



WWF – New Caledonia

Seminar on the ecological restoration and the biodiversity vision of New Caledonian dry forests

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Nouméa, January 2005

Dry Forest Project Partners





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January 2005

Rapport n° 02/2005

Acknowledgements

All my thanks go to

- The IRD for making their premises available for this seminar, for their help throughout the event as well as their moral support during the preparation phase.
- The project director, Christian Papineau, who gave me the green light to organize this seminar despite a very busy schedule.
- Overseas experts Pete Lowry, James Aronson, Jean-Claude Rameau, Susan Cordell and Daniel Vallauri, who contributed original thinking necessary for the project members and partners to initiate new actions for the remaining New Caledonian dry forests.
- All project partners who have accepted to give presentations contributing to the collective effort.
- Nathalie Domergue-Schmidt, owner of the Pointe Maa , for her warm welcome during a field trip on her property.
- Evelyne Collé, my assistant, and David Plumley, active member of WWF, who took turns to do simultaneous translation of all talks for our English speaking guest, Susan Cordell.
- The WWF voluntary helpers, Laurence, Marilys, David, Nicolas, Emmanuelle et Maéva, whose help made it possible to take up the challenge of organising the event.
- The WWF-int Forest Landscape Restoration project, for its financial and technical contributions to this seminar, and for its general investment on this ground-breaking project in New Caledonia.

I also wish to thank all who encouraged and helped me throughout this seminar and its preparation.

Seminar on the ecological restoration and the biodiversity vision of New Caledonian dry forests

INTRODUCTION

The scope of the project must be based on a realistic and pragmatic analysis of the status of the remaining New Caledonian dry forests. Since Man arrived, about 3000 years ago, and with increasing activity intensity over the last thirty years, 99% of the ecoregion's sclerophyllous forests have disappeared. Several factors have contributed to this extremely critical situation: fire, land clearing for cattle breeding, overgrazing by cattle and deer, urban sprawl on the southern fringes and the introduction of alien plants and animals. Today, the remaining 45 km² are divided in 106 sites and 240 fragments along the west coast, from the Nouméa area to the northern tip of the New Caledonian main island.

Following these findings, in 1998, 9 partners decided to work together on a programme to counteract this ecological disaster and, in 2001, collective action was agreed on for a 5 year programme based on 5 topics

- Research
- Protection
- Restoration
- Public information and socio economic valorisation
- Sustainable management

Since then, a tenth partner, NGO Conservation International, has joined to support this ambitious project.

In May 2004, we reached the half way mark of the first 5 year phase, with new data, first concrete results, and a general view on the implementation of the management plan approved in 2001.

The present seminar on restoration is an opportunity to :

- **Assess actions taken to restore dry forest areas**
- **Benefit from international experience to promote different levels of analysis and action**
- **Draw up technical recommendations for further action.**
- **Integrate these findings into a long term strategic conservation plan for the New Caledonian Dry Forest Ecoregion**

By way of a preamble, we give below some answers to key questions. These questions were submitted to participants prior to the seminar so as to channel and provoke thought and cogitation.

What is an ecoregion?

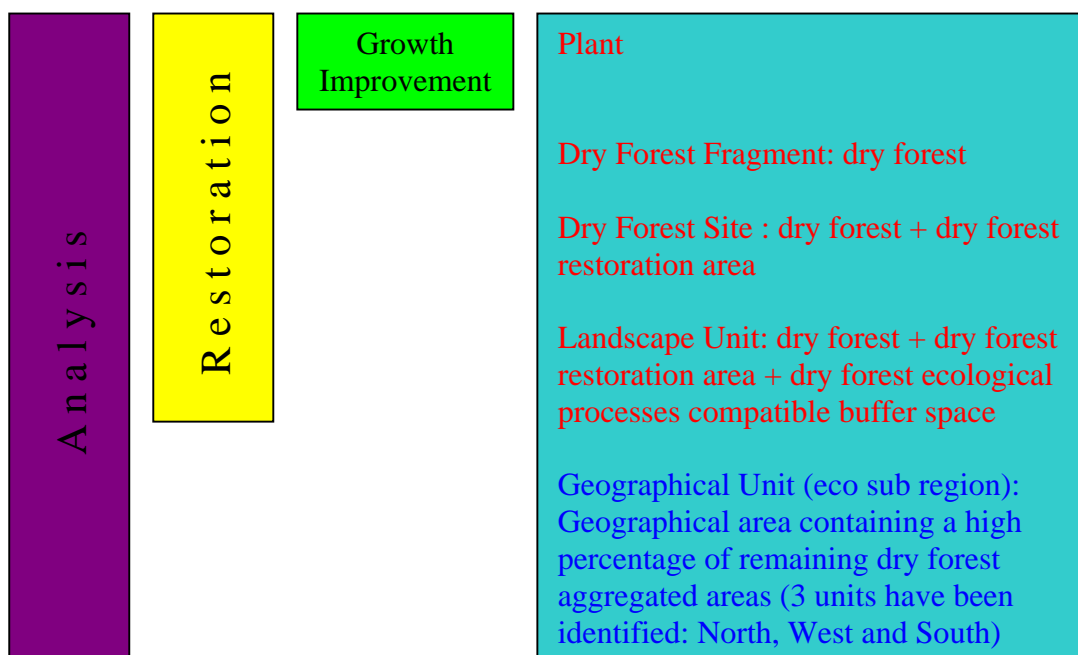
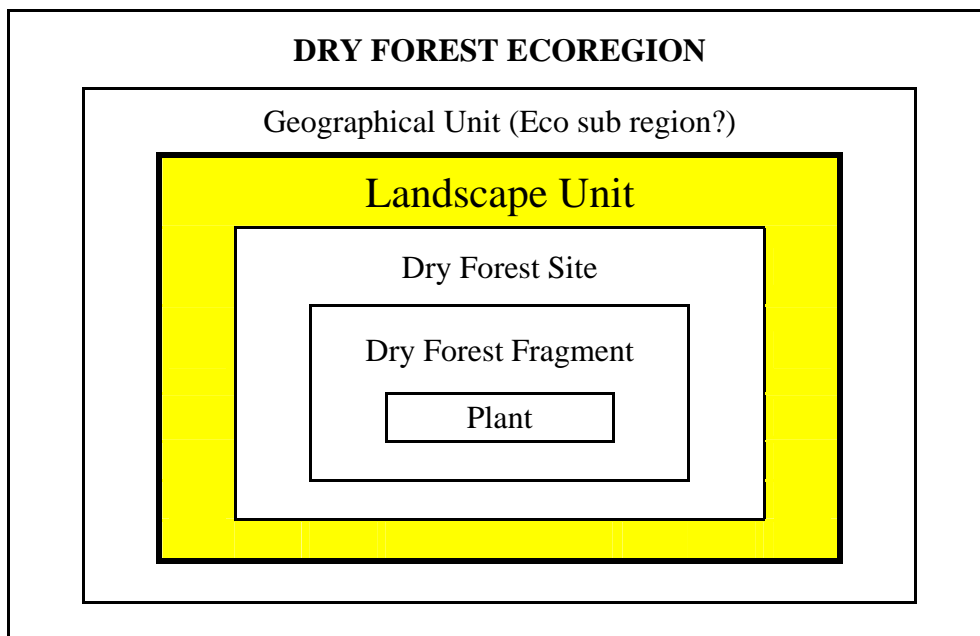
Ecoregions are ecosystems covering relatively large areas of land or water that contain a geographically distinct assemblage of natural communities; they share a majority of their species, dynamics and environmental conditions (Dinerstein et al 1995). WWF "Global 200" programme has identified 238 priority ecoregions throughout the world, based on specific richness, endemism and level of threat. Four of these ecoregions are found in NC : fresh water, coral reefs, rain forests and dry forests.

Why should restoration be envisaged at the landscape level?

Dry forest areas are so small, isolated and scattered, that their long term ecological survival, which we hope can still be achieved, depends on landscape management. An eco-socio-systemic study of the environment at landscape level of the forest remnants is necessary to evaluate all inter-actions, positive or negative, existing or potential, between landscape components and dry forest.

Must be taken into account

- Users and uses of the forest patch itself (and its ownership) but also all stakeholders who have an impact at landscape level.
- Present and past events but also the dynamics of the matrix (ex : urban development in a rural matrix)



Do geographical units correspond with biogeographical sub units?

Studies must be carried out to evaluate if specific species series can be identified or if genotypes are distinct. Possible biogeographical sub-units might not be visible because of the extreme fragmentation suffered by the Dry Forest Ecoregion. If such biogeographical sub units do exist,

restoration projects should take them into account and caution should be taken about genetic flows between sites.

On the contrary, restoration actions carried out by PCFS might produce genetic mixing which could be beneficial for dry forests, by reactivating ecological processes. These processes had been hindered or stopped by the dry forest ecosystem fragmentation, which had isolated plant populations.

Why should a view of dry forest ecoregion biodiversity be drawn up?

Since it was launched in 2001, the project follows the strategy previously agreed by all partners and defined in the management plan.

It is a valuable tool for the implementation of annual work programmes, but it only gives a partial view of our long term impact on dry forests. The complex problems met during the implementation of our project necessitate a vision beyond the first five years.

The present seminar will help us find a method to shape a view of what we want to achieve during the coming decades. Which viable forests should be restored, protected reconnected and developed? Which forests should be sacrificed? This future tool will support and guide our outlook on all aspects of the project. It should help us to optimise our investment in conservation of this forest environment.

Three connected studies will have to be carried out in order to map out the biodiversity conservation landscape of New Caledonian dry forest.

1. Identify ecoregional sub-units (climate, altitude, soil, biology)
2. Identify which dry forest remnants are worth preserving (study of remaining patches : size, distance, perimeter length)
3. Prospect analysis (town planning, land status) and threats

The biodiversity conservation landscape will have to comply * with the four main objectives of the biodiversity view for New Caledonian dry forest.

1. resilience of dry forest biodiversity to global environment changes (climatic changes)
2. development of viable animal and plant populations
3. conservation of the main ecological processes
4. preservation of representatives of all biological communities

* *The New Caledonian dry forest ecoregion is in an extremely critical condition. It is therefore important that the conservation plan objectives – and in particular conservation strategy - takes this fact into account. According to Noss & Cooperider (1994) 15 to 40% of an ecoregion must be preserved to guarantee long term biodiversity conservation. As mentioned in the introduction, only 1% of the original dry forest area remains. It is not possible to state that the remaining patches, even if they are completely preserved, will ensure ecosystem survival. However, every effort must be made to achieve it.*

OPENING TALK BY THE PROJECT DIRECTOR

After welcoming addresses by Jean Chazeau , interim director of IRD Nouméa, on which premises the seminar is being held, and Hubert Géraux, WWF NC ecoregional coordinator and organiser of the event, Christian Papineau officially launched the work session:

Ladies and gentlemen,

As spokesman and director of the New Caledonia dry Forest conservation project, I am glad that this seminar is being held for three main reasons :

The first reason is that, half way through the 2001-2006 dry forest project launching period, we will be able to advance on the ecological restoration issue, as well as other aspects of the project.

I refer, in particular to our public information, forest protection and sustainable management programmes.

The second reason is that, work carried out in the conference room and the workshops during three days, will generate profitable exchanges and produce practical recommendations that will be tested in the field on the fourth and last day of the seminar.

The third and last reason is that we have brought together scientists, technicians, nursery gardeners, land managers, and plant users on a common subject: conservation and value enhancement of dry forests.

I, also, welcome you to this seminar.

Thank you

PROGRAMME

	time	Theme	Contributor(s)
M o n d a y 1 0 M a y 2 0 0 4	0900-09.10	Opening	J. Chazeau/IRD H. Géraux/WWF C. Papineau/PCFS
	0910-0920	Presentation of objectives and schedule	H. Géraux/WWF
	0920-0950	Presentation of the project (history and actions)	C. Papineau/PCFS
	0950-1005	Coffee break	
	1005-1030	Review of research findings on NC dry forest fauna and flora , typological approach	G. Dagostini/IRD J. Chazeau/IRD
	1030-1055	Dynamic typology of forestry research stations, a key tool for the manager (examples in Mediterranean, temperate and tropical climates)	J-C. Rameau ENGREF
	1055-1130	Questions and answers sessions	Everyone
	1130-1300	Lunch break	
	1300-1305	Presentation of the restoration aspect of PCFS	J. Tassin/IAC
	1305-1320	Choice of plant species and reproduction for ecological restoration	J. Tassin/IAC
	1320-1335	Microbiology contribution to the active restoration of dry forests	B. Fogliani/UNC
	1335-1350	Ruminants impact on dry forest restoration : allies or enemies?	M. Degarine- Wichatitsky/IAC
	1350-1405	Introduced plants management : setting up invasive plant control routes in Tiéa Dry Forest, Pouembout	V. Blanfort/IAC
	1405-1435	Invasive plant control techniques	J-C. Rameau ENGREF
	1435-1500	Questions and answers session	Everyone
	1500-1515	Coffee break	
	1515-1600	Presentation of a biodiversity vision elaboration process (ex rain forests in Central Africa and dry forests in Madagascar	P. Lowry/MBG- MNHN H. Géraux/WWF
	1600-1630	Questions and answers session	Everyone

T u e s d a y 1 1 M a y 2 0 0 5	time	Theme	Contributor(s)
	0830-0850	Presentation of paper on “ecological restoration” of the Forest Landscape Restoration project	D. Vallauri/WWF
	0850-0935	Presentation of the Hawaiian Dry Forest restoration programme	S. Cordell/Institute of Pacific Is. Forestry
	0935-0950	Coffee break	
	0950-1035	Presentation of international experience on sclerophyllus environments (failures and success, lessons learnt)	J. Aronson/CNRS
	1035-1130	Questions and answers session	Everyone
	1130-1330	Lunch break	
	1300-1320	The dry forest Geographic Information System: a technical and strategic tool for restoration.	Y-E. Boyeau/SMAI
	1320-1340	Questions and answers session	Everyone
	1340-1345	Presentation of dry forests which will be studied in the landscape analysis : Pointe Maa	A-C. Goarant/DRN
	1345-1400	Coffee break	
1400-1630	New Caledonian Dry Forest Landscape analysis demonstration : Pointe Maa and Pic Jacob	J. Mahé/IAC Everyone	

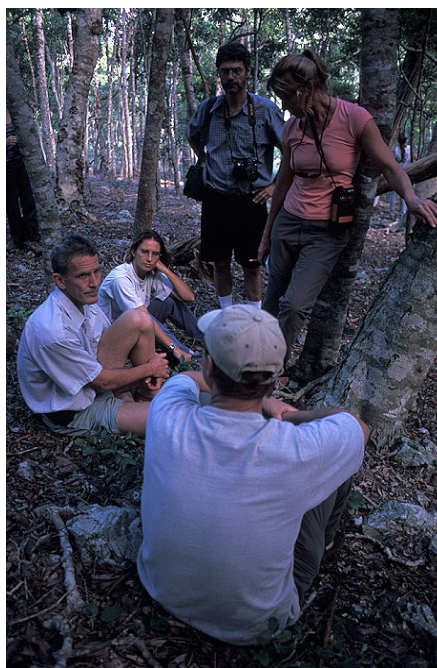
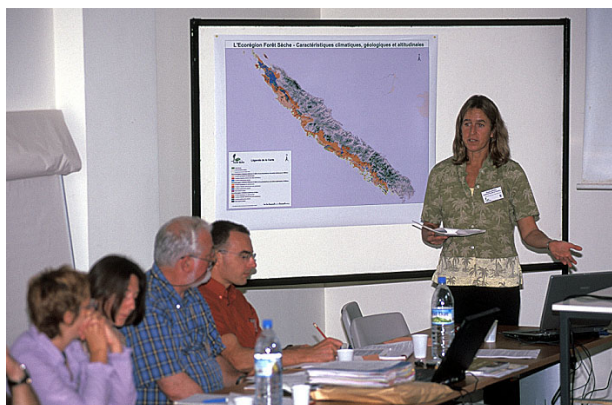
W e d n e s d a y 1 2 M a y 2 0 0 4	time	Theme	Contributor(s)
	08.30-08.40	Presentation of the field trip of Thursday 13. organisation and practicalities	H. Géraux/WWF A-C. Goarant/DRN
	0840-0900	Reminder of the project objectives	C. Papineau/PCFS
	0900-0915	Presentation of the 10 key questions that the Program will have to answer	D. Vallauri/WWF
	0915-1000	Report / discussion on identification of emerging ecosystems	J. Aronson/CNRS Everyone
	1000-1015	Coffee break	
	1015-1045	Ecoregion mapping by abiotic factors crosschecking: example of Iran-Jaya and its application to the NC dry forest ecoregion	H. Géraux/WWF
	1045-1130	Discussion / debate	Everyone
	1130-1300	Lunch break	
	1300-1315	Main patterns of dry forest plant distribution	J. Tassin/IAC
	1315-1430	Debate on key issues	Everyone
	1430-1445	Coffee break	
	1445-1620	Debate on key issues	Everyone
1620-1640	Summery of the seminar and closing speech	H. Géraux/WWF C. Papineau/PCFS	
1730	Closing cocktail	Everyone	

T h u r s d a y 1 3 M a y 2 0 0 4	time	Theme	Contributor(s)
	0830-1130	Pointe Maa (Païta) dry forest field trip	Everyone
	1130-1300	On site picnic lunch	
1300-1500	Visit to the zoological forestry park dry forest and of the first restoration site		

TALKS AND DEBATES

On the accompanying CD, we enclose all papers (power-point and word documents) which were presented during the 3 day workshop as well as background documents.

All the photographs included in this document have been taken by Nicolas Petit, professional photographer and active member of WWF and are available on the enclosed CD and when used must be accompanied by the copyright statement “©Nicolas Petit /WWF”.



A few photographs taken during the seminar



FIELD TRIPS - 13/05/04

Pointe Maa Dry Forest field trip (Païta municipality) - Morning



With the help of maps, the forest and its conservation problems were explained to all participants by Christian Papineau, PCFS project director and Anne-Claire Goarant, assistant to the environment department head of the DRN.

- Meeting with Mrs Domergue-Schmidt, landowner, who has undertaken to preserve this forest in association with the Southern Province and PCFS. This site is among the 22 priorities listed by the project.
- At the southern end of the property, Christian Papineau explains problems on this site.
- Inside the dry forest, presentation by various scientists of work and studies carried out on site (phenological route, study and management of herbivores, avifaunistic inventory)
- On site discussion of restoration issues
- Picnic on the beach near Mme Domergue-Schmidt's house



*Jean-Paul Chauvin, of the IAC Port Laguerre nursery displays mature fruit of *Ochrosia inventorum*, a tree which can only be found in this forest of only a few dozen hectares.*

Field trip to the Forestry Park : First replanting site for plants produced ex-situ (Nouméa) - Afternoon

c.f. annexe – “Summary of the first dry forest restoration project at the Forestry Park in 2003”, DRN



*8 August 2003 : replanting of young species in a clearing after invasive *Leucena leucocephala* and *Schinus terebenthifolus* plants had been removed.*



13 May 2004 (9 months later) : plants as seen during the seminar field trip



18 January 2005 (17 months later) same view as above showing plant growth, some being now over 2m in height.

Visit of the first patch cleared of false mimosa dominated vegetation (*Leucena leucocephala*) and replanted with 25 dry forest species in August 2003. For information: the young *Terminia cherrieri* (badamier de poya) planted on this occasion have produced viable seeds at the end of 2004. A rare occurrence, since, in its natural distribution area, the seeds are systematically parasitised. *Cleistanthus stipitatus* are also bearing fruit, whereas the rare liana *Turbina Inopinata* and the shrub *Premna serratifolia* are in flower. This site, though small, will produce seeds of threatened species, for the project, in 2005

- Visit of the second dry forest patch which was enriched with dry forest plants in 1990. The educational trail is already in use and in 2005 information panels will be installed. Degraded areas will be replanted.



Interview by RFO (the local state radio) of Susan Cordell and Christian Papineau on the subject of dry forest restoration in Hawaii and New Caledonia.

CONCLUSIONS AND OUTLOOK

During this seminar, we shared with a wide circle of New Caledonian and overseas participants our experience on actions undertaken for the restoration of dry forests. In addition, this seminar has made a positive contribution to the dynamics of PCFS in several ways which will be developed below. Firstly, here are two main points on which further research will be needed:

- **technical restoration recommendations:** Participants have taken note of the Hawaiian experience on producing and planting sclerophyllus forests and from the scientific follow up described by Susan Cordell (4 259 plants with a success rate of 70%). This initial exchange between our two Pacific projects sharing the same objectives constitutes a first stage in a collaboration which must be maintained in the future. In any event, we must continue to develop a network of international collaboration with other restoration projects on similar ecosystems which could also contribute technical expertise (ex: experiment in Guanacaste Costa Rica - see annexe 2 "Case study restoration Guanacaste Costa Rica)
- **changing the space scale** is a view that has not been unanimously accepted. From the site scale, we suggested moving up to the landscape level and the ecoregion scale. Moving up to the landscape level, with experiments suggested for the Pointe Maa and Pic Jacob areas has met with general approval et will be implemented in 2005, as described below. The proposal to work on an ecoregional scale was questioned and provoked concern about management at such a scale. Therefore, its relevance is clarified in point 1 below, and the complementarity of the different spatial scales has already been presented in the introduction. The matter will be further explored after this seminar within the framework of PCFS. However, knowledge of the biodiversity spatial distribution throughout the forest ecosystem, and particularly of the endemic flora, remains an essential element for determining a strategy and a conservation plan for this ecoregion. The small size and the scattered distribution of dry forest patches do not allow an intellectual visualisation of an ecoregion structure. However mapping the various dry forest landscapes (which will concern 10% of the ecoregion) should make it possible. Lastly, we must keep in mind that the ecoregional scale is not intended to weaken the impact of our interventions (which was the fear expressed by some participants of the seminar), but on the contrary, is meant to orientate and optimise action, as explained below.

1) INVESTIGATION OF TWO NEW SPATIAL SCALES : THE ECOREGION SCALE AND THE LANDSCAPE LEVEL.

The Ecoregion scale is particularly suited to :

- taking account of the genetic diversity of dry forest species populations.
- taking account of territorial management policies (urban expansion, mining and agricultural development)
- determining an invasive species control management strategy (progression front, new areas of invasion)
- setting up fire fighting strategies (distribution of prevention and control resources, optimised through spatial analysis of high risk areas)
- addressing the political impact at a level which provides a conservation vision of the New Caledonian natural resources over and beyond geopolitical boundaries (provinces and municipalities)
- defining global objectives for long term preservation of dry forest ecosystem biodiversity.

IRD botanists have determined that **99%** of dry forest has disappeared. Project interventions have concentrated on the one per cent remaining of a dry forest that used to cover the whole of the West coast. However, where dry forests have been wiped out, they have been replaced, either through natural growth or through man's intervention, by other formations and land uses. Each one of these is, either by its composition, by its structure, and by its relative position, more or less favourable to maintaining the ecological function of dry forest remnants.

If an ecological restoration path is to be drawn up, it is essential to identify and map those formations which contain dry forests.

This mapping of the ecoregion's ecological components, natural or anthropic, will enable:

- the delimitation of landscapes on which the project will concentrate to preserve and restore enclosed dry forests.
- and thence the completion of a map for a long term conservation vision of the New Caledonian dry forest ecoregion (protected areas, buffer zones, ecological corridors, sacrificed zones)

Advantages of the **Landscape level**:

- given the limited area of the dry forest remnants, their **ecological viability** can only be envisaged by implementing measures at the level of the landscape which contains them.
- at landscape level, **stakeholders** can contribute to dry forest ecological restoration objectives by adapting their activity and therefore their impact on the landscape matrix.

There is **no existing reference primary ecosystem** (in a mature state), and this constitutes another difficulty for the definition of a restoration strategy . Existing dry forest fragments cannot be considered an ecological reference since they all present various levels of degradation. An **ecosystem reference** (or **emergent ecosystem**), based on a new ecological balance, will have to be created.

This seminar also showed the necessity to give deeper consideration to **the way we look at Landscape Ecology**.

Beyond daily problems in dry forest conservation, it is essential to set large and ambitious objectives for restoration and preservation: **45,000 ha** of dry forest and connecting zones for preservation and long term development.

	Number of units	Area (ha)
Sites	106	4,500
Landscape	9 (area defined by J. Mahé, presentation 13/09/04)	45,000 (10% of ecoregion)
Ecoregion	1	450,000

Two intervention strategies must be developed **according to the nature of the landscape matrix** of the dry forests involved:

- Agricultural matrix : reclaiming land for dry forest and changing agro-pastoral practice.
- Urban matrix : strategy of enrichment of public and private gardens with dry forest species.

During the seminar, an analytical table for landscape units was devised, based on the one used for dry forest sites, which takes into account biological priorities and management potential. Its elements are :

- **cumulated area of dry forest in the landscape**
- **cumulated richness of dry forest in the landscape**
- **potential area for restoring/replanting dry forest**
- **evolution potential for uses of the landscape area**
- **number and type of landowners (assessment of potential collaboration)**
- **human activities and induced anthropic pressures**
- **diversity and nature of the ecosystems which make up the landscape**
- **connection conditions**
- **connection to, or proximity to, protected areas**
- **Nature Capital potential**

The landscape approach is worth developing on priority landscapes where a wide human and spatial integration of our dry forest sites has previously been clearly established :

- **Gouaro-Deva/Montagnes Blanches** – possibility to participate in the development plan for his rural coastal area which contains the largest dry forest in New Caledonia and which will have to conciliate cultural, development, and conservation stakes.
- **Pindai/Nekoro** – this landscape includes several of the largest dry forest fragments. Public (Northern Province) and private landowners are favourable to conservation measures.
- **Païta/Dumbéa/Nouméa (+ Mont-Dore) urban area** – It is important to be a partner in the future development plan of this landscape (which covers several local authority areas) to ensure that the status of the last dry forests of this region will be taken into account, and to follow the evolution of the rural landscape matrix in the north western part.

In 2005, the following actions will be carried out :

- landscape analysis of the Pindai-Nekoro and Gouaro-Deva areas, (supervised by the project)
- a six month trainee programme (supervised by WWF and SMAI) to draw up operational definition and spatial identification of dry forest landscapes, and a proposal for a landscape management methodology.

2) NEW OPPORTUNITIES FOR PCFS TO ACCESS THE NATIONAL AND INTERNATIONAL NETWORK OF RESTORATION EXPERTISE.

- **ENGREF** (Jean-Claude Rameau) : ENGREF has offered PCFS access to information on :

- New Caledonia dry forest typology (which tools are required for the follow up? Definition of technical choices. Identification of functional groups)
- Dynamic regressive or progressive history of dry forest areas

In concrete terms, for the period 2004-2006, PCFS will receive support from ENGREF through the loan of FIF-ENGREF trainees to work on 3 subjects:

- **Identification of functional groups and position analysis on ecological gradients** (supervised by IAC-Forêt) in 2004.
- **Dry forest vegetation dynamics** (supervised by IAC-Forêt) in 2006.
- **Dry forest stations guide**, for the use of all PCFS partners, as well as landowners and managers (supervision to be determined) in 2006.

- **Hawaiian dry forest conservation programme** (Susan Cordell) : The Pacific Islands Forestry Institute has offered PCFS collaboration on different themes common to both our projects (c.f. Annexe “New-Caledonia – Tropical dry forest workshop, May 2004. Project suggestions & recommendations and potential collaboration between Hawaii and New Caledonia”, document provided by Susan Cordell).

- Scientific methodologies
- Protection
- Rehabilitation
- Value enhancement

PCFS is also invited to attend the Hawaii Conservation Conference in 2005 and meet the participants in the Hawaiian project as well as other experts on these problems of ecological rescue.

CNRS (James Aronson) : The CNRS will make available new publications about innovative eco-socio-systemic approaches on restoration ecology and its vital factors.

3) PCFS OPPORTUNITIES TO ASSOCIATE NEW LOCAL TECHNICAL PARTICIPANTS

One of the essential aims of PCFS is to integrate into its action programme new participants who are at the moment only peripheral to our project, but who have an important role to play in implementing restoration actions. PCFS will not launch all dry forest restoration projects, but will lead the development of an actions network. It will also act as technical adviser to project initiators so as to optimise their contribution to the global plan for dry forest ecosystem conservation.

Taking into account their geographical locations, these new participants will be particularly important in action programmes at landscape level and specially when setting up ecological corridors.

People who should be involved include :

- landscape gardeners and nursery gardeners
- property developers
- private landowners
- local authorities parks and gardens maintenance departments
- provincial roads departments (responsible for roadside landscaping)

This seminar has been the occasion for some of them to get to know the project, for others to know it better, in any event for all to improve their understanding of the PCFS dynamics and we hope find

a way to participate in it. Priority has been given to strategy during this seminar, however questions have been asked on technical information about production and availability of dry forest plants. This is the kind of problem that PCFS is going to address now. The project will thus help initiatives on dry forests, new restoration or plantation sites without having to manage them.

4) OTHER ACTIONS RESULTING FROM THE SEMINAR'S DISCUSSIONS

Assessment: It is important **to start one or two pilot restoration projects during the final two years** of this first 5 year phase of the project. Even if knowledge on dry forest ecology is still limited, a restoration project with strict follow up procedures will allow field practice to be tested and corrected before being applied to future sites. It will also be possible to collect data on plant growth, soil mycorrhizian activity, invasive plant performance, biocoenosis quantity and quality development.

Action: During the second half of 2004, two pilot sites have been identified and production of several thousand plants has been started. The two sites are the **Pointe Maa** dry forest in the Southern Province (which was visited on a field trip during the seminar) and **Tiéa** dry forest in the Northern Province.

Assessment: It is important to increase our efforts on public land in order to ensure durable ecological benefits of actions carried out. This will also allow public institutions who own dry forest land to offer conservation and restoration examples to other forestry land owners, private or tribal.

Action: Special support will be given by the Northern and Southern provinces for the conservation actions planned by PCFS on priority sites covering large areas : **Pindaï** dry forest and **Gouaro-Deva** dry forest.

ANNEXES

A. – Participants

B. – Documents

A. Participants

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A. Participants

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B. Restoration and ecological conservation literature available from the Dry Forest Project

Types of Document	TITLE	AUTHOUR(S)	ORGANISATION
Book(2) 73 p.	Dynamique de la biodiversité	Angélique QUILICHINI; Marc GIBERNAU; Jacques BLONDEL.	Ministère de l'Aménagement du Territoire et de l'Environnement
Book 67 p.	Quelle biodiversité en zone d grande culture?	Sandrine PETIT; Françoise BUREL; Véronique BARRE; Jacques BAUDRY;	Ministère de l'Aménagement du Territoire et de l'Environnement
Book 18 p.	Improving Protected Area Management	Jamison ERVIN	WWF- Programme Forests for Life
Book 261 p.	Book blanc sur la protection des forêts naturelles en France	Daniel VALLAURI	WWF
Book (3) 192 p.	Recréer la nature. "Réhabilitation, restauration et création d'écosystèmes"	J.L. CHAPUIS, V. BARRE; G. BARNAUD	Programme National de Recherche
Catalogue 45 p.	Evaluation, économie et recherche.	Collectif	Ministère de l'écologie et du développement durable.
Book 372 p.	L'expérience agri-environnementale française. Environnement et gestion des territoires.	Jean-Paul BILLAUD; Véronique BARRE	Ministère de l'Aménagement du Territoire et de l'Environnement.
Scientific Report 24 p.	Recréer les forêts? Une vision écologique pour soutenir une stratégie de restauration après les tempêtes.	Daniel VALLAURI; Hubert GERAUX	WWF

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Types of Document	TITLE	AUTHOUR(S)	ORGANISATION
Book 48 p.	Des clés pour la gestion des ressources génétiques. Quelques acquis du 3e colloque national.	Collectif	Bureau des ressources génétiques
Book (2) 110 p.	Rehabilitation and Restoration of Degraded Forests.	David LAMB; Don GILMOUR.	WWF; IUCN (the World conservation Union)
Book 20 p.	Restauration des paysages forestiers, exemples concrets dans 5 écorégions	Tim ECOTT	WWF
Book 23 p.	Forests for Life. Working to Protect, Manage & Restore the World's Forests.	Collectif	WWF
Book (2) 51 p.	Une aide pour les stratégies de conservation & de restauration des milieux perturbés. Les adaptations génétiques locales.	Perrrine GAUTHIER; Roselyne LUMARET; Véronique BARRE.	Ministère de l'Aménagement du Territoire et de l'Environnement
Book (copy) 141 p.	A review of Department of Conservation mainland restoration projects and recommendations for further action.	Collectif	Department of conservation. <i>Te Papa Atawhai.</i> New Zealand
Résumé 15 p.	Restauration d'îles sub-antarctiques Françaises par manipulation d'espèces introduites. Récapitulatif des travaux de recherche et des actions de transfert.	Jean-Louis CHAPUIS; Edouard LE FLOC'H; James ARONSON.	Programme National de Recherche

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Types of Document	TITLE	AUTHOUR(S)	ORGANISATION
Copies 6p.	Setting priorities for conservation action - Conservation Targets.		
Report 9 p.	A proposal to develop a simulation model for decision makers to explore and understand the consequences of different land-use options in forest landscape restoration.		WWF - FLR
Report 44 p.	Review of Forest Landscape restoration Portfolio	Don GILMOUR	WWF International Gland, Switzerland
Report 22 p.	Forest restoration in Europe. Ecological approach and needs.	Daniel VALLAURI	WWF-France, Forest restoration officer
Article 14 p.	What Practitioners Need from Restoration Ecologists	André CLEWELL, John P. RIEGER	California Department of Transportation - USA
Booklet 15 p.	Quel avenir pour les peuplement RTM de pin noir d'Autriche sur substrat marneux dans les Alpes du Sud ?	Daniel VALLAURI	Cemagref
Article 4 p.	Towards a long term ecological framework for forest restoration programs. An illustration from restoration for erosion control on badlands in South-Western Alps (France)	Daniel VALLAURI	Cemagref, secteur forêts de montagne

B. Restoration and ecological conservation literature available from the Dry Forest Project

Types of Document	TITLE	AUTHOUR(S)	ORGANISATION
Report 11 p.	An analysis of forest Restoration 120 Years after reforestation on Badlands in the Southwestern Alps.	Daniel VALLAURI; James ARONSON; Marcel BARBERO	Cemagref; WWF France, Forest Conservation Department; CEFE; University of Marseille
Article 12 p.	Nature, histoire, loisirs et forêt. Relecture par un écologue des principaux écrits sur la restauration d'espaces érodés dans les Alpes du Sud.	Daniel VALLAURI	Cemagref, secteur forêts de montagne
Article 9 p.	Biologie et forêt. L'écologie de la restauration appliquée à la forêt.	Daniel VALLAURI; Ch. CHAUVIN.	Cemagref, secteur forêts de montagne
Article 2 p.	The french perspective. A 125-years-Old restoration Program in Haute Provence.	Daniel VALLAURI	WWF for Nature - France, Forest Conservation Department.
Video Cassette	Corridors biologiques et aménagement du territoire.	Région Nord Pas de Calais	Ministère de l'aménagement du territoire et de l'environnement
Article 9 p.	Ecological Restoration and NonIndigenous Plant Species: A Review	John J. BERGER	Society for Ecological Restoration
Book 359 p.	Ecologie du paysage. Concepts, méthode et applications.	Françoise BUREL, Jacques BAUDRY	CNRS, INRA

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Types of Document	TITLE	AUTHOUR(S)	ORGANISATION
Book 48 p.	From the vision to the Ground. A guide to implementing ecoregion conservation in priority areas.	Colby LOUCKS, Jenny SPRINGER, Sue PALMINTERI, John MORRISON, Holly STRAND	WWF, Conservation Science Program
Book 20 p.	Integrating Forest Protection, Management and Restoration at a Landsape Scale.	Mark ALDRICH; Alexander BELOKUROV; Jill BOWLING; Nigel DUDLEY; Chris ELLIOT; Liza HIGGINS-ZOGIB; Jack HURD; Leonardo LACERDA; Stéphanie MANSOURIAN; Tom MCSHANE; Duncan POLLARD; Jeffrey SAYER; Kirsten SCHUYT	WWF, Forests for Life Programme
Book 26 p. (+ carte)	Vision de la Biodiversidad de la Ecoregion del Bosque Atlantico del Alto Parana : unir para conservar la vida	Di Bitteti M.S, Placci G & Dietz L.A	WWF US
Scientific Report	A biodiversity vision for the upper parana atlantic forest ecoregion : designing a biodiversity conservat° landscape & setting priorities for conservat° action	Di Bitteti M.S, Placci G & Dietz L.A	WWF, Fundacion Vida Silvestre Argentina
Document (traduction française) 9 p.	Présentation de la problématique de conservation des forêts sèches hawaïennes	S.Cordell	USDA Forest Service

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Types of Document	TITLE	AUTHOUR(S)	ORGANISATION
Document 6 p.	New Caledonia - Tropical Dry Forest Workshop, May 2004. Project suggestions & recommendations and potential collaboration between Hawaii & New Caledonia	S.Cordell	USDA Forest Service
Document 4 p	Présentation succincte des 1ères opérations de restauration de FS conduites au PZF en 2003		PRT-DRN
Article 10 p.	Restoration & rehabilitation of degraded ecosystems in arid and semi-arid lands I.A. view from the South	James Aronson et al.	CNRS
Article 11 p.	Vital landscape attributes : missing tools for restoration ecology	James Aronson & Le Floc'h	CNRS
Article 7 p.	L'Ecologie de la restauration, Définition de quelques concepts de base	E. Le Floc'h & James Aronson	CNRS
Scientific Report 89 p.	Directives OIBT pour la restauration, l'aménagement et la réhabilitation des forêts tropicales dégradées et secondaires		OIBT
Book 30 p. (+ map)	Les Alpes : un héritage naturel unique - Une vision commune pour la protection de leur biodiversité	Fränk Mörschel et al,	WWF
Article 5 p.	Restoring Hawaii's dry forests	William Allen	St Louis Post-Dispatch

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Types of Document	TITLE	AUTHOUR(S)	ORGANISATION
Report 41 p.	Taxation policy as an incentive for forest management in Hawaii	George A. Myles	USDA Forest Service
Article 15 p.	Effects of long-term ungulate exclusion and recent alien species control on the preservation and restoration of a Hawaiian tropical dry forest	Robert J. Cabin et al,	USDA Forest Service