



PLANT-NET CY

Establishment of a Plant Micro-Reserve Network in Cyprus
for the Conservation of Priority Species and Habitats



Annex 7

**DELIVERABLE - Post-Project, Long-Term Monitoring and
Management Plan**



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Action C.3:

Monitoring of the Plant Micro-Reserves



Deliverable:

Post-Project, Long-Term Monitoring and Management Plan

PLANT-NET CY

June 2013

This deliverable has been produced within the framework of Action C3 of the PLANT-NET CY project. Action C3 focuses on the monitoring of the Plant Micro-Reserves (PMRs) by recording factors relating to the priority species and their habitats. The Post-Project, Long-term Monitoring and Management Plan contributes towards the sustainability of the PMR Network in the long term. Specific conservation priorities (monitoring parameters and management measures) are designated in this plan to be implemented after the completion of the PLANT-NET CY project. The elaboration of this Plan took into consideration several sources of information, such as the experiences gained throughout the implementation of project's conservation actions, the data derived during the four years of monitoring and the results presented in the Final Monitoring Reports (Action C.3)

The monitoring parameters and management measures, which are presented at Tables 1-6 below, were agreed between the competent authorities of Cyprus for nature conservation (Department of Environment and Department of Forests, Ministry of Agriculture, Natural Resources and Environment). One of the main concerns for determining the monitoring parameters and management measures included in the Plan, was to secure the feasibility of the implementation of these measures by the personnel of Department of Environment and Department of Forests. The wider aim was to secure the sustainability of the PMRs in the long term.

The selected parameters are divided in Compulsory "compulsory" and "non-compulsory". The compulsory Compulsory parameters are considered crucial for the re-assessment of the conservation status of the targeted species and habitat types in the near future. These parameters should be implemented according to the proposed timeframe. The non-compulsory parameters are considered useful for a more complete monitoring of the targeted species/habitat types, however, the competent authorities are expected to decide whether they will adopt them, according to their available resources. The implementation period of this plan is 10 years. The plan must be revised by the end of period.

The methodology described in the Monitoring Plans (Action A.3) and Management Plans (Action A.4) for each PMR related to the targeted species and habitat types, will be used for the proper implementation of the Post-Project, Long-term Monitoring and Management Plan.

Table 1. Monitoring parameters and management measures apply in PMR 1 (**Ophrys kotschy*).

*Ophrys kotschy						
S/N	Monitoring Indicator	Management Measure	Timeframe	Frequency	Type	Notes
1.	Geographical distribution	-	March	Every 3 years	Compulsory	Mapping of new individuals within the boundaries of the PMR.
2.	Subpopulation size	-	March	Every 3 years	Compulsory	Recording of <i>Ophrys kotschy</i> individuals within the PMR.
3.	Habitat's composition	-	April	Every 5 years	Compulsory	Flora recording using the modified Braun-Blanquet 9-grade cover-abundance scale within the 9 (1x1 m) established sample plots.
4.	Threats	-	March-April	Every 3 years	Compulsory	Recording of the direct threats and stresses, according to the IUCN categories.
5.	Individuals' monitoring	-	March	Every 5 years	Non-compulsory	Recording of the status of the 70 marked <i>Ophrys kotschy</i> individuals, according to the respective Monitoring plan.
6.	Reproductive effort	-	March-April	Every 5 years	Non-compulsory	Flowers and fruits recording of each one of the 70 marked <i>Ophrys kotschy</i> individuals.
7.	Relative Reproductive Success	Hand pollination	March	Every 3 years	Non-compulsory	Hand (self and cross) pollination of <i>Ophrys kotschy</i> flowers to promote sexual reproduction and recording of the fruit setting achieved.
8.	-	Removal of dried, flammable biomass	March-April	Very year	Non-compulsory	The dried, flammable biomass degrades <i>Ophrys kotschy</i> habitat and increases wildfire risk.

Table 2. Monitoring parameters and management measures apply in PMR 2 (*9390 - Scrub and low forest vegetation of *Quercus alnifolia* monitoring parameters).

*9390 - Scrub and low forest vegetation of <i>Quercus alnifolia</i>						
S/N	Monitoring Indicator	Management Measure	Timeframe	Frequency	Type	Notes
1.	Geographical distribution	-	April-May	Every 5 years	Compulsory	Mapping of habitat type 9390 within the boundaries of the PMR
2.	Subpopulation density	-	April-May	Every 5 years	Compulsory	Recording of <i>Quercus alnifolia</i> individuals in two age-structured classes: young and mature individuals, within the 5 established sample plots (20x20 m).
3.	Habitat's composition	-	April-May	Every 5 years	Compulsory	Flora recording using the modified Braun-Blanquet 9-grade cover-abundance scale within the 5 established sample plots.
4.	Threats	-	March-April	Every 3 years	Compulsory	Recording of the direct threats and stresses according to the IUCN categories.
5.	Regeneration	-	Jan-Feb: initial seedlings emergence Apr-May: seedlings establishment Sep-Oct: final survival	Every 3 years	Non-compulsory	Monitoring of seedling emergence within the 25 established sample plots.
6.	-	Addressing seed predation	Through the year	-	Non-compulsory	An integrated study on predation of <i>Quercus alnifolia</i> seeds is needed. The study will point the species responsible for the low sound seeds percentage. The study's outcomes will contribute to the sustainable management of predation in <i>Quercus alnifolia</i> .

Table 3. Monitoring parameters and management measures in PMR 3 (*9590 - *Cedrus brevifolia* forests (*Cedrosetum brevifoliae*)).

*9590 - <i>Cedrus brevifolia</i> forests						
S/N	Monitoring Indicator	Management Measure	Timeframe	Frequency	Type	Notes
1.	Geographical distribution	-	April-May	Every 10 years	Compulsory	Mapping of habitat type 9590 within the boundaries of the PMR according to the methodology described in the respective Monitoring plan.
2.	Subpopulation density	-	April-May	Every 5 years	Compulsory	Recording of <i>Cedrus brevifolia</i> individuals in two age-structured classes: young and mature individuals, within the 5 established sample plots.
3.	Habitat's composition	-	April-May	Every 5 years	Compulsory	Flora recording using the modified Braun-Blanquet 9-grade cover-abundance scale within the 5 (20x20 m) established sample plots.
4.	Threats	-	March-April	Every 5 years	Compulsory	Recording of the direct threats and stresses according to the IUCN categories.
5.	Regeneration	-	May-Jun: initial seedlings emergence Aug: seedlings establishment Oct-Nov: final survival - summer Feb-Mar: final survival - winter	Every 3 years	Non-compulsory	Monitoring of seedling emergence within the 5 established sample plots.
6.	Seedrain	-	-	Every 3 years	Non-compulsory	Cones recording of each of one of the 30 marked <i>Cedrus brevifolia</i> trees. .
7.	Survival of seedlings and saplings	Provision of water in extreme drought conditions	June-September	Annually	Non-compulsory	Recording of cedar seedlings and saplings that will survive after a period of extreme drought.

Table 4. Monitoring parameters and management measures in PMR 3 (**Arabis kennedyae*)

<i>*Arabis kennedyae</i>						
S/N	Monitoring Indicator	Management Measure	Timeframe	Frequency	Type	Notes
1.	Geographical distribution	-	April	Every 3 years	Compulsory	Mapping of new colonies within the boundaries of the PMR.
2.	Subpopulation size	-	April	Every 3 years	Compulsory	Recording of <i>Arabis kennedyae</i> individuals within the PMR.
3.	Habitat's composition	-	April	Every 5 years	Compulsory	Flora recording using the modified Braun-Blanquet 9-grade cover-abundance scale within the 10 established sample plots (8 plots of 25 m ² and 2 plots of 900 m ²).
4.	Threats	-	April-May	Every 3 years	Compulsory	Recording of the direct threats and stresses according to the IUCN categories.
5.	Relative Reproductive Success	-	March-April	Every 5 years	Non-compulsory	Recording of flowers and fruits in 40 <i>Arabis kennedyae</i> individuals.
6.	<i>Arabis kennedyae</i> density	-	March-April	Every 5 years	Non-compulsory	Individuals count within the 10 sample plots (1x1 m).
7.	-	Enrichment	November-December	Every 3 years	Non-compulsory	Seedlings establishment at selected sites of Tripylos area. Seedlings will be produced in the nurseries of the Department of Forests.
8.	-	Restoration or Enhancement	June	Every 3 years	Non-compulsory	Seed dispersal for subpopulation enhancement of certain colonies or for the restoration of colonies that have been lost.

Table 5. Monitoring parameters and management measures in PMR 4 (**Centaurea akamantis*)

*<i>Centaurea akamantis</i>						
S/N	Monitoring Indicator	Management Measure	Timeframe	Frequency	Type	Notes
1.	Geographical distribution	-	June-July	Every 3 years	Compulsory	Mapping of new polygons within the boundaries of the PMR according to the methodology described in the respective Monitoring plan.
2.	Subpopulation size	-	June-July	Every 3 years	Compulsory	<i>Centaurea akamantis</i> individuals' count within the PMR.
3.	Threats	-	June-July	Every 3 years	Compulsory	Recording of the direct threats and stresses according to the IUCN categories.
4.	Reproductive effort	-	June-September	Every 5 years	Non-compulsory	Flowers and fruits recording in 5 inflorescences of 30 <i>Centaurea akamantis</i> individuals.
5.	-	Subpopulation enhancement	April	Every 3 years	Non-compulsory	Seedlings establishment at selected sites in Avakas Gorge. Seedlings will be produced in the nurseries of Department of Forests.

Table 6. Monitoring parameters and management measures in PMR 5 (*Astragalus macrocarpus* subsp. *lefkarensis*)

<i>*Astragalus macrocarpus</i> subsp. <i>lefkarensis</i>						
S/N	Monitoring Indicator	Management Measure	Timeframe	Frequency	Type	Notes
1.	Subpopulation trend	-	March-April	Every 3 years	Compulsory	<i>Astragalus macrocarpus</i> subsp. <i>lefkarensis</i> individuals' count within the 3 established sample plots (2 plots of 225 m ² and 1 plot of 100 m ²).
2.	Habitat's composition	-	March-April	Every 5 years	Compulsory	Flora recording using the modified Braun-Blanquet 9-grade cover-abundance scale within the 2 established sample plots (225 m ²).
3.	Threats	-	March-April	Every 3 years	Compulsory	Recording of the direct threats and stresses according to the IUCN categories.
4.	Relative Reproductive Success	-	March-June	Every 5 years	Non-compulsory	Recording of flowers and fruits in 30 <i>Astragalus macrocarpus</i> subsp. <i>lefkarensis</i> individuals.
5.	-	Addressing seed predation	February-May	-	Non-compulsory	A study on seed predation by <i>Bruchidius plagiatus</i> is needed. All efforts to sustainable control the negative impact of the species to the fruits of <i>Astragalus macrocarpus</i> subsp. <i>lefkarensis</i>) failed.
6.	-	Mild pruning - weeding of the main competitors	February-March	Every 3 years	Non-compulsory	This measure decreases <i>Astragalus macrocarpus</i> subsp. <i>lefkarensis</i> competition by other plant species.
7.	-	Subpopulation enhancement	February-March	Every 3 years	Non-compulsory	Seedlings establishment at selected sites within PMR. Seedlings will be produced in the nurseries of Department of Forests.