Conservation of Biodiversity

Permanent Ecological Network Structures
and
Ecological Corridors
using
The Sicirec Formula

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Contents

1. Introduction

The natural forests of the world continue to vanish at an alarming rate. What is left after human intervention are isolated and isolated patches of forest and bare land. This imposes a serious threat upon the world's biodiversity. Valuable wildlife and plant species are left on small isles and as a result extinction is only a matter of time. With the extinction of so many species mankind is losing the greatest treasure that mother earth has to offer.

Rainforests are among the most biodiverse ecosystems on earth

1.1 What is biodiversity?

In the simplest of terms biological diversity is the variety of life and its processes; it includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.
(Keystone Center, "Final Consensus Report of the Keystone Policy Dialogue on Biological Diversity on Federal Lands," 1991)

1.2 Why is biodiversity so important?

The natural environment is the source of all life. Environmental processes provide a wealth of services to the living world — providing us with air to breathe, water to drink and food to eat, as well as materials to use in our daily lives and natural beauty to enjoy.

Complex ecosystems with a wide variety of plants and animals tend to be more stable. A highly diverse ecosystem is a sign of a healthy system. Since the whole of the living world relies on the natural environment, and especially we ourselves, it is in our best interest and the interest of future generations to conserve biodiversity and our natural resources.

2. The Sicirec context

Sicirec realises and supports sustainable and ecological reforestation projects that earn a good financial return and at the same time, by means of conservation and restoration of ecological networks, maintain or restore biodiversity. More specifically, in all Sicirec's projects the emphasis is on the establishment of permanency for all restored and protected ecological areas. In this way the realised ecological networks are made stable and permanent. Profitable forestry is thus combined with lasting repair and protection of biodiversity.

2.1 Sicirec's philosophy

Sicirec's philosophy is simple: anywhere where land is used in whatever way, ecological repair and production methods based on ecological principles, can both be combined effectively with financial profitability. It is a common misunderstanding that ecology and profitability are incompatible per se. Combining the two is a matter of know-how, which is sadly missing in most cases. Sicirec helps to disseminate this knowledge and experience.

Combining the two aspects of ecological repair and profitability is of the utmost importance since:

- If nature conservation is not supported by economic and social sustainability, it will not be sustainable in the long run. The active protection of a nature reserve cannot earn the qualification "sustainable" if there is any chance whatsoever that the future protection of the reserve can no longer be guaranteed.
- Preservation on its own is not enough. A healthy environment also depends on sound ecological networks. By restoring these networks a coherent ecosystem will be established that is worth preserving.

Each project making use of Sicirec's investment and subsidy-scheme for planting trees, is obliged to contribute a minimum of 20% of the area in question contributing to an ecological network. The areas are selected in such a way that they as much as possible connect the project area with surrounding nature reserves.

Where it is not possible to establish connections with surrounding nature reserves, the establishment of "stepping stones" or natural pockets act as a pragmatic intermediary goal and in such cases the ecological stepping stone effects must be optimised.

In all of Sicirec's projects the ecological areas created will be given permanent status by means of ecological leans (servidumbres ecológicas) or other comparable legal structures.

2.2 How?

Combining ecology and profitability is realised by means of comprehensive land use planning and long term safeguarding of sound ecological networks and corridors. Within the production areas the goal is maximisation of profits, whereas in the natural core areas and in the corridors the sole objectives are the preservation of nature and the maximisation of ecological values.

2.3 Importance of ecological corridors

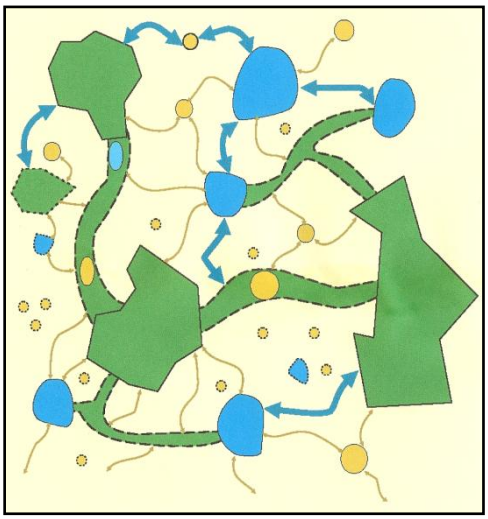
Ecological corridors, as crucial elements of ecological networks, have the vital role of facilitating the movement and migration of animal and plant species between core and adjacent areas. As such, ecological corridors are essential for the long term survival of biological diversity.

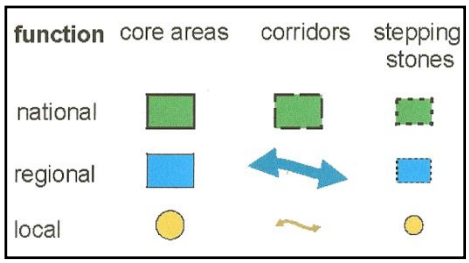
The fragmentation of nature, or what is left of it, is in fact one of the major causes of species becoming extinct. If unable to migrate, animals and plants sooner or later become extinct at a local level due to natural fluctuations in numbers, with no option to repopulate the area again in a later stage. This tendency can be prevented effectively by preserving and repairing the ecological corridors between the remnants of nature that still survive.

The changing climate is one more reason why sound ecological networks and ecological corridors are imperative in order to maintain biodiversity. Due to climate changes appropriate habitats for animal and plant species are shifting, forcing species either to migrate or to become extinct at a local level. It is therefore the quality of the ecological networks and ecological corridors that determines to a large extent the durability of habitats in the face of variations in climate.

Since an ecological network provides a home for many different animal and plant species it helps in diminishing the chances of pests and diseases spreading to adjacent production areas. As a result, less effort has to be spent on combating pests and disease , saving valuable time and money as a result.

2.4 Main elements of an ecological network





Ecological network
(source: www.bfn.de; presentation of dr. Karin Ullrich)

2.4.1 Core areas:

These are areas where the primary function is biodiversity conservation. They should be legally protected under national or regional legislation. These areas preferably should provide a substantial representation of key natural or semi-natural ecosystems and contain viable populations of important or threatened species.

2.4.2 Corridors:

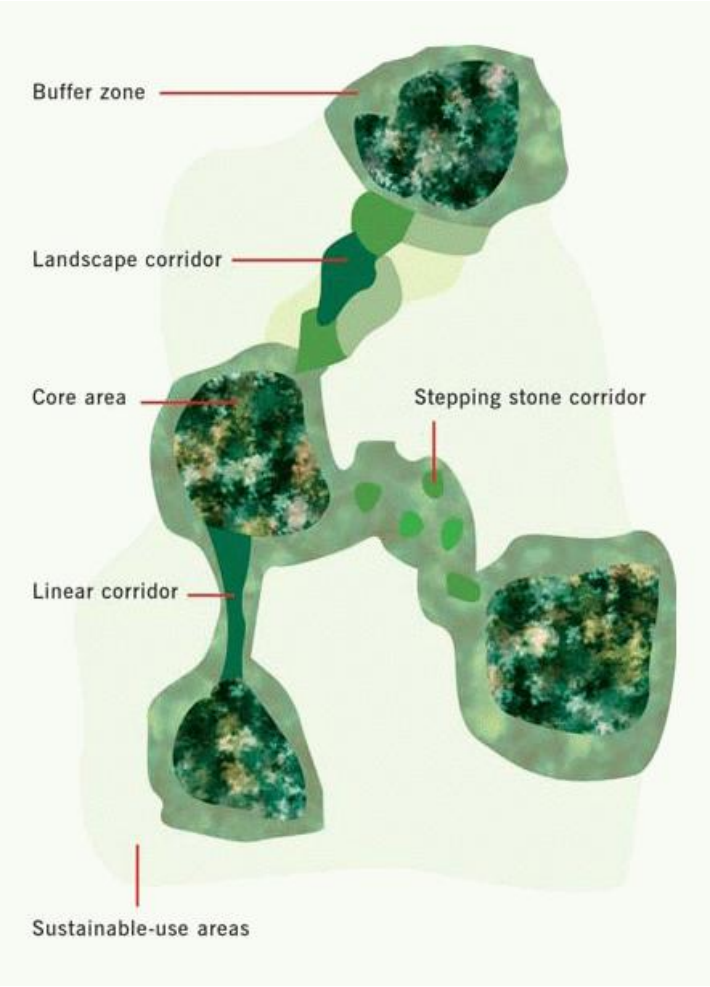
These are areas of suitable habitat and limited width that provide functional linkages between core areas. For example, they may stimulate or allow species migration between areas. Corridors can be continuous strips of land or 'stepping stones' that are patches of suitable habitat.

2.4.3 Stepping stones:

These are patches of natural habitat that are interlinked by virtue of the fact that the distance between them is limited and small enough for animal and plant species to be able to migrate from one to another, thus facilitating the possibility of moving between different core areas.

2.4.4 Buffer zones:

Protected areas should not be considered as islands that are safe from negative external effects. Buffer zones allow a smoother transition between core areas and surrounding land use. The size and utilisation of buffer zones depends heavily on the particular needs of the specific ecosystem and its local population.



Source: countdown2010.net

2.4.5 Sustainable use areas:

These are remaining areas that can be subject to more intensive land use. However they should still contribute to the successful provision of ecosystem goods and services.

3. How it works in practice

The Sicirec formula can be applied on different scales. The larger the scale, the more attractive are the resulting ecological network structures. In addition, ecological network structures are more difficult to realise on the smallest scale because they necessitate the cooperation of many different parties and individuals. However, if the Sicirec formula can be realised at that smaller scale, it can be applied on any scale. Below is an example of the smallest possible scale, with participation by smallholders in Bolivia.

Potential areas for reforestation and remaining patches of primary forest are identified by using satellite images

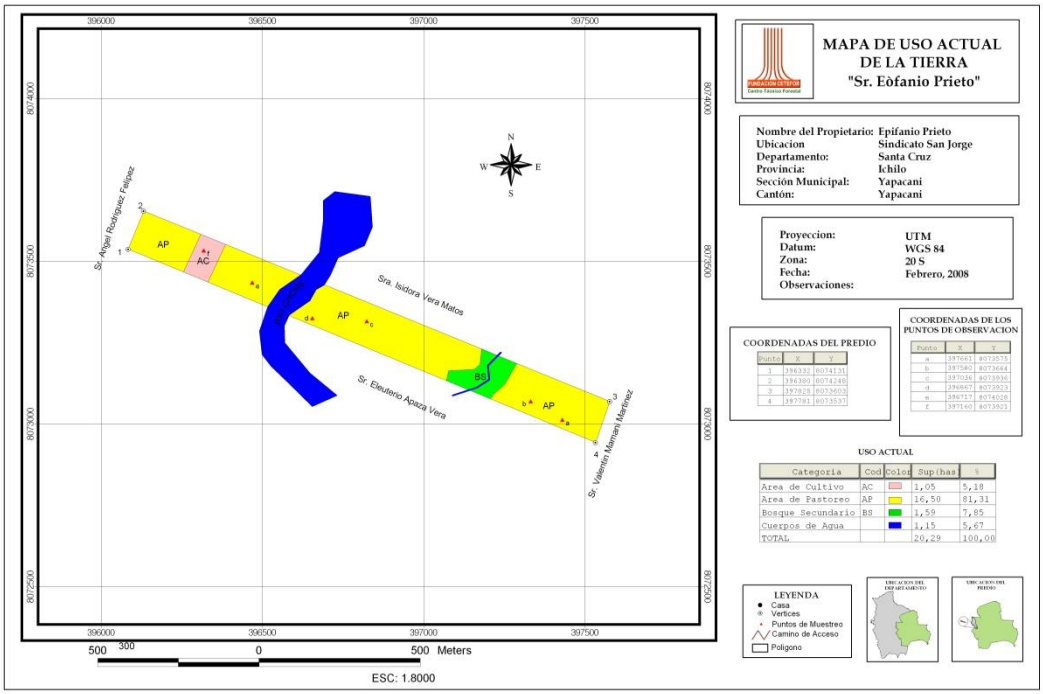
The whole property of the smallholder is mapped by GPS. The boundaries of the terrain are defined and all land use changes are recorded by means of a length transect.


Field survey with GPS and earth-drill

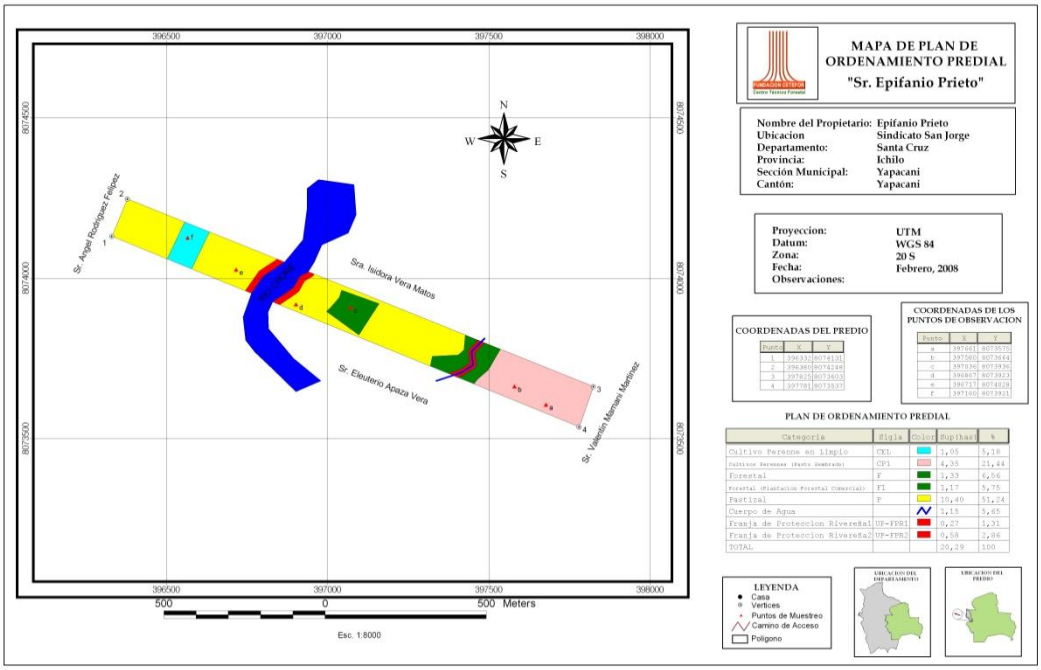
A technical employee discusses with the smallholder his future plans for his property. Together they determine what measures can be taken to prevent water and wind erosion and which part of the terrain is to be used for permanent nature conservation.

All data are collected on paper and subsequently digitalized. From these data two reports are produced; the so called POP (Plan de Ordenamiento Predial) or Land Use Plan and the integral management plan. The POP covers all technical aspects of the land use plan and the integral management plan covers, amongst other matters, all the social aspects of the land use plan. These plans are currently available for reference as Field Forms.

After the POP has been discussed with the smallholder, it is submitted for approval to the “Superintendecia Agraria” (SA). In Bolivia this is the regulatory institution for the sustainable use of land. The SA verifies all legal aspects such as land ownership, the legal status of the owner and the technical aspects, especially the capacity and productivity of the soil.



Actual land use map



The same parcel with future land use, with protected areas in red and forest in green

The areas to be permanently protected are also determined in the POP. The POP confers a legal and permanent status for the proposed type of land use, including a legal status for areas defined as conservation areas. The supervision and control by the SA acts as confirmation of government involvement.
By law, future changes of the POP need the approval of the AA Cetefor-Sicirec.

4. Costs and Financing

Preservation of primary and secondary forest remnants ,the establishment of ecological corridors and a subsequently sound ecological network, can in principle be realised at very low cost. In principle it involves good organisation and strict control , rather than the employment of more costly, cultivation measures.

Multi-functional river bed vegetation; a perfect corridor