LIFE16 NAT/PT/000754

Midterm report

Covering the project activities from 01/10/2017 to 31/12/2019

Reporting Date
29/02/2019

Data Project

Project location:	Portugal (Serra da Estrela, Mata da Margaraça and Monchique)
Project start date:	01/10/2017
Project end date:	30/09/2022
Total budget:	1,654,899 €
EU contribution:	1,219,078 €
(%) of eligible costs:	73.66 %

Data Beneficiary

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2. List of key-words and abbreviations

ADRUSE - Associação de Desenvolvimento Rural da Serra da Estrela

APA - Agência Portuguesa do Ambiente

CICYTEX - Centro de Investigaciones Científicas Y Tecnológicas de Extremadura

CMSeia – Município de Seia

CMMon – Município de Monchique

ECOMED – Project; "Soil and water bioengineering, Hazard Assessment and Techniques Selection in Mediterranean Environment"

GEOTA - Grupo de Estudos de Ordenamento do Território e Ambiente.

ICNF - Instituto da Conservação da Natureza e das Florestas

IGOT - Instituto de Geografia e Ordenamento do Território

ISA – Instituto Superior de Agronomia

OP – Operational Plan (A2 action)

SPECO - Sociedade Portuguesa de Ecologia

UAlg – Universidade do Algarve

UÉVORA – Universidade de Évora

3. Executive summary

LIFE-RELICT main goal is to improve the conservation status of the priority habitat 5230* in Portuguese Natura 2000 Network, targeting two rare and unique communities of Portuguese-laurel (*Prunus lusitanica*) and Rhododendron (*Rhododendron ponticum subsp. baeticum*). The intervention areas are located in PTCON0014 – Serra da Estrela, PTCON0051 – Complexo do Açor and PTCON0037- Monchique. Due to several threats, especially fire and land use, these paleotropical relics are currently in a very poor condition in Portugal (Unfavourable-Bad), requiring urgent management measures for its preservation and survival in continental Europe.

The specific goals of this project are: **[1] Improve 5230* structure** and its ecological function in Portuguese Nature 2000 network in at least 11 ha; **[2]** I**ncrease habitat area** in 20.5 ha; **[3] Reduce invasive alien species** occupancy within 4 ha; **[4] Decrease risk of fire** in 104 ha controlling the helophyte shrubs and creating adjacent native forests (habitats 9230 and 9240) in 11.4 ha; **[5]** Test the effectiveness of all management techniques and methods used, and ensure its transference and replication in at least 2 different territories; **[6] Increase awareness, motivation, skills and cooperation** of local people and regional authorities for this habitat, contacting at least 20 local authorities and 50 national organizations, as well as at least 1 000 students; **[7] Increased local nature-based tourism** with the establishment of two pedestrian pathways and support material; **[8] Increase local economy** by financial import and job creation.

In December 2019, **all works foreseen in actions "A" were completed,** with an exception in A1: following EASME suggestion (letter from 2018-12-18), we are now establishing a new agreement with the landowners of Seia intervention areas (referring specifically 20 years of agreement), missing the signatures of owners who do not live in this territories. Therefore, **main goals were achieved**: **A1.** Territory characterization was done; **A2.** Operational Plan was concluded; and **A3.** we were able to finish the *Rhododendron* study on natural regeneration. All A1, A2 and A3 results have shown to be very important for other actions, especially for the ones related to conservation management.

Regarding **actions "C"**, **in C1** we **finished the third recollection campaign** and collected propagation material for all foreseen species. We had several problems with the propagation of some species, including with Portuguese-laurel and Rhododendron, but we were able to find solutions and so far **most of the issues were overcome**. The biggest problem we **still have** is the **low growth rate of Rhododendron** specimens produced seminally. For this reason, in order to have bigger plants faster, in 2019 we started to invest in the vegetative propagation of this species, with success. In December 2019 **6747 plants were already delivered** to project Municipalities (19% of the plants foreseen). The deliveries will continue in the beginning of 2020. **In C2 "levada" is completely recovered in the 1.2 km** foreseen in the project. Also, in **60% of *Prunus lusitanica* areas, selective vegetation control** was already executed (in Margaraça and Estrela). However, **plantations will only start in the beginning of 2020**. **In C3** Selective control was carried out in the foreseen 3 hectares of Rhododendron (**100% executed**). However, plantations have been delayed, once Rhododendron plants still too small to be planted. **C4** has been executed in Estrela-Cabeça, with the vegetation selective control and Control of non-invasive alien species (**30% of the foreseen area for C4 is executed**). **C5** was not started yet once Rhododendron plants still too small to be planted. **In C6** *Hakea sericea* was cut and burned in all the foreseen area (phase I executed in 100% of the area). In *Acacea dealbata* area, two different interventions were carried out: debark in the core with larger specimens and cut in the core with smaller plants, not suitable for debarking. For this species 54% of the existent clusters were already executed with many difficulties enhanced by local orography. **In C7, 2 km** of paths already existent in Estrela-Cabeça were reestablished. Selective control of vegetation was executed in: **Estrela (50%), Margaraça (13%), Monchique (100%).** Plantations were not done but will start until the end of this winter. However, in Monchique intervention areas **11.94 ha of native trees were planted without LIFE funding** (done in areas for which no planting was planned, with LIFE supervision). Control of non-invasive alien species was done in all the area in Monchique and is in progress in Estrela-Cabeça. Also in Monchique, **90% of the Chestnut forest was improved**.

In relation to **actions "D"**, the work has been going as planned. **In D1** We are monitoring the germination and survival rates of propagated species since 2018. Also, we are monitoring the vegetation response to interventions made in actions C2 to C7, through the annual record of vegetation associated to 41 permanent transects. **In D2** 35 indicators were defined in order to understand project impact in several economic and social sectors. Also, **100 surveys were made to web users,** about Project web site, and its contents. Results showed that over **60% of respondents did not know our web site**, but **77% would recommend it** to their contacts. In 2018 we also implemented 120 surveys to local population (from the 3 involved Municipalities) in order to understand their **knowledge mainly about habitat 5230, plant species, Nature 2000 Network and LIFE Project. In D3** we are trying to **assess Project ecosystem services using *Tessas*' methodology**. To implement it, we established the "reference state" and the "alternative state" of project areas, define major impacts, and also the major services produced by their ecosystems (a total of 23 services). **In D4** we **evaluated project cost/efficiency until December 2018**. Finally, through **D4** we have followed the performance indicators of the project and the KPI indicators.

Regarding **actions "E"**, in **E1** the **Webpage** (www.liferelict.ect.uevora.pt) was published on-line in Mars 2018 and **Facebook page** (www.facebook.com/Life-Relict) was launched in February 2004. Both have been regularly updated in Portuguese and, since September 2019, the webpage is also in English. **Project panels have been done** in Portuguese and English for the 3 territories (Estrela, Margaraça and Monchique).
In E2, **informative flyers have been done**, one about Portuguese-laurel communities and the other about Rhododendron communities (A5 size, divided into two different parts: one with project main information and the other part with a postcard). We have also **established the layout for the itinerant exhibitions** but this work is not yet finished. Also, we **started to work in Monchique interpretive trails**, establishing a partnership with Almargem Association (coordinator of the Great Pedestrian Route known as *Via Algarviana*). In **E3**, Seia and Monchique Municipalities started the education/awareness actions with local schools and since December 2017 we are present annually at the event "Cabeça Aldeia Natal. However, the school contest has not yet been launched because we think it is better to have done more the education/awareness actions for local students, as well as the promotional material ready. In **E4**, until December 2019 we had successfully organized a seminar and have two technical workshops. Also the UÉvora has been disseminating Project results in several scientific seminars and congresses, as well as by its own students. In **E5**, we have contacted several national and international projects to establish networks. Also, we have communicated with Portuguese and Spanish municipalities in order to promote the project and its practices, encouraging replication. Scientific committee was defined and four formal meetings were done.

In relation to **actions "F"**, through F1, Project is being coordinated by the UÉvora under the responsibility of professor Carlos Pinto Gomes. The current project team has been defined in the beginning of the project and partnership agreements signed. In **F2**. Two meetings have been already done, as well as the first visit to project areas.

So far we had a set of problems in some actions, which are described with detail in the Technical part of this report (point 6.1 and 6.2). Overall we highlight the following major ones: **[1]. Difficulties in plant propagation**, including initial problems with the germination of some species that identified and corrected in 2019, and **low growth rate of Rhododendron**, which compromises the execution of other actions of the project (C3 and especially C5); **[2.] Fire in Açor_Complexo da Margaraça in October 2017.** what enforced us to reformulate the intervention areas; **[3] Delay in the recovery of existent trails in Estrela**, for reasons external to the project, delaying the execution of C6 and compromising the execution of other interventions (C2, C5 and C7); **[4] lack of specialized companies available for forest works**, once there is currently a widespread lack of companies available to carry out forest works, such the ones requested by C2, C4 and C7.

Globally, **from the 16 deliverables due in December 2018, 15 were concluded**, missing the material related with the exhibition (E2), that is behind schedule (**ANNEX I. Deliverables and Milestones achieved)**. However, we are also reformulating the long-term commitment letters from landowners, according to EASME request. In relation to milestones, from the 30 expected to be achieved until the end of December, 22 are in schedule, 6 are in progress (all will be finished in the first months of 2020) and 2

haven't been started, but expected to be finished in the beginning of 2020. Overall, we can say that project is ongoing, and large part of the tasks are being executed. The major delays occur in management interventions in Estrela (although CMSeia already started the works and we have indications that they will be finished in 2020) and with regard to plantations in Monchique and Estrela.

4. Introduction

In the Iberian Peninsula still exists some traces of tertiary vegetation, of Laurel type, which prospered in Southern Europe during the Tertiary. Due to its natural importance, this vegetation was included in a priority habitat of community interest: *habitat 5230* - Arborescent matorral with Laurus nobilis*. However, currently, the overall assessment on conservation status of this habitat in Portugal, reported on Article 17 Reports (2001-2006; 2007-2012; 2013-2019), is "Inadequate" for both Mediterranean and Atlantic Regions.

In this regard, LIFE-RELICT project appeared with the desire and need to improve the conservation status of this priority habitat in Portuguese Natura 2000 Network, targeting two rare and unique communities of Portuguese-laurel (*Prunus lusitanica*) and Rhododendron (*Rhododendron ponticum* subsp. *baeticum)*, in three Portuguese Nature 2000 Sites: PTCON0014 – Serra da Estrela; PTCON0051 – Complexo do Açor; and PTCON0037- Monchique. Currently, these two communities subsist almost exclusively in remote areas of the western Iberia, in rare climate situations (mild, humid and without frost), being in a very poor condition and requiring urgent management measures for its preservation and survival in continental Europe. Their major threats are fire, invasive species and land use changes induced by man (e.g. plantations of exotic pines and eucalyptus in their native space), all responsible for the reduction of 5230 habitats within their natural niche. In addition, climate change is also limiting dispersal ability of Rhododendron that, according with our A3 results, it seems to face a general lack of seminal dissemination.

Facing this threats, LIFE-RELICT conservation actions are based on: [1]. increasing habitat resilience: Through restoring the physical and ecological community structure (Actions C2, C3), and reducing the impact of two of the major drivers of global biodiversity loss – invasive species (Action C6) and fire (Action C7); and [2]. Increase habitat area (Actions C3 and C5) through plantations. In parallel, this project will also benefit forest habitats 9230, 9240 and 9260.

LIFE-RELICT started in October 2017 and will finished in September 2022. It's being led by the UÉvora and executed by a team with complementary valences, combining entities with scientific knowledge and large experience implementing conservation measures (UÉvora, CICYTEX), with local managers and stakeholders (CMSeia, CMMonc, ADRUSE). The intervention areas are located in the interior of Portugal, in Seia, Arganial and Monchique municipalities. Those are territories with a declining and old population (with the consequent decrease in land use) and low levels of qualification, which results in low-skilled and low-cost labour, thus constraining market dynamics and economic initiatives.

The main LIFE-RELICT objectives are:

1. Improve 5230* structure and its ecological function in Portuguese Nature 2000 network in at least 11 ha (8 ha of Portuguese-laurel and 3 ha of Rhododendron communities);

2. I**ncrease habitat area** through the reconstruction of favourable adjacent areas, in 20.5 ha (10.5 ha of Portuguese-laurel and 10 ha of Rhododendron]. To do it, project expects to produce 35.500 native plants typical of this territory;

3. Reduce invasive alien species occupancy within 4 ha (obj. 3);

4. Decrease risk of fire in 104 ha controlling the helophyte shrubs and creating/benefit adjacent native forests (habitats 9230 and 9240 in 11.4 ha; plus, habitat 9260 in 1.8 ha);

5. Test the effectiveness of all **management techniques and methods** used, and **ensure its transference** and **replication** in at least 2 different territories;

6. Increase awareness, motivation, skills and cooperation of local people and regional authorities for this habitat, contacting at least 20 local authorities and 50 national organizations, as well as at least 1 000 students;

7. Increased local nature-based tourism, with the establishment of two pedestrian pathways and support material;

8. Increase local economy by financial import and job creation.

5. Administrative part

LIFE-RELICT is being coordinated by the UÉvora under the responsibility of professor Carlos Pinto Gomes (project coordinator) and Catarina Meireles (Project Manager). Globally, project core team has been maintained since its beginning (please see **ANNEX II. Updated organogram**, with team main structure). Each partner has its own responsible: Carlos Pinto Gomes (UÉvora); Ana Fonseca (CMSeia), Sónia Martinho (CMMon), Francisco Vasquez (CICYTEX) and Cristina Garcia (ADRUSE).
The administrative and financial structure from the coordinator beneficiary is set since October 2017. However, for maternity reasons, the financial and administrative technician has change twice, and is now of the responsibility of Cristina Louro (since January 2019). At the beginning of the project, the UÉvora hired, through public calls, two full time grants, as foreseen in the project proposal: Rui Cataño (post-Doc) and Mauro Raposo (Master). However, Rui Castaño finished is grant in May for personal reasons. To offset this situation, a new call was launched and the grant was attributed to Mariana Machado (Master). However, three-month latter she got a PhD scholarship, and had to quit the LIFE grant (although she had continued to give some voluntary support to the project in the first months). Consequently, we launched a new call, won by Cristina Baião (Master) that is in the project since September 2019. Although in the LIFE-RELICT proposal was foreseen hiring a post-Doc and a Master, we decided to replace the post-Doc for another Master. This option makes possible to extend this hiring longer than expected, which is essential for the implementation of the planned activities. Also, the team has already several PhD members (including project Manager), capable to guide and ensure all project stages, including data analysis. For the reasons explained above, **we also ask EASME for the authorization to replace the 2.5 years' post-doc grant, for a master grant until the end of the project.**

The technical, administrative and financial structure from the UÉvora, gives all the support asked for the other beneficiaries. All documentation is shared between partners using a two shared folders, one for the financial/administrative part, and other for the technical component.

Also, the UÉvora team keeps regular contact with all the beneficiaries. As foreseen, these contacts are mostly made by telephone or video-call. However, we also made regular in-face meetings: two annual meetings between steering committee and in-person meetings involving two or three beneficiaries when necessary/opportune. Within the UÉvora team, at least one monthly formally meeting is held to schedule works and discuss project implementation. Within the other beneficiaries, regular meetings are also taken in order to analyse and define all the tasks related to LIFE-RELICT implementation.

As planned, LIFE-RELICT First Progress Report was sent to EASME in the end of October 2018. This report was preceded by a letter from EASME, in December 2018. The issues raised to Project team in this letter are answered in **ANNEX III. Answer to EASME letter – First Report.**

We have a very collaborative relation with our Project monitor, Dra. Sara Barceló, that has always responded quickly to all our answers. We send her regular progress reports, when requested. In this process the Project Coordination asks all partners for a state of play, which is then compiled and sent to the Project monitor. **All partners have been very available and collaborative in all the project.**
The first visit of our Project monitor, Dra. Sara Barceló, took place in January 2018 (SEIA), with field trip to Margaraça target areas. The second visit comprised two trips: to CICYTEX (Badajoz) in January 31, to check the achievements in plants propagation; and to Monchique in February 6-7, with field trip to respective target areas. First visit was preceded by a letter from EASME, in April 2018, which was answer in previously report. The second visited was also followed by a letter, which **answer** is delivers in **ANNEX IV. Answer to EASME letter – Second visit**.

In relation to the administrative part we also have to mention that there was a change in the administrative structure of UÉvora and the current rector for Research is Prof. António Candeias and not Prof. Paulo Quaresma (who signed all previous institutional documentation for LIFE). Therefore, Prof. Antório Candeias is now the legal representatives of the UÉvora. (Please see **ANNEX V. UÉvora administrative**).

6. Technical part

6.1.Technical progress, per Action

A1. Territory characterization update - Collect and complement project crucial data.

1. Status: This action was considered completed. However, as asked by EASME we are now establishing a convention of 20 years with the landowners.

Foreseen start date: **Oct 2017**	Actual start date: **Oct 2017**
Foreseen end date: **Dec 2018**	Actual (or anticipated) end date: **-**

2. Progress: In relation to the **landowner's long-term commitment letters**, we provided all the documentation in first progress report. However, later, EASME informed us that the letters provided missed the duration of the agreement. Therefore, as suggested by EASME, we are now establishing a convention of 20 years with the landowners, with the help of local authorities (Municipality and Parish council). So far we have collected 23 landowner's signatures (in a total of 56), missing those from owners who live faraway and only return in some festivities **ANNEX A1.1. Landowners convention – provisional document**. We hope to get all subscriptions in 21 of Mars, in a meeting that takes place annually in Casal do Rei village.

Regarding the **territory description**, the biophysical characterization was mainly made by Plan2BeCompetitive company (External Assistance) in collaboration with the UÉvora team. This company delivered the final version of the report "Characterization of Life-Relict Project Areas" in November 12, 2018 (**ANNEX A1.2. Characterization report – biophysical - DELIVERABLE**). As expected, this report contains the descriptions of several biophysical features (soil, climate and bioclimatic position, hydrology, present vegetation, potential vegetation, habitats of community interest, Land use, landscape characterization), of the target areas. Also, it includes several maps respecting land use and habitats of each of the intervention areas. This maps did not exist, but has they were considered essential to Project, were made by the hired company with the revision of UÉvora team. The information obtained from A1 biophysical characterization has been crucial for other project actions, especially for A2, C's, D3. Furthermore, ADRUSE made the socio-economic characterization of Life-Relict Project Areas (**A1.3. Characterization report – socioeconomic - DELIVERABLE**). The results show territories with socioeconomic weaknesses: a declining and aging population; a decrease in land use; low levels of professional qualification; and with serious problems of population and economic attractiveness. This helped us to know better local population and to improve communication strategies/approaches (important mainly to E's actions), for example demonstrating ways to better improve local economy through nature-based tourism.

Based on this information, as well as on other collected so far, the UÉvora team was able to implement a **Geographic Information System** (GIS) that collects all the geographical data of LIFE-RELICT and will be used and constantly updated in the scope of other project actions. All GIS information is presented in **ANNEX A1.4. LIFE-RELICT GIS project - DELIVERABLE**. Other data, non-cartographic, was also collected **LIFE-RELICT database (ANNEX A1.5. LIFE-RELICT database**). The LIFE-RELICT database also have information collected in other project actions (for instance, D1 and D3).

Has referred, in the last report, the **equipment** necessary to carry out this action was purchased by UÉvora: one laptop, one personal computer, one GPS.

3. Problems and delays: Apart from the problems referred in the first progress report (identification of landowners and delays on the contracting process for external assistance), we point out the difficulty in recollect the landowners' signatures, since many of them do not live in the Municipality of Seia, and some are even based in other countries.

4. Next steps: Complete landowner's signatures.

A2. Operational Plan.

1. **Status:** Completed. Executed by ADRUSE in collaboration with all partners.

Foreseen start date: **Oct 2017**	Actual start date: **Oct 2017**
Foreseen end date: **Dec 2018**	Actual (or anticipated) end date: **Dec 2018**

2. Progress: Led by ADRUSE, the OP was finished in December 2018. All partners have collaborated in the process. Several meetings and phone calls were held since November 2017 to Dec 2018. Guidelines and methodologies were defined and interventions discussed in all its components. The report was prepared by ADRUSE with the help of the UÉvora, that was also responsible for all included maps. Several versions of the report were made over time, until final version that was reviewed and accepted by all partner at the end of December (**ANNEX A2.1 Operational Plan - DELIVERABLE**). The OP is structured by intervention areas (Monchique, Margaraça and Estrela) and by respective actions/sub-actions. For each intervention the following parameters were described: location, method/technic and timetable.
All the planning presented in the OP, took into account the following questions:
[1]. The required alterations to the original project, made as a result of 2017 fires in Margaraça (in line with the explanation/proposal already presented in First Progress Report);
[2]. The need to correct the limits of intervention areas according to A1 vegetation and habitats maps. As cartography used during project preparation was out of date, we had to correct intervention areas, based on the detailed maps resulted from Action A1. For instance, the existent map of habitat 5230 was quite different from the detailed one produced in A1. This was done with no alteration of project target areas and without compromising the original Project objectives and deliverables (e.g. area targeted under each Action);
[3] The list of Heliophilous plants (to be controlled) and characteristic species (to be maintained) observed in each territory, during Action D1;
[4.] The necessity of prioritize areas to be targeted within the same action. Therefore, maps present prioritizations, in order to define which areas should be targeted first. This option was made to ensure some planning in non-expected situations, like the ones we faced already (e.g. lack of *Rhododendron ponticum* plants ready to be planted; lack of workers/enterprises (external assistance) that ensure work execution in a given time window).

This report also highlights the necessity to include some measures not referred in the original Project description, to overcome problems observed during Project execution (ex. vegetative propagation of *Rhododendron*). Those changes will be detailed and proposed latter in this report, during respective action explanation.

The OP and all the maps related (including shapefiles) are available to all partner in the Administrative folder shared. Cartography was also included in the GIS project done in A1.

3. Problems and delays:
As explained in previous report, there was a delay in the delivery of A1 action, which data was crucial to the execution of A2. This was a consequence of the required time for the contracting process for external assistance. However, the joint work between LIFE partnership and contracted company made possible to continue A2, even before the final A1 work has been delivered. Furthermore, to complete the report in time, was also important the final team effort to accomplish this goal.

4. Next steps: -

A.3 Evaluating the propagation capacity of *Rhododendron ponticum*.

1. Status: Completed, executed by the UÉvora with punctually help of CICYTEX team.

Foreseen start date: **Oct 2017**	Actual start date: **Oct 2017**
Foreseen end date: **Nov 2018**	Actual (or anticipated) end date: **Oct 2019**

2. Progress: As referred in our last Progress Report, after establishing the study protocol, the 2018 fieldwork has been executed. As planned, first we seek for Rhododendron's seedlings and juveniles inside plots installed under "C" actions. Once no seedlings/juveniles were found inside plots, we decided to seek throughout its potential areas in Monchique LIFE target territories. For each specimen found we register GPRS geopositioning, plant height, length and height of its biggest leave, and local aspect, slop, soil type, % of vascular plant cover, and % of mosses. First results indicated that seminal propagation of Rhododendron is small in Monchique area: only 128 plants detected during first reporting period, clustered in very particular niches (generally facing NW, in semi shadow and in moistly soils). Once seedlings detectability might have been influenced by local vegetation density, in most cases nearly impenetrable, we asked for A3 extension from November 2018 to Mars 2019 (First Progress Report, A3 description). This allowed us to repeat the same procedure after the helophyte vegetation control, planned for the first trimester of 2019 (within "C" actions). However, as explained below, we felt the necessity to extend this action until October 2019.

Therefore, in 2019 we visited the areas already target by C3, where helophyte shrubs were removed. Again, we searched for Rhododendron's seedlings/juveniles, inside and outside plots, first in Mars and then in May and July, with little success. We concluded that the first year results hadn't been influenced by the difficulty to detect small seedlings inside the dense vegetation, but for its real scarcity. Nevertheless, we were able to detect new individuals since the last reporting period, mainly concentrated in one particular area (syenite slope). Overall the maximum number of seedlings/juveniles was observed in January 2019, when we register 231 individuals.

The final results show that in LIFE target areas, Rhododendron's seminal propagation is present in the following niche characteristics: 745-760 meters high; slopes between 35-45%; facing W-NW; in syenite rocks; water with Ph~6.3 and condutivity~139µS/cm; permanent (or almost) moistly soils; plant cover less than 20% and less than a meter away from a rhododendron adult plant. Both water pH and conductivity measurement were not foreseen, but were executed by the UÉvora with no costs associated. *Rhododendron* is a siliceous plant and we wanted to make sure that water carbonate content was not influencing seedling survivor and/or plant installation.

During 2019, we also monitor throughout the year (January, July and October), all the seedlings/juveniles within the two most abundant clusters, present in two rocky environments with permanent moisture. The goal was to assess the age structure and evolution of seedlings/juveniles, detect mortality, as well as limiting factors to population maintenance and expansion. This study was done, even not foreseen, because we believe that understanding species behaviour in nature will give us tolls to overcome potential (and some already detected) problems in C1 action (Rhododendron's propagation), C3 and C5 (Rhododendron's plantation). This monitoring indicated a decrease in younger individuals (plants with height <5 cm) from January to October and a reduction in the number of individuals as their size increases.

Therefore, from A3 results **we can conclude that**: [1] Sexual recruitment of *Rhododendron ponticum* individuals is **virtually non-existent** in Project areas, since germination is scarce and, when it occurs, the vast majority of plants die in an early stage of its development; [2] Existing seminal regeneration is restricted to particular conditions, especially in terms of shade and humidity (areas with low shrub coverage, with few hours of direct sun exposure and humidity all year round); [3] When appropriate conditions exist, a high number of seedlings can be observed; [4] However, seedlings appear in ecological conditions that do not allow its long-term survival, so most are condemned within a few years. The **contributions** of this study to LIFE-RELCIT are of **major interest**, once will allow us to adopt strategies to maximize the success of C1, C3 and C5 actions. This major contributions are: [1] species germination occurs in saturated water environment; [2] Plantations to be done under actions C3 and C5 can have low success due to hydric limitations-so plants should have a well-developed root system and solutions must be found to increase their water availability (watering, application of absorbent polymers,

selection of shaded locations); [3] Due to this results project should also complement plantations with methods of increasing vegetative regeneration (especially by "dipping" – not foreseen in LIFE project).

All the produced A3 information was collected in the report "Natural regeneration of *Rhododendron ponticum* subsp. *baeticum* - Assessment in Life-Relict Project Areas" present in **ANNEX A3.1 – *Rhododendron* Regeneration Study – DELIVERABLE**

3. Problems and delays: Although Project foresee the execution of A3 through External Assistance, we decided to do it with the UÉvora staff, once the expected time required for the legal hiring process would put at risk its execution, because field work would have to be carried out since the beginning of 2018. Ultimately, this option turned out a positive aspect, as it allowed us to adjust the methodology over time, according to the results/achievements. From the implementation point of view, one of our major problem was the difficulty to detect these small seedlings in a place covered by dense, high, and spiny shrubs. For this reason, we have asked for an action extension from November 2018 to Mars 2019, to repeat the study after "C" interventions. However, as explained above, we felt the necessity to extend this action until October 2019, in order to conclude works. Also, in all this process, we foreseen to measure soil water content in seedlings location, with a **soil moisture sensor** (to be purchased by the project). The "GrandBeing 4" device was bought in the beginning of 2019 (purchased without LIFE support), recommended by Francisco Vasquez (CICYTEX) and a soil professor from the UÉvora (**ANNEX A3.2 – soil moisture sensor photos**). However, this device has been shown to be inaccurate because it was no able to correctly evaluated water content in a very thin soil area. This situation was overcome in two different ways: (1) we collected soil samples, that we weigh before and after drying, obtaining the soil water content (results are in the **ANNEX A3.1 – *Rhododendron* Regeneration Study – DELIVERABLE**); (2) we also monitored this area and noted that soil is always dry, even during summer. This process allowed us to answer to the original question "*how long soil dries during the year?*", without using a soil moisture sensor.

4. Next steps: -

C.1. Collection and propagation of plant material.

1. Status: This action is in progress and been developed by CICYTEX, with the help of the UÉvora, CMSeia and CMMon. The overall progress within each task of C1 action is present in Table 1.

Foreseen start date: **Oct 2017** Actual start date: **Oct 2017**
Foreseen end date: **Dec 2021** Actual (or anticipated) end date: **Dec 2021**

Table 1. Overall progress within each task of C1 action.

TASKS (2017-2021)	Foreseen start	Actual start	Foreseen end	Actual end
Seed collection	Oct 2017	Oct 2017	Dec 2020	Dec 2020
Seed conservation	Dec 2018	Dec 2018	Oct 2021	Oct 2021
Seed germination	Dec 2017	Dec 2017	May 2021	May 2021
Stem Cuttings	Dec 2017	Dec 2017	Nov 2020	Nov 2020
Stem Cuttings rooting	Jan 2018	Feb 2018	Feb 2021	Feb 2021
Plant development	Feb 2018	Fev 2018	Sep 2021	Sep 2021
Plant achievement	Sep 2018	Sep 2018	Nov 2021	Nov 2021
Dissemination	May 2019	Dec 2018	Dec 2021	Dec 2021

2. Progress: Until the end of 2019 the following tasks have been implemented: [1] Request ICNF license for seed recollection in Nature2000 areas; [2] Seed collection; [3] Seed conservation; [4] Seed germination; [5] Picking of cuttings; Rooting of cuttings; [6] Development of plants; [7] Delivery of plants to partners; [8] Improving species multiplication methodology; [9] and multiplication manual writing.

The first step for C1 implementation, was to obtain ICNF licenses for recollection and detection of plant material. As detected by EASME, there was an error with the 2018 licenses, which referred a recollection limited to 20 seed for each species. This situation was corrected in the beginning of 2019 and we are now allowed to recollect 20 seeds by plant (not species) (**ANNEX C1.1. ICNF 2019 licenses**). The recollection areas and used methods were defined by CICYTEX with the help of UÉvora, CMSeia and CMMon (**ANNEX C1.2. Seed recollection details, ANNEX C1.3. Plant propagation details**. Seed recollection was started in October 2017 and is now in its third campaign (2017/18; 2018/19; 2019/20). Were obtained by CICYTEX, with some help from UÉvora and CMSeia help), as close as possible from the area where will be planted. The estimate collected seeds are found in Table 2 (for more details, please see **ANNEX C1.2. Seed recollection details**). We collected seeds from all foreseen species, with special attention to *Rhododendron*, *Prunus* and *Quercus*. For some species, we also collected cuttings, to ensure we had plants with adequate development to install in the field and overcome some germination issues observed meanwhile. The number of cuttings collected for each species is present in ***Table 2***. We should note that, due to initial problems with seminal regeneration and plant growth of Rhododendron, our strategy was to invest also in vegetative production of this species, with the collection of a considerable number of cuttings and the search for the best propagation methodology (Table 3).

The only species referred in Project that we didn't collect was *Acer monspessulanus*. The reference to this species in the Project is a mistake, once it was foreseen for Açor areas were no plantation are planned. Furthermore, there were no seeds in the plants visited in Margaraça in 2017/18. Complementarily, two additional species have been collected: *Quercus occidentalis* (250 seeds), which A1 and D1 proved to be a part of local forest communities; and *Crataegus monogyna* (100 seeds), once D3 results suggested that it's an important species for Monchique's lichens diversity.

Table 2. Seeds and cuttings collected in LIFE-RELICT until December 2019.

SPECIES	Seeds collected 2017	Seeds collected 2018	Seeds collected 2019	TOTAL seminal	Cuttings collected 2017	Cuttings collected 2018	Cuttings collected 2019	TOTAL cuttings
Arbutus unedo	-	530	620	1150	-	70	-	70
Phyllirea angustifolia	-	210	450	660	-	60	-	60
Phyllirea media	-	-	380	380	-	40	-	40
Prunus lusitanica	1782	5600	3500	10882	-	80	-	80
Quercus broteroana	300	1970	1100	3370	-	-	-	0
Quercus canariensis	400	1800	1500	3700	-	-	-	0
Quercus estremadurensis	100	32	120	252	-	-	-	0
Quercus marianica	250	750	250	1320	-	-	-	0
Quercus pyrenaica	250	610	550	1410	-	-	-	0
Rhododendron ponticum	3500	3400	2500	6900	-	200	450	650
Rhamnus alaternus	-	140	320	460	-	-	-	0
Viburnum tinus	-	530	400	930	-	50	-	50
TOTAL	**6652**	**15572**	**9190**	**31414**	**0**	**285**	**500**	**950**

Also, CICYTEX was able to preserve in a germplasm bank (Junta de Extremadura), the following seeds: *Prunus lusitanica* (6 locations); *Rhododendron ponticum* (3 locations).

The number of produced plants gathered in CICYTEX facilities is present in Table 3. In July 2019 there were 13342 plants. Since October 2019, CICYTEX has been delivering plants to CMSeia and CMMonc for future plantations. Those are being temporarily stored in the respective municipal nurseries. In total, at the end of 2019, **6747 plants were delivered (close to 20% of the plants foreseen in Project)**: Seia – *Prunus lusitanica* (2890); *Quercus broteroana* (1260); *Viburnum tinus* (385); Monchique – *Rhododendron ponticum* (456); *Quercus canariensis* (1126); *Quercus marianica* (602) e *Phillyrea angustifolia* (27). In December 2019, after delivering, CICYTEX had in respective facilities 3363 plants, able to be delivered in the nest months. The encouraging results obtained in 2019, make it possible to expect that two-thirds of the production of plants foreseen in the Project will be achieved in 2020.

Also, as some of these species didn't have published methodologies for their multiplication, CICYTEX used the acquired knowledge to establish the respective multiplication protocol. For example, *Rhododendron ponticum* subsp. *baeticum* doesn't have any published manual about vegetative multiplication of tall trees or stakes and the methods that are commonly used are of vegetative cultivation (for callus, organisms such as flowers) always under cultivation medium. With the LIFE experience, CICYTEX was able to develop a new methodology of vegetative multiplication, that facilitates the obtaining of cuttings rooted in less than 3 months and, consequently, the possibility of obtaining plants for conservation purposes in (7-9)12-14 months.

3. Problems and delays: So far, we had a set of problems with C1 execution. First, as referred in first Progress Report, **ICNF permits only arrived in February 2018**. However, we were able to start seed collection in October 2017, through direct negotiation with ICNF. Second, we faced **problems with seed germination of *Prunus lusitanica*, *Arbutus unedo*, *Phillyrea angustifolia* and *Viburnum tinus***. For *Prunus lusitanica*, after the first campaign, we realized that for seeds collected directly from the tree, the germination percentage did not exceed 0.5%, but best results were obtained with seeds collected directly from the soil, with percentages exceeding 30%. A similar behavior was observed in seeds from *Arbutus unedo*, *Phillyrea angustifolia* and *Viburnum tinus*. With this information we were able to correct this aspect the following campaigns, and so, this species seeds are being collected only from soil.

Table 3. Plants present in CICYTEX in July (before plant distribution) and December 2019 (after plant distribution).

Especies	Plants seminal Jul 2019	Plants seminal Dec 2019	Plants cuttings Jul 2019	Plants Cuttings Dec 2019
Arbutus unedo	50	20	15	10
Phyllirea angustifolia	-	-	75	55
Phyllirea media	52	25	90	10
Prunus lusitanica	4500	1000	45	45
Quercus broteroana	1850	550	-	-
Quercus canariensis	1810	600	-	-
Quercus estremadurensis	20	20	-	-
Quercus marianica	645	10	-	-
Quercus pyrenaica	448	420	-	-
Rhododendron ponticum	3440	450	21	100
Rhamnus alaternus	17	17	6	6
Viburnum tinus	610	120	95	40
TOTAL	**13342**	**3232**	**347**	**266**

In relation to the **rooting of cuttings**, the first tests carried out in *Arbutus unedo*, *Phillyrea angustifolia* and *Viburnum tinus*, **showed a decrease in the degree of rooting in the stems with more than one year,** so that the best stakes must proceed of branches of the last year. This aspect was correct in the 2018-2019 campaign.

Another important issue that we had to deal with is related to **plant production of *Rhododendron* from seeds**. First results showed **low percentage of survival** during 2018-2019(<5%). However new approaches have been implemented and last result obtain during 2019 showed an increase of roots produce to 72% (24%-72% for different origins and methods variations). However, we continue to observe a **small development** of plants produced, that still **too small** and may be too sensitive to be planted. **In this sense our strategy has been to postpone plantations of this species as much as possible, in order to ensure their maximum development and maximum survival after planting.**

In relation to plant development, no other major problems have been observed. There have been occasional limitations in some species due to excessive irrigation, as in *Prunus lusitanica*, and in others because of outside temperature excess, like *Quercus broteroana*. In all cases the problem has been coped and developments have been optimal. Currently we think we have solved the majority of the problems found and we point out especially the increase of *Arbutus*, *Phillyrea* and *Rhamnus* germination percentage (>60%), together with survival percentage of *Prunus* (>90%).

4. Next steps: We intend to develop the plants multiplied vegetatively during a period of 6-10 months, in order to have a root cell suitable for installation in the field during 2020 (for Rhododendron). We planned to continue the recollection campaign and transport existent plants to target areas.

C.2. Improving the conservation state of *Prunus lusitanica* areas.

1. Status: *In Progress*. In execution by CMSeia with the collaboration of the UÉvora. The Overall progress within each sub-action is present in Table 4.

Foreseen start date: **Jan 2018** Actual start date: **Jan 2018**
Foreseen end date: **Mar 2022** Actual (or anticipated) end date: **Mar 2022**

Table 4. Overall progress within each sub-action of C2 action.

* we didn't mention the foreseen start of C2.1 in the project because we knew that it will depend on the weather

Sub-actions	Foreseen start	Actual start	Foreseen end	Actual end
C2.1	-*	Nov 2018	Dec 2018	Dec 2019
C2.2	Oct 2018	Nov 2019	Mar 2022	-
C2.3	Oct 2018	-	Mar 2022	-

2. Progress:

***C2.1 - Recover the feed flows of Prunus lusitanica* areas**

Finished. In Estrela-Cabeça area, "**levada" recovery in 1.2 km was completed** on January 31, 2019 (Figure 1 and Figure 2). Works were executed by CMSeia own staff. However, in the fall of 2019 several ruptures were identified due to the levada having been abandoned for several years, and CMSeia had to perform punctual repairs in November and December, 2019. Currently, water flows along the "levada". All of this labor was very difficult to perform and very demanding for CMSeia workers. Besides being a totally manual work, that involved the transport of sand and stony material by hand, the conditions of the relief, very steep and with a risk of collapse, represented a constant danger for worker falling in the cliff. Additional information is present in **ANNEX C2.1. Recover of feed flows.**

We highlight a **complementary action**: encouraged by the LIFE project, CMSeia with the help of local Parish Council, restored the "levada" outside the LIFE area (same waterway) in an extension of about 500 m (with no extra costs for LIFE Project). Today is completely recovered from its beginning to a mill, where the water is redirected to river. The "levada" is very important to *Prunus lusitanica* habitat, but it is also part of the local heritage, so the resident population welcome this LIFE intervention.

Figure 1. Pré-intervention photographs of "levada".

Figure 2. Post-intervention photographs of "Levada".

C2.2- Selective vegetation control

In Progress. Globally we have executed, so far, 4.8 ha from the 8 ha foreseen in Project (**60% executed**). As referred in previous report, C2.2 was started by CMSeia in **Margaraça** areas, in June 2018, before the foreseen start date. The decision was made in order to reduce local fire risk and associate the work execution with the 1st technical journey (Action E4), so that the participants could see the results of management techniques. The action was executed by the CMSeia (External Assistance) follow-up by the UÉvora. It comprised the selective cut of the heliophilous vegetation in the unburnt site of the project area, in a total surface of 2 ha.

In **Estrela**, for reasons related to worker availability we had to prioritize interventions. Because of this, C2 was started in Estrela-Cabeça. In C2.2 all heliophilous shrub vegetation, not characteristic of the 5230 habitat, is been removed, namely the herbaceous species with the greatest risk of fire, such as ferns (*Pteridium aquilinum*), as well as other species referred in the OP (A2). CMSeia, opened the tender procedure on September 24, 2019, for the acquisition of Silviculture services from service provider. Works are now being executed by an external assistance from "João Lopes da Silva Lda." Company (local), with the technical monitoring of the CMSeia and the UÉvora. Up to now 2.8 ha of the expected 3.8 ha have been executed in Estrela-Cabeça. The scheduled date for the beginning of works was October, but started only on November 25th. The deadline fixed by CMSeia was 120 days. According to the schedule proposed by the company, the execution of the works is proceeding as stipulated. The deadline will be March 25, 2020. Work is time-consuming in Estrela, due to the very difficult conditions of the terrain

There are no complementary actions outside LIFE to report. Additional information on C2.2 is present in **ANNEX C2.2. Recover *Prunus* habitat.**

C2.3 - Improvement of habitat structure through plantations

Not started. Plantations had not been initiated in December 2019. As explained in the OP (A2), due to the size of the propagated plants, the team considered to be more prudent to proceed with plantations in the winter of 2019/20, than in 2018/20 as foreseen in Project.

To note: During the execution of actions A1 and D1, it was very clear that in Estrela C2 areas there were several non-invasive alien species (Pine and Eucalyptus, please see D1 report for more details, pag.) that should be removed in order to naturalize this habitat and reduce the risk of fire. In this sense CMSeia is now proceeding with this elimination, on the same basis described in C4. For this reason, plantations have been postponed because all exotic species will have to be removed first (which has not yet been completed) to ensure that the plantations will not be affected. However, it is expected to proceed with this plantations, still this winter.

3. Problems and delays:
The beginning of **C2.1** was delayed throughout 2018 especially due to working conditions, namely a steep slope area where it was impossible to work in adverse weather conditions (intense rainfall in the spring and autumn of 2018). Also, "levada" structure was very damaged, with many leaks/infiltrations, with fallen walls and very silted, making it necessary to transport the material resulting from the silting up with resources using manual means due to the lack of access.
In relation to **C2.2 and C2.3**, we also point out the lack of specialized companies available for forest works. As a consequence of the measures taken at a national level related to the protection of rural areas against forest fires, there is currently a widespread lack of companies available to carry this type of works requested by LIFE for C2, C4 and C7. This was clear in the first tender that CMSeia launched for the execution this actions in Seia-Cabeça (in august 2019), when no specialized company applied. In consequence, CMSeia had to lunch a new tender with increased budget and longer implementation period.
Another issue, relates to the storms observed in the end of 2019, which led to the fall and degradation of some native species in this area.
Overall, we also emphasize the difficulty of carrying out these works in a mountain area with steep slope, harsh climate and difficult to progress due to vegetation density.

4. Next steps: Works already started in Seia-Cabeça will be finished until March (2020), including plantations during next months. CMSeia has already launched in febuary 7th a new tender procedure to execute the works is the other areas of Estrela-Casal do Rei and Estrela-Fontão. Works will start in Mars-April

C.3. Improving the conservation state of *Rhododendron ponticum* areas.

1. Status: *In progress*. Lead by CMMonc with the collaboration of UÉvora. The Overall progress within each sub-action is present in Table 5.

Foreseen start date: **Oct 2018** Actual start date: **Oct 2018**
Foreseen end date: **Mar 2022** Actual (or anticipated) end date: **Mar 2022**

Table 5. Overall progress within each sub-action of C3 action.

Sub-actions	Foreseen start	Actual start	Foreseen end	Actual end
C3.1	Oct 2018	Oct 2018	Mar 2022	-
C3.2	Oct 2018	-	Mar 2022	-

2. Progress: C3.1 sub-action was done. However, due to the difficulties in the production of *Rhododendron ponticum*, C3.2 have been delayed, but will be started in the beginning of 2020.

C3.1 - Selective control of vegetation

In progress. Selective control was carried out in the foreseen 3 hectares of Rhododendron. The work started in October 2018 and was done by the CMMoc own staff. The first phase of heliophilous species removal was completed in Mars (**ANNEX C3.1. Recover *Rhododendron* habitat**). However, as there was a significant growth of Brambles, interventions were repeated in June in order to prevent potential fire propagation.

C3.2 - Improvement of habitat structure through plantations

Not Started. However, in February 2019 we made a test with 20 plants of Rhododendron with vegetative origin. All plants ended up dying even with periodic watering, provided by CMMon. In this regard, we should note that the spring of 2019 was very dry and that rhododendron plants had little developed roots (a situation that has already been corrected/improved by CICYTEX).

3. Problems and delays: As exposed in previous report, *Rhododendron ponticum* have a small growth and in the end of 2019, plants were still too small to be planted this year. In these since we think we must delay species plantation as much as possible, in order to enhance installation success. **In this sense, we asked EASME to postpone the planting of this species until the fall of 2020,** so that the plants have the maximum size and, at the same time, we will have one year to monitor them during the Project's lifetime. Regarding plants of vegetative origin, despite the encouraging results in relation to rooting, we believe that planting is also better as late as possible. If they agree, plantations of other species characteristic of the habitat will be carried out during the winter of 2019/20. In order to overcome this issues, we have also implemented, throughout C3 intervention area, Rhododendron vegetative propagation by **"diving".** This species, don't have any special structures that allow it to multiply vegetatively. However, in nature, when its branches are covered with soil they can take root and ultimately give way to an independent individual, genetically equal to its parent. In this sense, "diving" was carried out in C3 area in order to increase species occurrence. The monitoring of this plants, allows us to confirm the success of this operation (plants still alive). Also, following the recommendations of A3, CMSeia recovered the natural drainage of the rainwater along the road, which had been directed to the edges, reducing the natural infiltration and, consequently, the water availability of Rhododendron. This was a simple intervention in which CMMonc did not associate expenses to LIFE.

4. Next steps: Proceed with plantations of characteristic species (except Rhododendron) until the end of present winter. Rhododendron species will be planted in the end of 2020.

C.4. Increase *Prunus lusitanica* areas.

1. Status: In Progress. In execution by CMSeia with the scientific collaboration of the UÉvora. The overall progress within each sub-action is present in Table 6.

Foreseen start date: **Oct 2018** Actual start date: **Nov 2019**
Foreseen end date: **Mar 2022** Actual (or anticipated) end date: **Mar 2022**

Table 6. Overall progress within each sub-action of C2 action.
* we didn't mention the foreseen start in the project

Sub-actions	Foreseen start	Actual start	Foreseen end	Actual end
C4.1	Oct 2018	Nov 2019	Fev 2022	-
C4.2	-*	-	Mar 2022	-
C3.3	-*	Nov 2019	Mar 2022	-

2. Progress:

C4.1- Selective vegetation control

In Progress. Globally we have executed 3.2 ha from the 10.5 ha foreseen in Project (**30% executed**, **ANNEX C4.1. C4 intervention details**. So far, for the same reasons explained in C2 description (see above), C4.1 is only been implemented in Estrela-Cabeça. Procedures are the ones specified in the OP and already referred in C2 description. A total of 8 ha of potential *Prunus lusitanica* are now being intervened, through selective control of spontaneous vegetation and control of non-invasive exotic species. Works started on 25 November 2019. CMSeia already launched the tender for the execution of the remaining areas (Estrela-Casal do Rei and Estrela-Fontão).

C4.2 - Improvement of habitat structure through plantations

Not started. Plantations had not yet started in December 2019. The motives are the ones explained in C2 (this sub-ation can only be executed after C4.1 and C4.3 implementations because its procedures can damage new plants) and so plantations had not been initiated in December 2019. However, they are scheduled for the beginning of 2020, being dependent on C4.3 implementation.

C4.3 - Control of non-invasive alien species

In Progress. Potential areas of *Prunus lusitanica* have in most cases been converted to Pine forests, so their restoration implies, necessarily, Pine removal as well as some eucalyptus. This species competes with *Prunus* and also increase local risk of fire. This sub-action had not started in December 2019. Additional information: C4.3 was just started in February 2020 and will be finished the end of April, being implemented in Seia-Cabeça area by the same contracted company. We are removing all exotic tree in all C4 area, especially Wild pine (*Pinus pinaster*) and eucalyptus (*Eucalyptus globulus*), in order to restore natural habitat, improve the conservation status of the tree grove and reduce the risk of fire inside *Prunus lusitanica* areas. The procedures adopted are the ones described in LIFE-RELICT Project: the wood material with economic value is given to land-owners (who in this particular case, reverted its value to the local parish council). In turn, the material with no commercial value is crushed and left in place, to increase organic matter and reduce the risk of fire. Since this process requires the entry of machines into the intervention areas, all necessary measures are being taken in order to minimize their impact at ground level, namely through the use of existing paths and trails.

3. Problems and delays: We had the same problems and delays referred for C2. Also the removal of large trees, in a place where there is soil and some species that we want to protect, has been a great challenge. However, CMSeia together with UÉvora, have followed the work and done everything to minimize the impacts of this process.

4. Next steps: In Seia-Cabeça works will be finished until Mars, including plantations during next months. CMSeia has already lunch a new tender to execute C4 in Casal do Rei and Fontão. Works will start in Mars-April

C.5. Increase *Rhododendron ponticum* areas

1. Status: *not started*

Foreseen start date: **Oct 2018**	Actual start date: **-**
Foreseen end date: **Mar 2022**	Actual (or anticipated) end date: **Mar 2022**

2. Progress: -

3. Problems and delays: This action was not started because of the lack of Rhododendron plants in conditions to be planted.

4. Next steps: Works will start in the second semester of 2020, once we are expecting to promote plantations in the fall/winter of 2020.

C.6. Control of invasive alien species

1. Status: *In Progress*. In execution by CMSeia with the collaboration of the UÉvora (scientific backup).

Foreseen start date: **Jan 2018** Actual start date: **Jul 2018**
Foreseen end date: **Mar 2022** Actual (or anticipated) end date: **-**

2. Progress:

In July 2018, CMSeia made a first Acacea debarking intervention in Seia-Cabeça. However, it becomes clear that the access to intervention area was too difficult and teams should wait for the access foreseen in C7.1.

Phase one has started on September 25, 2019, and is expected to be completed on March 2020. It has been executed by CMSeia own staff (Please see **ANNEX C6. Control of invasive alien species**). *Hakea sericea* was present in Seia-Cabeça, inside the 4 hectares of C6 intervention area, in dispersed, dense and impenetrable nuclei within the pine forest. Plants were all cut (**100% executed**) but contrary to what was mentioned in the project, we don't expected plants to dry for a year before being burned. This option was taken since we now know that in this species, all seeds produced during the life of the plant are stored in the woody follicles that open only after the death of the plant, for example by cut or fire (Richardson, 1987). Therefore, plants were all cut and then joined in few cores and burned, once this procedure accelerates the opening of the follicles and germination (Richardson, 1987), reducing its dispersion over a greater distance (what will be expected if we left the plants to dry).

For *Acacea dealbata*, during the execution of action A1 it was possible to assess it real occurrence area within Seia-Cabeça: in the 4ha of C6 area, species occurs only occasionally, but there are two main clusters (one with older and larger specimens with 1.05 ha, and other with small plants with 0.51 ha). Two different interventions were carried out in this two main plots. In the one with larger specimens, we used physical control by debark. Until December 2019, 0.344 ha of the 1.05 hectares foreseen were done by CMSeia staff. In the other plot, with smaller plants, not suitable for debarking, physical control by cutting was carried out in a total of 0.51 ha. This area will subsequently be subject to extensive fire to stimulate regeneration and eliminate the seed bank in the superficial layers of the soil. This will be done by the end of May, after drying and when the conditions are suitable for its execution. Overall, 0.85 ha from the total 1.56 ha of *Acacia* nucleus were already executed in December 2019 (**54% executed**).

In relation to interventions made in July 2018, specimens in 2019 were already dead (see photos in **ANNEX C6. Control of invasive alien species)**

3. Problems and delays: The first phase in the control of alien invasive species had as foreseen start date January of 2018 and foreseen end date June of 2018. As explained in previous report, due to constant delays related to the C7.1 sub-action, we were unable to establish a proper access to C6 area. Also, in 2019 C6 works are being delayed due to the lack of CMSeia staff, who have been deployed to fight fires. In terms of constraints, we also make note of the extreme difficulty of the Acacia debarking. Typically, very time consuming, this labour is even more difficult here due to the steep slope, the characteristic climatic conditions of a mountain area and the high density of acacia trees, many of them quite small.

4. Next steps: Finished first phase until Mars and beginning phase II, if necessary.

C7 - Reducing the risk of fire

1. Status: *In progress.* Executed by CMSeia and CMMon, with the scientific support of the UÉvora. The Overall progress within each sub-action is present in Table 7.

Foreseen start date: **Jan 2018** Actual start date: **Apr 2018**
Foreseen end date: **Mar 2022** Actual (or anticipated) end date: **Mar 2022**

Table 7. Overall progress within each sub-action of C7 action.

Sub-actions	Foreseen start	Actual start	Foreseen end	Actual end
C7.1	Jan 2018	Oct 2018	Dec 2018	-
C7.2	Oct 2018	Apr 2018	Mar 2022	-
C7.3	Oct 2018	-	Mar 2022	-
C7.4	Oct 2018	-	Mar 2022	-
C7.5	Oct 2018	-	Mar 2022	-

2. Progress:

C7.1 - Recovery and cleaning of access roads in the study area

In progress. Globally 2km of access roads, from the 3km foreseen in Project, have been restored (**executed 66%**). Specifically, 2 km of paths already existent in Estrela-Cabeça were reestablished by CMSeia workers (**ANNEX C7.1. Recovery and cleaning of access roads**). This recovery has been essential for the implementation of all management actions (C2, C4, C6 and C7) and will be a good support structures for the future forest fires prevention/extinction. The remaining 1km of paths from Estrela-Casal do Rei will be executed before C2, C4 and C7 implementation. Given that the receipt of proposals to execute C2, C4 and C7 in this territory ends on February 20, we estimate that the path in question will be executed during the first half of March 2020 (the contracted company will restore the road).

C7.2 - Selective control of vegetation.

In progress. This sub-action was foreseen to start just in October 2018, but it was started in Abril 2018 in Açor-Complexo da Margaraça. This action is foreseen for the three target territories (Estrela, Açor and Monchique) and globally has been implemented as referred below (please also see **ANNEX C7.2. Reducing fire risk - Selective control**):

Estrela: In Estrela territories, works started and are been implemented in Seia-Cabeça, for the reasons and with the same methodologies and stakeholders explained before in C2.2 descriptions. So far, at least 5 ha have been executed from the 10 ha foreseen in the Project for Estrela areas (more than **50% executed**).

Açor: As referred in previous report, works were done in 1.8 ha of Margaraça (from the 13,6 ha foreseen, **13% execution**). The intervention, comprised cutting of the burnt trees and shrubs and the creation of cords according to the contour lines, with the aim of reducing erosion and protect soil. This intervention was done to promote rapid plant growth and regeneration, in order to indorse rapid forest grow (creation of native forests to protect *Prunus lusitanica* remaining areas against fire) and protect all the area from soil erosion. Please see last Progress Report for details. After fire all the area experienced the rapid growth of heliophilous shrub vegetation. In this sense, CMSeia expects to carry out, already this year, C7.2 interventions in the remaining area in accordance with what is stipulated for action C7 in LIFE Project and OP.

Monchique: In Monchique-Cruz da Foia and Monchique-Vale Largo C7.2 was executed by the CMMon own staff in the whole foreseen area (**100% executed**). The works started in November 2018 and were finished in June 2019. As planned, a selective cut was made, with the removal of heliophilous species (only the ones not characteristics of habitats 5230 and 9230), using light machinery. However, in February 2019 heavy machinery (a tractor) was used only next to the national road, in places without characteristic spices and whenever the slope allowed (in about 0.55 ha). This was done with urgency due to legal imposition, for the passage of an important bicycle race (Algarve Tour, stage Almodovar/Alto da Foia, 21/02/2019).

We highlight a **complementary action**: in Açor-Complexo da Margaraça, ICNF has replicated LIFE-RELICT interventions made in C7.2 in about 6 ha. Those have been done in accordance with LIFE already implemented procedures in contiguous spaces to the project intervention areas (Please see photos present in **ANNEX C7.2. Reducing fire risk - Selective control**).

C7.3 - Plantations

Not started. This sub-action it hasn't been done yet in both territories (Estrela or Monchique), because C7.2 and C7.4 had to be implemented first and plants had to be ready to be planted. In both cases works will start until the end of Mars.

We highlight a **complementary action**: after the selective cutting we were able to confirm that most of the C7 areas of Monchique were very degraded and didn't have plants characteristics of evolved vegetation. Thus, in areas where plantations were not planned in LIFE-RELICT, CMMon made an effort to find entities to sponsor new plantations. Therefore, in November 2019 offered forest plants (*Quercus suber* and *Arbutus unedo*) were planted in order to accelerate ecological progression and reduce the risk of fire in the medium to long term. In total, 1.84 ha were planted in Monchique-Vale Largo and 10.10 ha in Monchique-Cruz da Foia (**executed 11.94 ha**). Plantation carried out by volunteers, with the support of municipal teams. This intervention had no cost to LIFE, but value and enhance respective results. Please see **ANNEX C7.3. Plantations made by sponsors.**

C7.4 - Control of non-invasive alien species

In Estrela, the surrounding areas of *Prunus lusitanica* were, in most cases, converted to Pine forests, which greatly increases the risk of fire throughout this intervention territory. In this sense, Pine and Eucalyptus (the vast majority are pines) are been removed from Estrela-Cabeça once, as explained in C2, works in Estrela have started in this area. Its implementation has been carried out by CMSeia through a contracted company. Work started in November 2019 and so far 1,42 ha have been executed (**14% executed**). This sub-action is expected to be completed on March 25.

In Monchique, in C7 areas the presence of Eucalyptus forests greatly increased the risk of fire in the entire LIFE area. Therefore, has foreseen, in December 2019, the cutting of non-invasive alien species had already been carried out in the entire C7 area (**100% executed**). To prevent regeneration by eucalyptus stump, the use of an adze was planned, which will break the stump into several fragments (avoiding the use of quimics). However, this technique is not recommended when the soil is very humid. It turns out that between November and the beginning of January the rainfall on the site was constant, which using this technique would promote more root pulling (and therefore greater erosion) instead of the intended fragmentation. At the moment, the soil is getting less soaked, and the exploitation leftovers (eucalyptus branch) are drier, which means greater security for workers. It is estimated that by the end of March this work will be finished.

For more details, please see **ANNEX C7.4. Control of non-invasive alien species in LIFE Areas**

C7.5 - Chestnut forest improvement

In Monchique, in the existing chestnut forest, (Monchique-Cruz da Foia), selective management of the vegetation cover was carried out to improve the structure of this Habitat, in order to increase the resilience to forest fires. This sub-action was made by CMMonc, using its own means, in close articulation with the

UÉvora. As foreseen, a total of 1.8 ha was executed (**90% executed**). Please see also **ANNEX C7.5. Chestnut forest improvement.**

3. Problems and delays: The recovery and cleaning of trails in Estrela (sub-action C7.1) had as foreseen start date January of 2018 and foreseen end date December of 2018. However, as explained in detail in last progress report, due to some constraints, most of them related with legislation/rules adopted after the fires occurred in 2017, this was not possible to do. However, this intervention has started in October 2018. In Estrela, we faced a set of problems already described in detail in C2 action (lack of specialized companies available for forest works, a rugged relief linked to adverse weather conditions which limit the progress of work, lack of plants suitable for plantation in 2018/19).

4. Next steps: In Estrela C7 will be finished in Estrela-Cabeça, including plantations, until the end of Mars. In the other Estrela territories, works will start as soon as possible, depending on the result of the tender already launched by CMSeia. In **Monchique** plantations will be done until the end of the present winter.

D1. Monitoring Conservation Actions

1. Status: This action is in progress and has been developed as planned.

Foreseen start date: **Jan 2018** Actual start date: **Jan 2018**
Foreseen end date: **Jun 2022** Actual (or anticipated) end date: **Jun 2022**

2. Progress: Action D1 is divided in 5 sections that expect to monitor the main objectives of the projected Conservation Actions. Except for one of this sections (Section I - Monitoring and evaluation of the production of plants –Action C1), the monitoring was planned to be done through the use of permanent transects installed in 2018, before the execution of the Conservation Actions.

Section I - Monitoring Action C1.

Since the beginning of the project, we have been following the seed germination rate and plant survival rate of the propagation material (seeds and cuttings) collect in C1. This work is being developed by CICYTEX, coordinated by Francisco Vasquez.

In the 2017/18 campaign, the germination success was high for the majority of the seeds collected (Table 8). However, we had problems with the germination of *Prunus lusitanica*, like explained before: a big part of the seeds was collected directly from the tree, and for those the germination percentage did not exceed 0.5%; the best results were obtained with seeds collected directly from the soil, with percentages exceeding 30%. In relation to cuttings, the success was lower (Table 9). In this particular case *Viburnum tinus* was the most successful species. Rhododendron germination, that was low in the end of 2018, it was improved with a change in temperature and humidity conditions (reduced the humidity up to 75% and the temperature was maintained at 24 ° C).

The main problems associated to germinations process were solvent with variations in the pre-germination process of the seed, such as in *Phillyrea* and *Rhamnus* taxa, during the germination cycles of temperature such as *Quercus estremadurensis* or the stratification seeds in *Prunus lusitanicus*.

Table 8. Main results from C1 monitoring since Project beginning.

Species	Germination rate (%) Oct2018	Survival rate (%) Oct2018	Germination rate (%) Dec2018	Survival rate (%) Dec2018	Germination rate (%) Dec2019	Survival rate (%) Dec2019
Arbutus unedo	12	4	14	7	74	15
Phyllirea angustifolia	20	40	7	78	35	27
Phyllirea media	-	-	-	-	28	24
Prunus lusitanica	32	98	2	91	77	89
Quercus broteroana	82	84	82	85	79	82
Quercus canariensis	77	90	77	89	82	88
Quercus estremadurensis	65	83	4	92	80	75
Quercus marianica	84	93	74	86	90	84
Quercus pyrenaica	91	99	22	72	75	82
Rhododendron ponticum	74	97	79	5	74	95
Rhamnus alaternus	-	-	4	25	33	21
Viburnum tinus	-	-	40	65	42	68

Table 9. Main details on cuttings rooting and survival rates.

	Dec2018			Dec2019		
	Cuttings	Rooting	Survival plants	Cuttings	Rooting	Survival plants
Arbutus unedo	70	14	24	20	10	30
Phillyrea angustifolia	60	46	37	-	24	55
Phillyrea media	40	26	17	28	-	35
Prunus lusitanica	80	45	39	-	10	45
Viburnum tinus	50	55	126	124	210	160

Sections II, III, and V - Monitoring Actions C2, C3, C4, C5, C7

In January 2018 the UÉvora team started to define the protocol for plant monitoring, having as basis the methodology proposed in the project, but also the field and vegetation particularities of project areas. We used specific literature to look for the best approach and visited the target areas to verify, locally, the suitability and feasibility of this protocol. This first visits were made in: Açor (January 20); Monchique (February 7); Estrela (Mars 2).

As planned, we decide to install 5 transepts for each action (C2, C3, C4, C5 and C7), in each of the 3 project areas (Estrela, Margaraça and Monchique). The only exception was the C6 action were we only installed one transept (in *Acacia dealbata* area), but larger than it was predicted (100m^2). Due to the high density of *Hakea*, and its big thorns, it was impossible to install any transept inside its formations, because they are impenetrable. Although we were able to measure species density and height, only in the Spring of 2020 a monitoring transept will be installed in the occurrence area. During work planning we realized that the 10x1m transepts, proposed in project, were too small to be a significant sample of local vegetation. To correct these situation, we decided to install 24x1,5m transect. The original idea was to select randomly the position of each transept. However, in many cases that was impossible, because vegetation was impenetrable due to the high cover of *Rubus ulmifolius*.

Globally, between April and August 2018 we have installed 41 transepts in a total of 1540m2. Specifically we installed: 16 transepts in Estrela areas [5 (C2) + 5 (C4) + 5 (C7) +1 (C6)]; 10 in Açor areas [5(C2)+5(C7); and 15 in Monchique areas [5(C3) + 5(C5) and 5(C7). For more detailed information about location monitoring protocol and fieldwork sheets please see First Progress Report. For the installation and limitation of transepts, treated sticks, offered by a colleague of the University, were used, instead of the metal stakes initially foreseen by the project. This led to a reduction of costs and the impact of metal stakes on this natural areas: as the vegetation was generally very high, the metal stakes would also have to be high to assure better visibility. The treated sticks were painted on top with fluorescent paint and the transepts bordered by coloured thread. The limits of the transepts were also marked using a GPS (whose purchase was planned and was made for this purpose).

For the monitoring of actions C2, C3, C4, C5 and C7 each transept was divided into 16 square plots with 1.5x1.5m. Each of these plots was surveyed separately, since this approach to a smaller scale, allows to gauge more accurately the total of the transept. First, it was registered: total cover; tree cover; shrub cover; herbaceous cover; moss cover; and vegetation high. All the trees and shrubs, present inside each 1.5x1.5m squares, were registered. The respective cover (%) inside this squares was also recorded. For herbaceous plants, we selected randomly 5 of this 16 plots and register all species, and respective cover, present inside this selected plots.

So far we have finished 2018 and 2019 field work and collected all the information in an excel spreadsheet. Also we have analysed data from 2018 and made action first report, concerning pre-intervention state. (**ANNEX D1.2. Monitoring "C" Actions: First report)**. In Monchique, as expected, Rhododendron is non-

existent in the intervention areas C5 and C7 and has an average coverage of around 60% in the monitored areas to be intervened by action C3. Also, floristic richness is greater in transects installed in areas of Rhododendron. The results also show the very significant presence of heliophilous species, especially in C5 areas, but also in C3 areas, which immediately supports the need to control this type of vegetation, in order to reduce fire risk. In Estrela, results show the lack of *Prunus lusitanicus* in the C4 and C7 intervention areas and a variable presence in the C2 transects. Also, a very significant presence of heliophilous species was observed, both in the areas of azereiral and in the areas of C4 and C5. In Margaraça the results are similar although they show the impact of the fires in the territory.

Sections IV - Monitoring Action C6

For action C6 we selected a plot with 100m^2 in order to monitor *Acacia dealbata* areas. In this area, for all the trees present, we collected: species; location (Latitude and longitude); and diameter at breast height (2 perpendicular measures). For a sample of these trees, we also measured tree height, distance to canopy and canopy diameter. For *Hakea* areas, as is very difficult to get inside this community, so we take the monitoring values after species was cut under action C6. In the Acacia plot, 52 trees were counted (49 *Acacia delabata*, 2 *Arbutus* unedo and one *Pinus pinaster*). The Average height of Acacia trees is 10.2 m, height to canopy = 6,17m and canopy diameter is 1,8 m, values that are reflex a core made of tall and very dense plants.

3. Problems and delays: The major problem we faced was the topography of the territory and the type of vegetation, which made the transepts installation very time consuming. This situation happened mainly in the areas of Estrela and Monchique, where the vegetation is often characterized by extensive scrublands of *Rubus ulmifolius*. In the areas of Seia the situation was even worse due to slope. This extra effort was possible due to the regular collaboration of two volunteer's students, from the University of Évora, with no extra costs the Project.

D.2. Monitoring the Socioeconomic Impact

Status: In progress. Is been executed by ADRUSE and the UÉvora. The overall progress within each task of D2 action is present in Table 10. The pre-project situation was described in a specific report (**ANNEX D2.1. Socio-economics report: pre-project situation – DELIVERABLE)**

Foreseen start date: **Jan 2018** Actual start date: **Jan 2018**
Foreseen end date: **Mar 2022** Actual (or anticipated) end date: **Mar 2022**

Table 10. Overall progress within each task of D2 action.

tasks	Foreseen start	Actual start	Foreseen end	Actual end
I	Jan 2018	Jan 2018	Set 2022	-
II	Jan 2019	Jan 2019	Set 2022	-
III	Jan 2018	Oct 2017	Set 2022	-

2. Progress:

Section I. Establishment of reference situation at the beginning of the project, through socioeconomic indicators, and evaluation of its evolution at the end of the project.

In progress. In order to monitor the socio-economic impact of the project at the local level, 35 indicators were defined by ADRUSE. Those indicators are included in the following sectors: Employment, Business Development, Training, Ecotourism, Environmental Education, Dissemination of the Project to the General Public, Awareness and Environmental Education. In the before-project assessment all indicators have been evaluated as zero. They will be evaluated again in 2022, to see the impact of project in this sectors. Please see **ANNEX D2.1. Socio-economics report: pre-project situation – DELIVERABLE.**

Section II. Conduct surveys and questionnaires for web users, about the site, and its contents (E1).

In progress: In the first trimester of 2019 we designed a survey to be implemented, expecting to understand the opinion of the general public about the LIFE-RELICT website. This survey was implemented through Google Forms application and included eleven questions divided into two groups: [1.] questions about the user (gender?, age?, qualifications?, profession?); [2.] and questions about their opinion on the site (know this site? frequency of use?, information is objective and clear?, site is easy to consult?, information is relevant?, like site design? and would you recommend this site to others?). The survey was made available on the LIFE Facebook page and WEB SITE (**ANNEX D2.2. On-line survey**) and sent through email to the Environmental Departments of all the Portuguese municipalities. When achieved the 100 surveys we analysed the obtained results (**ANNEX D2.1. Socio-economics report- pre-project situation**). Most of the respondents are women (67%), between 30-50 years old (59%), have higher education and are mainly personnel linked to engineering, medicine and education (teachers), as well as technicians and students. About 63% of respondents did not know the LIFE website, and 62% never use it. Among those who use the site, most do it "rarely". Only 3.4% of respondents say they visit the site in a weekly basis. For the ones who answer to the following specific questions (41%), the majority (between 35-39%) are satisfied or very satisfied with the objectivity and clarity of the content, with the ease of searching and consulting the website, with the relevance of the information and with the website design. Finally, 77% of respondents would recommend the site to their contacts. The **collected information made us understand the needed to make efforts to make the project more visible** - Who knows the website like it, but most of the people we managed to reach didn't even know it. In this sense, when the UÉvora had to replace one of its project fellows, we made an effort to select someone with experience in science communication and awareness raising technics.

Section III. Monitoring the knowledge of the population in the intervention territories about habitat 5230 (actions E1, E2, E3).

In progress. This work was carried out by a multidisciplinary team from the UÉvora and ADRUSE. The work was organized in 3 steps: definition of surveys content; implementation of surveys; and results analysis. The detailed information about surveys definition and implementation was described in First Progress Report. Obtained results are also in **ANNEX D2.1. Socio-economics report- pre-project situation**.

In Action D2, ADRUSE also implemented a SWOT analysis to the obtained results. With it, was possible to identify the Strengths/Weaknesses and Opportunities/Threats of the territory and ultimately of the LIFE-RELICT (**ANNEX D2.1. Socio-economics report- pre-project situation)**. From obtained results, we underline the most important: Strengths (local population Knows target plants and their importance; They recognize invasive species); Weaknesses (Population know little about Nature2000 Network and LIFE RELICT); Opportunities (Population wants to participate in LIFE-RELCIT); Threats (Local population is old).

3. Problems and delays: The major difficulty was the existing population to respond to the surveys: in all the intervention areas we have low population density and increasing population aging. To improve time consumption, in some cases we previously contact the parish councils asking for their help to define places and people to visit.

4. Next steps: As foreseen in LIFE Project, repeat the surveys of section II and III in 2020.

D.3. Monitoring the impact of the project ecosystems services

1. Status: In progress. Led by Prof. Conceição Castro from UÉvora. The pre-project situation was described in a specific report (**ANNEX D3. Ecosystem services – First report – DELIVERABLE)**

Foreseen start date: **Jan 2018**	Actual start date: **Feb 2018**
Foreseen end date: **Sep 2022**	Actual end date: **Sep 2022**

2. Progress: As explained in detail in First Progress Report we have reflect about the methodological approach to local ecosystem services and decided to adopt TESSA approach, once is well structured, was feasible with the resources we have, and is in line with life document "Assessing ecosystems and their services: a guide for LIFE projects". This methodology is based on the definition of a current state and an alternative state that is the result of the activities that affect, or will affect, the studied territory (in this particular case the LIFE-RELICT interventions). For the current state we first map todays habitats, identify major Ecosystem Services associated to those habitats and, at last, we map todays Ecosystem Services. In turn, the alternative state is projected according to the changes planned for land use and which translate into a new mapping of habitats and, consequently, a new mapping of Services. Briefly, in this process we try to answer to the following questions: what habitats exist today in the territory and what areas do they occupy? What activities do, or will, chance land use in the territory? What habitats will exist in the future and what areas do they occupy? What is the benefit of each of these habitats? What is the change in Ecosystem Services in the future? Which services are the most important in the future? And finally, which of these services can we evaluate during the time of implementing LIFE-RELICT? Thus, for each studied territory, a mapping of the habitats and services for the present and for the future was obtained. For this territories we identified 23 Ecosystem services. Altogether, the results show an improvement of ecosystem services in the future, for this territories, partly due to the conversion to areas with more developed and natural vegetation and more resilient to threats.

Of these 23 Ecosystem Services, 13 were chosen to be monitored throughout the project, which are: 2.2.1.5 - Regulation and maintenance of fire protection for people; 2.2.2.3 - Regulation and maintenance of genetic heritage; 2.2.3.1 - Regulation and maintenance of pest control (includes invasive species); 2.2.4.2 - Regulation and maintenance of decomposition effects on soil formation; 5 1.1.5.1 - Supply of edible plants or mushrooms; 6 1.1.6.2 - Supply of fibres or other materials; 1 1.2.1.1 - Seed supply (harvest); 1 3.1.1.1 - Cultural Tourism, health and leisure (active); 1 3.1.1.2 - Cultural Tourism, health and leisure (passive); 2 3.1.2.1 - Cultural scientific research and traditional ecological knowledge; 2 3.1.2.2 - Cultural Environmental Education and training; 3.2.1.1 - Cultural of Symbolic Elements; 3.2.2.1 - Cultural of existential value; 3.2.2.2 - Cultural Value for future generations. For details please see **ANNEX D3. Ecosystem services – First report**.

3. Problems and delays: The slight delay in the beginning of this action, was due to the extra work we had in January, 2018, with the assessing of the post-fire situation in Açor-Complexo da Margaraça. For these reason in the First Progress Report we asked for a 6 months extend to execute first report, but work has been extended to the end of December 2019.

4. Next steps: For each ecosystem service selected we will conduct a proper assessment and whenever suitable we will present a quantitative and/or qualitative analysis.

D.4. Cost-efficiency monitoring

1. Status: In progress. Executed by UÉvora with the help of all project partners.

Foreseen start date: **Oct 2018**	Actual start date: **Jan 2019**
Foreseen end date: **Dec 2021**	Actual end date: **Set 2022**

2. Progress: At the beginning of 2019, after collecting all the financial information needed, we proceeded with the cost-efficiency analysis for the 3 action started until the end of 2018 (C1, C3 and C7). This analysis was made with the foreseen methodology (for details please see **ANNEX D4.1. 2019 Cost-efficiency report)**: for C1 we compared the cost of seed recollection and plant propagating with the number of plants produced; for C3.1 and C7.2 sub-actions we divided costs by the number of hectares executed under each action. The main results for 2018 are: [1] to produce 4,314 plants, 27,255.4€ was invested, thus obtaining a unit cost of 6.32 € (C1); [2] selective control of vegetation over three hectares in the Serra de Monchique was 5 720,25€, resulting in a cost per hectare of 1 906,75€. [3]. The selective control of vegetation on 2 hectares of the C2 in Margaraça had a cost of € 4,759.47, resulting in an investment per hectare of € 2,379.7. These results should be regarded as a first approach, because we expect them to change in the next years. For example, in 2019 we improved C1 procedures allowing a higher success in seed germination and plant installation. Also the value of the purchased material, will be diluted for the remaining years.

3. Problems and delays: no problems.
4. Next steps: Annalise data from 2019 and report it has foreseen I Project (Mars, 2020).

D.5. Monitoring project indicators

1. Status: In progress. Executed by the UÉvora with the help of all team. Indicators evaluation is present in **ANNEX D5.1. Project Indicators_Dec2019 (DELIVERABLE).**

Foreseen start date: **Jan 2018**	Actual start date: **Jan 2018**
Foreseen end date: **Set 2022**	Actual end date: **Set 2022**

2. Progress: Since the beginning of LIFE-RELICT, we have collected the necessary information to fill in Project Performance Indicators with the help of all partners. Also, following the request from EASME, we also have filled Project KPI in respective platform, according to NEEMO's orientations. Please see **ANNEX D5.1. Project Indicators_Dec2019 (DELIVERABLE).**

In relation to **Project Performance Indicators**, the best improvements were obtained for indicators related to biodiversity resilience, as consequence of interventions made in C1, C3, and C7 to (1) decrease fire risk and (2) improve relict communities structure. Also with great improvement are the indicators linked to Communication, dissemination and awareness, as consequence of interventions made in E actions, mainly: (1) students and local population involved and (2) success of the Web and Facebook pages (measured by the number or visits and number of friends, respectively). There was also an improvement in the indicators related to forest management, resulting from the improvement of some areas of cherry trees. This also

In relation to KPI, management interventions carried out so far have contributed to the improvement of indicators; 1.5. improvement of the conservation status of an area; 4.2.1. broad leaf forest management, 7.3. Habitat condition; and 7.5. Annex I habitats. However, due to the mentioned delays in management work, these indicators still have low values, a situation that is expected to be reversed in 2020.

On the other hand, the success of the activities carried out in E's actions, have been translated into the great improvement of a set of indicators, in particular; 11.1. N. º of individuals/unique visits of the webpage; 12.1, Networking; and 12.2. Professional training and education. In relation to this indicators, except for "Publications/Reports", goals foreseen for the end of the project were already achieved.

3. Problems and delays: no problems.
4. Next steps: continue monitoring.

E.1. Dissemination to the general public

1. Status: In progress. Has been implemented by all partners. The overall progress within each sub-action of E1 is present in Table 11. The digital version of panels is present in **ANNEX E1.1. Informative panels-DELIVERABLE**).

Foreseen start date: **Oct 2017** Actual start date: **Jan 2018**
Foreseen end date: **Sep 2022** Actual (or anticipated) end date: **Sep 2022**

Table 11. Overall progress within each task of C1 action.

Sub-action	Foreseen start	Actual start	Foreseen end	Actual end
E1.1	Oct 2017	Jan 2018	Sep 2022	-
E1.2	Jan 2019	Jan 2019	Jun 2019	Mar 20
E1.3	Jan 2021	-	Mar 2022	-

2. Progress: As referred in previous report, at project very beginning we identified and contacted main stockholders, from which we received 26 support/interest letters: Public bodies, including Municipalities that have the same habitat in their territories (11); ONG's, national and local (8); Universities and other educational establishments, including Spanish's universities (6); and local companies (1) (please see previous report for details).

Sub-action E1.1. Production and maintenance of project website and Facebook page

In progress. The Webpage **www.liferelict.ect.uevora.pt** is on-line since Mars 2018. Is regularly updated in Portuguese and, since September 2019, in English. The web page has news, events, publications and photographs. Globally it has 20 articles and over 32 pages. Since its launch it had 42 067 views. The Facebook page **www.facebook.com/Life-Relict** it has now 652 likes, but 708 followers since its launch in February 2018. Both webpage and Facebook pages have increased its visibility since September 2019 fostered by the new Uévora member, Cristina Baião. For additional data please see **ANNEX E1.2. Adicional on web site and facebook.**

Sub-action E1.2. Installation of informative panels on the project.

In progress. Panels content and layout was conceived by the UÉvora with revision and validation from CMMonc and CMSeia. Panels were project in order to meet national legislation on Panels inside Protected areas. Panels layout are available online in LIFE-RELICT Webpage. For additional information please see **ANNEX E1.3.** ***Installation of informative panels***

In December 2019 a total of 4 panels were ready. Project foresee the installation of 6 panels, one for each intervention area. However, only 4 panels are being installed (2 for Estrela, not 3); 1 in Monchique (not 2) and 1 in Margaraça. Since intervention areas are not easily accessible to general public, we considered more important to place panels in nearest villages/crossing points: Seia (Casal do Rei and Cabeça), Monchique (Alto da Foia), Margaraça (Margaraça ICNF Interpretation Center). Also, E2 foresee the installation of project panels in the interpretative trails, so will not make sense to gather two panels in the intervention areas. In December 2019 panels were not placed yet, because of the bureaucratic process. **Additional information:** presently Panel from Monchique is already placed. Panels for Estrela and Margaraça are made and will be in placed in Mars.

Sub-action E1.3. Execution of the Layman's Report

Not started**.** This action has not yet been initiated, and it is expected to be carried out according to the schedule foreseen in the application.

3. Problems and delays: we had a slight delay in the Facebook page launch, because we waited for project logo. The installation of the informative panels suffers a slight delay due to several factors such as external bureaucratic process related to legal procedures, receiving companies' budgets and also due to internal bureaucracies regarding the selective process and purchase proceedings.

5. Next steps: Continue to improve/develop project website and Facebook page.

E.2. Communication and nature tourism

1. Status: In Progress. The overall progress within each sub-action of E2 is present in Table 12.

Foreseen start date: **Oct 2017** Actual start date: **Dec 2017**
Foreseen end date: **Sep 2022** Actual (or anticipated) end date: **Sep 2022**

Table 12. Overall progress within each task of E1 action.

Sub-action	Foreseen start	Actual start	Foreseen end	Actual end
E2.1	Jan 2018	Jun 2018	Dec 2019	-
E2.2	Aug 2018	Oct 2018	Set 2022	-
E2.3	Jul 18	-	Dec 2021	-
E2.4	-	Jun 19	Set 2022	-
E2.5	Jan 2018	Dec 2017	Set 2022	-

2. Progress:

Sub-action E2.1. informative flyers

In progress. The UÉvora finished the contents and presented the general idea to CMMon and CMSeia. The flyers have an A5 size and are divided into two different parts: one with project main information and the other part with a postcard. This layout was selected because: postcards have utility and so, this format will decrease the chances of flyer been thrown away; enhances message dissemination (with a postcard we can potentially reach one other person away from the project). Flyers layouts have been finished and respective pdf. are present in **ANNEX E2.1. informative flyers – Deliverable.**

Sub-action E2.2. Creation of itinerant exhibitions

In progress. The creation of an itinerant exhibition is ongoing. Tasks were divided by each partner, namely CMMonchique and CMSeia since they will have two different exhibitions, being the UÉvora the responsible of its contents. Contents are being created and, at the same time, revised by all team members. The same is being made for design proposals, that are also evaluated in order to meet everyone expectations. Therefore, this process has been time consuming which has required an extra effort of all member involved. Special care has been given to the production of this communication material in order to guarantee its utility of the information given during and after the project ends. In this sense **we now miss respective deliverable**, foreseen for December 2019, because we need more time to make it better (6 months' extension). We anticipate that the first exhibition will take place no later than October.

Sub-action E2.3. Implementation of interpretive trails

In progress. UÉvora and CMMon had started to implement a partnership with Almargem Association, which is the coordinator of the Great Pedestrian Route (GR13 – Via Algarviana) and one of the biggest nature-based tourism promotor in Algarve. On the 9th of October, 2019 all partner met in Monchique and approved this partnership in order to guarantee the sustainability of the Life-Relict programmed small route. Thus, the interpretation route foreseen, around the Pontic Rhododendron in Monchique will be included in Via Algarviana as a complementary small interpretative trails. Almargem is reissuing all the communication materials for the Via Algarviana and will launch a new publicity campaign by June 2020. Therefore, the time couldn't be more perfect for this partnership since it will provide higher visibility to Life- Relict small interpretative route than was expected initially. The implementation of this sub-action will be anticipated to meet the deadlines of Almargem publicity campaign. We hope that with this

partnership, the interpretative small route of Life-Relict in Monchique will be promoted during and after the end of the Project to a wider audience, thus ensuring its dissemination. At the end of October 2019, the outline of the route was georefered and delivered to Almargem as well as a brief description, so that it can be included in the new communication materials. CMMon is updating the budgets for 3 information panels and will check the number of signal marks needed to be placed along the route. The route will be circular and with an extension of 1.54km. Almargem will present a design proposal for the sign brands. UÉvora will finish the contents for the panels and leaflets (that we expect to be finished in June 2020), and the design of these materials are of the responsibility of CMMon as well as their production (ANNEX E2.3. Monchique small route). Inauguration will take place in 2020.

Sub-action E2.4. Implementation of reports

Started. In June 2019, a report (video) was made by APA (Portuguese Environment Agency) on the actions developed by the LIFE-RELICT project in Monchique. This report happened together with the second project workshop (ANNEX E2.4. Additional information about APA video report). Also, several contacts to national, regional media channels and specific journalist have been made throughout the time in order to disseminate news on the project' progress, thus, the curiosity of the media has grown in the last year as it can be proved by the increase number of article produced and disseminated in our website (http://www.liferelict.ect.uevora.pt/index.php/imprensa/?lang=en). Meanwhile, we are working closely with a regional newspaper to contribute for a more complete article on the project and it is expected to receive more request as such in the next few months as a result of the regular efforts made to contact the media.

Sub-action E2.5. Dissemination action during the event "Cabeça, Aldeia Natal"

In progress. As programmed, since the end of 2017, we have promoted LIFE-RELIT at the event "Cabeça, Aldeia Natal", in the village of Cabeça. In 2017, we set an exhibition where visitors could learn about the Project and the importance of Habitats conservation. In 2017, the organization estimated that 15 000 persons visited "Cabeça, Aldeia Natal". In 2018 (December, 27) and 2019 (December, 14 and 27) CMSeia with the help of UÉvora organized interpretive visits to *Prunus lusitanica* forest. The activities consisted of a pedestrian walk (3km) in Cabeça surroundings and was part of "Aldeia Natal" program. Participated in the trails 12 persons in 2018 and 45+12 in the two editions of 2019. For extra information please see **ANNEX E2.4. Cabeça Aldeia Natal event.**

3. Problems and delays: the production of E2 material has been much more laborious, then we expected, both in the production of contents and layouts, but also in the convergence of different opinions/contributions of the several team members. However, all the different point of views has always been discussed and we always achieved consensus. However, all this process has been time consuming. The task of producing communication material has proven to be the hardest one because it's complicated to reach the equilibrium between what is scientifically correct and extremely important and, what is attractive/interesting to the general public.

4. Next steps: In the next months we will finish the missing material. We will organize our 2020 participation in "Aldeia Natal".

E.3. Awareness and Environmental Education

1. Status: This action has started and been developed as planned. The overall progress within each sub-action of E3 is present in Table 13.

Foreseen start date: **Jun 2018** Actual start date: **Jan 2018**
Foreseen end date: **Sep 2022** Actual (or anticipated) end date: **Sep 2022**

Table 13. Overall progress within each task of E3 action.

Sub-action	Foreseen start	Actual start	Foreseen end	Actual end
E3.1	Jun 2018	Jun 2018	Jul 2020	-
E3.2	-	-	Jul 2020	-
E3.3	Dec 2017	Dec 2017	Dec 2021	-
E3.4	-	-	Set 2022	-
E3.5	Oct 2018	-	Set 2021	-

2. Progress:

Sub-action E3.1. environmental education projects in schools

In progress. The preparation of the materials to be used in the environmental education projects, that will take place in the schools began in June, 2018. In Monchique, in June 2019, CMMonc carried out environmental actions for 160 students in the municipality, with visits to project areas explaining the importance of this project, as well as the characteristics of Rhododendron and its habitat.

In Estrela, on the July 14th of 2019, took place in Estrela-Casal do Rei, an environmental education activity with the students from the preschool and primary school of Loriga's School (the closest school to the study área). Were involved twenty-two children, primary school teachers and a preschool teacher. We talk about the project and about *Prunus lusitanica* habitat. Also, in September 2019, we started the project CMSeia made for LIFE-RELICT "Da Árvore à Floresta" (From the tree to the forest), directed to primary school students. The activity includes several sessions that take place in CISE, along two school years, and a visit to Project area in the end of each year. So far we have made 4 sessions: 3ºC class at the Seia School Center - September 27th of 2019; 3ºA class at the Seia School Center - October 2th of 2019; preschool and primary school of Loriga - November 21th of 2019 and 3rd year class at Tourais-Paranhos school - November 21th of 2019. Involved in this project are about 60 students, 4 primary school teachers and a preschool teacher. The project will continue from April to June 2020 and during the academic year 2020/2001. Please see **ANNEX E3.1. Data from environmental education**.

We highlight a **complementary action**: In November 2019 we were contacted by Diogo Pimenta (from burricadas.org/) asking for our project to be integrated in a **national project called "Autoctone"**. This is an environmental education project, with private funds, which is currently being elaborated and has two distinct aspects: a physical space close to Mafra city, where there will be an exhibition on conservation projects that are being carried out in Portugal (one per municipality); and a team that will travel to schools to talk about those same projects. LIFE-RELICT was chosen to be part of this project, which is expected to start next year. The "Autoctone" project will produce all the promotional material related to LIFE-RELICT, committing our team to provide all the scientific support for its execution. **This project will allow us to enhance our environmental education work, free of charge, until the end of the project and in a post-project phase. The web site will be lunch in the next months and we will establish a protocol with them soon.**

Sub-action E3.2. School contest

Not started. Contest has not yet been launched because we presently think this activity will be more efficient if done after there was more educational activities in schools and promotional material (flyers and exhibitions) ready. **In this sense we ask EASME the authorization to postpone this sub-action to the academic year 21/22.**

Sub-action E3.3. informative sessions

In progress. On December 28, 2017, took place in Cabeça, with the local population, a public session about the project. Several landowners and other interested residents were present. The session was made by the UÉvora and CMSeia. More than 30 persons were present. Professor Pinto Gomes (UÉvora) and Alexander Silva (CMSeia) led the session. In the 2019 edition of "Cabeça Aldeia Natal" in the end of the trail we organized, in collaboration with local parish council, a "magusto" (a popular autumn reunion around a fireplace, eating roasted chestnuts) for local population and visitors. About 35 persons participated, and we had the opportunity to talk about LIFE-RELICT. For extra information please see **ANNEX E3.3. Cabeça Aldeia Natal informative sessions.**

Sub-action E3.4. Plantations with volunteers

Started. On December 27th, 2019, during the event "Cabeça-Aldeia Natal", CMSeia made a symbolic plantation with volunteers, in Estrela-Cabeça in C2 intervention area. We planted 20 Portuguese-laurel produced by CICYTEX in C1. **ANNEX E3.4. Photos from Plantations with volunteers.**

3. Problems and delays: In 2018, a informative session was foreseen in Cabeça. However, as we did not yet have important management actions on the ground, we decide not to do it, considering that could be counterproductive because the local inhabitants/owners have always been anxious with the beginning of the works. No more problems were found and we did not have major delays so far.

4. Next steps: In the next reporting period we will continue the projects foreseen for local schools, make at least one session of tree plantation with volunteers and promote another informative session in Estrela territory.

E4. Scientific dissemination

1. Status: This action is in progress and, in general, been developed as planned.

Foreseen start date: **Jan 2018** Actual start date: **Out 2017**
Foreseen end date: **Sep 2022** Actual (or anticipated) end date: **Sep 2022**

2. Progress:

Sub-action E4.1 - Organization of seminars

In progress. The 1st LIFE-RELICT Seminar took place, with very success, in November 14-15th, and was done in association with SPECO (17th National Ecology Meeting). The 15th of November was the specific day for LIFE-RELICT, and so, was free for participants. This event was published nationally since April 2018, especially in several net platforms. SPECO created the advertising material, with our help, but without extra expenses for LIFE-RELICT. UÉvora team contact sponsors and got several offers that were given to the participants: bags from "Piscinas Biológicas", pen drives from ECOMED project, pencils and folders from "Assus" insurances, coffee from "Delta Cafés" and extra food from several local stores (fruit, cheese, sausages, wine). The seminar took place in UÉvora facilities. We had 180 inscriptions and a full amphitheater. The strategy was to focus this seminar in conservation main problems, ensuring knowledge exchange between conservationist, researchers and conservation projects. In this regard, we invited three speakers: Angel Penas (climate specialist); Tomás Diaz (specialist in invasive control in Spain), and Elizabete Marchante (specialist in invasive control in Portugal). We also invited, without extra expenses, other LIFE projects, including LIFE-PRIOLO that was done some similar management interventions in Azores islands (For E5 objectives). In total in LIFE day we had 24 oral communications (including 3 conferences). After the seminar we organized a visit to Évora heritage (led by a specialist from Évora Municipality) followed by a cocktail with Alentejo Popular songs. Both visit and cocktail were offered by the municipality of Évora. Please see **ANNEX E4.1. Seminar information**, for details.

Sub-action E4.2 - Organization of technical workshops

In progress. So far we organized two technical workshops. The 1st was led by the UÉvora and took place in Margaraça. It was a real success, with the attendance of 35 participants from different entities (Quercus, ICNF, Reflorestar Portugal, Cicytex, the Municipality of Oleiros, Center for Functional Ecology - University of Coimbra, and local associations members) (See First Progress Report for more details). The 2nd workshop took place in Monchique and was led by CMMonc. This time theme was "Valorization and Management of Mediterranean *Rhododendron ponticum* communities". Again, we planned this event for 25 participants, but we decided to extend the number of entries to 45, to ensure the participation of all interested entities: ICNF, GEOTA, APA, ISA, IGOT, UAlg, 2bforest, Biopiscinas, and several other local associations. Once more we made questionnaires to participants mainly to understand their perception of the workshop. The results (**Annex E4.2_tecnhical Journey information)**, show that the majority already heard about *Rhododendron ponticum* and know that they are rare and in poor condition. Also 68 % knew LIFE-RELICT and the majority referred that they increased their knowledge in *Rhododendron* habitat and accomplished their main objectives.
Finally, we are now preparing the 3rd workshop, that will be done in CICYTEX facilities in next February 14th 2020. The theme will be "Vulnerable Species Propagation" and is been published since the second half of January.

Sub-action E4.3 - Representation in national and international seminars and congresses

In progress. So far we were present in 16 events: [1] I Congresso Luso-Extremadurense (Évora, 20-21 Oct, 2017, 1 poster presentation, no costs to LIFE-RELCIT); [2] European Meeting of Phytosociology (Cabo Verde Islands, 5-7 Nov, 2017, 1 oral presentation, no costs to LIFE-RELCIT); [3] Congresso Internacional em Planeamento Sustentável e Ordenamento Territorial (Madeira Islands, 4-6 Jun, 2018, 1 oral presentation, no costs associated); [4] XII Séminaire international Gestion et conservation de la biodiversité (10-17 Jul, 2018, Ordino, Andorra, 3 oral presentations); [5] II Congresso Luso-Extremadurense (Badajoz, Spain, 18-19 Oct, 2018, 2 oral presentation); [6] Seminário LIFE-RELICT/Encontro Nacional de Ecologia (Évora, 15 Nov, 2018, 2 oral presentations; 1 poster); [7] Seminário em Estudos Avançados em Ciências do Ambiente (Évora, 29 Nov, 2018, no costs to LIFE-RELCIT]; [8] I Conferência Internacional Rota

das Aromáticas na História da Medicina (21 Mar, 2019, 1 oral presentation); [9] LIFE-PRIOLO Seminar (29-30th Apr, 2019, Ponta Delgada, Azores, 1 oral presentation); [10] XII Séminaire international Gestion et conservation de la biodiversité (Faro, 2-7 Jun, 2019, Loulé, 2 oral presentations); [11] XI Seminário Internacional de fitossociologia (9 Sep, 2019, Faro, 2 oral presentations; [12] IV Encontro de Estudantes de Doutoramento (11- Jun, 2019, Évora, 1 oral presentation); [13] LIFE-Imperial seminar (Castro Verde, 15 Nov, 1 oral presentation); [14] III Congresso Luso-Extremadurense (Évora, 25-26 Nov, 2018, 1 poster presentation, no costs to LIFE-RELCIT);

In E4.3 scope, we presented 23 oral communications and 2 posters, reaching 1134 persons (estimated based in registrations). For specific details, please see **Annex E4.3. Participation on scientific meetings.**

Sub-action E4.4 - Promotion of talks

In progress. So far we have done 16 talks for UÉvora students within degree classes and degree seminars (5); master classes and master seminars (10) and within a master students visit to Serra da Estrela (1). The target audience were university students, from Biology master students, landscape students, ecology students and ecotourism students. Globally, 289 students assisted. In order to reach new audience in Mars 2019 we held an open class with the title "Do you now continental Laurissilva?", for all interested. This class was properly disseminated through our platforms and with posters placed throughout the UÉvora. Attended to this event 21 students from the following degrees: Forestry; Environmental Architecture; Biology; Ecology and Environment; and Architecture.

Sub-action E4.5 – field Guide
Not started as foreseen.

3. Problems and delays: In the project we predicted the execution of the 1st Seminar until July 2018. However, during the first months of the project we realized that it would be better to do it later in 2018, in order to: 1. have more time to better organize it; and so that it would not be done very close to the 1st technical journey, scheduled for June. After talk to our project monitor we scheduled it for November. We now believe it was the best option because it allows us to define a different approach and have much interest in this seminar.

4. Next steps: The next workshop will be done in February 2020

E5. Replication efforts and networking with other projects

1. Status: This action is in progress and been developed as planned.

Foreseen start date: **Out 2017**	Actual start date: **Out 2017**
Foreseen end date: **Sep 2022**	Actual (or anticipated) end date: **Sep 2022**

2. Progress:

Sub-action E5.1 - Establish a network of contacts with other projects

In progress. During the reporting period we had the opportunity to established several contacts with other national and international projects. In October 2017, in LIFE Kickoff meeting in Bruxels, we were able to meet several other projects, exchanging information later with three of them. In October 2017 LIFE IAS Free Habitats (LIFE16 NAT/BG/000856), from Bulgaria (through Dimitrina Boteva), asked us about information on Invasive Alien species control. We send them the information we had. The same information was also sent to LIFE ALNUS (LIFE16 NAT/ES/000768), from Spain (through Jordi Camprodon). In April we changed information about ecosystem services with LIFE IN COMMON LAND (LIFE16 NAT/ES/000707), also from Spain (through Boris Hinojo). In May 2018 we were in Fundão in the meeting "INTER LIFE PT 18" promoted by LIFE PT CAPACITY (LIFE14 CAP/PT/000004) were we were able to contact with the projects: LIFE WW4ENVIRONMENT (LIFE08 ENV/P/000237); LifeCiP (LIFE12 ENV/FR/001113); LIFE AGUEDA (LIFE16 ENV/PT/000411); LIFE Food & Biodiversity (LIFE15 GIE/DE/000737); LIFE CERSUDS (LIFE15 CCA/ES/000091); and LIFE ELCN (LIFE16 PRE/DE/000005). We also maintain regular communication with the other LIFE projects developed by the UÉvora, including LIFE CHARCOS (LIFE12 NAT/PT/000997); LIFE LINES (LIFE14 NAT/PT/001081); LIFE SARAMUGO (LIFE13 NAT/PT/000786); and LIFE MONTADO ADAPT (LIFE15 CCA/PT/000043). In December 7th, 2018 we attended to the closing event of Portuguese LIFE CAPACITATION (LIFE14 CAP / PT / 000004) were we were able to contact with the projects: "LIFE SWSS (LIFE14 ENV/PT/000508); "LIFE Food & Biodiversity (LIFE15 GIE/DE/000737); "Life-RENDER" (LIFE16 ENV/ES/000173), "LIFE DeNTreat (LIFE16 ENV/IT/000345); LIFE FLUVIAL (LIFE16 NAT/ES/000771); LIFE-Dairyclim (LIFE14 CCM/BE/001187), LIFE OPTIMELT (LIFE15 CCM/NL/000121); OPAL- (LIFE14 CCM/FI/000254); LIFE ADAPTATE (LIFE16 CCA/ES/000049); lifeBiodiscoveries (LIFE13 BIO/PT/000386); LIFE VIDALIA (LIFE17 NAT/PT/000510); LIFE WolFlux (LIFE17 NAT/PT/000554) LIFE GreenShoes4All (LIFE17 ENV/PT/000337); LIFE AGUA DE PRATA - AGUA DE PRATA (LIFE17 CCA/PT/000076 and LIFE IP AZORES NATURA (LIFE17 IPE/PT/000010).

We also **received Dr. Gianni Bacchetta** from PROVIDUNE (LIFE07NAT/IT/000519) and LIFE RES MARIS (LIFE13 NAT/IT/000433) in a meeting to exchange knowledge about propagation of rare species. Those contacts are translated in experience exchanges and support.

CICYTEX also identify **LIFE PRIOLO (LIFE12 NAT/PT/000527)** as the project most important for us in this context, because they are also promoting laurissilva relicts in Azores islands, using *Prunus*. We make the contact with them and **visited** (Dr. Pedro Santos, from the UÉvora team) the project in April 2019. Another important connection was with the European project ECOMED (http://ecomedbio.eu/), a project that aims to generate a theoretical-practical sectoral program, essential for the specialization process of the Mediterranean Eco-engineering sector. We were able to bring Klaus Peklo (with no costs to the project), from ECOMED to visited the burned area of the Margarida Forest. The purpose was to help us to do our foreseen interventions in the best way possible to stop soil erosion after the fire of 2017.

In order to establish a network with other projects and local stakeholders, in October 2019 we offered **our collaboration in the project "Via Algarviana - An Praise to Nature", with the promotion of 2 training actions in the area of Botany, with visit to project areas,** targeting technicians and tourist entrepreneurs (totaling 18 people). These activities will also contribute to the objectives of action E2.

Please see **ANNEX 5.1. Networking with other projects.**

Sub-action E5.2 - Replication efforts

In progress. We have contact some municipalities from the central Portugal, were the habitat is present, offering orientation in their habitat areas. So far our replication efforts translate to: **[1]. Mação Municipality** - Estimated the population of *Prunus lusitanica* in the Municipality with georeferencing. Also, when making interventions on water lines, they already take into account the management guidelines of our project. We were asked to participate in the monitoring of some management interventions, and Professor Carlos Pinto Gomes attended it, within the LIFE-RELICT: **[2]. Pampilhosa Municipality** - georeferenced the areas where *Prunus lusitanica* occur and are also following the LIFE guidelines. They showed interest in our collaboration in the scope of future projects to be submitted. However, no follow-up has yet been requested; **[3] Oleiros** - Although they have already prepared a letter stating that they intend to replicate LIFE-RELICT actions in practical terms only a publicity action was carried out (25-05-2019) entitled "Discovering Laurissilva". Although there are intentions to carry out concrete management actions, these have not yet materialized; **[4] Proença-a-Nova** - Although there is no remnant of this habitat in this municipality, its potential exists. Thus, the Municipality, in close collaboration with LIFE-RELICT, has been making every effort to discover some areas where its resettlement is possible. In fact, in this sense, it should be noted that areas in the West of the Municipality, with strong potential, are being recognized in detail, namely in the parish of Maljoga; **[5] Margaraça** - As referred before ICNF, in the burnt areas adjacent to the LIFE areas, similar management actions were carried out; **[6]. Monchique** - The GEOTA Group within the scope of the "Renatura Monchique" project is already following the management guidelines of LIFE-RELICT. This fact is already expressed through a protocol signed between GEOTA and UÉvora. Regarding the contacts with Leon which we referred in previous report, we didn't have positive results, given the lack of interest shown by the local entities. With the support of Professor Angel Penas (ex-rector from the University of León) we have tried several times to replicate our management actions in local ongoing projects, but we had no success.

3. Problems and delays: no problems or delays in the action.

4. Next steps: continue efforts.

F1. General coordination of the project by UÉvora

1. Status: This action is in progress and, in general, is been developed as planned leed by UÉvora.

Foreseen start date: **Oct 2017**	Actual start date: **Oct 2017**
Foreseen end date: **Sep 2022**	Actual (or anticipated) end date: **Sep 2022**

2. Progress: As foreseen is sub-action F.1.1, the project is being coordinated by the UÉvora, led by Professor Carlos Pinto Gomes and managed by Dra. Catarina Meireles. The administrative and financial structure from the UÉvora was defined in October 2017, and started to be led by Dr. Liliana Rosmaninho, that was replaced in April 2018 by Dra. Isália Morais and later by Dra. Cristina Louro (in both cases for maternity reasons). As foreseen, project Manager has been hired (Dr. Catarina Meireles) and started to work at full time since January 2018. In November Dr Rui Cataño was also hired to integrate the UÉvora team with the function of supporting the practical execution of the UÉvora tasks (pós-doc foreseen in project). See **ANNEX IV** that presents the general project team. As foreseen in sub-actin F.1.2 professor Carlos Pinto Gomes is coordinating the scientific component of the project.

Partnerships agreements with all 4 partners were firmed in November 2017. The delay was due to the Municipality elections, and the necessity to wait for the new mayors.

A Kick-Off Meeting was attended in Brussels in 18 and 19 October 2017, by two members of the UÉvora (Dra. Catarina Meireles and Professor Conceição Castro). As referred in previous report, a presentation was made and we had the opportunity to change information with other projects and make some questions about procedures.

Since the beginning of this project, the coordination team keeps regular contact with all the beneficiaries, including by regular meetings as foreseen in sub-action F.1.3 (**ANNEX F1.1. Project meetings details)**. These contacts were mostly made by telephone or video-call. In August 2018 project Logo was selected.

In the end of November, the steering committee was already defined. It includes one representative of each partner and the project Manage. Please see respective minutes in **ANNEX F1.2. Steering committee - DELIVERABLE**. We keep regular contact with Sara Barceló, our NEEMO monitor. We make regular situation points with her, and always had her quick feedback and help. We had her first visit on the 24th and 25th of January. The first day was in Seia and the second was made in Açor project area. The second visit comprised a visit to cicytex in February and a visit to Monchique.

3. Problems and delays: As mentioned before, in October 2017 a large forest fire affected the project area named Açor-Complexo da Margaraça. Since November the project coordination team carried out various meetings with the management responsible, from the ICNF, and with the CMSeia, in order to: 1. know the affected areas, 2. understand the impact of the fire on this place; 3. realize conservation needs; and to establish the measures needs to ensure compliance with the Project objectives. Those meetings were made in Açor-Complexo da Margaraça (ICNF offices) in January 20-21, February 5, Mars 20, April 18 and June 8.

4. Next steps: This action will continue to be carried out as planned.

F2. Scientific Committee

1. Status: This action is in progress and, in general, is been developed as planned lead by UÉvora.

Foreseen start date: **Oct 2017**	Actual start date: **Oct 2017**
Foreseen end date: **Sep 2022**	Actual (or anticipated) end date: **Sep 2022**

2. Progress: In the end of November, the scientific committee was already defined. This committee includes now: one representative of each partner (as refereed in First Progress Report), a representative from the central services of ICNF (Dr. Pedro Ivo Arriegas) and three representatives of Universities from the Spanish and French territories with the same target communities (Professor Sara Del Rio, Professor Eusébio Cano, Professor Jean Jaques Lazard) (please see First Progress Report for detailed information). As recommended by EASME in the first letter, three ICNF representatives from the three Natura2000 sites involved in the project, were also included in Scientific Committee (Dra. Silvia Neves from Açor, Dra. Maria José Gomes from Monchique and Dr. Jacinto Diamantino from Estrela).

The first meeting took place in Évora in November 15, 2018. The second visit took place on 11-14 September 2019 and included an office meeting (September 11) where the project and work progress were discussed. This meeting was followed by a visit to the intervention areas: Monchique (September 12); Margaraça (September 13) and Estrela (September 13). Were present 10 membros of the Commission (Carlos Pinto gomes, Cristina Garcia, Nuno Fidalgo, Artur Costa, Alexandre Silva, Sara Del rio, Francisco Vasquez, Pedro Ivo Arriegas, Eusébio Cano and Maria José Gomes). The visits have been very useful because they allowed an open discussion about the ecological characteristics of each location (ex. vegetation dynamics), the management measures carried out or planned and problems encountered so far (please see **ANNEX F2.1 Scientific Committee,** for details).

3. Problems and delays: -

4. Next steps: Continue with project management

F3. Audit

1. Status: Not started.

F4. Post-LIFE Plan

1. Status: Not started.

This action has not yet been initiated, and it is expected to be carried out according to the schedule foreseen in the application.

6.2. deviations, problems and corrective actions implemented

So far we encountered several problems and difficulties in project implementation, but for the vast majority a solution was found. Major problems are described below**:**

[1]. Difficulties in plant propagation. We had initial problems with the germination of some collected plant material. First we faced **problems with seed germination of *Prunus lusitanica*, *Arbutus unedo*, *Phillyrea angustifolia* and *Viburnum tinus***. For *Prunus lusitanica*, after the first campaign, we realized that for seeds collected directly from the tree, the germination percentage did not exceed 0.5%, but best results were obtained with seeds collected directly from the soil, with percentages exceeding 30%. A similar behavior was observed in seeds from *Arbutus unedo*, *Phillyrea angustifolia* and *Viburnum tinus*. This aspect was corrected in the 2018-2019 campaign and seed from this species started to be collected only from soil. Also, in the case of Rhododendron, in first campaign infrutescences were collected just before seed maturity and large part was unviable. This problem was also corrected in the second campaign, collecting the fruits later. Nevertheless, one of our main problems still remain, the **low growth rate of Rhododendron**, which compromises the execution of other two actions of the project, C3 and especially C5. Rhododendron plants still too small to be planted. In this situation, in 2019 we decide to invest more in vegetative propagation, once the method developed by CICYTEX allows to obtain larger plants much more quickly. We have also decided to delay as much as possible the planting of specimens of seminal origin because results from A3 also suggest that in nature, existing seminal regeneration is restricted to particular conditions, especially in terms of shade and humidity, suggesting that plantations can have low success due to hydric limitations and so plants should have a well-developed root system. Another decision taken was to insist on "diving" as an alternative vegetative propagation method and, which has been found effective, to increase the area of occupation of the species. Nevertheless, we consider **that this is undoubtedly the major problem we faced so far**.

[2]. Fire in Açor_Complexo da Margaraça in October 2017. Since a large part of the Açor-Complexo da Margaraça burned in 2017, the total remaining area of Portuguese-laurel area has been reduced, preventing us from fulfilling the objective of improving 8 ha of this plant community. To get over this question, we had to reformulate the intervention areas and propose the inclusion of a new compensatory area (please see First Progress Report for details);

[3]. Delay in the recovery of existent trails in Estrela. For reasons external to the project and that we were not able to control (ICNF permits, trail recover outside intervention area made by local Parish Consul) was not possible to recovery and clean the trails in Estrela until 2019. This circumstance barred the execution of action C6 and compromised the execution of the other interventions in the area (C2, C5 and C7). However, this situation was overcome.

[4]. lack of specialized companies/workers available for forest works. As a consequence of the measures taken at a national level related to the protection of rural areas against forest fires (Fire prevention legislation- DL 10/2018 of 14 February - published after the big fires of June and October 2017 in Portugal, when more than 100 people died), there is currently a widespread lack of companies available to carry out forest works, because they are busy with the fuel management required by current legislation. This situation has limited the execution of management actions such the ones requested by C2, C4 and C7. This was clear in the first tender that CMSeia launched for the execution this actions in Seia-Cabeça (in June 2019), when no specialized company applied. However, CMSeia was able to overcome this problem increasing the initial budget and, especially, talking to local specialized companies in order to found solutions and try to schedule these jobs in company's own agendas. The consequences of this legislation on Project execution they are still more substantial, since the employees of the municipalities of Seia and Monchique, assigned to LIFE project, have to give priority to the fulfilment of the work required by this legislation, punctually delaying LIFE execution.

[5]. As a consequence of points 1., 3. and 4., **the major deviation from the original project plan concerns the delays in plantation, that will be done in 2020**, which brings delays in the recovery of native vegetation, but also in terms of interventions monitoring.

[6]. Some **administrative procedure** demanded by public entities for hiring, equipment acquiring and services acquiring, have also limited some LIFE procedures. This happened, for example, in the contracting process for external assistance in A1. However, with a close collaboration between the UÉvora and the hired company, it was possible to continue the other connected action (A2), even before the final work has been delivered.

[7]. We have experience some **resistance from schools** to receive projects. Schools are currently requested by several projects/initiatives and, with the demands of complying with school curricula, it is not always easy to integrate a new project. In this sense, UÉvora, CMSeia and CMMon are currently preparing a school plan integrated in the school curriculum of the students we want to reach, facilitating the teacher's work. It should be noted that these municipalities, having been confronted with major fires, today have a considerable number of awareness projects underway.

Apart from this there have been other deviations that we should mention:

[8]. Differences between budgets mentioned in LIFE proposal (made in 2016) **and current values**. This is observed in the budgets of full time grants foreseen, whose remuneration is established by national regulations. In the case of doctorates (where the project manager is located), the University started to oblige the execution of a fixed-term contract and did not accept grants, which made an increase of initial budget. In the case of scholarship holders, the reference values have also been updated recently. These situations are being monitored by UÉvora and can be compensated with from savings in same actions, as in amounts allocated in the project to external hires, in actions A3 (hiring a company to make study), C1 (hiring support in seed collection) and E1 (hiring a company to run the Site), which were provided by the UÉvora team. **Consequently, we ask EASME the authorisation to move 54 981€ from "External Assistance" to "Personnel" in UEvora budget, in order to ensure the amounts required by hiring additional personnel for respective team.** This will not affect the 2% rule because is for additional personnel. Expenses higher than expected were also observed in the purchase of magnifiers (C1) and in the budgets for printing the panels (E1).

[9]. In A3, instead of the service acquisition proposed in the LIFE application (14 760 €), work was done by UÉvora team, once the expected time required for the legal hiring process would put at risk A3 execution. This presupposes a surplus in the budget for this action, in "External assistance".

[10]. In C1, seed collection was planned to be done with the external support of a service provider (€ 36,900.00). However, given the unpredictability of the works (which depending on the species and the year of collection) and difficulties in some species differentiation (namely in *Quercus*) the same is being ensured by UÉvora and CICYTEX. This presupposes a surplus in the budget for this action, in "External assistance".

[11]. In D3 we adopted TESSA approach to evaluate Ecosystem services instead of the methodology proposed in PROJECT, once is well structured, feasible with the resources we have, and is in line with life document "Assessing ecosystems and their services: a guide for LIFE projects".

[12]. In E1, webpage was made with UÉvora personal instead of "External assistance" what presupposes a surplus in the budget for this action (3321 €) in "External assistance".

6.3.Evaluation of Project Implementation

The methodology described in LIFE-RELICT project is globally being followed despite the inevitable adjustments already described above (Table 14). The conclusion of some works, especially within "C" actions, has been delayed for several reasons explained previously. In 2020 we will accomplish the majority of our core conservation actions. The only exception is C5, because we still can't ensure the success of Rhododendron plants, although we are increasing knowledge about this species considerably and trying alternative solutions. Overall, management measures on the ground are immediately visible, as soon as they are carried out, as they involve impacts in local vegetation. It should be remembered that the management measures implemented, often imply the conversion of a Human-made landscape (e.g. production forest) to an autochthonous forest. In this sense, the removal of heliophile, exotic or invasive species has an immediate impact on the landscape and an immediate decrease in the fire risk. However, the greatest impact will take several years to become visible, when the planted species give way to an autochthonous forest environment. In addition, the improvement of the "levada" had also an immediate impact.

Concerning **replication**, as referred in Action E5, we are making important progresses. Concerning **dissemination** project is going well, above expectations, although we do not yet have the promotional materials ready. We have great expectations that they will improve better due to the promotional materials (flyers, exhibitions, trails support material) that we are producing and the collaboration protocols that we are establishing.

In relation to **policy Impacts**, LIFE-RELICT is contributing to the following policies:
- **Habitats Directive**. Through the management interventions that are being executed, Project is contributing to the full application of this Directive", especially for two of its main objectives: to favour the maintenance of biodiversity; and to achieve a favourable conservation status of habitats, ensuring that target habitats have sufficient area and quality to ensure their survival into the medium to long term, along with favourable future prospects in the face of pressures and threats.
- **EU 2020 strategy for biodiversity**. Also, the taken conservation measures are also in line with European Union biodiversity strategy, especially with regard to: Goal 1: conserve and recover nature; Goal 2: maintain and enhance ecosystems and their services; Goal 5: combat invasive alien species; and Goal 6: tackle the global biodiversity crisis.
- **National Strategy for Adaptation to Climate Change (ENAAC).** In relation to climate, the implementation of these actions will improve the resilience of target habitats, in line with the in the strategic sector of Biodiversity.
- **Portuguese national strategy for nature and biodiversity conservation**. Project contributes for several strategic targets of this national strategy, including the ones related to ensure the conservation and enhancement of the natural heritage, promote scientific research, promote the valorisation of protected areas, and promote education and training and ensure public information, awareness and participation.
- **EU strategy for forests and the forest sector**. The management interventions that are being carried out will allow the development of areas occupied by native forest, increasing their resilience and improving the services of the ecosystems associated with them, two of the priority areas of this European strategy.

In this sense, so far, the project is delivering the results foreseen in the Grant Agreement form B3 "EU ADDED VALUE OF THE PROJECT AND ITS ACTIONS".

Table 14. Evaluation of LIFE-RELICT implementation – Contrast between achieved VS expect results foreseen in the proposal

Action	Foreseen in the revised proposal	Achieved	Evaluation
A1. Territory characterization update	**Objective:** **O1.** Systematization and complement ecological and socioeconomic characterization of target territories, to inform conservation work and collect landowner's long-term commitment letters **Expected results:** **R1.** Biophysical and Socioeconomic characterization **(D)** **R2**. GIS Project **(D)** **R3**. landowner's long-term commitment letters signed **(D)**	Main goals and expected results were achieved in time. However, EASME asked us to provide new letters (with specific duration) and we are now establishing a convention of 20 years with the landowners. So far we have collected 27 signatures, missing the ones from landowners that life outside respective Municipalities.	**CONCLUDED IN TIME** (Except for a few land owners' signatures) Works have been executed in time and results have been used in Actions A2, C2, C3, C4, C5, C6, C7, D2, D3, E1, E2, E3 and E4. All deliverables ready
A2. Plan.	**Objective:** **O1.** Make an OP reformulating and specifying conservation measures according to new information from A1 and D1. **Expected results:** **R1.** Operational Plan Document **(D)**	Main goals and expected results were achieved in time.	**CONCLUDED IN TIME** Results have been used in Actions C2, C3, C4, C5, C6 and C7. Cartographic information was included in GIS project (A1) All deliverables ready
A.3 Evaluating the propagation capacity of *Rhododendron ponticum.*	**Objective:** **O1.** Understand limitations on natural seed propagation of Rhododendron to promote success in C1 and future plantations. **Expected results:** **R1.** Regeneration report **(D)**	Main goals and expected results were achieved.	**CONCLUDED IN TIME** However, we have asked for an action extension in Frist Progress Report to improve results obtained in 2018. Results have been used in Actions C1, C3, C5 and E4. All deliverables ready
C.1. Collection and propagation of plant material.	**Objective:** Collect propagation material from 5230, 9230 and 9340 habitats' characteristic species and produce plants for foreseen plantations in C2, C3, C4, C5 and C7. **Expected results:** **R1.** Collect propagation material from 13 species; **R2.** Produce 35 500 plants.	Respecting **R1** we collected propagation material (seeds and/or cuts from the **14 species**, 11 species foreseen (one species was ignored purposely), plus 2 more. Respecting **R2**, **19%** of foreseen plant were delivered to CMSeia and CMMon for plantation.	**IN EXECUTION UNTIL DEZ 2021** we had several problems so far, but the vast majority of which were overcome. Although the plants produced are below expectations, the latest results are encouraging and we are confident that we will achieve the foreseen plants.
C.2. Improving the conservation state of *Prunus lusitanica* areas.	**Objective:** Recover feed flows to favour Portuguese-laurel and Improve conservation status of Portuguese-laurel habitat. **Expected results:** **R1.** Recover "levada" in 1,2 km; **R2.** Selective cut of the heliophilous vegetation in 8ha; **R3.** Plantation of characteristic species in 5,5 ha;	**R1** was completed in **100%** of the foreseen length. **R2** was completed is made in **60%.** **R3** has not started.	**IN EXECUTION UNTIL MAR 2022** "Levada" was completely done. This task is behind schedule, limited especially by the lack of forest workers and delays in plant production.

Action	Foreseen in the revised proposal	Achieved	Evaluation
C.3. Improving the conservation state of *Rhododendron ponticum* areas.	**Objective:** Improve conservation status of Rhododendron habitat. **Expected results:** **R1.** Selective cut of the heliophilous vegetation in 3 ha; **R2.** Plantation of characteristic species in 3 ha;	**R1** was completed in **100%** of the area **R2** has not started	**IN EXECUTION UNTIL MAR 2022** This task is behind schedule, limited by the problems with Rhododendron propagation (plants still too small to be planted).
C.4. Increase *Prunus lusitanica* areas.	**Objective:** Increase Portuguese-laurel habitat área. **Expected results:** **R1.** Selective cut of the heliophilous vegetation in 10.5 ha; **R2.** Control of non-invasive alien species in 10.5 ha **R3.** Plantation of characteristic species in 10.5 ha;	**R1** was completed in **30%** of the area **R2** has not started **R3** has not started	**IN EXECUTION UNTIL MAR 2022** "Levada" was completely done. This task is behind schedule, limited especially by the lack of forest workers and delays in plant production.
C.5. Increase *Rhododendron ponticum* areas	**Objective:** Increase Rhododendron habitat área. **Expected results:** **R1.** Selective cut of the heliophilous vegetation 10 ha; **R2.** Control of non-invasive alien species in 10 ha; **R3.** Plantation of characteristic species in in 10 ha;	This action will start in 2020.	**NOT STARTED** This task is behind schedule, limited by the problems with Rhododendron propagation (plants still too small to be planted).
C.6. Control of invasive alien species	**Objective:** Control invasive alien species in Estrela_Cabeça **Expected results:** **R1.** Control *Hakea sericea* in 4 ha **R2.** Control *Acacea dealbata* in 4 ha, including 2 dense species cores with 1,5 ha.	**R1** is **100%** completed **R2** cores are **54%** completed	**IN EXECUTION UNTIL MAR 2022** This task is behind schedule, due to an initial issues related to the lack of proper access to C6 area. In terms of constraints, we also make note of the extreme difficulty of the Acacia debarking. Typically very time consuming, this labour is even more difficult here due to the steep slope, the characteristic climatic conditions.

Action	Foreseen in the revised proposal	Achieved	Evaluation
C7 - Reducing the risk of fire	**Objective:** Reduce risk of fire in Estrela, Margaraça and Monchique areas, reducing risks and increasing protection through the creation of native forest in habitat 5230 surroundings. **Expected results:** **R1.** Recovery access roads/trails in Estrela area in 3km. **R2.** Selective cut of the heliophilous vegetation in 68,5 ha; **R3.** Control of non-invasive alien species in 68,5 ha; **R4.** Plantation of characteristic species in in 11,4 ha; **R5.** Chestnut forest improvement in 1.9 ha	**R1** was done in 2 km, **66%** completed. **R2** is **?? %** completed. However, in Margaraça is 100% completed . **R3** is **?? %** completed. However, in Margaraça is almost completed. **R4** Not started. However, **in Monchique 11,94 ha were planted as a complementary action.** **R5** is **90%** completed.	**IN EXECUTION UNTIL MAR 2022** Some of the tasks are behind schedule, limited by the lack of forest workers and delays in plant production.
D1. Monitoring Conservation Actions	**Objective:** Evaluate the impact/efficiency of conservation actions (C1, C2, C3, C4, C5, C6 and C7) in local vegetation. **Expected results:** **R1.** Annual evaluation of seed germination rate and plant survival rate in C1; **R2**. Installation of 41 permanent transects; **R3**. Collect annual data to monitor vegetation in installed plots; **R4**. Analyse collected data and produce annual report **(D)**	Main goals and expected results are being achieved in time.	**IN EXECUTION UNTIL SET 2022** Works have been executed in time. 2018 report **(D)** was finished (deliverable ready) 2019 data was collected and data will be analysed in the beginning of 2020 (as planned).
D.2. Monitoring the Socioeconomic Impact	**Objective:** Evaluate the socio-economic impact of LIFE-RELICT. **Expected results:** **R1.** Define socio-economic indicators to be monitor **R2.** Conduct 100 surveys to web users, about the site, and its contents. **R3.** Monitoring knowledge of local population about Habitat, LIFE and nature2000, conducting 100 surveys. **R4.** Report results in project beginning and end **(D)**	Main goals and expected results are being achieved in time. **In R1**, 35 indicators were defined **In R2**, 100 surveys were implemented and analysed. **In R3**, 120 surveys were implemented and analysed. **In R4**, **first** report was finished	**IN EXECUTION UNTIL SET 2022** Works have been executed in time. 2018 report **(D)** was finished (deliverable ready)
D.3. Monitoring the impact of the project ecosystems services	**Objective:** Evaluate the effects of the project conservation actions on ecosystem functions **Expected results:** Evaluate main ecosystem services for the three territories	Main goals and expected results are being achieved in time.	**IN EXECUTION UNTIL SET 2022** First report **(D)** was finished (deliverable ready)

Action	Foreseen in the revised proposal	Achieved	Evaluation
D.4. Cost-efficiency monitoring	**Objective:** Evaluate the cost-efficiency of LIFE-RELICT conservation actions. **Expected results:** **R1.** Report results on an annual basis **(D)**	Main goals and expected results are being achieved in time.	**IN EXECUTION UNTIL SET 2022** Works have been executed in time. 2018 report **(D)** was finished (deliverable ready)
D.5. Monitoring project indicators	**Objective:** Evaluate Project progress using a set of bioindicators. **Expected results:** **R1.** Report Project Performance Indicators on an annual basis **(D)** **R2.** Report KPI Indicators on an annual basis.	Main goals and expected results are being achieved in time.	**IN EXECUTION UNTIL SET 2022** Works have been executed in time. 2018 and 2019 reports were finished (deliverable ready)
E.1. Dissemination to the general public	**Objective:** Publicize Life-Relict, as well as habitats and RN2000, to the general public in order to induce a change in social behaviours and minimize some of the associated threats. Expected results: **R1.** Digital Layman report **(D)** **R2.** Digital informative panels **(D)** **R3.** Facebook page creation **R4.** Webpage online **R5.** Implementation of the informative panels	**R1** has not been concluded since its deadline is only in sep. 2022. **R2**, **R3** and **R4** has been concluded. **R5** is ongoing and expected to be concluded in fev. 2020	**IN EXECUTION UNTIL SET 2022** The dissemination of the project progress to the general public will be carry out until the end of the project through the website and facebook page, which are regularly updated and its outreach is beyond expectations. The installation of the informative panels suffers a slight delay due to several factors such as external bureaucratic process related to legal procedures, receiving companies' budgets and also due to internal bureaucracies regarding the selective process and purchase proceedings. However, the majority of the constrains have already been overcome.

Action	Foreseen in the revised proposal	Achieved	Evaluation
E.2. Communication and nature tourism	**Objective:** Increase social awareness for the importance of this habitat conservation including the historical and natural value it represents. Additionally, it aims to promote nature-based tourism by creating structures and materials that support it, which are indispensable for the sustainable socio-economic development of these inland regions. **Expected results:** **R1.** Conclusion of the informative flyers about the habitats and the project **R2.** Digital Sample the informative flyers about the habitats and the project **(D)** **R3.** Opening of the exhibition to the general public in Seia **R4:** Opening of the exhibition to the general public in Monchique **R5.** Exhibition contents in digital version **(D)** **R6.** Conclusion of the pedestrian's route implementation **R7.** Conclusion of the promotional material for the pedestrian's routes **R8.** Digital sample of the promotion leaflets about the pedestrian's routes **(D)** **R9.** Dissemination of the two video reports about the project **R10.** Digital Photo Book of the communication and tourism activities **(D)**	In respect of the informative flyers (**R1, R2**), is concluded in Monchique and ongoing in Seia. For the creation of an itinerant exhibition (**R3, R4 and R5**), the contents are being created and revised by all team members. Several proposes on design are being evaluated. Regarding the implementation of interpretative trails (**R6, R7** and **R8**) is in progress and its conclusion is expected to be anticipated due to the partnership created with Almargem Contacts have been made to national TV media in order to produce **R9.** **R10** has not started but will be produced at the end of the project.	**IN EXECUTION UNTIL SET 2022** The communication materials have suffered some delays due to opinions divergency amongst project members regarding its design and contents. However, most of the divergency have been overcome. The task of producing communication material has proven to be the hardest one because it's complicated to reach the equilibrium between what is scientifically correct and extremely important and, what is attractive/interesting to the general public.
E.3. Awareness and Environmental Education	**Objective:** Guarantee the future conservation of the Relict Continental Laurissilva through awareness raising in school's community and, consequently, the local population. **Expected results:** **R1.** Scheduling of the first environmental education actions **R2.** End of the environmental education actions **R3.** Preparation and launch of the school competition **R4.** Environmental education and awareness activities report **(D)** **R5.** First planting action for the general public **R6.** first awareness and clarification action for the population of Cabeça	Regarding the environmental education actions in the school's communities, **R1** have been achieved and it is expected that it lasts until the end of the project, thus. **R2**, **R3**, **R4** will be then finished. Regarding **R5** we made first plantation in December 2019 In **R6** two awareness action were made so far	**IN EXECUTION UNTIL SET 2022** This particular action is ongoing as planed

Action	Foreseen in the revised proposal	Achieved	Evaluation
E.4. Scientific dissemination	**Objective:** Dissemination of the methodologies used and the results obtained in order to promote the scientific dissemination of the project. **Expected results:** **R1.** Project's initial seminar in Évora **R2.** Project's Intermedium seminar in Monchique **R3.** Final Project seminar in Seia **R4.** First technical workshop in Margaraça **R5.** Second technical workshop in Monchique **R6.** Third technical workshop in Badajoz **R7.** First scientific representations in seminars and congresses **R8.** First University lecture **R9.** Paleotropical relict field guide **(D)** **R10.** Report on the implementation of scientific dissemination actions **(D)**	The 1st seminar has happened in Évora (**R1**) and the following (**R2** and **R3**) will go as planned. **R4** and **R5** have happened already with great participation. The **R6** is under planning. **R7** and **R8** were concluded early in the Project. **R9** and **R10** have not stated yet but due in the end of the project as planned.	**IN EXECUTION UNTIL SET 2022** This particular action is ongoing as planed and has had great success in participation
E.5. Replication Efforts and Networking with Other Projects	**Objective:** Establish contacts with other national or international projects, as well as with entities that may have an interest in the replication of management measures validated during the project. **Expected results:** **R1:** Initial contacts with entities interested in replication **R2**: Initial contacts with those responsible for other projects **R3:** Sending project reports to managers of other similar projects **R4**: Implementation report on the replication efforts and network actions (**D**)	**R1** and **R2** have been achieved early in the project **R3** and **R4** are ongoing until the end of the project	**IN EXECUTION UNTIL SET 2022** Going as planned with great successes accomplishing partnerships interested in replication.
F1. General coordination of the project by UÉvora	**Objectives:** Ensure a management structure that guarantees the proper project execution **Expected results:** **R1.** Define project Manager **R2.** Define partners structure **R3.** Ensure easy communication between partners **R4.** Establishment of executive committee.	Action ongoing as predicted. Objectives and results are being achieved	**IN EXECUTION UNTIL SET 2022** Works have been executed in time.
F2. Scientific Committee	**Objectives:** Ensure an advisory board for project execution **Expected results:** **R1.** Define Scientific committee **R2.** Provide annual meeting	Action ongoing as predicted. Objectives and results are being achieved	**IN EXECUTION UNTIL SET 2022** Works have been executed in time.
F3. Audit	**Objectives:** Verification of financial compliance with LIFE requirements. **Expected results:** **R1.** Verification of expenses eligibility		**NOT STRATED**

Action	Foreseen in the revised proposal	Achieved	Evaluation
F4. Post-LIFE Plan	**Objectives:** Establish a post life plant ensuring the continuation of important conservation measures **Expected results:** **R1.** Define Pan		**NOT STRATED**

6.4. Analysis of benefits

The major project benefits are:

1. The great benefit of the work carried out so far was the **improvement of the conservation status** of the habitat of community interest 5230*, directly benefiting this habitat in three SAC's;
2. The **risk of fire reduction**, through the management of heliophilous scrubs existing inside the habitat and in the surrounding areas, including in the surrounding habitats;
3. Improving Ecosystem services by improving habitat, especially soil conservation, increased resilience to forest fires, increased water infiltration and, consequently, biodiversity.
4. Control of exotic species, above all of an invasive character, with considerable impact on the landscape, transforming a monospecific landscape to a more biodiverse space;
5. As a result of the work developed, the local populations acquired a greater sensitivity about the importance of this habitat, going so far as to take it as "their" fact that will surely contribute to its conservation in the future.
6. Thanks to the existing constraints regarding the multiplication of target species, we have acquired a deep knowledge, ranging from the collection of material from the propagules, to the methods of germination and seminal and vegetative propagation. This knowledge is already being prepared to be widely disseminated in society, namely through publications on the methodologies for vegetative propagation of vulnerable species.
7. In relation to tourism, we should be noted that, as referred in E5, within the scope of the project, training activities have already been carried out to tourist entrepreneurs, specifically in the Serra de Monchique, highlighting the ecological and heritage importance of this habitat, as well as some characteristic species with protection status, with a view to increasing tourist activity.
8. Based on the surveys, it was possible to better understand the sensitivity that locals and visitors have about this habitat and about RN2000.

7. Key Project-level Indicators

As referred in Action D5, KPI are being monitored. For the ones that we were able to estimate a quantitative value for Project end, the majority of them are now exceeded (Table 16). The major tops are observed in indicators related with Project promotion, awareness and networking, for which we gave special attention in 2019 (it was one of the weaknesses that we had identified previously). For the other and, with little impact are the indicators directly related to the management actions of habitats and/or forests, largely due to the constraints that led to the delay of the work in Estrela and in the plantations of Estrela and Monchique. However, with the works foreseen for 2020, we are sure that this situation will be reverse soon.

Table 15. Evaluation of major quantified KPI in December 2019.

INDICATOR CODE	DESCRIPTOR	Progress DEC 19	End Value	Achieved %
1.5.	Conservation or improvement of the status of an area or segment	17,8	104	17%
1.6.	Humans (to be) influenced by the project/Others	5125	1000	513%
1.6.	Humans (to be) influenced by the project/Others regularly present in the project area	28	20	140%
4.2.1.	Sustainable Forest Management /broad-leaf	4,8	31,7	15%
7.3.	Annex I Habitats Directive/ Habitat 9240	7,8	28,5	27%
7.3.	Annex I Habitats Directive/Habitat 9230	0	0	0%
7.3.	Annex I Habitats Directive/Habitat 5230	0	0	0%
7.3.	Annex I Habitats Directive/Habitat 9260	1,6	1,8	89%
10.2.	Involvement/NGO	12	5	240%
10.2.	Involvement/Public body/bodies	43	50	86%
11.1.	Website /No. of individuals	44791	200	22396%
11.1.	Website /No. of unique visits	4869	2000	243%
11.2.	Awareness of the general public/Other media (video/broadcast)	2	2	100%
11.2.	Awareness of the general public/Displayed information (poster, information boards)	23	8	288%
11.2.	Awareness of the general public/Publications/reports	0	2	0%
11.2.	Awareness of the general public/Events/exhibitions	8	8	100%
12.1.	Networking/Other	16533	500	3307%
12.1.	Networking/Members of interest groups	400	10	4000%
12.2.	Professional training or education/Professionals	139	80	174%
12.2.	Professional training or education/Students (in higher education)	729	150	486%
13.	Jobs	2	5	40%

8. Comments on the financial report

8.1.Summary of Costs Incurred

Table 16, "PROJECT COSTS INCURRED", evidences a summary of the project's financial execution, having for basis the costs incurred/reported until 31/12/2019 by all beneficiaries. Globally this table evidence a total execution of 595 596,08, representing a 36% of the total budget.

Globally, current financial execution is still low. This situation is partly due to the fact that most of the management measures are currently being implemented, or will be in the near future, and have not yet been paid (implying large sums). This has effects mainly in External Assistance and Personnel. Also, as explained above, same of the works addressed to the UÉvora, were planned to be done by external assistance but end up to be made with University own staff (Personnel - additional). This point also partly explains why Personnel expenses are higher than expected, although this value is also being influenced by an increase with the foreseen grants, as explained previously in 6.2.

Another value that stands out corresponds to "Other Costs", which mostly corresponds to values associated with E actions, which have not yet been carried out (as is the case of trails) or which had not yet been paid in December 2019 (as is the case of the information panels).

In relation to "Travel", budget is below expectations, but a greater execution is expected with the monitoring of the works during the next year. We also realized that UÉvora did not have a budget for D3 in this item, so some of the expected value for C3 has been directed to this action (despite corresponding to a low value).

Regarding "Durables goods" most of the equipment foreseen was already purchased.

Table 16. Project Costs Incurred Until December 2019

PROJECT COSTS INCURRED			
Cost category	Budget according to the grant agreement in €*	Costs incurred within the reporting period in €	%**
1. Personnel	782 514,00 €	436 909,82€	**56%**
2. Travel and subsistence	165 393,00 €	26 554,98 €	**16%**
3. External assistance	399 018,00 €	48 977,29 €	**12%**
4. Durables goods: total non-depreciated cost			
- Infrastructure sub-tot.			
- Equipment sub-tot.	33 646,00 €	23 004,64 €	**68%**
- Prototype sub-tot.			
5. Consumables	83 503,00 €	16 704,61 €	**20%**
6. Other costs	82 562,00 €	4 480,92 €	**1%**
7. Overheads	108 263,00 €	38 963,82 €	**36%**
TOTAL	**1 654 899,00 €**	**595 596,08 €**	**36%**

8.2. Accounting system

As already presented for some beneficiaries during NEEMO's monitoring visit, all beneficiaries have set into practice – as obliged through the Cooperation Protocols – a set of electronic accounting systems that allow for identification/separation of the project costs from general accounts. Table below presents a summary of the applicable accounting systems codes/names.

Table 17. LIFE-RELICT applicable accounting systems

Beneficiary Name	Name of Account	Code of Account
UEVORA	LIFE RELICT	930843
ADRUSE	LIFE16 NAT/PT/000754	9425
CYCITEX	LIFE RELICT	201814301000700
CMMonchique	Projeto LIFE RELICT (ADELFA)	246202
CMSeia	Projeto Life Relict – Life16 NAT/PT/000754	041107310

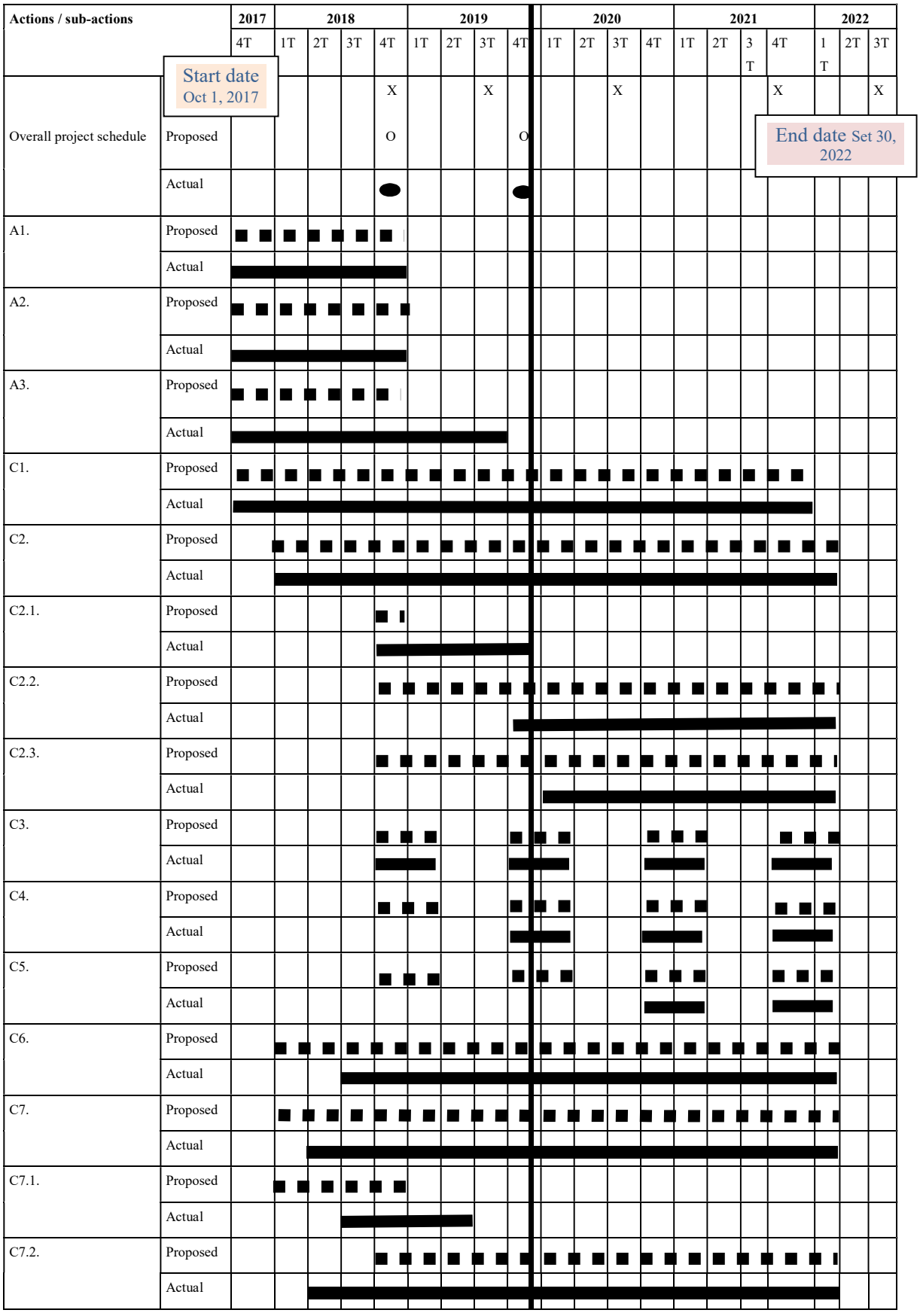
9. Envisaged progress until next report

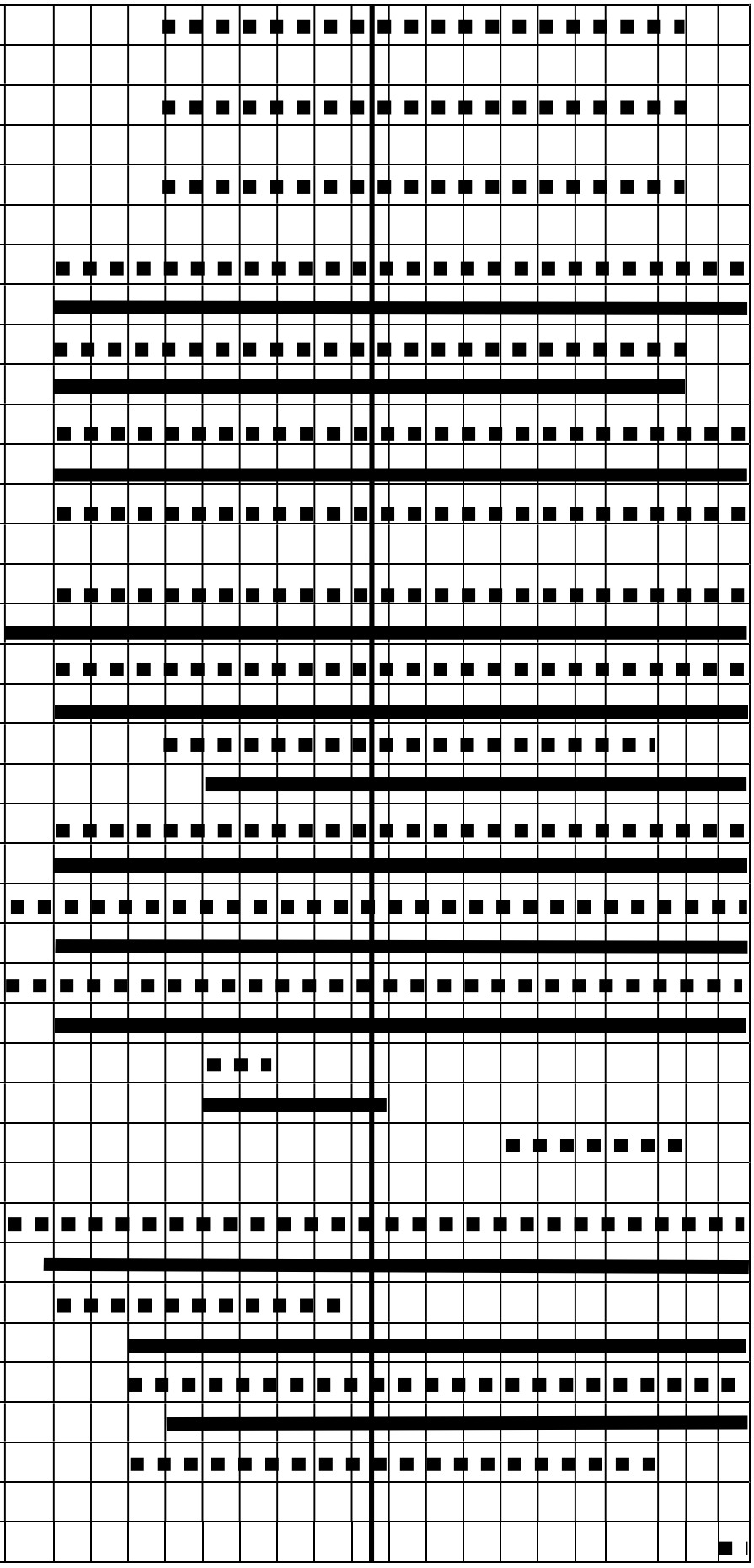
Globally, by the next report we hope to take on the interventions that are taking place in Estrela, as well as carry out the plantations planned for Monchique and in at least most of the territory of the Estrela. in addition, we hope to finalize the flyers and exhibition and proceed with the production of material to support the trails. We will also carry out the planned actions of environmental education and activities for the local population, as well as the collection of seeds and the monitoring scheduled for 2020.

In more detail, the envisaged progress includes:

- **C1, C2, C3, C4 and C7** – conclude all the works in progress and start plantations;
- **C6** – Conclude first stage and begin stage two;
- **D1, D4 and D5**. Make second monitoring report and in the case of D1 take on the third monitoring campaigned;
- **D2**. Implement new surveys;
- **D3**. Define and start to implement the methodologies to assess the value of the selected Ecosystem Services;
- **E1**. Continue to improve the web page and Facebook page and install all informative panels;
- **E2**. Print flyers, finish exposition and open it to public, finish the implementation of Monchique trail and start to work on Estrela trail. We will be present again in Cabeça Christmas event;
- **E.3.** Continue with the foreseen educational sections and activities;
- **E.4.** Execute the technical workshop in CICYTEX and continue to represent project in other scientific events;
- **E5.** Continue with the started replication efforts and try to find new opportunities.

Project Gantt chart



C7.3.	Proposed	
	Actual	
C7.4.	Proposed	
	Actual	
C7.5.	Proposed	
	Actual	
D1.	Proposed	
	Actual	
D2.	Proposed	
	Actual	
D1.I.	Proposed	
	Actual	
D2.II.	Proposed	
	Actual	
D2.III.	Proposed	
	Actual	
D3.	Proposed	
	Actual	
D4.	Proposed	
	Actual	
D5.	Proposed	
	Actual	
E1.	Proposed	
	Actual	
E1.1.	Proposed	
	Actual	
E1.2.	Proposed	
	Actual	
E1.3.	Proposed	
	Actual	
E2.	Proposed	
	Actual	
E2.1.	Proposed	
	Actual	
E2.2.	Proposed	
	Actual	
E2.3.	Proposed	
	Actual	
E2.4.	Proposed	

	Actual	
E2.5.	Proposed	
	Actual	
E3.	Proposed	
	Actual	
E3.1.	Proposed	
	Actual	
E3.2.	Proposed	
	Actual	
E3.3.	Proposed	
	Actual	
E3.4.	Proposed	
	Actual	
E3.5.	Proposed	
	Actual	
E4.	Proposed	
	Actual	
E5.	Proposed	
	Actual	
F1.	Proposed	
	Actual	
F2.	Proposed	
	Actual	
F3.	Proposed	
	Actual	
F4.	Proposed	
	Actual	