern – for species which are globally critically endangered or endangered.
- TPCs for degradation – degradation is reflected in a decrease in soil stability, infiltration and nutrient cycling indices.
- TPCs for heterogeneity – this integrated TPC is designed to track a loss, or potential loss of biodiversity through homogenisation of the ecosystem.
- TPCs for invasive alien biota - currently represent management or operational TPCs, including specific TPCs for bovine tuberculosis (BTB).
- TPCs for river geomorphological diversity, terrestrialisation and sedimentation.
- TPCs for river flow and quality.
- TPCs for river health, specified through fish assemblages.

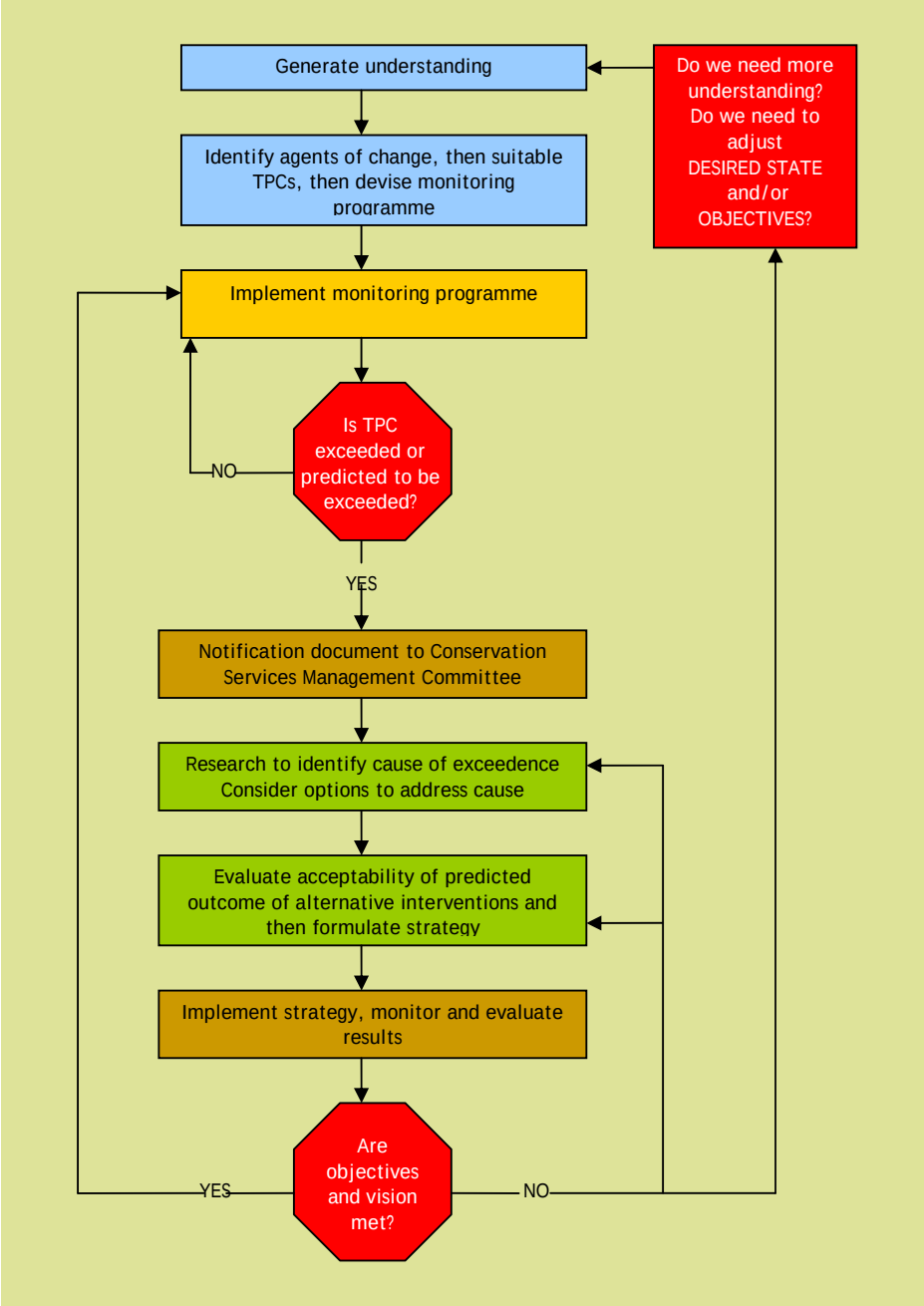


Figure 6.3: An adaptive management decision support system using TPCs

6.2 A spatial representation of the desired state

Park Zoning Plan based on the Conservation Development Framework

A zoning plan is used to guide development and protection of wilderness areas. The primary objective of a park zoning plan is to establish a coherent spatial framework in and around a park to guide and co-ordinate conservation, tourism and visitor experience initiatives. The rationale for standard zonation criteria is contained in the SANParks zonation policy (SANParks, 2006). A zoning plan plays an important role in minimizing conflicts between

different users of a park by separating potentially conflicting activities whilst ensuring that activities which do not conflict with the park's values and objectives can continue in appropriate areas. Ideally the zonation should be based on a full Conservation Development Framework. The CDF is underpinned by sensitivity-value analysis which is a consensus based multi-criteria spatial decision support tool that relies heavily on systematic conservation planning. In essence this process sets a spatial desired state for biodiversity and aesthetics in different zones within a park, that supports both biodiversity and tourism objectives of the park. Critical to the CDF (which is an explicit statement of spatial desired state, including biodiversity, tourism and management outcomes) is a biodiversity (and aesthetic/wildness) desired state couched in terms of limits of acceptable change for each zone.

Zoning decisions are based on a number of factors:

- Biodiversity sensitivity-values
- The stakeholder defined desired state
- Tourism opportunities
- Current research areas
- Heritage and other unique features
- Regional linkages
- Land claims
- Concessions
- Wilderness areas
- Adjacent land use
- The historic legacy of existing infrastructure.

Park expansion planning

A systematic conservation planning process for park expansion sets quantitative targets for biodiversity within a park (e.g. 'x' hectares of intact habitat 'y', which is sufficient to allow processes 'a', 'b', 'c' to work sufficiently; 'z' amount of linkage to other intact areas to allow 'd', 'e', 'f' ecological processes to operate; 'x' hectares of nationally threatened habitat, amount of area of suitable habitat for a threatened species assemblage) and also the targets required for non-biodiversity objectives (e.g. 'y' amount of lowland game viewing area), and then identifies the key areas which are required to meet the spatially explicit part of the objectives of a park. This in effect defines the gross extent of the "spatial desired state" for a park, in others words the geographic area needed in order to reach biodiversity, tourism and other targets.

SANParks' expansion and consolidation strategies are therefore aimed at the establishment and expansion of its national parks in order to represent the biodiversity, landscapes and associated heritage assets of South Africa. The country has set a target of ensuring that 8% of its terrestrial areas and 20% of its coastline are under protection by 2010.

The setting aside of large conservation areas is primarily designed to maintain essential ecological patterns and processes associated with preserving functioning examples of the country's different biomes, land- and seascapes, and cultural landscapes. Large size also enhances the aesthetic appeal of an area, especially its recreational and spiritual values. Furthermore, expansion of national parks remains necessary in the face of the consequences of climate change and the habitat needs of threatened and endangered species. Thus, for national parks to meet their essential requirement of conserving biodiversity, and meeting human needs, they must:

- Be large enough to support representative examples of one or more natural ecosystems
- Contribute to biodiversity and ecological processes and preserve special cultural feature
- Provide spiritual, scientific, educational and recreational opportunities
- Incorporate the needs and aspirations of local, national and international communities

- Reduce occupation and exploitation that are largely in direct threat to its main purpose

Land can be incorporated into a national park based upon any of the following principles:

- The *maintenance of ecological integrity*
- *An enhancement of biological representation*
- *An enhancement of biological diversity*
- *An improvement of economic viability*
- *A minimisation of threats*
- *An enhancement of management effectiveness*
- *To conserve and maintain cultural heritage sites particularly those with universal value*

Furthermore, the process of incorporating land into a national park will:

- *Be informed by national conservation priorities*
- *Be in congruence with the accepted objectives of the park*
- *Follow the best information and selection criteria and methodology possible*
- *Be done with due sensitivity and responsibility to potentially affected and vulnerable sections of society*

A range of incorporation mechanisms are employed in this strategy which include:

- The transfer of protected areas already managed by other state agencies or departments to the management of SANParks in order to be accorded the highest level of protection as national parks
- The purchase of privately owned land to expand and consolidate or to establish new national parks
- The contractual incorporation of privately and communally owned properties, and their proclamation as contractual national park, without a change in land ownership

Objectives for the 'Park interface zone'

Systematic planning is applied to the areas outside the park – the spatial aspects of external threats to biodiversity within the park are considered within planning for what is known as the "Park interface Zone". This aims to provide a sustainable land use mosaic around parks in order to sustain the long term persistence of biodiversity within them. This analysis supports SANParks' reaction to Environmental Impact Assessments, inputs to Spatial Development Frameworks, and other regional land use planning initiatives.

6.3 Policy and planning for different stages of Protected Area development

Though SAM is a generic management cycle that is used for all parks, different steps in the cycle may form the primary focus for different parks (Figure 6.4), depending on their stage of development (Figure 6.5) as protected areas, and depending on the distance between their current and desired states.

Parks that are defending a Desired State:

Focus on monitoring for breaches of TPCs and on refining TPCs through research and reflection.
For these parks the sequence of thinking and action could appear to follow a different sequence to the classic SAM cycle: Desired State → Set TPCs → Monitor TPC indicators → Select management options if TPC breached → Implement → Monitor → Review (management action, TPC validity, Desired State).

Parks that are still advancing toward a desired state:

Focus on setting a series of time-stepped interim objectives to progress toward the desired state, and identifying and implementing management interventions to achieve these.

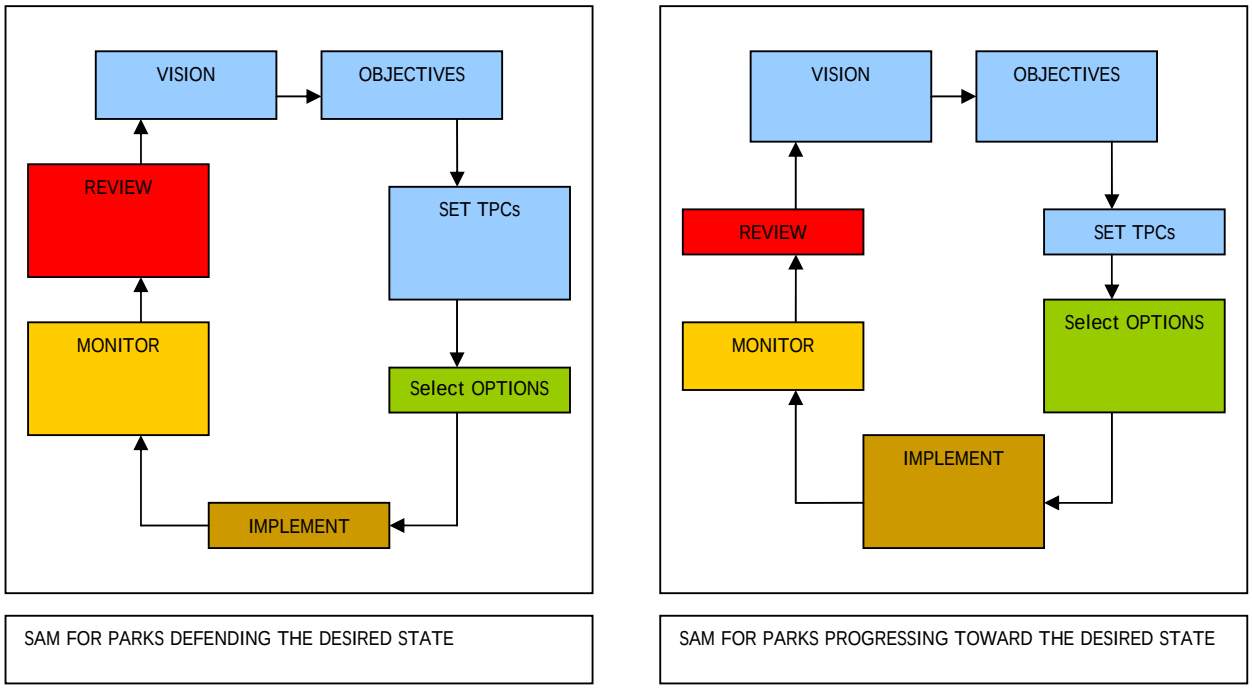


Figure 6.4: The SAM cycle for parks at different stages of development

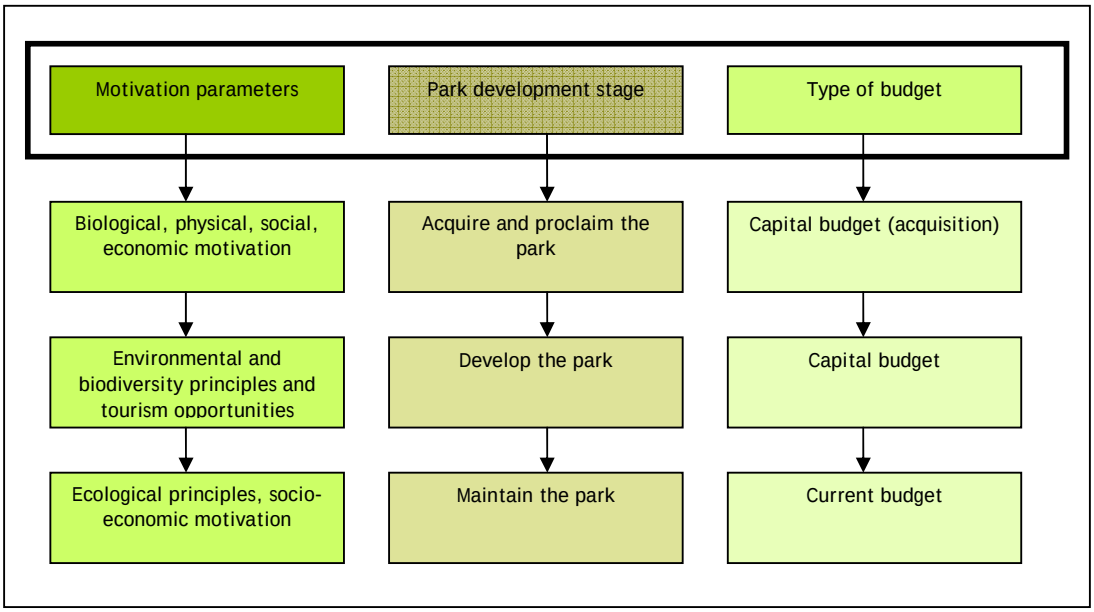


Figure 6.5: Different stages of protected area development

6.4 Review and reflection

Lack of informative and effective feedback, which should stimulate proper reflection by managers, is the commonest underlying cause of failure of adaptive management, and hence of reaching the desired outcomes we set for parks. The hallmark of adaptive management is ongoing learning, and this only results if users apply their minds to the adaptive cycle (Biggs and Rogers 2003). The following feedback mechanisms are needed:

- Feedback that the management action as decided upon and specified, is carried out as such
- Feedback whenever a TPC specifying the endpoints of any biodiversity objective is violated, or is credibly predicted to be violated in the future
- Feedback that the predicted outcome of a management intervention, in response to the exceedence of a TPC, is achieved, or what materialised instead in its place
- Feedback to SANParks Head Office of the overall performance of Marakele relative to its stated objectives
- Feedback as to whether organisational or societal acceptance of the consequence of an intervention is still, as agreed on previously, acceptable
- Feedback as to whether the monitoring programme and list of TPCs is parsimonious and effective
- Feedback as to whether overall park objectives need adjustment in the longer-term
- Feedback regarding, or at least latent preparation for, surprises

Evaluation should include (Figure 6.6):

- Evaluate both outputs (what were the results?) and outcomes (what did we achieve?)
- Did predicted consequences of management arise?
- Did consequences of management options indeed turn out to be acceptable to all stakeholders?
- Do the observed ecosystem and social changes meet the vision and objectives?

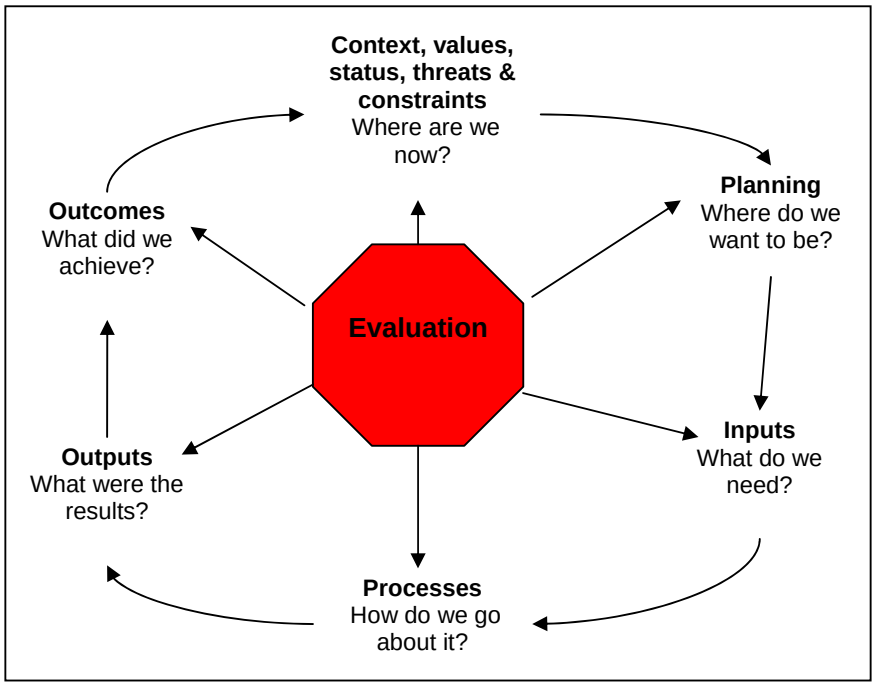


Figure 6.6: An example of an adaptive review process for protected area management

Measures of success: characteristics of a good plan

A successful, strategic, adaptive and participatory planning process will produce a management plan with the following attributes that should be evaluated at each review:

- It is **strategic** in that it begins with a clear mission statement/vision of the future and has clear, **innovative** objectives/targets for **improved outcomes**.
- It aims to achieve **explicit outcomes, across the five core components of management** (Conservation, Sustainable Tourism, Building Co-operation, Effective Operations, Corporate Support), within resource constraints.
- Ecosystem response to management actions is **predicted, monitored, evaluated and reviewed.**
- It is achievable and adaptive. It reinforces **corporate values** and underpins the **rationale for decisions.**
- It ensures that **short term (event) decisions**, or action, are made in terms of the **long term strategic purpose**, and thereby focuses decision making.
- It streamlines and focuses workload to **reduce crisis management**.
- Acknowledges surprises and **confronts uncertainty**.
- The **learning** process and **knowledge management** are explicit in the plan, central to operations and rewarded.
- It ensures that both individuals and institutions are **accountable, transparent and co-operative.**
- Responsibility for achieving objectives is clearly assigned and audited with **performance rewarded.**
- Has time frames for action and a built-in **revision cycle**.
- Is **legally unambiguous**.
- It **involves stakeholders** in decision making, and is formally endorsed by the institutional and governmental hierarchy.
- **Builds trust** and constituency between stakeholders through shared rationality and decision making.
- It has an **approved budget** and resource inventory.