



Autonomous Region of the Azores
Regional Secretariat for the Environment and Climate Change

LIFE IP Azores Natura (LIFE17 IPE/PT/000010)

Progress Report

covering the project activities of sub-action C4.1

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GOVERNO
DOS AÇORES

Secretaria Regional do Ambiente
e Alterações Climáticas



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List of key-words and abbreviations

DLR	Decreto Regulamentar Regional (Regional Regulatory Decree)
DRAM	Direção Regional dos Assuntos do Mar (Regional Directorate for Sea Affairs)
DRRF	Direção Regional dos Recursos Florestais (Regional Directorate for Forest Resources)

GesFlorA Plataforma Digital para a **Gestão Florestal** nos **Açores** (Digital Platform for Forest Management in the Azores)

HD Habitat Directive

IAS Invasive Alien Species

POBHL Plano de Ordenamento das Bacias Hidrográficas das Lagoas (Lagoon Basin Management Plan)

1. Technical part

1.1. Action C4 – Implementation of integrated best practice works for habitats

1.1.1. Sub-action C4.1 – Best practice for terrestrial habitat conservation

This sub-action stipulates the implementation of various best practice interventions for the conservation of HD priority habitats, thereby contributing to the conservation of HD species on 7 islands of the Azores archipelago. Planning of the specific tasks commenced in January 2020, when the Technical Assistant to the Project Manager was contracted.

As a first step, the intervention areas on the 7 islands were visited, and Operational Programs were subsequently devised per island. The concrete best practice works implemented in each of the intervention areas targeted by this sub-action vary according to the threats/issues encountered in each of these areas. The present report will therefore describe the activities carried out up until 31 December 2021, specified separately for each of the islands, including mapping of all interventions.

Pico

On Pico Island, the visits to the 4 intervention areas revealed that all of them would require fencing in order to block the access of cattle to the areas. The following table shows the length of fence required in each of the areas.

Table 1. Required length of fence (km) to be constructed in each intervention area on Pico Island.

Intervention area	Length of fence (km)
Caveiro	13.78
Mistério da Prainha	1.41
Bosque da Junqueira	1.11
Pico da Urze	0.42
Total	16.72

All necessary equipment and machinery were acquired in November 2020. After a training event delivered by the supplier in January 2021, which enabled the Operational Assistants to acquire the necessary skills for the use of the machinery, the construction of the fence began in May 2021. This is the time of year when weather conditions start to improve, rendering the work in the intervention areas possible.

Table 2. Equipment acquired for fence construction on Pico Island.

Item	Units
Hagro' Fence post driver 80mm with Honda motor GX3	1
DeWalt XR staple gun	2
DeWalt 40mm staples (960 staples per unit)	7
Treated pine posts, 1,8 m	1500
Barbed wire (250 m per role)	54
Manual post driver	2
Hammer	4
Sledgehammer	2
Plier	4
Wire cutter	4

Construction began in the west of the Caveiro intervention area, and work made very good progress, until the post driver broke down due to a defective part, combined with wear and tear of the machinery due to the rocky substrate in the area. By the time that the post driver broke down, approximately 1.7 km of fence had been built along the access road of Paúl lagoon (Figure 1).

Since then, construction of the fence on Pico Island has stopped, as the pile driver was under repair for over 6 weeks (due to shipping times for replacement parts and communications with the supplier about the warranty of the machine). To avoid this type of hold-up in the future, and given that there are about 14 km more of fences to be installed on Pico Island, a second post driver was acquired in September 2021. Due to the need to carry out this type of work during a limited time window, i.e. the summer months, because of harsh weather conditions, the construction of the fence has not been able to be continued this summer.

From day one of the fence construction, farmers that were illegally releasing their cattle inside the Natural Reserve were encountered. They were duly informed of the applicable legislation, to no avail. During the time that fence construction was on hold due to the repairs of the post driver, the fence was vandalized in several stages. At one point, the Nature Wardens noticed that close to 70 poles had been stolen. However, this theft was carried out without cutting the barbed wire, and the fence remained standing (approximately every 2 or 3 posts were removed, removing the staples with which the barbed wire was attached to the posts). On September 6, 2021, staff of Pico Natural Park confirmed the continuation of the theft and vandalization of the fence, with the barbed wire being cut in several places and 177 posts stolen. This theft was reported to the police on October 6th.

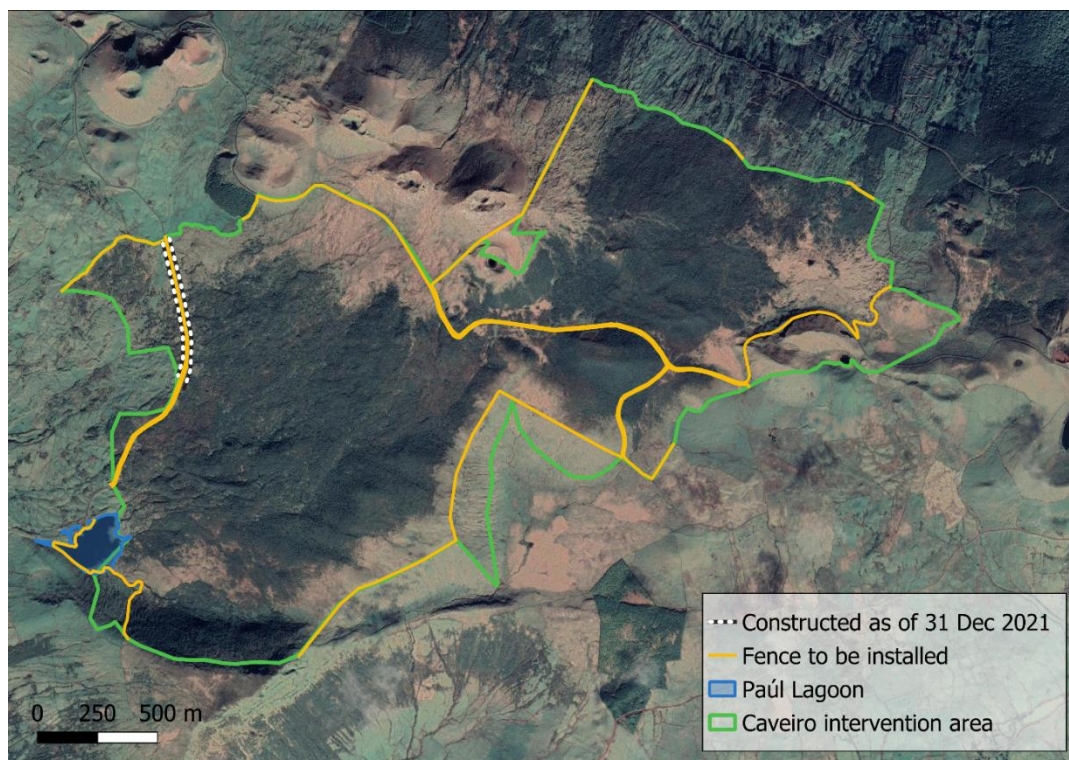


Figure 1. Required fencing and fence installed as of 31 Dec 2021 in Caveiro intervention area, Pico Island.

In early September, the earmarks of several cows found within the Caveiro Natural Reserve were registered, which led to the identification of their owner. This owner was contacted by the Nature Wardens with the request to remove the cows within a few days, and the warning that the next time

the owner's cows were found in the Reserve, a fine would be issued. On September 21, a second trip was made to identify earmarks of cows found within the Natural Reserve, during which 13 cows belonging to 8 different owners were identified. A letter by the Director of Pico Natural Park has been dispatched, to alert these owners of their obligation to remove their cows from the Natural Reserve, also informing that if individuals from these owners were caught during a subsequent visit, fines would be issued.

Since in May 2021, it became clear that problems would arise with the farmers who illegally use the Caveiro Natural Reserve to graze their cattle. It was therefore planned to hold a meeting with the Pico Island Farmers Association, in order to address the issue and try to find a solution. Firstly, the Dutch company P2 was contacted, which carries out mediation work. This company had already delivered a training course in negotiation techniques to the LIFE IP Azores Natura team in February 2020, which was organized by DRAM. As a result of this training course, contact with this company was maintained. On June 16, 2021, a meeting was held with the P2 team, in order to receive advice on how to address the issue with the farmers on Pico Island in a constructive way. This meeting resulted in a set of guidelines for the planned meeting with the Pico Island Farmers Association, the Forest Service and the Agrarian Development Service and, in a next step, with the farmers that use the Caveiro Natural Reserve. However, due to various factors, including the change in the structure of the SRAAC and the entry into Service of the new Director of the PNI, Vanda Serpa, progress has not yet been made with the holding of this meeting.

Faial

On Faial Island, it was necessary to install 5.7 km of fence in order to keep cattle out of the intervention area (Figure 2). This fence was built by an external contractor in April 2021. Similar problems as on Pico Island have been experienced, with the fence being continuously vandalized by farmers in several locations in order to allow the cattle to enter the intervention area. After each detection of a vandalization event, the Operational Assistants of the LIFE IP Azores Natura project proceed with the repairs. Local Farmers Associations and individual farmers have been duly informed about the installation of the fence and its objectives.

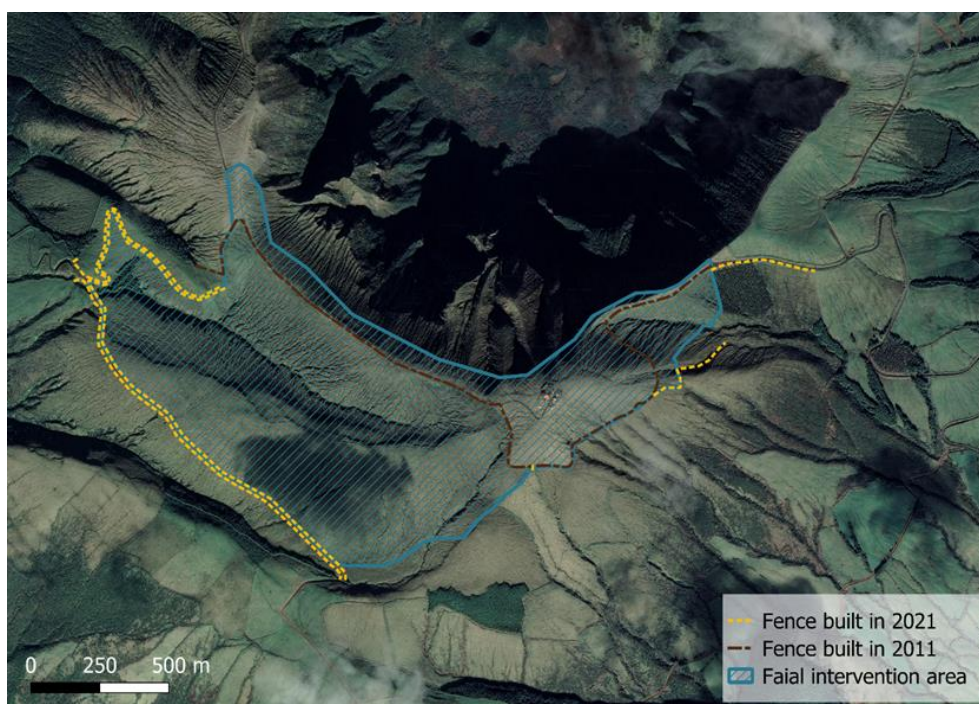


Figure 2. Fences installed around the intervention area south of the Caldeira in 2011 and 2021, Faial Island.

Corvo

On Corvo Island, the necessity of a fence with a length of 917 m was ascertained during the initial visit to the intervention area (Figure 3). All necessary materials have been acquired in 2021, and the beginning of the construction is planned for 2022. An expected problem is the difficulty of transporting the material (posts, barbed wire, machinery) to the building site, given that it needs to be carried approximately 1.5 km along a narrow path, with no access for vehicles.

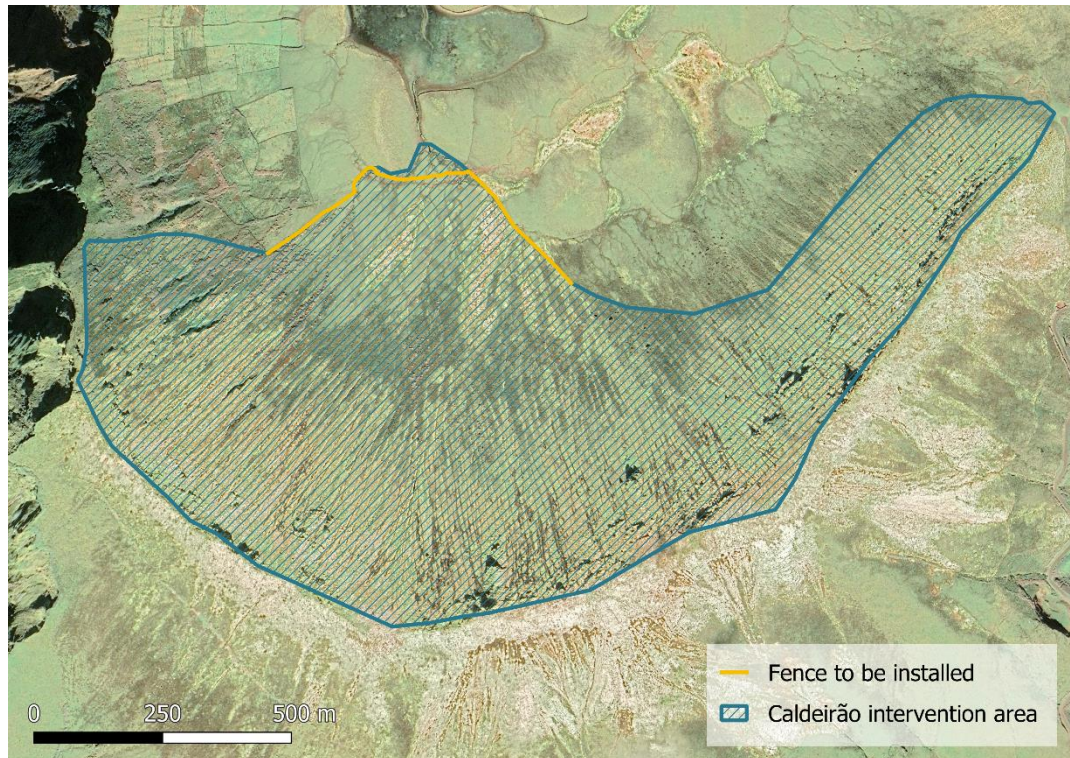


Figure 3. Fence to be installed in the Caldeirão intervention area in 2022, Corvo Island.

Flores

During the initial visit to the intervention area on Flores Island, it was established that it would be beneficial to move the intervention area slightly to the south, in order to include a highly invaded area which would otherwise serve as a source for the dispersal of IAS seeds into the intervention area. Through this alteration, which was approved during the 3rd Monitoring Visit in March 2021, the northern boundary of the intervention area is now constituted of a creek, which acts as a natural barrier for the cattle grazing the pastures located to the north of the intervention area. Fencing is therefore not required on Flores Island.

Furthermore, nuclei of invasive species to be removed have been assessed in part of the intervention area, both in the field and using drone flights. The whole removal process is being done mechanically, given that the Lagoa Branca intervention area is entirely within the lagoon's hydrographic basin (Lagoon Basin Management Plan, DLR no. 6/2013/A), wherefore the use of chemicals is not permitted. This increases the difficulty of controlling the highly proliferate ginger lily *Hedychium gardnerianum*, which constitutes the main invasive species in the area, requiring continuous maintenance to control regeneration.

In addition, the requirements in terms of numbers of trees to be planted in order to prevent the invasive species to reclaim the cleared areas, have already been quantified:

- 500 *Frangula azorica*
- 500 *Ilex perado* subsp. *azorica*
- 250 *Juniperus brevifolia*
- 500 *Laurus azorica*
- 500 *Prunus azorica*
- 500 *Vaccinium cylindraceum*
- 500 *Viburnum treleasei*

Terceira

On Terceira Island, interventions within the frame of sub-action C4.1 have been, or will be, carried out in 7 areas: Turfeira da Lomba, Vale da Vinagreira, Lagoa do Negro, Biscoito da Ferrara, Quinta da Madalena, Rocha do Juncal, and Pico Alto e Tamujal 5. The initial project also lists the intervention areas Terra Brava, Furnas do Enxofre, and Ribeira dos Gatos under this sub-action. However, since a survey of these areas revealed that the tasks that are necessary to be carried out there are better described by sub-action C8.1 (Terra Brava and Ribeira dos Gatos: invasive species removal) or sub-action C4.2 (Pilot for ecological corridor implementation: creation of nuclei of native plants to reinforce the ecological corridor), they will be included in the reports relating to those sub-actions. Similarly, although the interventions carried out in the Lagoa do Negro area are – according to the project description – encompassed by action C4.2 (Pilot for ecological corridor implementation), they will be included here, given that they fulfil the same general goal as interventions within the frame of action C4.1.

In the **Turfeira da Lomba** intervention area, a metal gate with a padlock was installed by the Operational Assistants hired within the frame of the project in order to deny access to pedestrians, unauthorised vehicles, and cattle from the surrounding pastures. The road to the intervention area was repaired along approximately 170 m in order to allow the machinery to access the intervention area. Due to high precipitation levels, a hut was constructed by the Operational Assistants using wood extracted in the area. This shelter will be removed when the work in this area is concluded.

In order to avoid negative impact on the peatland caused by the frequent passage of the Operational Assistants, planks were cut from the extracted wood and laid out as a walkway across the peatland.

Cryptomeria eradication in Turfeira da Lomba started in October 2020 and is expected to be concluded during the winter of 2021/2022. Small and medium sized *Cryptomeria japonica* were felled and the exposed surface of the cut immediately brushed with a mix of phytopharmaceuticals and food colouring, in order to leave a visible mark on the stumps that had already been treated. Altogether, 15 263 *Cryptomeria japonica* trees were removed between October 2020 and December 2021, in a total area of 18.76 hectares (Figure 4). Larger individuals were killed using the drill and inject method. The accumulating biomass was removed from the area whenever possible. The intervened area will be left to regenerate naturally. Only where removal of *Cryptomeria japonica* created clearings larger than 200 m², will plantings of native species be carried out, utilizing seeds collected in the area.

In the **Vale da Vinagreira** area, the 14 individuals of *Cryptomeria japonica* natural regeneration were killed with the drill and inject method in March 2021.

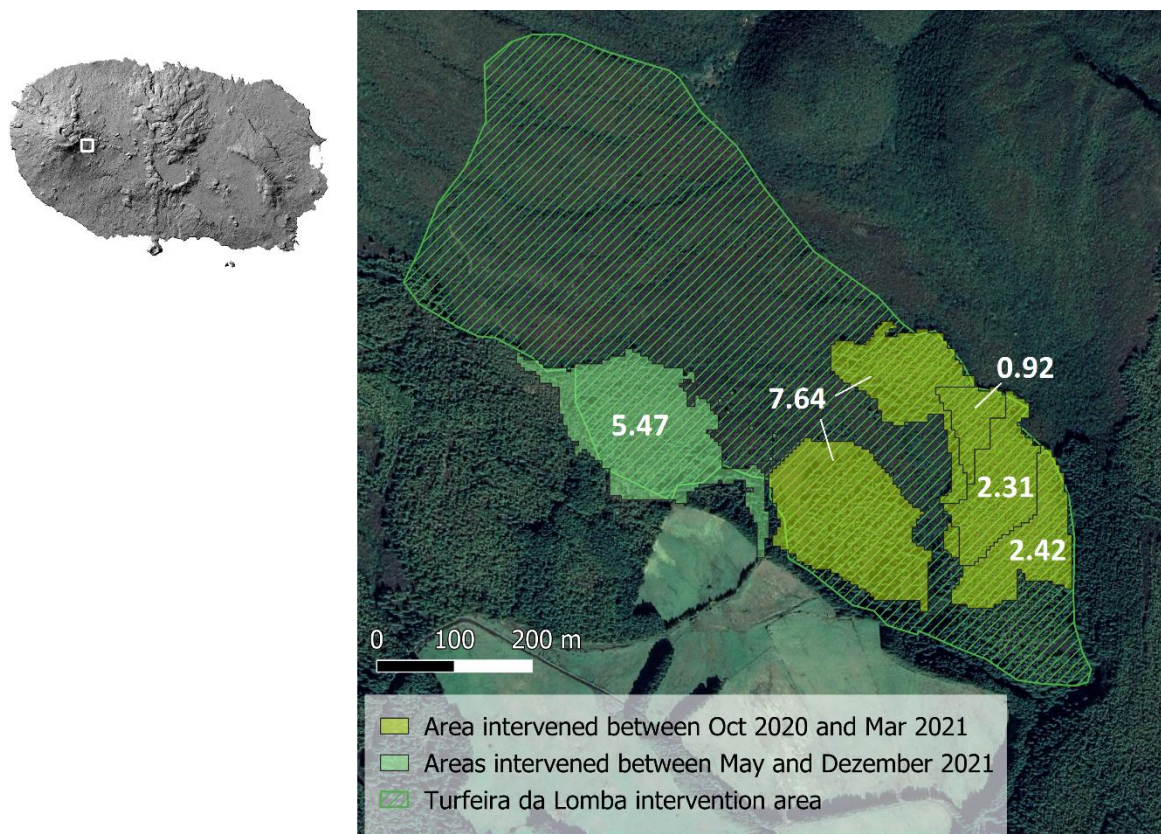


Figure 4. Area intervened in the Turfeira da Lomba intervention area, Terceira Island, between October 2020 and December 2021 (values given in hectares).

Two wooden gates were installed in the **Lagoa do Negro** intervention area, one in August 2021, and another one in September 2021, in order to prevent cattle from crossing into the peatland areas (Figure 5). A total of 9 439 *Cryptomeria japonica* trees has been cut or killed using the drill and inject method between March and September 2021. During the planting season of 2021/2022 (during the winter months), it is planned to carry out plantings of *Prunus lusitanica* subsp. *azorica*, which have been propagated using *in-vitro* tissue cultures from Terceira's natural population of this species. The transport of the plants from Faial to Terceira is currently being organized (as of December 2021).

A gate was also installed in one of the access roads to the **Biscoito da Ferraria** and Rocha do Juncal area in September 2021, in order to prevent cattle and unauthorized vehicles from accessing the area (Figure 6). In this area, a *Cryptomeria japonica* production forest with a size of 3.75 ha exists, for which a formal request has been made to the Forestry Service of Terceira in order to be able to cut these trees. The licence for timber extraction has already been issued, and it is planned to launch a bid for timber extraction in 2021. Dispersed *Cryptomeria japonica* trees originating from natural regeneration will be killed using the drill and inject method; this action is expected to be carried out in the summer of 2022.

In the **Quinta da Madalena** area, a total of 335 *Cryptomeria japonica* trees (natural regeneration) were killed using the drill and inject method in October 2021. Currently, a hedge consisting of 133 *Cryptomeria japonica* trees remains in the area, for which the request to cut the trees has to be formally made to the Forestry Services of Terceira Island.



Figure 5. Gates in the Lagoa do Negro intervention area, Terceira Island.

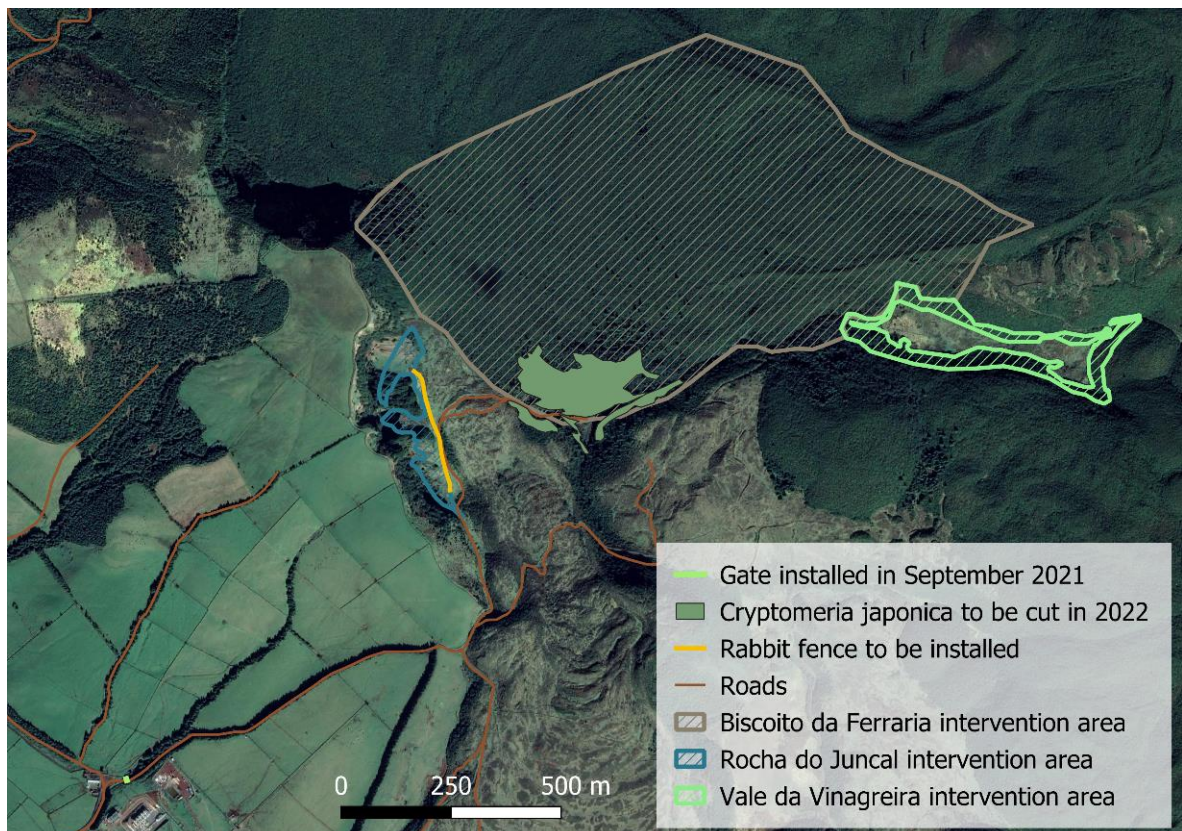


Figure 6. Gate installed on the access road to several intervention areas, and *Cryptomeria japonica* stand to be felled in 2022, Terceira Island.



Figure 7. Rabbit fence to be installed in the Rocha do Juncal intervention area, Terceira Island.

In the **Rocha do Juncal** intervention area, the construction of a rabbit fence to protect the populations of *Ammi trifoliatum* and *Lactuca watsoniana* will be necessary (Figure 7). The fence will have an approximate length of 300 m and be partially underground in order to prevent rabbits from digging under it. Its construction depends on the acquisition of a tractor within the frame of the LIFE IP Azores Natura project, and is predicted to be built in 2022/2023. During this time, the few individuals of *Cryptomeria japonica* in this area will also be killed using the drill and inject method.

In the **Pico Alto e Tamujal 5** area, natural regeneration of *Cryptomeria japonica* will be treated with the drill and inject method during the summer months 2023.

A further intervention area on Terceira Island which is occupied by *Cryptomeria japonica* is **Pico Alto e Tamujal_1** with a size of 35.7 ha. However, given that this production forest is not yet at a developmental stage that allows for its cost-effective cut, it has been proposed during the current phase amendment to redirect the interventions to a new parcel of 36 ha (Turfeira do Sanguinhal), that allows for restoration works in habitats that still exist (91D0*, 7140, 7130). Intervening in this area also creates a geographical continuum with other intervention areas (Biscoito da Ferrara, Rocha do Juncal, Vale da Vinagreira, Pico Alto e Tamujal 3 and Furnas do Enxofre), which will favour overall resilience of the area.

São Miguel

In the Lagoa do Fogo intervention area on São Miguel Island, so far, a total of 11 019.6 m³ of biomass of *Cryptomeria japonica*, *Rubus ulmifolius*, *Acacia melanoxylon*, *Hedychium gardnerianum* and *Dicksonia antarctica* have been removed. After the conclusion of the removal and control of these species, native vegetation will be restored through plantings. The plants are already available, so that

2000 *Viburnum treleasei*, 5000 *Erica azorica*, and 2000 *Vaccinium cylindraceum* will be planted in the spring of 2022.

Given that the Lagoa do Fogo intervention area is located within the Forest Perimeter with defined spatial Forest Management Units, and within the scope of action C2.1 (internal capacity building) members of the LIFE IP Azores Natura team received training by the DRRF to learn how to use the digital platform GesFlorA. GesFlorA is a tool developed by the DRRF, which public and private entities can use to elaborate their Forest Management Plans for any given spatial unit, by defining the management options and actions to be implemented in the medium to long term, according to the biophysical characteristics of the land and the management objectives that have been established. Data on all the interventions carried out in the area have been introduced in this GesFlorA platform, which is managed by the Regional Directorate of Forest Resources.

São Jorge

In the Fajã dos Cubres intervention area on São Jorge Island, the opening of the stone walls existing in the Cubres Lagoon, in order to increase water flux, is currently under way, with 3 of 4 canals already opened (1 canal in walkway 1, and 2 canals in walkway 2 have already been opened; a further canal will be opened in walkway 3; see Figure 8). Work on this task started in the end of September 2021. Intermittently, works have been on hold due to high water levels after precipitation events, and it is expected that they will be concluded in February 2022.

The material necessary for the construction of two bird observatories in the Fajã dos Cubres, as described in the respective Operational Plan, has already been acquired in April 2021. However, part of this material was utilized to reinforce the new canals built into the stonewalls across the lagoon, wherefore this material is currently in the process of being substituted.

Regarding the restoration of native vegetation in the Fajã dos Cubres, 159 individuals of *Myosotis maritima* were planted in October 2021.



Figure 8. Opening of canals in three stonewalls crossing Cubres Lagoon, São Jorge Island.

2. Overall progress of sub-action C4.1

Overall progress of the implementation of sub-action C4.1 is well within the timeframe defined in the project, and so far, all due milestones and deliverables have been achieved (Table 3).

Table 3. Milestones and deliverables for sub-action C4.1.

Milestone	Due date	Achieved
1 st habitat restoration activity implemented	31/12/2020	✓
Habitat restoration action implemented on all Azorean islands	31/12/2022	
All cattle fences placed	31/12/2023	
All <i>Cryptomeria japonica</i> within sub-action intervention areas removed	31/12/2024	
Deliverable	Due date	Achieved
Intermediate report	31/12/2021	✓
Detailed and specific mapping of all interventions	31/12/2021	✓
Intermediate report	31/12/2025	
Final report	31/12/2027	

The first milestone (1st habitat restoration activity implemented) was achieved in October 2020. The present report constitutes the first intermediate report describing the developments in the implementation of this sub-action and the associated results (deliverable D88), including the detailed and specific mapping of all interventions (deliverable D89).

Table 4 illustrates the actual progress of the implementation in relation to the proposed timeframe.

Table 4. Gantt-chart illustrating overall progress of sub-action C4.1.

Action		2020				2021				2022			
		1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T
C4.1	Foreseen												
	Executed												

Legend:

	Defined period in application
	Implementation according to plan