FIRST REPORT

PROJECT

Restoration of temperate forests in the southern Chile: integrating ecological and socioeconomic variables.

Rufford Small Grant

Application ID: 9922-1

June 2012

1. Project area

We have had several difficulties that have forced us to modify some of the proposed methodology. The main problem was the inability to achieve ALOS image, because the institution that had offered their support finally was unable to meet its commitment. In such circumstances we decided to use a Landsat image. Given their lower spatial resolution (30 m) we decided to expand our work area to the total surface of the Costal Range of the Región de los Ríos (Fig. 1). We will establish plots of 500 m^2 and increase the intensity of sampling in forest ecosystems. Plots of 1,000 m^2 would not have allowed the establishment of an appropriate sample size in the time available.

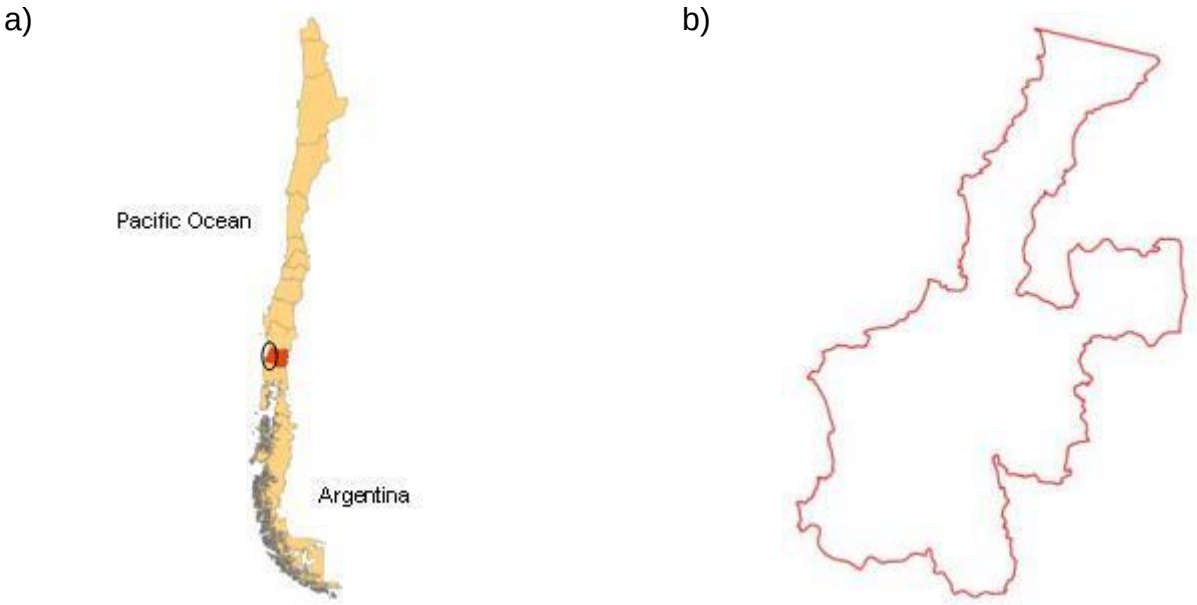

Figure 1. (a) Location of the study area and, (b) Coastal Range of Region de los Ríos, southern of Chile

2. Satellite Scene

We used a satellite scene Landsat (TM, February 2011). This scene was pre-processed, including geometric, atmospheric and topographic corrections using the software ArcGis, ERDAS and PCI Geomatics.

We finished the spatial configuration analysis of native forest of the coastal range of Región de los Ríos. The 30 m resolution of Landsat scene allowed the identification of forest and non-forest area within forest patches. In the analysis of the scene a minimum mapping unit of 5 pixels was used.

2.1. Classification and validation

To aid image classification we used the “Catastro”, a GIS-based data set of thematic maps of forest types and structure developed in Chile by the Chilean forest service in 1999 and it actualization for the Región de los Rios in 2006 (Conaf et al. 1999; 2006). This data set was developed at 1:50,000 scale and was derived from aerial photographs and satellite imagery with a minimum mapping unit of 6.25 ha. A second reference data corresponded to 150 control points sampled in field in January-April of 2012. The classification of the scene was performed with a supervised method and the Maximum Likelihood criterion. The selection of training sites was done considering representation of all digital categories of radiance

according to the numeric values (spectral signature) and colour composites. Signature separability was assessed by the Bhattacharrya distance.

2.2. Land cover
We defined seven classes of land cover: (1) native forest, (2) exotic forest plantations, (3) shrubland, (4) grassland, (5) wetland, (6) bare ground, and (7) rivers.

3. Plots

To determine the degradation level of the forest we established randomly 129 plots of 500 m^2 considering forest structure defined by the Catastro (mature, mature-secondary forests and secondary forest).

4. Socioeconomic and political context

To define the feasibility of implementing restoration programs we carried out 52 semistructured interviews with several local actors and 7 workshops with local communities. The interviews include owners and leaders of 14 rural communities, university researchers, professionals from local and international NGOs, government agencies, and political authorities. The interviews were based on informal conversations which ranged different topics of interest. The duration of the interviews depended exclusively on the interviewees and of the time required to include each of the issues of interest.

PARTIAL RESULTS

1. Land cover and forest distribution

According to the Catastro and the forest types defined by Donoso (1993), the most extensive forest in the coastal range corresponds to Siempreverde with near to 80% of the surface (fig. 2). Thereby we concentrate our project in this type of forest.

The forests present a continuous distribution along the Coastal Range. However, the study area can be classified into two major areas separated by the main river of the province of Valdivia (fig. 2). The northern area is characterized by second-growth forests, highly degraded by the intensive livestock, cutting of forests for firewood production, and substitution of forests to plantations of exotic tree species. While these changes are registered in practically all the Coastal Range, the southern area of the territory is characterized by a larger area of mature forests and in better state of conservation respect to the forests of the northern area (fig. 2).

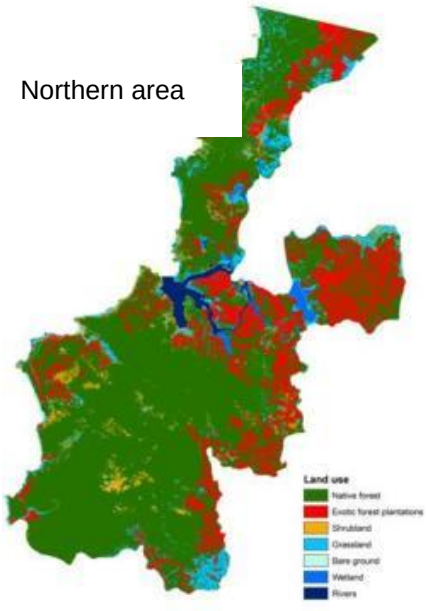

Figure 2. Land use classes and forest distribution.

The Costal Range of the Región de los Ríos has a total area of 265,366 hectares. The largest area corresponds to forests (69%), exotic forest plantations (17%) and grasslands (6%).

2. Socioeconomic and political context

The small properties (< 200 hectares) are concentrated in the North of the Coastal Range. In this area also there is the mayor number of properties of indigenous people (figure 3). On the contrary, the southern area is characterized by the concentration of large properties (> 5,000 hectares).

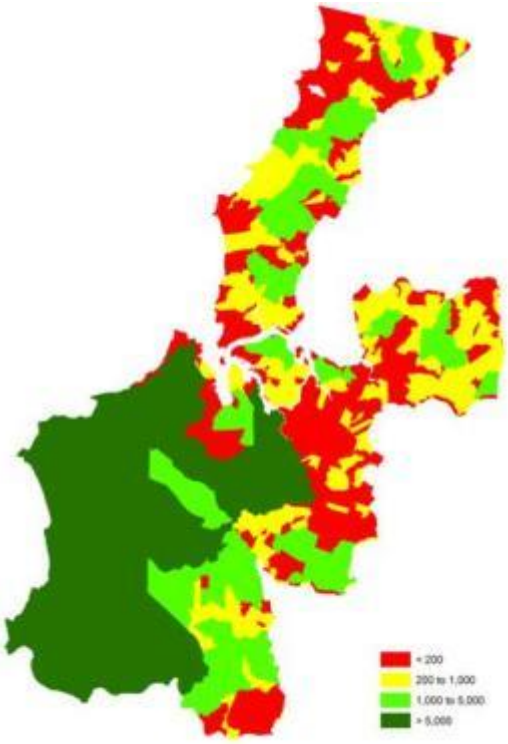

Figure 3. Distribution of property by size (hectares) in the Coastal Range of the Región de los Ríos.

3. Forest restoration

We will integrate ecological and socio-economic information through spatially explicit multicriteria analysis. Based on these results we will select rural communities and small landowners to implement forest restoration programmes in the Coastal Range of the Región de los Ríos.

4. Other achievements

We obtained the support of the Forestry Institute (Instituto Forestal, INFOR in spanish), the main forestry research centre in Chile. This institution develops restoration experiences exclusively on large properties, given their higher socio-economic stability allows planning restoration activities long term. Our methodology and the potential impact of the project were key factors to have the support of this institution. This support is represented by the provision of vehicle, support staff and the purchase of some materials (wire for fences, plants, etc..) for the implementation of our restoration activities.

5. References

CONAF, CONAMA, Birf, Universidad Austral de Chile, Pontificia Universidad Católica de Chile, Universidad Católica de Temuco. 1999a. Catastro y Evaluación de los Recursos Vegetacionales Nativos de Chile. Informe Nacional con Variables Ambientales. Santiago, Chile.

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Donoso, C., 1993. Bosques templados de Chile y Argentina: variación, estructura y dinámica. Universitaria, Santiago, Chile.