

# LIFE SAFE-CROSSING

## ACTION C2. ACTIVITIES TO ENHANCE CONNECTIVITY BETWEEN CORE AREAS THROUGH READAPTATION OF UNDERPASSES AND INTERVENTIONS ON ROAD SIDES

BRIEF TECHNICAL REPORT – DEADLINE August 2023



## Contents

### INTRODUCTION

1. ADAPTATION OF CROSSING STRUCTURES	3
1.1 Greece	4
1.2 Romania	5
1.3 Italy	6
2. INTERVENTIONS ON ROAD SIDE	8
3. GENERAL CONSIDERATIONS	9
ANNEX Maps and photos of the interventions in each project area	10



# 1. INTRODUCTION

The LIFE SAFE-CROSSING (LIFE17NAT/IT/464) project aimed at implementing actions to reduce the impact of roads on some priority species in four European countries: Apennine brown bear (*Ursus arctos marsicanus*) and wolf (*Canis lupus*) in Italy, Iberian lynx (*Lynx pardinus*) in Spain, and Brown bear (*Ursus arctos*) in Greece and Romania. The main actions carried out were:

- Installation of Animal-Vehicle Collision Prevention Systems on most critical road segments;
- Adaptation of crossing structures to enhance connectivity for the target species;
- Development of activities to increase the attention of drivers about the risk of collisions with the target species.

The aim of the action was the adaptation of existing crossing structures to reduce habitat fragmentation in order to improve ecological connectivity for the target species. In Spain, where the interventions on crossing structures were already made in the frame of a previous life project, LIFE IBERLINCE, the aim of the action was the management of road verges to increase drivers' visibility, in order to reduce the road kills of Iberian lynx.

This action was not implemented in the province of Terni, where there aren't crossing structures along the selected road segments.

The interventions foresaw in the project proposal were the followings:

Italy: 7 crossing structures adapted on the SS 83 road (PNALM) + 12 fences on SS17 road and 3 underpasses cleaned on the SS 487 road (PNM)

Romania: 30 crossing structures adapted

Greece: 50 crossing structures adapted

Spain: Vegetation clearance on most critical road segments

This document summarizes the activities implemented in each project area, while the evaluation of the effectiveness of the interventions is part of the Action D1.

In the annex of this report, there are the map and all the photos of the intervention carried out by each project partner.

## 2. ADAPTATION OF THE CROSSING STRUCTURES

The selection of crossing structures to be adapted were based on the results of Action A4. The interventions followed the recommendations included in the Guidelines, always produced in the frame of Action A4.

We selected the crossing structures located in areas critical for the ecological connectivity of the target species, and on the basis of road kill and telemetry data (Action A3).

The total number of the crossing structures where the interventions were carried out were 98:

- Greece: 55;
- Italy: 13 (4 in PNALM, 9 in PNM);
- Romania: 30

In the following paragraph there is the description the type of the intervention carried out in each country, while the maps and the photos are presented in the Annex .

### 1.1 Greece

The crossing structures to be readapted, located along the Vertical Axis A29 of the Egnatia Highway, were 55, compared to 50 foreseen in the project proposal. This increase was possible due to a precise definition and planning of the necessary interventions to be carried out, occurring in the frame of Action A4.

On 24/10/2020 EOSA organized a meeting with the authorities from the Prefecture of Kastoria, concerning the permits for the interventions.

The authorities involved by the interventions that were asked for their approval, were:

- Region of Western Macedonia, Dept of Roads
- Region of Western Macedonia, Dept of Roads of Kozani Prefecture
- Region of Western Macedonia, Dept of Roads of Kastoria Prefecture
- Municipality of Argos Orestiko (Prefecture of Kastoria)
- Municipality of Voio (Prefecture of Kozani)
- Municipality of Kastoria (Prefecture of Kastoria)

The official approval for the interventions were sent by all authorities between November and December 2020.

The works to adapt the crossing structures started in September 2021 and were finalized in spring 2022. From an administrative point of view EOSA included these works in a bigger pre-existing contract for maintenance works, instead of making a new tender which would request a lot of time with the possible delay of the action implementation.

The interventions realized were the following:

- Planting: basic interventions for the provision of natural conditions and increase attractiveness around the entrances of the structures. A total of about 7.000 native plants were planted in 41 crossing structures; the intervention included the construction of an irrigation system, as well as the construction of a protective fence, in areas with livestock around. The plants used were *cotinus* and *spartium*.
- Pruning: to improve approachability of the structures; this intervention was made in 14 crossing structures.
- Cleaning/Debris removal: to improve openness index and approachability of the structures. This intervention, in many cases, required the use of mechanised vehicles and excavators to

remove soil and all obstacles that prevented or hindered access to the structure. Overall, this kind of intervention was made in 29 structures.

- Construction of stairs/ramps: to allow/improve the use of the structures by animals. This intervention was realized in 8 structures (12 stairs/ramps), where the presence of a wall impeded the passage of wildlife.
- Construction of dry ledges: to improve the structure use, especially by small mammals, in case of water flow. Dry ledges were built in 4 structures (5 ledges), the length of the ledges was between 50 and 90 meters, while the width was 1 meter.
- Correction of existing high fence: to improve the structure entrance approachability, in order to guide the animals directly into the structure. Fence improvements were made in 12 structures, and a total of around 300 meters of fence were installed.
- Installation of light screens: in 10 structures, light screens, made of thick plastic used in playgrounds, were installed to create a safer perception of the structure entrance for wildlife.
- Adding natural material: to guide the animals towards the entrances of the structures. Woods and rocks were placed near the entrances, and this was especially important for small mammals. This kind of intervention was made in 8 structures.

These interventions not only increased the use of the existing crossing structures by wildlife, but in several cases, they resulted in the creation of new safe passages to cross the highway. This was possible because the removal of debris made it possible to pass through these crossing structures that were previously completely obstructed. The same effect was achieved with the construction of stairs/ ramps that allowed the use of the crossing structures, which was previously impossible.

The effectiveness of the interventions carried out was witnessed by the huge number of videos collected through the installation of the prototype developed by COSMOTE.

The results obtained were extremely important, because they really improved the ecological connectivity for the bear and other wildlife species.

## 1.2 Romania

The Action started earlier than was foreseen in Romania where the interventions on the crossing structures began in June 2019. The 30 crossing structures, selected to favour their use by the brown bears as well as the other wildlife species, were located 5 in the road segment D13 Pandurea bogatii (Romania 4), 15 in DN 1 National road Brasov-Comarnic (Romania 1), 5 in, DN1A Cheia-Brasov road (Romania 3) and 5 in E68, DN1 Brasov-Vlădeni road (Romania 5).

All the crossing structures were located in critical areas for the ecological connectivity of the target species, and some of them between Natura 2000 sites.

Prior to action implementation several meetings were made with road authority in order to explain the aim and type of the interventions.

The main interventions carried out for each crossing structure were: cutting and managing vegetation in order to guide the animal toward the entrances of the structure, removal of debris brought by water and removal of garbage in order to allow animal's passages. Each intervention was carried out by a team of 20 people and lasted around 2 days.

The interventions on the 30 crossing structures were carried out on a seasonal basis (spring and autumn) twice per year therefore a total of 60 interventions were made each year. Most of the interventions consisted of collecting the garbage, especially in the busiest sector of the project, Romania 1 (DN 1 National road Brasov-Comarnic), where people coming from Bucharest on the weekends, use the road as a garbage bin. In the other 3 sectors (Romania 3, 4, and 5), consisted of

cutting the vegetation that was blocking the entrances and also the removal of objects that were carried by the high waters, after a heavy rain, usually at the start and the end of summer. Overall, a total of 300 interventions were carried out.

In order to ensure the continuity of this action after the end of the project an agreement was made between INCDS and the road authority, in this way the 30 adapted structures will keep cleaned thus ensuring the ecological connectivity in the long term.

### 1.3 Italy

#### *PNALM*

The interventions were carried out on 2 crossing structures along the SS83 road, 1 along the SS17 road, and the remaining one along the SP 17.

The works to be carried out were presented to ANAS and to the province of L'Aquila but no formal authorization was required

A preliminary intervention, concerning the cutting of vegetation to clear the entrances of both crossing structures along the SS83 road was carried out in 2019. In summer 2019 was also organized the removal of fruit from the road, always along SS83, in collaboration with volunteers. Unfortunately, this action could not be repeated in 2020 due to Covid-19 restrictions. The presence of fruit along the road is a big problem because it attracts bears therefore increasing the risk of a road accident.

The two structures along the SS83 road were both culverts, one at the 55,800 Km called Casone Antonucci, the other at the 54,600 Km called Crugnale.

Casone Antonucci: the intervention started in September 2021 and was finalized in July 2022. The work mainly consisted in the removal of debris around the entrances and the installation of a metal fence to guide the animals toward the structure. The fence was a rhomboidal net, stretched by spinning n. 5 transversal cables, placed respectively 1 at the foot, 1 in the middle and 3 in the upper part. The galvanised tubular posts, spaced 2,5 meters between them, had a height of 2.50 m. above the ground, including the anti-burglar fold inclined at 45 degrees. The total length of the fence was around 450 meters.

The fence was checked regularly, especially the lower part to close some holes that had been created by the passage of wild boars, as the rocky terrain had prevented the net from being buried. The holes in the net were closed with natural material and the use of metal pickets.

Crugnale: the intervention started in September 2021 and was finalized in July 2022. A wood fence was installed to guide the animals toward the culvert. The wood poles had a section of 10-12 cm, and were tied together. All the obstacles at the entrances of the structure were removed and natural substratum was added in order to increase the approachability of the culvert. In August 2022 a metal fence was added to the wood one in order to better guide the animals, increasing the total length of the fence.

The third intervention was the installation of a metal fence along the SS17 road (Km 146,100) where a female bear was killed on the road in December 2019, and where 1 AVC-PS was installed in April 2021.

The intervention started in July 2022, the entrances of the crossing structure were cleared of bushes and a metal fence was installed on both sides of the road. The total length of the fence was around 1200 metres. The installation of the fence was co-funded by WWF and Salviamo l'Orso, this made possible to cover a larger area. The intervention was completed in October 2022.

The fourth intervention was the removal of vegetation from the entrances of the crossing structure on the SP 17 road near the junction with SS83 road where one of the 3 AVC-PS was installed. This intervention was carried out in July 2023 in order to better secure the area.

The adapted crossing structures were less than was foreseen (4 respect to 7). This was related to the fact that 3 crossing structures indicated in the project proposal, during the characterization phase (Action A4) resulted not suitable for medium large size mammals, therefore only minor interventions of vegetation cleaning were carried out. Instead, more emphasis was put on the other 4 crossing structures, therefore finally the length of the fences installed was almost 1800 m, with respect to 400 m foreseen in the project proposal.

### *PNM*

Through the implementation of Action A4 all the existing crossing structures have been characterized and the analysis of this data together with the ones collected with the other A actions, allowed the individuation of the priority crossing structures to be adapted for use by bears. The adapted crossing structures, in the frame of C2 action were 9: 2 on SS 487 road and 7 on SS 17 road. The interventions carried out were the removal of vegetation and debris from two crossing structures on SS 487 road. These interventions were made in Spring 2022, and then repeated the following year. The entrances of these crossing structures were completely obstructed before the intervention. In the field work, in addition to park staff, volunteers from Servizio Civile Universale were involved.

The intervention on the SS 17 road was extremely complex, because the SS 17 road is one of the main barriers between Abruzzo Lazio and Molise National Park and the Maiella National Park.

Before starting the intervention planning, a budget evaluation was conducted as well as a fine scale field evaluation to choose the exact location where to intervene among 4 possible sites. From the budget evaluation immediately came up the issue of a low budget available as the actual cost of the fence installation resulted more than triple of the one foreseen in the proposal (about 30 Euros/meter as compared to the actual estimation of at least 100 Euros/meter). In order to ensure the implementation of an effective intervention, PNM managed to use additional own funds to augment the available budget and also managed to implement an executive project aimed at maximizing the use of resources available. In fact, the exact location chosen for the installation of fences along the SS17 Pettorano-Roccaraso is the one where the maximum number of existing crossing structures could be adapted with the available budget thanks to the high density of crossing structures (7 in ~1.2 Km) and the presence of existing barriers already working as “invites” to use the crossing structures rather than crossing the road (e.g. high walls). The careful analysis developed (both at an economic and technical level) and the use of additional PNM funds allowed the installation of 1,5 Km of fence that, together with the existing barriers made 3 Km of SS 17 became a “safe crossing” for bears in one of the most important corridors for the bear range expansion (Ciucci et al. 2017). The intervention consisted in the installation of electro-welded, galvanized and plastic-coated wire 5x7.5 cm mesh, 2 mm wire, supported by galvanized tubular posts with a diameter of 60.00 mm, placed at a distance between centers of no more than 2.50 m. The height of the net from the ground is 2.00 m. The posts are fixed to the ground using holes 70 cm deep and pouring anti-shrink mortar. The net is anchored to the posts by three lines of 6.00 mm stranded steel cable and two lines of 2 mm intermediate edges. Additionally, specific interventions were also implemented to impede wildlife access to some tunnels with side openings: a galvanized electro-welded mesh 10x10 cm fixed to a height of at least 2.00 m to the structural reinforced concrete. Finally, ANAS contributed to the works replacing the existing metallic fences aimed at preventing animal falling out from the top of the tunnels.

The implementation of this task required a huge preparatory work developed by PNM and ANAS that resulted in about 25 meetings/field surveys and a strong collaboration to individuate the best period to start the works in order not to overlap with ANAS extraordinary maintenance works. This last issue is the reason why works needed to be postponed from summer 2022 to spring 2023 meaning when extraordinary maintenance works were not ongoing.

### 3. INTERVENTIONS ON ROAD SIDES

In Spain the aim of the action was the management of road verges to increase drivers' visibility, in order to reduce the road kills of Iberian Lynx. The selection of the sites of the intervention was based on the results of Action A4.

The interventions started in October 2021 and were carried out on the following Road: A 481 and SE-MA01 in Donana area and CO-3102 and N-20 in Sierra Morena. The total length of the intervention was around 27 km: 7,6 Km on SE-MA01 road, 3,6 Km on CO-3102 road, 3,25 Km on A-481 road, and 12,3 km on N-420 road. This last intervention was carried out by the Spanish Ministry of Public work following the indications of the LIFE SAFE-CROSSING staff.

The details of the interventions carried out were the followings:

SE-MA01: All vegetation on both sides of the road were cleared (3,8 kilometers on each side). A geotextile was placed in the cleared area and covered with mineral material to prevent and/or slow down the growth of vegetation in the intervention area. The work lasted from October 2021 to December 2021.

CO-3102: The ditches on both sides of the road have been cleared (1,8 kilometer on each side). The low branches of the trees near the road have also been pruned to increase visibility. The intervention was carried out in October 2021.

A-481: Clearing and pruning of bushes was carried out on both sides of the road for a total length of 3,25 Km. Vegetation was removed from the roadside to the existing fence. The work lasted from October 2022 to December 2022.

N-420: The ditches on both sides of the road were cleared (total length of 12,3 Km). Moreover, in this road segment 3 wildlife crossings were built. The work started in October 2021 and was finalized in December 2022.

## 4. GENERAL CONSIDERATIONS

The action was successfully implemented in each project area and was of great importance to improve the ecological connectivity for the target species.

The interventions made by EOSA were very impressive because they implement different kind of solutions to favour the use of the structures by bears and the other wildlife species. This was possible due to detailed planning phase made in the frame of Action A4. This is one of the first cases in Europe in which, in the frame of a LIFE programme, a company responsible for the management of a Highway realized such a large number of interventions on the existing crossing structures to improve biodiversity conservation. The added value of this action is the potential replicability in Greece as well as in other European country. EOSA already started to apply these interventions in one other segment of the Highway, and the staff of EOSA in the future can also train the staff of other road management authorities and share its knowledge with them. Considering the increasing impact of linear infrastructures on biodiversity it is fundamental that the lessons learned become available to the key stakeholders, and in this sense the guidelines produced in the frame of the project, also based on the results of the C2 action can play a crucial role.

In Romania the adaptation of the 30 crossing structures were very important because they were carried out on critical structures for the ecological connectivity of the target species, especially those ones located on DN1 road (sector Romania 1) the main communication road between Brasov and Bucharest. The involvement and the collaboration with the road management authority will ensure the continuity of the interventions after the end of the project.

The interventions realized by PNM and PNALM on the road SS17 are of crucial importance, because as it is already stated this road represented the main barrier between PNALM and PNM. One of the principal threats for the conservation of the Apennine brown bear is habitat fragmentation caused by linear infrastructures that prevent the expansion of the species, therefore making the SS 17 road safe is an important step in this direction. The interventions carried out in the frame of LIFE SAFE-CROSSING project, not only the ones of Action C2, represented a valuable example of what has to be done and replaced in the future to the other stretches of the SS17 already identified. The involvement and the collaboration established with ANAS is another added value to guarantee the possibility of such kind of interventions.

In Spain the management of road verges was another example of an important intervention to be implemented in the other roads that cross the Iberian lynx range. The works carried out by the National Ministry on the road N420, under the supervision of the LIFE SAFE-CROSSING, is therefore really promising in terms of the replicability of this action.

It's important to underline that the effectiveness of the interventions carried out in each project country, have been already assessed in the frame of Action D1 and will be more visible in the following years because for all the wildlife species an adaptation period to the interventions carried out is needed. The proper maintenance of the interventions carried out, ensured by the afterlife plan, will guarantee the long-term positive effect of the action for the conservation of the target species.

**ANNEX**  
**Maps and photos of the interventions**  
**carried out in each project area**



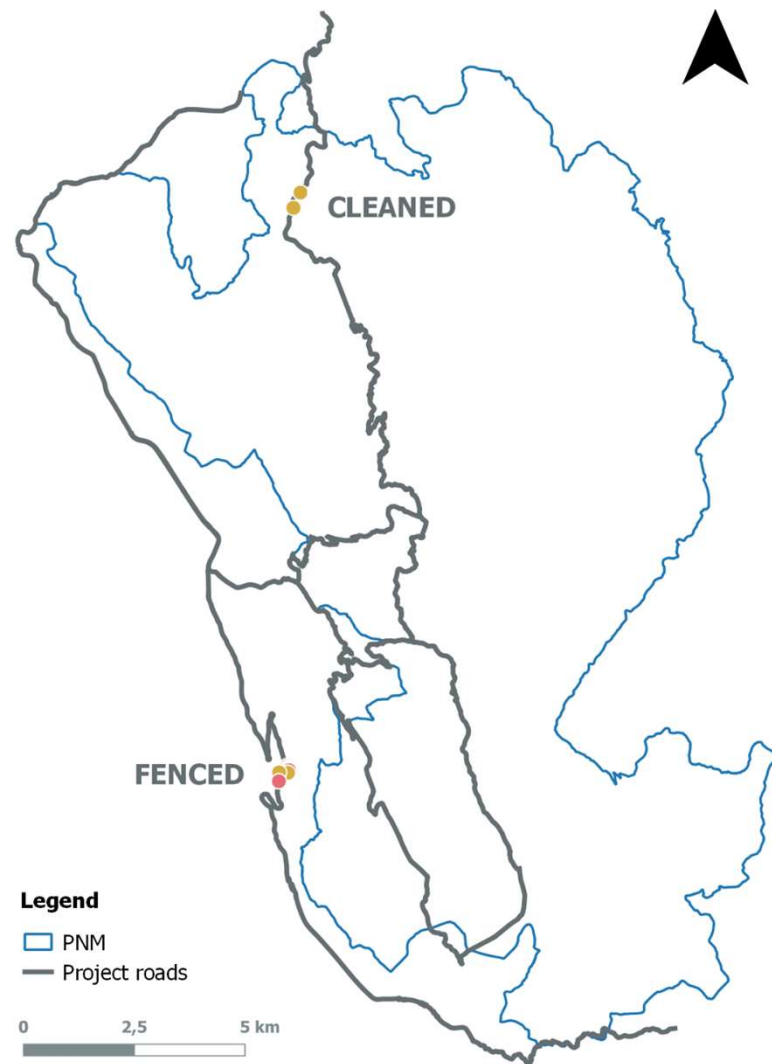


# PHOTOS OF INTERVENTIONS UN UNDERPASSES

*Action C2*



PNM



## Map of underpasses



VIASS17 116+300; OVPSS17 116+400; VIASS17 116+500;  
OVPSS17 116+600; VIASS17 116+700; VIASS17 117+200;  
OVPSS17 117+700





VIASS17 116+300; OVPSS17 116+400; VIASS17 116+500;  
OVPSS17 116+600; VIASS17 116+700; VIASS17 117+200;  
OVPSS17 117+700



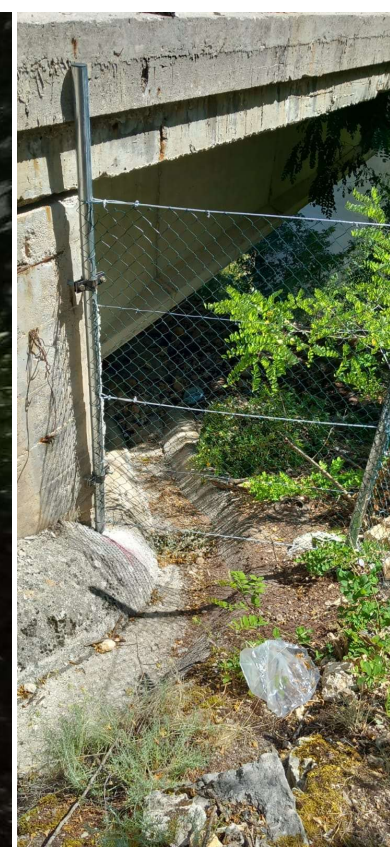


VIASS17 116+300; OVPSS17 116+400; VIASS17 116+500;  
OVPSS17 116+600; VIASS17 116+700; VIASS17 117+200;  
OVPSS17 117+700





VIASS17 116+300; OVPSS17 116+400; VIASS17 116+500;  
OVPSS17 116+600; VIASS17 116+700; VIASS17 117+200;  
OVPSS17 117+700





VIASS17 116+300; OVPSS17 116+400; VIASS17 116+500;  
OVPSS17 116+600; VIASS17 116+700; VIASS17 117+200;  
OVPSS17 117+700





VIASS17 116+300; OVPSS17 116+400; VIASS17 116+500;  
OVPSS17 116+600; VIASS17 116+700; VIASS17 117+200;  
OVPSS17 117+700





## VIASS487 12+500





## VIASS487 12+500





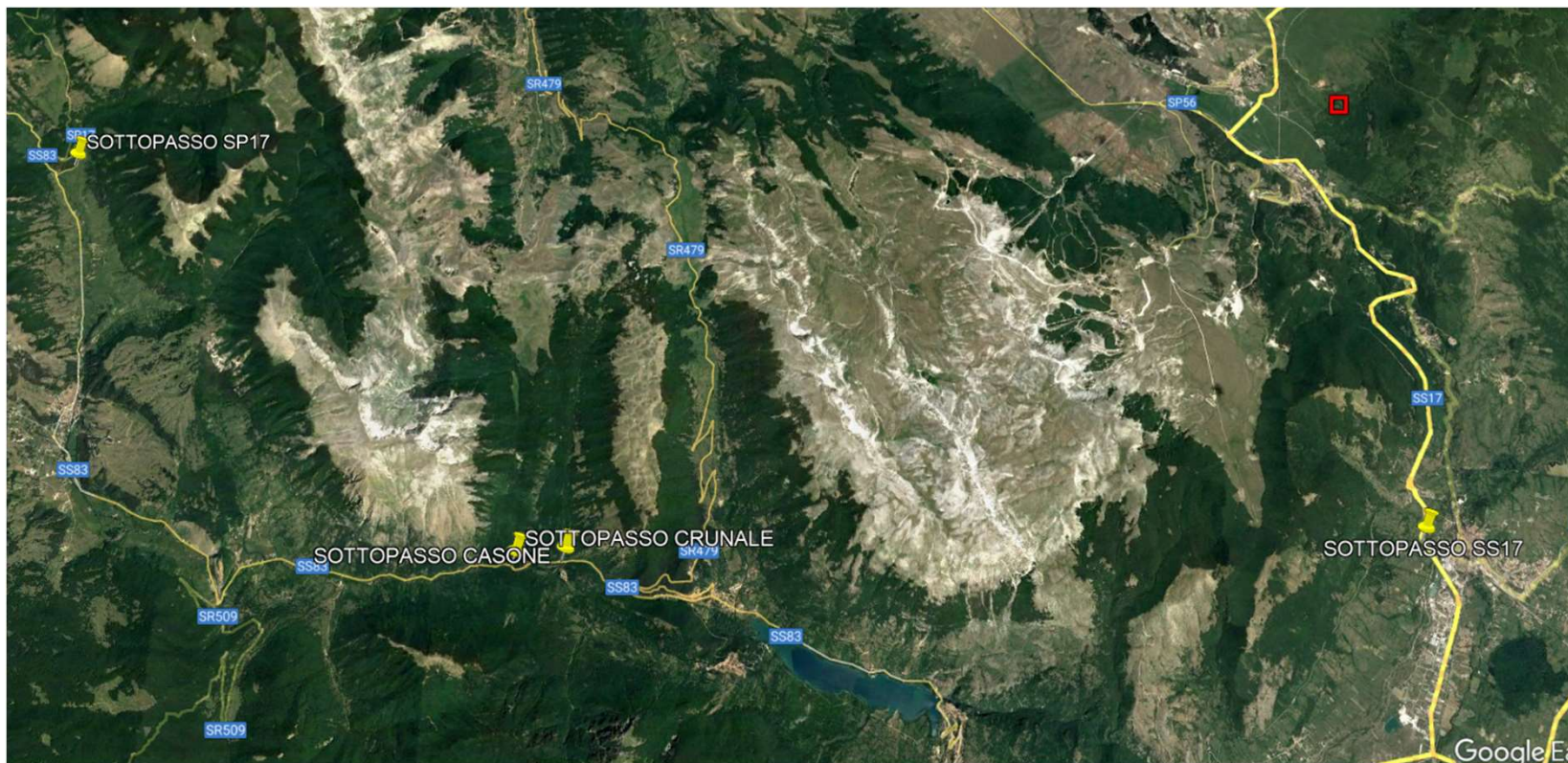
## VIASS487 12+500





PNALM

## Map of underpasses (2 SS83, 1 SP 17, 1 SS17)



# Map of underpasses

## Underpasses: Casone Antonucci Crugnale, SS 83





## UNDERPASS CASONE ANTONUCCI-SS83





## UNDERPASS CASONE ANTONUCCI- SS83



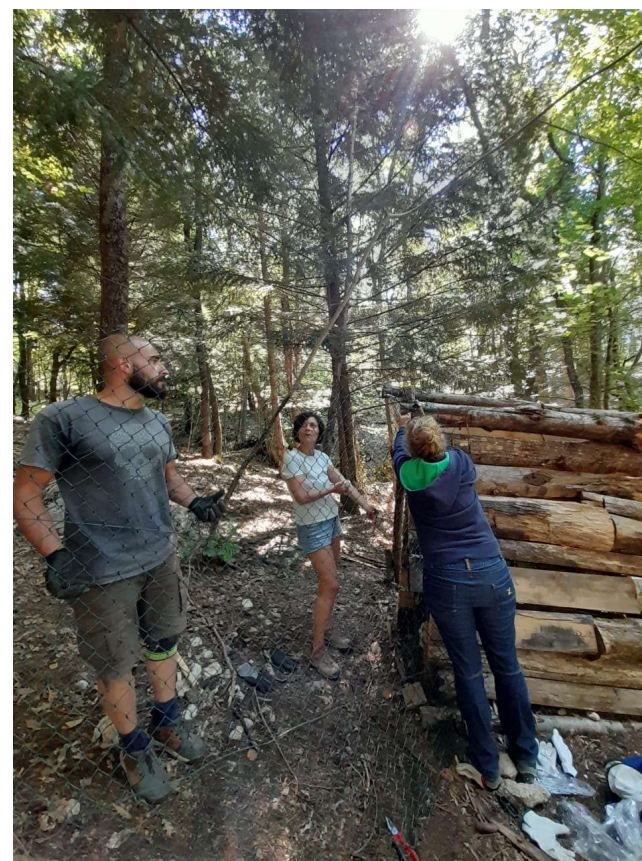
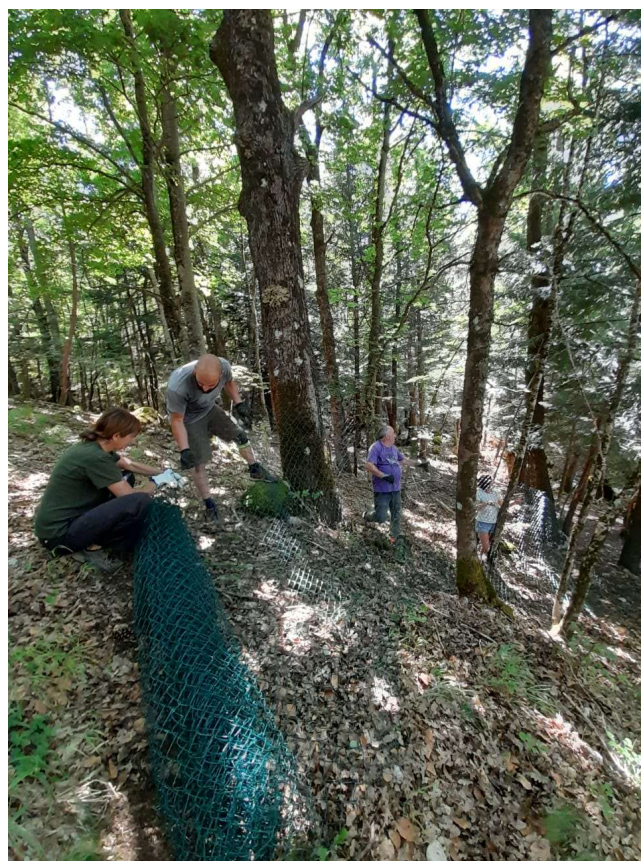


## UNDERPASS CASONE ANTONUCCI- SS83





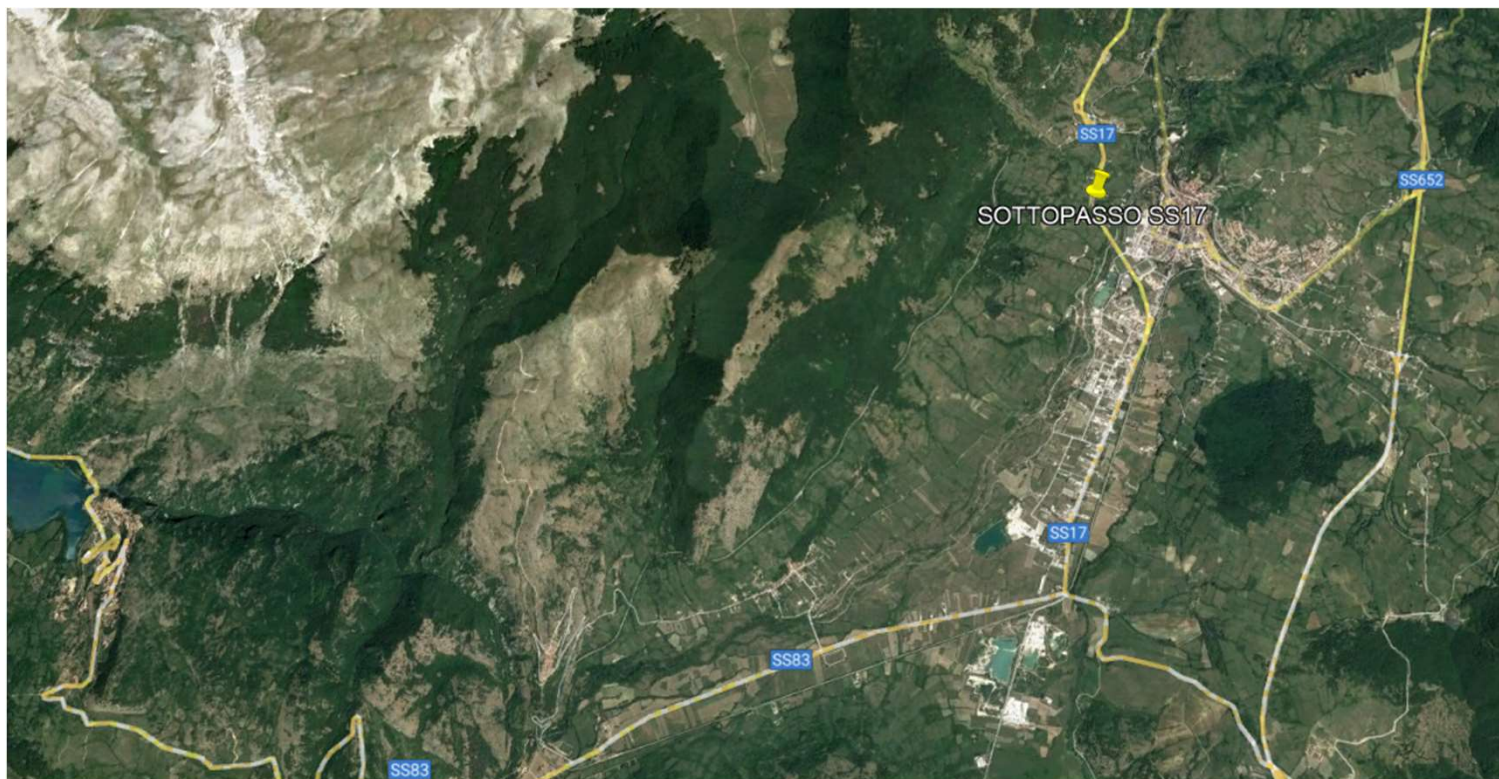
## UNDERPASS CRUGNALE- SS83





# Map of underpasses

## Underpass: SS17





# UNDERPASS SS 17-before and after





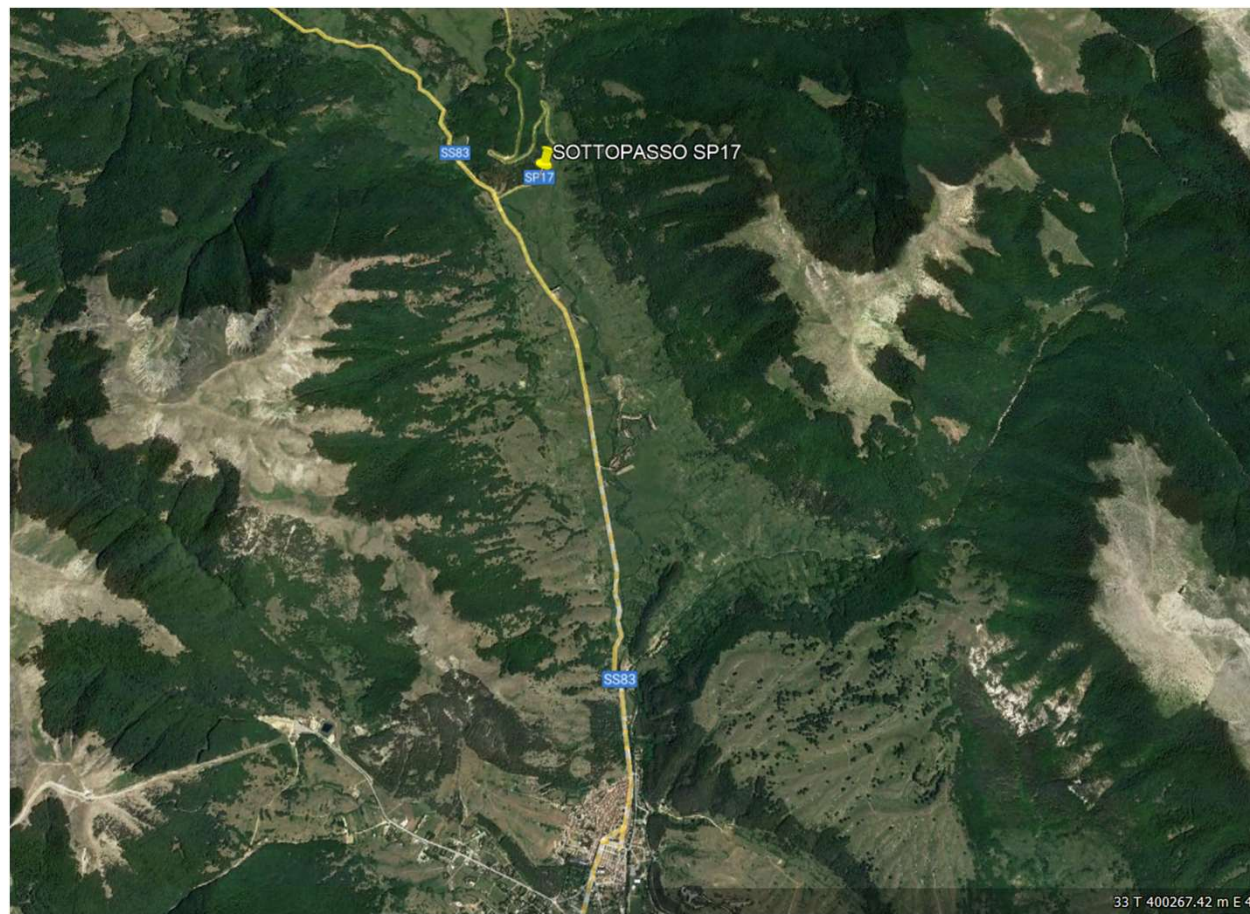
## UNDERPASS SS 17





# Map of underpasses

## Underpass: SP 17





## UNDERPASS: SP 17



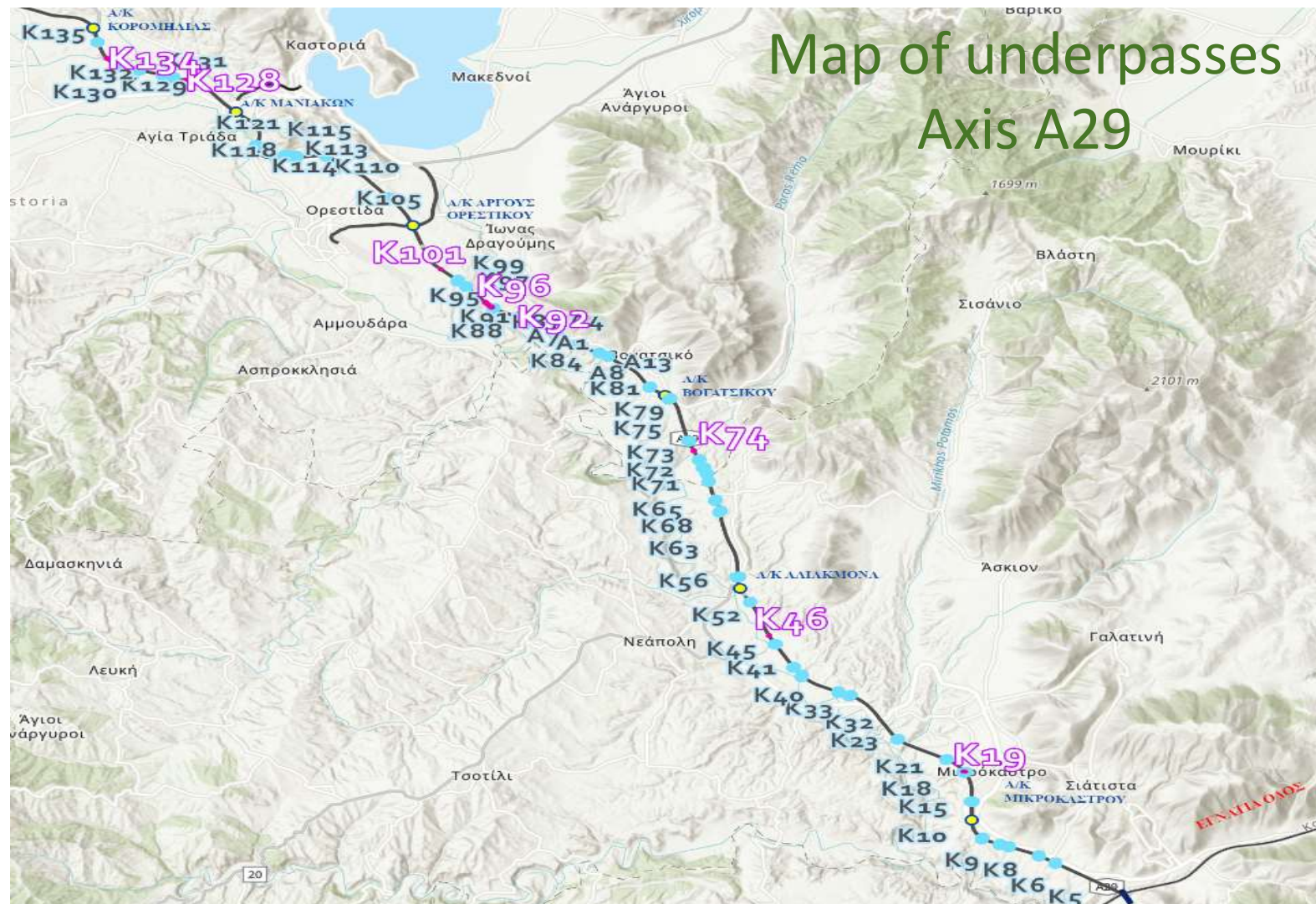


## UNDERPASS: SP 17



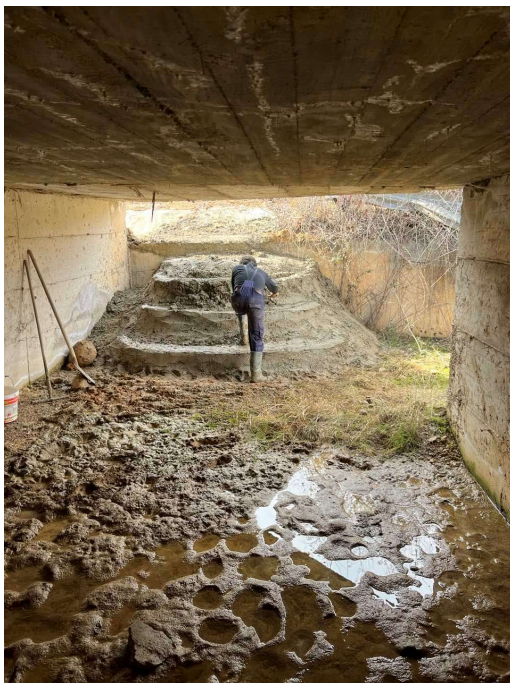
# GREECE





## Structure K138

### 2 Ramps, Light screen, Fence



Fence: 14 m





# Structure K135

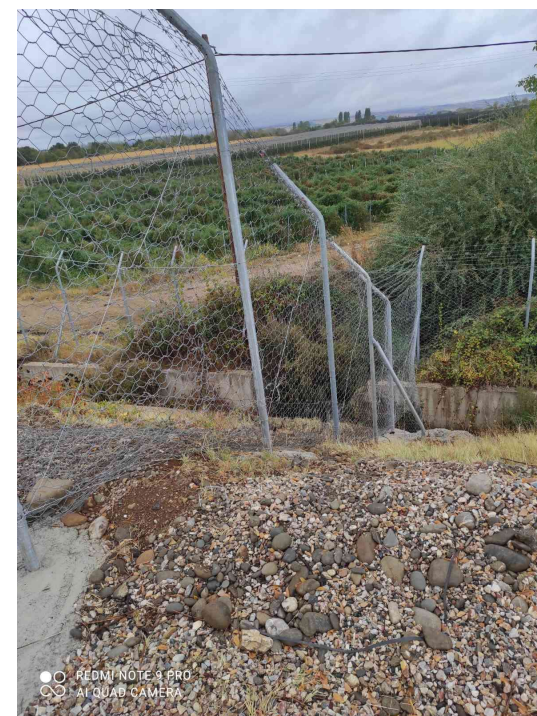
## Cleaning, Planting, Dry ledges, Fence

Plants: 150



Dry ledge: 55 x 1 x 0,4

Fence: 50 m





## Structure K134

### Planting, Dry ledge, Fence



Plants: 300

Dry ledge: 50 x 1 x 1



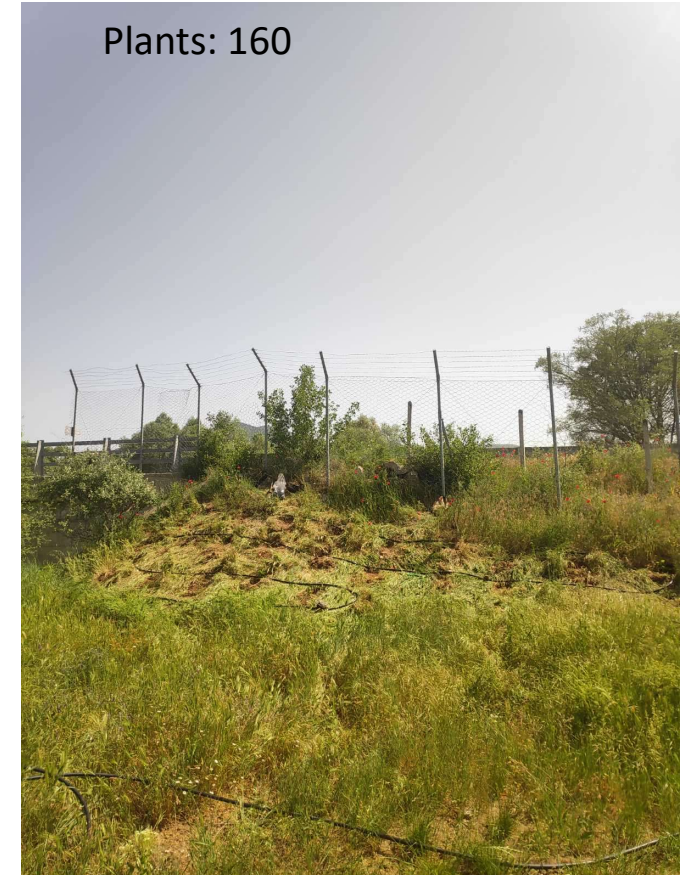
Fence: 8 m



## Structure K132 Cleaning, Planting



Plants: 160





# Structure K131

## Cleaning, Planting

Plants: 170





# Structure K130

## Cleaning, Planting

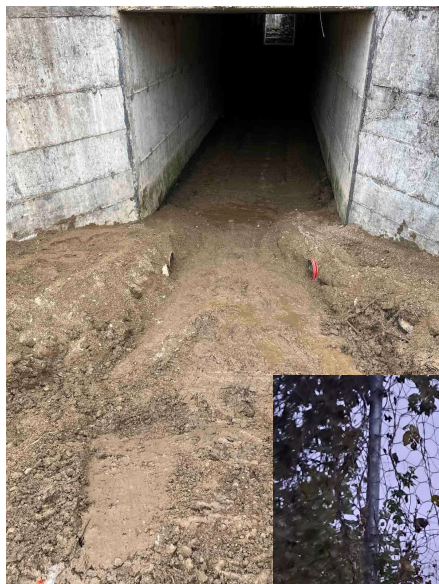
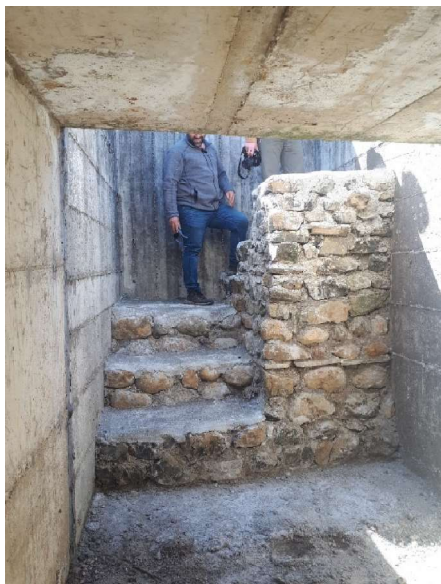
Plants: 70





# Structure K129

## Ramp, Cleaning, Planting, Light screen, Fence



Plants: 60



Fence: 10 m



## Structure K128

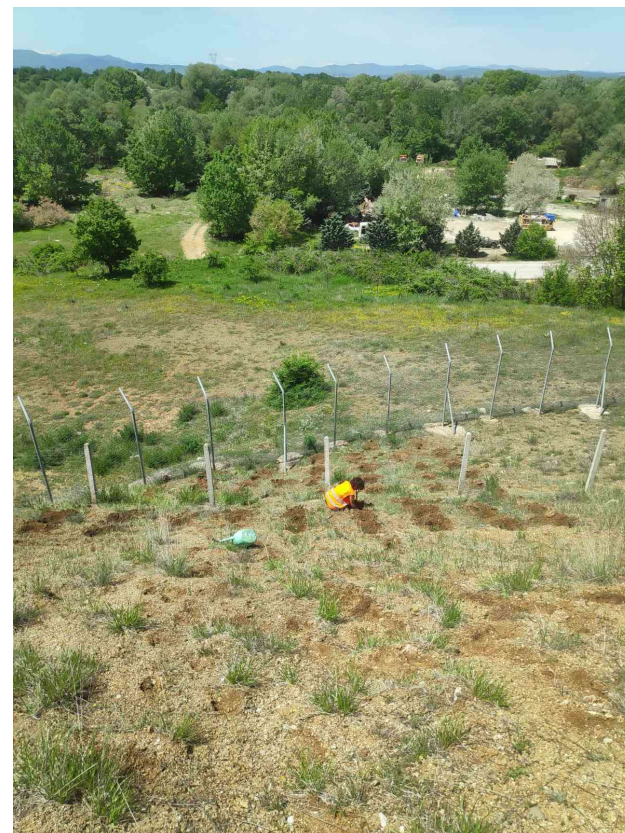
### Cleaning, Pruning, Light screen





# Structure K121 Planting

Plants: 430





# Structure K118 Cleaning, Planting

Plants: 400





# Structure K115

## Planting, Adding natural material

Plants: 380





# Structure K114 Cleaning, Planting

Plants: 380





# Structure K113

## Cleaning, Pruning, Planting

Plants: 230





# Structure K110

## Planting

Plants: 210





# Structure K105

## Ramps, Planting, Light screens

Plants: 160





# Structure K101 Cleaning, Planting

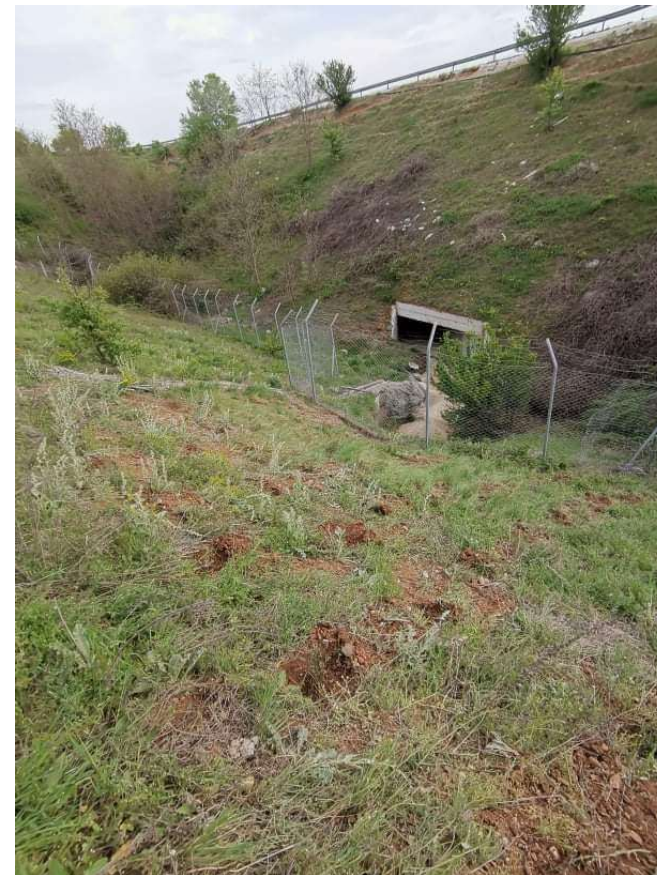


Plants: 250



## Structure K99 Cleaning, Planting

Plants: 630





# Structure K97

## Cleaning, Pruning, Planting, Light screen



Plants: 50

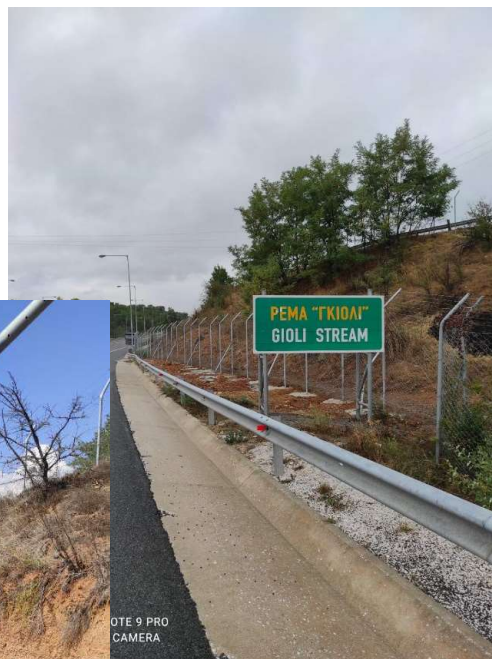




# Structure K96

## Pruning, Fence

Fence: 50 m





## Structure K95 Planting



Plants: 100



## Structure K91

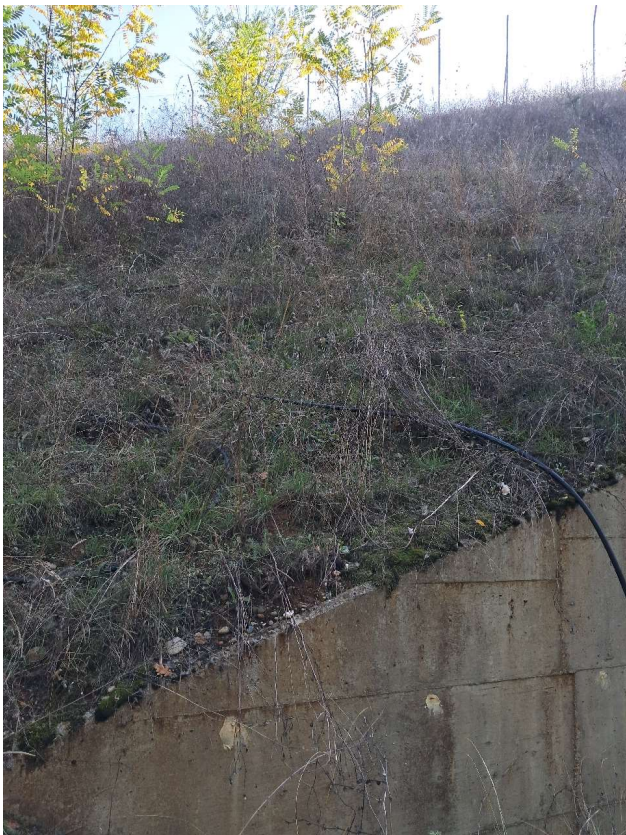
### Adding natural material





# Structure K88 Planting

Plants: 270





## Structure K87

### Planting, Light screen

Plants: 160





## Structure A7 Planting

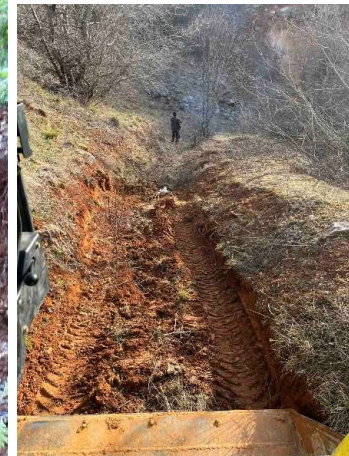
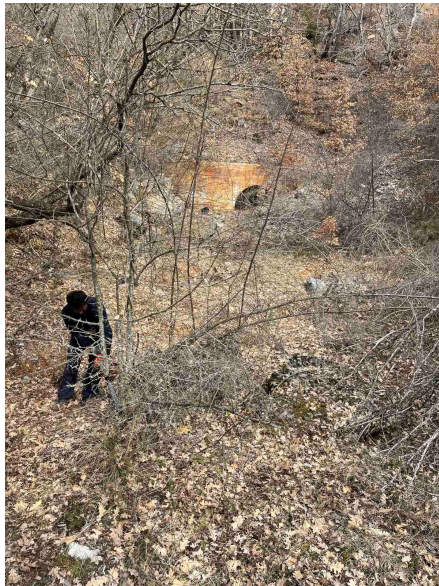


Plants: 280



# Structure A1

## Ramp, Cleaning, Pruning





# Structure K84 Fence

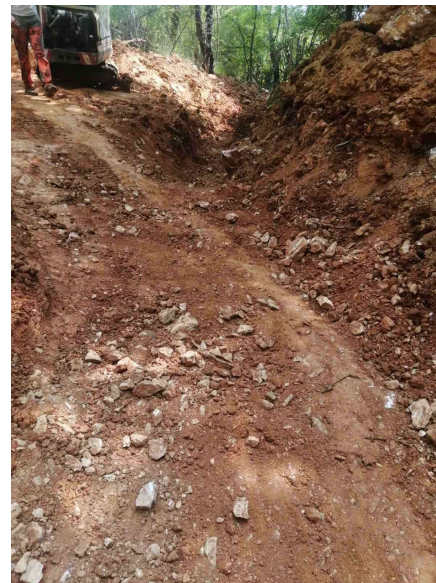
Fence: 12 m





# Structure A4

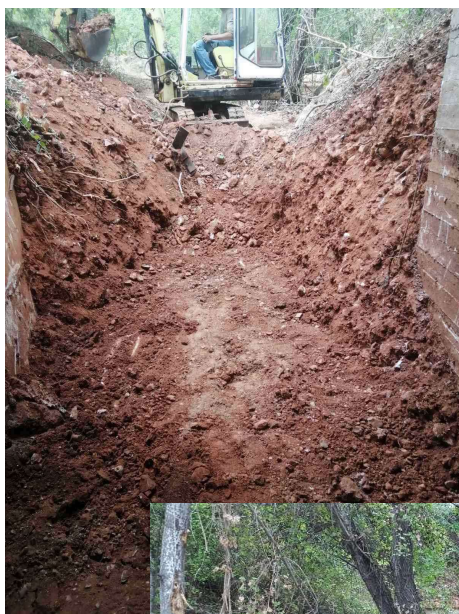
## Cleaning, Pruning





# Structure A13

## Ramp, Cleaning, Pruning, Fence



Fence: 80 m





## Structure A8

### Cleaning, Planting, Adding natural material

Plants: 100





# Structure K81 Planting



Plants: 300



# Structure K79

## Ramp, Planting, Fence

Plants: 240

Fence: 20 m





# Structure K75 Planting

Plants: 220

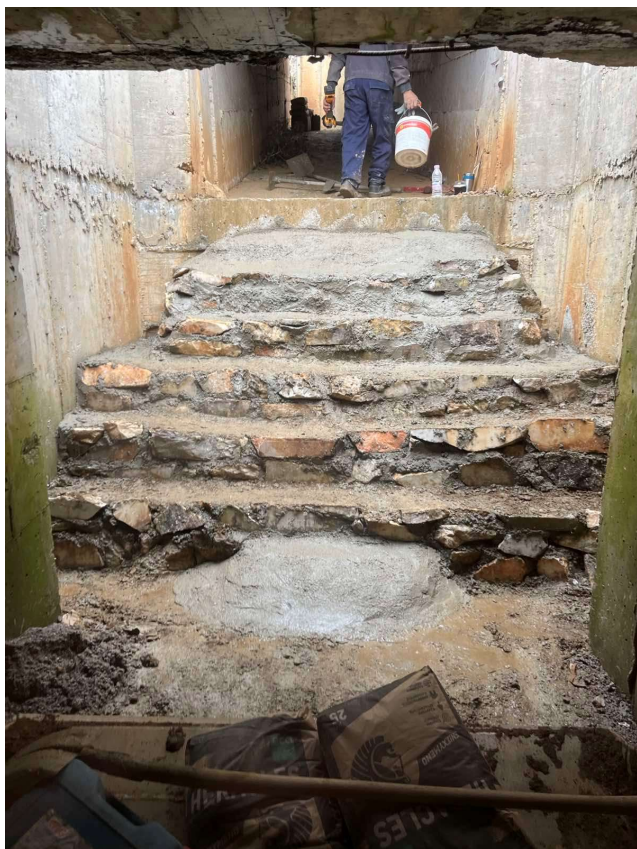




## Structure K73

### Ramps, Cleaning, Planting

Plants: 90

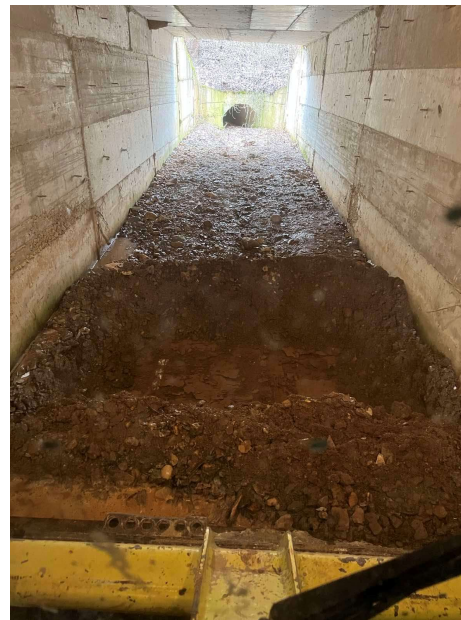
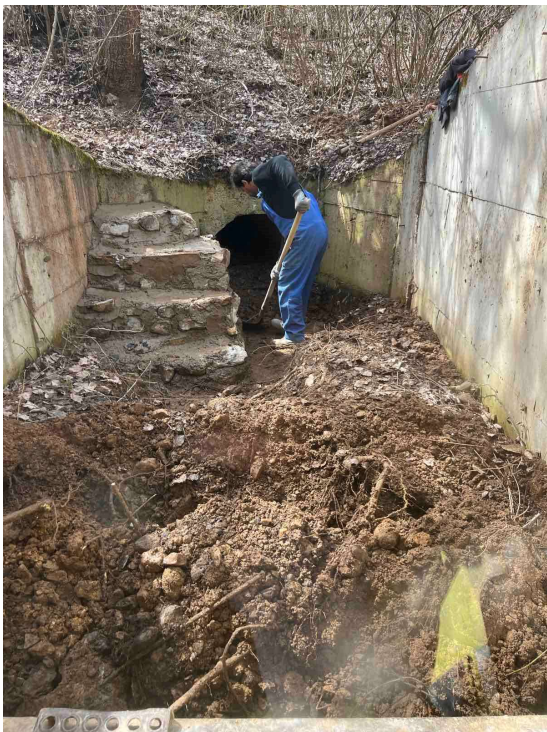




# Structure K72

## Ramp, Cleaning, Pruning, Planting

Plants: 100





## Structure K71

### Planting, Light screen

Plants: 50





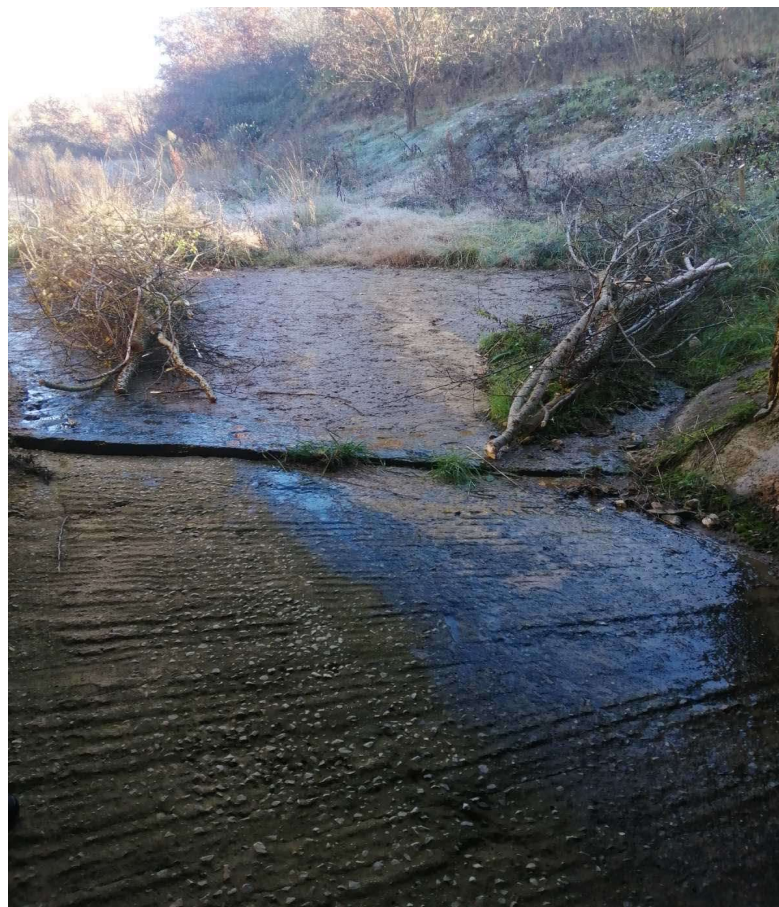
## Structure K68 Cleaning, Pruning





## Structure K65

### Adding natural material





# Structure K63 Cleaning, Planting



Plants: 100





## Structure K56

### Pruning, Dry ledges



Dry ledge: 2 \* (70x1x0,5)





# Structure K52

## Cleaning, Pruning, Light screens





## Structure K46 Planting, Fence

Fence: 12 m



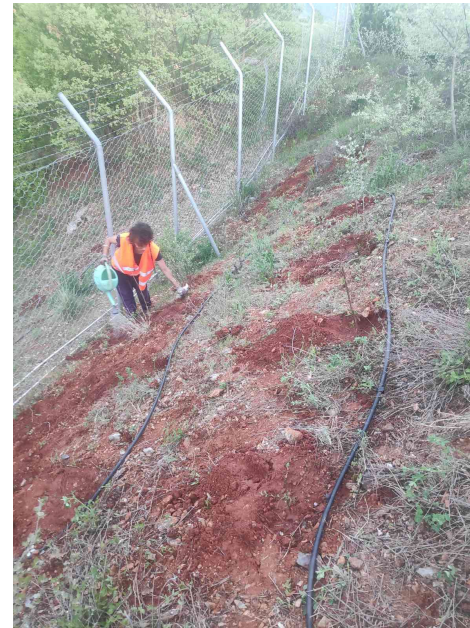
Plants: 80





# Structure K45 Cleaning, Planting

Plants: 60

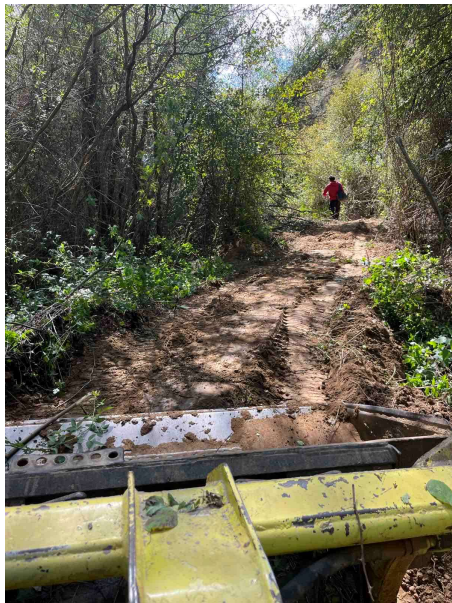




# Structure K41

## Cleaning, Planting

Plants: 80





# Structure K40 Pruning





# Structure K33

## Cleaning, Pruning, Planting, Adding natural material

Plants: 110





# Structure K32

## Cleaning, Planting

Plants: 200





# Structure K23 Cleaning, Planting

Plants: 160





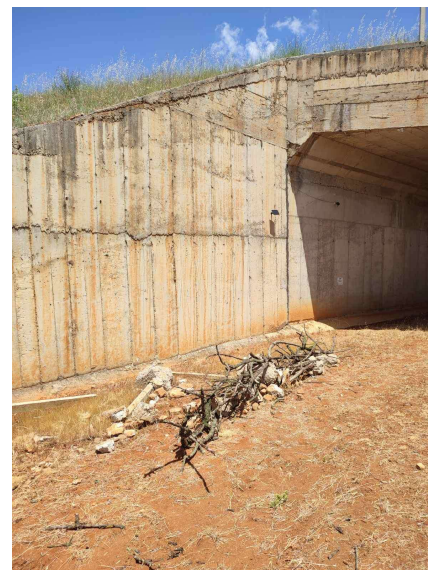
## Structure K21

Cleaning, Planting, Adding natural material, Light screen, Fence

Plants: 160



Fence: 24 m





# Structure K18

## Cleaning, Pruning, Dry ledge, Fence

Dry ledge: 90 x 1 x 0,5



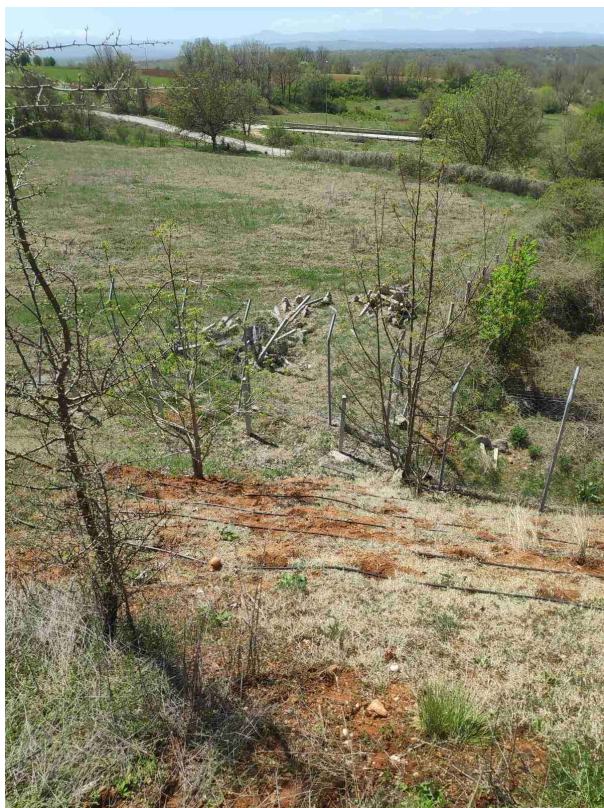
Fence: 12 m





## Structure K15 Planting

Plants: 200





# Structure K10 Planting

Plants: 130





## Structure K9

### Planting, Adding natural material

Plants: 50





## Structure K8

# Planting, Adding natural material, Light screen, Fence

Plants: 160



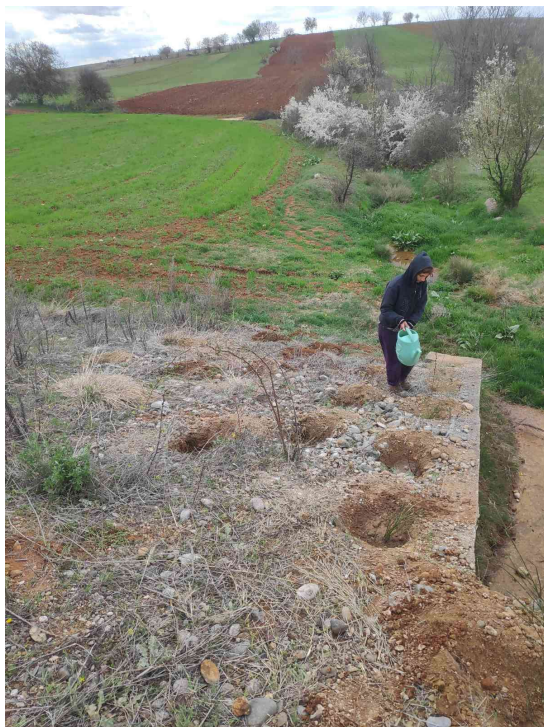
Fence: 24 m





# Structure K6 Planting

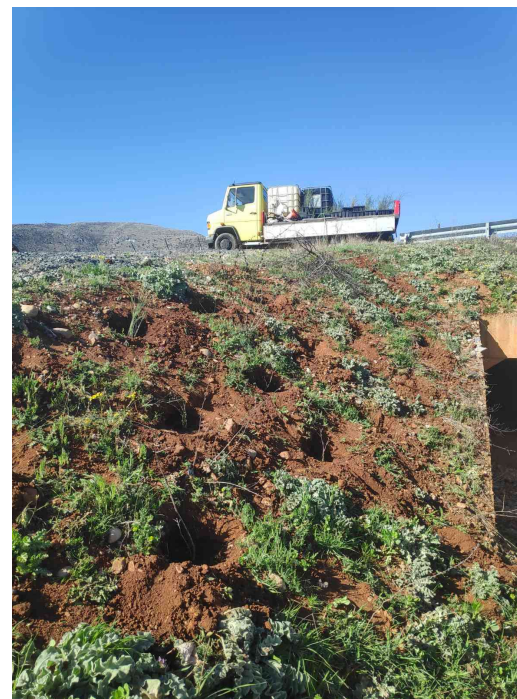
Plants: 90





## Structure K5 Planting

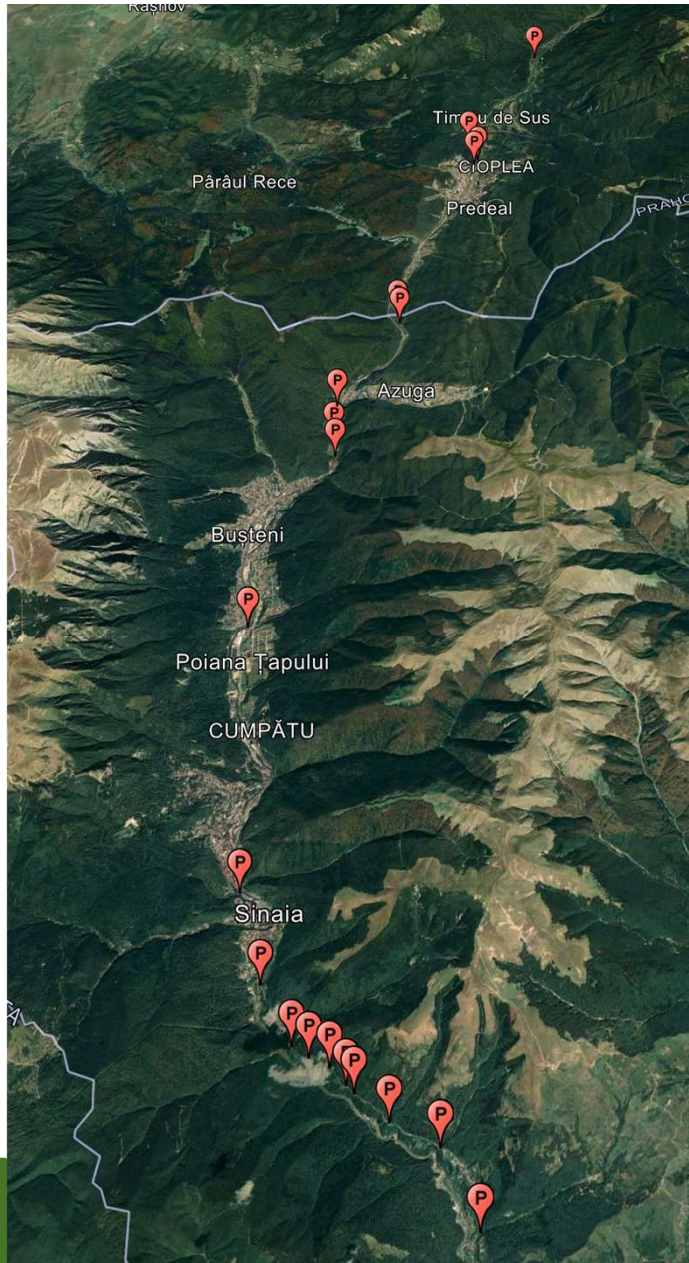
Plants: 130





# ROMANIA



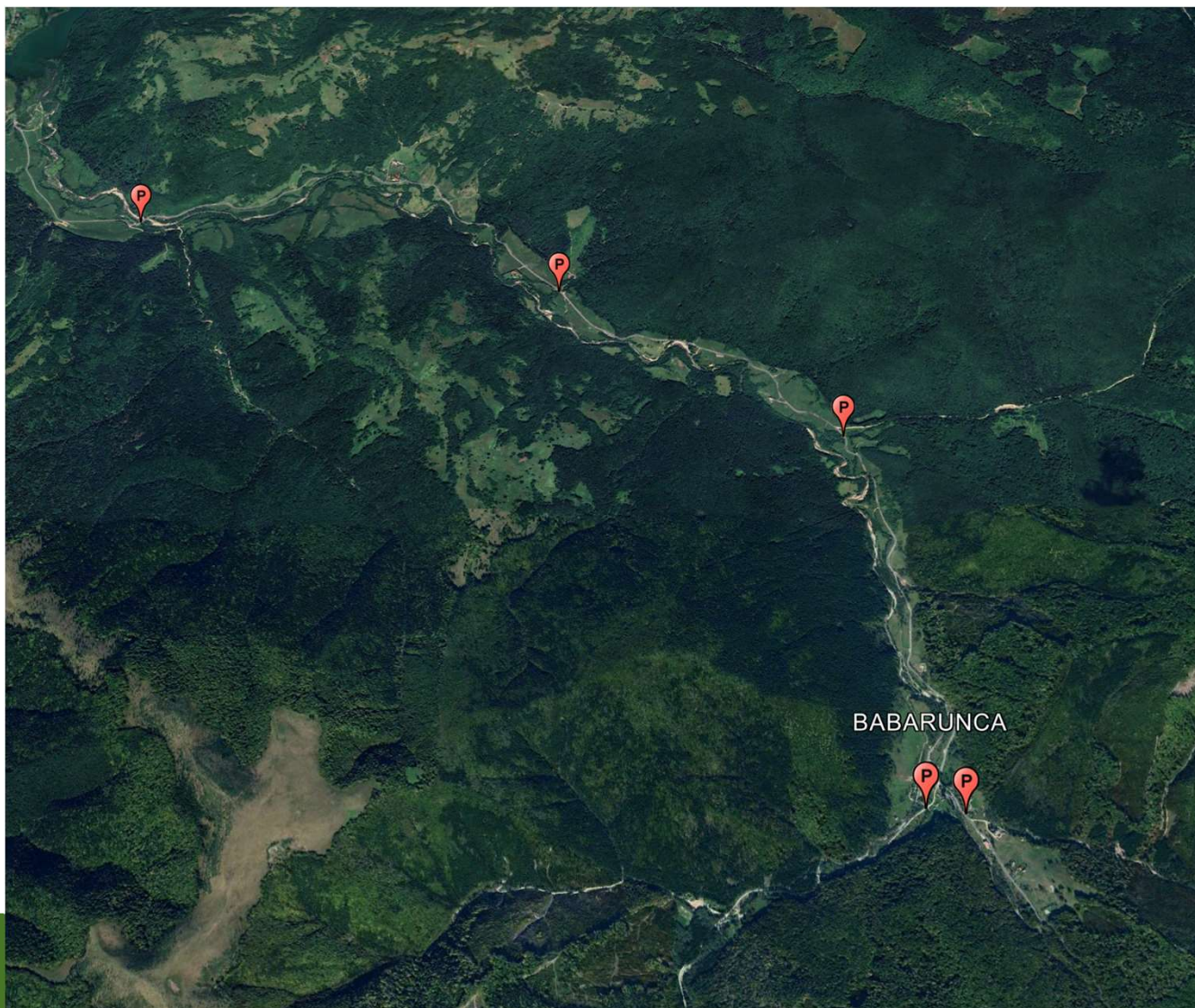


## Map of underpasses

### DN 1 National road Brasov- Comarnic (Romania 1)



## Map of underpasses



DN1A Cheia-Brasov  
road (Romania 3)



## Map of underpasses

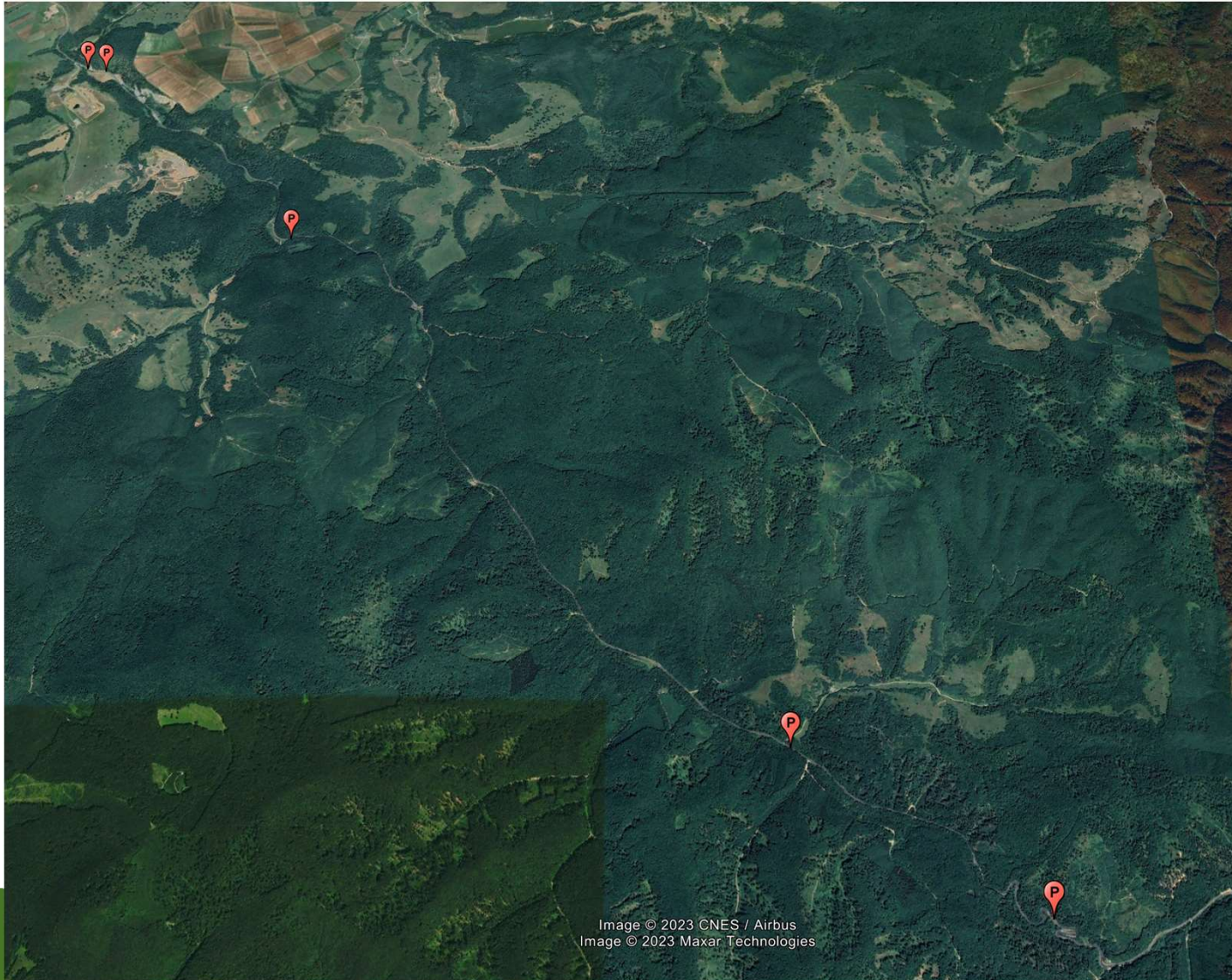


Image © 2023 CNES / Airbus  
Image © 2023 Maxar Technologies

D13 Pandurea  
bogatii  
(Romania 4)



## Map of underpasses

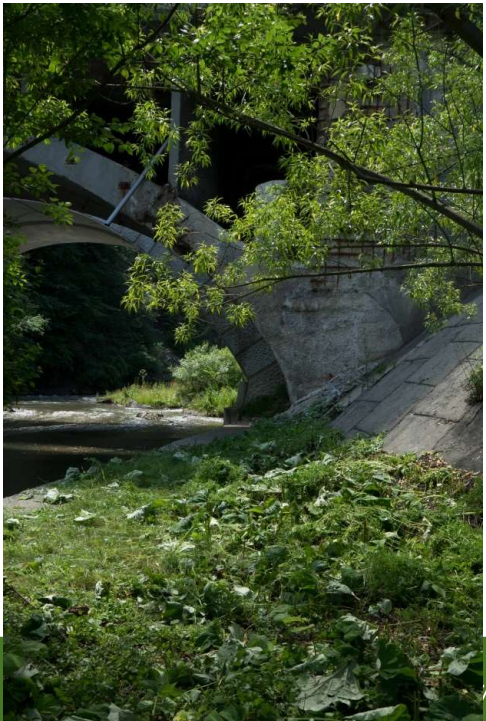
### DN1 Brasov-Vladeni road (Romania 5)













**LIFE SAFE CROSSING**  
PREVENTING  
ANIMAL-VEHICLE  
COLLISIONS

