



## **Restoration of Native Forests Burnt by Wildfires in Los Alerces National Park, Chubut Province, Patagonia, Argentina**



## **Project Executive Summary**

May 2010

## 1 - Project Quick Facts

<b>Background</b>	In February 2008, 7,200 ha of primary forests and grasslands were wiped out by a violent fire outbreak inside Los Alerces National Park
<b>Project Goals</b>	Restoration of selected sites with native species and successful recolonization of remaining sites by late succession species
<b>Expected Outcomes</b>	<ul style="list-style-type: none"> <li>- Restoration of burnt forests</li> <li>- Restoration of important habitats for native animal populations</li> <li>- Environmental awareness-raising and engagement of neighbouring communities through the active participation of local schoolchildren in the project</li> </ul>

## 2 - General Information on Los Alerces National Park

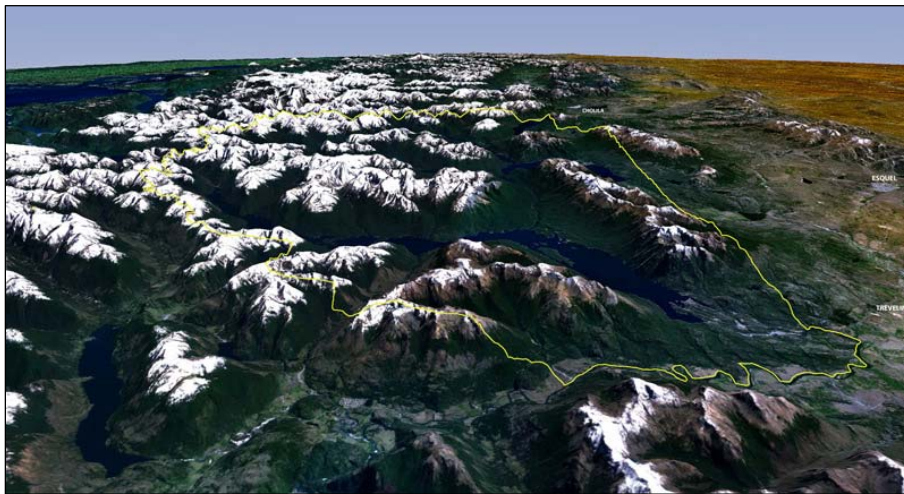
Los Alerces National Park	
<b>Categories (IUCN and others):</b> - I (Strict or Scientific Natural Reserve) - II (National Park) - VI (Reserve/ Protected area with managed resources)	<b>Location:</b> <i>In the northwest of the Chubut Province, in the Futaleufú Department</i> <b>Main creation objectives:</b> <i>Protect the Patagonian Cyprus forests (lahuán or alerce), an emblematic species of the andean-patagonian flora</i>
<b>Surface Area:</b> 263,000 ha	<b>Biomes:</b> <i>Temperate Broadleaf &amp; Mixed Forests, Water Bodies, Rocks and Ice</i>
<b>Date of creation:</b> May 11, 1937	<b>Ecoregions:</b> <i>Valdivian temperate forests</i>



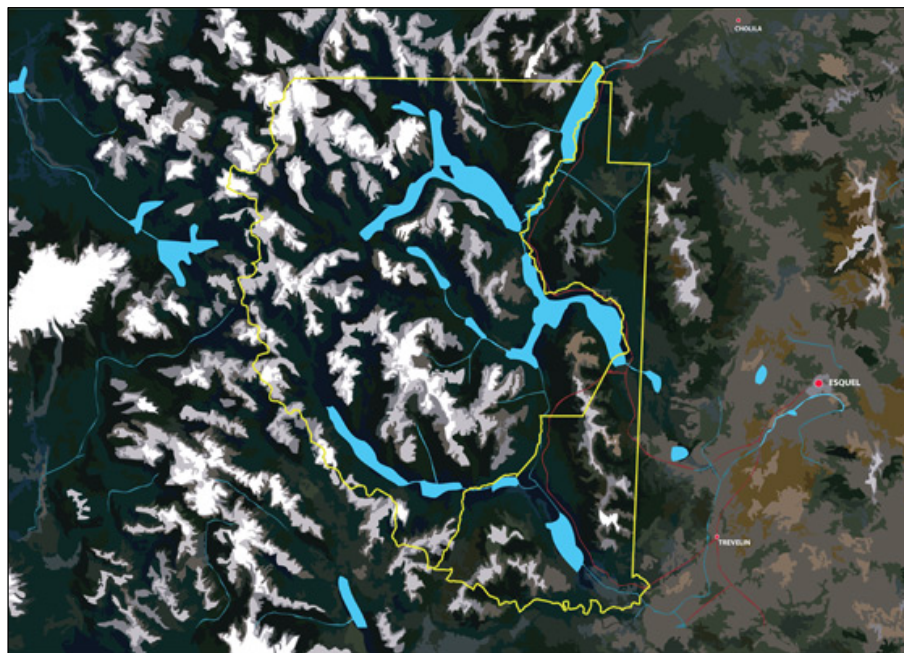
### 3 - General Description of the Park

#### 3.1. Geographic Location

Los Alerces National Park has a total surface area of 263,000 ha, of which the entire western sector, comprising 187,500 ha, is zoned as National Park and Strict National Reserve, and the remaining 75,000 ha pertain to the National Reserve category. It is located between 42°55' latitude S and 71°52' longitude W, in the northwest of the Chubut Province in the Futaleufú Department. It comprises a network of lakes surrounded by mountains reaching an altitude of 2,000 m.



3D aerial view and physical map of Los Alerces National Park



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*Lago Las Juntas*



*Lago Menendez*

**3.2 Abiotic Characterization**

<b>Geographic Location</b>	Located in the northwest of the Chubut Province in the Futaleufú Department, with an altitude range between 500 and 2,000 m above sea level.
<b>Climate</b>	The local climate corresponds to the humid cold temperate type, in which frosts are recorded well into the summer season.
<b>Hydrography</b>	The park is characterized by a network of lakes whose watersheds are mainly located outside of the protected area. To the northwest, Lago Cisne, whose waters originate in the headwaters of the Navarro and Alejandro rivers, joins Lago Menéndez, which then serves its waters to Lago Verde via a series of rapids. The Frey River receives its waters from the artificial Amutui Quimei lake formed by the Futaleufú hydroelectric dam.
<b>Relief</b>	The landscape is a result of Andean orogeny, whose characteristics in the region are the presence of numerous traces of quaternary glacial and volcanic activity. The rock outcrops are primarily granitic Andean batholiths formed from magma cooled deep in the Earth's crust and brought to the surface in the Mesozoic era.
<b>Archeological Sites</b>	There are some cave paintings at just 1,200 m from the information center (Villa Futalaufquen). The prehistoric human presence in the area is represented by the remains of two settlements of hunter-gatherers located around the Desaguadero River: the Alero del Shaman and the Interpretation Trail
<b>Tourist Attractions</b>	The park offers numerous attractions (lakes, whitewater rivers, lush forests, mountains, glaciers) and recreation opportunities (canoeing, kayaking, camping, trekking, mountain climbing, horse riding, etc).

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*Lago Krügger*



*Lago Los Alerces*

### 3.3 Biotic Characterization

#### a. Biodiversity

The park is located within the Patagonian Forest and High Andes ecoregions, in which 204 vertebrate species have been described (13 fish, 18 amphibians, 125 birds, 12 insects, 32 mammals and 2 reptiles, among others). The flora of the park is very rich, consisting of 417 species, among which the Patagonian Cypress (Alerce) *Fitzroya cupressoides*, which is the park's most emblematic species.

#### b. Threatened and Vulnerable Species

##### High Conservation Value Species Within the Park:

##### FLORA

Scientific Name	Taxonomic Group	Common Name	Global Red List	CITES Listing
<i>Fitzroya cupressoides</i>	Cupressaceae	Patagonian cypress or Alerce	EN	I y II
<i>Nothofagus antarctica</i>	Fagaceae	Antarctic beech		-
<i>Nothofagus pumilio</i>	Fagaceae	Lenga beech		-
<i>Pilgerodendron uviferum</i>	Cupressaceae	Guaitecas cypress	VU	I
<i>Weinmannia trichosperma</i>	Cunoniaceae	Tineo		-

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**FAUNA**

Scientific Name	Taxonomic Group	Common Name	Global Red List	CITES Listing
<i>Batrachyla antantardica</i>	Amphibia			-
<i>Batrachyla fitzroya</i>	Amphibia	Alerce frog		-
<i>Columba araucana</i>	Aves	Chilean pigeon	LC	-
<i>Dromiciops gliroides</i>	Mammalia	Microbiotherid	VU	-
<i>Dusicyon gymnocercus griseus</i>	Mammalia	Argentine grey fox		-
<i>Hippocamelus bisulcus</i>	Mammalia	Huemul	EN	I
<i>Hylorina sylvatica</i>	Amphibia	Emerald forest frog		-
<i>Lontra provocax</i>	Mammalia	Southern river otter	EN	I
<i>Merganetta armata</i>	Aves	Torrent duck	LC	-
<i>Olivaichthys viedmensis</i>	Actinopterygii	Otuno		-
<i>Oncifelis guigna</i>	Mammalia	Chilean cat, Kodkod	VU	II
<i>Pudu puda</i>	Mammalia	Pudu	VU	I
<i>Puma concolor</i>	Mammalia	Puma	NT	I y II
<i>Vultur gryphus</i>	Aves	Andean condor	NT	I

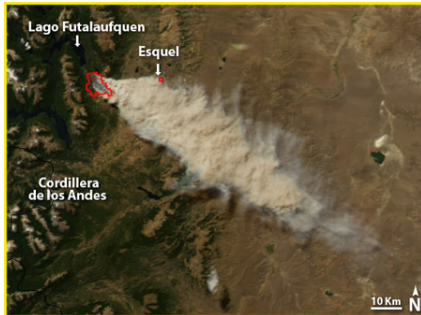


Trunks of gigantic Alerce trees (*Fitzroya cupressoides*)



Huemul (*Hippocamelus bisulcus*)

#### 4 - Planned Activities



The main objective of this project is to restore with native tree species forests destroyed by intense wildfires that swept across the area in 2008.

In addition, this project aims to test demonstrate the cost-effectiveness of a habitat restoration method known in local jargon as 'piles' (*rumas* in Spanish), which relies on the dead biomass left over by the flames.

#### What does the 'pile' approach consist in?

The fire left numerous dead adult and juvenile trees standing. Considering that one of the major threats following wildfires on steep slopes is soil erosion, a simple and cost-effective method was devised to protect both the soil and the planted seedlings: felling and placing the largest trees at a 90° angle with respect the slope (see photo) and reinforcing them with woody material from surrounding grounded trees generates natural fences against water runoff and shelter for the seedlings.



The wooden piles are about 5-6 m large, 2-3 m wide and 1 m high. Their density depends on the density of available tree material, but they tend to be separated by 10-15 m, harbouring between 10 and 13 seedlings each.

#### Activities carried out to date



During the month of November 2009, two plots of approximately one hectare each were selected for reforestation within the area affected by the 2008 fire and treated with the above described method. Both sites were chosen for the east-southwest orientation of their slope, favourable to the survival of seedlings due to a moderate exposure to sunrays.

The soils were significantly affected by the fire,

which damaged the entire upper horizon and left the bare rocky and sandy substrate exposed to the winds and rainfall, thus fostering erosion processes.

Throughout the burnt forests, a large number of dead trees and shrubs remain standing, some with young shoots sprouting from the roots, some completely dead. The former are left untouched, while the latter are used to build the afore-mentioned piles.

In February 2010, the first seedlings were planted to assess the method's effectiveness, in particular as a protection against cattle grazing. Four piles were built and a total of 40 individuals from the following species were planted: ñire (*Nothofagus antarctica*), maitén (*Maytenus boaria*) and cypress (*Austrocedrus chilensis*). This experiment was carried out by volunteers of the park's management team.



Two months later, in mid-April, the piles were controlled and their efficacy against livestock grazing could be confirmed since no single sapling showed signs of deterioration in spite of livestock presence. Of the 40 seedlings, only one died, apparently due to lack of water. The rest was found in good state, with healthy leaves and a satisfactory general turgidity.

These results encouraged the team in charge of the reforestation plan to extend the initial area and involve children of surrounding schools alongside park staff (it should be noted that the seedlings used in this project come from a greenhouse jointly tended by School N°25 and the park administration).

In the next two-day field session, we aim to plant approximately 1000 seedlings. We also intend to engage local residents willing to participate as volunteers, and with whom we hope to plant another 1000 individuals.

Based on these experiences, we plan to repeat the experiment after the winter and then every year at around the same dates in order to cover an increasing area and foster a recurrent activity involving as many volunteers as possible. In conclusion, the goal for 2010 is to plant 2000 native tree seedlings, and to match this number in 2011. With external financial support, this objective could easily be multiplied by one order of magnitude.



5 - Pictures



**Left:** Building a pile  
**Top:** Finished pile  
**Bottom:** Fire prevention talks in schools and some of the firefighters who fought the battle against the 2008 fires

