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**Integrated conservation management of priority habitat type 9590\* in the  
Natura 2000 site “Koilada Kedron-Kampos”**

**(LIFE15 NAT/CY/000850)**

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DELIVERABLE:

**MINUTES OF THE 2<sup>ND</sup> MEETING OF THE SCIENTIFIC COMMITTEE  
(ACTION F.1.2)**

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MAY 2018  
NICOSIA

BENEFICIARIES:



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<b>ACTION F.1: Project Management</b> <b>DELIVERABLE F.1.2: Scientific Committee</b>
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## **A. Introduction**

The project “Integrated conservation management of priority habitat type 9590\* in the Natura 2000 site Koilada Kedron-Kampos” (LIFE-KEDROS; LIFE15 NAT/CY/000850) which is implemented within the framework of the LIFE program of the European Union, organized the 2<sup>nd</sup> Scientific Committee (SC) meeting, on the 21<sup>st</sup> – 23<sup>rd</sup> of May 2018. The SC meeting is one of the commitments of the project and part of *Action F.1 - Project Management*.

The purpose of the SC meeting was:

1. The evaluation of the scientific quality of the deliverables that have already been completed.
2. The review of the Conservation Monitoring Protocol (Action D.1).
3. The review of the Project Monitoring Protocol (Action F.2).

For the 2<sup>nd</sup> SC meeting, the relevant agenda was prepared and disseminated to all participants (Annex I)

Participants included the following:

Members of the SC present:

1. Dr. Andreas Christou, Project Coordinator & Scientific Coordinator (Department of Forests - Chair)
2. Dr. Nicolas-George Eliades, Project Manager (Frederick University)
3. Dr. Constantinos Kounnamas (Representative of Frederick University)
4. Mr. Costantinos Pericleous (Representative of Cyprus Forest Association)
5. Dr. Thomas Boivin (External expert on Seed Wasps and Bark Beetles)
6. Dr. Gavriil Xanthopoulos (External expert on Forest Fires)

Consortium Members present:

7. Mr. Kostas Papageorgiou (Department of Forests)
8. Dr. Petros Petrou (Department of Forests)
9. Mrs. Areti Christodoulou (Department of Forests)
10. Mr. Soteris Soteriou (Department of Forests)
11. Mr. Marinos Christodoulou (Department of Forests)
12. Mr. Haris Nikolaou (Department of Forests)

13. Mrs. Iro Kouzali (Frederick University)

*Dr. Elias Miliotis (External expert on Silviculture), member of SC, did not participate in the second meeting for personal reasons. However, he will be informed about the meeting's progress and at the same time it will be considered whether he can visit the Project area at a later period.*

## **B. The Meeting of SC**

### First day of SC meeting – Field visits

On **21<sup>st</sup> May 2018**, the members of the SC visited the Natura 2000 sites: “Koilada Kedron-Kampos” (CY2000008) and “Ethniko Dasiko Parko Troodos” (CY5000004) in order to be informed about the progress of the LIFE-KEDROS project. More specifically, the SC saw how the concrete conservation actions are being implemented in the field, based on the outcomes from the preparatory actions. Thus, the members of the SC had the opportunity to observe activities carried out as part of the actions (Fig. 1):

- Silvicultural interventions in *Cedrus* stands: Thinning of competitive trees to habitat 9590\* within man-made stands.
- Restoration and expansion of the habitat type 9590\*: Sowing of cedar seeds in the area of habitat 9590\*.
- Protection of the habitat type 9590\* against forest fires: The installation of information/warning signs, the permanent closure of selected roads using heavy duct bars and the removal of dry herbaceous plants along roads.
- Measures for improving the resilience of habitat type 9590\*: The installation of artificial nests (10 for barn owls and 20 for bats species), as well as the installation of 24 insect traps for bark-beetle mass trapping for controlling of harmful species. In addition, the control of soil erosion by construction of dry stone terraces for improving soil and water conservation conditions.
- Ex situ conservation of the targeted habitat type: The collection and storage of seeds in a seed bank and the progress of the establishment of the *ex situ* plantation in Amiantos Mine.





Figure 1: The visit of the SC in the field, where Dr. Christou presented the progress of the project.

Second day of SC meeting (Office meeting)

On 22<sup>nd</sup> May 2018, the SC meeting took place at the premises of the Department of Forests (DF) where all SC members were present and had the opportunity to be informed on the theoretical and technical progress of project.

**A. Presentation of the project’s progress (particularly Actions A and C)**

**1. Welcome and Presentation of the LIFE-KEDROS project activities from its beginning to the current period (09/2016 – 05/2018)**

Speaker: Dr. Andreas Christou [Project Coordinator and Scientific Coordinator, DF].

**Presentation:**

Dr. Andreas Christou welcomed the members of the SC and gave a presentation about the project’s progress. He presented in detail the progress of all preparatory actions, together with the phases of the running concrete conservation actions. At the same time, he demonstrated, using tables, the “Foreseen end date” and the “Actual end date” for each of the project’s action and deliverable.

Finally, Dr. Christou presented and discussed the deviations from the project’s proposal that need to be authorized by the SC. These include:

1. Restoration and expansion of the habitat type 9590\* (Action C.2)

The DF intends to use “water boxes” for the planting of *Cedrus brevifolia*. This method will be in addition to the initial proposal of the project. This approach will be adopted in spots where irrigation is impossible, and, hence can eliminate this negative factor by using “water boxes”. The cost of “water boxes” will be covered by the project’s budget, and in all cases without increasing the total budget of the project.

2. Replace the six (6) water guzzlers with artificial lakes/pools with running water (Action C.3)

The DF suggested replacing the six (6) water guzzlers with artificial lakes/pools with running water. The establishment of 6 water guzzlers to collect rain water

	<p>in order to provide water to mouflons which will approach the area for grazing within the boundary of habitat 9590*, as part of pre-suppression measures, is a milestone of <i>Action C.3 - Protection of the habitat type 9590* against forest fires</i>. However, the responsible beneficiary (DF), suggested the establishment of artificial lakes/pools with running water coming from natural springs in the area. The suggested action will not have any financial impact on the project’s budget.</p> <p>3. <u>Establishment and maintenance of an <i>ex situ</i> plantation</u></p> <p>A plantation, instead of a provenance trial, will be established for the <i>ex situ</i> conservation of habitat type 9590*. The establishment of a provenance trial for the <i>ex situ</i> conservation of habitat type 9590* is part of <i>Action C.5 - Ex situ conservation of the targeted habitat type</i> according to the project’s proposal. However, the responsible beneficiary (DF), suggested the establishment of an <i>ex situ</i> plantation which will facilitate the purpose of the action.</p>
<b><u>Decision:</u></b>	<p><b>For these deviations from the project’s proposal the Project Management Team (PMT) will elaborate a specific detailed letter to SC, in order to gain approval from the SC members.</b></p>

**2. . Presentation regarding Action A.1 & C.1: Elaboration of marking guidelines and silvicultural interventions in *Cedrus* stands**

**Speaker: Dr. Petros Petrou [DF]**

<b><u>Presentation:</u></b>	<p>Dr. Petrou presented the results of the deliverable “Marking guidelines for silvicultural treatments of the habitat 9590*” (<i>Action A.1 – Composition and structure of habitat 9590*, A.1.2 - Elaboration of marking guidelines for thinning and felling in Cedrus brevifolia stands</i>). Following this, he explained how the deliverable’s guidelines are being implemented for the purposes of <i>Action C.1 - Silvicultural interventions in Cedrus stands</i>.</p>
<b><u>Comments for discussion:</u></b>	<ul style="list-style-type: none"> <li>• <u>Management of felling trees</u></li> </ul> <p>Dr. Xanthopoulos pointed out that it is very important that after felling, the logs are not left at place since this increases the danger of forest fire. He also commented that thin material can increase the chance of fire. Additionally, he commented that the delayed removal of wood from the forest can also result in loss of its value and he explained that if wood is removed earlier than 14 months from felling it can be used in other areas such as for electricity piles/ pickets apart from fuel. He finally expressed his concern regarding the fact that if the stand faces insect infestations, the wood/material left in the forest after felling, will increase the problem.</p>

	Dr. Boivin explained that there is the option of debarking the logs when cut, in order to avoid insect infestations but on the other hand this method may increase the danger of forest fire. He also added that the bark beetle <i>Orthotomicus erosus</i> feeds from the bark of both cedars and pines, even if there is difference in the width of their bark.
<b><u>Decision:</u></b>	The wood from felling will be removed from the forest and sold as firewood, especially in winter time. However, some of it, especially in places where approach is difficult, will be left for decomposition or will be used in log erosion barriers made of stems of pine trees (placed and anchored along the contours of bare steep slopes). In case where wood will be left for decomposition, mainly in natural stands, the logs will first be debarked to avoid <i>Orthotomicus erosus</i> ' infestations.

<b>3. Presentation regarding Action A.2 &amp; C.3: Elaboration and implementation of a fire protection plan for the habitat type 9590*</b>	
<b><u>Speaker:</u> Mr. Kostas Papageorgiou [DF]</b>	
<b><u>Presentation:</u></b>	<p>Mr. Papageorgiou presented the outcome of deliverable “Fire Protection Plan of the habitat 9590*” (<i>Action A.2 - Elaboration of a fire protection plan for the habitat type 9590*</i>) and how the measures proposed in the plan are implemented within the framework of <i>Action C.3 - Protection of the habitat type 9590* against forest fires</i>. He also mentioned that DF works with Dr. Xanthopoulos, producing fuel maps for the study area, something that has helped studying different scenarios of the development of forest fire.</p> <ul style="list-style-type: none"> <li>In continuation, Dr. Xanthopoulos explained in more detail the computation simulation, which is used to estimate the forces in each case and through different fire types.</li> </ul>
<b><u>Comments for discussion:</u></b>	<ul style="list-style-type: none"> <li><u><i>Implementation of Fire Protection Plan</i></u></li> </ul> <p>Dr. Christou explained that the measures proposed in the “Fire Protection Plan” are very important and their implementation will not take place only during the project but also in the future. DF is responsible for the management of state forest so all actions that take place during the project can continue under their responsibility using their own resources. He also explained that some measures were implemented by district foresters which have the guidelines to repeat the measures in the future.</p>

<b><u>Decision:</u></b>	Is a commitment of the project to prepare an After-LIFE Plan which will include fire protection measures and DF will be responsible for their implementation for a 5-year-period after the end of the project, using their own resources.
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**4. Presentation regarding Action A.3 & C.4: The occurrence and damage seriousness of *Rattus rattus* on habitat 9590\*: suggested control measures**

**Speaker:** Mr. Haris Nikolaou [DF]

<b><u>Presentation:</u></b>	<p>Mr. Nikolaou presented the results of the deliverable “Report on the occurrence and damage seriousness of <i>Rattus rattus</i>, suggested control measures including a map locating the control measures” (<i>Action A.3 - Assessment of health and vitality of habitat type 9590*</i>) and the measures implemented within the framework of <i>Action C.4 - Measures for improving the resilience of habitat type 9590*</i> in order to control the population of <i>R. rattus</i> within the targeted habitat type.</p> <p>Mr. Nikolaou gave information about the specifications of the cameras, while he presented a number of photographs, as well as infrared photos taken during night shooting. He also mentioned that from the material recorded it was obvious that there is a <i>R. rattus</i> population of a considerable size, at the site and there are records of rats climbing on the trees. However, it was not possible to see their activity on the trees. Mr. Nikolaou mentioned that snakes were not recorded but this should have been a matter of luck since it is known that snakes occur at the site. Additionally, the cameras recorded barn owls living at the site which was questionable until now.</p>
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<b><u>Comments for discussion:</u></b>	<ul style="list-style-type: none"> <li>• <u><i>Monitoring of nests inhabited and investigation of bats and owls’ pellets</i></u></li> </ul> <p>Dr. Boivin asked about the time that will take for nests to be inhabited, while he asked whether DF thought of analyzing pellets to study insect diversity.</p> <p>Mr. Nikolaou said that the nests were established in February 2018 but usually birds colonize the nest in 2-3 years from establishment. He also added that if DF establishes a camera close to a colonized nest and analyzes some pellets this will result in new information.</p> <p>Dr. Christou added that it is known that rats make nests on pines and eat their cones but it was not possible to get such records for cedars from the cameras.</p>
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<b>5. Presentation regarding Action A.3 &amp; C.4: Health and vitality of habitat type 9590*</b>	
<u>Speaker:</u> <del>Mr. Constantinos Nikolaou [DF]</del> & Dr. Boivin [ExEx]	
<b><u>Presentation:</u></b>	<p>Due to the absence of Mr. C. Nikolaou, Dr. Boivin explained to SC the preparation and results of the deliverable “Assessment of health and vitality of the habitat 9590*” (<i>Action A.3 - Assessment of health and vitality of habitat type 9590*</i>). He explained that the female insect of the species <i>Megastigmus schimitscheki</i> penetrates the cone and lays her eggs without destroying the cone. Even when the “flowers” of the cone are not fertilized, the insects/eggs produce hormones which maintain the maturation of the cone for their survival.</p> <p>He also commented that the rate of infestation in Cyprus is low and this could have two explanations: either the presence of a predator of the parasites / the cones, or the demography of the insect is constrained due to cone production (it has good seed crops every six years).</p>
<b><u>Comments for discussion:</u></b>	<ul style="list-style-type: none"> <li>• <u>Seed predators monitoring</u></li> </ul> <p>Dr. Boivin mentioned that seed damages by seed wasps (<i>Megastigmus schimitscheki</i>) within the cedar habitat were found low to moderate, with a significant variation in seed infestation rates between individuals between and among the 12 sampled plots. These results may suggest that seed wasps populations are maintained at low to moderate levels by the slow dynamics of cedar seed production, which represents a food resource limitation for wasp population growth, and by the likely presence of specific natural enemies (parasitoid wasps).</p> <ul style="list-style-type: none"> <li>• <u>Bark beetles management</u></li> </ul> <p>Dr. Boivin argued that the monitoring of bark beetle populations within habitat 9590* indicated the predominant presence of <i>Orthotomicus erosus</i>, a polyphagous species already known to potentially harm cedars across the Mediterranean basin. <i>O. erosus</i> represents a risk for <i>C. brevifolia</i>'s health that would interfere with the LIFE KEDROS' silvicultural actions, in case that logged trees cannot be removed from the habitat for practical reasons. These remnant cut trees constitute a resource for the second seasonal flight of bark beetles (early September-late October) and increases further local outbreak risks.</p>
<b><u>Decision:</u></b>	<p><u>Seed predators monitoring</u></p> <ul style="list-style-type: none"> <li>- Repeat the cone sampling procedure (collection of 5 to 10 cones each on 10 random trees in each plot) to ascertain the magnitude of seed predation rates</li> </ul>

	<p>as these can substantially vary interannually, and to increase the chance to sample potential natural enemies of seed wasps developing within seeds before they are released. Again, seeds extracted from collected cones will be sent to INRA Avignon France (T. Boivin’s lab) for numerical X-ray analysis of their content.</p> <ul style="list-style-type: none"> <li>- Implement yellow sticky traps within the 12 plots to check for the seasonal presence of flying adults of seed wasp parasitoids, which are currently unknown.</li> </ul> <p>For this purpose, 2 sets of yellow sticky traps can be sequentially implemented in each plot in two phases. The first set can be implemented in early April (first phase, 3 traps per plot), removed in mid-May and then replaced by new traps (second phase, 3 new traps per plot), which will be removed in early July. The second set can be implemented in early September (first phase, 3 traps in each plot), removed in mid-October and then replaced by new traps (second phase, 3 new traps per plot).</p> <p>The traps will be sent to INRA Avignon France (T. Boivin’s lab) for trapped insect identification.</p> <p><u><i>Bark beetles management</i></u></p> <ul style="list-style-type: none"> <li>- Trees are debarked as soon as they are logged, so that bark beetles cannot use them for both feeding and reproduction. Debarked trees then do not constitute a risk for further outbreak anymore.</li> <li>- Cut trees are debarked in early winter (e.g. late November-December), i.e. after bark beetles have infested the cut trees, so that these trees constitute trap trees that can impede local insect population growth.</li> <li>- Additional baited insect traps (the same as those used for bark beetle monitoring) can also be implemented in late August on sites where tree cuts are expected in order to trap flying bark beetle adults before they reproduce.</li> </ul>
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<b>6. Presentation regarding Action C.2 &amp; C.5: Restoration and expansion of the habitat type *9590 and its ex situ conservation</b>	
<u>Speaker:</u> <b>Dr. Andreas Christou [DF]</b>	
<u>Presentation:</u>	Dr. Christou presented the progress of the conservation actions: <i>C.2 - Restoration and expansion of the habitat type 9590*</i>

	<p>For the purposes of this action, up to now, the production of plantlets has been started and 2,700 cedar plants and 750 plants of other woody species (<i>Arbutus andrachne</i>, <i>Rhus coriaria</i>, <i>Pistacia terebinthus</i>) have been germinated and grown, at the nurseries of the Department of Forests. For the production of cedar plantlets more seeds were collected but there was 15% loss during germination. The plantlets will be planted in October – November 2018, for the restoration and expansion of habitat 9590*.</p> <p>Seed sowing (dispersal) was implemented, in November 2017, in openings at three locations, with total coverage of 15.97 ha. Up to now, 112,500 cedar seeds (~ 7.5 kg) have been dispersed.</p> <p><i>C.5 - Ex situ conservation of the targeted habitat type.</i></p> <p>Until now, the collection, cleaning and storage of 142.5 kg of cedar seeds at the Seed Bank of Department of Forests, has been completed. The production and growth of cedar plantlets, from 10,500 seeds, is under implementation at the nurseries of the Department of Forests. The plants will be used for the ex situ plantation.</p> <p>The preparation of the area for the establishment of an ex situ plantation at Amiantos Mine has started. 4.061 m<sup>3</sup> of soil has been transferred to the mine for the earthworks (soil improvement) and up to now, 880 one-year-old plants have already been planted at Amiantos Mine for the ex situ plantation.</p>
<p><b><u>Comments for discussion:</u></b></p>	<p><b><u>Comments for discussion:</u></b></p> <ul style="list-style-type: none"> <li>• Regarding the sowing of seeds which was implemented in 2017 for the purposes of Action C.2, Dr. Christou said that DF expects a failure in seed germination mostly because seeds are removed/eaten by ants, or seedlings are consumed by rodents or birds.</li> </ul> <p>Dr. Xanthopoulos suggested the covering of some of the plots where sowing took place and the establishment of a camera at the covered plots, as well as at the uncovered ones in order to record animal activity.</p>

## B. Discussion about Actions E

Following the presentations, the SC members discussed about the implementation of the deliverables/milestones of actions E.1 and E.2. Dr. Eliades (PM) informed the SC members about the

dissemination activities of the projects and especially for those that have already been carried out, as well as about the project's networking with other similar projects from Cyprus and abroad.

Dr. Eliades also explained the planning for the implementation of the "Technical guide for the sustainable management and the long-term conservation of narrow endemic habitat type in a limited area of occupancy: The case of the 9590\* habitat type", which is a deliverable of *Action E.2.2*. He presented to the SC members a proposed table of contents and asked for their scientific support and contribution in the finalization of the table and the writing of the guide. This guide will be in the format of a scientific book with ISBN and will be distributed in Universities, professional unions, NGOs, and Governmental Departments dealing with legal and regulatory issues regarding the implementation of the Habitat Directive in Cyprus etc.

#### **Comments for discussion:**

- **Networking with other projects**

The PM will contact Dr. Boivin in June – July 2018 in order to arrange the visit to France in October – November 2018. This visit will be under the frame of project networking with another similar project dealing with a cedar forest. Dr. Boivin agreed that such a visit will be very interesting since INRA's team can provide information regarding their actions on *Cedrus atlantica*, insect invasions, cedar silviculture to favor resistance to drought and modelling procedures for coming up with scenarios on conservation. Dr. Boivin also confirmed that the INRA team can arrange field visits in order to enlighten LIFE-KEDROS members about the implementation and results of specific conservation measures in combination with the scientific background of these.

- **Presentation in Scientific conference**

The project has a budget for presenting its outcomes to the scientific community through the presentation and publication in a scientific conference. The members of the SC can suggest an international conference that the project can attend. For this reason, Dr. Eliades (PM) will be in touch with the SC members.

- Dr. Xanthopoulos suggested the Forestry Conference in Greece (2019) organized by the Hellenic Forestry Society.

- **Technical guide for the sustainable management and the long-term conservation of narrow endemic habitat type in a limited area of occupancy: The case of the 9590\* habitat type**

Dr. Eliades (PM) will send the draft of the "Table of Contents" for this technical guide to all SC members. The members of SC agreed to make suggestions about this Table and contribute to the writing/preparation of the deliverable.

#### **C. Evaluation of Conservation Monitoring Protocol (Action D.1)**

The PM presented the Conservation Monitoring Protocol (CMP) which is a deliverable of *Action D.1 - Monitoring and evaluation of project's performance, findings and outcomes* and reminded SC members about how this could be a tool for the monitoring of the implementation of conservation actions and for evaluating these actions' impact on the conservation of the targeted habitat type.

Following the discussion, the PM confirmed that he will forward the CMP to all SC members by email and allow them some time (until 30<sup>th</sup> June 2018) for comments and suggestions.

#### **D. Evaluation of Project Monitoring Protocol (Action F.2)**

The PM presented the Project Monitoring Protocol (PMP) which is a deliverable of *Action F.2 - Project Monitoring and Compilation of information* and reminded SC members about how this could be a tool for the evaluation of the project's progress.

Following the discussion, the PM confirmed that he will forward the PMP to all SC members by email and allow them some time (until 30<sup>th</sup> June 2018) for comments and suggestions.



Figure 2: Photos taken during the second day of the SC meeting.

#### **Third day of SC meeting**

At the 3<sup>rd</sup> day of SC meeting, the External Experts (members of SC) met with the staff members from the Department of Forests and the Project Manager, in order to organize the next steps of Actions, based on the decisions made during the 1<sup>st</sup> and the 2<sup>nd</sup> day of the SC meeting.