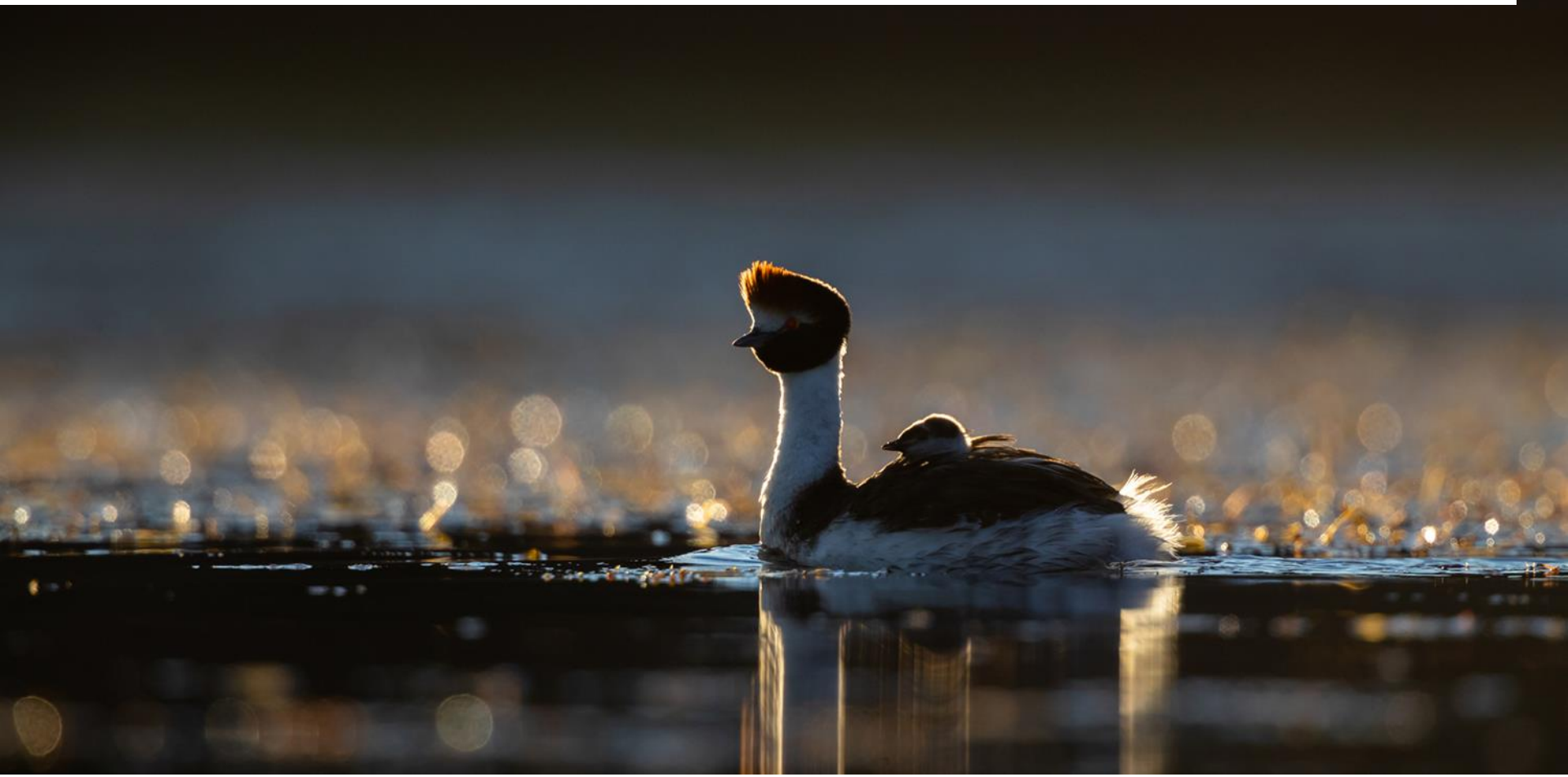
Reducing the acute impacts of American mink on rural livelihoods and biodiversity in Chilean and Argentinian Patagonia: the international reach of efforts piloted in Scotland



Xavier Lambin
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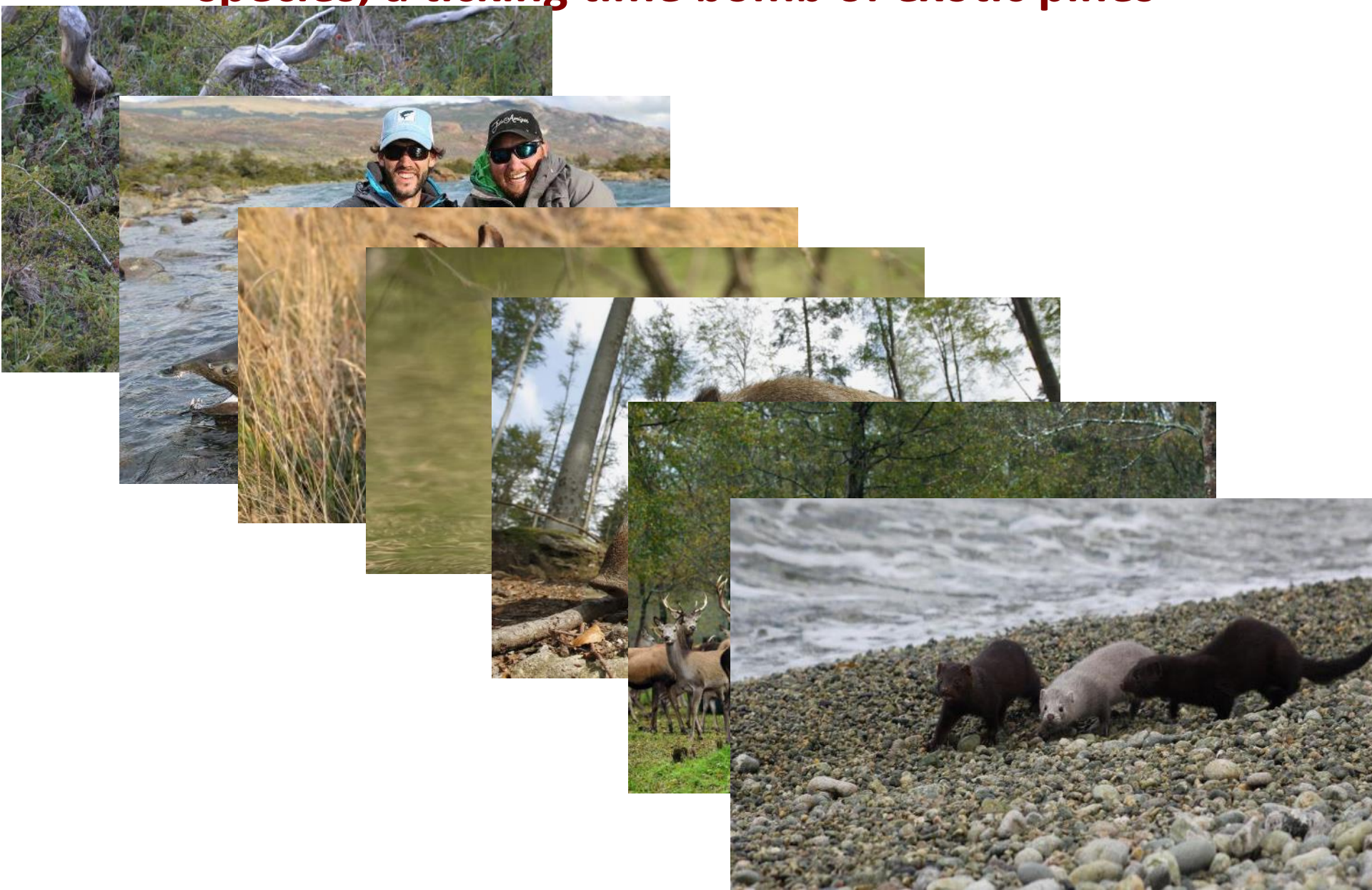
UNIVERSITY OF ABERDEEN

Heavily invaded South America: e.g. 24 vertebrates species, a ticking time bomb of exotic pines



Patagonia: the same sad tale of invasion and destruction by American mink

Project CONTAIN: Optimising the long-term management of invasive species affecting biodiversity and the rural economy using adaptive management

NERC SCIENCE OF THE ENVIRONMENT · CONICET · FAPESP · CONICYT · CONCYTEC

Newton Fund Latin American Biodiversity Programme
Phase II: Biodiversity – ecosystem services for sustainable development

Lambin X, et al (2020) NeoBiota 59: 119–138

An international team and common vision

Understanding ecology of invasive species, the economic cost of action (and inaction) **and** the motivation of people affected can help design management action that makes invasive species tolerable

CONTAIN
PROTECTING BIODIVERSITY AND LIVELIHOODS

Participants

Funders

“Mink on the moon” threatening critically endangered Patagonian grebe

PROYECTO MACÁ TOBIANO

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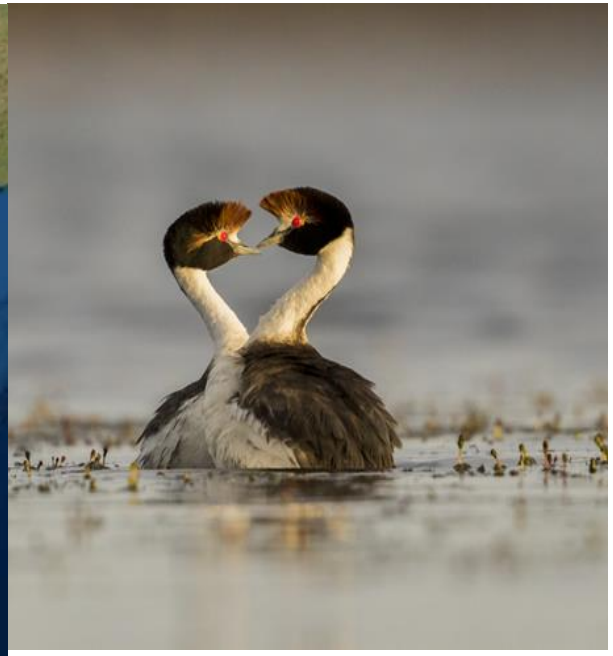


PROYECTO MACÁ TOBIANO

... Cold windy desert


Vast landscape

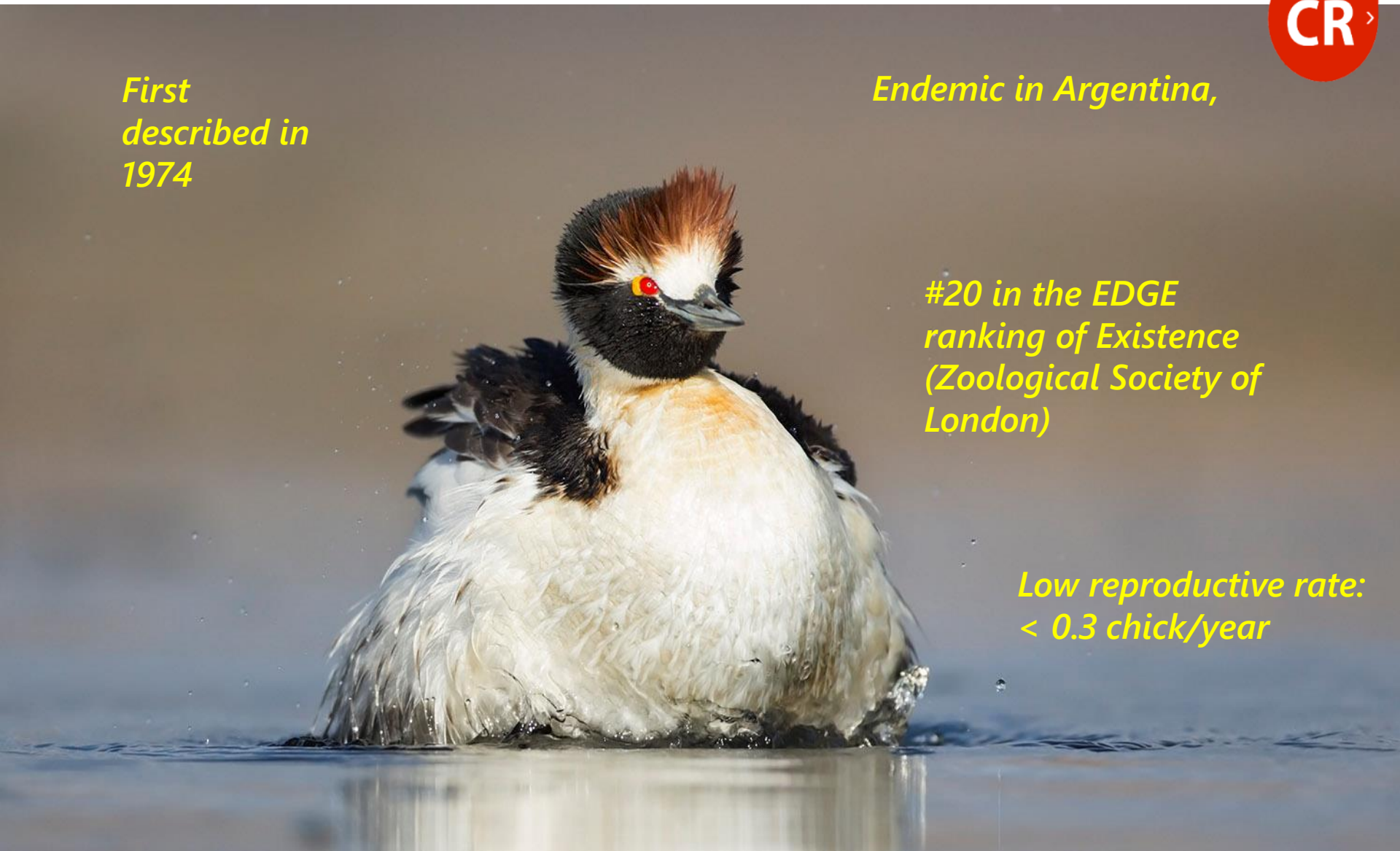
Mesetas and steppes

Mink on the moon

Nesting habitat of critically endangered Patagonian grebes **Macá tobiano**

Macá Tobiano *Podiceps gallardoi*

CR



First described in 1974

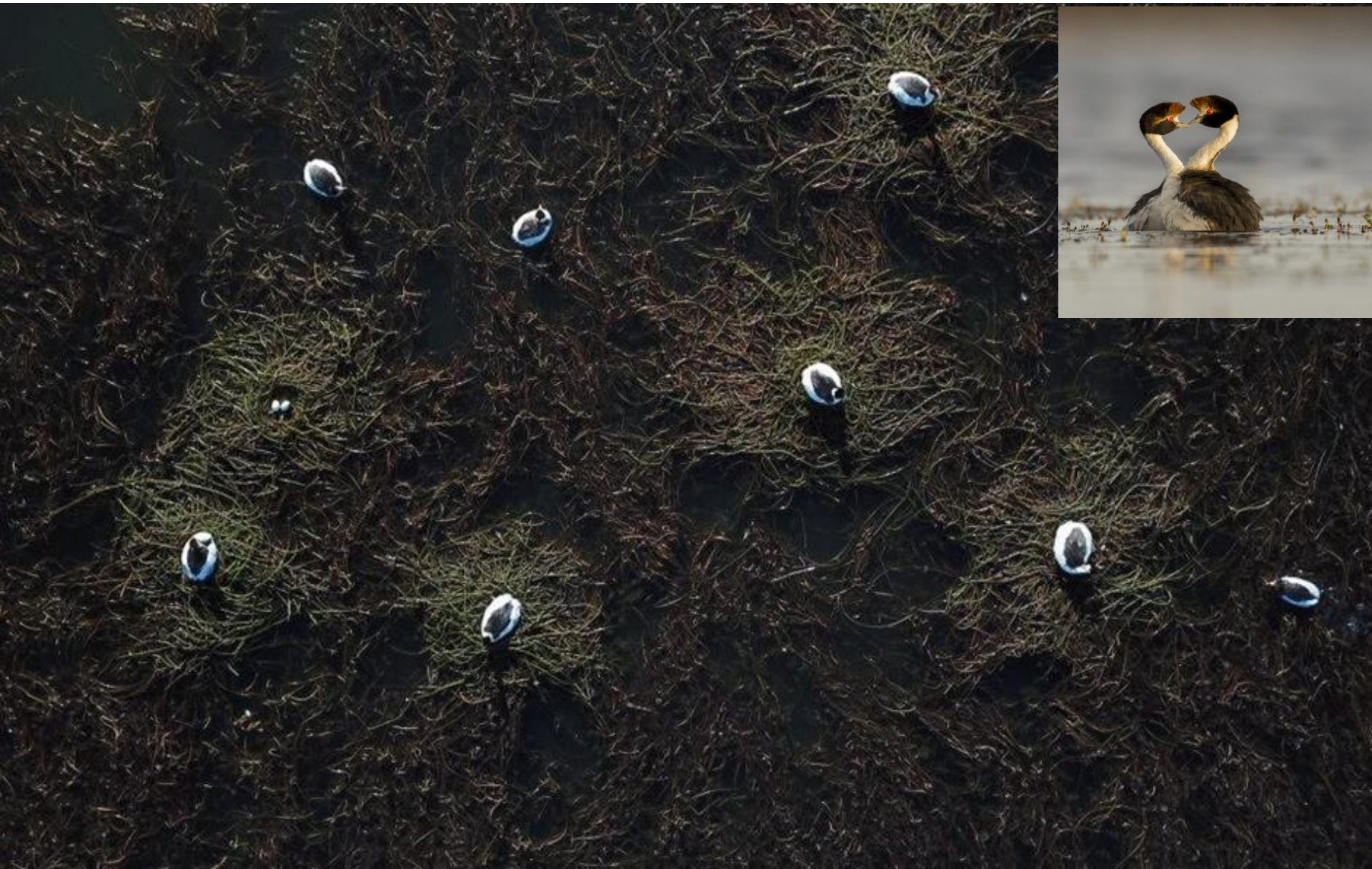
Endemic in Argentina,

#20 in the EDGE ranking of Existence (Zoological Society of London)

Low reproductive rate: < 0.3 chick/year

Lagunas on wind-swept plateaux (mesetas)

The worst-case scenario: critically endangered, Argentina endemic Patagonian grebes killed by dispersing mink



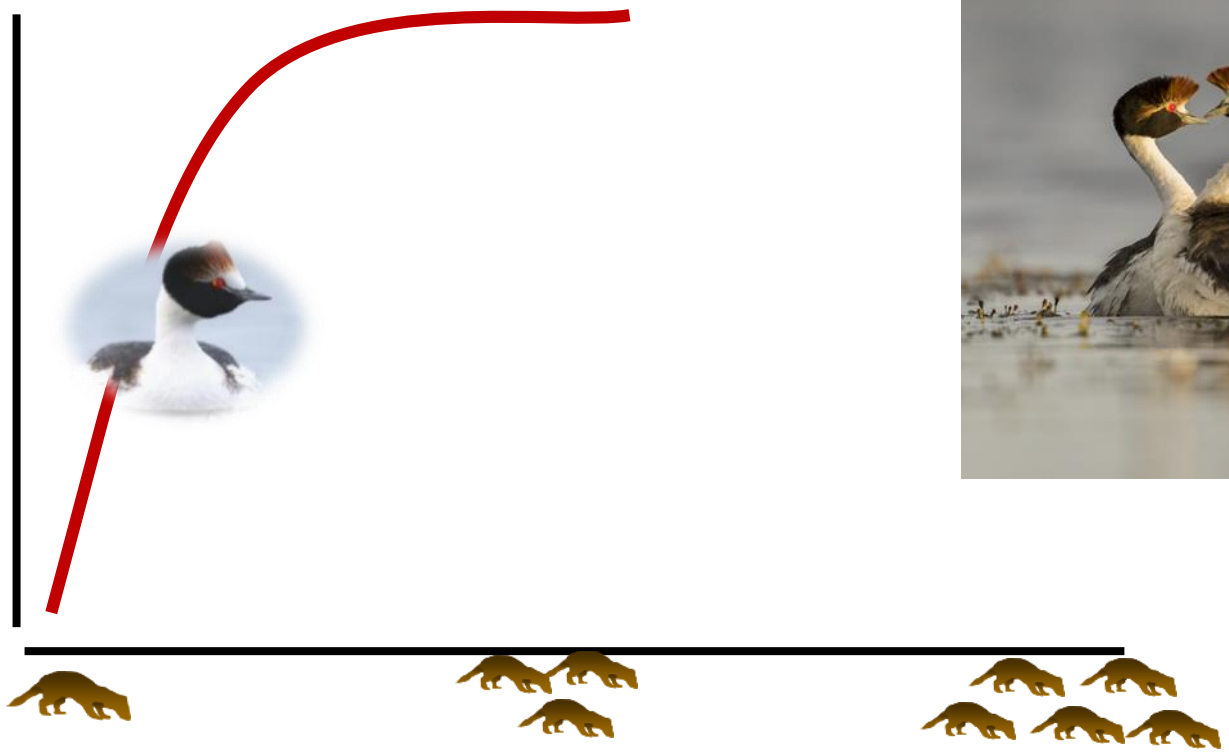
Extreme impact: critically endangered, Argentina endemic Patagonian grebes killed by dispersing mink

One American mink killed 33 nesting adults (Roesler et al. 2012).

Extreme impact: critically endangered, Argentina endemic Patagonian grebes killed by dispersing mink

One American mink killed 33 nesting adults (Roesler et al. 2012).

Extreme impact: one (dispersing) mink is too many mink



Steep abundance–impact relationship

Huge control effort: ~25 dispersing mink intercepted mink each year

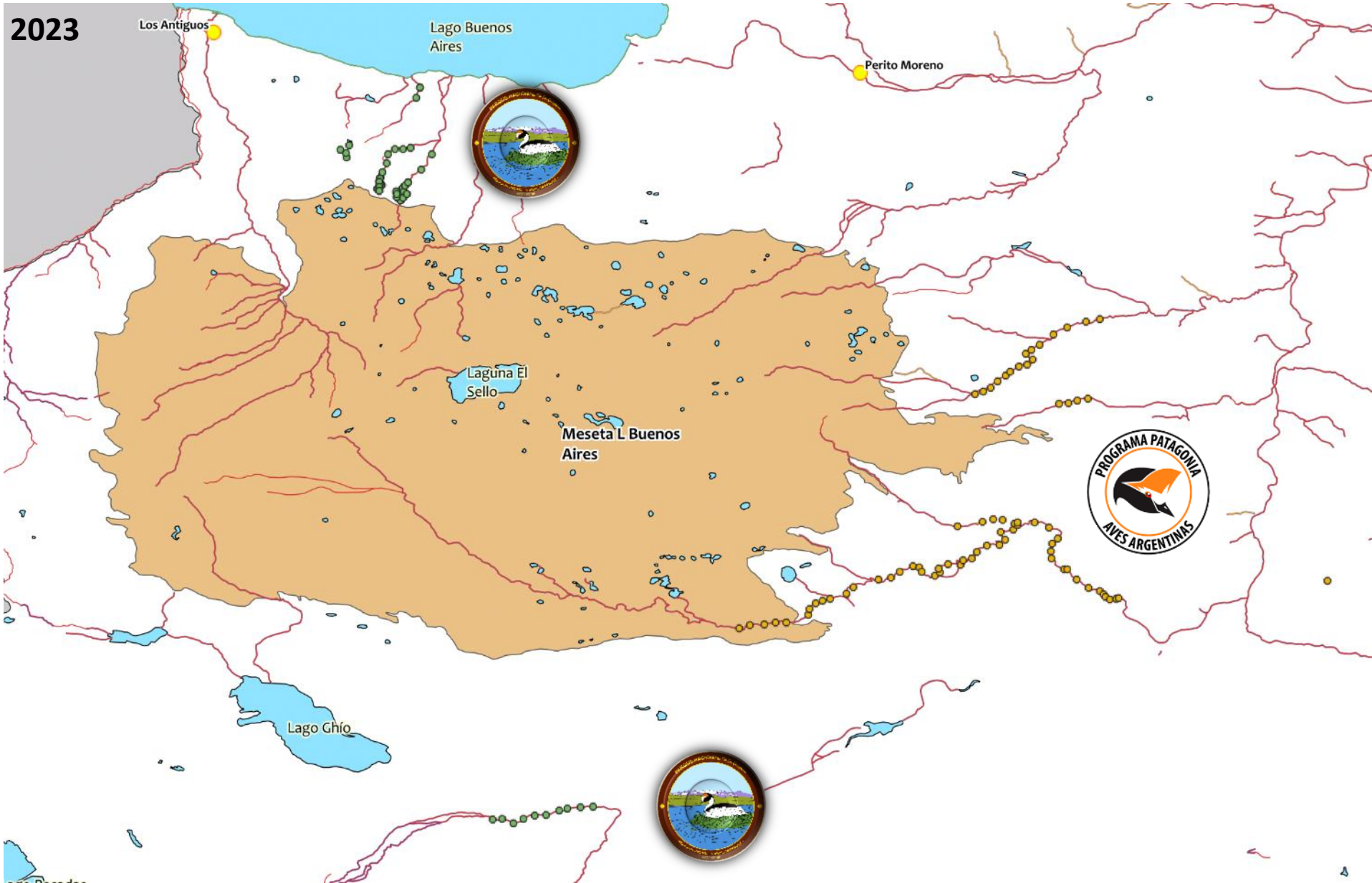
Super woman Lali Fasola

Hugely committed Kini Roesler

…but they keep coming back

Lessons 1. from Patagonia: American mink colonised and impact extreme environments, vastly harsher than the Cairngorms plateau

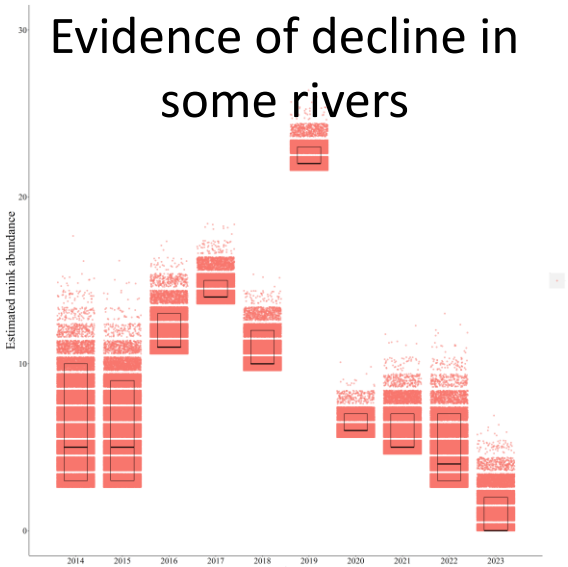
Protecting Meseta (7 hours bumpy ride to cross 50 km) from dispersing mink



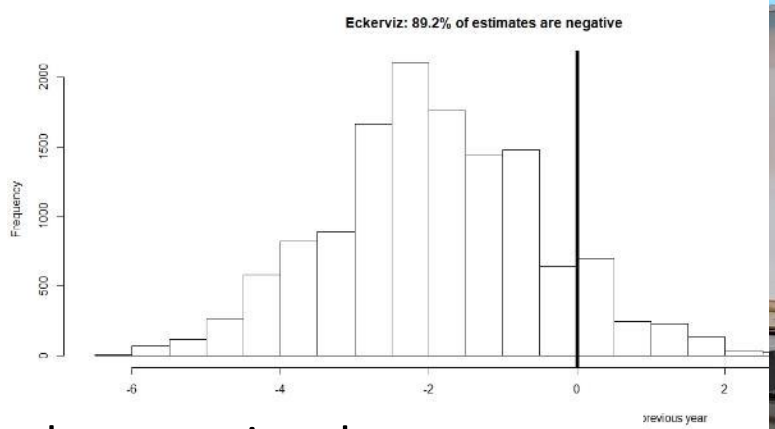
Lessons 2. from Patagonia: Data in gathered "scientifically", “ready for analysis” and adaptive impact-based management

CONTAIN's contribution: applying state of the art statistical removal models to quantify the impact of management on mink populations

Evidence of decline in some rivers

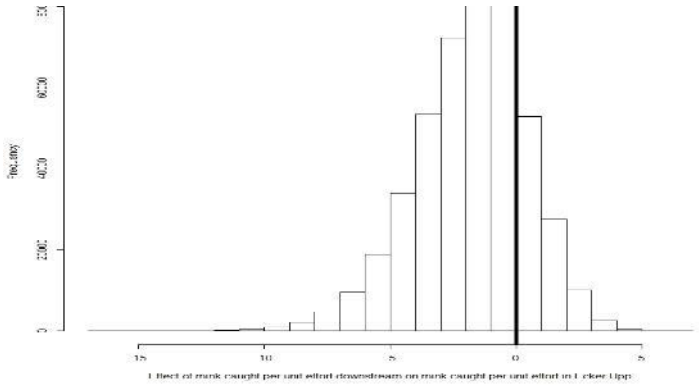


Evidence that trapping reduce subsequent density in some rivers



Talented Pablo Garcia-Diaz

Evidence that trapping downstream reduces impact upstream (mesetas)



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PROTECTING BIODIVERSITY AND LIVELIHOODS

Crossing the Andes, **Communitary mink control to protect rural livelihoods** Región de Los Ríos, Chile

FNDR CONTROL COMUNITARIO DEL VISON

CONTAIN

PROTECTING BIODIVERSITY AND LIVELIHOODS

Los Rios region of Chile: green, lush, farmed, full of rivers and mink

Los Rios region of Chile: full of rivers and mink

Los Rios region of Chile: full of rivers and mink and diverse prey species

Los Rios region of Chile: remote indigenous communities, reliant on natural resources

Los Rios region of Chile: giant alerces trees, Andean rivers

Cangregos
“mink jellybeans

Trapping by campesinos removed a staggering 10,746 mink in 8 years. 1,200-2,500 mink/year

Small holding farmers, and citizen conservationists losing poultry operate cage traps supported by project staff … and are paid a cash bounty

SAG
Ministerio de Agricultura
Gobierno de Chile

FNDR CONTROL COMUNITARIO DEL VISON

A community-based project removed 10,746 mink from 11,000 km^2 in 8 years

FNDR CONTROL

Lessons 3. from Patagonia: abundant native, lizards, rodents) and introduced **alternative preys** (carps, salmonids, visiting researchers) may lead to huge densities

lizards

Jellybean for mink crayfish

visiting researchers

CONTAIN's contribution: quantify trapping effort and volunteer retention with **state-of-the-art statistical models**

Little evidence of reduction in HUGE mink population size but …

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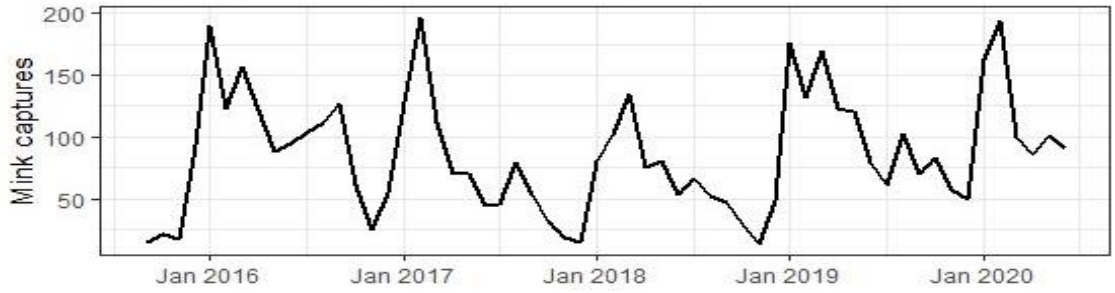
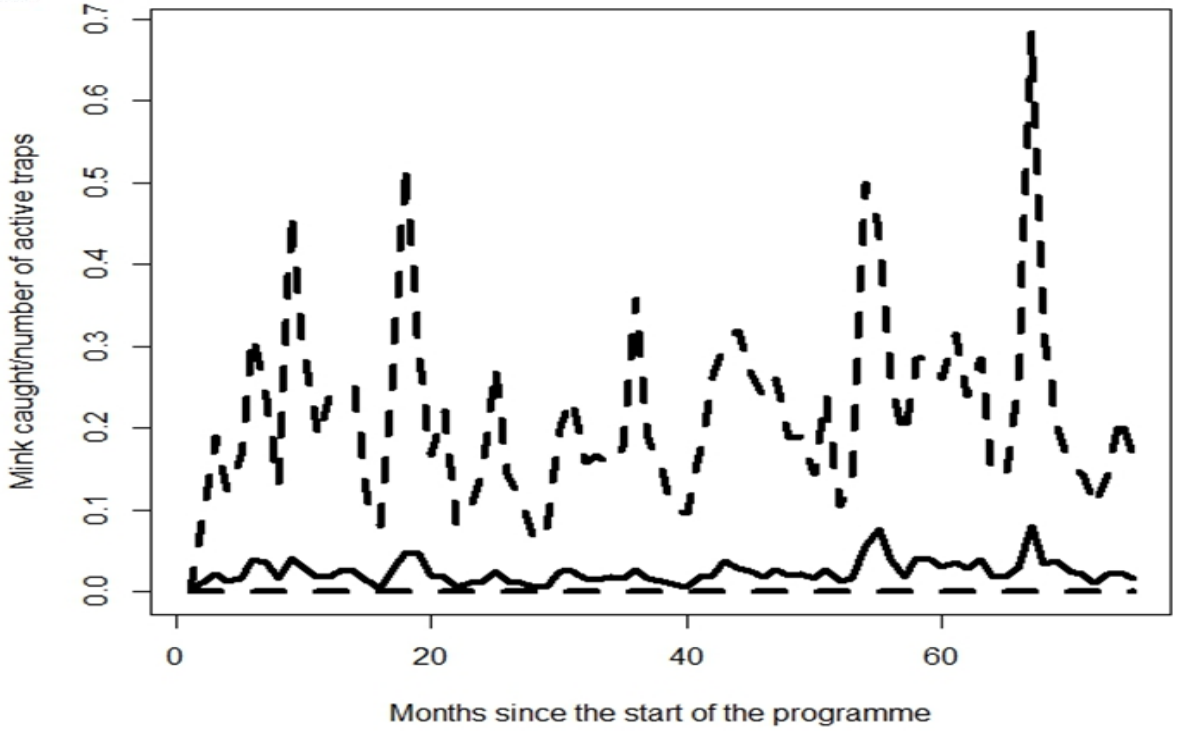
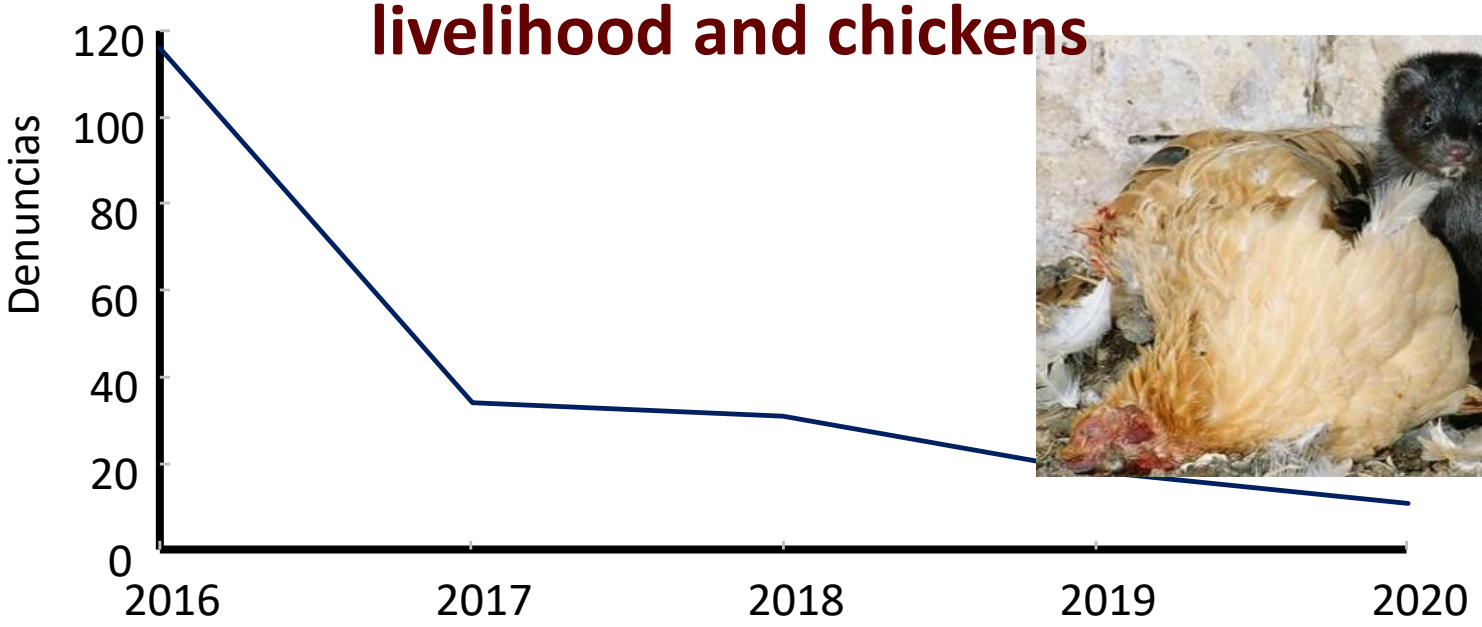
PROTECTING BIODIVERSITY AND LIVELIHOODS





Talented Pablo Garcia-Diaz

But control reduced perceived mink impact on farmer's livelihood and chickens



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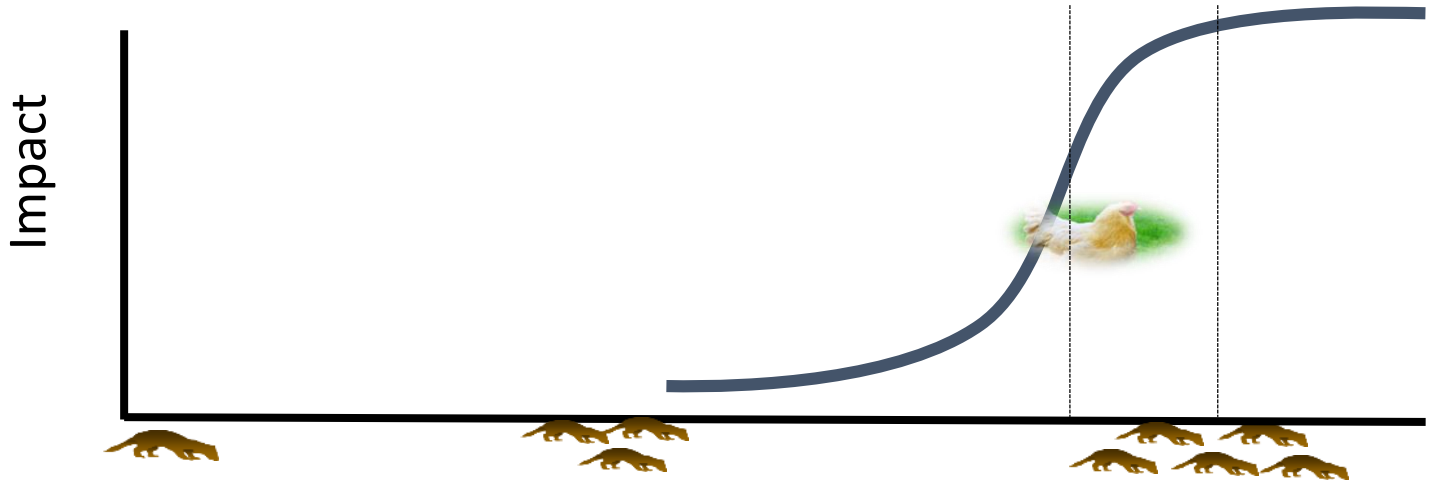
Shallow abundance–impact relationship



Lessons 4. from Patagonia: Socio-economic impact as motivation: commercial/individual aviculture protection

People have

- sense of belonging to project by operating traps in their households
- sense of being listened to by governmental agencies and authorities
- sense of protection and autonomy against threats

Lessons 5. from Patagonia: Socio-economic impact as motivation: commercial/individual aviculture protection

Wide citizen participation (more than farmers), unprecedented in Latin America contributes to targeting effort to high impact areas and sustainability

Success breeds success, new funding to expand to adjacent provinces .. As mink spreads northward

Open question: What are ecological gains as by-product on wetland birds/mammals?


FUTURE…