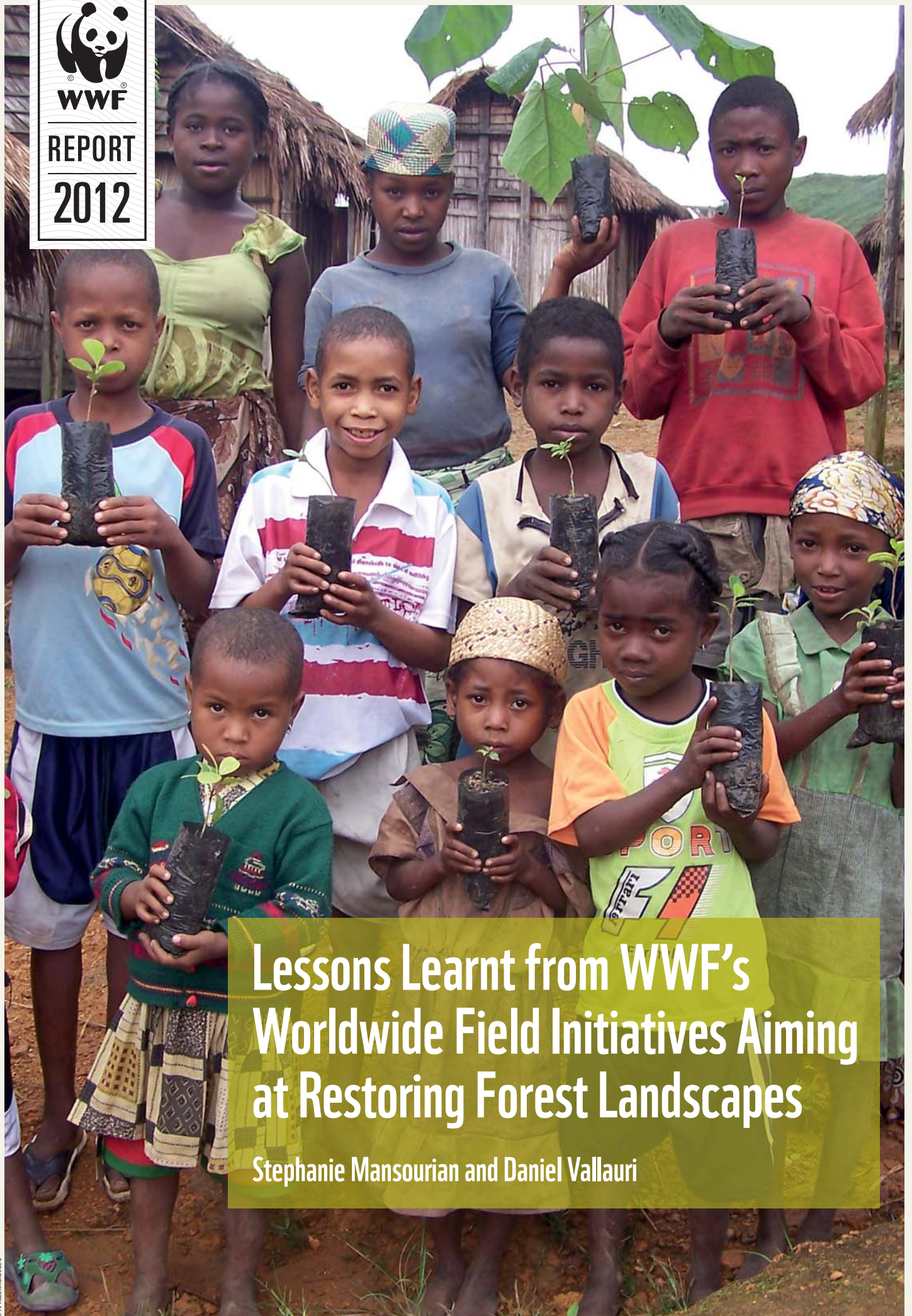




WWF®

REPORT

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Lessons Learnt from WWF's Worldwide Field Initiatives Aiming at Restoring Forest Landscapes

Stephanie Mansourian and Daniel Vallauri

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ACRONYMS

CBD	Convention on Biological Diversity
CCBA	Climate Community and Biodiversity Alliance
CDM	Clean Development Mechanism
CFLRP	Collaborative Forest Landscape Restoration Program
CI	Conservation International
CIFOR	Centre for International Forestry Research
COP	Conference of the Parties
FAO	Food and Agriculture Organization of the United Nations
FLR	Forest Landscape Restoration
GPF	Global Programme Framework
HCVF	High Conservation Value Forest
ICRAF	World Agroforestry Centre
ITTO	International Tropical Timber Organization
IUCN	International Union for the Conservation of Nature
MDG	Millennium Development Goal
PES	Payment for Ecosystem Services
REDD	Reducing Emissions from Deforestation and Forest Degradation
RSPO	Roundtable on Sustainable Palm Oil
SER	Society for Ecological Restoration
TDP	Target-driven Programme
TNC	The Nature Conservancy
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests

EXECUTIVE SUMMARY

In the last twelve years the restoration of forest landscapes has gradually gained in importance within WWF, its partners and numerous other organisations, conventions and political processes. While small-scale forest restoration efforts have existed in WWF probably for decades, it is only since 2000 that the organisation began working on “forest landscape restoration” (FLR), defined as: “*A planned process that aims to regain ecological integrity and enhance human wellbeing in deforested or degraded landscapes*”.¹ The important and novel dimensions in this approach being: a) to link restoration to the landscape scale, b) the aim to tackle and reverse deforestation or forest degradation and c) the intention to balance both ecological and human needs (wellbeing) within a forested landscape.

In 2000, WWF introduced forest landscape restoration within its global forest programme (the “Forest for Life Target Driven Programme”), by setting the following target: *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.* In response to demand from the field programmes and further to five years of experience implementing forest landscape restoration programmes, WWF coordinated in 2004-5 the production of a handbook or guidance manual on forest landscape restoration. This world-wide review of expertise, processes and outstanding issues was published by Springer in 2005. The book has generated significant interest and has been translated into Chinese.

After 2005, with the end of the “target-driven programmes”, while there was no longer a central programme for the restoration of forests within WWF, forest restoration work continued throughout the WWF Network. Furthermore, a node of expertise on forest restoration remained in WWF France which manages or contribute to some forest restoration field projects (notably in Madagascar and New Caledonia) and has staff with relevant international expertise (Dr. Daniel Vallauri, Hubert Géraux and Jean-Baptiste Roelens). However, the lack of a coordinated global programme on forest landscape restoration has meant that it is more difficult to identify initiatives working on forest landscape restoration, to promote the approach as a viable contribution to conservation, and to collect and exchange lessons, tools and knowledge emerging from implementation.

In this context, WWF France commissioned this review with the specific intent to:

1. Extract lessons learnt to date, particularly in the last 5-6 year period, from WWF’s work on the restoration of forest landscapes.
2. Inform future restoration work, both within the WWF Network and beyond.

A desk review, interviews and questionnaires all contributed to the production of this report. The ten sites selected and highlighted in this report were chosen based on prior knowledge of the programme. Furthermore, six of these ten ecoregions are biodiversity hotspots as per the commonly agreed definition (rating levels of endemism and extent of threat²). These sites by no means cover all of WWF’s efforts on the restoration of forests in landscapes.

Results

A wealth of information emerged from this shortlist of projects. Some lessons were very specific to the different project/programme locations, while others were common to several initiatives or regions.

¹ WWF and IUCN 2000.

² Caucasus, New Caledonia, Mediterranean, Madagascar, Eastern Africa and Atlantic forest.

³ See Conservation International, <http://www.biodiversityscience.org/>

The overarching lessons are presented according to an organising framework¹ for planning and implementing the restoration of forests in landscapes. More detail on each lesson can be found in Section 3 of the report.

LONG TERM COMMITMENT IS CRUCIAL FOR RESTORING FORESTS IN LANDSCAPES

Lessons on initiating a restoration programme

- **Lesson 1:** Understanding the local context – both socio-economic and ecological – is critical for local acceptance and sustainability
- **Lesson 2:** Engaging stakeholders and partners, and negotiating trade offs, although time consuming, are key to securing long term success
- **Lesson 3:** A strategic approach to the design and development of forest landscape restoration initiatives is preferable, but frequently opportunities dictate project development, with ensuing repercussions (on duration, stakeholder engagement, planning..)
- **Lesson 4:** Long term engagement is essential in the restoration of forest landscapes
- **Lesson 5:** WWF has a specific added value in facilitating partnerships to launch the large scale, long term initiatives necessary for the restoration of forest landscapes

Lessons on defining restoration needs and linking restoration to a large scale conservation vision

- **Lesson 6:** Addressing socio-economic needs is imperative to long term success in the restoration of forest landscapes
- **Lesson 7:** The purposes of restoration in WWF work are diverse : a typology can be defined to better increase the understanding of this tool within the organization and beyond
- **Lesson 8:** Scaling up from sites to landscapes presents significant operational challenges
- **Lesson 9:** While maps and hectare-based targets are valuable in planning, they can be very sensitive and require careful interpretation
- **Lesson 10:** Locally-adapted techniques are critical to acceptability and sustainability of the effort
- **Lesson 11:** The landscape approach to conservation has inherited the challenges of forest landscape restoration

Lessons on defining restoration strategy and tactics

- **Lesson 12:** Endpoints for restoration must be clearly defined
- **Lesson 13:** When restoring forest landscapes, constant flux rather than stability characterises the situation and therefore, there is a need for flexibility

Lessons on implementing restoration

- **Lesson 14:** Small scale restoration has a role to play within the larger landscape (demonstrative pilot action) but such interventions need to be carefully designed with the wider landscape in mind
- **Lesson 15:** Further knowledge of indigenous species is needed in most cases

¹ See: Vallauri, Aronson and Dudley 2005.

- **Lesson 16:** Land tenure is a critical element in ensuring the sustainability of the restoration of forest landscapes
- **Lesson 17:** There are numerous conservation side benefits to forest landscape restoration in addition to restoring forest functionality
- **Lesson 18:** Success breeds success

Lessons on piloting systems towards fully restored ecosystems

- **Lesson 19:** A long timeframe, at least ten years, is necessary to implement a forest landscape restoration programme and to see visible results
- **Lesson 20:** Attaching a value to a restored landscape is important to ensure land use decisions and trade offs can be adequately informed
- **Lesson 21:** Embedding forest landscape restoration in existing frameworks will help secure its financial and political sustainability
- **Lesson 22:** Collecting and recording experiences and lessons is important to build up a solid expertise and knowledge base
- **Lesson 23:** Designing and implementing an effective monitoring framework for the restoration of forest landscapes remains a challenge

Recommendations

Many recommendations can be made as a result of the lessons emerging from this report, however we chose to focus on six quite specific ones, three internal to WWF and three for the wider conservation community.

Recommendations for the WWF Network:

- **Recommendation 1: The institution should integrate more explicitly the contribution that the restoration of forests in landscapes is making to WWF's broader goals (as defined in the Global Programme Framework).** The restoration of forest landscapes has a very clear role to play in contributing to WWF's overarching goals. However, this link is not explicit within the WWF organising frameworks and therefore, valuable efforts on the restoration of forest landscapes are not appearing as contributions to the wider objectives of the organisation. Efforts are needed to better align these restoration actions to the overall goals and in turn to effectively collect these contributions to the overall programme.
- **Recommendation 2: WWF should promote positive experiences and field stories.** There are many interesting and positive forest landscape restoration experiences in WWF, many lessons emerging from/for the WWF Network, and also good stories to communicate to the wider public, yet these are not sufficiently promoted and shared – both within the Network and beyond. WWF offices should be encouraged to communicate these stories.
- **Recommendation 3: The WWF Network should undertake a needs assessment to identify specific gaps and tools needed to further support forest landscape restoration efforts.** While there is significant experience, there are clearly gaps and areas where efforts are being duplicated throughout the Network. The implementation of forest restoration in landscapes also generated the need for new areas of expertise and methodologies for the WWF Network (on social approaches, agriculture and forest techniques), some of which are not common in the WWF culture, and require support at

WWF SHOULD BUILD ON LESSONS LEARNT, PROMOTE POSITIVE FIELD STORIES AND DEFINE MORE EXPLICITLY THE CONTRIBUTION THAT RESTORATION IS MAKING TO ITS BROADER CONSERVATION GOALS

least to create an effective link to relevant organisations (e.g.: Care, Oxfam, agriculture and research centres...). A comprehensive assessment of needs would help to identify gaps and also eliminate redundancies. This is all the more important as staff changes are likely to occur over the lengthy duration needed for the restoration of forest landscapes.

Recommendations for the wider conservation community:

– **Recommendation 4: Build on lessons learnt.** This report has identified a vast array of very useful lessons emerging from the last ten years of WWF’s work on the restoration of forest landscapes around the globe. These lessons are very pertinent and WWF should disseminate them widely and apply them as relevant in its various conservation programmes. As shown through this report, the restoration of forest landscapes remains an important element in large scale conservation. Learning from the past will help to strengthen future efforts, within WWF and beyond.

– **Recommendation 5: Relevant institutions should make a concerted effort to mobilise long term efforts and resources towards forest landscape restoration.** Achieving real and lasting impact in restoring forest landscapes takes time (at least 10 years), human resources and a diversity of partners from different backgrounds. Partners should pool resources in priority areas for restoration in order to achieve the scale of change necessary.

– **Recommendation 6: Conservationists should determine whether forest landscape restoration or the landscape approach is the best approach in a given ecoregion.** There remains some confusion between the two approaches, which clearly exhibit significant overlap. However, they are not one and the same. The restoration of forest landscapes assumes that within a landscape the single most important conservation action needed is the restoration of forest functionality. This will be particularly important where forest degradation and/or loss are significant and where pressures on forests are high. It will also be important where priority species are facing extinction because of habitat loss. In many cases, however, this is not or should not be the main conservation thrust, but instead the landscape approach where a mix of tools (which may include restoration interventions) is applied to maintain and sustainably manage into the future a functional, forested landscape, would make more sense. In order to secure successful forest landscape restoration initiatives, a vital step is to ensure that the approach is applied where it is really needed.

RÉSUMÉ EXÉCUTIF

Au cours des douze dernières années, la restauration des paysages forestiers a graduellement gagné en importance à l'intérieur du WWF, auprès de ses partenaires, et de nombreuses autres organisations, conventions et processus politiques. Bien que des petits projets de restauration forestière aient probablement été entrepris par le WWF durant plusieurs décennies, ce n'est qu'en l'an 2000 que l'organisation commença son travail sur la restauration des paysages fo-

restiers. Ce concept fut défini comme étant « *un processus planifié visant à regagner l'intégrité écologique et à améliorer le bien-être humain dans les paysages déforestés ou dégradés* ». ¹ Cette approche ouvrit des dimensions nouvelles et importantes, à savoir : a) le lien entre la restauration et l'échelle du paysage, b) l'objectif visant à inverser le processus de déforestation ou de dégradation forestière et c) l'intention d'atteindre un équilibre entre priorités écologiques et le bien être des êtres humains au sein d'un paysage forestier.

En l'an 2000, le WWF introduisit la restauration des zones forestières dans son programme global sur les forêts (« Forest for Life Target-driven Programme »), définissant l'objectif suivant : « *D'ici à 2005, entreprendre au moins vingt initiatives de restauration des paysages forestiers dans les régions forestières du monde menacées, dégradées ou victimes de la déforestation afin d'améliorer l'intégrité écologique et le bien-être des êtres humains* ».

En réponse aux requêtes des programmes sur le terrain et suite à cinq années d'expérience dans l'implémentation des programmes de restauration forestière, le WWF coordonna en 2004-2005 la production de directives sous forme d'un manuel sur la restauration des paysages forestiers. Ce dernier passa en revue les connaissances accumulées par l'expérience ainsi que les problèmes en suspens, et fut publié par Springer en 2005. L'ouvrage engendra un grand intérêt et fut même traduit en langue chinoise.

Après 2005, avec la fin des programmes globaux, bien qu'il n'y ait plus eu au WWF un programme central pour la restauration des forêts, le travail de restauration forestière continua à travers le réseau. De plus, un noyau d'expertise en la matière demeura au sein du WWF France, lequel continue à ce jour de gérer ou contribuer à certains projets sur le terrain (notamment à Madagascar et en Nouvelle Calédonie) et possède un personnel reconnu (Dr. Daniel Vallauri, Hubert Géraux et Jean-Baptiste Roelens). Cependant, l'absence d'un programme global coordonné sur la restauration forestière signifie qu'il est difficile d'identifier des initiatives pertinentes, de promouvoir cette approche en tant que contribution viable à la conservation, et de compiler ainsi que d'échanger des enseignements, des outils et autres connaissances résultant du terrain.

Dans ce contexte, le WWF France a commandité ce rapport afin :

1. d'extraire les enseignements acquis dans le domaine de la restauration, plus particulièrement au cours des 5-6 dernières années ;
2. d'éclairer les travaux futurs de restauration, dans le réseau WWF ainsi qu'au-delà de ce dernier.

Une lecture de documents pertinents, ainsi que des entrevues et un questionnaire ont contribué à la production de ce rapport.

Les dix sites sélectionnés et mis en avant dans ce rapport ont été choisis grâce à une connaissance préalable de leurs activités. De plus, six² de ces dix écorégions sont des haut-lieux de

¹ WWF et IUCN 2000.

² Le Caucase, la Nouvelle Calédonie, la Méditerranée, Madagascar, l'Afrique de l'Est et la forêt Atlantique.

la biodiversité selon les définitions communément admises (taux d'endémicité et degré de menace)¹. Les sites sélectionnés ne prétendent pas couvrir tous les efforts du WWF dans le domaine de la restauration des paysages forestiers.

Résultats

Malgré une liste succincte de projets une importante quantité d'informations a été collectée. Certains enseignements ont été spécifiques à certaines localisations (de projets/programmes), tandis que d'autres ont été communs à plusieurs initiatives ou régions.

Les enseignements majeurs sont présentés selon un cadre organisationnel² pour la planification et la restauration des forêts dans les paysages.

La section 3 de ce rapport donne plus de détails sur chaque enseignement.

L'ENGAGEMENT À LONG TERME EST ESSENTIEL POUR LA RESTAURATION DES PAYSAGES FORESTIERS

Enseignements concernant l'initiation d'un programme de restauration

- **Enseignement 1 :** La compréhension du contexte local - dans ses dimensions socio-économiques aussi bien qu'écologiques - est critique pour l'acceptation et la durabilité.
- **Enseignement 2 :** L'implication des partenaires et autres parties prenantes, ainsi que la négociation des compromis, sont essentielles pour le succès à long terme, bien qu'exigeant beaucoup de temps.
- **Enseignement 3 :** Il est préférable d'avoir une approche stratégique pour la conception et le développement des initiatives de restauration des paysages forestiers. Cependant le développement des projets se trouve souvent dicté par des opportunités particulières, d'où des répercussions sur la durée, la planification, l'engagement des parties prenantes etc.
- **Enseignement 4 :** L'engagement à long terme est essentiel pour la restauration des paysages forestiers.
- **Enseignement 5 :** Le WWF a une valeur ajoutée spécifique dans la facilitation des partenariats en vue de lancer des initiatives à long terme et à grande échelle, telles qu'elles sont nécessaires pour la restauration des paysages forestiers.

Enseignements concernant la définition des besoins de restauration et l'articulation de la restauration avec une vision de conservation à grande échelle.

- **Enseignement 6 :** Il est impératif d'aborder les besoins socio-économiques afin d'assurer le succès à long terme dans la restauration des paysages forestiers.
- **Enseignement 7 :** Les buts de la restauration dans le travail du WWF étant divers, il est utile de définir une typologie afin d'améliorer la compréhension de cet outil au sein et au-delà de l'organisation.
- **Enseignement 8 :** L'élargissement de l'approche à l'échelle d'un site à celle d'un paysage tout entier s'accompagne de défis opérationnels certains.

¹ Voir : Conservation International, <http://www.biodiversityscience.org/>

² Voir: Vallauri, Aronson and Dudley 2005.

- **Enseignement 9** : Bien que la définition d'objectifs chiffrés (par exemple en ha), en utilisant la cartographie, soit précieuse dans la planification, ces objectifs peuvent être délicats et requièrent une interprétation soignée.
- **Enseignement 10** : L'adaptation au contexte local des techniques est décisive pour l'acceptabilité et la durabilité de l'effort de restauration.
- **Enseignement 11** : L'approche paysagère dans le domaine de la conservation en général présente les mêmes défis que la restauration des paysages forestiers.

Enseignements sur la définition des tactiques et stratégies de restauration

- **Enseignement 12** : Les cibles à long terme de la restauration doivent être clairement définies.
- **Enseignement 13** : La restauration des paysages forestiers est caractérisée par une trajectoire plutôt qu'une stabilité de la situation, d'où la nécessité d'une certaine flexibilité.

Enseignements sur la mise en œuvre de la restauration

- **Enseignement 14** : La restauration à petite échelle a un rôle à jouer dans un paysage plus large (démonstration), mais de telles interventions doivent être soigneusement définies tout en gardant à l'esprit le contexte plus large du paysage.
- **Enseignement 15** : De plus amples connaissances sur les espèces indigènes sont nécessaires, dans la plupart des cas.
- **Enseignement 16** : Le régime foncier est un élément critique pour assurer la durabilité de la restauration des paysages forestiers.
- **Enseignement 17** : Il existe de nombreux co-bénéfices pour la conservation dérivant de la restauration des paysages forestiers, en plus de la restauration des fonctions des forêts.
- **Enseignement 18** : Le succès engendre le succès.

Enseignements sur l'accompagnement des systèmes en vue de la restauration entière des écosystèmes

- **Enseignement 19** : Une échelle de temps d'au moins dix ans est nécessaire pour exécuter un programme de restauration de paysages forestiers, afin d'obtenir des résultats visibles.
- **Enseignement 20** : Il est important d'attribuer une valeur à un paysage restauré afin de permettre les décisions dans l'utilisation du sol et d'éclairer la négociation de compromis adéquats.
- **Enseignement 21** : L'insertion de la restauration des paysages forestiers dans les schémas existants peut aider à garantir sa durabilité financière et politique.
- **Enseignement 22** : La collecte et la compilation des expériences et des leçons sont essentielles pour construire une solide base d'expertise et de connaissances.
- **Enseignement 23** : La conception et l'exécution d'un schéma de suivi efficace pour la restauration des paysages forestiers demeurent un défi.

Recommandations

Plusieurs recommandations peuvent être émises suite aux enseignements émergents de ce rapport. On n'en retiendra cependant que six recommandations spécifiques, dont trois concernant le WWF et trois la communauté plus large, dans le domaine de la conservation.

**LE WWF DEVRAIT
TIRER PROFIT DES
ENSEIGNEMENTS
APPRIS, PROMOUVOIR
LES EXEMPLES DE
TERRAIN POSITIFS ET
DÉFINIR DE FAÇON
PLUS EXPLICITE LA
CONTRIBUTION QUE LA
RESTAURATION
APPORTE À SES
OBJECTIFS GLOBAUX
DE CONSERVATION**

Recommandations pour le réseau WWF :

– **Recommandation 1 : L'institution devrait intégrer plus explicitement la contribution que la restauration des paysages forestiers apporte à ses objectifs plus larges (ainsi que précisé dans le « Global Programme Framework »).**

La restauration a un rôle très clair à jouer en contribuant aux objectifs principaux du WWF. Cependant cette relation n'est pas explicite dans les schémas organisationnels du WWF et par conséquent, les efforts appréciables dans la restauration des paysages forestiers n'apparaissent pas comme des contributions aux objectifs plus larges de l'organisation. Il est nécessaire de déployer des efforts pour mieux aligner ces actions de restauration avec les objectifs généraux et pour documenter efficacement leur contribution au programme global.

– **Recommandation 2 : WWF devrait promouvoir les expériences positives et les récits d'action de terrain.** Le WWF possède de nombreuses expériences intéressantes et positives dans le domaine de la restauration des paysages forestiers, de même que plusieurs enseignements émergent du réseau, tandis que des récits de qualité peuvent être communiqués au public. Toutes ces contributions ne sont pas suffisamment promues ni partagées, aussi bien au sein du réseau qu'au-delà. Les bureaux du WWF devraient être encouragés à communiquer de telles expériences.

– **Recommandation 3 : Le réseau WWF devrait entreprendre une évaluation des besoins pour déterminer spécifiquement les lacunes ainsi que les outils nécessaires pour soutenir davantage les efforts de restauration des paysages forestiers.** Bien que le réseau WWF possède une expérience importante, il existe des lacunes aussi bien que des domaines où les efforts sont dupliqués. D'autre part, l'exécution de la restauration des paysages forestiers a engendré des besoins nouveaux du point de vue de l'expertise et de la méthodologie (sur les approches sociales, sur les techniques agricoles et forestières); certaines de ces expertises ne sont pas communes dans la culture du WWF et requièrent un support technique au moins à travers des liens avec des organisations adéquates (par ex. Care, Oxfam, Centres de recherche en agriculture etc.). Une évaluation systématique des besoins aiderait à identifier des lacunes et à éliminer des redondances. Cela est d'autant plus important que des changements de personnel sont probables sur les durées relativement longues nécessaires pour la restauration des paysages forestiers.

Recommandations pour la communauté de la conservation :

– **Recommandation 4 : Construire sur la base des enseignements acquis.** Ce rapport a identifié un large éventail de leçons émergentes des dix dernières années de travail au WWF dans le domaine de la restauration des paysages forestiers à l'échelle globale. Ces enseignements sont très pertinents et le WWF devrait les diffuser largement et les appliquer aux besoins de ses programmes de conservation. Comme l'a montré ce rapport, la restauration des paysages forestiers demeure un élément important de la conservation à grande échelle. Le passé, par ses enseignements, peut aider les efforts futurs, aussi bien au sein du WWF qu'au-delà.

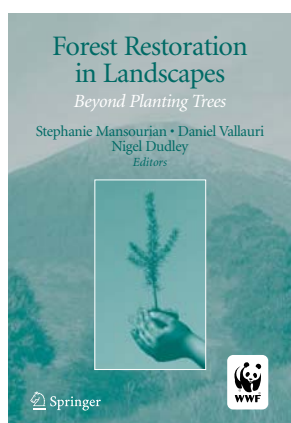
– **Recommandation 5 : Les institutions adéquates devraient faire un effort concerté pour mobiliser des ressources et entreprendre des actions à long terme visant à la restauration des paysages forestiers.** Il faut au moins dix ans pour atteindre des résultats concrets et durables dans le domaine de la restauration des paysages forestiers. Cela implique des ressources humaines et un partenariat diversifié, ainsi que des contributions multidisciplinaires. Les partenaires dans une telle entreprise se doivent de conjuguer leurs efforts dans les domaines prioritaires de restauration afin d'atteindre l'échelle nécessaire.

– **Recommandation 6 : Déterminer si la restauration des paysages forestiers ou l'approche paysagère est préférable dans une écorégion donnée.** Il existe une certaine confusion entre les deux approches, qui manifestement se recouvrent partiellement. Cependant elles sont bien distinctes. Dans la restauration des paysages forestiers on postule que l'action de conservation la plus importante est de restaurer la fonctionnalité de la forêt. Ceci est particulièrement important là où la dégradation ou destruction des forêts sont importantes et où les pressions sur les forêts sont fortes. Cela sera aussi important là où des espèces prioritaires sont menacées d'extinction suite à une perte d'habitat. Dans plusieurs cas, cependant, cela ne devrait pas être le souci principal pour la conservation, mais plutôt une approche paysagère serait indiquée utilisant un ensemble d'outils (qui pourraient inclure des interventions de restauration). Une telle approche maintiendrait et gèrerait un paysage forestier fonctionnel. Afin d'assurer avec succès des initiatives de restauration des paysages forestiers, un élément clef est de s'assurer que l'approche est appliquée là où elle est vraiment indiquée.

INTRODUCTION

“If we wait until tomorrow to restore forests it will be too late. If too little is left, it will take longer, will be more difficult, and will cost much more to begin restoring a healthy forest – and it may also be too late.”¹

Between 2001 and 2005 WWF’s Forests for Life target driven programme (TDP) revolved around three pillars: **protection, management and restoration** of forests within landscapes. The restoration pillar was addressed through “forest landscape restoration” which was defined in 2000 at a joint WWF/IUCN workshop in Segovia (Spain) as: “A planned process that aims to regain ecological integrity and enhance human wellbeing in deforested or degraded landscapes”.¹



In response to demand from the WWF Network, a guidance manual on forest landscape restoration was published in 2005, with input from over 70 international experts.

Forest landscape restoration was the newest area of work for the WWF network and as such the target selected for the programme was designed specifically as a learning one: *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.* WWF’s aim was to actively contribute ten of these landscapes and in doing so, to build a knowledge base as well as to strengthen its own capacity to implement forest restoration in landscapes.

Unlike protected areas, restoration, particularly of forest functionality and at a landscape scale, was a new concept for WWF. It evolved parallel to the increasing interest in ecoregions, as the conservation community was scaling up its efforts from sites to larger scales. The presence of a coordination unit in WWF International managing forest landscape restoration and promoting it, helped to raise awareness about the role of forest restoration within conservation, support pilot efforts, develop tools, jointly identify options to restore forests in landscapes and to promote cross-learning as the programme grew.

Since the end of the target driven programmes there has been no central hub or clear driver for forest restoration within the WWF Network, although WWF France has maintained a node of expertise on forest restoration and continues to provide some technical support for the wider Network. Nevertheless a number of forest restoration activities have been continuing and new programmes have emerged throughout the Network. This report focuses on some of the larger, more well known and longer lasting projects/programmes on restoration since these are believed to have the most experience from which lessons can be extracted.

The objectives set for this report were to:

1. Extract learning (what has worked well, challenges, opportunities, successful approaches, etc.) from WWF’s recent work (as of 2005) on restoration in forest landscapes
2. Inform future restoration work both within the WWF Network and beyond.

The report was commissioned by WWF France and carried out jointly by an independent consultant (Stephanie Mansourian) and WWF France (Dr Daniel Vallauri) during the period September–November 2011. Three methods were used for data gathering: a desktop review of reports and other relevant materials, interviews and questionnaires.

¹ Chief Emeka Anyaoku (WWF president 2002–2009) cited in Mansourian, Vallauri and Dudley, 2005.

² WWF and IUCN, 2000.

A total of 14 persons were interviewed from 11 WWF offices (see Annex 1). Of the 15 offices (one being non-WWF) who received the questionnaire, 11 offices responded with 13 individual questionnaires (see Annex 2).

The first section of this report sets the scene, looking at the importance and relevance of forest landscape restoration. The next section explores specific lessons emerging from the different regions analysed. The third section explores common and overarching lessons and the final section concludes the report with some recommendations.

Young boy in forest burnt for cultivation in Madagascar



FOREST LANDSCAPE RESTORATION IN CONTEXT

Hundreds of millions of people depend on forests for food, energy, protection, medicines, building materials etc. Forests are also home to millions of species and provide services such as carbon sequestration, water protection, soil stabilisation and micro-climate regulation, among others. Yet, we are losing and degrading forests at alarming rates. According to a remote sensing exercise by the Food and Agriculture Organisation of the United Nations (FAO), net forest cover loss totalled 72.9 million ha (an area the size of France plus two times Switzerland) between 1990 and 2005.² This net figure masks the fact that annually, a total

of 14.5 million ha of forests (the size of Nepal) are lost. These losses are offset by re-planting – some of which may be lasting, and ecologically and socially beneficial, much of it not. Protecting biologically-important areas of existing forests and sustainably managing others are essential actions for the conservation of forests and forest biodiversity. Yet, restoring forest landscapes is also a critical means of securing forests for future generations.

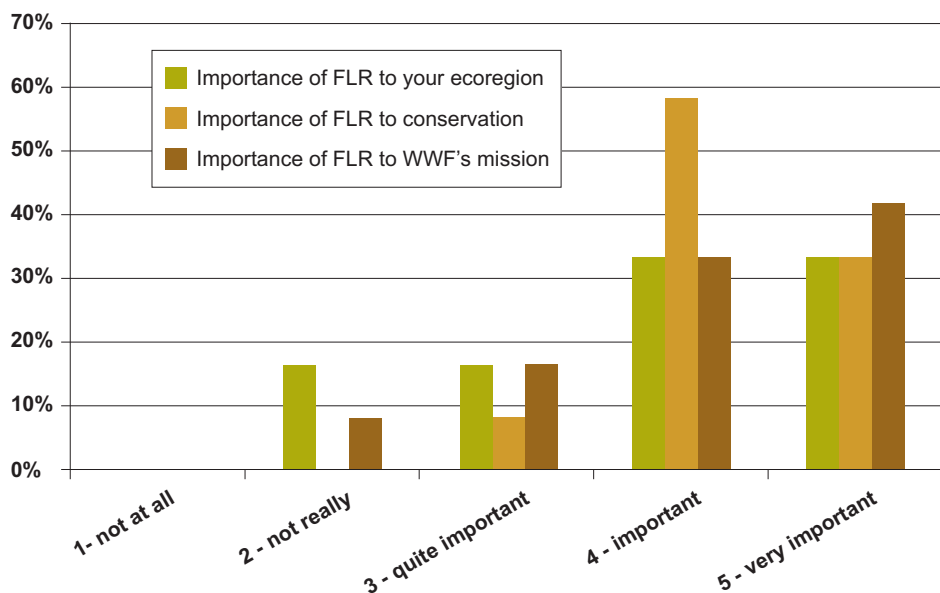
Importance and Relevance of Forest Landscape Restoration

Within the framework of this report, questionnaire recipients were asked to rate the importance of forest landscape restoration to their specific ecoregion, to WWF’s mission and to conservation more broadly. The responses can be seen in the graph below.

The majority of respondents, ie: 69 per cent, rated the role of forest landscape restoration in their ecoregion as either “very important” (4) or “extremely important” (5) as can be seen from the chart in Figure 1.

Concerning the more specific question related to WWF’s mission, again a majority of 75 per cent rated it as important or very important, with only nine per cent rating it as “not really important”. Finally, an overwhelming 92 per cent rated the relevance of forest landscape restoration to conservation as either “important” or “very important”.

Figure 1. Responses about the importance of forest landscape restoration



¹ Chief Emeka Anyaoku (WWF president 2002-2009) cited in Mansourian, Vallauri and Dudley, 2005.

² FAO, 2011.

Annex 4 further details the relevance of forest landscape restoration to other major conservation organisations and to current global policy priorities.

WWF's Global Programme Framework and Forest Restoration

WWF's strategy, the Global Programme Framework (GPF), approved in 2008, has two meta-goals for the year 2050:

By 2050, the integrity of the most outstanding natural places on earth is conserved, contributing to a more secure and sustainable future for all.

By 2050, humanity's global footprint stays within the earth's capacity to sustain life and the natural resources of our planet are shared equitably.

PROTECT, MANAGE, RESTORE ARE THREE TOOLS TO FIGHT FOREST DEGRADATION

Annex 4 of the framework which contains an outline monitoring plan, notes under the first meta-goal "**restored habitat cover**" as one desired result. It is noteworthy that restoration has been lost however, when it comes to monitoring WWF's intermediate goals (to 2020) related to priority places. Instead, to 2020, the desired results focus on protection and sustainable management. While the long term perspective needed for restoration can justify the inclusion of restored habitat only in the year 2050, the current reality as seen in WWF's programmes is that unless restoration is explicitly mentioned in the shorter term, it will not be a priority. However, given the long timeframe required for restoration, unless programmes are initiated soon, the result of "restored habitat" will not be reached by 2050.

Furthermore, a quick analysis of data from the IUCN Red List¹ shows that "habitat loss" is a major threat for all the forest-inhabiting priority species in the GPF, as can be seen in Table 3.1 in Annex 3. Equally, a rapid analysis of the main threats to WWF's forested priority places in the GPF identifies habitat loss, degradation and fragmentation as a major concern in 16 of the 28 forested priority places (out of a total of 35 - see Table 3.2 in Annex 3). While the loss of habitat does not in itself signify that restoration is the main or only strategy to pursue, a forest landscape restoration approach that seeks to restore forest functionality within landscapes would be a relevant contribution to conservation. This is particularly true as forest landscape restoration takes a comprehensive view of the landscape and aims to restore its functionality, via a range of actions including reducing pressures on forests by promoting alternative livelihood options (see for example the Madagascar case study), or by fencing off certain areas for a time to allow natural regeneration (see for example the New Caledonia case study), or by educating and training local foresters (see for example the Bulgaria case study).

Given the high levels of habitat loss and degradation affecting WWF's priority places and species (as per the Global Programme Framework), well-planned forest landscape restoration can play a critical role in reaching the organisation's long term goals.

The Global Forest Programme and Restoration

Since 2008 WWF's forest programme has set a challenging overarching target of "zero net deforestation and forest degradation" by 2020. The campaign was launched at the

¹ IUCN Red List of Threatened Species, see: www.redlist.org

Conference of the Parties to the Convention for Biological Diversity (CBD) in Bonn in 2008 where delegates from 67 countries pledged their support. In order to contribute to this target, WWF's Forest Programme developed a new strategy in November 2010 which stresses that to reach this target: *(a) most natural forest should be retained– the annual rate of loss of natural or semi-natural forests should be reduced to near zero; and (b) any gross loss or degradation of pristine natural forests would need to be offset by an equivalent area of socially and environmentally sound forest restoration*¹. The strategy thus maintains restoration within landscapes as one of its core approaches to achieve forest conservation and sustainable use (Figure 2).

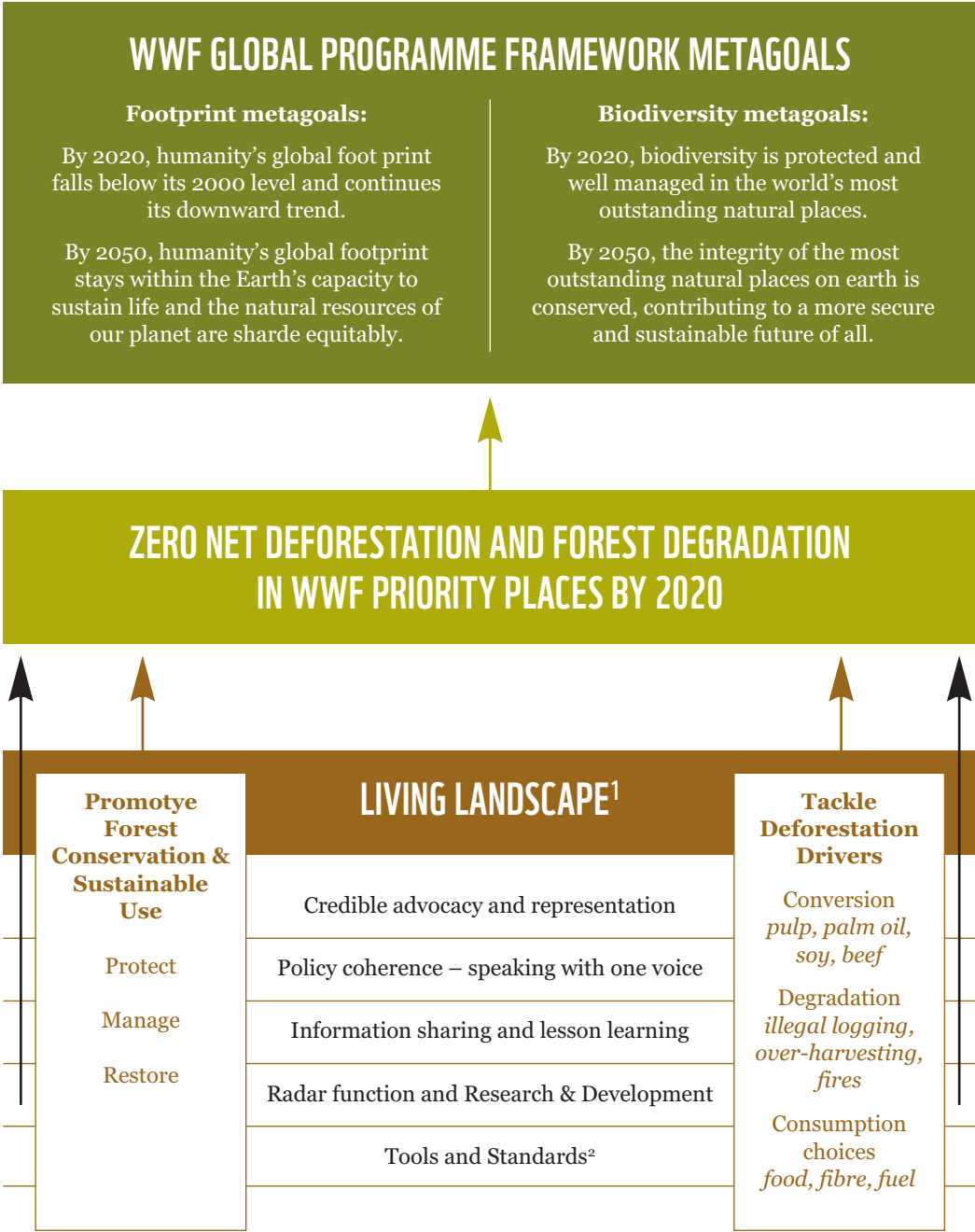
The framework for this strategy foresees that within each “living landscape” a mixture of approaches will be applied (as depicted in Figure 2) to achieve zero net deforestation. *“The vision for a living landscape is that good governance, sound land-use planning and responsible business practices will combine to halt forest loss, while allowing for economic development.”*

The strategy recognises that restoration, if done appropriately, can play a role in supporting the reversal of forest degradation. However, it should not detract from ensuring that the drivers of forest loss and degradation are addressed. Furthermore, the strategy notes the importance of developing tools for forest restoration (among other topics).

**ANY GROSS LOSS OR
DEGRADATION OF
PRISTINE NATURAL
FORESTS WOULD NEED
TO BE OFFSET BY AN
EQUIVALENT AREA OF
SOCIALY AND
ENVIRONMENTALLY
SOUND FOREST
RESTORATION**

¹ WWF, 2010

Figure 2.
WWF Forest Programme's contribution to the Global Programme Framework



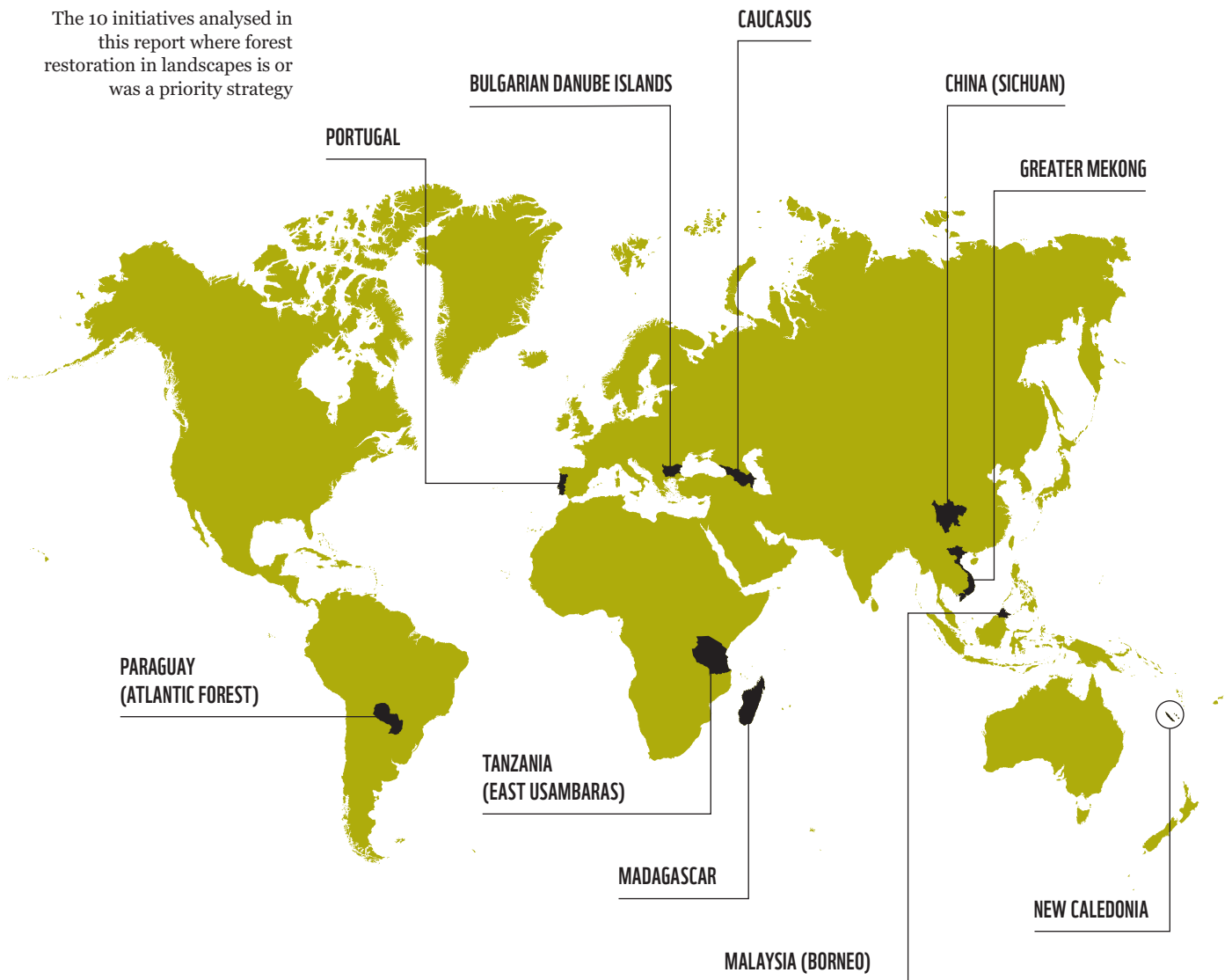
¹ Landscapes, where good governance, sound land-use planning and responsible business practices combine to halt forest loss, while allowing for economic development.
² For example: Scorecards, certification, payments for ecosystem services, climate adaptation.

CASE STUDIES AND LESSONS LEARNT

This section reviews a number of initiatives where forest restoration in landscapes is or was a priority strategy (figure 3). All of the initiatives listed in this section were specifically chosen because they were begun under WWF's Forests for Life target driven programme.¹ The intention was to see what emerged from these efforts ten years later. For each initiative we briefly describe the initial project (pre-2005) and then look at follow up, post-2005/6, main

impacts, specific emerging lessons and future challenges. The projects listed by no means represent an exhaustive list of WWF's work on forest restoration.

The 10 initiatives analysed in this report where forest restoration in landscapes is or was a priority strategy



¹ except for the Caucasus – see 2.10

MALAYSIA (BORNEO)

Working with palm oil companies to identify the best restoration techniques along the Kinabatangan river in Borneo and restoring orang utan habitat in the Heart of Borneo.



Background

WWF's restoration work in Sabah started in the northeast along the Lower Kinabatangan river, and has since extended further south towards central Borneo. The lower Kinabatangan river was identified as early as the 1980s as being a priority wildlife corridor, notably for Borneo pygmy elephants (*Elephas maximus*), orang utans (*Pongo pygmaeus*) and proboscis monkeys (*Nasalis larvatus*), and a critical freshwater ecosystem providing valuable natural resources to the local Orang Sungai people. Yet pressure from a growing palm oil industry has been increasingly threatening the very survival of this biodiversity corridor as well as the rest of Borneo. It has led to increasing human-wildlife conflict as animals are being forced out of natural areas closer to villages, loss of fishing areas for local villagers, poor water quality and loss of viable habitat for the myriad species inhabiting this unique island. In the mid-1990s the government of Sabah agreed to create a 27,000 ha wildlife sanctuary along the Lower Kinabatangan but in part because of lobbying by palm oil companies, it took a further 10 years before this zone was officially declared a wildlife sanctuary, in 2006.



The endangered Bornean orangutan (*Pongo pygmaeus*)

Initial project

WWF's initial forest landscape restoration work in Sabah focused on the Lower Kinabatangan river and centred on engaging the three main stakeholder groups: local authorities, communities and palm oil companies. With local authorities, WWF sought to establish the sanctuary to protect remaining fragments of forests; with palm oil companies it sought to improve standards, notably to protect high conservation value forests on concessions and to restore degraded areas; and with communities it sought to promote the values of natural forests through alternative income generating schemes such as ecotourism.

Follow up

Further to successful engagement with local stakeholders, WWF Malaysia was able to reduce its engagement in the Kinabatangan as many responsibilities and follow on actions were transferred to local authorities and communities. Instead, WWF continued its restoration work in Sabah south of the Kinabatangan watershed, in the framework of WWF's Heart of Borneo initiative.¹ The area where restoration is taking place is a 12,000 ha patch of degraded forest situated between oil palm plantations and the Segama river and was chosen because of its importance for the orang utans, a priority species for WWF. The objectives of the programme are to restore the structure, habitats and ecosystem functions of the water catchment. In this area the density of orang utans per hectare had in-

¹ One of WWF's flagship programmes or "Global Initiatives"

RSPO MEMBERS COULD BENEFIT FROM FOREST LANDSCAPE RESTORATION APPROACHES

creased to unsustainable levels (2.5/ha) as a result of insufficient viable habitat. More recently it would appear that the population is more evenly distributed with a density of 1.5/ha. This could be a positive sign related to restoration actions, although the correlation is as yet difficult to confirm for lack of concrete monitoring data. The focus of restoration has been on fruit trees which are an important component of the orang utan's diet, and also fast growing pioneer species in open areas in order to close the canopy, enabling the orang utans to move around from tree to tree without having to crawl on the ground where they expose themselves to several threats. In more shaded areas, slower growing species have also been used. The restoration area fits within a larger priority landscape of 280,000 ha which is part of the Heart of Borneo global initiative, one of WWF's flagship programmes.

Main results and impacts¹

→ **Successful handing over to local stakeholders** – With a re-focus on the Heart of Borneo global initiative, WWF has reduced its engagement in the Lower Kinabatangan. It was also in part able to do this based on successful appropriation of the programme by different local stakeholders, such as the authorities, the palm oil companies and the communities.

→ **Using restoration to improve practices in oil palm concessions** – WWF has been working closely with the Roundtable on Sustainable Palm Oil (RSPO) which has set some criteria for the sustainable production of palm oil. Criterion 4.4² highlights the need to maintain the quality and availability of surface and ground water and this can be done by restoration as highlighted in the indicators of the guidance document for RSPO certification. A number of the companies in the region are members of the RSPO. For example, Nestlé has recently (September 2011) announced that it is engaging in a 2400 ha restoration project along the Kinabatangan river, called RiLeaf, which aims to reforest riparian sites of the Kinabatangan River, and thereby create a landscape where people, nature and agriculture (oil palm) can co-exist harmoniously.

→ **Increasing the value of natural forests to communities** – ecotourism and the commercial exploitation of native species nurseries increased the value of natural forests and biodiversity (versus oil palm plantations) to local communities. For instance, most of the contractors employ villagers to prepare the seedlings needed for restoration. Tree planting has become an increasingly popular proposition in this region, in particular for carbon credits. Ecotourism in the Kinabatangan zone has grown with numerous lodges and tours being offered, a testimony to the economic value of biologically rich natural forests. Most of these ventures are run by local communities and they represent a viable economic alternative to working on oil palm plantations.

Lessons learnt in Borneo

Restoration can be successfully integrated within sustainable forest management – In Borneo, the concept of restoration has been closely integrated within sustainable forest management.

Knowledge on the restoration of indigenous species remains limited – The two main actors in reforestation in the region (Sabah Foundation and the forestry serv-

¹ For each region, a selection of major results and impacts has been chosen. This section does not intend to be in any way exhaustive.

² See: RSPO, 2007.

ice) all have experience with fast growing and exotic species but limited knowledge when it comes to indigenous species and ecological restoration.

Mixing fast and slow growing tree species can be an effective means of reaching different objectives – The project needed to identify and work on the propagation of various relevant tree species: in order to rapidly close the canopy (for the orang utans to be able to move in between patches of forest) fast growing species were used. At the same time, slower growing species were used in order to ensure a diversity of species (notably, fruit trees of importance for orang utans' diets).

Proper seedling preparation is important – the way seedlings are prepared is very important and can be critical to the survival of the plant. For example, some species are very sensitive and will require deep bags in order to survive transportation to the restoration site.

Future challenges

The challenge remains to make restoration a viable alternative to large scale conversion to oil palm plantations in Borneo. Designing accurate and comprehensive monitoring systems that can measure improvements in landscape functionality is also important.

Sengkuang,
Dracontomelon dao,
planted for its dense foliage
and fruits, a favourite food for
the orang-utan. In this photo
the tree is less than 2 years old.



© J. Gassis, WWF Malaysia

MADAGASCAR



Restoring a degraded priority conservation landscape in Madagascar's moist forest

Background

Madagascar's moist forest can be found all along the eastern half of the island and is heavily fragmented and degraded. Yet, it is home to a unique variety of species, notably the endemic indri (*Indri indri*), the recently discovered hairy-eared dwarf lemur (*Allocebus trichotis*), over 20 species of small mammals, including several tenrecs, and numerous other endemic species. Unsustainable use of natural resources, notably through slash and burn agriculture, by poor rural populations has led to the loss of an estimated 90 per cent of original forest cover in Madagascar. As a result, protection, management and restoration of forest landscapes are all priority tools to achieve lasting conservation of Madagascar's unique biodiversity.

Initial project

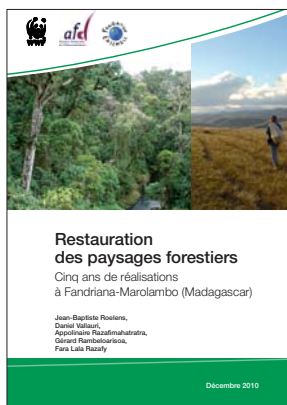
A participatory approach was taken in Madagascar to identify a priority landscape for restoration (summarised in the diagram below). As a result jointly agreed criteria for the selection of a priority landscape for restoration led to the identification of the 200,000 ha Fandriana-Marolambo landscape in central Madagascar in 2003. The long term aim of the project submitted to the French Ministry of Foreign Affairs for funding in 2004 was to improve both the quality and quantity of forests while providing enhanced goods and services, and improved livelihoods for the benefit of rural populations. The specific objective was: "The goods, services and authenticity of the moist forests of the landscape of Fandriana-Marolambo are restored so as to support the development of the populations and to secure the objectives of biodiversity conservation."

Steps in selecting a priority landscape for FLR in Madagascar



Follow up

The project was successfully implemented over the course of 2004-2009. A final evaluation was made for the donor and a report highlighting lessons learnt was produced in 2010. Many successes were reported; however, the ultimate objective of “restoring the goods, services and authenticity of the moist forests of the landscape of Fandriana-Marolambo so as to support the development of the populations and to secure the objectives of biodiversity conservation” clearly required longer term engagement. As a next phase to this project, WWF Madagascar was able to secure funding from other donors, notably Air France and the GoodPlanet foundation, WWF Switzerland and WWF Sweden, via follow on projects that include sustainable financing, transfer of forest management rights to communities, carbon financing, civil society engagement and a more holistic landscape approach to conservation. These projects run out in 2012-2013.



Main results and impacts

→ **Clear benefits to local communities** – A final evaluation assessed the number of direct beneficiaries of the project as totalling 1,400 families (8,400 individuals). These benefits range from improved food production, to increased revenue and development of new skills.

→ **Collaborative and participatory approach** – from the very start of the programme, the forest landscape restoration work in Madagascar sought to be fully participatory. The project itself served to create a common vision about the landscape and the objectives of restoration within this large area. Local populations were actively engaged in the restoration process and specific zones were delineated for active or passive restoration. A total of 70 community associations participated in the restoration effort, managing 58 nurseries and were responsible for the production of more than 850,000 seedlings.

→ **Improved knowledge of local species** – despite their initial reluctance, communities have been able to successfully produce 474,250 plants from 100 indigenous species, of which 15 present great potential for restoration activities (capacity to grow on degraded soils, ease of large scale production etc.).

→ **Changes in agricultural practices** – Agricultural practices were improved (fertilization of soils, crop combinations and cropping system over vegetative cover to reduce the impact of slash and burn practices) and agroforestry techniques disseminated. In addition, alternative livelihood enterprises were started, such as the production of essential oils, honey, and small animal and fish farming. Improvement in rice cultivation techniques introduced through the project, led to a five-fold increase in production of rice in Ambodionoka and in the rural commune of Betsimisotra, thus, reducing pressure on the forests while improving the communities' livelihoods.

→ **Multiplication** – WWF now has significant expertise and is including some restoration activity in all of its community management transfers (and in advising others in their plantation sites). Equally, other partners such as Conservation International (CI) and the authorities (regional, communal and the national park managers) are benefitting from the project's lessons and results.

Lessons learnt in Madagascar

Forest landscape restoration requires significant staffing needs – given the large size of the landscape (200,000ha), the tools developed and the diversity of ethnic groups in the landscape, more staff was required than was in the initial proposal, including, importantly, local staff based in the landscape all year. Their role is key to establishing trust and facilitating work with local communities.

Appropriateness of applying a mix of slow and fast growing species – slow growing indigenous species were needed for restoring the ecological values of the landscape and fast growing exotic species served to meet the needs of the local population (both for energy and wood production).



Community nursery

Critical distance needed between the tree nursery and the restoration sites – it was important to reduce the distance between the tree nursery and the forests (a maximum of 2 km) so that the community members responsible for transporting the seeds first to the nursery and then the seedlings to the restoration area, did not have to walk too far.

Directly transplanting wild seedlings proved difficult – transplanting directly from the wild proved tricky with low survival rates, while transplanting via tree nurseries (ie: from the wild to a nursery then to the restoration site) proved to be the most effective process.

Use of both seeds and seedlings – A greater number of seeds than seedlings can be transported at a time, but seedlings will be more resilient; seedlings collected from the wild will have already survived the first tricky period of growth and will therefore, be easier to nurture and then re-plant than seeds that will require a longer period of development (the exception being some “big seed” species that could be pre-germinated in nurseries during two to three weeks and then show good growth potential when planted).

Importance of the distance between plants – the ideal distance between plants should be between 2 and 3 m, with a density of 1,000 to 2,500 plants of indigenous species per ha. Creating space around young plants without exposing them directly to the sun is critical for most species.

Lack of data signifies more time for the project – there was a need for more precise information (for example, on households and their use of land, on identification of key drivers of deforestation, on indigenous species etc.) early on in the project, something which had not been factored in the initial project design.

Value of technical support – the project benefited from visits by technical staff from WWF in Antananarivo, WWF International and WWF France. A full time French volunteer with a background in restoration was also added to the staff between 2008 and 2010. These visits and support also served to motivate local populations, as well as providing specific technical input.

Land tenure issues proved highly important - For example, protected area authorities would not allow local communities to restore within the zone that was delineated as a protected area in the landscape, since communities could then claim that land as their own.

APPROPRIATE FIELD STAFF NUMBERS ARE NEEDED TO DEVELOP SUCH AN INNOVATIVE AND COLLABORATIVE APPROACH

Reality on the ground can impact on ambitious goals – the ambitious initial project proposal needed to be revised given the reality on the ground.

Importance of working with young people and with children – building capacity and creating awareness among future generations is a way of multiplying project impacts.

Future challenges

Even with a longer project duration, an exit strategy would need to be carefully designed. Land tenure continues to be an issue in the country. Governance concerns at the national level, which are reflected in accelerated environmental degradation, are a challenge for the long term sustainability and potential replicability of a large scale restoration initiative such as that of Fandriana-Marolambo. Sufficient means need to be allocated to the promotion, education, communications and transfer of the success stories of this project.

Planting season

**THE RIGHT SPECIES
IN THE RIGHT SITE
AT THE RIGHT TIME**



© A. Razafimanantsoa

GREATER MEKONG

Development of a landscape scale monitoring system in the Central Annamites landscape



Background

The WWF Central Annamites landscape is a vast area of forest straddling Lao PDR and Vietnam. It is exceptionally rich in biodiversity, and is home to the relatively recently discovered rare and elusive saola (*Pseudoryx nghetinhensis*). It also harbours the large-antlered muntjac (*Muntiacus vuquangensis*) and the near endemic douc langur (*Pygathrix nemaeus*). In 1998, the government of Vietnam issued a policy to restore five million hectares of land by 2010 with the following main objectives: 1. To speed up forest plantation and protect existing forests, 2. To increase the forest cover to 43 per cent of the national territory 3. To create raw materials needed for development of the forest product processing industry thus contributing to hunger elimination and poverty reduction, developing production and creating conditions for secure livelihoods. While there was provision for the use of native species, most of the effort to date had been using exotic species. In a first phase, WWF felt that the most effective intervention in terms of beginning to introduce principles of forest landscape restoration in the Central Annamites was to influence this 5 million ha restoration strategy. As the WWF Greater Mekong programme evolved, forest restoration actions were integrated into other projects.

3. To create raw materials needed for development of the forest product processing industry thus contributing to hunger elimination and poverty reduction, developing production and creating conditions for secure livelihoods. While there was provision for the use of native species, most of the effort to date had been using exotic species. In a first phase, WWF felt that the most effective intervention in terms of beginning to introduce principles of forest landscape restoration in the Central Annamites was to influence this 5 million ha restoration strategy. As the WWF Greater Mekong programme evolved, forest restoration actions were integrated into other projects.

Initial project

In the Central Annamites WWF felt it was appropriate to develop a landscape-wide monitoring system which would serve to engage stakeholders to define the indicators for restoration, thereby beginning an important dialogue with them, while also defining the future restored state for the landscape via the choice of indicators¹. The ultimate aim was also to integrate the monitoring system with the government reforestation programme and policy so as to influence their approach and multiply impacts. A final report and monitoring system was published jointly by WWF and the Vietnamese Ministry of Agriculture in 2003.

Follow up

In practice, although officially adopted by the government, the monitoring system appears to have never been implemented. Several iterations followed the finalisation of WWF's "version" of the monitoring system, but to date none seems to have been applied.

¹ Dudley, 2004.



The WWF Greater Mekong programme underwent a number of significant changes in recent years, including in the way the programme priorities were sub-divided (both geographically and thematically). Three separate initiatives reflect the increasing priority given to restoration within the landscape level conservation work being undertaken in the region. Each project is very distinct and restoration is one strategy applied among others in achieving conservation:

1. A project on sustainable harvesting of rattan funded by the EU is seeking to sustainably produce rattan and includes elements of forest restoration while engaging local communities and focusing on ecosystem services restoration¹.
2. Inspired by the experience in Vietnam, a project around Kui Buri national park (Thailand) aimed to restore the forest ecosystem in the landscape which was converted to pineapple plantations, using a mix of indigenous species and food species for elephants with the explicit objective to mitigate human-elephant conflict (with the elephants from the park regularly coming into conflict with the populations living around the park and cultivating mono-cultures of pineapple)².
3. A third relevant project in the region is one on forest carbon funded by the German government's international climate initiative. This four year project which started in early 2011 is seeking to improve protected areas management, halt illegal timber trade, secure sustainable timber production and restore corridors. Through this multi-pronged approach within a forested landscape, the project is seeking to maintain carbon stocks.



Main results and impacts

→ **Engagement with government with a view to amend policy** – The FLR monitoring system was published jointly by WWF and the Vietnamese Ministry of Agriculture and Rural Development in 2004. The main benefits provided by the monitoring framework include: identifying and engaging key stakeholders in the landscape around a relatively “neutral” process (the development of the monitoring framework), identifying projects (and entities) that could contribute to the landscape monitoring framework and beginning to identify the key issues that need addressing in the landscape with respect to restoration. Importantly, while the government had experience in plantations of exotic species and the intention to use such plantations to meet its objectives, the lengthy and comprehensive process of engaging with them to identify the values that indigenous species and ecological forms of restoration could provide, served to open up new opportunities for changing their practices.

→ **Comprehensive monitoring and evaluation (M&E) tool for landscapes** – Significant effort went into developing a solid tool for the Central Annamites which, although based on restoration actions, was also applicable to wider landscape conservation. This tool went through various consultations and has received significant expert input. It is a solid product that warrants being used and adapted as necessary beyond Vietnam.

Lessons learnt in the Greater Mekong

Work on the restoration of forest landscapes was applicable to landscape-level work more generally in the Central Annamites – The landscape approach more broadly being implemented in the Mekong region has built on the forest landscape restoration work.

Importance of valuing the services to restore – In order for restoration to be sus-

¹ See: http://wwf.panda.org/what_we_do/where_we_work/greatermekong/our_solutions/sustainable_rattan/

² Parr *et al.* 2008.

tainable it is important to elaborate the ecosystem service value of forests (particularly in developing countries).

Changes in staff and in WWF's focus has set back some of the forest landscape restoration work in the Central Annamites – The departure of key team members combined with a re-definition of the WWF Mekong programme has led to a loss of momentum on some of the forest landscape restoration gains.

Future challenges

Initial successes in Vietnam in engaging with the authorities to develop indicators to measure progress on the Central Annamites landscape appear to have been affected in part by a change of priorities and staff in WWF and probably by changes in priorities in the government. The challenge would be to somehow tap into the efforts undertaken at the time and to identify why they were not fully implemented, what lessons emerge and how to re-engage in this effort.



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PORTUGAL

Re-directing EU agriculture subsidies to forest landscape restoration



Background

The Mediterranean Basin is a biodiversity hotspot hosting more than 25,000 plant species, 50 per cent of which are endemic to the region, and a number of endangered or critically endangered vertebrates. Southern Portugal is included in the Mediterranean ecoregion, with a total of 3.7 million ha, of which 1 million ha is Mediterranean forest. Portugal is the country with the most extensive area (736,700 ha) of cork oak - a WWF priority species¹.

The Southern Portuguese forests contain one of the most biodiversity valuable forests in the western Mediterranean. These forests include the cork oak (*Quercus suber*), the African oak (*Q. canariensis*) and the holm oak (*Q. ilex*). Restoration was identified as an important priority within this landscape given large areas of degraded forest due to poor forest and agriculture management practices as well as land abandonment with resulting shrub encroachment and loss of habitat heterogeneity. Wildfires have contributed to further forest degradation and created the need to restore connectivity between forest patches.

Initial project

Through WWF's ecoregional work in the Mediterranean region, a "Green Belt" was identified in southern Portugal (1999). The "Green Belts" represent a series of functional landscape units in the Mediterranean seen as the necessary building blocks to achieve overarching ecoregional conservation priorities. The initial approach to restore these forest blocks in Southern Portugal focused on working with local NGOs, in particular when applying for subsidies provided by the EU and the Portuguese Government to support agricultural and forest activities. Ninety per cent of Portugal's forests are privately owned and in the south, small property sizes are the norm. It is therefore important to work with local stakeholders and to secure their engagement.

Follow up

Some of the actions recommended at the end of phase 1 were not implemented at the landscape scale, as attempts to use EU subsidies for restoration proved to be a lengthy and bureaucratic process which most private landowners could not afford.

Following on from recommendations in phase 1, technical restoration projects were developed in three priority landscapes of the Green Belt territory: Grândola, Monchique and the Guadiana valley.

→ In the Grândola landscape, dominated by cork oak forests, the field intervention covered the period: 2006-2008. This project had as its main objective: "To promote the productive and ecological functions of the cork oak forest, in a representative area of the southwest Iberian Peninsula." It sought to achieve this objective by restoring 20 ha (ap-

¹ The cork oak is a "Footprint Impacted Species", signifying that it is a priority species that WWF will strive to conserve by tackling the drivers (primarily trade and consumption) impacting on it.

IMPROVING
KNOWLEDGE ABOUT
NATIVE SPECIES IS
ESSENTIAL FOR
RESTORATION



Planting native species

proximately 20,000 trees from 20 species) of Cork oak forests, Mediterranean shrubland and riparian forests. Restoration activities included planting indigenous species, but also pruning species, removing the fire-prone shrubs and stabilising slopes.

→ A second project in the Monchique Natura 2000 site, was implemented in 2005-2009 and was undertaken by WWF in partnership with the *Direcção Geral dos Recursos Florestais Núcleo do Algarve* and the *Aliança Florestal* of the Group Portucel Soporcel. Its objectives were essentially to act as a pilot site to demonstrate techniques for restoration after fire. This project focused its restoration interven-

tions on plots identified through a high conservation value forest (HCVF) exercise. It sought to achieve this objective by restoring 70 ha of priority habitats occurring within a eucalyptus plantation dominated landscape. Restoration activities included pruning native species, removing eucalyptus from the habitats identified as HCVF, and stabilizing slopes.

→ A third project in the Guadiana Valley Natural Park (2008-2010), in the Vascão river valley, a tributary of the Guadiana river, aimed to restore the ecosystem, by protecting against erosion, recovering ground cover and re-establishing the seed bank, improving vegetation cover to promote forest succession, strengthening the establishment of species of later succession and increasing biodiversity. It was followed by another phase aiming to improve water quality, the morphology of the riverbed and to preserve riverine vegetation. The specific objective was to promote restoration of the riparian zones along the Vascão river which have been affected by erosion and degradation, and to recover the ecological functions of the riparian corridor and the associated habitats to conserve local fauna, mainly the endemic and endangered fish *Anaocypris hispanica*, and flora.

New Generations Plantations project in Portugal

Through the “New Generations Plantations” project WWF has been collaborating with a number of plantation companies around the world to look at the role that plantations can play in future societies so that they do not alter key features of healthy, diverse and multi-functional forest landscapes, compatible with both biodiversity conservation and human needs. In Portugal the company Portucel manages around 120,000 hectares of plantations scattered all over the country. As a result of its potential impact on such a diversity of social and ecological zones, the company has carefully designed its strategy to integrate biodiversity conservation in its forest management model. Practical measures include notably establishing protective buffer zones around water courses and enhancing wildlife corridors and connectivity.

Source: www.newgenerationplantations.com

Main results and impacts

→ **Site demonstration projects** – While the technical restoration projects undertaken are small scale and do not have the capacity to transform the landscape, their more important impact is in terms of teaching new approaches and building capacity among the local forest owners and managers.

→ **Improved knowledge about indigenous species** – A large number of plantation techniques for indigenous species (e.g., common myrtle (*Myrtus communys*), Holm

oak (*Quercus rotundifolia*), and others) were tested over five years, mainly in the Monchique and Guadiana areas, leading to a better understanding of restoration techniques for these species.

Lessons learnt in Portugal

Economic context creates new challenges for restoration – Portugal’s forests are 90 per cent privately owned and small in size (averaging 5-10ha in some areas). For restoration to be sustainable in this context landowners need to see an economic return linked to the activity.



River bank restoration

Site focus – The recent approach to forest restoration in Portugal has been more site-focused, due in large part to the constraints imposed by the small size of private properties. More recently, efforts are being made to integrate restoration as one of many tools within a landscape scale approach to forest management in Portugal.

Forest landscape restoration promoted a dialogue with landowners – The approach to restoration enabled a dialogue with forest owners and managers. It provided a good forum to highlight the different options for restoring forest landscapes (rather than just planting monocultures of exotic plantations, a common feature of forestry in Portugal).

Expense and duration of large scale forest restoration efforts are limiting factors – Forest restoration, when done actively through tree planting, is expensive and takes a long time (all projects in Portugal were too short for any lasting results and did not include maintenance). Without a proper economic internalization of the costs, forest managers will have great difficulties in applying such active restoration practices.

Lengthy process to redirect EU and government subsidies – The initial idea of engaging private landowners to apply EU subsidies to better practices proved unrealistic given the amount of time and bureaucracy involved to obtain the necessary approval from the EU.

Restoring forest landscapes is a real challenge in a context with a multitude of forest owners – With 90 per cent of forest land being privately owned, seeking to coordinate a common landscape level effort is more difficult than when dealing for example, with the State as the single landowner.

Future challenges

The challenge in Portugal is to build a landscape approach which includes forest restoration as one of various tools that can mobilise private forest managers to invest in good management practices that include forest restoration. This approach is being developed in a new project, launched in 2011, the “Green Heart of Cork”, which brings together the tools of forest restoration, “high conservation value forests” (HCVF), certification and “Payments for Ecosystem Services” (PES).

NEW CALEDONIA

Restoring an endangered ecosystem in one of the world's biodiversity hotspots



Background

New Caledonia is one of the world's most important centres of endemism. The dry forests of the west coast are particularly important because of their high degree of plant endemism but they are vulnerable to fire, invasive species, clearing and urbanization. While originally New Caledonian dry forest covered at least 4,500 km² along the western slope of the Grande Terre island, today only one per cent is left.

Dry tropical forest of New Caledonia



© Daniel Vallauri

Initial project

The dry forest programme in New Caledonia was set up in 2001 and is a consortium of 10 entities, both public and private. The objectives of the programme are:

1. Improving understanding of the importance and value of the dry forests
2. Protecting the endangered sites by fences, fire-breaks and regulations
3. Restoring and replanting the target areas
4. Developing the economic valuation of the dry forest
5. Sustainably managing the dry forest.

In a first phase much of the knowledge about the indigenous New Caledonian dry forest species was acquired. Focus was on awareness-raising about the importance of the natural heritage and the precariousness of this forest – something which Caledonian civil society did not realise before 2001. The dry forest programme obtained significant political recognition and was inserted in the five year budget and workplan between the local au-

thorities and the French government, thus providing funding security and significant political weight to the programme.

Follow up

The follow up phase built on the knowledge acquired and awareness raised in the first phase as well as on the partnerships established. Native species were reproduced on a large scale in nurseries, and were re-planted in priority locations. An increasing number of nurseries have been offering native plants for restoration activities but also for private gardens and public areas.

Main results and impacts

→ **Gradually scaling up** – While the overarching plan for the dry forests was always one of restoring forest landscapes, in reality, the programme has evolved in small steps, with awareness raising, protection of remaining forest stands (and individual species) and building a knowledge base being the first fundamental steps. In more recent years, serious efforts have been made to scale up to the landscape level.

→ **Increased political engagement** – Politicians have witnessed the engagement of civil society and have been more convinced about the political need (and will) for forest landscape restoration and for new ways of managing land in New Caledonia. The recent formal establishment of the programme as a legal entity also gave it more political recognition as well as the ability to raise funds independently.

→ **Successful re-establishment of highly endangered plants** – Numerous endemic species were planted during the last few years. For example, 200 plants of the endemic *Pittosporum taniatum*, of which three individual plants were re-discovered in 2002, are now in the “parc forestier” and are flourishing, while of the three original ones found in the wild, two have died and one appears to be dying.

→ **Increase in demand for native species** – Demand for native plants from tree nurseries has been growing rapidly as local people’s understanding of the problems associated with exotic species and the value of their own native species has been rising.

Lessons learnt in New Caledonia

Improved knowledge of indigenous species – A first important step in New Caledonia was to develop a thorough understanding of its unique flora, including how to propagate the different species. Now, 10 years since the programme started, there is concrete know how and a good understanding about individual species (and the programme was also able to revise and update the IUCN Red List of threatened species). This has enabled nurseries to grow native species and thereby reduce demand (and offer) of exotic species. There is also increased understanding and expertise concerning the ecological restoration process itself, including planting, care and maintenance.

Restoration has supported other conservation efforts – The forest landscape restoration work in the dry forests has had repercussions on conservation in New Caledonia beyond just restoration (and beyond just the dry forest). For example, it has provided an opening to work on specific species such as the giant snail or on better understanding the invasion strategy of exotic ants.

**RESTORATION ON
DEMONSTRATION
SITES BY CIVIL SOCIETY
AND WWF SERVES AS
A TOOL TO ENGAGE
POLITICAL AUTHORITIES
ON LANDSCAPE
SCALE ACTION**

Lack of good indicators – The programme still suffers from a lack of good and meaningful indicators for forest restoration in landscapes, for example using the length of fencing as an indicator for areas set aside for natural regeneration does not consider the quality of the fencing.

Future challenges

While much of WWF's work in New Caledonia was conceived with a large landscape and even ecoregional scale in mind, in practice it proved difficult to engage stakeholders at this scale and many actions undertaken were of a site nature. While progress in this direction has been made, the challenge remains to further elevate the scale of thinking to the landscape.

Introduced deer and
invasive species,
a key factor of degradation



© Hubert Gérard

BULGARIAN DANUBE ISLANDS

Economic and political arguments to restore a biodiversity corridor



Background

The mighty Danube is one of Europe's most biologically important rivers, with over 3,400 species of aquatic fauna and is an important breeding, feeding and resting area for pelicans and 300 other bird species. The islands have been to a vast extent converted to hybrid poplar plantations to supply the government's timber industry. In 2000 an agreement was signed between Bulgaria, Moldova, Romania and Ukraine, to protect, sustainably manage and restore the 1000 km stretch of the Lower Danube. This "Lower Green Danube Corridor" aimed to: 1) effectively protect 1 million ha of existing and new protected areas; 2) restore 224,000 ha of natural floodplain; and 3) promote sustainable use and development along the lower Danube.

Initial project

Restoration work in the lower Danube corridor focused on the Bulgarian Danube islands. An initial cost benefit analysis by the World Bank and WWF in 2000, demonstrated the lack of financial arguments for further conversion of native floodplain forests into poplar plantations. As a result, the Bulgarian government adapted its forest strategy and agreed in 2001 to halt any further conversion of the floodplain forest and to restore one third of its Danube islands. Together with technical support from WWF Germany's Auen Institute, Bulgarian foresters were trained in methods for restoring natural forests on the islands.



Follow up

Restoration was undertaken by the forestry service with input from WWF in additional pilot sites along the Danube islands. While the forestry service fully mastered planting techniques for monoculture plantations of poplars, it took significant effort to engage them in planting indigenous species such as the oak (*Quercus oxycarpa*). Restoration was also expanded beyond the islands to riverine forests.

Unfortunately, elevated prices for pulp have meant that the results of the financial analysis undertaken in 2000 have been skewed. Consequently there is still some potential financial value and incentive in converting areas to poplar plantations. This remains a challenge for ecological restoration.

Main results and impacts

- **Enhanced political will** – The agreement to restore native forests on the Bulgarian islands represented an initial success. Furthermore, several provincial level plans were amended to reflect the importance of restoring floodplain forest on the Danube islands.
- **Training and capacity building of forest service** – The training of forest officers in ecological restoration techniques represented an important positive impact.

**DESIGNING A SIMPLE
MONITORING SYSTEM
THAT CAN COLLECT
DATA IN THE LONG
TERM IS ESSENTIAL**

→ **Cross-border collaboration** – Initial collaboration with Romanian counterparts and exchange visits helped to engage the Romanian forestry service in restoring their own Danube islands.

→ **Creation of new protected areas** – In the last ten years, ten small protected areas were designated on the islands within the framework of the “Lower Danube Green Corridor”.

Lessons learnt in Bulgaria

Problem of low ambitions – The forest strategy had low targets for restoration with the result that it was easy for the forestry service to meet those targets and to continue planting exotic species on some of the biologically sensitive areas.

Value of an organising framework – The “Lower Danube Green Corridor” agreement provided a useful organising and overarching policy framework for the restoration of specific sites within this larger landscape.

Compromising for results – The methods used by the forestry service for “ecological restoration” were not necessarily ideal (eg: planting in straight lines), but given that they were originally trained to plant monoculture plantations of exotic species, it was difficult to make them radically change their approaches and some compromises were necessary to ensure that they would still go ahead with restoration activities.

Training value of small scale restoration effort – While many of the actions were small-scale, they served as training sites for the forestry service.

Importance of regular training – While the forest service staff does not have a high turnover, it is still important for them to receive regular training on new techniques and to reinforce the value and approaches to ecological restoration.

Challenge of monitoring – Effective and long term monitoring is difficult and costly. Designing a simple monitoring system that can collect data in the long term is essential to ensuring that the restoration effort is connected to the broader “Lower Green Danube Corridor” vision.

Mix of approaches used for effective and cheaper restoration – In some cases restoration implied planting seedlings or seeds, in others it involved removing competing species and allowing natural regeneration to take place.

Future challenges

In Bulgaria more generally the challenge remains to ensure on the one hand that commitments made under the forest strategy for the Danube islands are honoured and on the other, to expand the forest restoration efforts to the mainland.



TANZANIA (EAST USAMBARAS)



Restoring forest fragments for the benefit of people in a high conservation value forest

Background

The East Usambara Mountains stretch from Kenya to southern Tanzania. This is an exceptionally rich area in terms of biodiversity, with numerous endemic species such as the Usambara eagle-owl (*Bubo vosseleri*), the African violet (*Saintpaulia*), the Usambara Dwarf ghecko (*Lygodactylus gravis*) and the Usambara shrew (*Crocidura usambarae*). These forests are being fragmented due to increasing human pressure, notably from settlements, fuelwood collection, agriculture etc.



© PJ Stephenson

Initial project

In a first phase (2004-2006) funding from the Finnish Foreign Ministry was obtained to undertake a project on restoring the East Usambaras with the overall objective: “to prevent the loss of globally important biodiversity values, improve the livelihoods of the local population and restore and maintain the multiple functions of forests in the East Usambara Mountains”. Specific objectives were to 1. Enhance connectivity between remaining forest areas in the East Usambara Mountain landscape, 2. Improve livelihoods, especially through enhanced income generating opportunities, and 3. Increase recognition of the values and importance of forests and proper land use. The project was being implemented by WWF Tanzania in partnership with the Tanzania Forest Conservation Group (TFCG).

Follow up

The project entered its second and third phases, with ongoing funding from the same donor. The purpose of the latest (and third) phase of the project is: *“Forest habitats are restored and protected in key areas outside Government Forest Reserves to enhance forest connectivity within the landscape.”* Enhancing connectivity is being addressed via a range of approaches: prioritizing the establishment of village forest reserves (VLFs) in the corridor areas, supporting deliberate efforts by local communities to engage in tree planting and agroforestry on their village land and in forest corridors, developing strategies for protecting river banks and working with private companies to develop their patches of natural forest as private forest reserves. The project also entailed reducing threats by providing a range of viable alternative income-generating activities for the local population.

THE THREATS OF FIRE AND ILLEGAL LOGGING WERE REDUCED THANKS TO WORK ON RESTORING THE FORESTED LANDSCAPE

Main results and impacts

→ **Increased vegetation cover** – After five years, vegetation cover in the landscape has visibly and measurably increased. New areas of planted forests total 963.25 ha since the start of the project. A total of 460,000 trees were planted in phase I and over one million have been planted in phase II. More trees are envisaged in this third phase.

→ **Numerous alternative income-generating activities in place** – Communities now have a number of options for income-generating activities that are compatible with biodiversity conservation, thus reducing pressure on the forest (and enabling it to regenerate naturally in some areas). These activities include farming and processing of medicinal plants, beekeeping and butterfly farming.

→ **Creation of two nature reserves in the landscape and Village and Community Land Forest Reserves** – Over the three phases of the project, 18 village and community Forest Reserves were created and six community forest reserves, as well as two government-run Nature Reserves. The community village reserves were set up to protect water sources and enhance the village environment.

→ **Reduced threats to forests** – An evaluation found that the threats of fire and illegal logging were reduced thanks to work on restoring the forested landscape.

→ **Transmitting experience beyond the project site** – Several study tours from other projects were made to the project site in order to share the experience in the East Usambaras with others.

Lessons learnt in Tanzania

Focusing on the linkages between forests was at the expense of restoring degraded forests – By focusing exclusively on the linkages between forest fragments, the project initially omitted to focus on the national forest reserves within the landscape which also needed some restoration work. This was addressed in a later phase.

Recognised value of restoring forests within a landscape – The forest landscape restoration approach provided a comprehensive framework to address several threats and drivers of forest loss as well as several microhabitats all at once in an integrated fashion.

Importance of looking at the whole chain when promoting alternative income generating activities – Taking a comprehensive landscape approach implied that the

project considered the entire chain of interdependence of new livelihood activities from production to marketing the final products, e.g. butterflies, ocimum, *Allanblackia*, and later honey, using feasibility studies and market research.

Importance of a strong monitoring and evaluation (M&E) plan – The initial phase suffered from a poor M&E plan, while now the project has a dedicated M&E officer and a comprehensive plan.

Sustainability needs to be prioritised – While the forest service staff does not have a high turnover, it is still important for them to receive regular training on new techniques and to reinforce the value and approaches to ecological restoration.

Challenge of monitoring – The sustainability of the project remains questionable as payments for ecosystem services are still in their infancy.

Future challenges

The three phases of the project will total nine years; a few more years of support would help to ensure that the project can become fully self-sufficient and sustainable. The project is trialling payments for ecosystem services which need additional facilitation and financial support in order to become fully functional and self-sustaining.



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CHINA

Restoring forests in the habitat of the giant panda

Background

The giant panda (*Ailuropoda melanoleuca*) inhabits 18 scattered forest fragments in China's western Sichuan province in the Upper Yangtze basin. These forests have been fragmented because of large scale infrastructure development such as roads and dams, and over-exploitation of natural resources. The resulting degraded environment has also taken its toll

on humans with landslides and flooding being attributed to the loss of an effective forest cover. With this in mind the government imposed a logging ban and a forest restoration drive in the late 1990s. This "Grain for Green" programme aimed to return tree cover to mountainous areas and has recently been renewed for a further ten years.

Initial project

The initial work on forest landscape restoration in China focused on influencing the approach taken in the "Grain for Green" government programme in order to promote a more integrated approach, notably concerning the selection of species. It also focused on improving habitat for the

panda populations and restoring connectivity, notably to improve the genetic exchange between isolated panda populations in the Minshan landscape.

Follow up

Work within the panda conservation programme has expanded to four other landscapes in the Upper Yangtze. A more integrated approach has been taken to look at riverine forests, and wetlands conservation and restoration. New corridors have been identified that are important to conserve and/or restore. In improving corridor management, activities such as planting of bamboo and removing mechanical fences have been used. Alternative livelihood activities such as bee-keeping and energy-saving stoves have been promoted among local villages to reduce pressure on the forests. Resource co-management models have also been trialled such as the Daping model neighbouring Xuebaoding nature reserve where traditional medicinal plants are being produced.

Main results and impacts

→ **A comprehensive review of the government programme helped to improve their restoration practices** – The review of the "Grain for Green" programme identified the successes and issues with restoring forest cover in the Upper Yangtze. As a result WWF was able to engage with the government of Sichuan on identifying better forest restoration practices.

→ **A more integrated approach has been taken to panda conservation** – This has included active restoration, but also reducing pressure on the panda habitat through alternative livelihood schemes for the local populations, integrating water and forest issues etc.



Qinling Panda Landscape,
Shaanxi

→ The forest landscape restoration book “Forest Restoration in Landscapes: Beyond planting trees”¹ was published in Chinese in 2011.

Lessons learnt

Importance of moving from sites to integrated landscapes – While in the past the work on restoration in China was very much site-focused, the move to a landscape scale helped to integrate forestry issues with water issues, panda conservation, alternative income generation activities etc.

Communications with stakeholders proved very important – In order to fully engage stakeholders and ensure that the wider landscape issues were understood by all, targeted communications was extremely important.

One demonstration project served to promote multiplication of the approach – The Minshan landscape served as a useful demonstration of the forest landscape restoration process for further replication of the approach in other landscapes.

Importance of seizing policy opportunities – The desire by the government of China to enhance tree cover via the “Grain for Green” programme, proved a significant opportunity for WWF to engage with them on influencing this programme in order to ensure it was used for the benefit of environmental conservation.

Future challenges

Balancing the short term priorities – development and energy production, as well as securing the panda population – with longer term forest landscape restoration actions, remains a challenge in China.

In Jiuzhaigou Nature Reserve



© Jiuzhaigou Nature Reserve

¹ Mansourian, Vallauri and Dudley, 2005.

PARAGUAY (ATLANTIC FOREST)

Engaging private landowners to restore connectivity in the fragmented Atlantic forest of Paraguay



Background

The Atlantic forest covers parts of Brazil, Paraguay and Argentina, stretching over a total of 123,400,000 ha. It is a unique zone home to some of the world's rarest primates, such as the endangered golden lion tamarin (*Leontopithecus rosalia*) and the critically-endangered black-faced lion tamarin (*Leontopithecus caissara*), but also to the jaguar (*Panthera onca*), the ocelot (*Leopardus pardalis*), the lowland tapir (*Tapirus terrestris*), the white-lipped peccary (*Tayassu tajacu*), and the giant otter (*Pteronura brasiliensis*). Only an estimated seven per cent of the original Atlantic forest remains today, much of it severely fragmented and degraded, essentially because of logging (illegal and/or unsustainable), forest conversion (for cattle rearing, biofuels, soy production, pulp and paper plantations, among others), and fuelwood extraction. Restoration was identified as a top priority to re-connect these forest fragments and to re-establish viable corridors for biodiversity. In particular three areas were prioritized by WWF within the Atlantic forest ecoregion: the Araucaria forest, Serra do Mar and Upper Parana in Argentina, Brazil and Paraguay for a total of 8,577,300 ha. Each country faces different socio-economic and political challenges which impact on the Atlantic forest and which therefore, require a different approach to reach the common objective of restoring a viable and functional Atlantic forest which can provide both biodiversity and socio-economic benefits to current and future generations.



Indigenous community
Tacuaro, Caazapa, Paraguay

Initial project

In 2003, the Atlantic forest ecoregional team identified a “biodiversity vision” which defined what the desired conservation landscape was to look like in 50 to 100 years. In order to reach this landscape vision WWF estimated that in addition to all existing protected areas, an additional 1.28 million ha of new protected areas were needed, combined with 4 million ha of sustainable use areas and the restoration of 2.6 million ha of forest within protected areas and corridors. Initially work focused on the Serra do Mar landscape (entirely in Brazil) and the Upper Parana (across all three countries). Unlike many other ecoregions, the goals of the overarching ecoregional action plan for the Atlantic forest specifically included forest restoration. Moreover, forests are themselves a conservation target for the ecoregion action plan, alongside the jaguar, and rivers and streams.

Much of this initial phase focused on mapping, stakeholder engagement and prioritizing areas and actions. Work also included lobbying the governments of Brazil and Paraguay to enforce a tri-national corridor.

Follow up

In 2010 a new ecoregional action plan was defined within which six strategies were identified: 1) forest restoration, 2) a system for protected areas and effective management, 3) new incentives for sustainable logging, 4) law enforcement authority for illegal hunting,

5) compensation mechanisms to avoid degradation caused by agriculture, and 6) better management practices in agriculture. In Paraguay, during this phase, efforts have centred on working with both the government and private landowners to improve implementation of the various laws requiring the maintenance of forest cover, improving the understanding and valuation of forests, and actively restoring key areas as identified through GIS mapping. In particular, two important laws in Paraguay have provided the framework for WWF action there: 1. A law requiring the maintenance of 25 per cent of the land area as a forest reserve and 2. A law requiring that 100 metre protective strips of gallery forest be secured along water courses. Using these laws, WWF Paraguay established a programme of “tradable forest rights”, also known as “Conformance with Forest Law” whereby landowners not meeting those requirements can “buy” the rights from other landowners or can pay for restoration actions. Successfully implementing such a system requires having accurate maps of each plot of land and of forest cover.



Municipal tree nursery in the town of Alto Vera

Main results and impacts¹

→ Establishing tree nurseries of native species –

When work started in Paraguay’s Atlantic forest tree nurseries provided only the five most well-known species and were based in a town near the capital city. However, through WWF’s efforts there are now several tree nurseries within the municipalities situated in the Atlantic forest (therefore, reducing the distance to obtain and plant the saplings), supplying a larger range of native species and providing work to local communities. Now a total of ten tree nurseries exist at both the communal and municipal levels.

→ **Establishment of a new foundation promoting restoration** – The foundation “*A todo pulmón Paraguay respira*”, an initiative by the director of the popular radio station “Radio Ñanduti” (established in April 2009) has mobilised significant funding for forest restoration and has helped to raise public awareness. This foundation’s initial goal was to plant 14 million trees in an area of 15,000 ha. Today they have become a well-established NGO with the primary objective to restore the Atlantic Forest in Paraguay in line with the ecoregional plan and biodiversity vision.

→ **Engagement of landowners** – More than 112 land owners have agreed to the scheme of “tradable development rights” (TDRs) in two watersheds in order to restore 100 metres on each side of water courses and/or to restore their 25 per cent of forest reserve (as required by law). Approximately 1,607 hectares have been either actively restored with native species or set aside for natural regeneration.

→ **Forest conversion moratorium** – A “forest conversion moratorium law” was promulgated in 2004 in Paraguay for a duration of two years. The law was renewed in 2006 for a further two years and then for a further five years until 2013. As a result, deforestation was reduced by close to 95 per cent between 2002 (110,000 hectares per year) and 2010 (6,230 hectares per year). This was a major result given that the value of forestland had increased by more than 500 per cent in just 10 years because of the soy boom.

¹ This section only covers the Paraguay part of the Atlantic forest, not Argentina or Brazil

Rio Ñacunday Gallery forest



© C. Vitale

**PROMOTING THE
VALUES OF NATURAL
FORESTS AND THE
NEED FOR THEIR
PROTECTION HELPS
TO MOBILISE
STAKEHOLDERS TO
RESTORE THEM**

Lessons learnt in the Atlantic forest

Communications, with a view to increasing understanding and changing behaviour, is essential – In the Atlantic forest, communication campaigns focused on explaining and promoting the value of the native forests. They have proven key to the engagement of local stakeholders.

Engaging stakeholders and giving them time to change, is critical – Given that over 90 per cent of forests in Paraguay are on private lands, it is insufficient to rely on the government to ensure adequate forest management, conservation and restoration, but instead it is necessary to work directly with landowners. It is unrealistic to expect rapid changes in land use practices and given the economic realities in all three countries of the Atlantic forest, it is also unrealistic to expect farmers to give up all of their land to forest cover. Therefore, time and patience are needed when seeking to negotiate acceptable tradeoffs with landowners.

Importance of trade offs – Given the high value of land for agricultural production, it has proven a challenge particularly in Paraguay, to carry out forest restoration actions and lengthy negotiations were needed and tradeoffs had to be acknowledged.

Mixing local and exotic species is a good means of achieving the twin goals of improving ecological integrity and human wellbeing – While local species are promoted, in a landscape approach there is still a role to play for exotic species (in this case, mainly, eucalyptus), particularly to provide fuel wood to remove pressure on native forests.

It is important to monitor closely the growth of new plants in the restoration process, particularly in the first three years where they are more vulnerable to frost, extreme drought, strong exposure to sun and cattle.

Landowners and municipalities need to be empowered – In order for restoration efforts to be sustainable, local stakeholders need to be in a position to take the work forward in the long term.

Incentives to avoid deforestation and degradation need to be developed – It is crucial to develop legal and financial mechanisms to support the conservation of forest. Therefore ecosystem services programmes, legal tools and REDD+ programmes should all be considered in the ecoregion. This is especially important for Paraguay when the land conversion moratorium law expires in 2013. However it is strongly recommended to extend this land conversion moratorium law until these mechanisms to avoid deforestation and degradation are in place and forest landscape-scale restoration is extended to other key priority areas.

Land tenure data is needed for forest landscape restoration – Unclear land tenure has delayed the implementation of restoration and mechanisms to avoid deforestation and degradation. Land tenure data will allow negotiation with land owners, communities, indigenous groups and with the government in order to achieve landscape-scale restoration.

Future challenges

Working with a diversity of landowners (rather than a single one, such as the State for example) creates complexity and requires more time. This is an ongoing struggle in the region, particularly with smaller landowners who need to compete with larger producers and for whom agriculture is their livelihood. An important longer term priority is to institutionalise the tradable development rights scheme. Finally, monitoring the long term results and impact remains a challenge.

CAUCASUS

Restoring forest ecosystem services, including carbon sequestration and climate adaptation



Background

The Caucasus ecoregion, spanning Armenia, Azerbaijan, Georgia, Turkey, Russia and Iran, is one of the world's most biologically rich areas, and a global hotspot. It harbours eleven species of large herbivores, notably the Armenian mouflon (*Ovis ammon gmelinii*) and the European bison (*Bison bonasus*), as well as five species of large carnivores, notably the North Persian leopard (*Panthera pardus saxicolor*) and the striped hyena (*Hyaena hyaena*). The area is important to millions of migratory birds. One fifth of its 153 mammals are endemic, as are one third of its 200 fish species. The Caucasus ecoregion is also particularly important for its flora with over one quarter of its 6,500 vascular plants being endemic. However, the region's biodiversity is declining at alarming rates faced with the following major threats: illegal logging, fuelwood harvesting, and the timber trade; overgrazing; poaching and the illegal wildlife trade; overfishing; infrastructure development; and pollution of rivers and wetlands. The restoration of degraded ecosystems was identified as a necessary strategy in the ecoregion's 2006 action plan.

Project

In the Caucasus, two restoration projects were set up after the end of WWF's target driven programme (in close collaboration with WWF Germany). One project, funded by the German government agency, BMU, officially lasted two years starting in 2008. It aimed to certify carbon emission reductions with the overall goal "to mitigate impacts of climate change through forest protection, management and restoration in the Southern Caucasus". The second project is currently ongoing and is funded by the EU for a period of three years. It is intending to replace mono-culture pine plantations with native species with the aim to restore a range of ecosystem goods and services, notably, but not exclusively climate adaptation. The project seeks to restore six pilot stands of 450 ha into highly resilient natural forest stands. It is also in the process of developing silvicultural guidelines to transform monocultures into more natural and climate change resilient forest stands.

Main results and impact

- **Capacity built** – The restoration work in the Caucasus has helped to build significant capacity both within WWF and within the forestry authorities in the region. Training was provided with notably, a field visit by five experts from the Georgian forestry authorities to Poland to learn new skills and techniques concerning tree nurseries.
- **Areas restored** – As a result of the project, nearly 1,500 ha of forest have been restored in Armenia, Azerbaijan and Georgia.
- **Development of restoration guidelines** – Guidelines have been produced on innovative methods for forest landscape restoration and a climate adaptation strategy has been elaborated for the forestry sector in these three countries.

THE RESTORATION OF DEGRADED ECOSYSTEMS WAS IDENTIFIED AS A NECESSARY STRATEGY IN THE ECOREGION'S 2006 ACTION PLAN

Lessons learnt in the Caucasus

Large scale restoration provided an opportunity for transnational cooperation between the forestry sectors of Armenia, Azerbaijan and Georgia.

Landscape scale forest restoration demonstrated a holistic approach that provides multiple benefits – The approach served to engage local people and to demonstrate how it can provide multiple benefits, both for biodiversity and people.

Limited knowledge on restoration – There was limited capacity and knowledge within the forestry authority concerning indigenous species since all too often their reforestation efforts involved a limited range of fast-growing exotic species.

Limited availability of good seedlings – During the course of the project it appeared that there was a limited availability of good quality seedlings.

Monitoring to date has been done essentially on survival rates of trees planted, although the high interest generated and awareness raised has also been considered a sign of success.

Value of demonstration sites – Successful demonstration sites helped to engage further partners within the landscape.

Future challenges

Further work is needed to scale up the restoration effort in the Caucasus. Maintenance and monitoring have suffered to date because of the short duration of restoration projects. These issues should be incorporated in future forest restoration projects.

Fencing in Chiauri restoration site, Georgia



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OVERARCHING LESSONS LEARNT

In 2006, after the termination of the forest TDP, a study tour was organised by WWF International¹ in an attempt to collect lessons learnt from five years of implementing forest landscape restoration. Given the learning nature of the forest landscape restoration target, this proved an invaluable effort. The results of the “study tour” were written up² and served as an important means of capturing valuable knowledge, experiences and lessons from 15 different

countries. It also enabled the different regional programmes to meet and exchange informally their lessons and experiences.

Table 1: Summary of key lessons on FLR identified in June 2006

	LESSON
Lesson 1	FLR is forward looking and aims to strengthen the resilience of forest landscapes while keeping future options open for both people and biodiversity
Lesson 2	Diverse restoration strategies are needed
Lesson 3	Stakeholders must be involved early on
Lesson 4	Importance of balancing public goods and private benefits
Lesson 5	Implementing broadscale forest restoration remains a challenge
Lesson 6	Long time scales involved signify that situations (political, social and environmental) change
Lesson 7	Monitoring and evaluation is needed at the start of projects
Lesson 8	Successful restoration needs to have long term funding
Lesson 9	Success will be easier where there is good governance
Lesson 10	Partnerships are important
Lesson 11	FLR has almost become synonymous with implementing a landscape approach with a focus on restoration elements

All of these broad lessons remain valid today. In addition, however, in this report with the benefit of a further five years of experience, we have extracted a large number of lessons which are in many instances more detailed and a level down from the eleven lessons above, in the hope that they can provide a concrete contribution to those engaged in forest landscape restoration, both in WWF and beyond.

Overarching lessons presented in the current section are divided according to the following key steps³ :

¹ Under the leadership of Mark Aldrich

² Dudley and Aldrich, 2007

³ Vallauri, Aronson and Dudley, 2005.

Table 2: Steps in restoring forest landscapes

STEP	DESCRIPTION
Step 1. Initiating a restoration programme and partnerships	Stakeholder engagement. Identification of the problem and agreement on solutions and targets.
Step 2. Defining restoration needs and linking restoration to a large scale conservation vision	Defining the role of restoration within the landscape.
Step 3. Defining restoration strategy and tactics, including land-use scenarios	Assessing current and potential benefits from the landscape. Defining what we can expect to restore. Defining restoration targets and a strategy.
Step 4. Implementing restoration	Pilot sites. Large scale actions.
Step 5. Piloting systems towards fully restored ecosystems	Regular evaluation. Reappraisal and corrective actions.

STEP 1: Lessons on initiating a restoration programme

→ LESSON 1: Understanding the local context – both socio-economic and ecological – is critical for local acceptance and sustainability

A thorough understanding of the local socio-economic as well as ecological context is essential. Large scale programmes such as those aiming to restore forest landscapes need to be based on sound data and locally-sensitive socio-economic data. For example, one mayor in the region of Fandriana-Marolambo in Madagascar threatened the project (and indeed the remaining forests) by actively promoting the “traditional” forms of slash and burn agriculture among the population in protest against the more innovative and environmentally-friendly techniques promoted by the project. A better understanding of the local social context at the start of the project may have avoided this situation.

→ LESSON 2: Engaging stakeholders and partners, and negotiating trade offs, although time consuming, are key to securing long term success

As found in 2006, (see lesson 3 above in Table 1), the importance of engaging local stakeholders early on in the restoration effort is paramount. One of the partners WWF worked with in Kinabatangan, the researcher Ancrenaz, co-authored an article in 2007¹ emphasising notably, the importance of engaging communities for lasting change. Equally, engagement means negotiation and compromise. In Madagascar significant efforts were undertaken to engage local groups. This effort created delays in project implementation but was essential to secure success. In Bulgaria it proved critical to engage local managers in the restoration effort, even if that meant compromising on the approaches, since local managers are the ones that can secure the longevity and sustainability of forest restoration.

→ LESSON 3: A strategic approach to the design and development of forest landscape restoration initiatives is preferable, but frequently opportunities dictate project development, with ensuing repercussions (on duration, stakeholder engagement, planning...)

The starting point for restoration varies significantly across WWF’s past and present portfolio. In some cases restoration was a major entry point to a landscape (for example in

¹ Ancrenaz, Dabek and O’Neil, 2007.

New Caledonia, Madagascar or Tanzania), in others it was more of an “afterthought”. In some instances, forest landscape restoration was not the main tool identified for conservation, however, because of a donor’s interest in a specific aspect of restoration, (eg: restoring sites degraded after mining operations or restoring for carbon sequestration) a project was initiated in response to the opportunity. For example, in the case of the Caucasus the donor and the funding call (which focused on climate adaptation and mitigation) drove the forest landscape restoration work rather than the conservation priorities for the region. That is not to say that forest landscape restoration could not contribute to conservation priorities, but restoring forest functionality was not the principle objective.

→ **LESSON 4: Long term engagement is necessary in the restoration of forest landscapes**

Forest restoration takes a long time. Restoring forest functions within a landscape can take even longer. This is in part because of the pace of biological processes but also because of the need to address drivers of deforestation and to engage a range of different stakeholders. Unfortunately, both donor and conservation organisations change staff, priorities and budget allocation on much shorter timeframes. In Madagascar it was estimated that funding would have been needed for at least 10 years before WWF could consider exiting the landscape. In Tanzania, the project is currently in its third three-year phase and ideally a fourth phase would be needed. In the Caucasus the projects were very short term (two years) and served essentially to plant trees but with no time allowed for follow up maintenance and monitoring.

→ **LESSON 5: WWF has a specific added value in facilitating partnerships to launch the large scale, long term initiatives necessary for the restoration of forest landscapes**

WWF now has over ten years of experience in forest landscape restoration. It has already engaged with many partners, internationally, regionally and locally in implementing this approach. As such, the organisation is well placed to play a major role in further expanding and multiplying these experiences.

STEP 2.

Lessons on defining restoration needs and linking restoration to a large scale conservation vision

→ **LESSON 6: Addressing socio-economic needs is imperative to long term success in the restoration of forest landscapes**

In many countries, particularly, but not exclusively, developing countries, in order to reduce the pressure on forests, realistic and adequate alternative livelihood activities will need to be identified and implemented in parallel and as part of any forest restoration activities. While such activities may appear to be dissociated from restoration, they can in fact enable natural regeneration to take place as is the case in many of the project sites. In Madagascar for example, one of the world’s poorest nations, restoration cannot work unless farmers are provided with alternative sources of revenue.

→ **LESSON 7: The purposes of restoration in WWF work are diverse: a typology can be defined to better increase the understanding of this tool within the organization and beyond**

A typology for FLR can be developed using the main purpose of the restoration in the projects explored in this paper as the defining criterion. Given the dual dimension of forest landscape restoration (ecological and socio-economic) these are split below as ecosystem and community benefits (see Table 3).

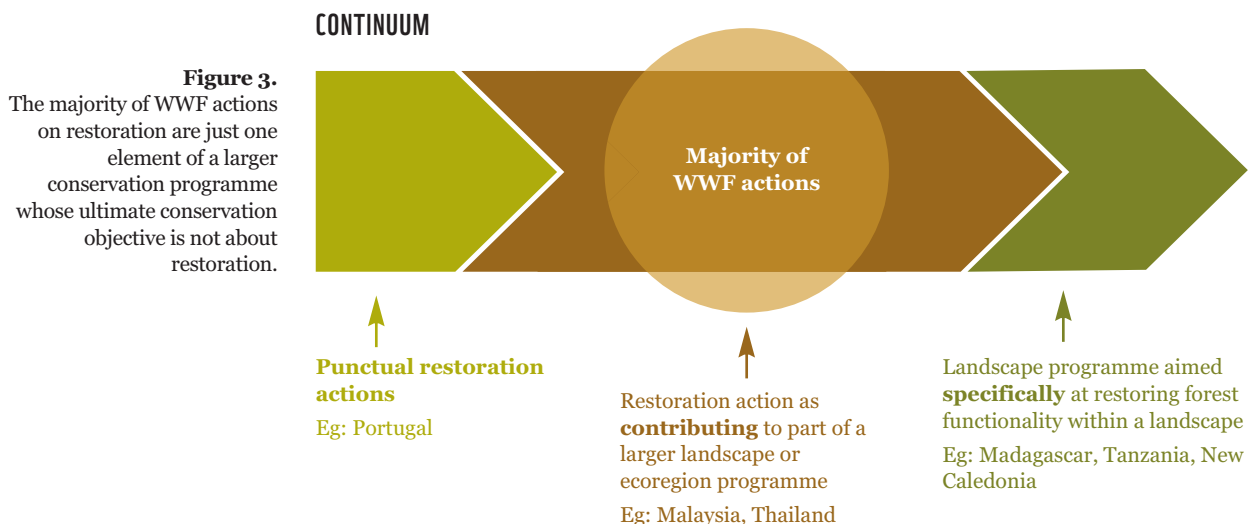
Table 3: A typology for restoration in landscapes

	Main objective of restoring forest landscapes	Examples from this report
ECOSYSTEM BENEFITS	Connectivity for wildlife	- Linking forest fragments in New Caledonia, Paraguay and China. - Reducing the fragmentary impact of oil palm plantations in Sabah.
	Strengthening the ecological value of protected areas	Restoration around nature reserves in the East Usambaras in Tanzania to multiply the benefits of the protected areas.
	Securing endemic plant species and maintaining genetic pool	Improved knowledge about endemic species and their reproduction in New Caledonia and Bulgaria.
	Ecosystem resilience	By strengthening connectivity and diversity, and improving forest structures, the resilience of the dry forests of New Caledonia is improved.
	Habitat and food for keystone species	- Restoring habitat and fruit trees (food) for orang utans in Borneo and New-Caledonia. - Restoring habitat for the endangered panda in China.
BOTH ECOSYSTEM AND COMMUNITY BENEFITS	Water protection	- Improving tree cover to protect the river from sedimentation and pollution in Sabah.
	Soil stabilisation	Protecting the banks of the river Vasco in Portugal against soil erosion.
	Carbon sequestration	Growing international interest in tree planting for climate change mitigation and for carbon credits, as in the Caucasus example.
COMMUNITY BENEFITS	Alternative income generation	- Production of essential oils, small animal and fish farming, and beekeeping in Madagascar - Butterfly farming in Tanzania. - Ecotourism revenue in Sabah. - fuel-efficient wood stoves and biogas systems, bee-keeping, Sichuan pepper orchards, and training on the sustainable harvest of wild medicinal plants in panda habitat in China.
	Demonstration of an alternative approach to tree planting	Demonstration sites with a view to building capacity in relevant techniques and influencing policies in Bulgaria, China and the Caucasus.
	Improved agriculture and agroforestry	Improved rice production, fertilization and diversification of crops in Madagascar
	Cultural values	Restoring pride in indigenous species in New Caledonia.
	Knowledge about indigenous species and restoration	Mastering techniques for reproduction of indigenous species in New Caledonia, Sabah, Paraguay and Madagascar.
	Education and awareness raising purposes	Tree nurseries and restoration areas provide a tangible and readily understood conservation message which, for example, the UNEP's "one billion trees campaign" has used and which projects in China have also used.

→ LESSON 8: Scaling up from sites to landscapes presents significant operational challenges

The forest landscape restoration concept evolved in parallel to WWF's more general work on landscapes (as the next level down from ecoregions). At the same time, within the forest programme, the approach of "protection, management and restoration" within landscapes was also being further refined and promoted.¹ As a result some confusion and certainly a lot of overlap was apparent between FLR and these two other approaches or conceptual models. The result of this can still be seen today with clearly differing interpretations of forest landscape restoration around the WWF Network. For some, it remains a site based activity of indigenous tree planting which happens to occur within a landscape. For others it is one of many tools to achieve landscape conservation. Yet for others it is in itself an over-riding approach to landscape conservation with restoration being the primary (but not only) focus.

In practice, most (but certainly not all) of WWF's efforts on forest restoration, as depicted in Figure 3, have focused on active restoration interventions that are perceived as a useful complementary activity to achieve broader conservation objectives.



→ LESSON 9: While maps and hectare-based targets are valuable in planning, they can be very sensitive and require careful interpretation

GIS mapping was used in several landscapes to identify priority areas for restoration (for example in New Caledonia, the Atlantic forest and Sabah) and in some cases targets (in hectares) were set (with or without such maps). Both maps and targets are valuable but can also serve to limit the restoration effort. For example in Bulgaria the hectare target set for restoration was relatively low, with the result that valuable areas are not being restored because the target has been reached and therefore there is no longer an incentive or obligation to continue restoration. Equally, while maps are an important and useful tool to identify visually important areas for connectivity for example, they can also serve to provide excuses for not restoring certain potentially important areas. Furthermore, if these maps are at too coarse a scale, their validity in terms of defining specific areas within a landscape where strategic restoration would lead to a more functional landscape, can be questionable. Such tools therefore, need to be used, interpreted and disseminated with caution.

¹ Aldrich et al, 2004

**THERE IS NO
SINGLE RECIPE, AND
TECHNIQUES NEED TO
BE ADAPTED TO THE
LOCAL REALITY**

→ **LESSON 10: Locally-adapted techniques are critical to acceptability and sustainability of the effort**

There is no single recipe, and techniques need to be adapted to the local reality. For example, in Madagascar it was important for techniques, notably monitoring, to be simple enough for rural villagers to understand them and eventually take over the long term responsibility for implementation to be sustainable.

→ **LESSON 11: The landscape approach to conservation has inherited the challenges of forest landscape restoration**

An integrated approach for forested landscapes that combines protection, management and restoration as well as addressing drivers of forest loss is WWF's current approach to reaching its target of zero net deforestation. Much of the thinking that went into the forest landscape restoration programme influenced WWF's landscape approach. At the same time, the landscape approach has also inherited many of the challenges involved with implementing, in a coordinated fashion large scale forest conservation.

**STEP 3:
Lessons on defining restoration strategy and tactics**

→ **LESSON 12: Endpoints for restoration must be clearly defined**

It is important to carefully define conservation endpoints and milestones, to be realistic and to clarify what is the ultimate purpose of the restoration. All too often tree planting is done simply to meet targets without a clear endpoint. A well defined endpoint is also essential for effective monitoring. These endpoints can be linked to the typology in Table 3 above.

→ **LESSON 13: When restoring forest landscapes, constant flux rather than stability characterises the situation and therefore there is a need for flexibility**

Because the restoration of forest landscapes focuses on large scales, which implies multiple actors and therefore a complex social, economic, political and ecological landscape, a forest landscape restoration plan and programme needs to remain highly flexible and adaptable. This lesson was already identified in 2006 (see lesson 6 in Table 1). For example, in Madagascar up to 30 local facilitators had to be hired in the landscape, something which was definitely not foreseen in the initial project document and proposal. This raises significant challenges for those implementing a programme and for those funding it. In Portugal, both staff changes and local realities meant that some actions planned in Phase I had to be abandoned. Equally in Vietnam, changes in WWF and in government priorities signified that the monitoring framework was not implemented.

**STEP 4:
Lessons on implementing restoration**

→ **LESSON 14: Small scale restoration has a role to play within the larger landscape but such interventions need to be carefully designed with the wider landscape in mind**

While forest landscape restoration seeks to reach the ambitious goals of restoring forest functions within a landscape, it is frequently important to start small-scale and to demonstrate at site level the potential of restoration, the methods, the implications etc. This serves the purposes of: a) engaging civil society (notably, for example, landowners in Portugal and New Caledonia, and communities in Madagascar), b) engaging the forestry service (for example in the Caucasus, Bulgaria and Malaysia), c) engaging companies (for example in Malaysia), and d) engaging authorities (for example in Malaysia, New Cale-

SPECIFIC EFFORTS TO EXPAND KNOWLEDGE ON INDIGENOUS SPECIES IS ESSENTIAL IF WWF WANTS TO PROMOTE A RELEVANT ALTERNATIVE TO PLANTATIONS OF FAST GROWING EXOTIC SPECIES

donia and Bulgaria). Thus, small scale restoration efforts, as long as they are done with the specific intention of being a demonstration/pilot and fit within a larger landscape-level framework, can be a very valuable method of learning by doing, raising awareness, and engaging key stakeholders for eventual larger scale efforts and replication. The challenge is to ensure those are indeed perceived as contributions to a larger effort and not forest landscape restoration in and of themselves.

→ **LESSON 15: Further knowledge of indigenous species is needed in most cases**

In many countries, the forest service (as well as local communities) has traditionally focused on a small number of exotic species which they master fully. However, when it comes to restoration with indigenous species, knowledge and understanding related to their propagation are much more limited. This has been seen in New Caledonia, in Madagascar, in the Caucasus, in Portugal and in most places where restoration projects were or are underway. Specific efforts to expand knowledge on indigenous species is essential if WWF wants to promote a relevant alternative to plantations of fast growing exotic species, the more common tool used by foresters worldwide. WWF could facilitate this process by collaborating with local research institutes.

→ **LESSON 16: Land tenure is a critical element in ensuring the sustainability of the restoration of forest landscapes**

Because restoration can be perceived as the establishment of new assets on land, in many cases unclear or conflictual land tenure can be a major stumbling block to the restoration effort. For example, in New Caledonia, it became clear in some areas that the political dimension concerning land meant that the restoration effort had to be scaled down. In Madagascar, the potential for communities to restore inside the area marked out to be a national park, was opposed by the governmental body in charge of protected areas because of the risk that the communities would then claim that land as their own once they had restored it. Equally, in Portugal because of the large number of privately owned forest patches, the potential to achieve significant strides in restoring landscapes is perceived as being limited.

→ **LESSON 17: There are numerous conservation side benefits to forest landscape restoration in addition to restoring forest functionality**

While many programmes are initially conceived with the main purpose of restoring forest functionality within the landscape, experience has shown that efforts to restore forest landscapes frequently deliver a number of important side benefits. In the Caucasus for example it served to promote collaboration across the forestry departments in the three countries; in the dry forests of New Caledonia, it served to raise awareness more generally about the importance of the environment; in Madagascar it served to engage with local communities; in both Madagascar and New Caledonia it also provided a trigger to secure the protection of certain parts of the landscape. It is probably difficult to dissociate whether these are benefits exclusively because of forest landscape restoration or because of the work at the landscape scale. However, clearly the landscape level planning and implementation of activities were key in yielding these collateral benefits. It is important to recognise that collecting this evidence and the lessons emerging from these examples is a valuable contribution to the body of knowledge on restoration in large landscapes.

→ **LESSON 18: Success breeds success**

Early successes (e.g. in mastering the cultivation of a local species) are a good means of encouraging local stakeholders and promoting further successes. This was seen in most of the WWF project sites. It is all the more important given the long timeframe needed to see large scale results of forest landscape restoration.

STEP 5: Lessons on piloting systems towards fully restored ecosystems

→ LESSON 19: A long timeframe, at least ten years, is necessary to implement a forest landscape restoration programme and to see visible results

In most regions an integrated and comprehensive approach to restoration such as that promoted through forest landscape restoration requires a long time, easily 10 years, for significant and visible results. The implications of this duration are manifold: firstly it is extremely rare to find donors that are willing to support a project that long. Secondly, as has been the case in several of the countries where forest landscape restoration programmes were started, changes in government (and therefore, government policies related to forests and the environment) can have serious impacts in terms of facilitating or on the contrary hindering future implementation of the project. Equally, changes in staff and in priorities within WWF itself (and other NGOs) over such a duration can lead to a loss of knowledge, expertise and funding.

→ LESSON 20: Attaching a value to a restored landscape is important to ensure land use decisions can be adequately informed

In order for restoration efforts to be sustainable, local land users and communities will in most instances need to perceive a direct benefit from the restoration. This benefit may be a non-use one such as the spiritual or cultural values attached to some natural ecosystems, but in most cases it will have a quantifiable value, be it for raw materials, food, water quality, protection or any of the multitude of other ecosystem goods and services provided by forest landscapes. Making this value explicit so that it can be correctly weighed against an alternative land use, such as oil palm plantations for example in Sabah, is important in order for informed land use decisions to be made and for the long term sustainability of any restoration effort. For example, in Bulgaria a cost benefit analysis between the ecosystem values of natural forests versus the timber value of poplar plantations served to convince decision-makers that it was better to restore natural forests. In Tanzania and Paraguay, experiments are being undertaken with payments for ecosystem services.

→ LESSON 21: Embedding forest landscape restoration in existing frameworks will help secure its financial and political sustainability

Given the duration and the scale of forest landscape restoration programmes, ensuring that they are embedded in policies or frameworks, provides a good means of securing their sustainability. Frameworks, political or other, help to provide a “home” for landscape-scale restoration initiatives. The “Lower Danube Green Corridor” agreement for example, provided a useful organising and overarching policy framework for the restoration of specific sites within this larger landscape. In New Caledonia, the dry forests programme was able to integrate into the framework agreement between mainland France and New Caledonia, thus securing long term funding. While it is clearly not always possible to do this, where such frameworks exist, they help to further the restoration work.

→ LESSON 22: Collecting and recording experiences and lessons is important to build up a solid expertise and knowledge base

Because forest landscape restoration is not “institutionalised” within WWF, the knowledge remains at the level of individuals and in all too many cases seen through the production of this report, as staff left, so did the knowledge, lessons and experiences gathered during their FLR work. Beyond WWF, in many instances the problem is the same. Unless experiences (both positive and negative) are captured and promoted within institutions, government bodies and private enterprises, they remain of limited value. Communications stories are also important to enthuse stakeholders and generate a multiplication effect.

**EMBEDDING
FOREST LANDSCAPE
RESTORATION
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→ **LESSON 23: Designing and implementing an effective monitoring framework for the restoration of forest landscapes remains a challenge**

Monitoring has been a challenge in all large scale conservation efforts, especially in programmes that require long timeframes such as restoration ones. On the one hand, the relatively easy indicators of increased forest cover require several years to show progress. On the other, a vast range of diverse indicators could be used to measure progress in restoring forest landscapes, including indicators related to reduced pressures on the landscapes. However, selecting the right indicators, and collecting baseline and progress data are challenges in most areas where restoration programmes are implemented within landscapes. Yet, without adequate monitoring, all the evidence for successes or failures of any restoration interventions remains anecdotal.

Voting for the need to continue forest restoration efforts in their landscape in Madagascar



NEXT STEPS: BUILDING ON LESSONS LEARNT

Restoration of forest landscapes continues to be of great relevance to WWF's work. Equally, a quick scan of other organisations and global environmental priorities (see Annex 4) served to highlight a number of environmental policies and priorities to which forest landscape restoration clearly contributes.

A large number of lessons have emerged through this report representing a huge body of knowledge within the WWF Network. Yet, to many, restoration or forest landscape restoration appears to have taken a back seat in WWF. Clearly while work is ongoing, communications, the collection and distribution of positive experiences, and importantly the contribution these efforts are making to WWF's broader goals and to global conservation priorities, are not being promoted. Staff changes, loss of written materials, lack of a node of expertise within the WWF Forest Programme and a simplified electronic data system containing limited information, all contribute to the difficulty in finding internal data on restoration.

For many conservationists, and this review of lessons learnt reinforced this fact, restoration of forests is frequently seen as being a competing action to protection and sustainable use which detracts from the fundamental goals of conservation. This misconception is probably caused by three things: 1. the belief that if forest restoration is actively proposed as a viable solution, it may encourage further forest loss and degradation, 2. the misunderstanding about the scale and options for forest restoration in landscapes – ie: it is not just about the expensive action of planting trees, but rather includes a diversity of options, both passive and active, and 3. the impatience to see rapid results from both donor and conservation institutions alike.

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RESTORATION

RECOMMENDATIONS

This review identified six main recommendations, three for WWF and three for the wider conservation community.

Recommendations for the WWF Network:

→ **RECOMMENDATION 1: The institution should integrate more explicitly the contribution that the restoration of forests in landscapes is making to WWF's broader goals (as defined in the Global Programme Framework).** The restoration of forest landscapes has a very clear role to play in contributing to WWF's overarching goals. However, this link is not explicit within the WWF organising frameworks and therefore, valuable efforts on the restoration of forest landscapes are not appearing as contributions to the wider objectives of the organisation. This signifies that when reporting, WWF programmes should be encouraged to explicitly make this link. It also implies that WWF International, both the Forest Programme and the Conservation Strategy and Performance unit would need to explicitly identify and highlight the role that forest restoration in landscapes makes to the broader goals of the organisation.

→ **RECOMMENDATION 2: WWF should promote positive experiences and field stories.** There are many interesting and positive experiences and lessons emerging from the Network – for example, the integration of forest landscape restoration principles in government policies in China, Bulgaria and New Caledonia;

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improved knowledge on the propagation of indigenous species in New Caledonia and Madagascar; the promotion of forest-friendly income-generation activities in Madagascar and Tanzania and many more as shown in this report. It is important to improve the collection and communication of these lessons learnt, positive experiences, tools and achievements related to restoration in landscapes – both within the Network and beyond. This recommendation could apply to all of WWF’s work however, it is particularly relevant to forest restoration in landscapes.

→ **RECOMMENDATION 3: The WWF Network should undertake a needs assessment to identify specific gaps and tools needed to further support forest landscape restoration efforts.** While there is significant experience, there are clearly gaps and areas where efforts are being duplicated throughout the network. The implementation of forest restoration in landscapes also created new needs for the WWF Network (on social approaches, agriculture and forest techniques), some of which are not common in the WWF culture, and require support at least to create an effective link to relevant organisations (e.g.: Care, Oxfam, agriculture and research centres...). A review of gaps and needs will help to reduce redundancies and ensure that new tools are developed as needed and shared widely across the Network. This is all the more important as staff changes are likely to occur over the lengthy duration needed for the restoration of forest landscapes.

Recommendations for the wider conservation community:

→ **RECOMMENDATION 4: Build on lessons learnt.** This report has identified a vast array of useful lessons emerging from the last ten years of WWF’s work on the restoration of forest landscapes around the globe. These lessons are very pertinent and WWF should disseminate them widely and apply them as relevant in its various conservation programmes. As shown through this report, the restoration of forest landscapes remains an important element in large scale conservation. Learning from the past will help to strengthen future efforts, within WWF and beyond.

→ **RECOMMENDATION 5: Relevant institutions should make a concerted effort to mobilise long term efforts and resources towards forest landscape restoration.** Achieving real and lasting impact in restoring forest landscapes takes time (at least 10 years), human resources and a diversity of partners from different backgrounds. Partners should pool resources in priority areas for restoration in order to achieve the scale of change necessary. Cases such as the dry forest programme in New Caledonia where, on the one hand the programme re-groups a range of institutions (both public and private) and on the other, the programme is “institutionalised” within New Caledonia’s budget, provide a good example of such a concerted effort.

→ **RECOMMENDATION 6: Conservationists should determine whether forest landscape restoration or the landscape approach is the best approach in a given ecoregion.** There remains some confusion between the two approaches, which clearly exhibit significant overlap. However, they are not one and the same. The restoration of forest landscapes assumes that within a landscape the single most important conservation action needed is the restoration of forest functionality. This will be particularly important where forest degradation and/or losses are significant and where pressures on forests are high. It will also be important where priority species are facing extinction because of habitat loss. This is clearly the case for example in the dry forests of New Caledonia where forest functionality has been lost. Thus, a series of interventions, many in no way related to technical aspects of forest restoration (but rather to policies, land tenure, governance, economics etc.), all contribute to restoring a functional forest landscape.

In many cases, however, restoration of the landscape is not or should not be the main conservation thrust, but instead the landscape approach where a mix of tools (which may include restoration interventions) is applied to maintain and sustainably manage into the future a functional, forested landscape, would make more sense. For example, in the Congo basin forests, while there may be some habitat loss and degradation, the restoration of forest landscapes is not a priority (ie: forest functionality has not been lost in most priority landscapes of the Congo Basin), instead the priority should be a landscape approach focusing on effective forest protection and sustainable forest management. The same question applies to priority species' conservation: if habitat loss and degradation are not the main factors in a species' decline, then forest landscape restoration should not be a priority intervention. In order to secure successful forest landscape restoration initiatives, one first important step is to ensure that the approach is applied where it is really needed.

We can anticipate an increased interest in forest restoration as the world seeks more options for climate adaptation, carbon sequestration, soil and water improvements, agriculture improvements etc. This is particularly true given population figures and resulting increased pressure on natural resources. Yet the scale and approach to forest restoration may not always be appropriate, as has been witnessed in many cases to date. WWF can play a major role, building on its valuable experience to date, in taking the lead on the subject, presenting an approach which provides multiple benefits, both human and environmental.

REFERENCES

General

Aldrich, M., Bowling, J., Dudley, N., Elliott, C., Higgins-Zogib, L., Hurd, J., Lacerda, L., Mansourian, S., McShane, T., Pollard, D., Sayer, J. and K. Schuyt 2004. *Integrating Forest Protection, Management and Restoration at a Landscape Scale*. Gland: WWF International.

CBD Secretariat, 2011. *Report Of The Tenth Meeting Of The Conference Of The Parties To The Convention On Biological Diversity*. Montreal: CBD.

CFLRP Coalition Steering Committee and the USDA Forest Service, 2011. *People Restoring America's Forests: A report on the collaborative forest landscape restoration program*. Washington DC: CFLRP.

Dudley, N. and M. Aldrich, 2007. *Five years of implementing Forest Landscape Restoration Lessons to date*. Gland: WWF International.

FAO, 2011. *Global forest land-use change from 1990 to 2005: Initial results from a global remote sensing survey*. Rome: FAO.

Mansourian, S., Vallauri, D. and Dudley, N. 2005. *Forest Restoration in Landscapes: Beyond Planting Trees*. New York: Springer.

RSPO, 2007. *RSPO Principles and Criteria for Sustainable Palm Oil Production Including Indicators and Guidance*. Kuala Lumpur: RSPO.

Taylor, R. (ed.), 2011. *WWF Living Forests Report*. Gland: WWF International.

Vallauri, D., Aronson, J. and Dudley, N., 2005. An attempt to develop a framework for restoration planning. In: Mansourian, S., Vallauri, D. and Dudley, N. 2005. *Forest Restoration in Landscapes: Beyond Planting Trees*. New York: Springer.

WWF and IUCN, 2000. *Minutes from the Workshop on Forests Reborn in Segovia*. Gland: WWF and IUCN.

WWF, 2008. *WWF Global Programme Framework 2008-2020*. Gland: WWF.

WWF, 2010. *WWF Forest Strategy – A Network Strategy For Achieving Zero Net Deforestation And Forest Degradation In Wwf Priority Places By 2020*. Gland: WWF.

Websites:

www.panda.org
 www.iucn.org
 www.ser.org
 www.ideastransformlandscapes.org/
 www.itto.int
 www.newgenerationplantations.com

Malaysia

1. Ecott, T., Mansourian, S., and Dudley, N., 2002. *FLR: Working Examples from 5 ecoregions*. Gland: WWF International.
2. WWF Malaysia, (no year). *Partners for Wetlands, Lower Kinabatangan Floodplain*. Kuala Lumpur: WWF Malaysia.
3. WWF Malaysia (no year). *Kinabatangan, A Corridor of Life, A Vision for the Kinabatangan 2020 Lower Kinabatangan Floodplain*. Kuala Lumpur: WWF Malaysia.
4. Ancrenaz M., Dabek L. and O'Neil S. 2007. The costs of exclusion: Recognizing a role for local communities in biodiversity conservation. *PloS Biol* 5(11): e289. Doi:10.1371/journal.pbio.0050289
5. WWF Malaysia website

Madagascar

1. CEPF, 2000. *Ecosystem Profile Madagascar Ecosystem Of The Madagascar & Indian Ocean Islands Biodiversity Hotspot*. Washington DC: CEPF.
2. Roelens, J.B., Vallauri, D., Razafimahatratra, A., Rambeloarisoa, G., and Razafy, F.L. 2010. *Restauration des paysages forestiers : Cinq ans de réalisation à Fandriana-Marolambo, Madagascar*. Paris: WWF France.
3. Air France press release, 24 November 2011. *Fighting deforestation and climate change, Air France's commitment in Madagascar* (see: corporate.airfrance.com)

Greater Mekong

1. Dudley, N. 2004. *Lessons learned from Forest Landscape Restoration in Vietnam*. A report to WWF International (internal).
2. Dudley, N., Nguyen Cu and Vuong Tien Manh, 2003. *A Monitoring and Evaluation System for Forest Landscape Restoration in the Central Truong Son Landscape, Vietnam*. Hanoi: WWF Greater Mekong office.
3. Parr, J.W.K., Jitvijak, S., Saranet, S., and S. Buathong, 2008. Exploratory co-management interventions in Kuiburi National Park, Central Thailand, including human-elephant conflict mitigation. *International Journal of Environment and Sustainable Development* 2008 – Vol. 7, No.3 pp. 293 – 310

Portugal

1. WWF Green Belts programme document. Rome: WWF Mediterranean Programme.
2. WWF Mediterranean Programme, 2008. Final Report 2008/09. *Forest Landscape Restoration MONCHIQUE NATURA 2000 , Herdade da Parra site*. Rome: WWF Mediterranean Programme.
3. WWF Mediterranean Programme and DGRF, 2006. Cansino project – *Plan of ecological restoration of the conservation Values of a burned area in the natura 2000 site of Monchique (Mediterranean southwest Iberia ecoregion – Portugal) first phase 2005/06*. Rome: WWF Mediterranean Programme.
4. WWF Mediterranean Programme, 2008. Report: *Parceria WWF Coca Cola. Relatório de Projecto de Restauo Ecológico da Encosta do Vascão 2008*. Rome: WWF Mediterranean Programme.

New Caledonia

1. Vallauri D., Géraux H., 2004. *Recréer des forêts tropicales sèches en Nouvelle-Calédonie*. Rapport scientifique WWF-France, 28 p.
2. WWF France, 2000. *Conservation programme, Dry tropical forests in New Caledonia*. Paris: WWF France.
3. Géraux, H. (coord.), 2005. *Séminaire de réflexion sur la restauration écologique et la Vision de la Biodiversité des Forêts sèches de Nouvelle-Calédonie*. Nouméa: WWF France, Bureau Nouvelle Calédonie.
4. Matthews K. , 2005. *Identification, cartographie des unités paysagères de Forêt sèche de la Nouvelle-Calédonie et méthodologie d'analyse et d'action*. Nouméa: WWF France, Bureau Nouvelle Calédonie.

Tanzania

1. WWF Tanzania, 2011. *Project Technical Progress Report – Forest Restoration Measures. Project: Securing long term benefits for the communities and forests of the East Usambara Mountains project in Tanzania*. Dar es Salaam: WWF Tanzania.
2. Malugu, I., Killenga, R. and Jones, T. 2008. *Training and collection of baseline monitoring data for nine village forest reserves in the east Usambara Mountains forest landscape restoration project*. Dar es Salaam: WWF Tanzania.
3. WWF Tanzania, 2006. *East Usambara forest landscape restoration project. Assessment of economic benefits of village forest reserves to local communities and identification of potential income generating activities in seven villages of East Usambara mountains of Tanzania*. Dar es Salaam: WWF Tanzania.

4. Lukumbuzya, K. and Forrester Kibuga, K., 2010. *Evaluation report*. Dar es Salaam: WWF Tanzania.

Caucasus

1. WWF, 2006. *An Ecoregional Conservation Plan For The Caucasus*. Tbilisi: WWF Caucasus Programme Office.
2. Proposal to BMU submitted by KfW, 2008. *Mitigating Impacts of Climate Change through the Restoration of Forest Landscapes in the Southern Caucasus*. Frankfurt: WWF Germany.

Atlantic forest

1. WWF and FVSA, 2011. *Abridged Priority Programme Report Template, (August 2011)*. Buenos Aires, Rio de Janeiro and Asuncion: FVSA and WWF.
2. Aquino O., A. L. and M. F. Mereles H., 2010. *Building coalitions to protect and restore the Atlantic Forest*. Asuncion: WWF Paraguay.
3. WWF and FVSA, 2010. *Atlantic Forests Ecoregional Action Plan*. Buenos Aires, Rio de Janeiro and Asuncion: FVSA and WWF.

China

1. WWF China, (no year). *Working together with WWF to Protect Pandas*. Beijing: WWF China.
2. WWF China, (no year). *The Green Heart of China*. Beijing: WWF China.

Bulgaria

1. Ecott, T., Mansourian, S., and Dudley, N., 2002. *FLR: Working Examples from 5 ecoregions*. Gland: WWF International.
2. International Commission for the Protection of the Danube River website

ANNEX 1: Persons interviewed

NAME	OFFICE
Mark Aldrich	WWF International
Lucy Aquino	WWF Paraguay
Peter Cutter	WWF Mekong office
Joseph Gasis	WWF Malaysia (Borneo programme)
Hubert Géraux	WWF New Caledonia office
Ivan Hristov	WWF Danube Carpathian programme office (Bulgaria)
Ling Lin	WWF China
Luis Neves Silva	WWF Mediterranean programme (Portugal)
Ilia Osepashvili	WWF Caucasus
Appolinaire Razafimahatratra	WWF Madagascar and Western Indian ocean
Lala Razafy Fara	WWF Madagascar and Western Indian ocean
Geri Steindlegger	WWF International
Peter Sumbi	WWF Tanzania
Rod Taylor	WWF International

ANNEX 2: Questionnaires by region

	ECOREGION NAME	QUESTIONNAIRES RECEIVED
1	Greater Mekong	2
2	Malaysia – Kinabatangan	1
3	China	2
4	New Caledonia Dry Forests	1
5	Eastern Africa Coastal Forest	1
6	Madagascar Forests and Shrublands	1
7	Mediterranean Forests, Woodlands and Scrub (Portugal and Morocco)	1
8	Danube River delta – Bulgaria	1
9	Atlantic Forests (Upper Parana)	1
10	Northern Andes - Ecuador	0
11	C. Andean Yungas (Peru)	0
12	WWF India	0
13	WWF Nepal	0
14	WWF Germany (Caucasus and SE Asia)	1
15	Scotland	1
	Total	13

Total number of responding offices: 11 out of 15

ANNEX 3: Analysis of WWF priority species and places and forest restoration

Table 3.1: WWF's forest-dwelling flagship species and threat of habitat loss

FLAGSHIP SPECIES IN WWF'S GPF	IUCN REDLIST STATUS	IUCN RED LIST - RELEVANT INFORMATION ON MAJOR THREATS
African elephant (<i>Loxodonta Africana</i>)	VU	"currently the most important perceived threat is the loss and fragmentation of habitat caused by ongoing human population expansion and rapid land conversion"
African great apes		
Chimpanzee (<i>Pan troglodytes</i>)	EN	- "Major threats include: 1. Habitat destruction and degradation..."
E. gorilla (<i>Gorilla beringei</i>)	EN	- Virunga sub-population: "Threats included incursions by militia, habitat destruction for firewood and farmland - Bwindi sub-population: "agriculture and pastoral activities are leading to massive loss and fragmentation of forest habitat"
W. gorilla (<i>Gorilla gorilla</i>)	CR	- "Conversion of forest for agriculture and grazing is occurring rapidly in many parts of the gorillas' range and the largest current protected area (...) contains enclaves of human settlements (...) threaten to divide the park into two"
Bonobo (<i>Pan paniscus</i>)	EN	- "The collective threats impacting the wild bonobo population today include: (...), and habitat alteration (commercial logging and agriculture, traditional slash-and-burn agriculture, increase of fallow land)"
Asian big cats		
Clouded leopard (<i>Neofelis nebulosa</i>)	VU	- "Clouded leopards prefer closed forest (...), and their habitat in SE Asia is undergoing the world's fastest deforestation rate (1.2-1.3% a year since 1990: FAO 2007)."
Snow leopard (<i>Panthera beria</i>)	EN	- "Military conflict is taking place across much of the snow leopard's range, causing immense damage to wildlife through direct loss of species and destruction of habitat..."
Tiger (<i>Panthera tigris</i>)	EN	"Tiger range has contracted by 41% over the last decade (...) Dinerstein et al. (2007) consider habitat loss and poaching for trade to be primary causes of a significant decline in Tiger range and numbers"
Asian elephant (<i>Elephas maximus</i>)	EN	"The pre-eminent threats to the Asian elephant today are habitat loss, degradation, and fragmentation"
Asian rhinoceros		
Indian rhino (<i>Rhinoceros unicornis</i>)	VU	"There have been serious declines in quality of habitat in some areas." (NB: habitat includes grasslands but also secondary forests)
Javan rhino (<i>Rhinoceros sondaicus</i>)	CR	"Little is known about the species' biology and the habitats in which the two remaining populations are found may not be optimal."
Giant panda (<i>Ailuropoda melanoleuca</i>)	EN	"Restricted and degraded habitat is the greatest threat to giant pandas."
Orangutans (<i>Pongo pygmaeus</i>)	EN	"Major threats include: 1. Habitat losses with the destruction of vast areas of tropical forest..."
Threatened kangaroo species		
Brush-tailed bettong or woylie (<i>Bettongia penicillata</i>)	CR	"The species is believed to have historically declined through (...) and habitat destruction and alteration"
Goodfellow's Tree kangaroo (<i>Dendrolagus goodfellowi</i>)	EN	"The species is highly threatened by (...), and additionally by habitat loss through local deforestation for wood and timber, and by shifting cultivation.."
Tenkile or Scott's Tree-kangaroo (<i>Dendrolagus scottae</i>)	CR	"This species is threatened by (...) and by habitat loss through conversion of forest.."
Huon Tree Kangaroo, Matschie's Tree-kangaroo (<i>Dendrolagus matschiei</i>)	EN	"This species is threatened by (...) and habitat loss due to conversion of forest to subsistence agricultural use and general human encroachment"
Golden-mantled Tree Kangaroo (<i>Dendrolagus pulcherrimus</i>)	CR	"The species is highly threatened by (...) habitat loss through conversion of forest to cultivated land."

Table 3.2: WWF's priority places and threat of habitat loss

WWF'S PRIORITY PLACES	SPECIFIC GLOBAL 200 ECOREGION	THREAT (SOURCE: WWF UNLESS OTHERWISE STATED)
Sumatra (including western tip of Java)	Sumatran Islands lowland and montane forests	"Between 65 and 80% of these forests have already been lost to agriculture (mainly oil palm plantations) and logging."
Atlantic Forests	Atlantic Forests	"Very little of the Atlantic Forest remains and what does is highly fragmented."
Altai-Sayan Montane Forests	Altai-Sayan Montane Forests	"Forest clearance, plant collection, trampling by hikers,..."
Borneo	Borneo lowland forests	"If the current deforestation trend continues, Borneo's lowland forests, and their biodiversity, will be gone within a decade"
Eastern Himalayas	Himalayan Broadleaf and Conifer Forests	"However, this rich tapestry is under threat: Climate change is affecting livelihoods, species, and environments; Deforestation, degradation and fragmentation is destroying habitats."
Mekong Complex	Annamite Range moist forests	"Clearance of natural habitats to increase levels of agricultural production is underway throughout the ecoregion but has been most severe in Vietnam"
Coastal East Africa	East Africa coastal forests	"only a few blocks of lingering forest remain widely distributed and isolated throughout the ecoregion"
Mediterranean	Mediterranean forests, woodlands and scrub	"The ecoregion is threatened by continuing conversion to agriculture, pasture, and urban areas. Frequent fires, logging of remaining native woodlands, exotic species, and intensive grazing are also threats."
Valdivia	Valdivian temperate rainforests	"Intensive logging and conversion of forests to timber plantations are the major threats to this region"
Madagascar	Madagascar dry forest, spiny thicket and moist forest	"Since the arrival of humans 2,000 years ago, Madagascar has lost more than 90% of its original forest cover..."
Western Ghats	Southwestern Ghats moist forests	"The Western Ghats were once covered in dense forests. Today, a large part of the range has been logged or converted to agricultural land for tea, coffee, rubber and oil palm, or cleared for livestock grazing, reservoirs and roads."
Southwest Australia	Southwest Australia	"Land clearing for agriculture remains the number one threat to the survival of animal and plant species in Australia, especially in the southwest."
Miombo woodlands	Central and eastern miombo woodlands	"Although large parts of the Miombo are relatively intact, natural woodlands are being cleared to meet other land needs"
Greater Black sea region	Caucasus-Anatolian-Hyrcanian temperate forests	"Excessive and illegal logging, intensive agriculture and unsustainable coastal development are problems on land."
Yangtze Basin	Southwest China temperate forests; Hengduan-Shan conifer forests	"Deforestation and loss of wetlands to agriculture have increasingly led to floods"
Southwest Pacific	New Caledonia moist forests; New Caledonia dry forests; Fijian forests; Solomons-Vanuatu-Bismarck Moist Forests	"The forests and biodiversity of Melanesia, including Papua New Guinea, are under threat from unregulated logging, overhunting and wildlife exploitation"

ANNEX 4: Positioning forest landscape restoration beyond WWF

While this report concerns primarily lessons learnt from existing WWF forest landscape restoration initiatives, in this annex a selection of related initiatives from other organisations are highlighted (although lessons learnt have not been analysed for these programmes/projects). The intention is to begin to place the restoration of forest landscapes in the context of other larger global policy concerns related to the environment in an effort to better frame future restoration interventions.

4.1. Forest landscape restoration programmes of other organisations

The International Union for the Conservation of Nature (IUCN)

IUCN has been a major player in forest landscape restoration since the start of the joint programme of work with WWF in 1999. Much of IUCN's work has been at a policy level, although, particularly in East Africa, it has also supported field work.

Together with the International Tropical Timber Organization (ITTO), IUCN was instrumental in developing guidelines for the restoration of tropical forests. The two organisations, together with Intercooperation, held a series of national training workshops for public and private sector actors addressing key topics in the restoration of tropical forest landscapes, notably in Côte d'Ivoire, Cameroon, Ghana, Guatemala, Mexico, Guyana, Myanmar and India.

Global Partnership on Forest Landscape Restoration

The Global Partnership on FLR (initiated by WWF, IUCN and the UK Forestry Commission) was officially launched at FAO's Committee on Forests in March 2003 in Rome. Several new partners have joined the partnership since its start, with a total of 19 partners represented today, including ITTO, UNEP-WCMC, the UNFF Secretariat, the CBD Secretariat, the World Agroforestry centre (ICRAF), the FAO, the World Bank, CARE International and several others.

The priorities of the Global Partnership on Forest and Landscape Restoration are to:

- Catalyze support for forest and landscape restoration
- Map and analyze restoration potential
- Build knowledge and networks on FLR

The partnership has organised a number of high level meetings around specific themes: in 2005, the "*Petropolis challenge*" was: to *restore forest landscapes to bene-*

fit people and nature and contribute to reversing the trends of forest loss and degradation; in 2009 the London challenge was: a shared vision for harnessing the potential of more than 1 billion hectares of lost forests and degraded forest lands worldwide to significantly improve local livelihoods, conserve biodiversity, complement and support agricultural productivity and make a tangible contribution to mitigating climate change through forest landscape restoration; and in September 2011 the Bonn challenge was: to restore 150 million hectares of lost forests and degraded lands worldwide by 2020.

Society for Ecological Restoration

The Society for Ecological Restoration International (SER) re-groups members interested and engaged in ecological restoration from over 70 countries. Over the years it has broadened its scope from pure site-based ecological restoration, to a more holistic approach that includes the human dimension. In 2011 the theme for the Society's annual meeting was "re-establishing the link between nature and culture" a concrete recognition of the importance of integrating the human dimension in restoration.

The International Topical Timber Organisation (ITTO)

In collaboration with IUCN, the Centre for International Forestry Research (CIFOR), the Food and Agriculture Organization of the United Nations (FAO), and WWF, ITTO developed "*Guidelines for the restoration, management and rehabilitation of degraded and secondary tropical forests.*" A manual, "*Restoring Forest Landscapes: An introduction to the art and science of forest landscape restoration*", was also written and published by ITTO in cooperation with IUCN in 2005 to clarify the concepts and strategies associated with forest landscape restoration. ITTO has also been working with IUCN to organise regional workshops to build capacity on the implementation of these guidelines.

The Nature Conservancy (TNC)

The Nature Conservancy is working with several partners in the US to implement a "Collaborative Partnership on Forest Landscape Restoration". This programme is being implemented in ten US landscapes and translates in practice into a vast array of actions, including restoring natural fire regimes, building forest resilience and planting native species. The partnership is a ten year initiative with expected results including job creation, improved water quality and reduced forest fires, amongst others.

Conservation International (CI)

Conservation International includes forest restoration in the priority hotspots in which it works, notably the Atlantic forest and Madagascar. It has also prioritised climate change as one of its main focal areas, and includes restoration of forests within this area of work. The organisation has also been taking a “mosaic” approach to its forest work within landscapes, which includes protection, management and restoration.

4.2. International policy context

At an international level, forest restoration has increasingly permeated all three Rio Conventions, which are about to celebrate their 20 years. In the UNCCD, restoration plays an important role in combating desertification. The second strategic objective in the Convention’s 10-year strategy (2008–2018) reads *“To improve the condition of affected ecosystems”* and includes actions to reduce land degradation. In addition, in an effort to mitigate the impact of climate change on land resources, the strategy foresees some restoration activities. In the CBD, the Convention of the Parties’ (COP) meeting in Nagoya in 2010, has come closest to explicitly acknowledging the importance of restoration by introducing a target on restoration, Target 15, which reads *“By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.”*¹ The UNFCCC has promoted for several years mechanisms such as the Clean Development Mechanism (CDM) and more recently, REDD+ that seek to encourage projects involving forest restoration with a primary focus on absorbing carbon to mitigate climate change. While in 2007 at the Bali Conference of the Parties, the term “Reducing emissions from deforestation and forest degradation “(REDD) first appeared, discussions now are focusing on REDD+ which goes one step further, by not only reducing carbon emissions but also conserving or sustainably managing forests and enhancing their role as carbon sinks. The Climate Community and Biodiversity Alliance (CCBA) is certifying a number of projects that would qualify as REDD+ providing biodiversity and community benefits.

Some of these are in priority regions highlighted in this report such as Madagascar, the Atlantic forest, China and Eastern Africa².

Rio+20

At the landmark Rio+20 conference (to be held in June 2012), the seven critical issues that have been identified include: decent jobs, energy, sustainable cities, food security and sustainable agriculture, water, oceans and disaster readiness. The restoration of forest landscapes can play an important role in addressing most of these priority challenges, notably the energy and food crises, water scarcity, disaster preparedness and increasing resilience.

¹ CBD Secretariat, 2011.

² See: http://www.climate-standards.org/projects/#pachijal_mira

ADDRESSES

Stephanie Mansourian

Consultant - Environment and Development

36 Mont d'Eau du Milieu

1276 Gingins

Switzerland

smansourian@bluewin.ch / smansourian@infomaniak.ch

Daniel Vallauri

WWF

6 rue des fabres

13001 Marseille

France

dvallauri@wwf.fr

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23

Overarching lessons are shared with the WWF network and beyond

A DECADE

From 2000 to date, great efforts to restore degraded forests at landscape level have been engaged by WWF



10

WWF worldwide initiatives on Forest Landscape Restoration are analyzed

6

Recommendations are proposed as a contribution of WWF's field experience to the current global vision and priorities for forest conservation



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To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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