

From seed to reintroduction

ex situ best practices for endangered
plant species





- habitat loss
- fragmentation of ecosystems
- climate change

As a result, many species are now critically endangered, and in some cases, they survive only in cultivation, outside their natural habitats.

Plant species are disappearing at an increasing rate due to human activities.



Nature conservation is divided into in situ and ex situ conservation.

In situ (lat. *in place*) involves the protection of ecosystems in the place where they occur

Ex situ (lat. *outside of place*) involves collecting generative and vegetative material from species' habitats, storing it, propagating it, and ensuring its safe survival until it is possible to reintroduce the species to its natural habitat. Botanical gardens fulfill this function by collecting, documenting, and maintaining conservation collections.



Rhododendron luteum

Legal acts regarding nature protection



Galanthus nivalis

The most important legal act concerning nature conservation in Poland is the **Nature Conservation Act of 16 April 2004**. According to Article 1, the Act 'specifies the objectives, principles and forms of protection of living and inanimate nature and the landscape'. The Act of 16 April 2004 is consistent with European Union law. According to the Act currently in force, the highest objectives of nature conservation are:

- **maintaining the stability of ecosystems and ensuring their durability;**
- **preserving biological diversity** (preserving the continuity of existence of all species of plants, animals and fungi, together with their habitats);
- **landscape protection** (excluding greenery in urban and rural areas);
- **maintaining balance or restoring the conservation status of natural habitats;**



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Warszawa, 04-04-2023

ZAŚWIADCZENIE

Stosownie do art. 63 ust. 1 i ust.4 ustawy z dnia 16 kwietnia 2004 r. o ochronie przyrody (Dz. U. z 2022 r. poz. 916 z późn. zm.) oraz art. 52 ust. 2 rozporządzenia Komisji (WE) nr 865/2006 z dnia 4 maja 2006 r. ustanawiającego przepisy wykonawcze do rozporządzenia Rady (WE) nr 338/97 w sprawie ochrony gatunków dzikiej fauny i flory w drodze regulacji handlu nimi, wpisuję:

Ogród Botaniczny Uniwersytetu Wrocławskiego,
ul. Henryka Sienkiewicza 23, 50-335 Wrocław

pod numerem:
PL 008

do rejestru instytucji naukowych uprawnionych do przewożenia w celach naukowych przez granicę Unii Europejskiej, bez stosownych zezwoleń, żywego materiału roślinnego, okazów zielnikowych, okazów muzealnych zakonserwowanych, zaszuszonych albo w inny sposób utrwalonych, gatunków podlegających ograniczeniom na podstawie przepisów Unii Europejskiej dotyczących Konwencji Waszyngtońskiej (CITES), w celu nieodpłatnej wymiany, użyczenia lub darowizny.

Z up. Ministra

Łukasz Rejt
Dyrektor
Departament Ochrony Przyrody
Ministerstwo Klimatu i Środowiska
/ – podpisany cyfrowo/

Otrzymuje:
dr hab. Zygmunt Kącki
Dyrektor
Ogród Botaniczny Uniwersytetu Wrocławskiego
Wydział Nauk Biologicznych
ul. Henryka Sienkiewicza 23
50-335 Wrocław

Telefon: (+48) 22 369 29 00
info@klimat.gov.pl
www.gov.pl/klimat

ul. Wawelska 52/54, 00-922 Warszawa
Ministerstwo Klimatu i Środowiska

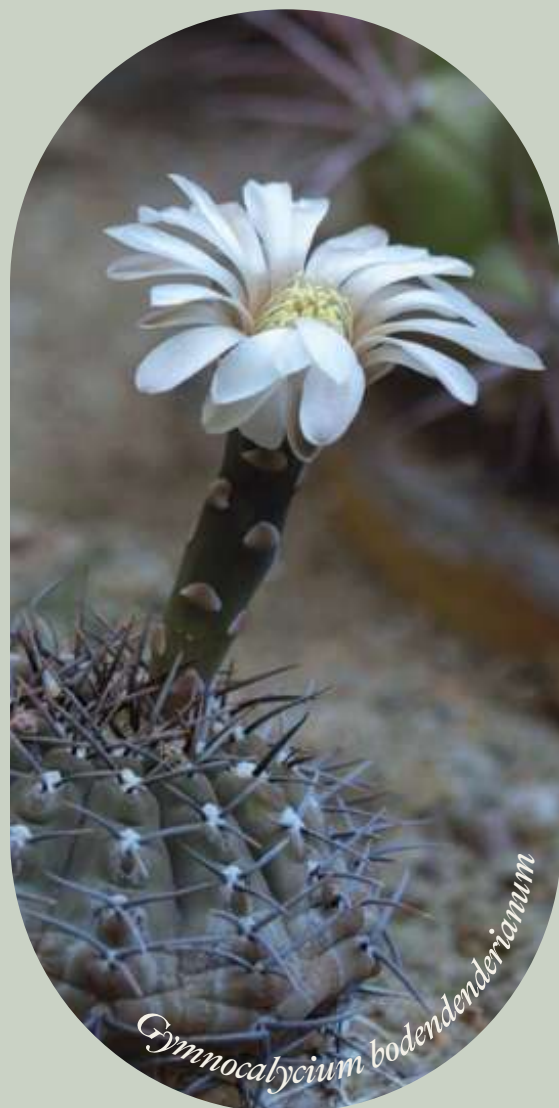
Działamy zgodnie z EMAS - zarządzając instytucją, dbamy o środowisko

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

which aims to eliminate illegal trade in endangered species of plants and animals.

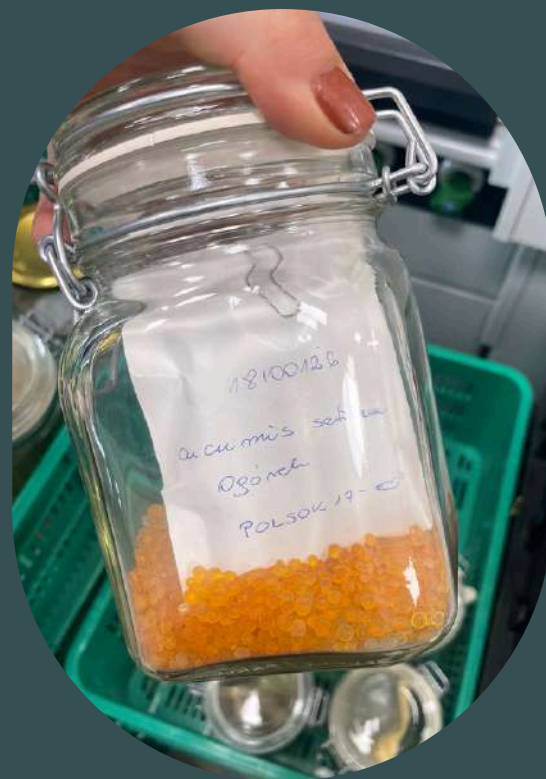
In 2023, the Garden was assigned a CITES registration number

In 2025, the Garden became a member of BGCI (Botanic Gardens Conservation International)



Ex situ conservation plays an important role as a safety backup for wild populations.

- preserve plant species outside their natural environments, especially when in situ conditions are no longer stable.
- maintain genetic diversity and provides plant material that can be used in the future for restoration or reintroduction programmes.



Regional Center for Horticultural Biodiversity in Skierniewice, Poland
Photo by Aleksandra Kwit, Botanical Garden UWr

Seed collection

Seed collection is the first and very important step in the conservation process. Material should be collected from natural populations, with a focus on capturing as much genetic diversity as possible.

Index Seminum

The Botanical Garden in Wrocław has been exchanging seeds since 1818.

- ▶ we send Index Seminum to 240 scientific institutions around the world
- ▶ we order seeds from about 60 scientific institutions
- ▶ we send seeds to about 40 scientific institutions
- ▶ In this way, we obtained about 150 new species of winter-hardy plants in our climate
- ▶ We obtained about 160 new species of greenhouse plants

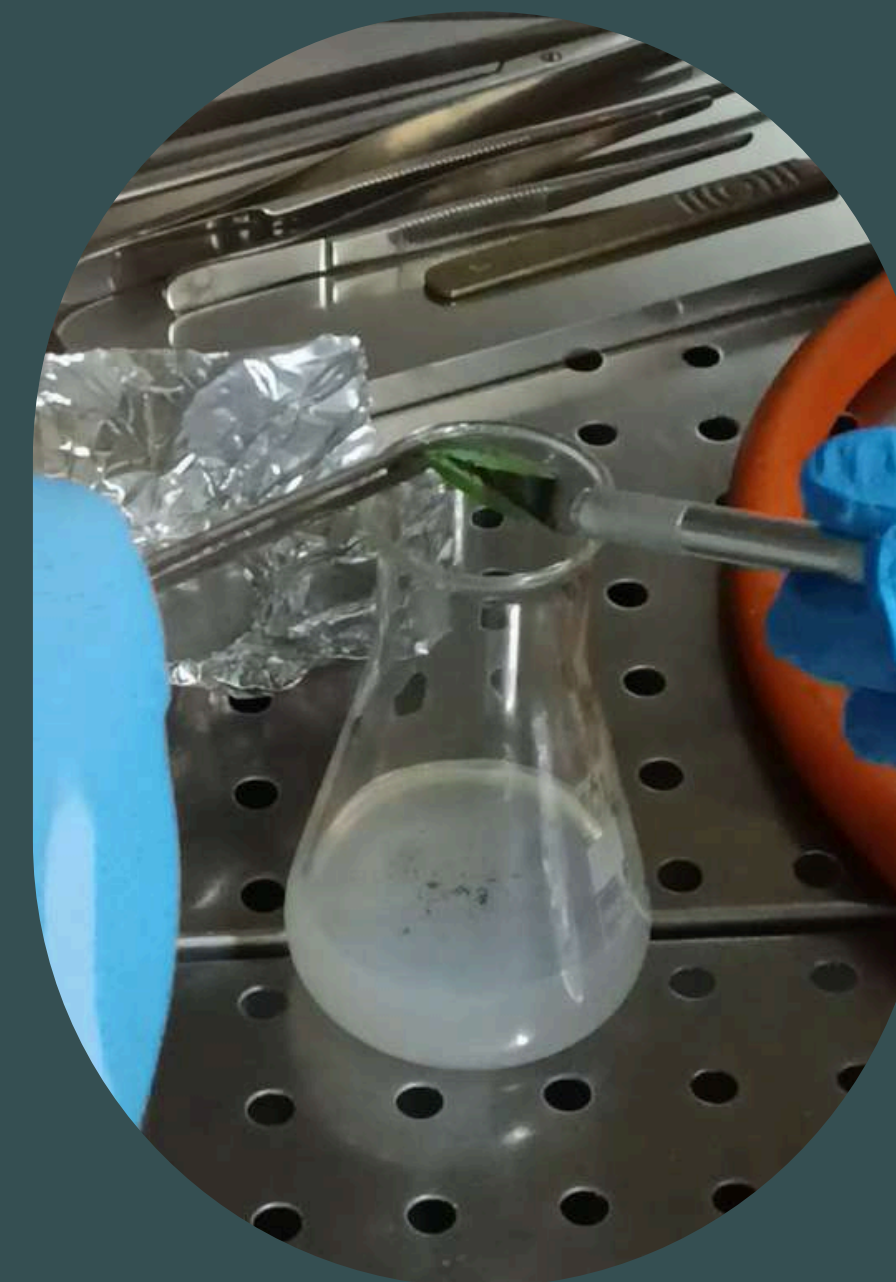
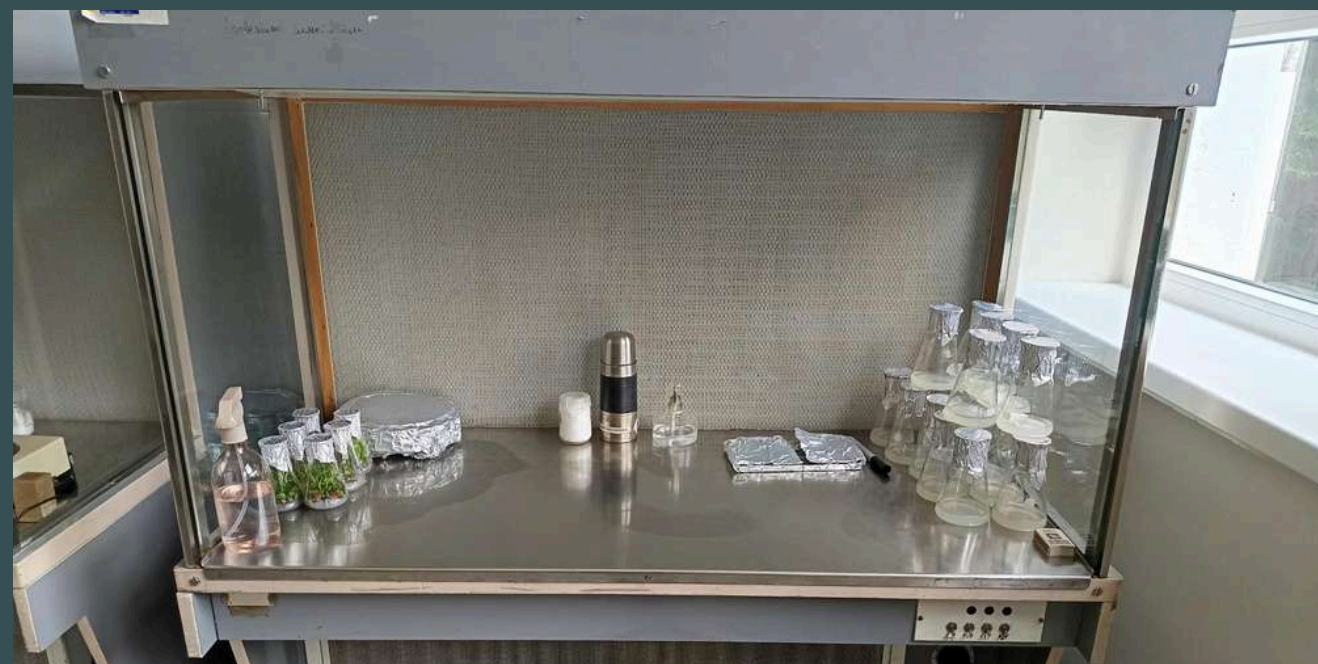
We take care of our young plants, statistically about 75% of them reach maturity

Seed storage

After collection, seeds are stored under controlled conditions to maintain their viability over time.



In some cases, vegetative propagation or in vitro techniques are necessary. The main goal is to obtain healthy plants that represent the original genetic diversity.



Propagation

Cultivation in botanical gardens

As a botanical garden, we provide controlled conditions for the cultivation and care of our plant collections. We monitor the health and development of the plants during cultivation.



Linum austriacum



Photo by Małgorzata Gębala, Botanical Garden UWrocław



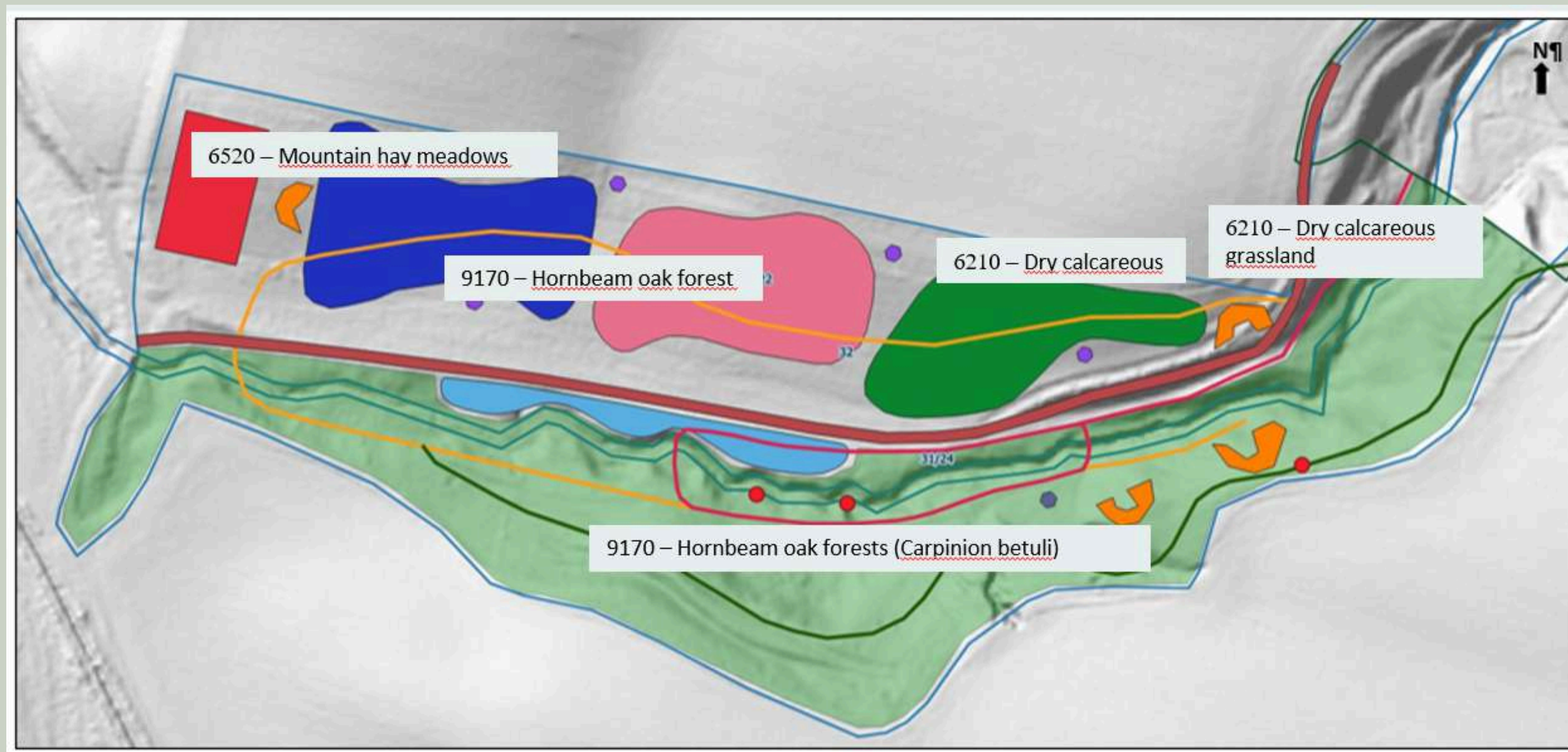
Welwitschia mirabilis



Photo by Aleksandra Kwit, Botanical Garden UWrocław

‘W Naturze’

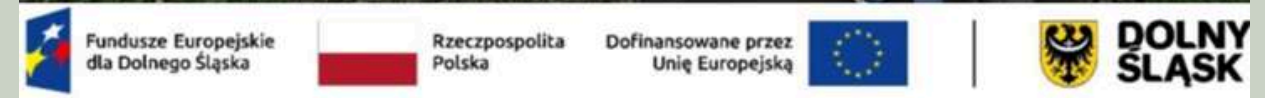
We are also developing a project called “In Nature” - a semi-wild area in Wojstawice Arboretum, where we want to create suitable habitats for reintroducing threatened plants.



Educational trails through the forest



9170 – Hornbeam oak forests (Carpinion betuli)



Project for the creation of semi-natural grassland and meadow habitats



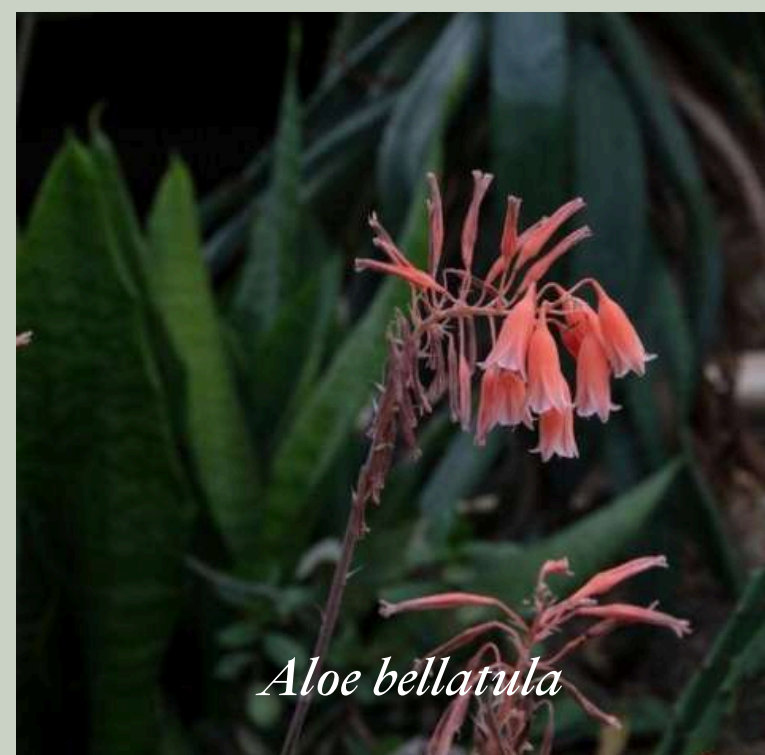
Endangered plant species

A collection of species threatened with extinction in Poland and around the world.



CITES

Collection of plant species covered by the provisions of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, signed in 1973. The Republic of Poland ratified its accession to the Convention on 12 December 1989.



Protected plant species in Poland

Collection of plant species that are rare, endemic, vulnerable and threatened with extinction, are subject to strict and partial protection in Poland pursuant to the Regulation of the Minister of the Environment of 9 October 2014.



Best ex-situ practices

- **Legal and ethical sourcing**

Seeds collected from natural populations or obtained from trusted institutions (e.g. botanical gardens, seed banks)

- **Genetic diversity matters**

Collect from multiple individuals and populations whenever possible

- **Proper storage and documentation**

Controlled conditions, viability monitoring, full traceability of origin

- **Targeted propagation**

Species-specific protocols (seed, vegetative, in vitro when needed)

- **Long-term cultivation**

Maintain healthy, genetically representative collections in botanical gardens

- **Integration with conservation goals**

Collections should support restoration and reintroduction, not only display

- **Monitoring and data management**

Record survival, growth, and origin data at every stage

- **Collaboration between institutions**

Exchange of material, knowledge and best practices between botanical gardens and partners

Four international cooperation agreements have been signed:

- Botanical Garden in Almaty (Kazakhstan)
- University of Sonora (Mexico)
- Padova
- Granada



Uniwersytet
Wrocławski



Ogród Botaniczny
Arboretum Wojławice

together we protect
biodiversity

