

Project Update: October 2015

The project schedule includes a period of 18 months, having started in October 2014 and ending in March 2016. Therefore, not all the original objectives have been achieved. This report details the activities carried out to date, the main difficulties we had to overcome to achieve the objectives, the level of achievement of the objectives and the main conclusions that have been generated in the course of these 12 months of work. The final formal report, including financial information, will be shipped on time, in March 2016, when the schedule of proposed activities completed.

(1) Provide conclusive information about the impact of mink on bird populations.

During the period October 2014 – February 2015, we carried out a total of 64 days of fieldwork, visiting a total of eight water bodies belonging to different watersheds, and revisiting each site five times on average (between three and eight times) along that period of time. Field activities to collect data were as follows (in brackets, is reported the sampling effort for such period of work): (i) line transect sampling (111 transects covered per person), to sample the aquatic and terrestrial birds; (ii) territory mapping (36 workdays per person), to assess the impact mechanism of the mink on grebes, ashy-headed goose (*Chloephaga poliocephala*), southern lapwing (*Vanellus chilensis*), red-gartered coot (*Fulica armillata*) and cinclodes; (iii) direct counts (63 counts per person), to compare the temporal tendencies of waterfowl communities and populations in mink infested sites, mink free sites, and the site with removal of minks.

In such activities, we could receive support from volunteers (10 undergraduate and two graduate students from national universities), seven rangers, and local birders (15 from San Martín de Los Andes, and two from Aluminé). Furthermore, three persons belonging to the technical staff of Lanín National Park participate in direct counts (Photos 1 and 2).

With respect to this goal, the only problem that arose was the inability to reliably map the territories of four of the five taxa of birds. Grebes defended large territories with diffuse boundaries. Ashy-headed goose and the cinclodes species showed territorial behavior at first of the breeding season, but during the most of its reproductive period, couples or families were moving without territoriality within large home ranges. Coots were found in large numbers, the majority of individuals did not show territorial behavior during the mapping visits, and chicks were close to one parent. Southern lapwing was the only species that showed territoriality throughout the breeding season, and their territories could be mapped reliably by consecutive chasing. To assign the territories of the other species we should concentrate four to five visits to each site at the beginning of the breeding season, but we have resource limitations; then, to assess the impact mechanism of the mink on these species we will use demographic data provided by line transect sampling.

Preliminary results suggest that waterfowl communities are significantly different in sites without mink, being notoriously depleted in the water bodies infested with minks. On the other

hand, communities and populations of terrestrial birds inhabiting forests not show differences between sites with and without minks.

We have achieved the 75% of this goal.

(2) Identify more vulnerable bird species inhabiting wetlands and forests.

With the preliminary results obtained from the field activities and the dietary analysis of mink (see below under "Other activities"), we conclude: (i) that water birds are more vulnerable than terrestrial birds to the mink's predation, although this predator can also prey on terrestrial ones; (ii) that the most vulnerable species, from the conservation view point, are those that breed in the Andean Patagonia, as the ashy-headed goose, the spectacled duck (*Speculanas specularis*), and the Andean ruddy duck (*Oxyura jamaicensis*); and (iii) that red-gartered coot, grebes and other duck species that breed in other regions, could recolonise the protected area, although the mink would impact on their populations at short term.

We have achieved the 100% of this goal.

(3) Provide knowledge about the impact mechanism mink on bird populations.

With the preliminary results obtained from territory mapping and dietary analysis of mink (see below under "Other activities"), we conclude that the mechanism of impact governing interactions between the invasive alien mink and native birds depends of the bird species: (a) the mink diminishes reproductive success and recruitment of great grebe (*Podiceps major*) and southern lapwing, predating principally chicks and fledglings; and (b) the mink affects all the population of the ashy-headed goose and the red-gartered coot, predating on a great number of adults.

We have achieved the 75% of this goal.

(4) Assess the experimental removal of minks.

With the preliminary results obtained from direct counts, we conclude that removals of mink are inefficient and produce little effect on waterfowl communities and mink population in the site of interest. Based on theory of meta-populations, this can be explained by the fact that this site is connected to other sources of minks by several watercourses, and is receiving continuously immigrant individuals. So, is very important to consider size, connectivity and complexity of a watershed to remove minks in a particular wetland.

We have achieved the 100% of this goal.

(5) Develop and implement a protocol for monitoring birds within temperate forests and wetlands.

To achieve this goal, we assessed advantages and disadvantages of different census techniques applicable to bird monitoring in forests and wetlands: Mackinnon lists, territory mapping, line transects, point counts and direct counts. To assess reliability of each technique we will assess performance of volunteers, rangers and local birders while they apply these techniques in the field, during the period of October 2015 - January 2016.

We have achieved the 50% of this goal.

(6) Develop and implement a protocol for monitoring mink populations in lake coasts and river banks.

To achieve this goal, we assessed advantages and disadvantages of different techniques applicable to monitoring carnivore mammals in riparian habitats: (a) continuous and discontinuous sign survey, based on the detection of scats and footprints along line transects; and (b) common track plate survey, track plate box survey, and track board survey, based on tracking plates on the ground or rafts. We have already evaluated performance of sign survey for mink populations monitoring, but to assess reliability for track plate surveys, we will employ this technique during the period December 2015 - February 2016.

We have achieved the 50% of this goal.

(7) Train rangers, technicians and other province and national government staff and local birdwatchers about regional conservation problems and monitoring techniques.

Since March 2015 to April 2015, we design a training workshop in collaboration with biologists working in research, conservation and management of wildlife in Andean Patagonia: PhD Gerardo Cerón (National University of Comahue), who investigate and conserve the torrent duck (*Merganetta armata*); PhD Javier Sanguinetti (Lanín National Park), who investigate and manage alien invasive mammals in northwestern Patagonia; PhD Martín Monteverde (Applied Ecology Center of Neuquén), who investigate carnivores in northwestern Patagonia; and Alejandro Valenzuela (National Park Administration), who investigate and manage alien invasive mammals in southwestern Patagonia.

Because most of the recipients from Aluminé village could not attend the workshop in San Martín de Los Andes (SMA), and vice versa, we decided to do the same workshop in the two towns.

We were going to perform the workshop in SMA for late April 2015, having gathered more than 40 participants. However, we had to suspend planned activities due to the consequences of the

Calbuco volcano eruption (Chile). Then, we will conduct the workshop in SMA in late October 2015, and we have already started the call for participants.

In early May 2015, together with Monteverde and Sanguinetti, we offered the training workshop in the village of Aluminé. We have the participation of nearly 30 people, including between them local birders, rangers and tourist guides. Most participants made an evaluation that will guide us in the development of a realistic and feasible protocol of monitoring for to be implemented in the future by different social actors in the region.

We have achieved the 75% of this goal.

(8) Generate brochures for stakeholders to raise awareness on the mink threat to native birds.

We have designed all the images and selected all the information needed to generate the posters and leaflets. We will draft, design and print these materials during October - December 2015 (Photo 3).

We have achieved the 50% of this goal.

(9) Develop and implement guidelines for selecting appropriate and priority sites for the elimination of mink and conservation of biodiversity, depending on the criteria used in a hierarchical manner.

We have selected the principal criteria which will be used to apply in a hierarchical way with the help of the GIS specialist. This is the less worked objective; nevertheless, we have advanced in extend the control of minks to other watersheds: the logistic complications arising after Calbuco volcano eruption have prevented that we execute the first campaign of mink control in the Queñi lake during late May 2015.

We have achieved the 25% of this goal.

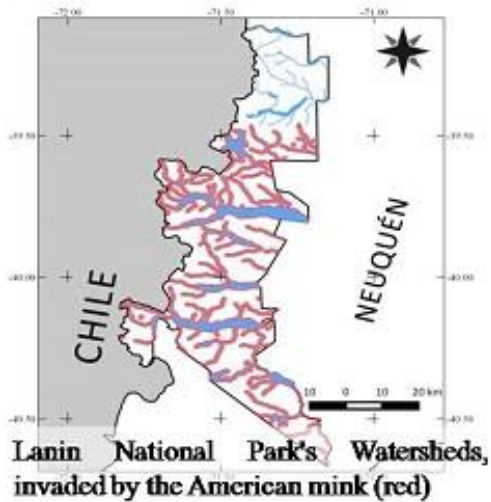
(10) Other activities

(a) Study of mink diet through the faeces analysis. We have complemented our field activities with mink faeces analysis in the laboratory. This activity has provided to us valuable information about: (a) the more vulnerable bird species to the predation by mink; and (b) the mechanism of mink impact on native birds.

(b) Informative talks about the life history of the mink. We have complemented our dissemination tasks about the mink problematics with (a) two informative talks open to the public (one in the San Martín de Los Andes village, and another in Aluminé village); and (b) a series of interviews with local and provincial radios.



Left: Four volunteers observing for the first time footprints of American Mink, in a shoreline of the Lake Queñi (Lanín National Park). Right: Navigating the Lake Tromen on touring kayak, together with a Lanín National Park ranger. Our goal is to arrive to Tromen's coasts nearly of the Huaca Mamuil lagoon, and once there conduct bird census.



American mink and Coypu swimming



Lesser grison in marching



Some of the generated images for brochures. Maps and drawings of American Mink, and two native mammals that local people and tourists confound with minks: the Coypu and the Lesser Grison. The latter brings with it problems of wildlife management and of protection for native biodiversity.