CHAPTER 13
PLANNING

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Convention on Biological Diversity

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TITLE PAGE PHOTO

Tasman Island, part of Tasman National Park, Tasmania, Australia.
Source: Graeme L. Worboys

The Tasman National Park is administered by the Parks and Wildlife Service of Tasmania and is managed consistent with its 2011 plan of management. In the 2010's, Tasman Island was infested with a feral cat population that impacted nesting seabirds. The management plan advised eradication and a very carefully researched, planned and executed feral cat eradication plan was successfully implemented. On-ground implementation was made possible by philanthropic grants from the Pennicott Foundation and an estimated 50,000 sea birds per annum have been saved thanks to this work.

Introduction

Planning involves deciding on a future desired state and the course of action to get there. In its simplest form, the purpose of planning is to establish how to get from where we are today (here) to where we want to be tomorrow (there). In order to do this we need to be clear about where we are, where we want to get to and our proposed path to get there. It is something that most of us do every day and it is a key function of management.

Concepts such as ecosystem services, resilience and connectivity conservation are bringing new and innovative approaches to planning. Once the domain of government-led processes, protected area planning is now more often than not a result of the collaborative efforts of scientists, practitioners, communities, indigenous peoples, non-governmental organisations (NGOs), individual landowners, large corporations and international bodies. Planning approaches are being re-engineered to reflect the interests of these groups and new governance arrangements.

To be effective protected area practitioners, we need to understand what planning is, why it is essential and the important role it plays in protected area governance and management. We also need to understand the various approaches to planning, their limitations and practical application in order to build and strengthen protected area systems that can counter, mitigate and adapt to global socioeconomic and biophysical change.

Planning brings many benefits to protected areas and to the organisations and individuals responsible for their governance and management. In particular, effective planning can strengthen the capacity of protected area practitioners to:

- meet global responsibilities under agreements such as the Convention on Biological Diversity (CBD) to build a comprehensive network of protected areas
- meet the statutory obligations within which they operate
- increase effectiveness by directing management towards achieving goals
- forecast risks and take the necessary precautions to avoid these
- optimise utilisation of all available resources to achieve goals
- reduce wastage of important resources and increase overall efficiency
- coordinate short, medium and long-term plans across geographical and functional areas
- provide accountability and continuity in management
- control and monitor effectiveness and adapt to change
- collaborate with, involve and partner with stakeholders in the community in decision-making
- build capacity among practitioners and the community (Thomas and Middleton 2003; Lockwood 2006).

One of the problems with much of the writing about planning, and with many plans themselves, is a lack of clarity about key planning terms. In this chapter:

- *goals* are statements of desired outcomes that are not measurable, but which set a broad direction for protected area establishment or management
- *objectives* refer to measurable, challenging yet attainable outcomes that management is seeking to achieve
- *policies* specify the instruments and types of activities that constitute the means by which goals will be addressed
- *actions* are statements of specific activities that are intended as the means to achieve an objective
- *strategies* are a type of plan that feature a combination of goals and policies.

First, we describe the types of plans typically associated with protected areas, the evolution of protected area planning approaches and their practical application to the establishment and management of reserve networks. We also provide examples of how various planning approaches have been successfully applied to protected areas around the world.

Types of plans relevant to protected areas

Planning for protected areas involves many different types of planning at various geographic scales and organisational levels. A typical planning hierarchy associated with protected area management is presented in Figure 13.1.

Corporate plans

Corporate plans at the highest level will typically state the overall objectives of the organisation and usually include a statement about how the organisation would like things to be in the future (a vision statement). Typically, a corporate plan may have a life of five to 10 years with reviews scheduled annually or every few years. A robust

Figure 13.1 The planning hierarchy
Source: Adapted from Thomas and Middleton (2003:12)

corporate plan should be a powerful management tool that guides an organisation's activities. Typically, the recommendations of these plans are inputs to the operational planning process. Government agencies, NGOs and some privately protected authorities often have corporate plans to guide their activities. Such plans are less relevant for community-governed protected areas and those owned by individual landholders.

Land and sea-use plans

Land and sea-use planning is the process of determining what lands and marine environments will be used for what purposes. Many jurisdictions have legislated processes for settlement, and natural resource and conservation planning, which determine which areas will be used for residential, commercial and industrial development, forestry, fishing, conservation and other uses. In this chapter, the focus will be on processes for determining which areas should be, or will be, designed as a protected area and how they should be managed.

Area or reserve management plans

Area management planning is concerned with how to manage the area of land consistent with its reservation under the land-use planning scheme. Management plans are reserve or place-specific plans that look at the values of an area, the issues and threats that may affect that area, and actions required to best manage the place to maintain or improve its conservation and other values.

Area management plans for reserves are also closely linked to functional or subsidiary plans such as conservation management plans, precinct plans, fire management plans, visitor management plans and pest species plans, which contribute to or flow from the area management plan.

Specific actions in management plans are included in operational plans to ensure resources are made available for their implementation. Recommended policies and significant threats may also need to be considered in the strategic and corporate plans of the agency responsible for the area.

The importance of planning to the US National Park Service and how it uses planning to bring logic, analysis, public involvement and accountability into the decision-making process for particular areas are discussed in Case Study 13.1, which also illustrates the interrelationship between various levels and types of plans, the importance placed on the values of the park, and the responsive and flexible approach adopted to protect these values. It helps managers determine the best way to comply with law and policy, and the best way to deal with the many competing interests in parks that are not directly addressed by law or policy. Park planning and decision-making are conducted as a continuous, dynamic cycle. Each park is able to demonstrate to

Wetlands of the Everglades National Park, Florida, USA, an intensively planned and managed protected area
Source: Ashish Kothari

decision-makers, staff and the public how decisions relate to one another in terms of a comprehensive and logical approach.

Management planning for protected areas is considered in detail later in the chapter.

Subsidiary plans

Subsidiary plans focus on more specific policy information and operate on a shorter time frame than reserve management plans. Thomas and Middleton (2003) provide a list of potential subsidiary plans that are often linked to reserve management plans such as development plans, conservation plans and site management plans.

Operational plans

Lower-level operational plans are used to state how the high-level objectives in the corporate plan will be implemented. While corporate plans may set objectives to achieve things that cannot currently be resourced, operational plans should only include activities that are currently achievable with existing staffing and other resources. Typically, operational plans are developed for parts of the organisation responsible for functional areas (for example, wildlife conservation or asset management) and for geographic areas (regional and local area management). Operational plans are typically completed each year. Such plans are also relevant for community-governed protected areas as they can be used to guide resource allocation decisions that reflect the intent of the higher-level plans. These plans are less relevant for conservation reserves owned by individual landholders.

Approaches to planning

Before we examine the specifics of reserve selection and management planning, it is useful to consider how one might, in theory, approach a planning problem. According to Alexander (1992), theory is a way of understanding the world—a framework to organise facts and experience and interpret them in a systematic way. Planning theory informs planning practice, and is used to guide and establish various approaches to protected area planning. Practice needs theory not only to structure the world and the environment, which are the objects of actions, but also to explain the actions to the actors themselves (Alexander 1992). Theory also allows us to see the assumptions and value judgments that underpin planning practice and provides a way to understand planning processes that are external to our own experience, intuition or common sense (Lockwood 2006).

Case Study 13.1 US National Park Service planning framework

The US National Park Service plans for one reason: to ensure that the decisions made for each park achieve the park's purpose as cost-effectively and consistently as possible. Each park's purpose is defined in part by the fundamental purpose of the National Park Service (NPS), which is to conserve park resources and values and to provide for their enjoyment in ways that leave them unimpaired, and in part by more specific direction included in each park's individual authorising legislation or presidential proclamation. Because each park has a particular purpose, the NPS management policies allow for considerable management discretion in determining the best course of management for each park, based on its purpose and significance, the interrelationships that exist among the park's resources and values, the range of stakeholder interests, knowledge of best practices, and other factors.

The NPS planning framework is based on the following principles.

- Enhance planning capacity service-wide through integration of other NPS program planning needs into regional and national planning programs.
- Confirm the park foundation document (described below) as a baseline for all future planning and decision-making at the park.
- Introduce the concept of the 'planning portfolio' to implement a responsive and flexible approach to meet park planning needs.

The principle of program integration is being implemented as opportunities arise. The idea is to enhance the broad potential for programs across a wide spectrum to contribute to park planning more effectively. The framework recognises the profile of planning within the NPS and builds on existing capacity to improve the effectiveness of park planning.

The park 'foundation document'

Each unit of the national park system is required to have a formal statement of its core mission that will provide basic guidance for all planning and management decisions—a foundation for planning and management. The park foundation document can be useful in all aspects of park management to ensure that primary management objectives are accomplished before addressing other factors that are also important, but not directly essential to achieving the park's purpose and maintaining its significance. It provides information necessary to effectively manage the park over the long term and to protect park resources and values that are integral to the purpose and identity of the park unit.

The primary advantage of developing and adopting a foundation document is the opportunity to integrate and coordinate all types and levels of planning and decision-making from a single, shared understanding of what is most important about the park. The park foundation document is developed as a collaborative effort among park staff and specialists in various program areas. The multidisciplinary approach provides the opportunity for a variety of sources and hierarchies of information about a park unit to be compiled and integrated. The information is then refined and focused to determine the most important attributes of the park.

The components of a park foundation document are as follows.

- *The park's purpose statement* identifies the specific reason(s) for establishment of a particular park and what is most important about the park. It is developed through an analysis of the enabling legislation that established the park and the legislative history that influenced its development.
- *Significance statements* express why a park's resources and values are important enough to merit designation as a unit of the national park system. They describe the distinctive nature of the park and why an area is important within global, national, regional and system-wide contexts.
- *Fundamental resources and values* are those that warrant primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance.
- *Other important resources or values* are those that are determined to be integral to park planning and management, even if they are not related to the park's purpose. They warrant special consideration in planning processes. For example, interpretative themes are the key stories or concepts that visitors should understand after visiting a park—they define the most important ideas or concepts communicated to visitors about a park unit.
- Many management decisions for a park unit are directed or influenced by *special mandates and administrative commitments* with other federal agencies, State and local governments, utility companies, partnering organisations and other entities. Some park-specific legislative or judicial requirements, along with some administrative commitments, may be worthy of discussion and special consideration because: 1) they are unusual (such as a special provision in a park's establishing legislation to allow grazing); 2) they add another dimension to an area's purpose and significance (such as the designation of an area in the park as part of the national wilderness preservation system, the inclusion of a river in the national wild and scenic rivers system, a national historic landmark designation for part of a park, or the designation of a park as a World Heritage site or a biosphere reserve); or 3) they commit park managers to specific actions (such as an action required by a court order).

The assessment of planning and data needs presents planning issues, the planning projects that will address these issues and the associated information requirements for planning, such as resource inventories and data collection, including geographical information systems (GIS) data. The assessment includes: 1) an analysis of fundamental and other important resources and values; 2) the identification of key issues and associated planning and data needs; and 3) the identification of planning and data needs (including spatial mapping activities or GIS maps).

The park atlas is a component of the park foundation document. The atlas is a GIS-based planning support tool that presents geographic data elements important for park management, such as natural and cultural resources,

visitor use patterns, facilities and the regional setting of the park unit. It serves as a reference for park projects and facilitates planning decisions.

The NPS Park Planning Program is spearheading the effort to complete foundation documents in all 401 park units by 2016. Park managers have responded enthusiastically to this initiative, and regional administrators—having seen the benefit of a shared understanding about a park—are advocating for foundation documents to be prepared for newly established parks.

Park planning portfolio

Foundation documents are at the core of each park's 'planning portfolio'—the assemblage of individual plans for a park unit. The concept is based on the assumption that a park's planning needs are met through the totality of planning documents currently in use at the park, updated as needed to provide timely guidance. This is a contrasting approach to the comprehensive plan template previously in place for park planning, in which a single plan document for each park set the stage for subsequent planning efforts. For some time, the agency had attempted to deal with the lengthy time lines and high costs associated with large-scale comprehensive plans and to support a more nimble and responsive way of delivering park planning products. The portfolio structure introduces greater flexibility for park managers, supporting formal planning efforts for some issues while acknowledging that existing plans and guidance are adequate for other issues.

The portfolio can be visualised as a loose-leaf binder, in which particular planning elements can be removed and updated, and new elements added, without revising the entire body of work. In some parks, the portfolio may take on the physical structure of a shelf or bookcase filled with plans; in others, it might exist electronically as a virtual compilation of cross-referenced documents. Whatever the format, the portfolio represents a series of building blocks to guide future actions for park management and resource staff, with individual items updated as needed.

— Patrick Gregerson, Chief, Park Planning and Special Studies, US National Park Service

US National Park Service resource specialist, Old Faithful geothermal area, Yellowstone National Park

Source: Graeme L. Worboys

Protected area planning is continually being redefined by new approaches. Over the years our scientific understanding of conservation biology has evolved, and so too has our understanding of the role and importance of planning and the benefits and pitfalls of various approaches. Over time, the ideas that were first generated from research in ecology and other disciplines such as social and economic science have been successfully integrated into what we know today as protected area planning. Over this same period planning has grown more, rather than less, complex (Alexander 1992) and the challenges for protected area planners have multiplied.

The complexity and uncertainty associated with the management of natural systems continually impact on how we plan for the future. Barber et al. (2004) suggest that complexity, uncertainty, change and conflict are the key forces that influence our approach to conservation planning. These forces are described as follows.

Complexity

The interdependence of natural systems and the ramifications of interactions of human activity with the natural environment are complex. Our understanding of the different components, processes and their interactions has developed over time (Alexander 1992; Barber et al. 2004; Figgis et al. 2012). In response to this complexity, planning approaches have shifted in focus from biodiversity conservation centred on threatened species and habitat management to ecosystem functions across large-scale, 'permeable' landscapes and resilience-based approaches to conservation planning (Pirot et al. 2000; Figgis et al. 2012; Wardrop and Zammit 2012).

Uncertainty

Due to the complexity of socioeconomic and ecological systems, it is unlikely we will ever have complete information about all the factors influencing our planning decisions (Alexander 1992). Nevertheless, decisions have to be made despite the lack of information about the area for which the decision is likely to have consequences. Planning approaches now recognise this uncertainty and allow us to adapt our actions based on learning.

Change

Environmental and socioeconomic systems are always changing. Many of these changes are triggered by human activities. Approaches to protected area planning have developed over time to consider possible changes and are now designed to be flexible enough to be able to respond (Wardrop and Zammit 2012).

Conflict

Different, and often conflicting, values and perspectives are usually involved in resource allocation and use decisions. As we look to broad-scale landscape approaches to achieve conservation objectives, the need to engage with, motivate and factor in the rights and perspectives of other landowners and managers has also become an important factor in protected area planning (Figgis et al. 2012). Over time, approaches to community engagement have recognised the needs and aspirations of local communities and have moved towards more shared decision-making models (Barber et al. 2004; Wardrop and Zammit 2012; Davies et al. 2013).

Observations of how complexity, uncertainty, change and conflict have influenced our approach to protected area planning over the past few decades have been described by Barber et al. (2004) and Wardrop and Zammit (2012) and others, as summarised in Table 13.1. Resilience thinking has become particularly influential. Building or maintaining resilience within the protected area network is increasingly cited as a means to achieve long-term conservation goals in the face of climate change and other human impacts (Figgis et al. 2012). Resilience planning is an application of adaptive planning and there is an emerging trend by protected area practitioners to use this type of planning to develop strategies for coping with uncertainty and change (see Chapter 10).

Resilience planning involves identifying a desired state and developing strategies to reduce vulnerabilities, increase adaptive capacity and monitor system feedbacks. The approach involves constructing a conceptual model of a system that includes resources, stakeholders and institutions, and identifies potential thresholds between alternative system states in order to provide insight into factors that build or erode a system's resilience. Resilience approaches to planning are increasingly being applied to marine protected area networks, catchment areas and the Arctic (Resilience Alliance 2014) as well as in local communities in Chile, Nepal, China and Thailand (IUCN 2014).

Whereas a traditional planning approach may focus on maintaining current conditions (for example, composition and abundance of native species) or promoting system efficiency (for example, maximum sustainable yield), a resilience-based approach focuses more on the desired system regime and maintaining functional and response diversity.

Planning theorists such as Friedmann (1987), Briassoulis (1989) and Allmendinger (2009) also offer various ways of classifying planning approaches. The four of most relevance for protected area planners are rational-comprehensive, adaptive, participatory and advocacy approaches. As general types, these approaches are rarely used in their pure form and most planning projects can be described in terms of mixtures of these approaches (Lockwood 2006).

Table 13.1. Shifts in approach to conservation planning

Focus	Previous approaches to conservation planning	Current and future approaches to conservation planning
Biodiversity conservation	Threatened species and habitats Protected areas considered the highest priority Terrestrial focus Limited private land involvement Government-led processes	Systematic conservation planning reflecting ecosystem functions Multiple stakeholders involved in assessment Various tenures Landscape and resilience-based approaches to conservation planning Critical species identified Species distribution and abundance management across landscape (tenure blind) Resilience framework for strategies and regional planning Marine and seascapes identified
Science input	Static ecosystem structures Models of predictable change Optimisation and economic tools used to assist decision-making	Nonlinear dynamics and complex systems Shocks, feedbacks and thresholds Cross-scale interactions Complex social ecological interactions Market-related concepts for valuation
Objectives	Mixed approaches Short-term objectives Fixed targets Mixed methods to measure effectiveness	Changed mix of approaches Longer-term objectives Flexible/adaptable targets Learning incorporated into planning and capacity-building
Management models	Rigid institutional structures Whole-of-government coordination Linear management	Integration across institutions and community Integrated planning across multiple scales Indigenous involvement and ownership Adaptive governance and structures Devolved sharing and decision-making drawing on a range of knowledge including indigenous communities Ecosystem-based partnerships
Community engagement	Government-led consultation Limited integration of science and community Dispersal of information to increase understanding	Engagement and decision sharing Range of tools available (digital) Community-led consultation Recognition of indigenous knowledge, participation and ownership Learning and capacity-building part of consultation process Knowledge sharing

Rational-comprehensive planning

The rational-comprehensive approach (also known as synoptic planning) is the dominant tradition and the point of departure for most other planning approaches, which represent either modifications or reactions against it (Alexander 1992). The rational-comprehensive approach to planning involves achieving a desired future state by defining goals and objectives and articulating the specific actions required to achieve them. It involves a number of stages that link thoughts to action resulting in decisions that are based on reason/logic. Typically, the stages in a rational-comprehensive planning approach involve:

- comprehensive documentation of the system under examination
- articulating goals and objectives
- identifying relevant resources and constraints
- designing alternative solutions or courses of action
- projecting the likely outcome of these alternatives
- evaluating these in light of objective criteria
- selecting one or more actions that the analysis suggests will best meet the objectives (Alexander 1992; Worboys et al. 2005).

Rational planning often produces decisions that can be clearly explained and justified. It typically looks at problems from a systems viewpoint, using conceptual or mathematical models relating ends (objectives) to means (actions). Debate about the issues tends to focus on technical issues such as the reliability of data. The central assumptions underpinning the rational-comprehensive approach to planning can be summarised as:

- it is possible to find the best solution to all planning issues
- the environment is controllable by using scientific knowledge and modern technologies
- solutions are found in the collection and examination of data
- there is a common public interest to solving the problem or finding a solution
- it requires the evaluation of alternative courses of action and the creation of systems for implementation
- change has to be engineered from the top (Alexander 1992; Allmendinger 2009).

The formality and rigour of the rational-comprehensive approach are both a strength and a weakness. On the strength side, rational-comprehensive planning should produce decisions that can be clearly explained and justified (Lockwood 2006). This is particularly evident when applied to large-scale, long-term, complex processes such as conservation planning when the connection between intention and outcome becomes more contingent (Madanipour 2010). Debate about the decisions tends to focus on technical issues such as the reliability of the data used or the validity of the models used to process the data.

It is unlikely, however, that a planner would have sufficient quality or quantity of information to adopt this approach for every aspect of a planning project. The rational-comprehensive approach also tends to be inflexible and often ignores social and political factors. Uncertainty and risk are very difficult to accommodate. The outcomes from a rational-comprehensive process may therefore not reflect community values or aspirations, and ignore political and institutional limitations. As a result, plans developed using this approach may not provide realistic guidance to managers, and can rapidly become out of date. There is a real risk that such plans will 'sit on the shelf' and fail to act as a practical guide for ongoing management, and therefore will not be implemented (Lockwood 2006).

Adaptive planning

An approach that seeks to overcome the challenges of uncertainty and change is adaptive planning. This approach analyses problems systematically, integrates new information and learning insights continuously, and adjusts the management response accordingly (Braus 2011). Rather than attempting to be comprehensive, adaptive approaches use systems understandings to identify key aspects of the system as the focus of planning and management intervention.

Planning and implementation are treated as an iterative process of review and revision, not as a series of fixed prescriptions (as in the rational-comprehensive approach). Interventions are seen as a series of successive and continuous adaptations to variable conditions. The approach emphasises flexibility, requires willingness to learn through experience and may require sacrificing present or short-term gains for longer-term objectives (Briassoulis 1989). The emphasis is on learning how the system works through management interventions that are both issue-oriented and experimental. Three key elements of adaptive planning are:

- *testing assumptions*: systematically trying different interventions to achieve a desired outcome
- *adaptation*: systematically using the information obtained through monitoring to take action that improves the efficiency and effectiveness of management
- *learning*: systematically documenting actions, processes and results so that lessons can be integrated into decision-making and shared with practitioners and researchers.

In the context of protected areas, this means that planners can study the changing relationship between ecosystems, social systems and land and natural resource use, and apply this information to develop new strategies and actions to achieve objectives (Barber et al. 2004). Advocates of this approach (Madanipour 2010; Barber et al. 2004; Wardrop and Zammit 2012) suggest that adaptation is a key requirement of conservation projects because in many instances there is insufficient knowledge to identify the 'best' answer to a conservation problem, and therefore actions need to commence based on the best available information and then be adapted as the project evolves. They also suggest that the time required to achieve improvements in biodiversity can be many decades; therefore projects need to define activities and expected results, and then measure short-term outputs in a way that builds confidence in the delivery of long-term

Case Study 13.2 Adaptive planning using social-ecological systems: Kruger National Park

South African National Parks' (SANParks) network of 19 protected areas traverses extensive environmental gradients and biodiversity, and is exposed to ever-changing and intensifying global population pressure. In response, SANParks has adopted an adaptive management approach to biodiversity conservation. SANParks' thresholds of potential concern form an integral part of the strategic adaptive management framework. The system involves a streamlined system of data collection, analysis, presentation of results and knowledge feedback. Data are collected to monitor the state of the environment. To ensure the accuracy of the data is preserved and the collection process standardised, a hand-held computer application (CyberTracker) is customised for each monitoring program. This icon-based system allows field workers to record observations, with latitude and longitude coordinates, using a personal digital assistant device that features an integrated global positioning system. In this way, data collected in the field are simultaneously captured electronically using graphic checklists, which enhance data accuracy. The data collection process can enable field rangers to contribute directly to the management and research of each park by simply collecting basic environmental data during their regular daily patrols (for example, distribution of rare and endangered species, availability of surface water and disease outbreaks).

The information gathered during the ranger patrols is used by SANParks management to:

- plan section patrols for area integrity mapping
- provide an early warning system for disease outbreaks
- identify trends in illegal exit and entry points
- enable the detection and control of invasive alien species
- report fence breaks to the State Veterinary Department for animal health purposes.

Data stored in the SANParks database are used in standardised routine analyses to assess whether the thresholds of specific ecological variables have been exceeded. This approach allows for a certain amount of ecosystem change brought about by resource use, provided it remains within the natural limits of variation. Consequently, these thresholds create a feedback loop between monitoring and management, which serves as an early detection system for undesirable changes to ecosystems and prompts informed management interventions to promote cyclical learning. There is also a socioeconomic component to sustainable resource use, as the process of developing monitoring indicators and thresholds is resource-intensive and time-consuming. This process entails the active involvement and support of all stakeholders to ensure effective monitoring of sustainable resource use and adherence to the rules. Stakeholder participation in resource use management is encouraged, including the incorporation of local knowledge in monitoring and evaluation systems. The roles and responsibilities of stakeholders vary according to the local context and purpose of the resource use.

Source: Adapted from Kruger and MacFadyen (2011)

outcomes. It is an iterative process that leads to stronger strategies and actions based on measured outcomes from prior iterations.

Adaptive planning also acknowledges the changes that occur in a team as they understand and develop responses to their planning context. Put simply, the things a planning team and their stakeholders and partners learn while making a plan change the way they understand the context and responses to that context; the plan a team first develops and implements is simply a 'stepping stone' to the next, and so on.

As noted above, systems understandings in adaptive planning are increasingly based on resilience thinking and associated analyses of social-ecological systems (see Chapter 10 for more detail on this thinking). In a protected area context, management planning for Kruger National Park in South Africa is a leading example (Case Study 13.2). The key lessons for protected area planners from the Kruger experience are:

- long-term monitoring data and appropriate ecological and socioeconomic indicators of change are needed for adaptive management to be effective
- an effective support structure for data collection, reflection and dissemination of knowledge to facilitate timely management decisions and associated actions is essential
- the participation of local resource users and other stakeholders can support data collection, incorporate local knowledge and give greater legitimacy to management decisions regarding sustainable resource use.

For adaptive planning to be effective, strong institutional capacity, governance and systems for capturing and drawing on corporate memory and learning are critical. This is more than simply a database, which is frequently a suggested solution in some agencies, but rather providing a supporting framework to apply key learning. Implementing the adaptive planning approach is, however, an ongoing challenge. In most cases, people are the primary driving forces behind change or the adoption of new technology within an organisation. If one or more of these drivers, or change agents, disappears from the system, the programs previously under their supervision may be at risk of collapse if the proper structures are not in place to

Bosawas Biosphere Reserve management planning, Nicaragua
Source: Eduard Müller

absorb the impact (Kruger and MacFadyen 2011). The time between assessment (an immediate evaluation of significance or performance) and reflection (a lengthy, deep consideration) is an important component of adaptive management leading to learning (Biggs et al. 2011). Managers are often faced with issues associated with: 1) maintaining ongoing stakeholder engagement and support over a long period; 2) securing political and financial support for the experimental approach; 3) testing innovations that will have some degree of risk associated with them; and 4) sustaining leadership effort and attention to both assessment and reflection to improve learning and management decisions. These difficulties are particularly acute for government protected area agencies. Community-based and private or NGO-governed areas may be better placed, as they often have more agility and flexibility to respond to new information, take advantage of emerging opportunities and be less constrained by political needs and agendas.

Participatory planning

Along with adaptive planning it is increasingly recognised that participative ways of planning are essential to protected area management. Participation has become a basic principle of protected area planning, since it has been recognised that without participation by the beneficiaries of the plan, implementation and outcomes will often fail. It assumes the importance of recognising the many voices, competing interests and goals, and shifts in interests and alliances in the planning process (Dawkins and Searle 2003).

The term 'community engagement' broadly captures public processes in which the general public and other interested parties such as interest groups, political decision-makers and local organisations are invited to participate in and contribute to plan-making or to comment on particular proposals or policy changes. The types of people who may be involved when preparing a plan include individuals and organisations likely to have a strong interest in or knowledge of the issue or geographical area, including indigenous people, government representatives, recreation user groups, researchers, conservation groups, tourism organisations and businesses.

Establishing and managing a protected area can result in costs and benefits for various stakeholders. Planning can involve competition and confrontation as it impacts on the value of land and quality of life, and is often the intersection between public and private-sector interests. In the face of diverse views and interests, it is

difficult to achieve universal consensus; however, it is widely acknowledged that early engagement with the community in both plan-making and implementation offers considerable benefits for all parties involved. It can assist better planning outcomes as a result of taking account of a wide range of views, increasing the integrity and quality of decisions.

As our knowledge of what to conserve has developed over the decades, so too has our understanding of how protected areas should be planned and managed. For government protected area authorities, community engagement has shifted from merely making information available or gathering the opinions and attitudes of interested individuals and organisations to a more active exchange of information and viewpoints between the sponsoring organisation, stakeholders and the general community, which, in some cases, leads to shared decision-making. For community-governed protected areas, greater community awareness, sharing of knowledge, capacity-building and collaborative decision-making strengthen the 'ownership' of the protected area and management of the associated issues.

For NGO and privately owned protected areas, collaboration can facilitate projects that create physical linkages across the landscape and offer options that are often too difficult for governments to achieve.

As well as producing a more effective plan, the involvement of outside organisations and individuals in planning for protected areas has the following benefits:

- it promotes the role of various organisations and communities in conservation
- it provides a mechanism for organisations and the community to make positive and meaningful contributions to the decision-making process and building capacity
- it generates external ideas and thinking that can lead to innovation
- it fosters understanding of a park's values and issues, and development and acceptance of the management solutions set out in a plan
- it builds a stronger and improved relationship between the protected area and the community
- it fosters broad cross-sectoral partnerships and alliances that can increase access to financial and other resources (Lockwood 2006; Figgis et al. 2012).

The goals of any participatory planning need to be explicit from the outset and understood by both the person coordinating the participation process and those involved. For example, in addition to deciding the reason for involving other parties, it is important to determine

- how people should be organised to facilitate the planning process
- who are the interested parties and/or the people involved
- who should have the power to make decisions
- what is the best way to ensure effective participation for various groups
- what planning methods or procedures should be used
- who should decide what the planning objectives should be
- what criteria should be used to select the best courses of action and who decides (Lockwood 2006).

Based on the above questions, a decision can be made as to the most appropriate means of participation, which can take different forms and varying degrees. There are many excellent examples of participatory planning in protected areas around the world and some are presented in Case Studies 13.4 and 13.7. Key learning from these case studies includes:

- participation should be an open, collaborative, interactive process that is established to enable community values, aspirations and needs to be identified and brought into the plan-making process
- participation and engagement strategies should be designed to effectively involve individuals and groups with an interest in the plan and its outcomes
- participation should be seen as a continual process in protected area management and extend beyond plan-making to implementation, evaluation and continual improvement
- developing participation strategies with those who need to be involved in planning before it commences is more likely to be effective and relevant over the long term
- planners need to be clear about the purpose of the participation, the various strategies available, and the financial and human resources required to make participation effective and meaningful
- the purpose of participation and the constraints need to be explained in an honest and clear manner so the community understands the process and purpose of participation, while it may disagree with the content of the plan.

The premise of participatory planning is that there is the possibility of achieving consensus among participants about objectives and required actions. Arriving at such consensus can be difficult because participants often have different and sometimes conflicting interests and objectives. In many respects, participatory processes are processes of negotiation that aim at resolving and managing existing and potential conflicts (between and among resource users, between resource uses, or between resource management objectives and strategies).

When dealt with in an appropriate manner, conflicts that arise in participatory planning present opportunities for assessment and evaluation and can act as a catalyst for change. In the context of participatory planning, conflict can help address issues that could hinder management at a later stage in the process. If not managed properly, however, conflict can be counterproductive and can undermine protected area management.

Conflict management is one of the unavoidable responsibilities of protected area managers, who are often required to play a range of different roles in the planning process, from facilitator to negotiator to decision-maker. In instances where the management agency is one of the parties in conflict, it is the responsibility of the manager to identify a method for dispute resolution and conflict management that will be appropriate and acceptable to all involved. Effective communication is the essential tool for conflict management, and techniques such as self-negotiation, facilitation, mediation and arbitration should be considered depending on the nature of the conflict.

Advocacy planning

The concept of advocacy planning arose in the 1960s partially as a reaction to the failure of rational-comprehensive and incremental planning approaches to deal with poverty and exclusion. Public participation is a central tenet of this model, which seeks to ensure that all people are equally represented in the planning process by advocating for the interests of the underprivileged and seeking social change. A plurality of public interests is assumed, and the role of planner is essentially as a facilitator who advocates for either social reform or social transformation agendas (Friedmann 1987).

In a protected area context, planners can be advocates for nature and/or cultural heritage conservation, advocates for fair and inclusive planning decision-making, as well as advocates for particular forms of human–nature interactions. A well-known example of advocacy planning is the Yellowstone to Yukon Conservation Initiative (Y2Y). Originating from an alliance between scientists and activists, Y2Y is an advocacy-based environmental NGO focused on habitat connectivity from Yellowstone National Park to the Yukon for grizzly bears (*Ursus arctos horribilis*) that began in the early 1990s. Y2Y works with local communities, through education and stewardship programs, to encourage conservation of the area. Y2Y covers five US States, two Canadian Provinces, two Canadian Territories and the traditional territories of 31 First Nations groups (Y2Y 2014).

Planning for protected area networks

Historically, protected areas have been established for a variety of reasons, from conserving sites of particular beauty to protecting habitats of high-profile species. Establishment was mostly incremental or *ad hoc* and often based on factors such as opportunity (the site is not seen as having any commercial value such as for agriculture), scenery, recreation and tourism potential, or protection for activities associated with hunting or water supply (Langhammer et al. 2007). Over time, conservation planning goals and associated strategies have evolved, and notions of protected area planning have changed accordingly (Barber et al. 2004).

Planning for protected area networks—that is, deciding which lands and seas should be considered for protected area designation—is undertaken at global, national and subnational scales. This section will first address key planning frameworks at the first two scales, and then consider the associated method of 'systematic conservation planning'.

Global-scale protected area network planning

Over the past 25 years, planning for conservation at a global scale has been established primarily through international conventions. These conventions establish global priorities for biodiversity conservation and assist individual countries to plan for biodiversity conservation through reserve establishment and geographical and species protection and management. These conventions establish the primary goals and conservation targets to which nations should aspire. They are the bedrock of the conservation planning framework.

At the 1992 Earth Summit in Rio de Janeiro, world leaders agreed on a comprehensive strategy for sustainable development. One of the key agreements adopted was the Convention on Biological Diversity (CBD). This

agreement among most of the world's governments sets out commitments for maintaining the world's ecological values as countries strive for economic development. The CBD establishes three main goals: 1) the conservation of biological diversity; 2) the sustainable use of its components; and 3) the fair and equitable sharing of the benefits from the use of genetic resources (CBD 2013). The CBD recognises that protected areas play a critical role in the achievement of these goals.

A central principle of the CBD is an 'ecosystem approach' to conservation planning (referred to later in this chapter), which expands the focus to broader landscapes and seascapes. This has involved the development of methodologies for dividing up the Earth into discrete spatial units possessing distinct biological and ecological characteristics and a strategic assessment of areas needing protection (CBD 2013).

In 2004, the CBD parties made a comprehensive and specific protected area commitment by adopting the Programme of Work on Protected Areas (PoWPA). The PoWPA enshrines development of participatory, ecologically representative and effectively managed national and regional systems of protected areas, where necessary stretching across national boundaries. The PoWPA is considered the defining framework for protected area planning for the coming decades (CBD 2013). It is a framework for cooperation between governments, donors, NGOs and local communities to plan for and establish a network of protected areas around the world (Barber et al. 2004).

In 2010, as considered in Chapter 2, the parties to the CBD adopted the *Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets* (CBD 2011). This plan presents the overarching framework for biodiversity of the entire UN system and is used to inform the biodiversity strategies and action plans for each nation. Target 11 of the strategic plan recognises that the establishment of comprehensive, ecologically representative, effectively managed and financially secured protected area networks is a critical strategy not only for biodiversity conservation, but also for securing ecosystem goods and services and supporting climate change adaptation and mitigation.

This planning target seeks to ensure that ecosystems, species and genetic diversity are safeguarded in both the land and the seascape, that key habitats are protected and that species migration and movement can occur. The target recognises protected areas as the cornerstone of conservation actions and as such is one of the main tools at a country's disposal to reduce habitat loss.

Several methods are also being used by NGOs to help determine global conservation priorities that focus on irreplaceability, targeting areas with highly diverse and endemic plant, bird or terrestrial vertebrate taxa. Some of these priority-setting approaches are considered proactive, focusing on sites with low threat but high irreplaceability, and others are reactive, prioritising both threat and irreplaceability (Brooks et al. 2006).

Perhaps the most widely known method for setting geographic conservation priorities at the global level is the 'hotspot' approach, which has been widely adopted in recent years among the conservation community. Simply stated, these are areas that are locally, nationally and globally important for the manifestation of biodiversity (at genetic, species and ecosystem levels). These areas cover different taxa. For example, the key biodiversity area (KBA) approach uses four criteria for setting priorities that stress irreplaceability and vulnerability. Using consistent global criteria of vulnerability and irreplaceability, the KBAs are mapped by national conservation organisations. KBA identification is focused on land, freshwater and marine environments under national jurisdiction. This is an important approach for national gap analyses and prioritisation to increase the effectiveness and establishment of protected areas. The LifeWeb Zero Extinction Campaign represents another example of biodiversity priority setting at a global scale. The campaign advances Aichi Biodiversity Target 12 to prevent the extinction of known threatened species. The campaign advances two main approaches to address the threat of extinction: 1) protection of key unprotected sites; and 2) enhanced protection of currently protected sites. An example of a reactive approach to biodiversity conservation planning is the Last of the Wild initiative of the Wildlife Conservation Society (WCS) (Sanderson et al. 2002). Last of the Wild places are identified using biodiversity indices in combination with threat indicators, such as human population density, accessibility of the regions to human development and land transformation (Sanderson et al. 2002; Naro-Maciel and Sterling 2008).

National-scale protected area network planning

Globally, the integrity and effective management of protected areas at the national level remain the highest priorities. A system plan is the design of a total reserve system covering the full range of ecosystems and communities found in a particular country (Davey 2008).

The plan should be a means to establish the priorities for a workable national system of protected areas and should address the following points:

- define the priority of protected areas as a worthwhile national concern and of strategic importance
- define the relationships between: a) different units and categories of protected areas; and b) protected areas and other relevant categories of land
- define the roles of key players in relation to protected areas and the relationships between these players, such as building support and a constituency
- identify gaps in protected area coverage (including opportunities and needs for connectivity) and deficiencies in management
- identify current and potential impacts, both those affecting protected areas from surrounding lands and those emanating from the protected areas that affect surrounding lands (Davey 2008).

A good example of a planning approach and conservation priority-setting at a national scale is in Australia (Case Study 13.3). A whole-of-government decision by the Council of Australian Governments in 1992 agreed to a strategic policy framework to establish a comprehensive, adequate and representative system of protected areas throughout Australia (Government of Australia 2010). Twenty years on, this remains one of Australia's key conservation policies, reflected most recently in *Australia's Strategy for the National Reserve System 2009–2030*. This commitment was followed some years later with a decision by the Australian and New Zealand Environment and Conservation Council to pursue a National Representative System of Marine Protected Areas (Government of Australia 2014).

The scientific foundation that underpinned and guided the strategy represented more than 25 years of significant collaboration between all governments and numerous scientific bodies to establish both the Interim Biogeographic Regionalisation for Australia (IBRA) and the Interim Marine and Coastal Biogeographic Regionalisation for Australia. Both have continued to be refined as new information and data become available.

This sound conservation planning approach has enabled governments and NGOs to develop strategies for new declarations and purchases of land. It has also been a major catalyst in building partnerships between government and NGOs and the community. For example, the private land trust sector has been able to leverage the Australian Government's two-for-one funding formula to attract major donors. New models for conservation management have developed and as a result four types of protected areas are now recognised in the National Reserve System (NRS):

- public (or government-owned) reserves
- Indigenous Protected Areas (IPAs)
- private protected areas
- shared management reserves.

Despite the strength of the planning approach and the steady growth of the protected area system in Australia, the challenges remain. Australia is not succeeding in stemming the loss of species and ecosystems, and it is becoming increasingly apparent that protected areas cannot be managed in isolation from other land management issues such as increased fragmentation, inappropriate fire management, resource use and uncontrolled invasive species, which weaken both species and ecosystems at a national scale. With government leadership and the resourcing capacity of the NRS diminishing in recent years, leadership from private donors, NGOs and community organisations will be vital for the ongoing implementation of the strategy.

Over the past decade there has been a shift in governance of land, water and natural resources and ownership and/or management to NGOs, communities, indigenous peoples and private parties—either alone or in partnership. This shift from the establishment of government-managed protected areas to new models of governance has also resulted in new approaches to planning. This is best illustrated by the model of the Indigenous Protected Area (IPA)—an entirely voluntary contract model between traditional owners and the Australian Government to manage land for agreed conservation priorities (Case Study 13.4). This concept has been successful with 55 IPAs declared as of 2014, covering 43 million hectares or 5.6 per cent of Australia, with many more communities expressing interest in developing an IPA (IUCN 2014). This is a significant contribution to the comprehensiveness, adequacy and representativeness of the protected area system in the 20 per cent of the continent under Indigenous ownership. It also provides important social benefits to Indigenous communities and helps maintain and strengthen attachment to the land.

While IPAs are inherently different from public protected areas in terms of formal security of conservation tenure and their governing institutions, management arrangements to secure biodiversity conservation are made through other effective means such as management plans that specifically take into account Indigenous cultural issues.

These approaches have broadened the types of partners contributing to the NRS and the planning, management and governance arrangements. These arrangements will inform and hopefully encourage other approaches to expanding Australia's NRS and perhaps areas further afield.

Case Study 13.3 Australia's National Reserve System

Australia has an evolving National Reserve System (NRS) of terrestrial parks and reserves that conserves examples of its natural landscapes and ecosystems. It also has an extensive marine protected area network that includes the Great Barrier Reef Marine Park, as well as fish habitat reserves, fish sanctuaries, aquatic reserves, conservation areas, marine parks and marine and coastal parks.

Land and inland freshwater protected areas

Australia's NRS is a national network of public, Indigenous and private protected areas covering land and inland fresh water. The goal of the NRS is to develop and effectively manage a comprehensive, adequate and representative national system of protected areas, as the primary means for securing long-term protection for Australia's terrestrial biodiversity.

Comprehensiveness refers to the aim of including samples of the full range of regional ecosystems recognisable at an appropriate scale within and across each IBRA bioregion.

Adequacy refers to how much of each ecosystem should be sampled to provide ecological viability and integrity of populations, species and ecological communities at a bioregional scale. The concept of adequacy incorporates ecological viability and resiliency for ecosystems for individual protected areas and for the protected area system as a whole.

Representativeness is comprehensiveness considered at a finer scale and recognises that the regional variability within ecosystems is sampled within the reserve system.

The NRS complements other efforts (in particular, actions to improve vegetation, habitat and water quality) to conserve biodiversity across terrestrial, inland fresh water and marine ecosystems and to meet Australia's international obligations to protect native species and habitats.

The NRS strategy 2009–30 (Government of Australia 2010) provides guidance for improved coordination and supports collaborative action by protected area managers and key stakeholders. The strategy identifies priority actions to provide a nationally coordinated approach under each theme, including the following national targets for an NRS:

- examples of at least 80 per cent of all regional ecosystems in each bioregion by 2015
- examples of at least 80 per cent of all regional ecosystems in each subregion by 2025
- core areas for the long-term survival of threatened ecosystems and threatened species habitats in each of Australia's bioregions by 2030
- critical areas for climate change resilience, such as refuges, to act as core lands of broader whole-of-landscape scale approaches to biodiversity conservation by 2030.

Actions to meet the national targets are supported by:

- clear identification and adequate protection of the biodiversity assets of each bioregion through collaborative and integrated management with other landowners and managers using a whole-of-landscape approach to address conservation priorities
- rigorous science and robust monitoring
- effective and adaptive management regimes
- consistent approaches informed by the development of national frameworks for management effectiveness and protected areas on private lands
- strong partnerships between governments, private landholders, Indigenous peoples, industry, local communities and NGOs
- routine reporting to a well-informed and supportive Australian community.

Each State and Territory in Australia is required to prepare a five-year plan to implement the strategy. These plans support the strategy and reflect the regional differences in conserving biodiversity across the landscape and the conservation challenges they pose.

The terrestrially based NRS has laid the cornerstone for biodiversity conservation in Australia and is recorded in a national database, the Collaborative Australian Protected Area Database (CAPAD), along with each reserve's classification in accordance with the IUCN protected area categories (Chapter 2). CAPAD is updated every two years and provides the official record of progress for reporting against numerous national and international obligations, making it quantifiable and open to public scrutiny and accountability (Government of Australia 2014).

National Representative System of Marine Protected Areas

The creation and management of marine reserves form an important strategy for the conservation and sustainable use of the marine environment. Marine reserves, when well designed and managed effectively, make an important contribution to maintaining the overall health and resilience of the world's oceans (Chapter 20).

This is recognised by the primary goal of Australia's National Representative System of Marine Protected Areas (NRSMPA), which is to establish and manage a comprehensive, adequate and representative system of marine protected areas to contribute to the long-term ecological viability of marine and estuarine systems, to maintain ecological processes and systems, and to protect Australia's biological diversity at all levels (Government of Australia 2014). The NRSMPA goals allow for a broad spectrum of activities, including recreation, tourism, shipping and the use or extraction of natural and living resources, where such activities are compatible with the primary goal (Government of Australia 2014).

The creation of the NRSMPA has been ongoing since 1998 following an agreement between the Australian Government, the States and the Northern Territory. The States and the Northern Territory are establishing marine protected areas in their coastal waters, while the Australian Government is establishing marine protected areas in Commonwealth waters around Australia. Once completed, the NRSMPA will meet Australia's international commitments as a signatory to the CBD to establish a representative system of marine protected areas within Australia's Exclusive Economic Zone (Government of Australia 2014).

Principles used in selecting areas suitable for inclusion in the NRSMPA include:

- the capacity of a marine reserve to mitigate identified threats to conservation values
- the occurrence of spatially defined habitats for and/or aggregations of threatened and/or migratory species
- the occurrence of ecologically important pelagic features that have a consistent and definable spatial distribution
- the occurrence of known small-scale ecosystems associated with the benthic/demersal environment
- relevant available information about small-scale distribution of sediment types and sizes and other geo-oceanographic variables
- occurrence of listed heritage sites (where inclusion in the marine reserve network would improve administration of protection regimes)
- socioeconomic costs.

The Goals and Principles for the Establishment of the NRSMPA in Commonwealth Waters (Government of Australia 2014) guide the identification of areas representative of the diverse ecosystems and habitats in Commonwealth waters. They provide guidance about how to design regional networks of marine reserves that meet the principles of 'comprehensiveness', 'adequacy' and 'representativeness'. Planning for the uses and management of marine reserves currently utilises the following inputs:

- scientific information for each bioregion
- data on the location and distribution of human activities in a marine region
- the views of ocean users and stakeholders in each marine region
- consideration of the contribution that existing spatial management measures can make to the NRMSPA
- consideration of potential management effectiveness—for example, the feasibility of compliance (Government of Australia 2014).

Systematic conservation planning

While we are developing a far better global sense of where the highest priorities for conservation lie, progress has also been made in developing tools for finer-scale systematic conservation planning of protected area systems based on explicit and quantifiable biodiversity conservation criteria at a regional scale. This encompasses size, shape, replication, complementarity and connectivity of protected areas. Conservation planning at regional and local levels addresses not only the content and location of individual protected areas and sets of protected areas, but also their design, which includes variables such as size, connectivity and alignment of boundaries for maximum effectiveness.

According to Margules and Pressey (2000), science is a fundamental component supporting systematic conservation planning and its effectiveness comes from its efficiency in using limited resources to achieve conservation goals, its defensibility and flexibility in the face of competing land uses, and its accountability in allowing decisions to be critically reviewed.

Margules and Pressey (2000) describe systematic conservation planning as a process in six stages, which has many feedback loops. The framework applies equally well to many problems in 'off-reserve' conservation, including habitat restoration. They suggest that systematic conservation planning at national and regional levels requires:

- decisions about the features to be used as conservation targets (species, communities or habitats, or environmental features related to vegetative cover and geographic features) for overall biodiversity in the planning process
- clear goals translated into quantitative operational targets
- recognition of the extent to which conservation goals have already been met in existing reserves
- simple methods for locating and designing new reserves to complement existing ones
- application of criteria for implementation, especially with respect to phasing actions when it is unlikely that all actions can be undertaken simultaneously
- objectives and mechanisms for maintaining conditions in reserves required to support key natural features, monitoring and adaptive management.

Margules and Pressey (2000) outline the stages in systematic conservation planning as follows. An example application of these stages is given in Case Study 13.5.

Case Study 13.4 Management planning for Indigenous Protected Areas

Indigenous Protected Areas (IPAs) are areas of land and/or sea over which the Indigenous traditional owners or custodians have entered into a voluntary agreement with the Australian Government for the purposes of promoting biodiversity and cultural resource conservation (Davies et al. 2013).

IPA management plans are based on making connections between Indigenous people, country, traditional law, custom and culture with the Australian and international systems for protected area management. IPA management plans are most effective if they make sure Indigenous peoples drive and determine how protected area management requirements will be met.

The IPA management plans provide a basis for formal government recognition of Indigenous lands as part of the Australian national system of protected areas and are also seen by the Australian Government as an important mechanism for supporting and invigorating the use of Indigenous ecological knowledge in biodiversity conservation. Development of a management plan has been integral to declarations made by 50 Indigenous groups in Australia of their intent to manage all, or part of, their customary estates for conservation outcomes in perpetuity as IPAs.

Most early IPA plans adopted a conventional distinction between natural and cultural values, reflecting a foundational principle of modernist Western thought that can make deep cross-cultural communication difficult (Davies et al. 2013). These concerns led IPA program managers to initiate the development of guidelines for use by traditional owners and IPA planners with the aim of ensuring that management plans reflected the distinctive characteristics of IPAs. Recent innovations in developing management plans appropriate to Indigenous and community conserved areas described by Davies et al. (2013) allow protected area managers to better understand and adjust to community settings when developing plans.

New approaches in some recent IPA management plans documented by Davies et al. (2013) include:

- overt recognition of the primacy of customary governance
- strategic planning formats that reflect interlinkages between people, place, plants and animals
- planning frameworks that encompass customary territories, identify cross-scale issues and challenge power relations embedded in colonial tenures
- a suite of planning documents for varied audiences and purposes, with an emphasis in the main plan on visual and spatial communication modes that facilitate accessibility to traditional owners.

These innovations are not widespread across existing IPA management plans, but their inclusion in management plan guidelines will encourage their wider adoption and ongoing innovation and will no doubt promote confidence among traditional owners about maintaining control of IPA governance, management and knowledge.

1. Compile data on the biodiversity of the planning region

- Review existing data and decide which data sets are sufficiently consistent to serve as surrogates for biodiversity across the planning region.
- If time allows, collect new data to augment or replace some existing data sets.
- Collect information on the localities of species considered rare and/or threatened in the region (these are likely to be missed or under-represented in conservation areas selected only on the basis of land classes such as vegetation types).

2. Identify conservation goals for the planning region

- Set quantitative conservation targets for species, vegetation types or other features (for example, at least three occurrences of each species, 1500 hectares of each vegetation type or specific targets tailored to the conservation needs of individual features). Despite inevitable subjectivity in their formulation, the value of such goals is their explicitness.
- Set quantitative targets for minimum size, connectivity or other design criteria.
- Identify qualitative targets or preferences (for example, as far as possible, new conservation areas should have minimal previous disturbance from grazing or logging).

3. Review existing conservation areas

- Measure the extent to which quantitative targets for representation and design have been achieved by existing conservation areas. A general 'gap analysis' (Case Study 13.6) can also be conducted.
- Identify the imminence of threat to under-represented features such as species or vegetation types, and the threats posed to areas that will be important in securing satisfactory design targets.

4. Select additional conservation areas

- Regard established conservation areas as 'constraints' or focal points for the design of an expanded system.
- Identify preliminary sets of new conservation areas for consideration as additions to established areas. Options for doing this include reserve selection

algorithms or decision-support software to allow stakeholders to design expanded systems that achieve regional conservation goals subject to constraints such as existing reserves, acquisition budgets or limits on feasible opportunity costs for other land uses.

5. Implement conservation actions

- Decide on the most appropriate or feasible form of management to be applied to individual areas (some management approaches will be a fallback from the preferred option).
- If one or more selected areas prove to be unexpectedly degraded or difficult to protect, return to stage four and look for alternatives such as restoration.
- Decide on the relative timing of conservation management when resources are insufficient to implement the whole system in the short term (usually).

6. Maintain the required values of conservation areas

- Set conservation goals at the level of individual conservation areas (for example, maintain several habitats for one or more species for which the area is important). Ideally, these goals will acknowledge the particular values of the area in the context of the whole system.
- Implement management actions and where possible zonings in and around each area to achieve the goals.
- Monitor key indicators that will reflect the success of management actions or zonings in achieving goals.
- Modify management as required.

Gap analysis

Although the growth in number and area of global protected areas has been spectacular in recent decades, it does not yet come near to fulfilling the objectives of the PoWPA or the needs of species and ecosystems, given that a large number of species, ecosystems and ecological processes are not adequately covered in existing protected areas (CBD 2013). One important development in the past decade is the use of ecological gap analysis to assess how well protected areas conserve biodiversity, and where the highest priorities are for expanding and reinforcing protected areas (Langhammer et al. 2007; Dudley 2010; Figgis et al. 2012).

The two main criteria to determine conservation targets and priorities are irreplaceability and vulnerability (CBD 2013). These criteria can be applied across all biogeographic regions and taxonomic groups and are designed for application through a national or regional level, bottom-up iterative process involving stakeholders (Langhammer et al. 2007).

Ecological gap assessment analyses the extent to which key biodiversity features (species, natural communities, ecological systems and the ecological processes that sustain them) are sufficiently represented within a protected area network. The aim is to identify those key biodiversity features that are not well represented. Ecological representation provides a unifying methodology to address gaps in a protected area system at a national scale.

Protected area management planning

Management plans are reserve or place-specific plans that look at the values of an area, the issues and threats that may affect that area, and the strategies and actions required to best manage the place to maintain or improve its conservation and other values.

The purposes of management plans are generally to:

- ensure reserves are managed to achieve objectives of legislation, stakeholder expectations (including local indigenous communities), corporate goals and conservation management objectives: quality assurance, consistency and prevention of incremental degradation through *ad hoc* decision-making
- gain public involvement in reserve management: give the community a way to have their say about management
- develop a shared understanding of and a vision for a reserve: identify the significance of an area, consolidate legislative and policy issues, integrate various elements of management, and convey to the public and management staff how the reserve will be protected and visitors provided for
- provide public accountability: a 'statement of intent' for the community, what we want to achieve and how, and the criteria by which the performance of management under the plan will be assessed.

As indicated in Lockwood (2006), in the 1970s and 1980s, management plans tended to include a lot of resource information that was not directly relevant to management strategies. Also, the planning process was often drawn out and involved specialist planners or planning teams. More recently, the trend has been towards leaner, more strategic management plans. There is greater emphasis on setting and meeting targets for

Case Study 13.5 Using systematic conservation planning in Mozambique and South Africa

The Maputaland Centre of Endemism, which forms part of the Maputaland-Pondoland-Albany hotspot, is an area of approximately 17 000 square kilometres that lies in Mozambique, South Africa and Swaziland (Steenkamp et al. 2004). A little more than half of the area is within South Africa, of which 28 per cent is located within reserves. This area is referred to as Maputaland. Maputaland is the focus of a number of conservation initiatives, which resulted in the need for a systematic conservation planning exercise to guide the land manager, Ezemvelo KwaZulu-Natal Wildlife (EKZNW), and other stakeholders when selecting preferable locations for new conservation-compatible projects outside the state-managed reserves.

From its inception, it was determined that the process would need to be supported by biodiversity data with a fine spatial scale, however, these data were limited. As a result, a preliminary planning analysis was undertaken of the distribution of the region's land-cover types, as these could be mapped at relatively low cost from satellite imagery.

Producing the GIS data

A land-cover map was produced from Landsat images. The land-cover classification was based on an existing system developed for northern Maputaland and modified to reflect more recent work on the region's vegetation communities. Five ecological zones were identified, which contained 29 natural habitat types and five types that had been transformed by agriculture or urbanisation. Its accuracy was measured by recording the actual and predicted land-cover types at 723 points throughout the study area.

Setting the biodiversity targets

The biodiversity targets were developed by EKZNW staff with experience in conservation planning and the ecology of Maputaland. Staff decided that targets should be based on original land-cover extent to avoid under-representing highly transformed habitats. Expert opinion and data on the current transformation levels of each of the ecological zones assisted the process. It was also decided that land-cover types endemic to the Maputaland Centre of Endemism, or that were perceived to be at greater risk of transformation, should have higher conservation targets. Targets were therefore set as being 20 per cent of original extent for most land-cover types and 40 per cent of original extent for endemic and threatened land-cover types.

Identifying areas of high conservation value

The data were analysed using MARXAN, a conservation planning program that uses simulated annealing techniques to identify a large number of near-optimal sets of planning units (where each set is called a portfolio) based on an iterative improvement method that incorporates occasional backward steps. MARXAN measures the effectiveness of a portfolio of planning units by calculating its portfolio cost, which in this case was based on three elements. The first element was the combined planning unit cost, which was set as being the combined area of the planning units, measured in hectares. The second element was the combined target penalty cost, which is the sum of the costs for not meeting individual representation targets. Ideally, these penalty values should have practical relevance, allowing MARXAN to make trade-offs between the costs of including more planning units in a portfolio and the cost of not meeting a target. The third element was the total perimeter length of the planning unit portfolio or 'boundary length', multiplied by a boundary length modifier. MARXAN minimises this boundary length cost by choosing patches of planning units, rather than a series of isolated units.

The simulated annealing process involved running the software a number of times, as it is based on an iterative selection process that generally identifies different portfolios at the end of each run. MARXAN then identifies the best of the portfolios it has produced—that is, the portfolios with the lowest total cost based on summing the planning unit, target penalty and boundary costs. In addition, it produces the summed solution output, which calculates the number of times each planning unit appeared in the different portfolios produced by the different runs. Increasing the number of iterations and the number of runs increases the likelihood of identifying low-cost portfolios but this also increases the amount of computer processing time.

The process used 37 943 planning units in the analysis, with each unit having an area of 25 hectares. Planning units with more than 50 per cent of their area within existing reserves were set as being already conserved. In addition, planning units were excluded from any possible conservation portfolio if more than 25 per cent of their area consisted of commercial agriculture, or if more than 80 per cent of their area consisted of subsistence agriculture. These units were excluded because MARXAN can select areas based on their connectivity value alone and it was felt these highly transformed units would not be suitable for such a role, with highly transformed commercial agriculture being less suitable than subsistence agriculture.

Results

The current protection afforded to land-cover types by the existing set of reserves ranged from 8.8 per cent for Lebombo grassland to 100 per cent for dune thicket. The summed solution map produced by MARXAN identified 316 planning units (0.8 per cent of the planning region) that were part of every planning portfolio identified by the 200 runs. All of these irreplaceable units bordered existing reserves and contained 20 different natural land-cover types, with *Terminalia* woodland and floodplain grassland best represented. An additional 3244 units (8.6 per cent of the planning region) were identified as being part of half or more of the different conservation portfolios. Most of these high-scoring units were found in areas that were adjacent to existing reserves; however, important patches of coastal plain vegetation were also identified.

The analysis showed that most of the land-cover types are well represented, although many of these reserves are ecologically isolated. In addition, this exercise provided valuable data on the location of important conservation areas in the region and this information has already helped inform local land-use decisions. In particular, EKZNW used the summed solution map to identify where new eucalyptus plantations should not be located, illustrating the role of conservation assessments in reducing the risk of losing important biodiversity.

Source: Adapted from Smith et al. (2006)

Case Study 13.6 Using gap analysis in South Africa

The South African Department of Water Affairs and Forestry (2005) used gap analysis to determine conservation planning priorities for the forest biome of South Africa. The size of the area and the large number of administrative boundaries involved make implementation of forest conservation planning in South Africa challenging. National planning is essential for providing a framework for finer-scale planning—necessary at provincial and local levels. There is also a need for facilitating the integration of national planning with the numerous bioregional and spatial development frameworks.

The forest biome intersects with a number of bioregional conservation planning programs, some of which have been identified by Conservation International as global biodiversity hotspots. The total area of forest in South Africa is calculated to be 4867 square kilometres. As part of the assessment process, 16 185 forest patches were evaluated, of which only 5856 are larger than 10 hectares, and just more than 800 patches are larger than 100 hectares. Being highly fragmented, the forest biome is particularly vulnerable and under ever-increasing threat from urban development, non-sustainable subsistence harvesting, agriculture, mining, invasive alien species and fires. Many high conservation-value forests considered as being under threat are also important to the livelihoods of poor rural communities. This project identified forest clusters that are likely to be more resilient to climate change, based on the identification of important forest clusters situated along large river corridors. Indicator ratings for each forest patch (and forest cluster) were calculated and used for prioritisation. These include irreplaceability, threat and livelihood value, vulnerability to edge effects, poverty, population density, accessibility and habitat transformation of surrounding forest buffer areas.

The gap analysis aimed to provide answers to four major questions.

1. How much of each forest type is under some form of protection?
2. How much forest is under strict protection, and what percentage of each forest type is still needed to achieve targets?
3. For each forest type, what percentage of the 100 per cent irreplaceable forests are in Type 1 protected areas?
4. What is the provincial contribution to target achievement for each forest type?

The study identified priority forest areas that are urgently needed for inclusion within a forest protected area network. The gap analysis provided a detailed scorecard that can be used to monitor conservation progress and target achievement/shortfall for each forest type. The study found that the current network of strict protected areas in South Africa is significantly unrepresentative of forest biodiversity. Overall, 44 per cent of the total area of indigenous forest is under some form of protection (this includes Type 1 and Type 2 protected areas, as well as state forests). For most forest types, many of the highly valuable forests (100 per cent irreplaceable) were not under strict protection. Overall only 32.6 per cent of the area covered by 100 per cent irreplaceable forests falls within strict (Type 1) protected areas. Gap analysis also considered 'target shortfall', or the percentage of the forest-type targets still outstanding. Only two forest types were reasonably close to meeting their conservation targets.

Source: Adapted from Department of Water Affairs and Forestry (2005)

Conservation planning exercise by local community, Wasini Beach Management Unit, Kenya

Source: Lorna Slade

preparation of plans for certain categories of reserve and there is now more direct involvement of park managers and the community in the preparation of management plans. Time frames for plan preparation have been condensed and the use of planning manuals and standard plan formats with some generic sections such as zoning has assisted this trend.

Some plans for larger parks have adopted a performance-based approach that specifies outcomes sought for each of the major planning components (for example, resource protection, access, recreation and tourism) and strategies with performance measures and indicators. Performance-based approaches comprise two components: first, criteria that describe the desired end result, and second, methods to define standards used to measure the acceptable limits of impacts to ensure the desired end result (such as recreation impacts). This style of plan provides for certainty through a clearly articulated desired end state. The approach allows for flexibility in the approach to be adopted to achieve the end result.

Box 13.1 Examples of management planning for ICCAs

Indigenous peoples and local communities that govern ICCAs (see Chapter 7) have planned the management of their territories and areas for centuries. However, planning is not a distinct activity, but an integral part of their lives and customs, as a response to external challenges, or as a means of securing the future. Most ICCAs continue to engage in such informal planning. Some, however, have begun to make planning a distinct and formal activity, especially as a means of seeking or responding to their recognition by government.

In Iran, norms and customs of indigenous peoples and local communities have sustained various ways of life and forms of natural resource management over thousands of years. In the case of mobile or nomadic peoples, this applies particularly to the planning of migration, the sharing of benefits from natural resource management, restoration (*qoroqs*) of degraded areas, customary management of rangelands and forests, collection and dispersal of seeds, sustainable use of plants and animals, and conflict resolution. The knowledge and practices embodied in these activities form the basis of recent initiatives at securing their territories for conservation, including sustainable use and livelihoods enhancement. This involves a set of planning and visioning exercises, facilitated by the civil society group Cenesta. A proposal for a territory-based Rangeland Management Programme aims at improving rangeland management and conservation, recognising the importance of traditional knowledge in the management of ecological complexity (including non-equilibrium ecosystems), and community-based mapping and monitoring.

In Kenya, beach management units (BMUs) are associations of fishers, traders, and other fishery users and stakeholders centered around coastal landing sites. These BMUs are able to develop and enforce rules governing their fishery, including demarcating its boundaries and excluding non-members from outside the area, with the support and sanction of the Department of Fisheries. They may create their own management plans for this. Examples of regulations developed under this framework includes the designation of certain areas as no-take zones or otherwise regulated for particular uses, levying fees or taxes on fish landings or other activities such as tourism, regulation of the types of fishing gear that may be used, and restriction of use of the fishery to registered fishermen and boats. The BMU thus provides a clear governance framework for local fishery users to circumscribe and regulate their fishery. This converts the fishery from a general open-access governance context to one based on establishment and enforcement of local territorial and access rights over marine resources. The Department of Fisheries plays a key role in registering BMUs and facilitating the development and eventual approval of local management plans, and provides general oversight of the BMUs as well to ensure local rules are being followed.

In the Philippines, indigenous peoples who obtain a title to their traditional territories under the *Indigenous Peoples' Rights Act* are enabled to prepare Ancestral Domain Sustainable Development and Protection Plans (ADSDPP). Groups such as KASAPI (the national association of indigenous peoples) and the NGO PAFID help in their preparation. Financial assistance is given for ADSDPPs by the National Commission on Indigenous Peoples. However, many indigenous peoples are critical of the prescribed uniform format for the formulation of ADSDPPs, arguing that it violates their right to self-determination and governance. This illustrates the pitfalls of top-down formalisation of ICCAs and their planning processes.

Sources: Naghizadeh (2012); Nelson (2012); Pedragosa (2012)

The content, support and effective implementation of management plans are influenced by stakeholders and communities involved in participatory planning approaches. Case Study 13.7 presents an example of a participatory planning approach for one of Australia's most complex protected areas. This case study illustrates that the long-term advantages of involving a wide variety of communities and groups in the development of the plan include ongoing support and advocacy for the plan's implementation.

The increased significance of community-based governance of protected areas is beginning to generate new approaches to management planning, as presented in Case Study 13.4. This case study illustrates some of the characteristics that management plans should have in order to be appropriate to Indigenous Peoples and Community Conserved Territories and Areas (ICCAs) in which communities, rather than government, are the major decision-makers (Figgis et al. 2012). Box 13.1 provides examples of how the governors of ICCAs approach management planning for their territories.

Processes for preparing management plans

Whilst there are no prescribed formulas for preparing a management plan, there are some steps that are common to the development of most plans. The IUCN guideline on protected area management planning (Thomas and Middleton 2003) outlines the elements of good practice

Figure 13.2 Rational, adaptive and participatory planning process

Source: Adapted from Lockwood (2006)

for management planning, recognising that it has drawn primarily on the experiences of government-managed terrestrial protected areas.

In summary, the most effective management plans are succinct documents that identify the key features or values of the protected area, clearly establish the management objectives to be met and indicate the actions to be implemented. They are flexible enough to cater for unforeseen events that might arise during the currency of the plan. The process of developing a management plan may be more or less complex depending upon the objectives of the protected area, the risks or threats to these objectives, the number of competing interests, the level of stakeholder involvement and the issues arising from outside the protected area.

Whether the plan is simple or complex, sound planning principles should be applied to guide the planning process and help ensure that the completed management plan can be implemented. The factors that determine whether this will be the case are outlined in Thomas and Middleton (2003) and can be summarised as:

- the process used during plan preparation
- the presentation, style and content of the resulting plan
- the context within which the plan must operate
- the resources, commitment and capacity to implement the plan.

In this section, two planning processes are summarised and their contributions to good practice considered: a mixed rational, adaptive and participatory process (Case Study 13.7); and an adaptive process called 'Open Standards' (Case Study 13.8). Case Study 13.7 demonstrates the value of participation in the design and execution of the planning process and the resources, commitment and capacity to implement the plan. Case Study 13.8 demonstrates the importance of designing a practical process for plan preparation that recognises the community's needs and values and recognises the context within which the plan must operate.

A mixed rational, adaptive and participatory process

This model demonstrates how a particular mix of approaches guiding the planning process will influence exactly how each step is carried out, their relative importance and their relationship to one another. An example of a management planning process that incorporates rational, adaptive and participatory elements is presented in Figure 13.2 and outlined in Case Study 13.7.

Case Study 13.7 A plan of management for Kosciuszko National Park

Kosciuszko National Park is the largest national park in New South Wales and one of the largest and most important conservation reserves in Australia. The park contains glacial landforms and possesses a diversity of alpine plant communities and species that provide habitats for a number of rare and unusual animal species. Elsewhere, the park contains significant karst systems, deep river valleys and frost hollows, as well as vegetation communities ranging from snow gum woodlands and subalpine grasslands to extensive eucalypt forests, pockets of cool temperate rainforest and stands of native cypress pines. The snow-fed rivers of the mountains provide some of Australia's most important water catchments. The park contains major commercial interests in the form of alpine resorts and the Snowy Mountains Hydro-Electric Scheme, which contribute significantly to State and regional economies. The park is also rich with evidence of, or associations with, Aboriginal culture and the phases of historical land uses, scientific endeavour and the recreation and conservation efforts of many generations.

The review of the Kosciuszko National Park Plan of Management commenced in January 2002, involving wide public consultation. Planning involved the general community, as well as park users, neighbours, scientists and interest groups. This approach was considered the cornerstone to help build public understanding, ensure sound decision-making and increase the probability that the plan would be supported by all groups. The final plan gave greater recognition to the social and cultural values of the park, the importance of community involvement in park management and environmental stewardship by all agencies and organisations operating in the park. Some community representatives who were involved in the planning process later became representatives on the park's Advisory Committee, suggesting that the planning process also resulted in capacity-building and ongoing stewardship. Details of the consultation process are found elsewhere (Worboys et al. 2005) and this case study will focus on the outcomes of the planning process and an overview of the plan's implementation.

The new plan acknowledges the importance of the park's cultural and social values, and the need to protect these values from key threats, such as inappropriate fire regimes, climate change, introduced plants and animals, inappropriate development and unmanaged increases in visitation. The condition of these values in the park is assessed each year, both as an important measure of management effectiveness and as a tool for informing adaptive management. To do this, the condition of each value and the trend in condition are tracked in an integrated monitoring and evaluation program, making use of the results of monitoring programs, independent scientific information and other data recorded by staff or corporate reporting.

The plan requires that a public annual report be prepared each year, which outlines the progress being made on the plan's implementation. Six annual reports have now been prepared and each one summarises the main management achievements, research and monitoring programs, the annual condition assessment of the park's values as well as a review of the plan itself (five years after its adoption). In the 2011–12 reporting period, of the 17 values assessed, nine were found to be in acceptable condition under the current management regime. The other eight values have a current condition of concern and adaptive management actions are required.

Since the plan's completion there has been an ongoing commitment by the land manager, the NSW National Parks and Wildlife Service, to allocate revenue from park entry fees to the adaptive actions required to maintain or improve the values of the park on an annual basis.

Summer wildflowers, alpine area, Kosciuszko National Park

Source: Graeme L. Worboys

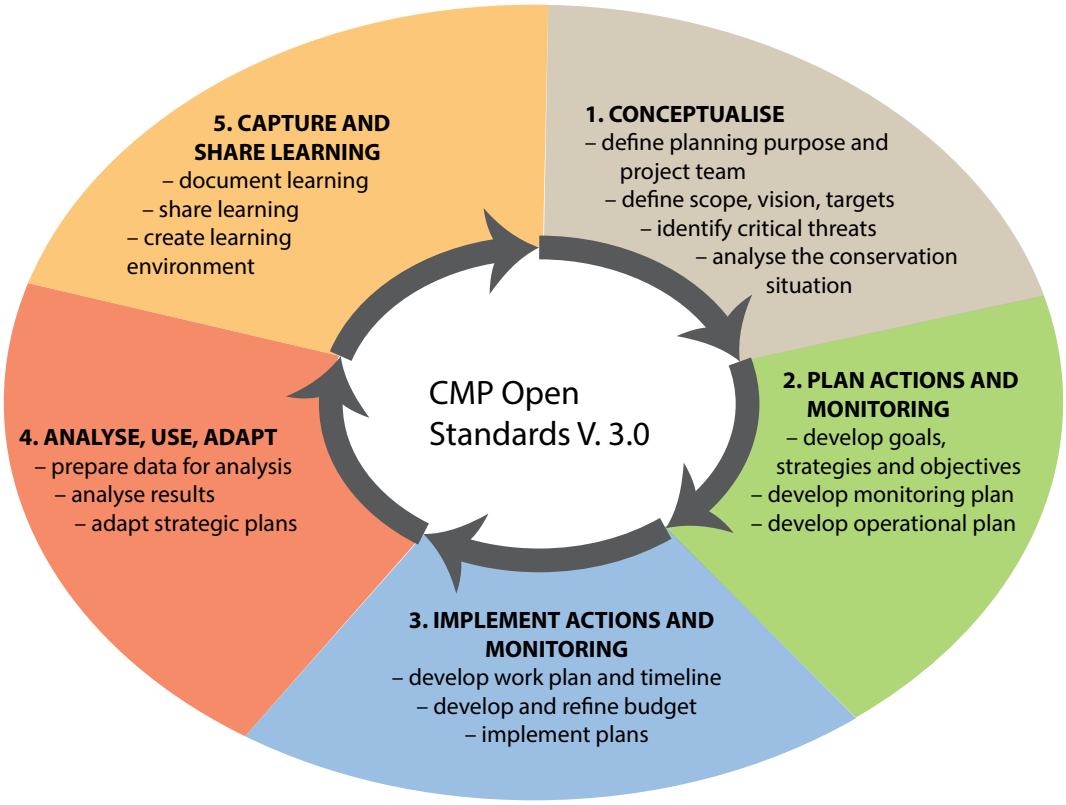

Figure 13.3 The Open Standards for the Practice of Conservation

Source: Adapted from CMP (2013)

An adaptive planning process: Open Standards

Some of the world's leading conservation organisations have collaborated to pool their experiences and develop a 'best-practice' process for developing, managing and improving conservation projects through adaptive planning. Developed out of a meeting of conservation practitioners in 2002 (Schwartz 2012), the Open Standards 'bring together common concepts, approaches, and terminology in conservation project design, management, and monitoring in order to help practitioners improve the practice of conservation' (CMP 2013:1). This process is called 'Open Standards for the Practice of Conservation' (Open Standards). Open Standards set out the step-by-step process for defining, planning, implementing and analysing conservation projects. In particular, Open Standards encompass:

- adaptive management: in which projects are adapted as they progress, based on the outcomes being achieved
- results-based management: an approach that integrates project design, management and monitoring to provide a framework for systematically testing assumptions, promoting learning and supplying timely information for management decisions; the focus is on performance and the achievement of outputs, outcomes and impacts on biodiversity.

The Open Standards draw on and combine a rich intellectual approach to planning with a pragmatic action-based approach to planning. Key forerunners are:

- the WCPA Evaluation Framework (for example, Hockings 2000)
- program logic (for example, Tucker 2005)
- evidence-based practice (for example, CEBC 2008)
- monitoring, evaluation, reporting and improvement (for example, ANAO 2004).

Open Standards aim to improve the quality of plans, guide their implementation and analyse the results being achieved so that plans can be adapted as implementation progresses. Open Standards establish a common language and standard set of steps (Figure 13.3). The use of consistent terms at some scale allows for improved aggregation to understand the cumulative impacts of action, but also to see how smaller-scale conservation can contribute to a larger scale. Open Standards use a 'common taxonomy' for threats and management actions.

The above steps are combined in a process that identifies key targets (or 'objects', following Ungar and Strand 2012, or building blocks), identifies and ranks threats (issues), evaluates the factors that contribute to those threats, and identifies prioritised strategies and actions that will mitigate threats or restore targets. In setting out an approach, the Open Standards propose that teams record their assumptions about how their targets function, how they are being impacted and how they expect interventions will make an impact, which fosters transparency (Schwartz et al. 2012).

The Open Standards require that practitioners are as clear and specific as possible in stating goals and objectives that are, as much as possible, 'SMART': specific, measurable, actionable, realistic and time-bound. The Open Standards then focus on 'repeated evaluation and prioritisation based on measured results [that are] central to maintaining a coherent project plan' (Schwartz et al. 2012:171). The Open Standards are, therefore, by their nature an adaptive approach. While the Open Standards provide a basic adaptive management 'framework', their implementation requires the capacity and willingness to adapt the framework to and use it in a specific project context. An example application of Open Standards is given in Case Study 13.8.

In their review of the use of Open Standards, Schwartz et al. (2012) suggested five areas that need consideration in their use and applicability. These are consistent with a number of issues identified in the Wunambal Gaambera case study and the practitioners' own experience. They highlight the need for the consideration of Open Standards both in terms of the theory of adaptive management and in the practical application of the approach.

Structure versus flexibility

As mentioned previously, the structured guidelines of the Open Standards provide a framework within which to establish a reasonable approach to establishing conservation actions. They are not a prescriptive tool and require flexibility and adaptability in their application to real-world situations.

Integrating multiple perspectives

Supporting Ungar and Strand's (2012) assertions about the impact of different cultural perspectives on the definition of plan targets (assets/building blocks), these need to include cultural and livelihood elements, not simply biophysical ones. The use of an ecosystem services approach (as currently outlined in the Open Standards) is insufficient to incorporate significant cultural differences. Further, it can be the case that one person's threat is another person's livelihood, and these need to be carefully and sensitively managed and understood.

Using many tools

Open Standards do not prescribe specific tools to be used in each step, but rather propose inputs and outputs. There are many specific planning tools that can be applied at each step of the process according to the specific needs of the particular project and the capacity of the team, and particularly where a high level of technical competence might be required (see Chapter 8).

Science and scientific method

A related point is that the Open Standards are 'a set of tools to help practitioners plan and implement conservation management, nothing more' (Schwartz et al. 2012:175). That is, they are not in and of themselves the conducting of conservation science, particularly in relation to determining the contribution and attribution of measures implemented through a plan to changes seen in the targets or threats being addressed. This requires well-constructed research programs with their concomitant resource requirements (time, capacity, funds). Game et al. (2012) further emphasise this point.

Cost/benefit

The Open Standards can be applied at many scales spatially and in time and expectations, and the use of tools needs to be adjusted accordingly. A process such as the Wunambal Gaambera project, establishing a 10-year strategic plan for 2.5 million hectares involving a large community, will clearly require a greater investment than a small short-term project. It is important for practitioners to be clear about the scale of investment that is appropriate for the context, and to adjust the use of tools accordingly.

Conclusion

Protected area planning processes have evolved to include clear articulation of overarching conservation imperatives defined by global priorities and links to larger-scale strategies, providing a strategic focus at a landscape scale. Successful planning has involved integration across various disciplines and inclusive and accessible processes, sophisticated and accessible systems of research, monitoring and communication, and experienced people to guide processes and implement the plans.

Case Study 13.8 Wunambal Gaambera Healthy Country planning process

The application of the Open Standards in a cross-cultural context was first contemplated in Australia as part of the Wunambal Gaambera Healthy Country planning process, and has subsequently given rise to a significant number of planning projects under the general Healthy Country planning approach. Wunambal Gaambera country (homeland) covers 2.5 million hectares of north-western Australia. The region is rich in both cultural and biophysical heritage, with a number of nationally important wetlands and rivers as well as a significant number of plants and animals of importance for conservation.

In 2007, the Wunambal Gaambera people sought the support and assistance of a number of organisations to develop a Healthy Country framework to guide their aspirations for looking after country and economic development. As the planning began, it quickly became apparent that it was not suitable to the context in terms of language and core concepts, and that targets needed to include wellbeing and cultural heritage (Figure 13.4). The process was adapted to allow local governance to better guide the process and content. Second, the core concepts were amended to better incorporate a Wunambal Gaambera world view. Both adaptations now form the core of regular training in northern Australia.

Wunambal Gaambera have now established a regular and permanent review committee, comprising both Indigenous and non-Indigenous members, to regularly review the plan. For a detailed discussion of the Wunambal Gaambera project, see Moorcroft et al. (2012).

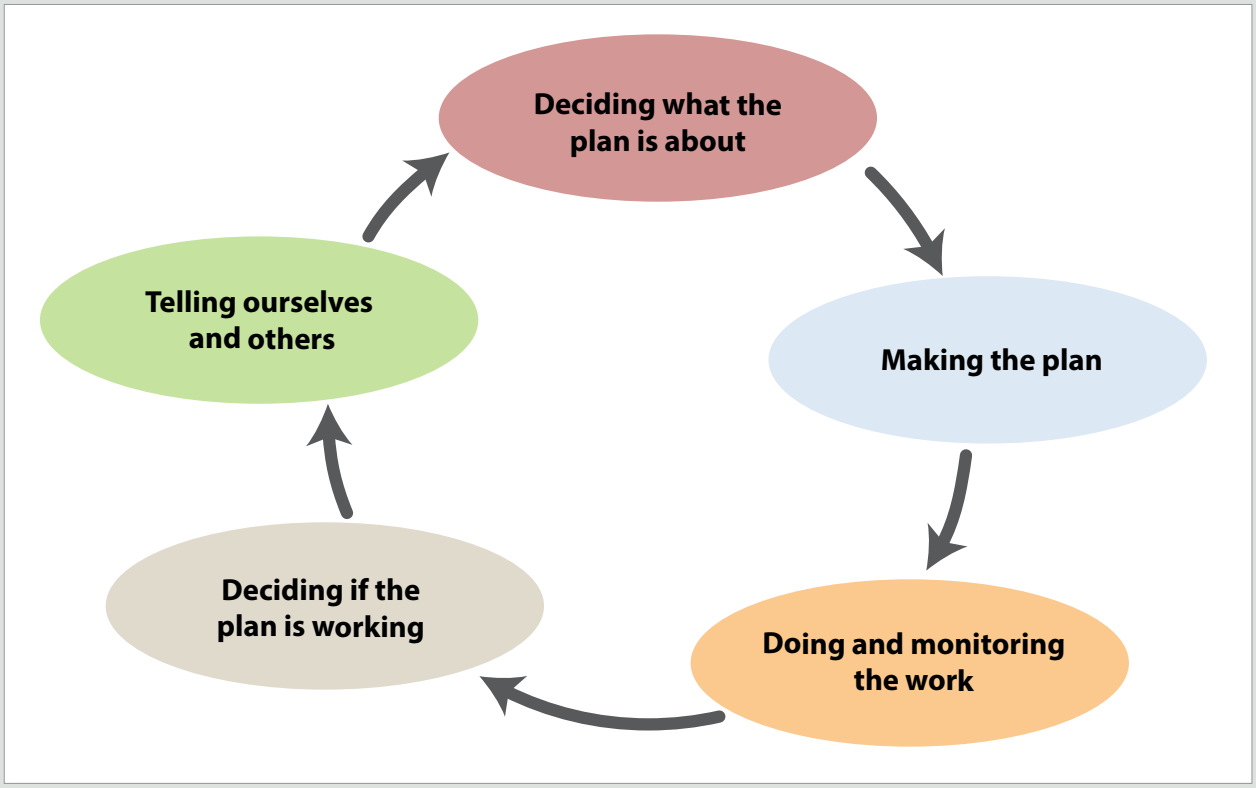

Figure 13.4 Revised Open Standards Approach as Healthy Country Planning using more appropriate language and simplified concepts

Source: Adapted from CMP (2013)

The importance and centrality of values (both agency and environmental values), a clear understanding of the issues affecting them (as illustrated by Case Study 13.1), linkages between objectives and actions that are clear and measurable, effective and adaptive management regimes, transparent decisions and routine reporting (illustrated by Case Study 13.7), and institutional frameworks that support the plan implementation and adaptation are all important elements of sound planning.

A key theme that emerges from this chapter is the centrality of participation and collaboration in planning processes and in improving the management of protected areas. The move towards adaptive and participatory planning is in part recognition that a community which appreciates the importance of biodiversity and healthy ecosystems is a critical ingredient to maintaining the momentum of inclusive, innovative conservation of these areas into the future.

Storm surge erosion, at Bar-mouth Beach, Ben Boyd National Park, NSW south coast, Australia. As sea-levels rise under the influence of forecast climate change (see Chapter 17), planners will need to deal with the consequences of more aggressive sea erosion of coastal areas including considering the associated environmental, social and political consequences.

Source: Graeme L. Worboys

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