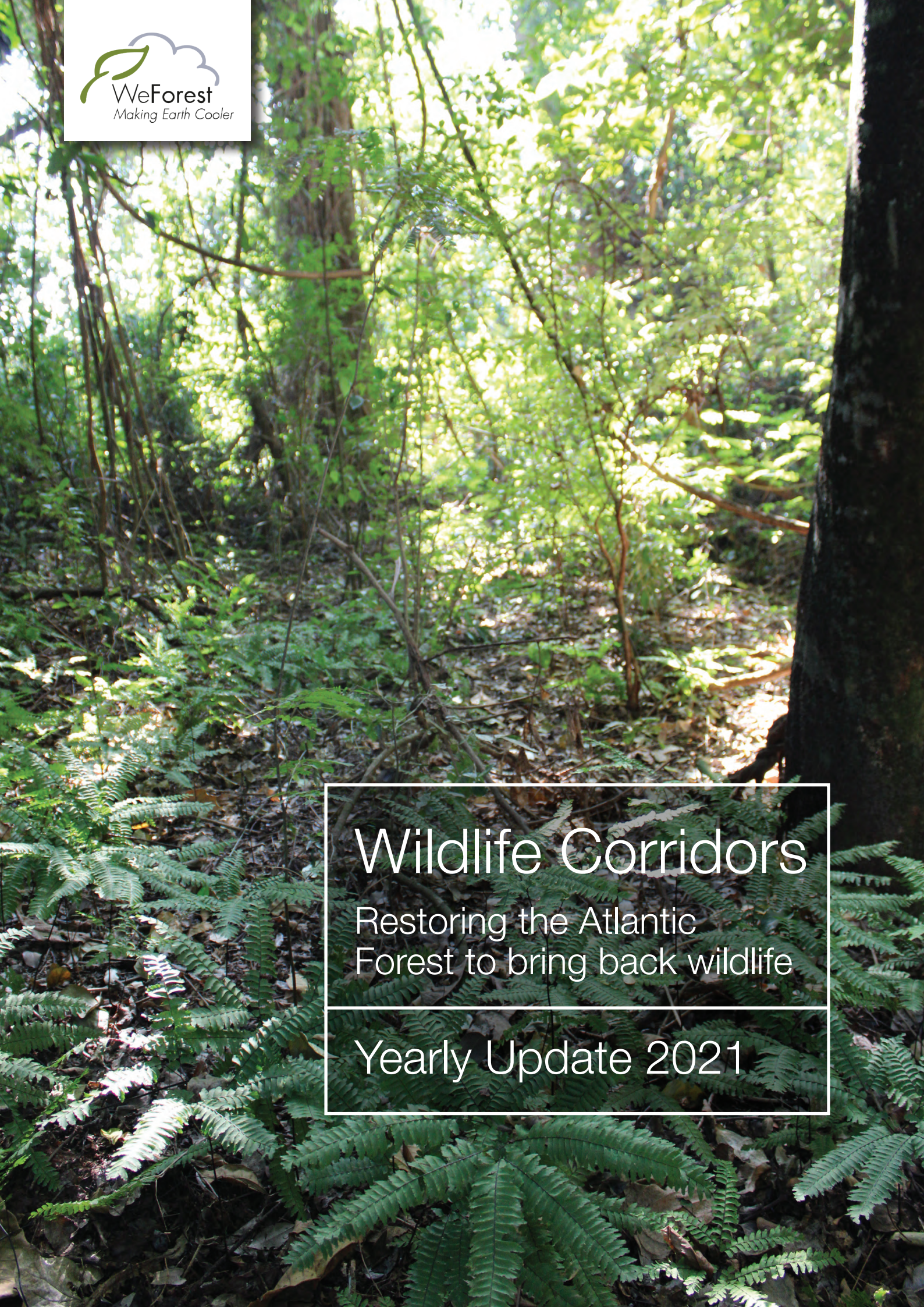


WeForest
Making Earth Cooler

Wildlife Corridors

Restoring the Atlantic Forest to bring back wildlife

Yearly Update 2021

Summary

Our collaboration with Brazilian NGO Instituto de Pesquisas Ecológicas (IPÊ) aims to scale up forest restoration in the Pontal do Paranapanema region, reconnecting forest fragments to create wildlife corridors.

Our planting schedule is back on track after droughts in 2020 and 305.24 more hectares were restored in 2021 with an estimated 610 000 trees growing. The creation of forest reserves on farms – potentially over 3000ha – was delayed by COVID-19 and will be re-activated in 2022.

The intense heat of 2021 – the worst dry spell in 91 years – followed by unprecedented frosts created a significant challenge for young seedlings here. Our monitoring assessments this year showed average survival rates of 40% in plantings less than two years old – half our target rate. A remediation plan for replanting, and other measures to improve survival in the face of a changing climate are under development. Sites planted in 2017 have performed well with a 68-73% survival rate.

Scientific research is a major aspect of our work, and 2021 saw the use of LiDAR to gather data on forest structure, biodiversity and a preliminary Index for Forest and Landscape Restoration.

Early signs of wildlife in the corridors have been captured on 29 camera traps and 120 audio recorders. So far, camera footage of 23 different animal species in the corridors include tapirs, pumas and even a jaguar, and data from 120 audio recorders is being analysed to quantify bird species and activity.

This report shares an update of our progress during 2021. Thank you for all your support!

2021 in numbers

305.24 ha concluded in 2021, representing over 610 000 trees

Another **120 ha** (240 000 trees) began planting in Q4

Over **11k** hours of audio recordings to identify bird species

Camera traps captured **23** species including the endangered tapir and near threatened jaguar

18 people are working in **4** companies that are providing planting services

90% are from the local area

Since the project began:

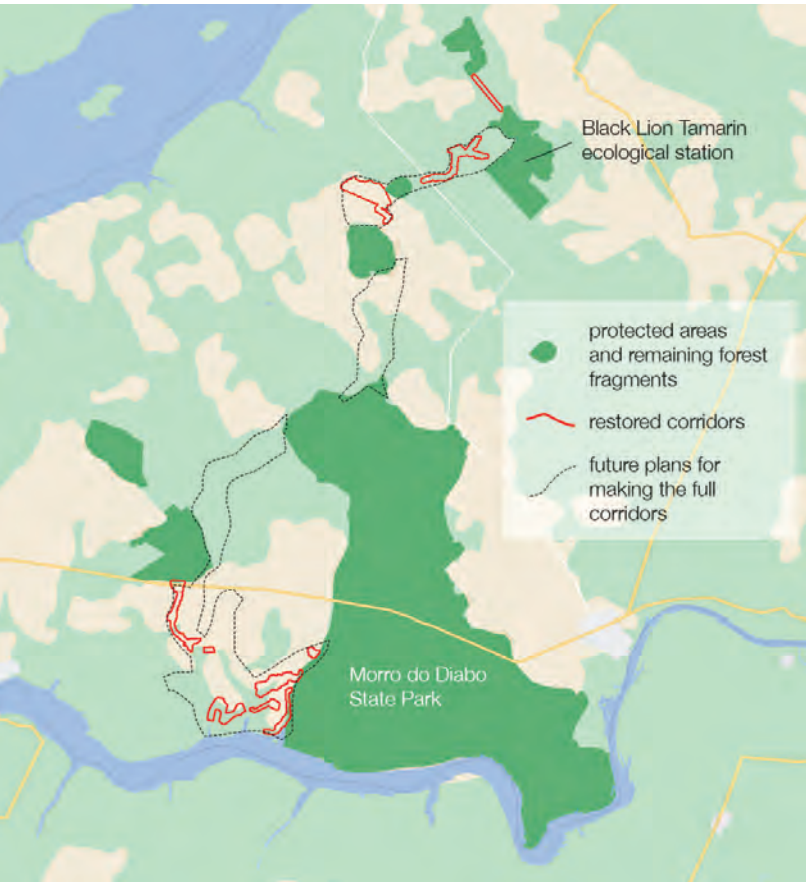
1133.18 ha restored

2 445 330 trees of **138** native species planted and regenerating

Of these, **5** are on the IUCN Red List: *Aspidosperma polyneuron* (EN), *Apuleia leiocarpa* (VU), *Cariniana legalis* (VU), *Cedrela fissilis* (VU), *Zeyheria tuberculosa* (VU)

Planting and restoring 305 ha (approx. 610 000 trees) completed

Our restoration in Pontal is back on track after droughts in 2020. 305.24 ha was brought under restoration in 2021 to create new forest corridors. A further planting of 120 ha (240 000 trees) has begun and will be concluded in 2022.



The new areas planted during 2021 represent over a quarter of the total area we have restored to date. They can be seen on our interactive map of the Pontal project: [1], [2], [3], [4], [5].

Each hectare has a target of 2000 trees, which means approximately 610 480 trees will be growing. They are either planted, or naturally growing and being protected and nurtured to grow *in situ*.

The 2021 monitoring campaign assessed survival rates in planted areas

- Sites planted in 2017 here, here and here measured a 68-73% survival rate against our 80% target.
- Sites planted in 2018 have a lower survival of planted trees at 51%, and despite this, there are good signs that restoration is actually taking place (see *Early signs of success*, below). As a result, while some will be replanted, it will not be necessary to replant 100% of the area to successfully restore these parcels.
- The most recently planted areas (less than 2 years old) have a lower survival rate of 40%. The intense heat of 2021 – the worst dry spell in 91 years – followed by unprecedented frosts meant that despite the regular care for these seedlings, they unfortunately couldn't cope with these extremes.

Above: Some seedlings resprouted after the frosts

A work plan and timeline for replanting is under development, including:

- Species selection to focus on those more resistant to low rainfall and less fertile soil. This is likely to reduce the number of native species planted but will be a more resilient planting strategy for future climate shocks.
- Pilot testing ways to the enhance survival and development of planted seedlings. One experiment will see fertilizer applied at the same time as irrigation and is expected to support faster root development during the high temperatures these seedlings endure. Watch a video about it here.

Creating Forest Reserves on Farms

Protecting remaining forests in this landscape is crucial. In 2019, 10 forest fragments that represent 3253 ha were identified and our aim is to work together with landowners to convert these forest fragments into Private Reserves – a Protected Area category that would guarantee they remain forests. Initial discussions have taken place with 6 out of the 10 landowners representing over 1732 ha, though COVID-19 restrictions on travel substantially delayed this work throughout 2021. Now restrictions are lifted, this programme will restart in 2022.

Who staffs the community nurseries?

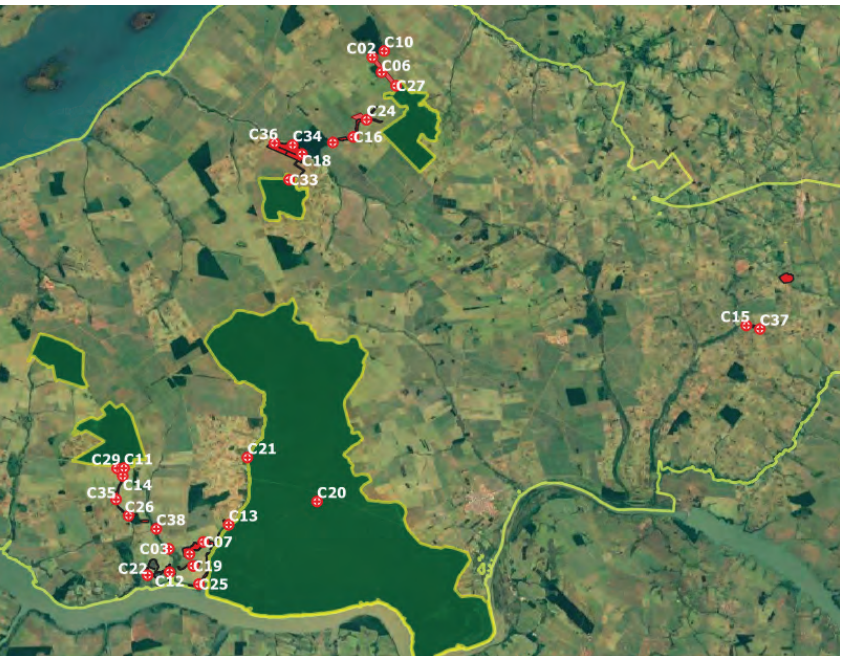
Women manage four of the ten plant nurseries that provide seedlings for the project, and of the 39 people working in the nurseries, 28% (11) are women. Around 80% of the staff are from the project landscape.

Early signs of success

The endangered black lion tamarin, jaguars, pumas, red macaws and tapirs, among countless others, rely on the forests here to feed, migrate and diversify their gene pool. We have been planting forest corridors since 2017 and to gauge whether our corridors are effective, we have begun to measure the presence and activity of animals.

Throughout the year, 29 camera traps (see map below) identified 23 different animal species, including incredible footage of maned wolves (above), tapirs, pumas and even a jaguar!

2021 also saw the deployment of 120 audio devices in collaboration with Rainforest Connection, to monitor bird species diversity, distribution and activity patterns. Audio was collected at sampling points located in restored polygons, forest fragments and agricultural areas and generated approximately 11 540 hours of recordings. The results will be shared in our next update.



Another way to measure whether animals use these young corridors is to identify regenerating trees that have been “planted” by the animal droppings. The assessment in 2021 identified very good natural regeneration results and the next stage is to identify which of these are dispersed by animals specifically.

In sites planted from 2017, the 514 to 5900 regenerating trees per hectare is well above the guidance for Sao Paulo state, which expects a minimum of 200 trees per ha. The average density of regenerating trees in sites that are less than 2 years old is already 226 per hectare (values range from 29 to 845 trees/ha in different planting sites).

Even in very young plots – where restoration took place a year or eighteen months ago – some species that help natural regeneration are already growing. For example, an abundance of short-lived species *Solanum granuloso-leprosum* and *Solanum mauritianum* (wild tobacco or woolly nightshade) are thriving. These species act as ‘pioneers’ to prepare the ground for other plants to follow and are very attractive to birds and bats, so they’ll be crucial for ecological processes such as flower pollination and fruit dispersal.

Above: More evidence of tapirs: footprints!

Local gardeners

We know tapirs have been around when we find these fast-growing Embaúba trees (*Cecropia* sp.) broken, as they love to eat the fresh leaves at the top. But it's not a problem: the hardy Embaúbas usually resprout, and eventually feed the tapirs again. And as tapirs also eat a lot of other fruits, they contribute to our work by leaving other types of seeds in their droppings, such as palm seeds, to regenerate spontaneously in our restored sites!

Using LiDAR to measure carbon sequestration

Through a scientific partnership with the University of São Paulo have measured the carbon stocks of our restoration sites and forest remnants using LiDAR – airborne Light Detection and Ranging – data.

Preliminary results show a total of 12,544.80 tCO_2eq were sequestered at our restoration sites, averaging 18.06 tCO_2eq/hectare in the 830.06 hectares under restoration where LiDAR data was obtained. A more detailed assessment of the results is underway to identify which areas are on track, and why progress in others is better or worse than expected.

Experimental design

Forests were classified as: restoration plantings, assisted natural regeneration, agroforestry systems, degraded and conserved forests; besides pasturelands and sugarcanes.
Based on this information, 41 plots were installed in different forest typologies of different ages to estimate forest carbon stocks, composition and richness, as well as soil attributes. Forest inventory data was used along with LiDAR metrics to map carbon stocks in WeForest restoration areas and forest remnants in the region.

Inventory data gathering

Plots installed measured 30 × 30 m (900 m²). Coordinates of plot edges were obtained using high precision Real Time Kinematic (RTK) GPS, which provides a margin of error <0.5 m.
The following information was collected in each plot:

Tree community: we tagged, measured height and Diameter at breast height (DBH), and identified all trees, shrubs, palms or ferns with DBH>5 cm. We also measured dead trees given their importance for fauna, but this was not considered when calculating carbon stocks.
Smaller tree community: we counted and identified individuals with height >0.5 m and DBH<5 cm in one 25 × 4 m (100 m²) subplot in each plot, as well as all individuals with height >2 m and DBH <5 cm in the whole 900 m² plot.
Abundance of lianas (long-stemmed, woody vines): separated in three diameter classes: i) 1-2.5 cm, ii) 2.5-5 cm and iii) >5 cm.
Soil cover: measured as i) dead wood, ii) litter, iii) invasive grasses.
Fine roots: collected from soil samples 0-10 cm deep in two points of the plot.
Soil attributes: i) chemical attributes, ii) carbon stocks, iii) water infiltration.

Table: Summary details of our carbon assessment

What's Next?

- Continue planting the 120 ha (240 000 trees) during 2022.
- Identify approximately 140 ha in preparation for the following planting season.
- Re-initiate the programme to establish over 3000 ha of "Private Reserves" from remaining forest fragments on private farmland.
- Replanting and corrective measures to address the mortality (density) and non-native species in young (less than 2 years old) restoration sites.
- Progress on best practices at plant nurseries: identification and control and registration of species list.

How do we know our restored forests are growing and making an impact?

Every hectare under restoration is mapped with GPS points to generate polygons (areas on a map) that are assigned to sponsors. Permanent monitoring plots are established in our sites and our forestry and science teams conduct surveys to monitor progress of biomass growth, tree density, survival rate and species diversity, among other indicators. Where social impacts are also critical, we measure socio-economic indicators such as the number of beneficiaries, people trained, and income generated from forest-friendly livelihood activities.

Please visit our **Why and How** webpage for more information.

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Stay up-to-date with your interactive **Wildlife Corridors map**, and check out the **photo album** of the project on Flickr.

Thank you for supporting the Wildlife Corridors project!