



## ESCAPE - Ex-Situ Conservation of Finnish Native Plant Species

LIFE11 BIO/FI/000917



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### Project description:

#### Background

*Ex-situ* conservation methods offer protected conditions to help build up stocks of endangered species prior to their release into the wild to restore and bolster habitats or populations at risk. An *ex-situ* action plan for the conservation of threatened native plant taxa in Finland was developed by the LIFE 'VACCIA' (LIFE07 ENV/FIN/000141) project. This included 11 targets to help ensure that 40% of the country's threatened species were protected via *ex-situ* conservation methods by the year 2016. A national seed bank is required to help achieve the target.

#### Objectives

The main objective of the ESCAPE project was to create a national (Finnish) gene bank for threatened native flora, including vascular plants and bryophytes. The aim was to preserve biodiversity by increasing the number of threatened plant species in *ex-situ* collections in Finland, to develop new *ex-situ* conservation methodologies, and compile instructions for *ex-situ* plant conservation techniques for conservation officers. The project aimed to implement the national action plan and reach its targets for the *ex-situ* conservation of plants. It also planned to test the possibilities for transferring *ex-situ* conserved plant material to new sites and to reintroduce plant species to sites from where they

have disappeared.

## Results

The ESCAPE project established a seed bank for threatened native flora in Finland, and increased the number of endangered plant species in *ex-situ* collections in accordance with the Finnish national action plan. A total of 175 taxa were collected, exceeding the foreseen figures for number and range of species collected, thereby increasing the percentage of threatened wild plant taxa in *ex-situ* conservation in Finland from 11% to 56%.

ESCAPE compiled a priority list of native plant taxa that would most benefit from *ex-situ* conservation activities. To obtain genetically-representative samples of these species, the project team collected seeds from many populations and, if possible, from at least 50-200 genetically-distinct individuals of each species. The project team collected an estimated 1 700 000 seeds good-quality seeds, and around 3 000 other plant materials. By the end of the project, the Finnish national seed bank contained 148 taxa.

The project developed new conservation methodologies and techniques, which helped to increase plant population sizes and ensured the genetic diversity of threatened plant species in Finland. An instruction book ('The *ex-situ* conservationist's toolbox'/'Etäsuojelijan opas') was compiled for conservation professionals responsible for local species conservation activities in Finland and other stakeholders. At the end of the project 41 taxa were either in micropropagation or cryopreservation, and 87 taxa were conserved *ex situ* in outdoor collections. Micropropagation and cryopreservation methods are now used routinely in plant *ex-situ* conservation in Finland, with bryophytes also successfully included.

Tests were conducted to establish the possibility for transferring *ex-situ* conserved plant material to new sites, and for reintroducing plant species to sites from where they have disappeared. From the *ex-situ* conservation material, 8 taxa were reintroduced during the project, and populations of 8 taxa were increased through *ex-situ* cultivation. Nine new populations of six threatened native plant taxa were reintroduced to sites from where they have disappeared. Three taxa were used for trials on assisted migration/reintroduction (*Artemisia campestris subsp. bottnica*, *Puccinellia phryganodes*, and *Salix pyrolifolia*). An additional three bryophyte species were used in *ex-situ* conservation trials, and tested for micropropagation and cryopreservation methods. The monitoring results of these actions were variable but mostly good.

The project disseminated its outcomes through guidebooks for *ex-situ* conservation professionals, scientific and popular articles, vascular plants and bryophyte handbooks, seminars, an exhibition on the *ex situ* conservation of threatened plant species that toured to several places, and other events for the general public. In addition, the project team delivered an integrated workshop for schoolchildren. A listing of 100 taxa was published on the project webpage, and the reasons for selecting these taxa for conservation was explained in detail in a separate publication.

The project helped Finland reach the 2010 Global Strategy for Plant Conservation (GSPC) target for the level of *ex-situ* conservation of 60%. The beneficiaries are

continuing the work after the project, and the 75% GSPC target for the number of endangered species protected through *ex-situ* conservation is expected to be achieved by the end of 2020.

The project helped secure the genetic diversity of endangered plants in Finland. These may include keystone species, and having these taxa readily available for reintroduction may essentially reduce the time lag for the restoration of ecosystem functions. Several Natura 2000 species are included in the *ex-situ* conservation and have been the subject for assisted migration and reintroduction experiments. Natura 2000 habitat types, such as seashore meadows, are directly affected by the project by these activities. Assisted migration is now viewed as a new tool that can also be utilised in adaptation to climate change.

The project is in line with a range of European and International policy, including the EU Biodiversity action plan, EU2020 Biodiversity strategy, the Convention on Biodiversity (Article 9) and the Global Strategy for Plant Conservation.

Long-term economic benefits may be derived from the economic potential of the genetic diversity and on new business opportunities that can be built on integrated plant conservation. This could also benefit regional development and socio-economic welfare in rural areas. Crop wild relatives in *ex-situ* collections are already globally utilised and considered very important for food security.

Further information on the project can be found in the project's layman report and After-LIFE Communication Plan (see "Read more" section).

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Environmental issues addressed:

Themes

Species - Plants

Keywords

endangered species, conservation of genetic resources, introduction of plant species, biodiversity, climate change adaptation

Target EU Legislation

- Nature protection and Biodiversity
- Convention on Biological Diversity - CBD (29.12.1993)
- COM(2001)162 - "Biodiversity Action Plan for the conservation of natural resources (vol. I & II)" ...
- COM(2011) 244 final "Our life insurance, our natural capital: an EU biodiversity strategy to 2020 ...

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	University of Helsinki
Type of organisation	University
Description	The Finnish Museum of Natural Heritage (FMNH) forms part of the University of Helsinki. FMNH is a research institute specialising in the fields of biology, geology and education. The Botany Unit of FMNH is a centre of expertise in European boreal flora.
Partners	University of Oulu, Finland Natural Heritage Services of Metsähallitus, Finland Finnish Environment Institute (SYKE), Finland

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Administrative data:

Project reference	LIFE11 BIO/FI/000917
Duration	01-SEP-2012 to 31-AUG -2017
Total budget	1,988,869.00 €
EU contribution	988,069.00 €
Project location	

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Read more:

Leaflet	Title: "ESCAPE: 1 September 2012 - 31 August 2017: Ex-Sity conservation of Finnish native plant species = SUOMEN LUONNONVARAISTEN KASVIEN EX SITU -SUOJELU" (2.42 MB) Author: Marko Hyvärinen (ed.) Year: 2013 Editor: LUOMUS No of pages: 2
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Leaflet	Title: "ESCAPE: Ex-situ conservation of finnish native plant species" (2.08 MB) Author: Marko Hyvärinen (ed.) Year: 2013 Editor: ESCAPE No of pages: 2
Leaflet	Title: "ESCAPE: 1 September 2012 - 31 August 2017: Ex-Sity conservation of Finnish native plant species" (1.27 MB) Author: Marko Hyvärinen (ed.) Editor: LUOMUS No of pages: 2
Leaflet	Title: "ESCAPE: 1.9.2012 - 31.8.2017: Ex situ conservation of Finnish native plant species: Suomen Luonnonvaraisten Kasvien etasuojelu" (787 KB) Author: Marko Hyvärinen (ed.) Editor: LUOMUS No of pages: 2
Leaflet	Title: "HEJ, VI FJÄRRBEVARAR VÄXTER PÅ NÄRA HÅLL!" (445 KB) Editor: LUOMUS No of pages: 2
Leaflet	Title: "HEI, ME ETÄSUOJELLAAN KASVEJA LÄHELLÄ!" (435 KB) Editor: LUOMUS No of pages: 2
Poster	Title: "ESCAPE: Ex-Situ conservation of finnish native plant species = Suomen Luonnonvaraisten kasvien ex-situ-suojelu" (1.25 MB) Year: 2013 Editor: ESCAPE No of pages: 1
Project web site	<a href="#">Project's website</a>
Publication: After-LIFE Communication Plan	Title: After-LIFE Communication Plan Author: M. Hyvärinen, P. Kulmala, S. Laaka-Lindberg, M. Mi Year: 2017 No of pages: 7
Publication: Book	Title: "ETÄSUOJELIJAN OPAS: TOIMITTANUT MARI MIRANTO. NORRLINIA: KASVI- JA SIENITIETEELLINEN JULKAISUSARJA, Numero 32" (4.32 MB) Author: Mari Miranto (ed.), Jaanika Edesi, ... [et al] Year: 2017 Editor: Luonnontieteellinen keskusmuseo LUOMUS No of pages: 68
Publication: Exhibition catalogue	Title: "Annex Pr2 E.2.1. ESCAPE Progress report 2 [Exhibition panels]" (3.47 MB) Author: Kirsi Hutri, Sanna Laaka-Lindberg Year: 2016 Editor: University of Helsinki No of pages: 13
Publication: Guidelines-Manual	Title: "Criteria for assisted migration = Avustetun leviämisen soveltuvuuden arviointiperusteet" (101 KB) Author: Maria Hällfors (ed) Year: 2013 Editor: Finnish Natural History Museum, Botany unit No of pages: 3
Publication: Guidelines-Manual	Title: "Action C.5 Milestone: Bryophyte ex situ conservation scheme" (1.16 MB) Author: Sanna Laaka-Lindberg, Xiaolan He Year: 2017 Editor: University of Helsinki No of pages: 12

Publication: Layman report	Title: Layman report (Finnish version) Author: Sonja Saine, Jessika Karvinen & Joose Lassila No of pages: 11
Publication: Layman report	Title: Layman report (Swedish version) Author: Sonja Saine, Jessika Karvinen & Joose Lassila No of pages: 11
Publication: Layman report	Title: Layman report Author: Sonja Saine, Jessika Karvinen & Joose Lassila No of pages: 11
Publication: Management plan	Title: "ESCAPE (LIFE BIO/FI/917, 1.9.2012-30.8.2017): Hoitosuunnitelma (Management plan, A3)-(toimenpiteet C6, C7, C8, C9, D2)" (204 KB) Author: Anne Jäkäläniemi Year: 2013 Editor: Metsähallitus, Pohjanmaan luontopalvelut No of pages: 10
Publication: Technical report	Title: Project's Final technical report Year: 2018 No of pages: 78
Publication: Technical report	Title: "Arviointiraportti ex situ -lisättyjen lajien luontoon palautuksista ajalta 2014-2016: LIFE+2011 BIO/FI/917 ESCAPE Action D.2: Deliverable report" (2.96 MB) Author: Pauliina Kulmala, Terhi Rytteri, Sanna Laaka-Lindb Year: 2016 Editor: University of Helsinki No of pages: 27
Slides Presentation	Title: "ESCAPE LIFE: Ex-situ Conservation of Finnish Native Plant Species: Milestone report on Action C.8" (1.2 MB) Author: Pauliina Kulmala Year: 2015 Editor: Metsähallitus No of pages: 6

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