



LIFE Project Number
LIFE14 NAT/PT/001081

Progress Report¹
Covering the project activities from 01/08/2015² to 30/06/2019

Reporting Date³
30/06/2019

LIFE PROJECT NAME or Acronym
**LIFE LINES - Linear Infrastructure Networks with
Ecological Solutions**

Data Project

Project location:	Alentejo (Évora, Montemor-o-Novo, Arraiolos, Estremoz, Vendas Novas) - Portugal
Project start date:	01/08/2015
Project end date:	31/07/2020
Total budget:	5,540,485 €
EU contribution:	3,324,303€
(%) of eligible costs:	60%

Data Beneficiary

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¹ Progress Report without any payment request (for Progress Reports with payment request, use the Mid-term Report template)

² Project start date in the case of the first Progress Report, otherwise date since the last reporting period

³ Include the reporting date as foreseen in Form C2 of Annex II of the Grant Agreement or as modified in agreement with EASME

Section 1 - Overall assessment of the achievements and as to whether the project objectives and work plan are still viable (2 pages max)

The project has 35 **actions**: A1, A3, A5, A6, C3, C10 are concluded and goals achieved. C5 will start later than predicted and consequently needs an extension. A2, A4, A6, C1, C5, C7, C8 are delayed and need extensions. A7, E11, F4 not predicted to start yet. Others are ongoing.

Regarding preparatory actions, A2 is delayed since the integration of concessionary Ascendi data is being developed and we still expect responses from other concessionaires. The prototypes (A4) are developed, being tested and tuned with data. Several adaptations were done to improve performance and that's why we didn't close the action. Two Mobile Mapping Trailer prototypes were developed, with excellent results: high rate of correct classification (>60%). The use of dissuasion devices for rodents and large birds were successful. We had to move the dissuasion device for owls to another spot with less noise and it will be monitored again in D3. The device for birds' approaching and behaviour on electrical lines is in the test stage. A6 was concluded with the technical report in May 2019. It was delayed (change of beneficiary and definition of Quercus team) but the power lines to intervene are chosen and EDP-Distribuição has already developed the prototype. Production and installation of the devices (C5) is expected to occur in September/October 2019

Regarding conservation actions, due to A6 delay, C5 is also late and an extension is needed (30/09/2020). IP concluded the installation of dry ledges and fences on culverts (C1). Installation of 100 Swareflex wildlife reflectors at EN4 was only executed in February 2019 due to difficulties in finding a company willing to sell and install these devices and conduction of the process separately from the Road Maintenance Contract. Barriers to elevate the bird's flight were concluded only in January 2019 due to tender process difficulties. Amphibian's roadkill mitigation measures were concluded in December 2018. Nets in slopes to avoid rabbits were applied on November 2017. Regarding the replacement of fences at IP2 and implementation of a net set in "L" format, full implementation of this measure could only be achieved with the beginning of the new Road Maintenance Contract, due to the delay in Government's approval. Fences implementation has already started and are expected to be concluded in October 2019. Consequently, a new extension of C1 is needed: 30/10/19. The strawberry tree barrier (C2) was implemented but in October 2018 and afterwards around 100 trees were planted to replace the ones that died during the unusually dry spring. The implementation of the micro-reserves was completed. Regarding the control of Invasive Species, the area to do the general control and mowing at least twice a year was increased (314 linear km) in order to enlarge the area covered. Concerning the classification as a recurrent action, IP considers that it may be so in what concerns the first annual execution but not the second. The APP (C4) suffered a delay due to technical amendments (possibility of an offline mode). On 30 July, it will be available to the public in Google Play. Seed mixtures were already developed and essayed (C6) and are being used in other actions. The plant nursery (C9) is installed and is raising plants used in conservation actions despite the mortality of plants or the delay of germination of some dormant seed species. C10 was concluded in 31/12/2018. Construction work associated with C7 has been concluded except for the owl elevated flight barrier in EM529 delayed due to difficulties with public tender procedures and provider negotiations. It will be executed by July 2019. In C8 the mitigation measures were concluded with the implementation of the canvas barriers in EM535, delayed due to the high rainfall in spring 2018. An additional campaign of control of invasive exotic species is predicted for late summer/yearly autumn 2019 and monitoring its effects in the spring of 2020.

Regarding monitoring actions, D2 started in July 2019 with compilation of information concerning ecosystem services in the context of project landscape and actions and evaluating the use TESSA as the main analysis tool. Socio-economic indicators predicted in D1 were updated in the 1st trimester 2018. This delay reflects some difficulty in exchanging information between partners. Regarding D3, globally, road interventions are working in promoting fauna biodiversity. Carnivores cross more often when culverts are not flooded showing the importance of the built dry ledges and placement of fences. There was an increase in richness and abundance of small mammals and butterflies in the microreserves under the poles and in the N4 microreserve. There was a significant reduction in the n° of roadkilled amphibians were the barriers were installed. The microreserves registered an increase in the diversity and richness of native flora species, the biodiverse seed mixtures have been successful both in ecotrails and road verges. Seeding at the base of the powerline poles showed low success so far. *Arundo donax* has been successfully controlled in some areas resulting in an increase in the richness and diversity of native species. However, in some other places it is re-sprouting.

The website (E1) has been updated 118 times, averaging 237 monthly users. 52 medium-sized outdoors and 1 large outdoor are on-site (E2). Project dissemination (E3) has been a priority for the last year, resulting in an increase in news. 10 teasers and 11 thematic videos were produced (E4). We established a collaboration with Radio Nova Antena (highest rated local radio) for 48 weekly radio spots. Four master theses were concluded and 2 master and 2 PhD theses are ongoing. We were present in 7 university classes for 146 students (E5) and did 3 workshops with 85 participants (E6). The workshops for GNR are delayed due to administrative issues but the agreement for the start of the workshops and inserting data from GNR into database will be signed in July 2019. Networking has been established with 8 LIFE/non-LIFE projects, and presentations in 12 European events (E7). E8 is going well, especially the plant nursery and seed collection activities, around 2000 participants have been involved in 63 volunteer activities. The control of invasive species with volunteering activities has faced some transportation difficulties, solved by the acquisition of a van by MARCA. We organized 3 thematic seminars and will organize the 2020 IENE Conference which will include the LIFE LINES final seminar- <https://iene2020.info/> (E9). Several activities were organized through the “Adopt a road program” (E10) and NIA (Environmental Interpretation Nucleus) was reopened in march 2019. Management actions (F) are proceeding globally as predicted although some predicted large CTAG and CG meetings were replaced by more efficient, cost-effective and productive partial/informal meetings involving only the directly interested parties (F1). The great majority of the indicators are improving as expected or above expectations (F2).

In relation with **impact on Nature & Biodiversity** project main targets, the n° of culverts crossings increased for 2 carnivore species after the placement of the fences (genet: before=128, after=274 / stone marten: before=68, after=113). After sowing and planting in the microreserves under the power lines poles, there was an increase: in the abundance of small mammals; in the flora richness and abundance (as well as in the microreserve of N4 road); in butterflies (827 individuals belonging to 14 species of butterflies were registered, including observation of target species - *Melanargia ines*, *Thymelicus lineola* and *Vanessa cardui*). In the microreserve of N4, there was an increase from 9 to 15 species, 252 individuals, including target species *M. ines*, *T. acteon* and *T. lineola*. There was a significant reduction in the n° of roadkilled amphibians were the barriers were installed (e.g. EN114 pre-intervention=142amp/km/year; post-intervention=20 amp/km/year). In the ecotrails 7 endemic flora species were promoted (4 only present in the seed mixture developed); habitat for 10 target and 1 non-target butterfly species was favoured; habitat for small mammals was also promoted. The control of *A. donax* has been partially successful and an increase in the richness and diversity of native species has been registered at these locations.

Section 2 - Identified deviations, problems and corrective actions taken in the period (max 2 pages)

The administrative procedures and hierarchical authorizations needed to perform some tasks typical of public entities (most of the beneficiaries) including tenders to implement larger works are very time-consuming and complex, resulting in delays in several tasks.

New fire prevention legislation (DL-18/2018) can limit the full potential of roadsides and other marginal areas for biodiversity conservation. This could have implications to the full achievement of some project objectives (microreserves and biodiversity refuges; control of alien invasive plants with non-cutting techniques). DL-18/2018 provides general indications to be considered in the control of vegetation but it also determines that each local council will decide where and when are these indications going to be applied. The project produced a document with guidelines for managing roadsides considering this legislation, and to support exceptions and adaptations requests in vegetation cutting in the project framework. These requests have already been done and accepted by some municipalities (Montemor-o-Novo and Arraiolos).

Some actions needed financial adjustments to better fulfil objectives. Examples include FCUP needing to buy a workstation for analysing images collected with the MMS3 prototype (3 million) and a storage system. They also needed to new MSc grant-holder to help in monitoring prototypes. UE needed a new MSc grant-holder to help with the communication strategy. Although A5 has been given as finished, MARCA had to execute improvements to the plant nursery structure, in order to be possible to produce and store more plants, create better conditions to plant growth and reduce mortality. Regarding the NIA infrastructure improvement (E10), CMMN needed to complement the budget available in the application to adjust to 2019 value prices. These changes used the surplus funds from another type of expenses or actions, because budget allocated to those resulted cheaper than expected or were not spent due to technical reasons.

For the measures for which implementation was delayed for several reasons, the monitoring period (D3) is shorter than the predicted. The strategy adopted is to start monitoring the efficacy of each conservation measure as soon and as long as possible. The spring season will be, for most of the fauna target groups, the more appropriate season to perform the surveys. So, because most of the conservation actions were finished in the winter of 2018, monitoring results will be collected for two years (spring of 2019 and 2020) allowing some inter-annual evaluation. Moreover, roadkills (an important indicator for evaluating the success of several conservation measures) are being monitored by IP on a weekly basis since October 2016 (to monitor the effect of road verges vegetation cutting and mowing on roadkills) and by UE, on a daily basis, since October 2017, after dry ledges on culverts have been built. The monitoring of the flora actions for 2018 and 2019 was mostly accomplished, except for some plots of invasive control of flora species in Montemor-o-Novo (C8) that haven't been subject to intervention until now. Nevertheless, the preliminary results obtained so far, as well as some setbacks, have risen the need for some adjustments, in order to enhance the reliability of the results and the effectiveness of the conservation measures. It would be important to carry out another monitoring period of the plots sown with the biodiverse seed mixture in the spring of 2020. This would imply the extension of the action C6. The relevance and demonstration ability of the control of Invasive Species as been an issue due to the difficulty of the task. The area to do the general control at least twice a year was increased in order to enlarge the area covered. So now IP is acting on a total extension of 314 km. The area of intervention is approximately 942 000 m². As to be a recurrent action, IP considers that it may be so in what concerns the first annual execution but not the second. So IP suggests presenting only the expenses with the second annual round of

invasive control to be financed by LIFE LINES. 58 invasive plants spots were selected for intervention. Different specific methods are applied under close monitoring in order to test and compare the results (The total area of the actual Control of Invasive Species Plan. is 7.073 m². Thus, IP was able to include more spots to the original Plan that comprised 5.979 m². Press conferences and radio spots were below than predicted. To overcome this situation, we have contracted a new team member just for communication (cheaper than a professional communication agency). The monitoring of the socio-economic effects is revealing to be a particularly complex task. A new and simplified list of socio-economic indicators is already being used. Nevertheless, some indicators are still hard to fill because they required information on individual costs (e.g. persons/day on service acquisition) that are not easily available in such detailed way.

From the mid-term report, regarding **deliverables**, the “Technical report on action A6” that was only delivered in May 2019. Regarding **milestones**, the “Conclusion of the trial evaluation period of operation of the deterrents for birds landing” and “Assessment of consequences in the functioning/operation of lines” will be delayed due to the late start of C5. “Completion of the monitoring of ex-situ seeding tests” was completed on time, June 2018.

Regarding **Project Specific Indicators**, 20.9% were largely achieved, 33.4% largely exceeded, 5.4% almost achieved, 18.9% still underachieved and 22.3% still not applicable. Regarding **Key Project Indicators** most of them show an adequate trend. For example, the control of 9,8 ha of invasive plant species (*A. donax*, *Ailanthus altissima*, *Acacia dealbata*, *Acacia melanoxylon*) and their replacement by autochthonous species in a major part of this area are contributing to improving the overall ecosystem condition. The total area of intervention predicted is expected to be must larger, after the adoption of the good practices developed by IP. The web page has 47.761 views. Fifty-three information boards have been installed, the broadcast in 6 national TV's programs as well as others forms to dissemination (radio n=10, printed and online journals n = 12, volunteer's actions, etc.) are increasingly contributing to a higher public awareness. Regarding solar energy production, we are trying to change some operative devices to solar systems to compensate for the impossibility of using in the microreserves water pumps as predicted due to safety reasons. Concerning the socio-economy, the direct creation of at least 12 new full-time jobs during the project and spending and acquiring services from local persons or firms, was been a great contribution for a peripheral depressed region. The full evaluation of the accomplishment of these indicators will only possible at the end of the project and for some (ecosystem trend and condition) after that. Despite this, ecosystem global trends in project indicators are positive.

Regarding the **project schedule**, A2, A4, A6, C1, C5, C7, C8 are delayed and need extensions of ending date. This will lead in some cases to less monitoring periods. In other cases, for example, in A2 will not affect the project (e.g. Roadkill data database incorporated, n=81104, has already exceeded the predicted number). The delay in A6 leads to the delay of C5. A few interventions in C1 (L-fence) and C7 (owl barrier) will only be finished in the autumn of 2019. Thus an extension of the project would allow one more monitoring period of the invasive control plots (fall of 2020). This is particularly important in C2 since the plantation of native shrubs in the areas previously covered with invasive species will be done in the autumn of 2019. It would also enable the assessment of the planted shrubs survival rate after the summer, and a larger time-lag in relation to the time of intervention, allowing a more reliable assessment of the techniques tested. For the same reasons, C8 would also benefit from an extension, as several plots of invasive species control have not yet been intervened. Although so far it does not seem critical to the project, we are considering the possibility of a 6 months' extension.