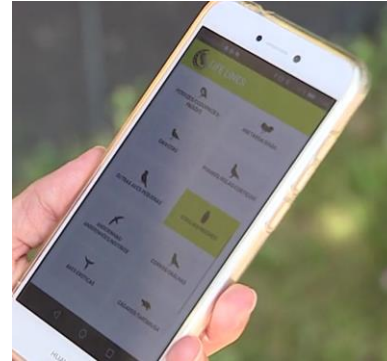


IP's participation in LIFE LINES: Reducing Fauna Roadkills and Defragmenting Habitats



Graça Garcia



1. Introduction

2. Actions of the project (IP)

- actions to prevent roadkills
- national roadkill database
- mobile application to record animal roadkills
- road verges management and control of invasive vegetation
- volunteering and public awareness events

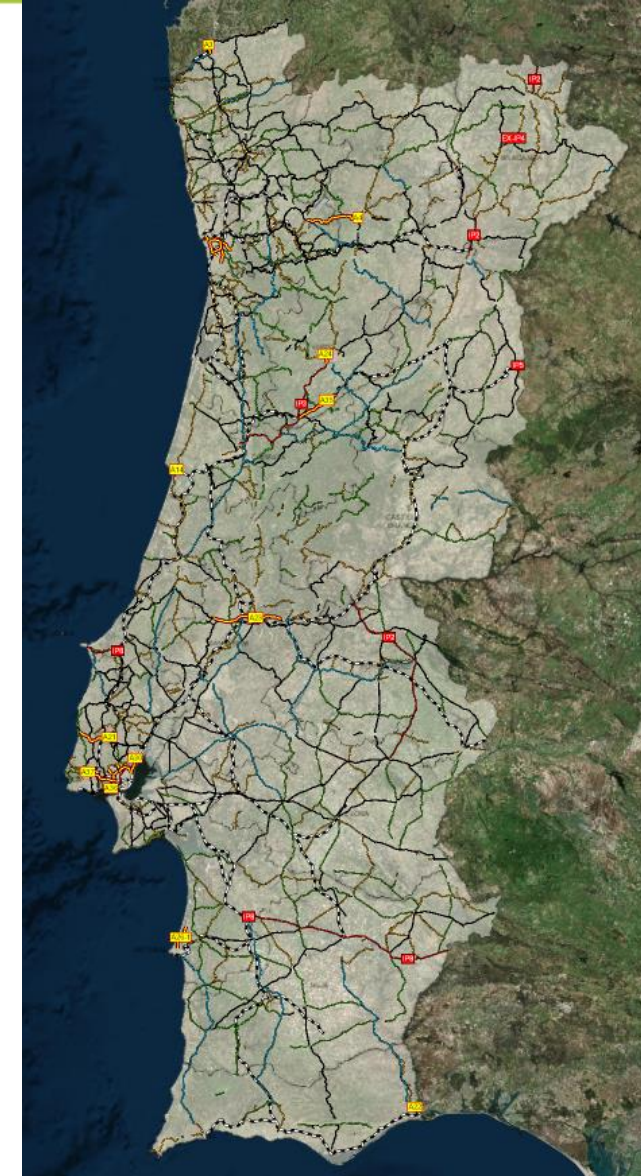
3. Final Considerations



Infraestruturas de Portugal (IP) is the Portuguese public company holding a long-term concession contract of the national road and rail infrastructures in Portugal.

IP manages around 14,000 km of roads and over 2,500 km of railways, providing a public service in areas such as funding, maintenance, operation and development of the Road and Rail Networks.

Environmental sustainability is one important goal of IP and is incorporated in IP's procedures.

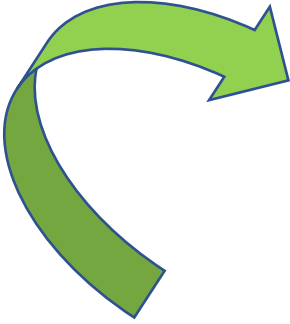


IP is one of the partners of **LIFE LINES - Linear Infrastructure Networks with Ecological Solutions**, and is responsible for the implementation of several actions at the project area:

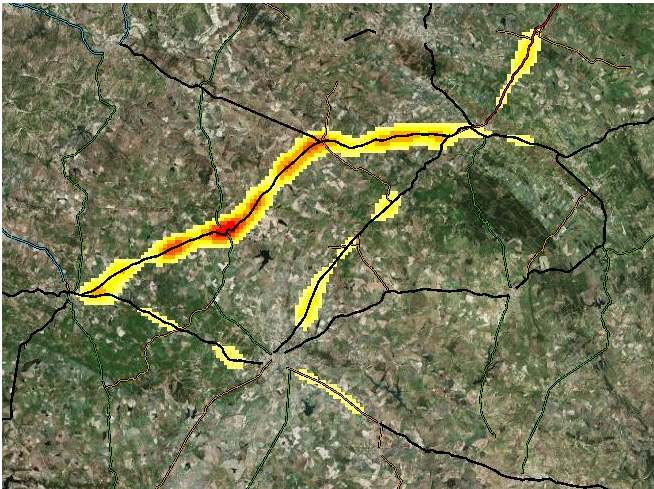
- mitigation of roadkills and increase of landscape connectivity
- Improvement of the vegetation along the road and control of invasive species
- volunteering activities, promoting environmental awareness and active participation, with collaborators and relatives



✓ Dry Ledges in culverts



Spots of higher levels of mortality



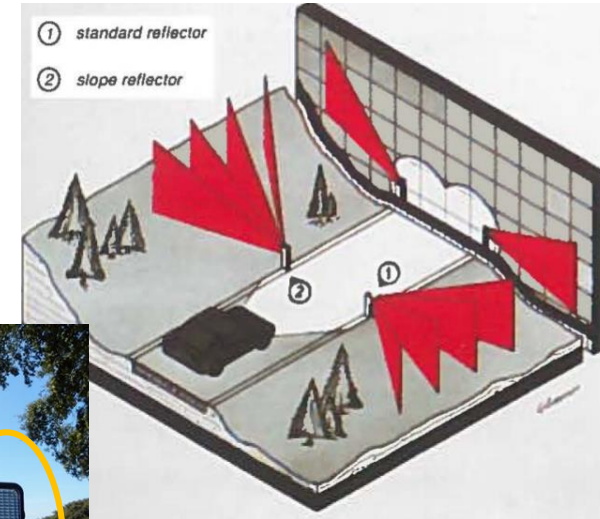
- ✓ Fences guiding the animals to underpasses
- ✓ Fences with additional small mesh net placed in "L" shape



- ✓ Barriers for amphibians, guiding them to adapted culverts
- ✓ Road sign specific for amphibians



- ✓ Barriers for raising the flight of birds
- ✓ Reflectors for light deflection of headlights to produce a warning effect in owls



✓ Tight mesh metal nets on the slopes to prevent their colonization by rabbits



IP

Évora University

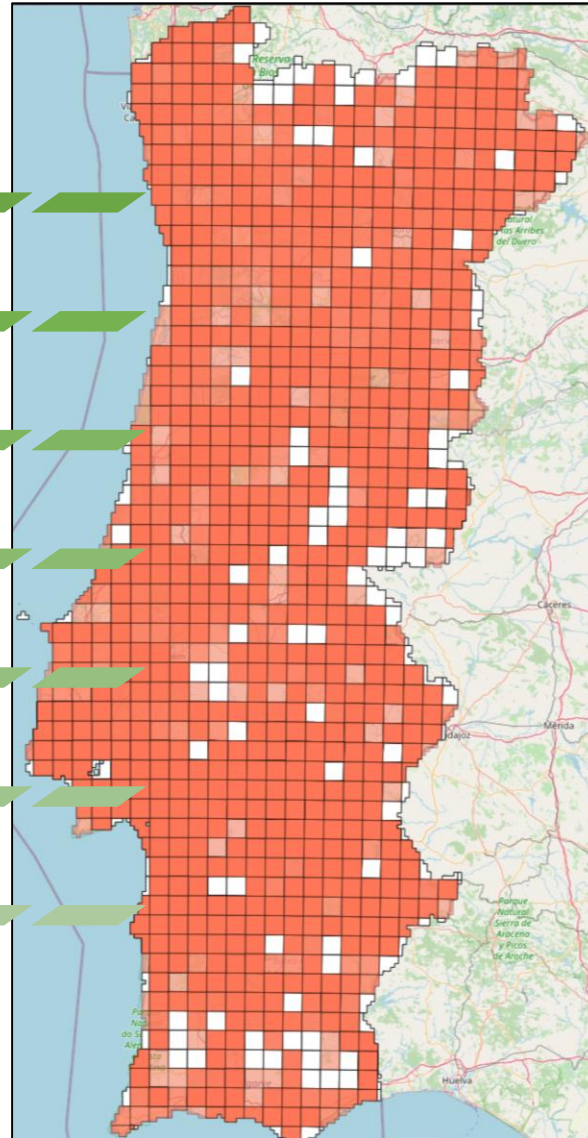
SEPNA

ICNF

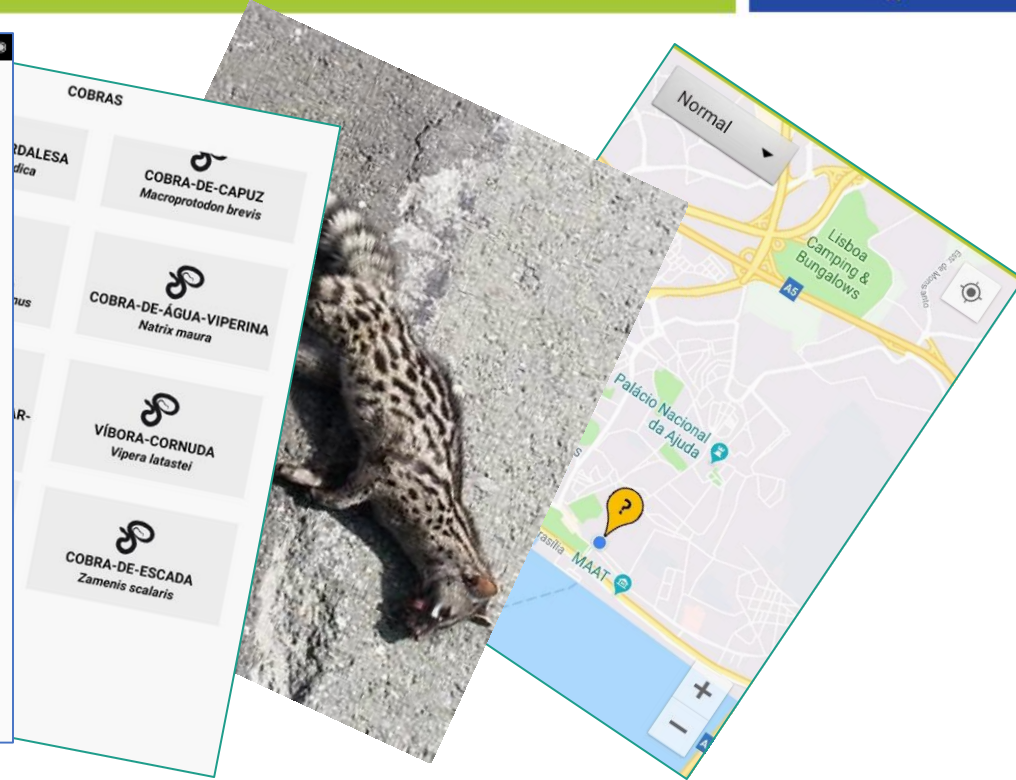
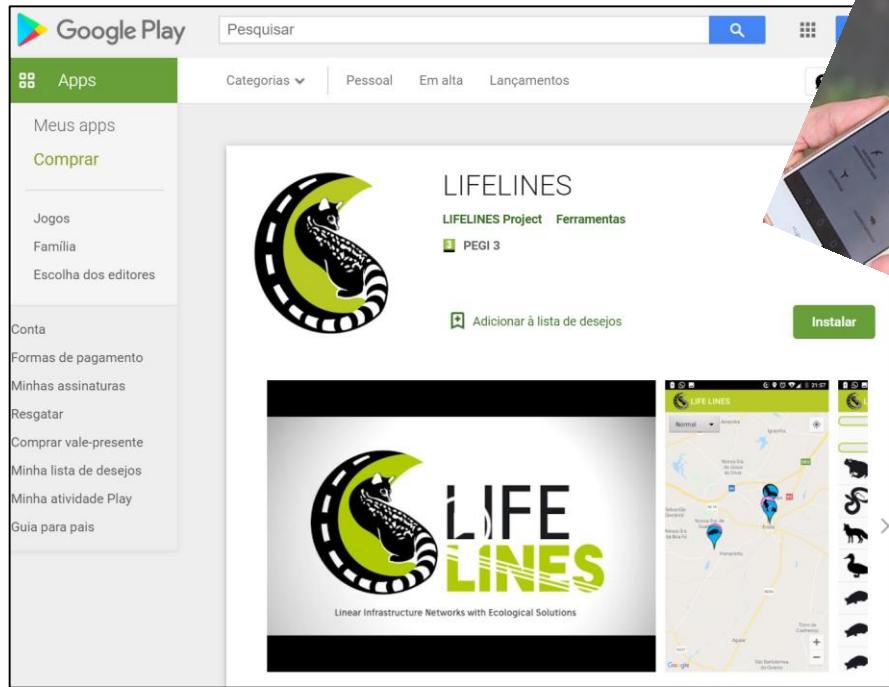
Researchers

Road Concessionaries

LIFE LINES public App



- The data can be consulted at LL website
- $\pm 100\,000$ records of 228 species (2001-2020)
- Any entity or researcher with data to share in this national database is welcome.
- Organizing and gathering the existing information on wildlife mortality in the same database allows enhancing the consistency of the dataset, and thus support the recommendation of sustainable and effective conservation and management measures.



- Submission of mortality events with corresponding properties such as species, age, sex (not mandatory), GPS coordinates, and photos.

- free and available to the public since July 2019
- Android operating system
- 700 registered users and 961 records
- It may work offline

- ✓ Mowing the vegetation at the track closer to the road to avoid risk of roadkills
- ✓ Managing the vegetation along the roads to promote its use by fauna as shelter, food supply and travel corridors



✓ Control of Invasive exotic vegetation

- Herbicide brush application on the stump immediately after the tree cut



- Injection of herbicide in the trees, so they die without new shoots



- Debarking of the tree trunk so the trees die without new shoots (*Acacia* spp.)



- Total remove of small new shoots (including the roots)

✓ Control of Invasive vegetation

- Herbicide pulverization of the shoots on parcels without environmental/social constrains



- Plantation of native species to compete with the invasive species (combined with the previous techniques)



- Successive cuts of the stems (*Arundo donax*)



- Total remove of reeds (*A. donax*) including the rhizomes (on level slopes)



✓ Creation of two micro-reserves



Fraxinus angustifolia, *Prunus spinosa* and *Quercus pyrenaica* were planted, maintaining clearings that enhance the habitat for **butterflies**.

Plantations were complemented with *Ulex australis* subsp. *welwitschianus*, *Asparagus aphyllus* and *Calicotome villosa* to promote refuge for **small mammals**.

Additionally, the central area of the micro-reserve A is being maintained under control to promote the regeneration of the natural vegetation, since several species with conservation interest are present there.



✓ Plantation of strawberry tree barrier to elevate owl's flight



This plantation, has also contributed to promote native vegetation and habitat for butterflies (e.g. *Charaxes jasius* which larvae feed only on this bush).

- Collecting acorns for replantation
- Sowing seeds and pricking plants
- Planting trees and shrubs
- Controlling invasive species



- LIFE LINES was an extraordinary opportunity to find new solutions and improve some known less-efficient/less-viable solutions to minimize the impacts of roads on biodiversity
- The unforeseen situations and challenges along the way, were also an opportunity to learn and gain tools to manage unexpected issues and difficulties
- The results are already indicating us the best solutions and techniques and how to apply them in different scenarios
- Most solutions that showed good results are already being applied at other roads /projects
- IP is preparing a manual to its collaborators, designers and constructors, concerning these solutions and how to apply them, assuring a more sustainable relationship between infrastructures and biodiversity.



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with Ecological Solutions
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Thank you

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