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FacultySummit 2011

Cartagena, Colombia | May 18-20 | In partnership with COLCIENCIAS

Live ANDES (Advanced Network for Distributions of Endangered Species): A New Tool for Wildlife Conservation

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Fauna Australis Research Lab

Biodiversity (Flora and Fauna) is a key asset in the Andean region of South America.
Wildlife Conservation aims to protect biodiversity for future generations.

Fauna Australis Research Lab (www.fauna-australis.puc.cl)

FAUNA AUSTRALIS
Wildlife Conservation

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ENTRADAS RECIENTES
- Investigación Fauna Australis en la Araucanía
- FAO publica trabajo: Grupo de Especialistas en Camélidos Sudamericanos
- UICN Newsletter 2011 (Abril)
- Libro sobre Biodiversidad y Cambio Climático
- Investigación y educación de los perros en ambientes naturales

Investigación Fauna Australis en la Araucanía

mayo 4th, 2011 Fauna-Australis

La estación experimental Fauna Australis de la Araucanía se ubica en la zona de Pichares, junto al Kodkod lugar de encuentros.

Director: Sr. Jerry Laker Agr., MSc.

Equipo de investigadores: Cristián Bonacic, Jerry Laker, Nicolás Gálvez (Ing Agr, MSc); Felipe Hernández (MV, MSc), Alberto Dittborn (Profesor de Diseño)

Postdoctorado: Elke Schuttler (Marie Curie)

Candidato a Doctor: Tomás Altamirano

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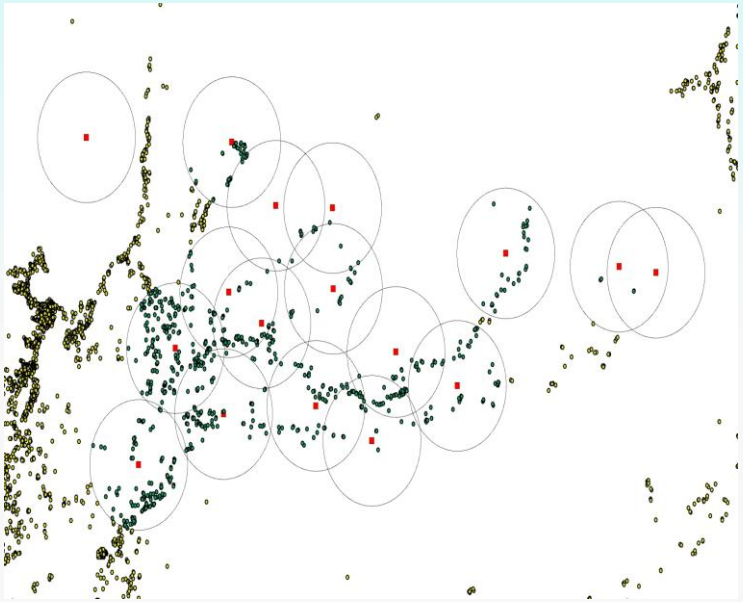
Fauna Australis Research Lab

- Studying wildlife with advanced field techniques
- Spatial analysis and modeling
- Considering natural and social background at a landscape scale

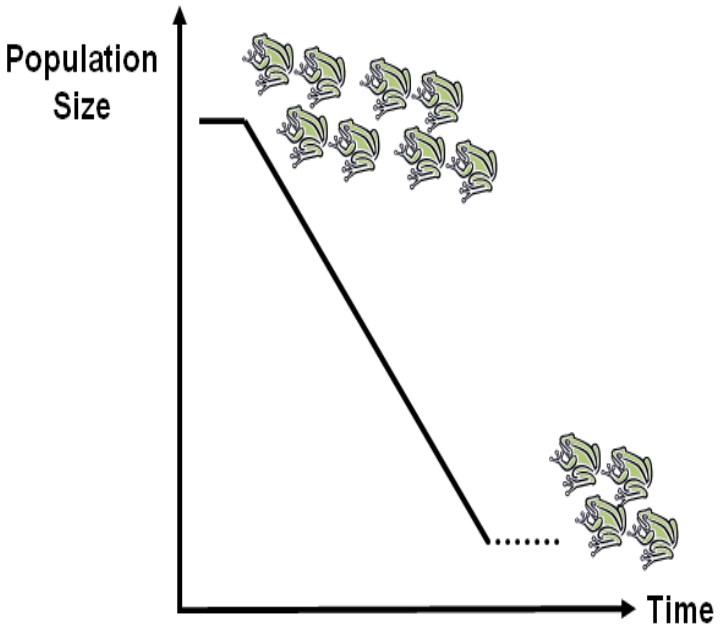


Why data sharing for endangered species is needed?

Extinction Risk

- There are more than 18,000 species threatened
- Many remain unclassified

(IUCN Red List)



IUCN – Red List of Threatened Species

International Union for Conservation of Nature and Natural Resources

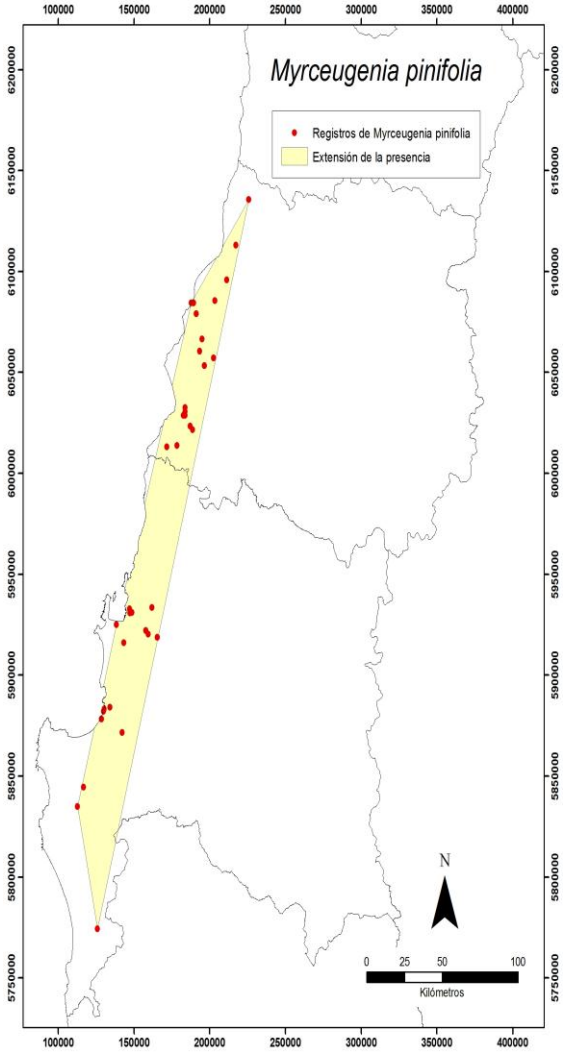
- Species classification for evaluation of extinction risk
- Monitoring the state of change of biodiversity
- Provide a global context for the establishment of conservation priorities at the local level

IUCN – Red List of Threatened Species

Species monitoring requires updated information about species distribution

Species presence records and mapping are increasingly important for IUCN classification

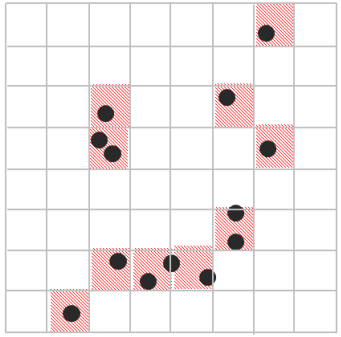
(IUCN workshop in Santo Domingo, Dominican Republic, January 2011)



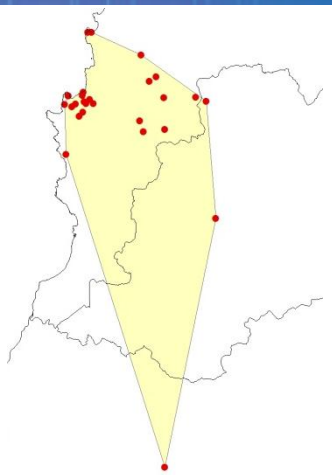
IUCN – Red List of Threatened Species

IUCN – Red List of Threatened Species: criteria

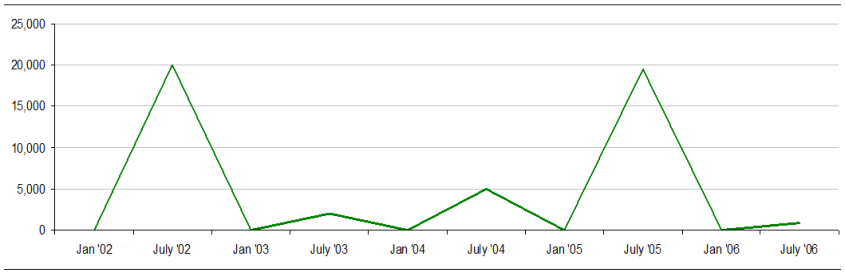
Occupancy area



Extend of ocurrence



Location

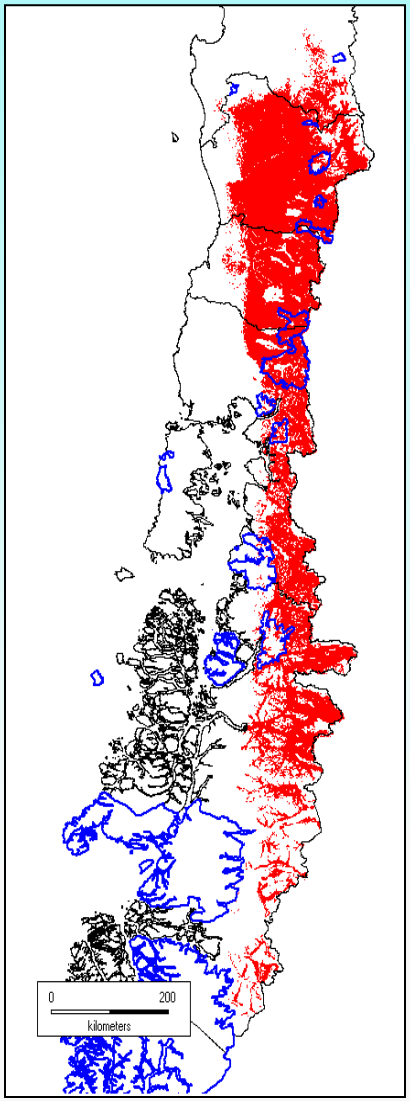


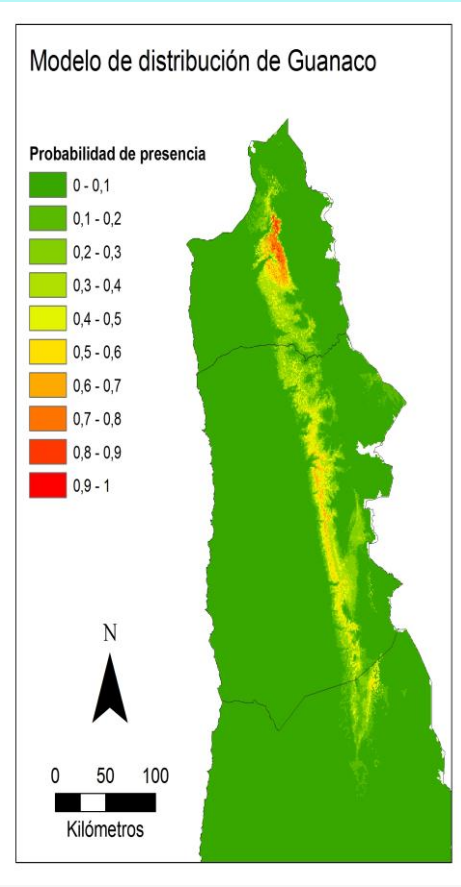
Extreme fluctuations

Species Distribution Models

Modeling from species presence records

Key data for mapping distribution of endangered species: Sightings





The problem: Wildlife Data Challenges in Latin America

We are facing an era of data-intensive science (Jim Gray's 4th paradigm of scientific exploration), but…

- Wildlife species are not easy to detect (data generation challenge)
- Poor technological training (knowledge challenge)
- Institutions are not coordinated (data sharing challenge)

Data Generation Challenge

- We still know little about many endangered species
- Many animals are not easy to detect (cryptic behavior, low population density, inaccessible habitats)
- Extensive surveys and adequate equipment are expensive

Knowledge Challenge

- Government officers lack of technology and skills to upload data
- There are training and language barriers to use available computational tools (e.g. GIS, computational models)

Data Sharing Challenge

- Government agencies have little experience sharing wildlife data and sometimes run parallel database systems for the same topic
- Sharing protocols are absent
- Cloud computing is almost none
- Many useful studies end up stored in papers or emails without being utilized
- Citizen science is not included into the valuable data for wildlife recording.

Wildlife Digital Databases – Georeferenced Data

Digital collections from museums, universities and other institutions

Citizen-science portal; online check-list for bird-watchers, data for scientists

http://ebird.org

Wildlife Digital Databases – Georeferenced Data

Bias in wildlife datasets for some species and countries

Common name	Scientific name	GBIF records	GBIF georeferenced records*	Arctos records	Arctos georeferenced records*	MaNIS, HerpNET records*
Ranita de Darwin	*Rhinoderma darwinii*	903	**13**	10	**7**	**13 (5)**
Gato Güiña	*Leopardus guigna*	31	**16**	0	**0**	**19 (13)**
Gato Colo Colo	*Leopardus colocolo*	2	**0**	0	**0**	**5**
Pudu	*Pudu pudu*	47	**27**	6	**3**	**27**
Comadrejita trompuda	*Rhyncholestes raphanurus*	36	**35**	1	**1**	**35**

* Many records are from the same localities. Records in parenthesis represent different localities.

Global database programs are not really useful at regional scale

Live ANDES: Advanced Network for Distributions of Endangered Species

Web Portal for uploading, visualize, and download wildlife species presence records

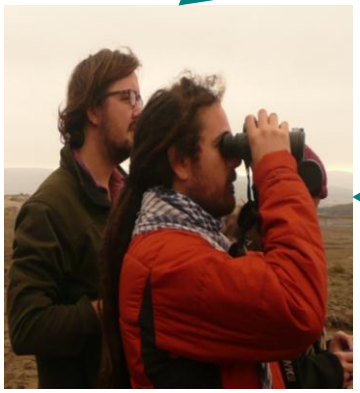
Aimed at improving wildlife knowledge and conservation

Promoting data sharing among citizens, scientists and government agencies

Live ANDES: Advanced Network for Distributions of Endangered Species

Observing endangered species is not always possible: One single sighting may provide key information

Scientists access to more data for analyses and can share results with policy makers



Citizen science

Citizens learn about wildlife and gather data for research and management

Officials and policy makers can manage their data, share it among them and have feedbacks with the scientific community

Live ANDES – Web Portal

Inicio | Mi Portal | Explorar Avistamientos | Ingresar Avistamientos | Enlaces | Acerca de

Bienvenidos a LiveANDES

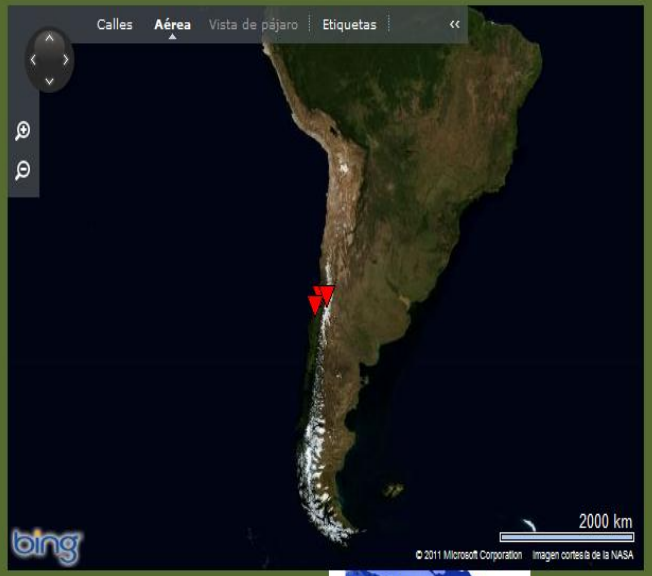
Live ANDES es un portal que permite compartir y visualizar registros espaciales de vida silvestre.

El objetivo de **Live ANDES** es aportar al conocimiento y conservación de las especies, promoviendo la observación e intercambio de registros de presencia.

En el contexto de ciencia-ciudadana, cualquier persona puede ingresar un avistamiento, que será de gran utilidad para científicos y organismos públicos y privados preocupados de la conservación y manejo de vida silvestre. Por otro lado, los usuarios pueden aprender más sobre la distribución de especies, organizar sus avistamientos y a portar a la conservación.

Live ANDES es un proyecto del Laboratorio Fauna Australis, de la Pontificia Universidad Católica de Chile, con el apoyo de Microsoft Research a través de Laccir (Latin American and Caribbean Collaborative ICT Research Federation).

Especie de muestra: Perdiz chilena - Nothoprocta perdicaria



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Live ANDES – Main Features

Data Exploration

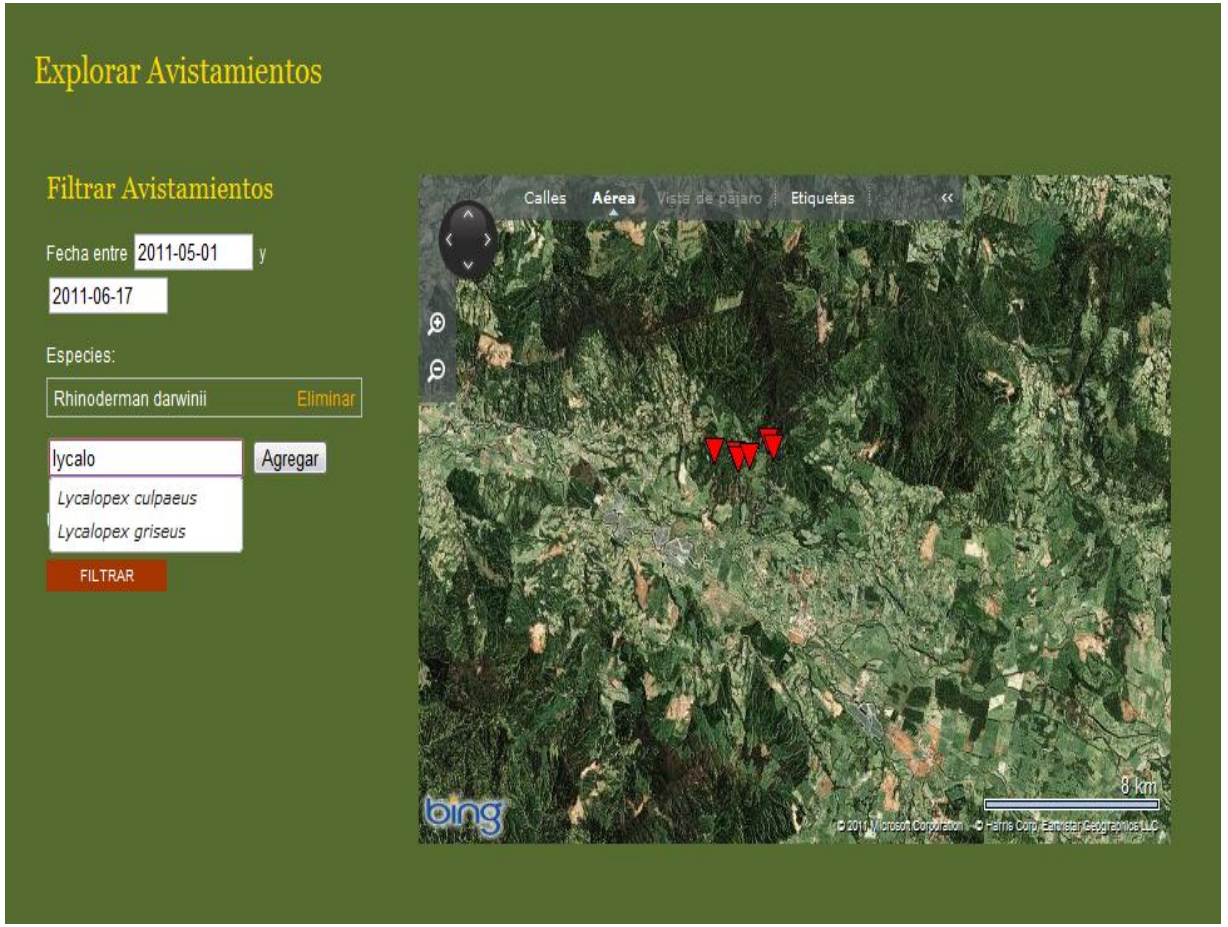
Geo-referenced records of observed species

Live ANDES – Data Exploration

Exploration by date and species

Valid scientific names of Chilean terrestrial vertebrates

Visualization in Bing Maps



Valid name of all species

Table visualization (more fields, more data)

Download formats: *.xlsx, *.csv, *.kmz, *.shp

Live ANDES – Data Upload

Direct observation, audio, camera trapping
Indirect signs; footprints, scat
Reported in a publication or interview

Data upload

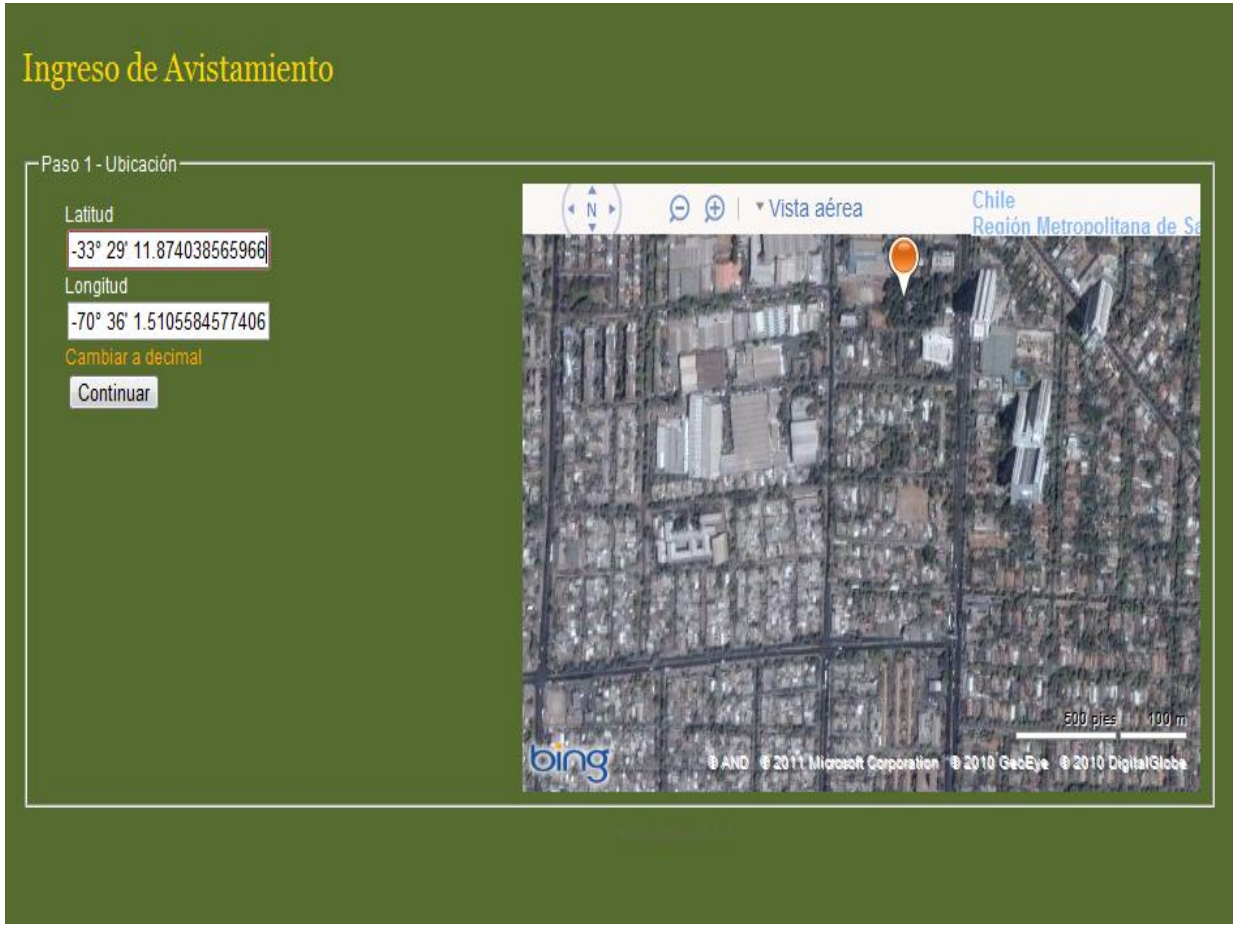
Individual records
List of records in table format

Live ANDES – Data Upload

Geographic coordinates
or
Map search

Improvement of Map Labels

Location Finder



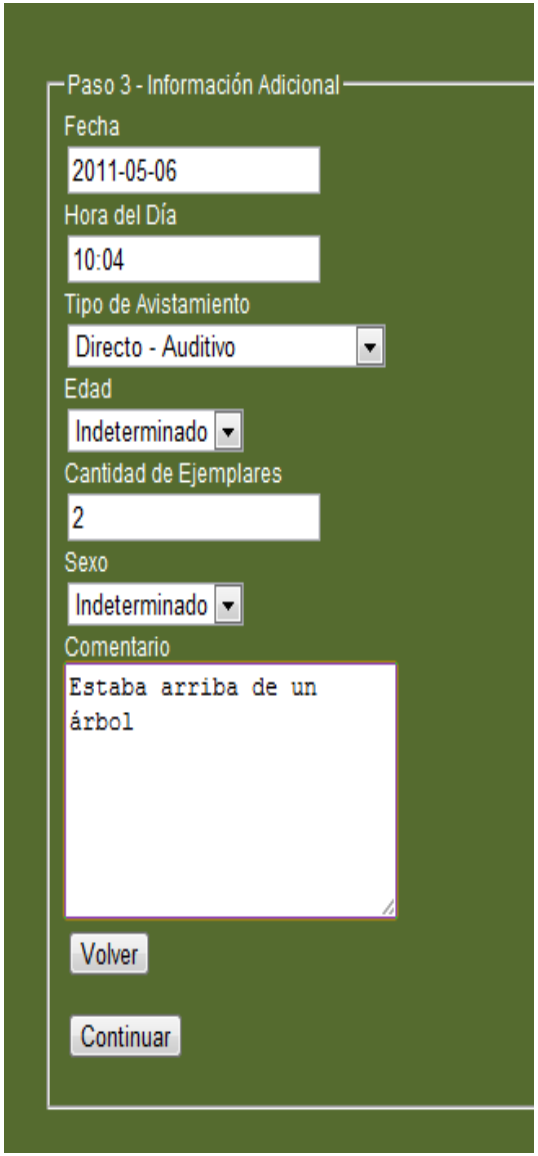
Live ANDES – Data Upload

Species selection from reference list

Option of uploading record picture

Additional information, required and optional

Reporting more than one species for the same location



Live ANDES – Data Upload

Batch upload in CSV table

Live ANDES – The future

Mounting extant biodiversity database

Coordinating with Government agencies, scientists, eco-tourist guides, park-rangers

Training about Live Andes & assembling a team of experts to validate information

Programming simple tools for data analyses in order to comply with IUCN Red List criteria for all species

Optimise Live Andes for connectivity with other tools

Extending Live Andes beyond Chile to the conservation community in Perú, Bolivia, Ecuador, Colombia

Live ANDES Team

Principal investigator
Dr. Cristian Bonacic

Project Coordinator
- Robert Petitpas

Coordination assistant
- Catalina Zumaeta

GIS and Remote Sensing
- Professor Marcelo Miranda

Software Development
Dr.Andrés Neyem

Software Development Coach
- Alfredo Bolt

Developers (Lycalopex team)
- Christian Anguita
- Juan Pablo Cornejo
- Virginia Opazo
- Guillermo Portilla
- Guillermo Robles
- Arturo Tagle
- Raúl Undurraga

Bonacic, Neyem, Petitpas (PUC)

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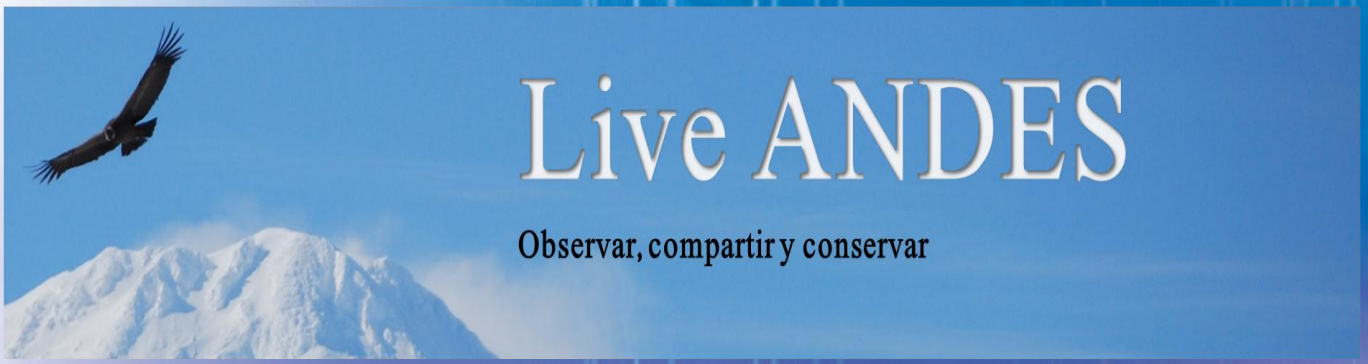

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