Integrating Forest Protection, Management and Restoration at a Landscape Scale

WWF Forests for Life Programme
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The WWF *Forests for Life* programme would be pleased to receive any comments about the content and opinions expressed in this paper and on suggestions for how future editions could be strengthened and improved. Please send comments to WWF as above

Forward

WWF has been actively involved in conservation for over forty years. Early grants helped to create the Galapagos National Park in Ecuador and the first protected areas in Madagascar. In order to raise public support, flagship species such as the tiger and black rhinoceros dominated the imagery of WWF. It was always the vision of the founders that ecosystems, water and soils were an essential part of species conservation and slowly the organisation helped to make biodiversity a known term. Much of the 1980's was spent learning new approaches to biodiversity conservation and in particular understanding the complex relationships between people and their environment, recognising that conservation could not succeed without taking into account human needs. Realising that we were winning some battles but slowly losing the war, the 1990's brought the drive to magnify our conservation effort to meet modern threats at the same scale to which they occurred. Thus WWF began to work at the scale of *ecoregions*: relatively large areas of land or water with characteristic species, communities, ecological dynamics and environmental conditions.

WWF has identified approximately 200 terrestrial, freshwater and marine ecoregions of which best represent biodiversity at a global scale, and these so-called *Global 200* have become the main focus of our work. Ecoregion conservation maintains ecological processes by integrating site-specific activities, including protected areas, sustainable management and where necessary ecological restoration, along with policy interventions to create an environmentally sensitive operating context, based on a ~50year *biodiversity vision*.

From their outset, ecoregion approaches include consideration of social and economic factors, to set conservation within a framework of sustainable development and to address issues that cannot be tackled on a site-by site basis, such as cause and impacts of climate change. WWF is running ecoregional action programmes in many of the world's most precious natural habitats: ranging from the Chihuahua Desert of Mexico, the Congo Basin, the Forests of the Upper Yangtze in China, and the seas of the Bering Straits.

If WWF only worked in these ecoregions however some important global processes would be missed. So at the same time, WWF has developed a series of more general programmes based around specific themes: forests, freshwater, oceans, species, climate change and toxics. By establishing a set of targets for each theme, WWF then runs programmes at a national, regional and global scale, mostly addressing fundamental policy issues, to achieve them – such as establishing a certain amount of protected areas, or introducing sustainable management policies for timber, fish or freshwater into a minimum number of countries. In this way WWF offices around the world work in concert to deliver on the targets and conserve their focal ecoregions.

The development of ecoregional programmes and target driven programmes has added focus and coherence to WWF. However, translating their ambitious ideals into everyday practice is challenging. The following paper by the WWF Forests for Life programme presents a framework which shows that the forest targets – on protection, management and restoration – can be combined into a coherent programme and delivered at a landscape scale in a priority ecoregion.

We publish this paper in the hopes that WWF offices and our partner organisations will find its guidance useful in tackling their practical problems. In turn we wish to collect the real-life experiences it stimulates so that we can accumulate a body of knowledge and learning which will help others to apply best practice in a variety of circumstances. We need your feedback and look forward to receiving your comments, suggestions and ideas.

Chris Hails
Programme Director,
WWF International

Summary
Protected areas, good forest management and forest landscape restoration address different aspects of forest conservation and development, but they interact in the field. The paper describes steps needed to integrate the three into a coherent approach at landscape level.

The proposed approach also addresses some of the key questions that emerge during a transition from site-based to ecoregional conservation, which need to be answered on a case-by-case basis, such as: "is it better for biodiversity to have a few large strictly protected areas surrounded by generally incompatible land-uses or smaller protected areas embedded in a sea of supportive land uses?"

The approach recognises that overall landscape values are more important than individual sites and that in a world of competing interests, conservation aims need to be integrated with those of for example poverty alleviation, human wellbeing and other legitimate forms of social and economic development. Conservation does not take place divorced from issues relating to human wellbeing, and those involved in conservation are usually also concerned about social justice and sustainable development. The approach therefore also considers where these different but overlapping interests can best be integrated into a multifunctional landscape. Such integration will necessarily include negotiation and trade-offs.

Conditions vary between regions and the paper therefore stresses the need for a flexible framework, where the precise actions and sequence will change with location; however, the principle of aiming for a balanced mixture of protection, management and restoration, providing both ecological and social benefits, remains the same.

Application should therefore be tailored to a particular location and set of circumstances, with strategic interventions being made at a range of scales from local to national, considering livelihood issues and in the context of existing policies, institutions and interests. They should also, wherever possible, be integrated with other conservation activities such as those relating to freshwater and marine ecosystems.

The integration of protection, management and restoration is based on a number of assumptions, which need to be tested during implementation, including in particular:

- **Assumption 1: Synergy**: An integrated approach to protection, management and restoration will give greater net benefits than those achieved by pursuing these aims separately

- **Assumption 2: Trade-offs**: Within a landscape context, it is possible to reach a negotiated outcome that portrays a scenario for a landscape meeting different needs and achieving a range of environmental and socio-economic goods and services

- **Assumption 3: Cost efficiency**: Integrating programmes of protection, management and restoration will allow more efficient use of available financial and staff resources

Some examples are given from WWF's own portfolio of projects and the paper also describes how the integrative approach fits into the existing WWF forest conservation targets and ecoregion action programmes.

The approach draws on, and is a practical application of, the *Ecosystem Principles* agreed by the Convention on Biological Diversity.

Part 1: Introduction

This paper describes an approach towards integrating protection, management and restoration at a landscape scale. It has been developed by the WWF *Forests for Life* programme as a contribution to the organisation's global conservation programme, drawing in part on a landscape approach developed jointly with partners including IUCN The World Conservation Union and the Ecole Polytechnique Fédérale de Lausanne. While written mainly for a WWF audience, we hope that the paper will be of interest to other NGOs, development agencies and governments. Part 2 outlines the context within which WWF is applying these ideas; the rest of the document describes the overall approach, which could be applied in other situations.

The approach is not a rigid framework but an iterative, flexible way of tackling complex conservation and development challenges. It draws both on our own work and on the many existing attempts to integrate protection, management and restoration, both inside and outside WWF: to some extent it has been produced in response to these efforts. It remains experimental and we need feedback from applications in the field. WWF will therefore be very pleased to receive comments and criticisms on what follows, particularly if they are based on real life examples and experience. We intend to collect and to draw on lessons learned and produce a second version of this paper over the next few years.

Part 2: Background: The WWF *Forests for Life* programme: Protect-Manage-Restore

Covering 30 per cent of the earth's surface, forests are the most important terrestrial reservoir of biodiversity. Millions of rural people depend on forests for food, medicinal plants and fuelwood. Forests also provide goods and services for those who live far away from them. They store carbon dioxide (which would otherwise contribute to global warming), regulate water runoff and quality and produce wood and many non-timber products.

Despite their value, forests are under threat and half the world's original forests have been lost. In the last 50 years, deforestation and forest degradation has occurred at a rapid rate in the tropics, with recent estimates placing natural forest loss at 14.6 million ha per annum, (the size of Nepal)[1]. After centuries of deforestation, forest areas in most temperate countries are now stable or increasing. However, this often masks a loss in forest quality, with the remaining areas of diverse natural forests being replaced with single species plantations. Sometimes forests are replaced by agriculture or tree crops, but often soils are too poor to sustain crops resulting in degraded lands with little value for biodiversity or development.

These changes have detrimental impacts on many wild plant and animal species and on many human communities: in the latter case it tends to be the poorest and least politically powerful people who suffer the most. Improving the forest estate should therefore be a common cause between ecological, social and economic interest groups, although their needs may be different and agreeing on a way forward will often take protracted analysis and negotiation.

The factors leading to forest loss and degradation are complex, including misguided forestry, agricultural and infrastructure policies of governments and international agencies, illegal logging, poaching and fire, and lack of secure tenure for communities. Governments often see forests as reservoirs of unoccupied, unproductive land, thus underestimating the market and non-market values they have for local communities and the world, leading to ill-advised policies that encourage clearance. Few benefit from these policies, while many suffer.

In response to these problems, governments and NGOs have put great efforts into trying to halt and ultimately reverse forest loss and degradation. Such efforts began at a site scale, initially by at setting aside important forests in protected areas to keep them safe from exploitation and damage. Although such efforts continue, it is increasingly recognised that they need to be augmented by actions in other forests, including changes to management and, where necessary, efforts at restoration where forests have already been lost or seriously degraded. A range of different actions is therefore needed within any forest landscape.

WWF has a long history of field and policy work on forest conservation. The WWF/IUCN Forest vision is for the world to have *more extensive, more diverse and higher quality forest landscapes. These will meet human needs and aspirations fairly, while conserving biological diversity and fulfilling the ecosystem functions for all life on earth*. Implementation is based around the philosophy of "protect-manage-restore", the integration of protected areas, good forest management and forest restoration into a landscape mosaic capable of supporting its full complement of biodiversity while fulfilling necessary social and economic functions[2]. WWF has agreed three global targets that reflect this approach, along with other activities that address key threats and pressures on forests (see box 1). These represent important steps in WWF's long-term conservation aims and will require work with many partners and approaches, at a range of geographical scales. The targets are mainly quantitative; however, in addition to addressing issues of **quantity** (e.g. hectares of certified forests) they highlight **quality** (e.g. of management) and **diversity** (e.g. of forest types, regions and land tenure regimes). The principles of ecological integrity, human wellbeing and the landscape approach underpin this work.

Box 1: WWF's forest targets: 2001-2005[3]

Target 1: The establishment and maintenance of viable, representative networks of protected areas in the world's threatened and most biologically significant forest regions, by 2010

- Milestone 1: A gap and threat analysis completed for all focal forest ecoregions by 2002
- Milestone 2: *Management effectiveness of protected area networks assessed by 20 governments using the World Commission on Protected Areas' framework by 2004*
- Milestone 3: *Target protected area sites identified and mapped to enhance representation of protected area systems in focal forest ecoregions by 2004*
- Milestone 4: Management improved in 50m ha of existing forest protected areas by 2005
- Milestone 5: *50m ha of new forest protected areas created with priority given to focal forest ecoregions by 2005*

Target 2: 100 million ha of certified forests by 2005, distributed in a balanced manner among regions, forest types and land tenure regimes

- Milestone 1: *Two new forest and trade networks with producer members established in key timber export regions and one network established in a major Asian timber consuming country by 2002*
- Milestone 2: *New national standards or working groups involving forest owners recognised by the FSC in at least 20 countries by 2004*
- Milestone 3: *At least 25% of wood production from FSC-certified forests identified by the FSC label on the final products by 2005*
- Milestone 4: *High Conservation Value Forests national protocols in place in at least 20 countries by 2005*
- Milestone 5: *Community forest management protocols in place in at least 20 countries that can lead to, or maintain, community forest certification by 2005*

Target 3: By 2005, at least 20 forest landscape restoration initiatives underway in the world's threatened, deforested or degraded forest regions to enhance ecological integrity and human wellbeing

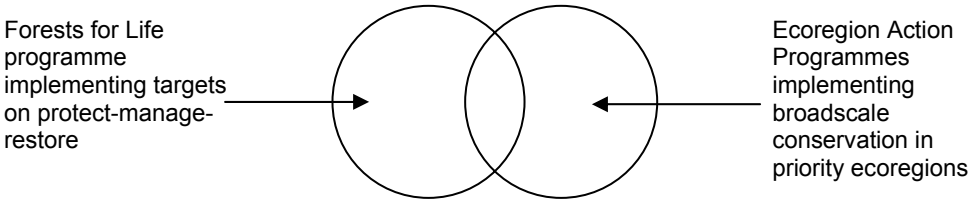
- Milestone 1: *A gap and threat analysis of priority conservation landscapes completed in all focal forest ecoregions by 2002*
- Milestone 2: *Socio-economic and ecological criteria & indicators developed for tracking progress with forest landscape restoration by 2002*
- Milestone 3: *10 forest landscape restoration initiatives underway in the world's threatened, deforested or degraded forest regions by 2003*
- Milestone 4: *The concept of forest landscape restoration adopted by 5 international organisations by 2003*
- Milestone 5: *At least 1 economic, financial and/or policy incentive that contributes to forest loss and/or degradation eliminated by 2004*

A number of key threats or drivers of change that could undermine attempts to reach the Forests for Life TDP targets and milestones have been identified. Each of these is being addressed through a cross cutting programme of activities.

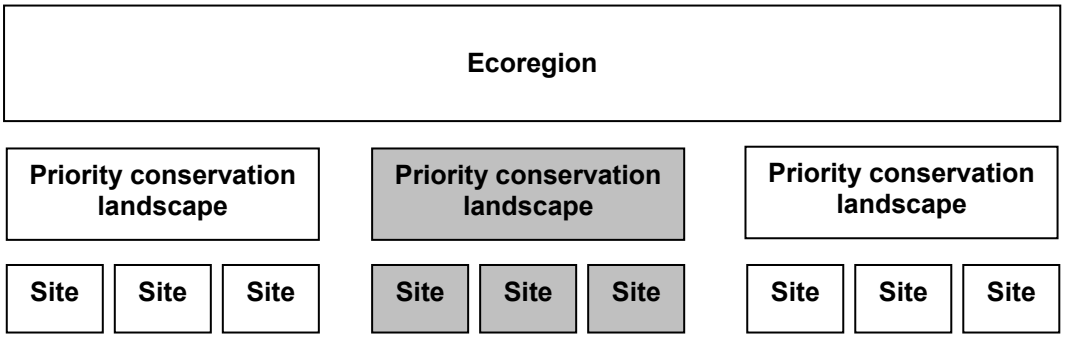
- **Illegal logging**: addressing problems of illegal logging and forest crime through policy interventions, advocacy and field projects
- **Climate change**: both ensuring that the Clean Development mechanism developed by the Kyoto Protocol of the Framework Convention on Climate Change does not undermine attempts at sustainable forest management and that forests and forest protected areas are managed to maximise their resilience to climate change
- **Forest conversion**: research and advocacy to remove perverse subsidies that are resulting in the destruction of natural forests to create massive edible oil plantations
- **Forest fires**: a major project looking at the underlying causes of forest fires and working with local communities to reduce the impacts of destructive fires, in Southeast Asia and elsewhere

In addition, through necessity in many ecoregions WWF staff will also be addressing other pressures, such as grazing, mining and poorly planned infrastructure development.

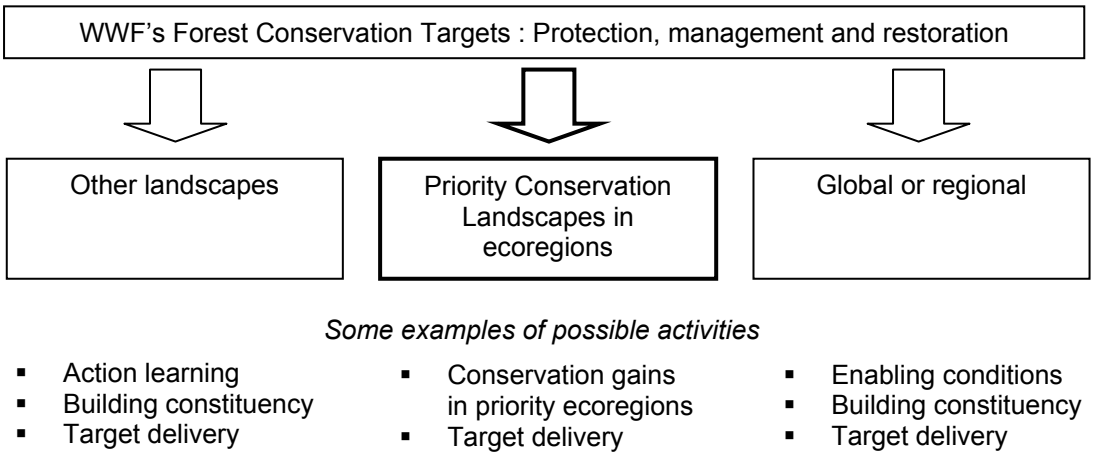
WWF is committed to a series of **Ecoregion Action Programmes** many of which are in forested ecoregions. WWF's six global **Target Driven Programmes** (on forests, marine, freshwater species, climate change and toxics) seek to overlap with work in priority conservation ecoregions, but also have a wider global remit. So for forests, the relationship might be represented thus:



The forest programme is working to increase the integration between its targets and ecoregion programmes and has chosen to focus at the level of **priority landscapes**, selected in key ecoregions through the ecoregion conservation process. Each priority area, or priority conservation landscape, will consist of many sites that together make up the landscape mosaic. Size of conservation landscapes is very variable – from a few tens of thousands of hectares to a million hectares or more and approaches need to change to reflect these scales. In theory, such a programme could also take place over an entire ecoregion.



Nonetheless, the forest programme will continue to work outside priority ecoregions as well, both to address its own targets and because some of the research needed to implement protect-manage-restore can best be addressed in other parts of the world.



One implication of integrating the three targets is that the landscape approach already adopted for the restoration component may usefully be extended to work on forest management and forest protection as well.

Part 3: Protect-Manage-Restore in the context of sustainable development
Forest conservation strategies draw from three related approaches:

Protected areas: land set aside as refuges for biodiversity (and sometimes also to preserve cultural landscapes, fragile human communities, spiritual sites and areas of recreation). Protected areas are defined by the World Commission on Protected Areas as: *An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.* WCPA defines six categories by management objective, ranging from strictly protected wildlife reserves to landscape or seascape areas with some protective functions[4].

Good forest management: the principle of tailoring management outside protected areas to maintain other values, including biodiversity is already reflected in national forest laws, regional criteria and indicator processes like the Ministerial Conference on the Protection of Forests in Europe[5] and third party certification schemes such as the Forest Stewardship Council. Agreeing different management approaches and intensities can play a key role, for example by maximising the usefulness of protected area buffer zones and maintaining biological corridors.

Forest landscape restoration: necessary when forest loss and degradation are well advanced: it is defined as "*a planned process that aims to regain ecological integrity and enhance human wellbeing in deforested or degraded forest landscapes*"[6]. Forest landscape restoration focuses on re-establishing functions and key ecosystem processes across a whole landscape rather than at just planting or restoring individual sites. As such, it looks at a mosaic of land uses including agricultural lands and forest types ranging from plantations to natural forests.

Integrating three approaches
Although protected areas, good forest management and forest landscape restoration address different aspects of conservation and development, they interact in the field. The current paper aims to **integrate the three into a coherent approach at the landscape level**. It will attempt to answer questions about how they can be mutually reinforcing, such as:

- Is it strategically more effective to set aside a particular forest into a protected area or encourage it to be managed on a sustainable basis for production purposes?
- How can timber concessions be designed to minimise impact on protected areas?
- How can restoration help to reduce pressure on a protected area?
- Where are the most cost effective sites to encourage regeneration in a landscape?
- Where does the extraction of timber and non-timber forest products have a role in protected areas?
- How can we best ensure a stream of tangible benefits through land-use decision-making and thus encourage local and national support for conservation priorities?

The broader context
Given the complexity of issues involved, any approach has to remain flexible to local conditions. A mixture of forest protection, management and restoration should therefore be applied as appropriate to a particular location and set of circumstances, with interventions being made at a range of scales from local to national, considering livelihood issues and in the context of existing policies, institutions and interests. Wherever possible, forest conservation should also be integrated with other conservation efforts such as of freshwater and marine ecosystems. Furthermore, conservation does not take place divorced from issues relating to human wellbeing and those involved in conservation are usually also concerned about social justice and sustainable development. The approach described below[7] creates a framework where these different but overlapping interests can best be integrated into a multifunctional landscape: it therefore not only addresses integration of forest protection, management and restoration but also integration of conservation approaches with sustainable development.

Both conservation and sustainable development usually take place against the background of a range of **cross cutting pressures and threats** (or "drivers of change"), so that attention must also be paid to these issues in landscape-scale approaches. Once pressures have been identified and assessed, it is important to build in strategies that address both the key threats: such as poaching, encroachment, forest fires, illegal logging, climate change and conversion, and also the underlying causes such as poor governance, poverty, perverse subsidies, trade barriers and investment flows. As with other elements of a landscape approach, strategic interventions to address threats will range from site-based actions to those at national, landscape, ecoregional and international level. Wherever possible, attempts to counter specific pressures should make the most of opportunities for work with partners, such as increasing community involvement in forest management.

Some assumptions
Integrating protection, management and restoration is based on a number of assumptions, which need to be tested during implementation, including in particular:

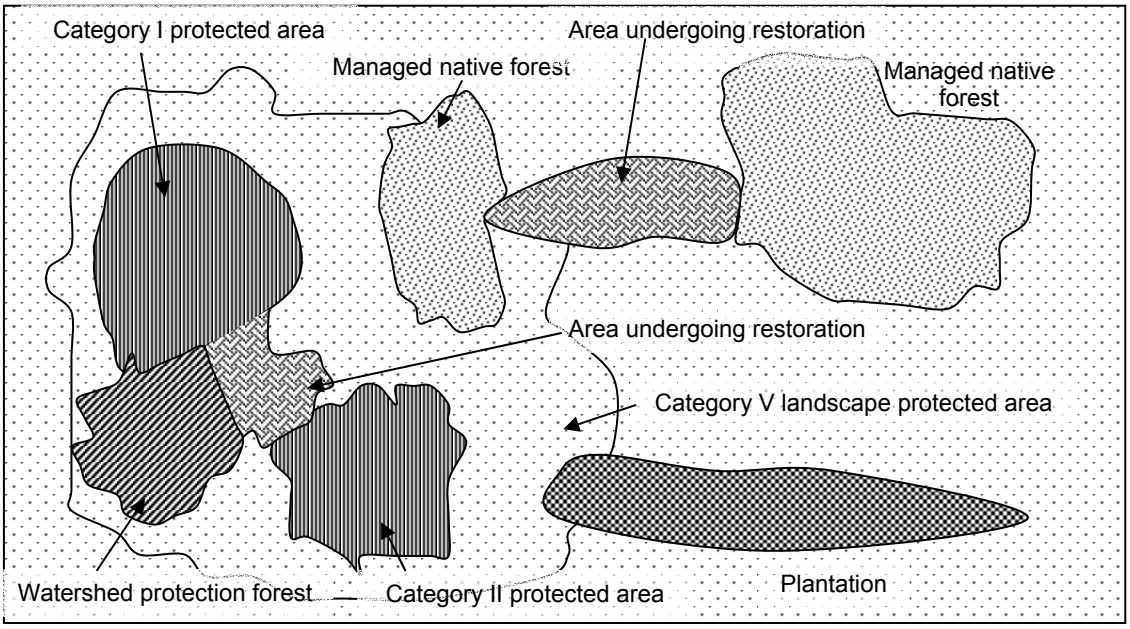
- **Synergy**: An integrated approach to protection, management and restoration will give greater net benefits than those achieved by pursuing these aims separately

- **Trade-offs**: Within a landscape context, it is possible to reach a negotiated outcome that portrays a scenario for a landscape meeting different needs and achieving a range of environmental and socio-economic goods and services

- **Cost efficiency**: Integrating programmes of protection, management and restoration will allow more efficient use of available financial and staff resources

The approach has been developed in close cooperation with WWF's Conservation Science Programme, based in Washington DC, and is being published simultaneously with a companion paper from CSP, which looks specifically at implementing conservation in priority areas[8].

Part 4: A landscape approach adding up to good conservation and development
What would such an approach look like? In October 2000 WWF and IUCN brought together a number of experts to consider this question at a workshop in Valais, Switzerland. The outcome of that workshop was first reported by Maginnis, Jackson and Dudley (unpublished)[9] and provides the basis for the content of this section. Considering landscape-scale benefits means paying more attention to the combined value of many sites than to individual sites. One scenario might be a forest mosaic like the one below: a scattering of protected areas of different IUCN categories (and thus different management regimes) for forests with the highest conservation value; some managed native woodland to provide a mixture of biodiversity and human benefits; some carefully planned timber and fibre plantations; forests managed for environmental benefits such as watershed protection; and judicious restoration, planned at a landscape scale to maximise benefits. Forest areas would also have to be integrated with other land uses, such as agriculture and settlement.



The precise mixture will change with location, forest type and biome and would for instance probably look very different in a landscape that still contained large areas of native woodland. However, the principle of aiming for ***a balanced mixture of protection, management and restoration providing biodiversity, ecological, economic and social benefits and resisting detrimental change*** remains the same.

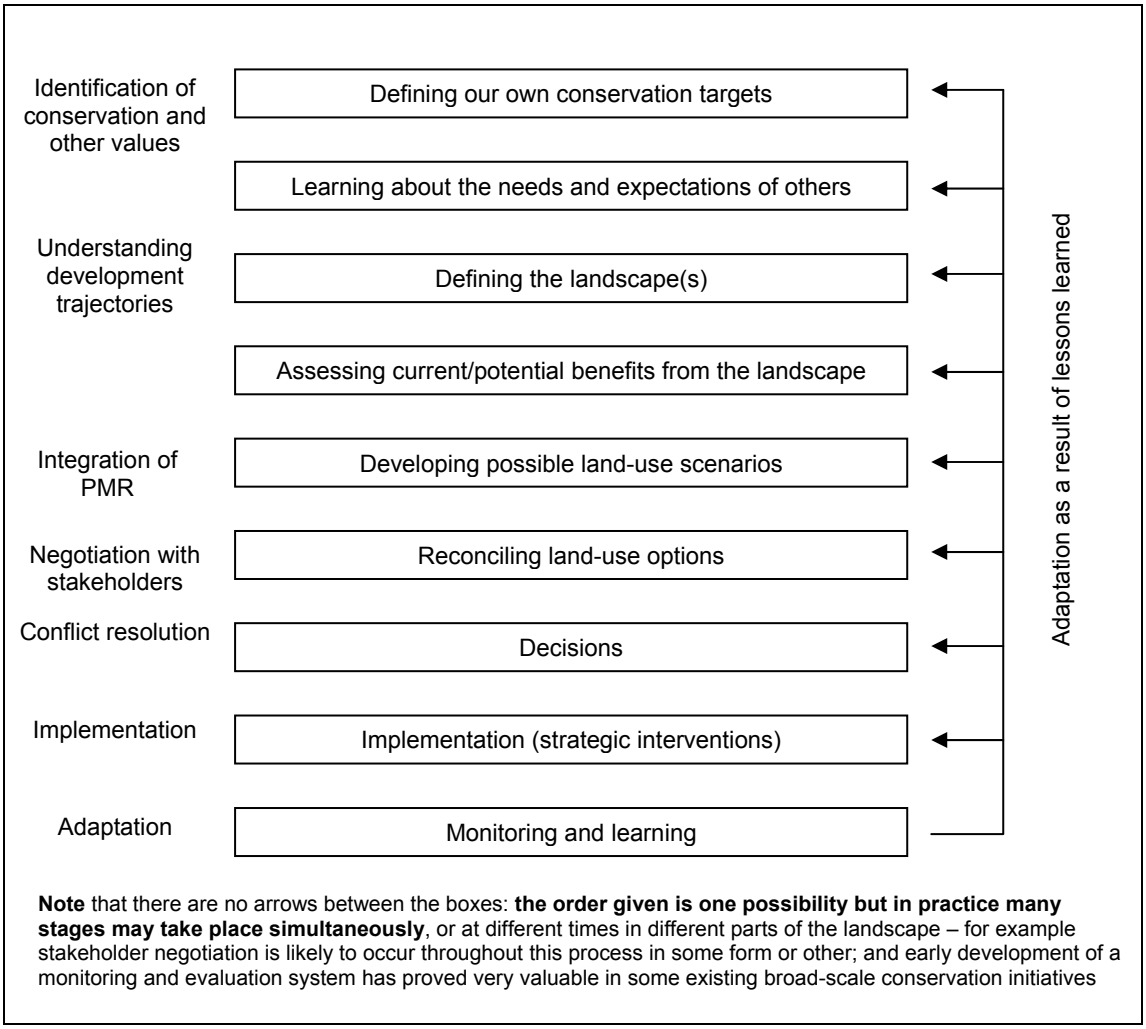
Such an approach assumes that it is possible to:
- Identify an optimum landscape mosaic or mosaics
- Agree with other stakeholders that such a mosaic is desirable

The approach does not imply that there is one "ideal" mosaic which, once achieved, will remain static indefinitely, but rather that there are a range of possible mosaics, of which a number of the "best" can if implemented help make the landscape viable to conserving biodiversity and resilient to further detrimental change. Furthermore, any "conservation vision" will have to be played out alongside many other, actually or potentially competing visions (economic development, sustainable development) and planned or unplanned social and political upheavals, meaning that over the timescale needed to implement a landscape approach, making the principle of adaptive management a critical necessity. In most landscapes, the conservation organisation or authority will not be the only stakeholder and may often be a relatively weak stakeholder. Successful broad-scale conservation programmes have therefore built partnerships with governments, private sector and local communities.

The philosophy driving this approach recognises that biodiversity conservation has to be balanced with poverty alleviation and socio-economic needs to achieve sustainable development and that this will inevitably entail negotiations and trade-offs. In addition to the questions raised earlier, the approach helps address some of the more general challenges that emerge when conservation is practised at this scale, such as:

- What mosaic of land uses is "best", and who decides what is best?
- How can policy issues be addressed that cannot be generalised at a national or a global scale – for example, are intensive forest plantations good or bad for biodiversity?
- How can the limitations of processes that are site-based or target driven be avoided – for example how can forest certification be integrated with protected areas?
- How can trade-offs be negotiated within and among stakeholders?
- How do issues of power relate to the range of possible outcomes and to what extent can these be accommodated?

The approach recognises that conditions vary between regions and stresses a flexible framework for broad-scale conservation. It draws on, and is a practical application of, the *Ecosystem Principles* agreed by the Convention on Biological Diversity. This landscape approach suggests that the following steps need to be taken into consideration in implementing conservation at a landscape scale:



Note that there are no arrows between the boxes: **the order given is one possibility but in practice many stages may take place simultaneously**, or at different times in different parts of the landscape – for example stakeholder negotiation is likely to occur throughout this process in some form or other; and early development of a monitoring and evaluation system has proved very valuable in some existing broad-scale conservation initiatives

Each of these stages is described in more detail below:

- **Defining our own conservation targets**

As stakeholders in this process, conservation organisations need to start with some ideas of the kind of landscape mix that they are aiming for. Many different methodologies for developing conservation visions, targets and strategies already exist[10]. Whatever approach is used, the end result should be a first idea about **priorities and targets**, including some ideas about **geographical areas** and **ecological processes** that are of primary interest for protection, sustainable management, restoration etc. These targets will make a first attempt at identifying how protection, management and restoration can best be integrated and will be progressively refined as a result of further analysis, negotiation and planning.

- **Learning about the needs and expectations of others**

A conservation body's ideas will seldom match those of all other relevant stakeholders and may be in conflict (and there are also likely to be disagreements amongst other stakeholders). At an early stage in any landscape initiative, it is important to get an initial idea about:

- Who the other key stakeholders are, and what are their relationships
- What they need and want and what they are planning[11]

Other wants and needs often focus on economic or development imperatives but will also be influenced by culture, history, and expectations within society, level of development and by spiritual and individual needs.

The question about when to engage with stakeholders is difficult and to some extent tactical: transparency will help engage stakeholders and win confidence but may also undermine a conservation position – for example publishing maps with the locations of forests that are being targeted for conservation has in some cases resulted in their rapid logging by companies anxious to get timber ahead of any possible restrictions. On the other hand, excluding stakeholders creates distrust and may make later negotiations longer and more difficult.

- **Defining the landscape(s)**

The concept of "landscape" is a social construct and has many different meanings depending on who is speaking. A conservation programme will usually be working within a pre-determined "conservation landscape" – often based around such factors as the area needed to maintain viable ecosystems and associated species. However, in addition to choosing the conservation landscape, it is also important to identify any "cultural landscapes" nested within or overlapping with the conservation landscape. A cultural landscape is defined here as an area that is of particular value to people resident in or frequently visiting the landscape: for example a village, a strip of land used by nomadic pastoralists or a timber concession[12]. While these may be even more difficult to define than the conservation landscape, some initial idea about their number and location is extremely important in planning a landscape approach. In practice, we may often start with a conservation landscape defined along strictly biological parameters, which may then be refined to take account of social, economic, political and institutional realities, ending up with the "landscape" in which a conservation organisation attempts to initiate an approach to forest conservation, in partnership with other stakeholders.

- **Assessing current / potential benefits from the landscape**

The next stage (some parts of which might take place concurrently with some of the above) will involve detailed assessment to identify lost, current and potential future values from the landscape. While conservationists naturally tend to focus on biodiversity and environmental values, assessment also takes full account of social and economic values, so that the various competing demands can best be integrated.

Amongst the information required at this stage is:

- The most important forests (e.g. High Conservation Value Forests – which includes both biological and cultural/spiritual criteria)
- Biodiversity values including particularly rare, threatened and endemic species
- Existing, lost and potential environmental, social and economic benefits associated with forest goods and services
- Serious gaps in the forest ecosystem
- Gaps in the protected areas system
- Stakeholders, their relationships and their needs and wants
- Distribution of benefits associated with forest goods and services among stakeholders
- Threats, opportunities and drivers of change
- Existing conservation programmes
- Existing and potential economic activities and their implications on land use
- Socio-economic conditions including Poverty Reduction Strategy Programmes
- Political, administrative, legislation and institutional context
- Development trajectories
- Other demands on land use
- Potential partners
- Critical factors that can either progress or impede a programme of forest protection, management and restoration

Such assessments should not solely be utilitarian in their analysis: many of the drivers and blocks on change may have more to do with hard to quantify issues relating to culture, traditional, social mores and personal preference. In many cases, some information will already be available and the need will be to fill in remaining gaps. A number of methodologies exist for assessing these values including gap analysis[13], threats analysis, forest quality analysis[14] and analysis of High Conservation Value Forests[15], economic valuation of ecosystem functions and public participation processes.

Whatever method is used, some generalised indicators will probably be necessary to act as a surrogate for a complete assessment of the whole landscape (and some of these indicators can also be used in the monitoring and evaluation system – see below).

The extent to which this assessment will be a *participatory process* (e.g. agreeing biological and social indicators with other stakeholders, collecting information at workshops etc) can be decided on a case-by-case basis: including stakeholders makes for a longer process but also means that assessment is *part of* the negotiation process.

Bringing stakeholders into the process at the stage of assessment can be an important step in establishing the trust and confidence needed to agree roles and responsibilities and is a necessary first step towards sustainable conservation programmes.

- **Developing possible land-use scenarios**

Integration of potential conservation and development actions to develop scenarios including a combination of elements such as:

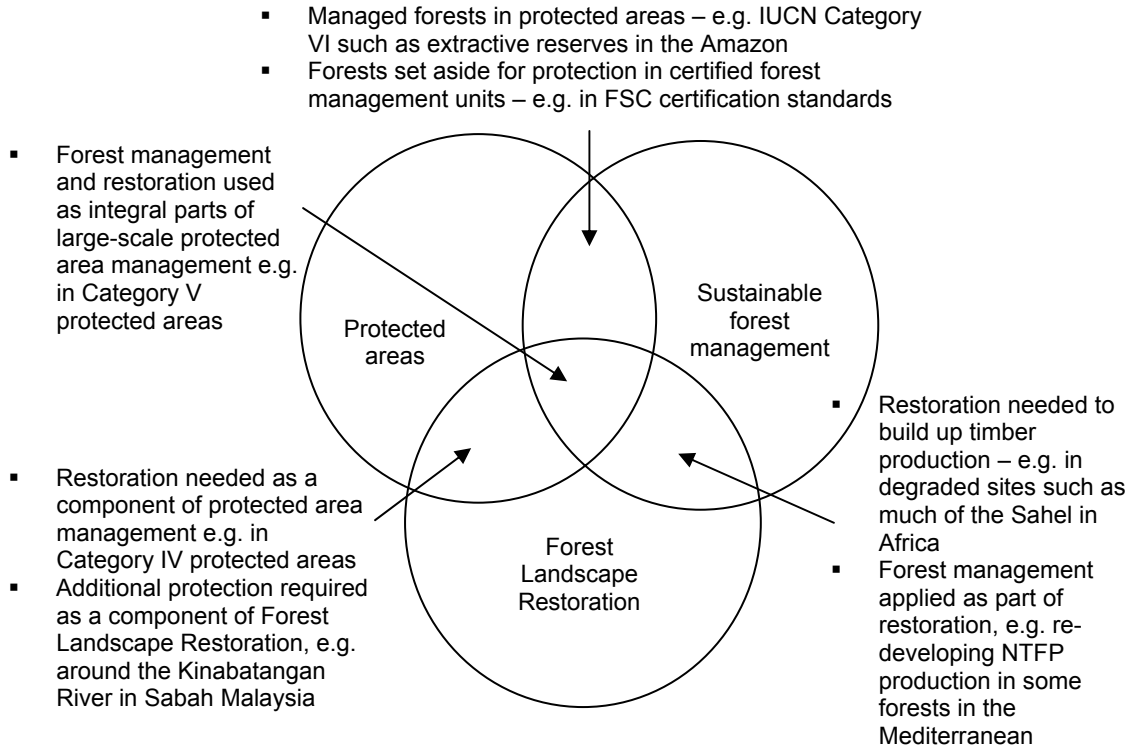
- Protected areas
- Other protected forests (set asides, watershed protection etc)
- Well managed forests
- Areas needing restoration
- Other compatible and competing land uses

All these factors interact. What kind of mosaic will work best? Is the infrastructure to support strict protection available or is some form of sustainable use more practical? How do other

land uses that conservationists cannot control affect the picture? Are we looking at one "master plan" or a pattern that emerges gradually over time? Scenarios must go beyond collections of protected areas to look at a mosaic of land uses that offers the best long-term options for biodiversity and human wellbeing. Sustainability is a critical element. The result should be one, possibly several, scenario(s) for a mixture of protected areas, managed forests and restoration, linked to other land uses. Some assessment processes run into planning, so this step and the previous one take place concurrently.

The extent to which the process is participatory, and which stakeholders are included needs to be addressed in each case (and reviewed constantly). A conservation organisation or department is not a neutral observer in this process, but a stakeholder with its own aims, which needs to build its own partnerships with diverse stakeholder groups. The Protect-Manage-Restore philosophy and accompanying landscape approach framework is attempting to integrate three particular approaches to forest conservation on a landscape scale, within a broader mosaic of land uses (farming, urban land etc.) However, the three approaches can also overlap in individual sites, building up into a complex mosaic of different interventions as illustrated in box 2.

Box 2: Overlaps between protection, management and restoration



- **Reconciling land use options**

The approach is predicated on the idea that trades-offs between social, economic and environmental quantities and qualities are often essential at the level of the landscape and are acceptable if overall values are maintained within the landscape. For example, although managed forest areas are unlikely to support the same quality of biodiversity as totally natural areas, the presence of managed forests need not lead to losses on a landscape scale so long as enough areas of natural forest are retained. Quality of management within managed forests can also affect biodiversity and in turn affect the proportion of the land that needs to be protected to maintain biodiversity. Getting the "right mixture" of uses and landscape patterns

is critical to successful conservation and successful sustainable development: its achievement in many cases is made more difficult by competing land uses.

In practice, conservation organisations are stakeholders with a particular vision that will sometimes be in competition with other legitimate economic and social "visions", and conservationists are therefore unlikely to get everything that they want. In some cases, trade-offs will be between deeply felt conservation and socio-economic or cultural values and will present hard ethical choices; in other cases issue may be intractable because of the political or economic power of opposing stakeholders. Sometimes the resulting trade-offs may be unpopular.

- **Decisions**

The longest and least straightforward part of the process will in most cases be reaching decisions about particular land uses and landscape mosaics; this is a stage that will merge with the negotiations discussed above. Despite some years of effort in planning and talking about ecoregional conservation approaches, there is little experience amongst conservation organisations in how to reach decisions about land-use, and a risk that the carefully drawn ecoregion visions will in some cases remain a theoretical exercise. **Working on how to reach decisions about land use with other stakeholders is therefore an urgent priority**. New skills, including negotiating with multiple stakeholders and conflict resolution, need to be developed by conservation organisations if they aim to work at this scale.

In some situations the government(s), NGOs, corporate interests and communities may be able to reach agreement on a wide package of actions that could result in a series of decisions within one action plan; this might represent an "ideal" end-point to a landscape approach negotiation. In many other cases, negotiations are likely to be continuing and sporadic: here it is unlikely that a single master plan for a large area could be agreed at one time and adhered to thereafter; rather decisions will be over smaller parcels of land within a broader framework that will continue to evolve (and will never be "finished"). The decision or decisions might consist of such things as establishment of protected areas, changes in the law to control poaching, changes in management in state-owned forests, agreement of private owners to certify forests, or redirection of reforestation grants into more natural regeneration. There may also be important decisions to be made about process, for instance in reconciling customary and statute laws.

Generally we would recommend making the most effort on those areas where disputes remain but where there are grounds for believing that progress can be made, and perhaps postponing involvement in more intractable issues until a later time.

In many countries, final decision about most land-uses remains with the government, and in these cases having the government as a partner in landscape approaches will be essential. In some situations other powerful stakeholders may have an influence – perhaps even a greater influence – than government ministers. It is important in dealing with other stakeholders not to make claims for a participatory process that the conservation organisation does not have the power to fulfil. Where most of the land is in private or community control then decisions are more complex, although the same basic approach will be required.

- **Implementation (strategic interventions)**

Some of the resulting actions or programmes will take place at the site level within the landscape and may involve a range of interventions, large and small, for example from a conservation perspective:

- Designation of a new protected area
- Management changes to increase effectiveness of existing protected areas including capacity building, development of a management plan, training etc

- Agreement with local village communities on voluntary buffer zones, community-managed forest areas and corridors between protected areas
- Certification of existing forest management unit with attendant management changes
- Development of certification in an area of natural forest that is coming into management, including promotion of markets for sustainable supplies of non-timber products
- Creating the right conditions for natural regeneration in forests – for example voluntary controls on grazing animals by nomadic herders
- Selective tree planting to reconnect fragments of natural forest, provide fuelwood or encourage regeneration of medicinal plants etc
- Introduction of game management to stabilise bushmeat hunting and to safeguard species and provide sustainable sources of meat
- Community initiatives to improve fire management regimes to prevent run-away fires

Other strategic interventions may be necessary at a landscape scale, or will take place even far from the landscape itself at national level, ecoregional level or global level for example:

- Trans-border actions against illegal logging
- Joint conservation/local community bids to development bodies for community-based natural resource management
- Advocacy in consumer countries to encourage pressure for better management of oil palm plantations
- Working with governments to re-align reforestation programmes to promote greater benefits to local communities and to wildlife
- Lobbying for changes in law to prevent mining in declared protected areas
- Legal and/or policy changes to allow local communities rights and /or access to natural resources
- Broad-based environmental education on the biological and livelihood values of the landscape and on sustainable management of wild plant and animal species
- Capacity building amongst government staff to help track and prevent poaching and wildlife trade
- Global conservation programmes with partners in industry

At the same time, other actions are likely to be taking place, including agriculture, extractive industries, infrastructure development, (road building, urbanisation) settlement and so on. As these other developments progress they will affect and in turn be affected by conservation plans, which will have to adapt to meet changing conditions.

It is seldom necessary (or even tactically sensible) to wait for the entire planning and negotiation process to be completed before starting some strategic interventions. Some elements of the landscape mosaic may already be clear (existing protected areas, forest management units currently under management in prime biodiversity sites) and interventions there can be agreed early in the process, while negotiations continue elsewhere. Whenever interventions take place, and whatever form they take, the principle of adaptive management should hold and such interventions should be assessed and modified as necessary as the overall programme continues.

When embarking on programmes stretching over many decades, government departments or conservation organisations will also have to be flexible to changing conditions and opportunities: it is likely that the socio-economic climate of some regions will be transformed during the lifetime of an ecoregion action programme and these changing factors will need to be reflected in planning, implementation and monitoring and evaluation.

- **Monitoring and learning**

Much of what we will be attempting with the landscape approach is quite new and therefore it is especially important to ensure that progress is monitored effectively and that lessons are both used to improve programmes as they develop and are also transmitted around and beyond the immediate conservation programme. Monitoring includes a number of steps:

- Agreeing on what the initiative is trying to achieve (and more academically *what hypotheses are being tested*)
- Agreeing a set of indicators
- Setting up a standard data collection and reporting mechanism
- Ensuring that management of projects and of the overall programme builds in regular means to assess and act upon the outcomes of monitoring

In practice, some kind of monitoring and learning also needs to be built into each of the steps outlined above, instituting an adaptive management approach by focusing on the questions:

- What do we monitor?
- What do we do when we learn something?

At a landscape scale, combining monitoring of many individual projects, along with some additional indicators that transcend individual project work, will be necessary to capture information about progress over the whole landscape.

Most programmes implemented at a scale of an ecoregion or priority conservation landscape have the potential to continue for many decades and monitoring programmes must also be sustainable. This has a number of implications in terms of indicators and data gathering: most monitoring and evaluation systems fail after a few years because they run out of money and choice of indicators needs to be influenced and to some extent constrained by their accessibility over time.

An important decision is whether the monitoring and evaluation system is a ***neutral measurement of progress*** or a ***tactical tool that can help to drive the process***. Getting agreement among stakeholders on measurement of a particular indicator can be a factor in making sure that the indicator is fulfilled – either because the indicator is something with a specific output attached to it or because the fact that all the stakeholders agree that the indicator is important is in itself part of a negotiation process. In this case some elements of the monitoring system will also be reflected within the assessment and negotiation stages discussed above.

Knowledge management and a learning network

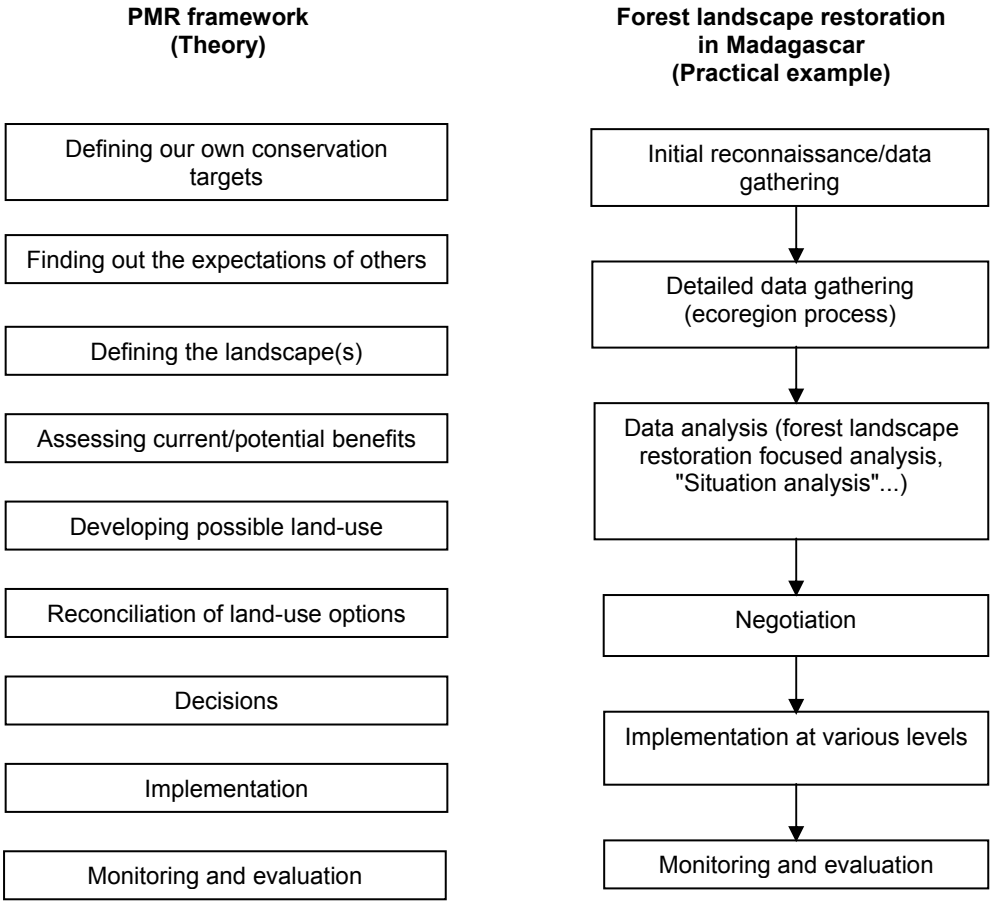
Individual projects will hopefully feed into wider learning networks aiming to build up experience and knowledge about forest conservation within conservation landscapes. Through work with partners, these lessons will also spread more generally amongst the conservation community – through collaboration with groups such as Foundations for Success[16].

A framework not a straitjacket

The list of actions needed to integrate the three approaches on a landscape scale is mainly common sense and should remain ***flexible to local conditions, needs and resources***. In particular, as noted above the order may change with circumstances and several "stages" in the framework presented here may be combined, or omitted if information is already available. To stress the adaptive nature of this approach, in Box 3 below, the framework is compared with an actual forest landscape restoration process being implemented in Madagascar using the PMR "model": although all the stages are present the order has changed in response to local conditions and such variability is to be expected.

For example, in Madagascar the "data analysis" stage covered three of the process: defining conservation targets, assessing current and potential benefits and developing possible land-use scenarios; while "negotiation" conflated reconciliation of land-use options with decisions.

Box 3: Comparison of framework for protected-manage-restore landscape approach with a working example in Madagascar



Part 5: Implementing protect-manage-restore

Until the last few years, most conservation organisations, and most government environment ministries and protected area agencies, have put the bulk of their effort into the "protection" part of the trilogy looked at in this paper. But the situation is changing. Within UNESCO, the Man and the Biosphere programme has made enormous progress looking at the issue of buffer zones and sustainable management around a core reserve. Ecoregion conservation assesses the full range of pressures which lead to environmental decline across the ecoregion and engages all relevant stakeholders. The ecosystem approach supported by the Convention on Biological Diversity is consciously aimed at broadening biodiversity conservation issues away from a sole reliance on protected areas. Below, in box 4, we summarise a few key examples that WWF has been working on in the last few years.

Box 4: Implementing protect-manage-restore

The preceding approach to integrating protection, management and restoration is still experimental, but parts or the entire framework have already been applied, or are being applied, in many WWF projects around the world. Nor is this a single, top-down "toolkit": a number of different WWF national organisations and programme offices have developed the same or similar aspects of the approach independently of each other, suggesting a reassuring convergence of experience and opinion. For example:

- In **Vietnam**, the Forests of the Upper Mekong Ecoregion Programme is applying a MOSAIC approach ("Management of Strategic Areas for Integrated Conservation") using the same framework to plan and implement a conservation programme in eight provinces in central Vietnam, linking key protected areas with sustainable forest management and working at levels ranging from local communities to government policy

- In **Madagascar**, the framework is being applied to plan and implement forest landscape restoration in the badly degraded humid forest region

- In **China**, a landscape approach is being used to develop and implement plans to protect high conservation value forest and key panda habitat in several counties in Sichuan, in the Forests of the Upper Yangtze Ecoregion. WWF and its partners are piloting a landscape approach to forest conservation that combines biodiversity protection with other aspects of sustainable development and gives all affected people a chance to participate in land use decisions

- In **Tanzania**, the landscape approach is being applied in tandem with the Wildlife Conservation Society's landscape indicator species methodology to compare and learn from the two methodologies. The framework is also being used to plan interventions in 2 priority coastal forest landscapes, which form part of the East African Coastal Forest ecoregion.

- In the **Chihuahua desert** of Mexico, protection, management and restoration have all emerged as urgent priorities from the ecoregion planning process

- In southern **Portugal**, the WWF Mediterranean Programme is working to define strategic guidelines to address the root causes of biodiversity loss and natural resource degradation and to propose a set of short- medium- and long-term priority actions (conservation/research, sustainable development, landscape restoration) at local, national and international levels. The overall goal of the work is:" By the year 2050, the natural environment and biodiversity of the Southern Portugal Green Belt, will be effectively conserved, restored wherever appropriate, and will deliver significant benefits to people of the region in a way that is embraced by local communities, endorsed by government and recognised internationally..

In addition to the above, the approach is also central to a new set of projects being developed by the WWF Forest programme in Bhutan, Zambia and the northeast Andes.

Sources

The paper draws on several other pieces of work. They include: *Reaffirming the Vision*, the WWF / IUCN forest strategy; the targets and milestones for the *Forests for Life* target driven programme agreed by the Global Forest Advisory Group; a draft document on the landscape approach edited by Stewart Maginnis, William J Jackson and Nigel Dudley and a chapter in a forthcoming book by the same authors; a theoretical framework for WWF's forest Integrated Conservation and Development programme written by Tom McShane; a framework for monitoring Forest Landscape Restoration prepared by Stephanie Mansourian and Nigel Dudley and a further paper by Stephanie Mansourian; a forest quality assessment methodology developed by Nigel Dudley and Rodolphe Schlaepfer in a project managed by Jean-Paul Jeanrenaud and William Jackson; a presentation on conflict resolution by Scott Jones; and the ecoregional conservation methodology developed by the WWF Conservation Science Program. The flow diagram that forms the centrepiece of the approach was developed under the auspices of the IUCN/WWF Forest Innovations project at a workshop in the Valais, Switzerland in 2000, attended by: Anthony Anderson, Per Angestam, Monika Bruess, Geoffrey Davidson, Tom Dillon, Nigel Dudley, Christian Glenz, Elie Hakizumwami, William Jackson, Jean-Marc Landry, Anders Lindhe, Tom McShane, Stewart Maginnis, John Morrison, Pedro Regato, Eric Sanderson, Agus Setyarso and Rod Taylor. The WWF Forest Team has since modified the diagram and the Conservation Science Program has commented in detail on the text. The ideas were tested in the field by Rod Taylor, Ketut Deddy and Helen O'Connor and their report fed into redrafting. Development was helped by discussions between Tom McShane and Nigel Dudley with staff at the Wildlife Conservation Society in New York, arranged by Kent Redford; by discussions with various people at The Nature Conservancy, including particularly Jeffrey Parrish; and through a meeting on Broadscale Conservation arranged by Sarah Christiansen and Sheila O'Connor of WWF US in the Adirondacks, New York State, in 2001. We are grateful for comments and support from Chris Hails and Bill Eichbaum.

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