

# Action Plans for Endangered Plant Species in the Czech Republic – theory and practise

Nature Conservation Agency of the Czech Republic

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# Action and Management Plans



- MoE assigned preparation and implementation to NCA
- AP/MPs based on Czech law No. 114/1992, § 52
- Currently 8 APs and 1 MP in CZ
  
- **AP** – sum of scientific-based measures leading to regeneration and long-time stabilisation of populations of the most endangered species, incl. special species management
- **MP** – complex solutions for protected species whose presence in nature is in conflict with human activities
  
- International level – recommendation of IUCN, Bern convention
- **Binding structure of AP/MP** (NCA 2008) – concrete biological goals → Conception of action and management plans of protected animals and plants in the Czech Republic (NCA 2013) – incl. Lists of candidate species
- The development of the AP/MP tool is planned in next 5 years (support of Norwegian Funds)

# Species selection I



- Species is included in **public notice** n. 395/1992 Sb.
- Species is included in **National Red list** in category critically endangered (**CR**) or strong endangered (**EN**)
- There is a visible **decrease of populations** which directly influences survival of the species in CZ
- There is a visible **decrease of populations** in whole area of species or in a big part of Europe
- Species **is not on the edge of area** (in history it was not on the edge), if yes it has to be endangered in whole area of distribution
- In the area of CZ exist in the history **viable population**
- **Reasons of threats** are known and could be eliminated



# Species selection II













- CZ hosts a large part of the whole world/european population or the species belongs to Czech subspecies or **endemics**
- Species needs special active management and AP brings **added value** (applied research, PR, etc.)
- **Umbrella species** or species dependent on endangered habitats, European priority species
- **Enough information** is available about the species (we know how to help and protect them) and **specialist** ready to cooperate



# APs and MPs approved by MoE



	since	coordinator	habitat management	reintroduction, enforcement	monitoring	research	education
 <b>Freshwater Pearl Mussel</b> <i>Margaritifera margaritifera</i>	2000, updated	Alena Peltanová					
 <b>European Ground Squirrel</b> <i>Spermophilus citellus</i>	2008	Jitka Větrovcová					
 <b>Aesculapian Snake</b> <i>Zamenis longissimus</i>	2008	Antonín Krása					
 <b>European Otter</b> <span style="float: right;">MP</span> <i>Lutra lutra</i>	2009	Jitka Větrovcová					
 <b>Scarce Fritillary</b> <i>Euphydryas maturna</i>	2011	Antonín Krása					
 <b>Marsh Angelica</b> <i>Angelica palustris</i>	2000	Jana Zmeškalová					
 <b>Long-stalked Pondweed</b> <i>Potamogeton praelongus</i>	2003	Jana Zmeškalová					
 <b>Spring Gentian</b> <i>Gentiana verna</i> ssp. <i>verna</i>	2008 - 2012	Anna Šlechtová					
 <b>Bohemian Sand Pink</b> <i>Dianthus arenarius</i> ssp. <i>bohemicus</i>	2008	Anna Šlechtová					
 <b>Bohemian Gentian</b> <i>Gentianella praecox</i> ssp. <i>bohémica</i>	2011	Jana Zmeškalová					





# APs and MPs approved by MoE













was tried



is planned



is being implemented

	since	coordinator	habitat management	reintroduction, enforcement	monitoring	research	education
 <b>Freshwater Pearl Mussel</b> <i>Margaritifera margaritifera</i>	2000, updated	Alena Peltanová	●	●	●	●	○
 <b>European Ground Squirrel</b> <i>Spermophilus citellus</i>	2008	Jitka Větrovcová	●	●	●	●	●
 <b>Aesculapian Snake</b> <i>Zamenis longissimus</i>	2008	Antonín Krása	●		●	●	●
 <b>European Otter</b> MP <i>Lutra lutra</i>	2009	Jitka Větrovcová	●		●	●	●
 <b>Scarce Fritillary</b> <i>Euphydryas maturna</i>	2011	Antonín Krása	●	○	●	●	○
 <b>Marsh Angelica</b> <i>Angelica palustris</i>	2000	Jana Zmeškalová	●	●	●	○	●
 <b>Long-stalked Pondweed</b> <i>Potamogeton praelongus</i>	2003	Jana Zmeškalová	●	●	●	●	●
 <b>Spring Gentian</b> <i>Gentiana verna</i> ssp. <i>verna</i>	2008 - 2012	Anna Šlechtová	●	●	●	●	
 <b>Bohemian Sand Pink</b> <i>Dianthus arenarius</i> ssp. <i>bohemicus</i>	2008	Anna Šlechtová	●	●	●	●	●
 <b>Bohemian Gentian</b> <i>Gentianella praecox</i> ssp. <i>bohemica</i>	2011	Jana Zmeškalová	●	●	●	○	●





# Marsh Angelica AP



## Threats and solutions by AP:

- Destruction of boggy soil meadows → habitats protection, education of farmers and public
- Degradation of hydrological system with low level of underground water → hydrological study of given locality, incl. suggestions for solutions
- Overgrowing of localities → quality and regular management of localities by mowing and removing shrubs
- Application of artificial fertilisers → cooperation with farmers, education
- Low density and number of populations → cultivation *ex situ* and repatriation *in situ*, comparisson of genetic diversity in the east-European area of the species → **stabilization of the population on the last locality, establishment of the second population**

## *Angelica palustris*

- boggy soil meadows in basins of big rivers
- 2 localities from repatriation
- European priority species
- AP since 2000





# Marsh Angelica AP



- Had 7 historical localities in CZ
- Last localities – Hrdibořické rybníky (†1985), Černovír († 1951)
- Extinct in CZ, but seeds were collected and cultivated *ex situ*
- Best localities for repatriation were chosen

→ **planting adults**

→ **sowing seeds**

- Hrdibořice (1998-2011), Černovír (1998-2012)
- Problem with moisture gradient, molluscs

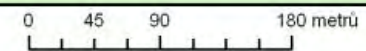
→ **recent stable population on Hrdibořice** (>1000 adults, thousands of juveniles), Černovír is being established (<100 adults)



# Marsh Angelica AP



## Matizna bahenní v NPP Hrdibořické rybníky v roce 2011









# Bohemian Sand Pink AP



## Threats and solutions by AP:

- Overgrowing of localities → regular and good quality mowing, disturbances of soil surface, removal of shrubs and expansive plants
- Change of pedological conditions → **mechanized removal of humus layer** at both localities after pedological study of the area
- Seed predation → monitoring and research of insect predators (*Cnephasia longana*, *Hypera arator*), protection of other host plants at the locality
- Improving knowledge from applied research (identification of interspecies hybrids with *Dianthus carthusianorum*)
- Low density and number of populations → **seed repatriation at both localities and study of population dynamics**
- Education of and cooperation with local community

## *Dianthus arenarius* ssp. *bohemicus*

- open sand grasslands
- last 2 localities
- European priority species
- AP since 2008





# Bohemian Sand Pink AP



- two last localities – only 200 old clusters in the Kleneč and one in Kyškovice in 1990. Any regeneration or new seedlings had not be observed for years.



- seeds were deposited in a genetic seed bank
- restoration of locality by mechanized removing of humus layer was done in 2009: 1500 m<sup>2</sup> and 2010: 2500 m<sup>2</sup>

→ **sowing seeds**



- Kleneč (1999, 2009-2010), Kyškovice (2008-2012)
- Problem with insect predators



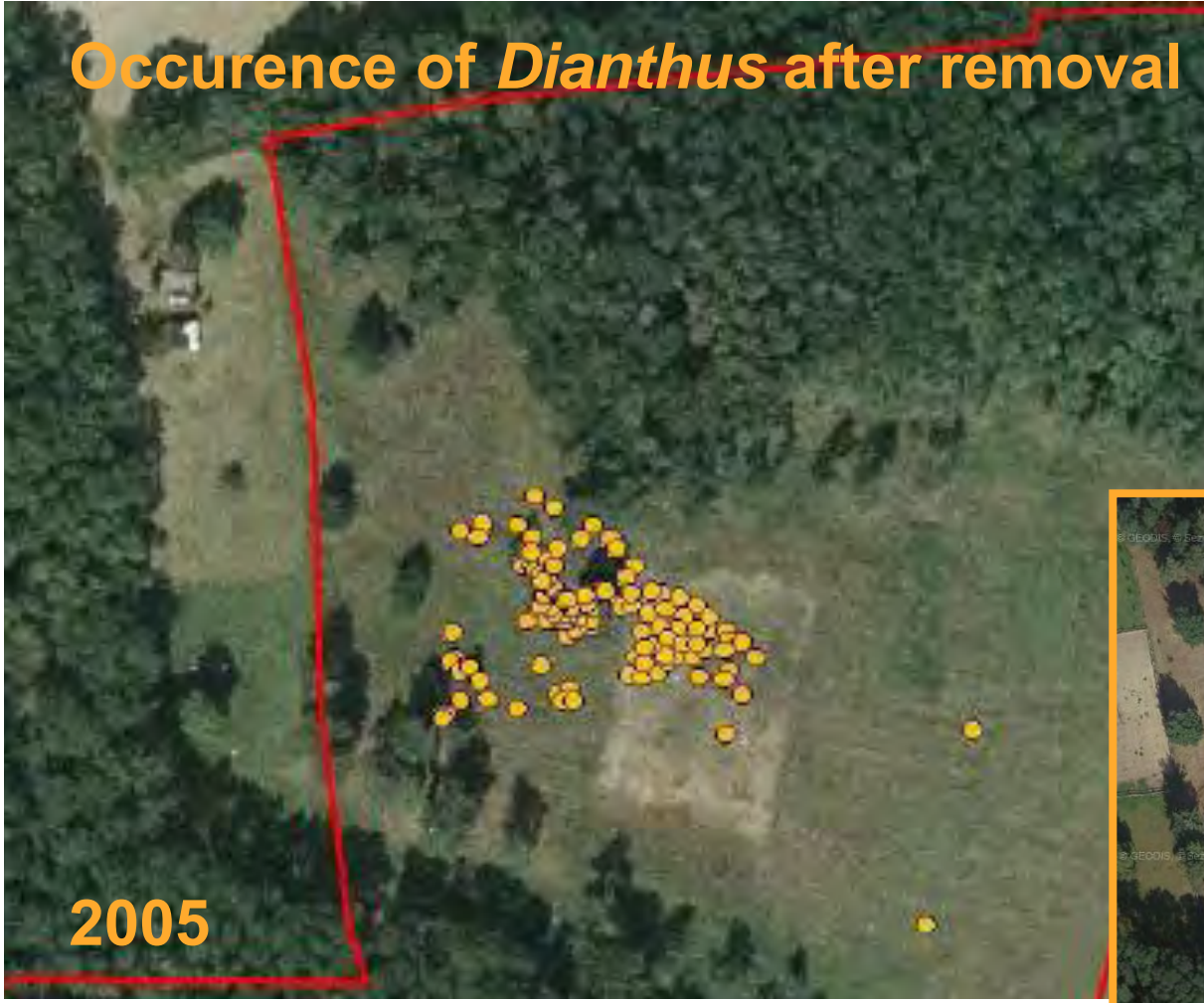
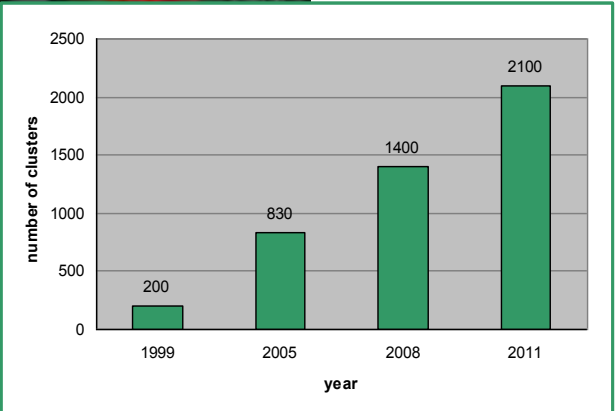
→ **last natural populations were enforced** Kleneč (>2000 adults), Kyškovice (>200 adults), new removal of humus is planned and placed according to insect inventorying results



# Bohemian Sand Pink AP



## Occurrence of *Dianthus* after removal







# Long-stalked Pondweed AP



## Threats and solutions by AP:

- Water eutrophication causes algae growth and shadow → management of shore vegetation, mechanical clearing of the plants
- High sedimentation in river arms → **removing mud and sediments from the localities, plan for building a barrier against sediment inputs**
- Breeding of inappropriate herbivorous fishes → education of fishermen
- Low density and number of populations → **sterile tissue cultivation, cultivation *ex situ* and repatriation** → enhancement of the last natural population by the individuals cultivated *ex situ*, establishment of 6 new localities of the species

## *Potamogeton praelongus*

- river arms with colder mesotrophic water
- last 1 natural locality and 5 localities with repatriated populations
- AP since 2003





# Long-stalked Pondweed AP



- Last locality – Rameno u Stříbrného rybníku
- seeds were collected and cultivated *ex situ*
- sterile tissue cultivation was established
- localities with good environmental conditions in a historical area were chosen

## → planting adults

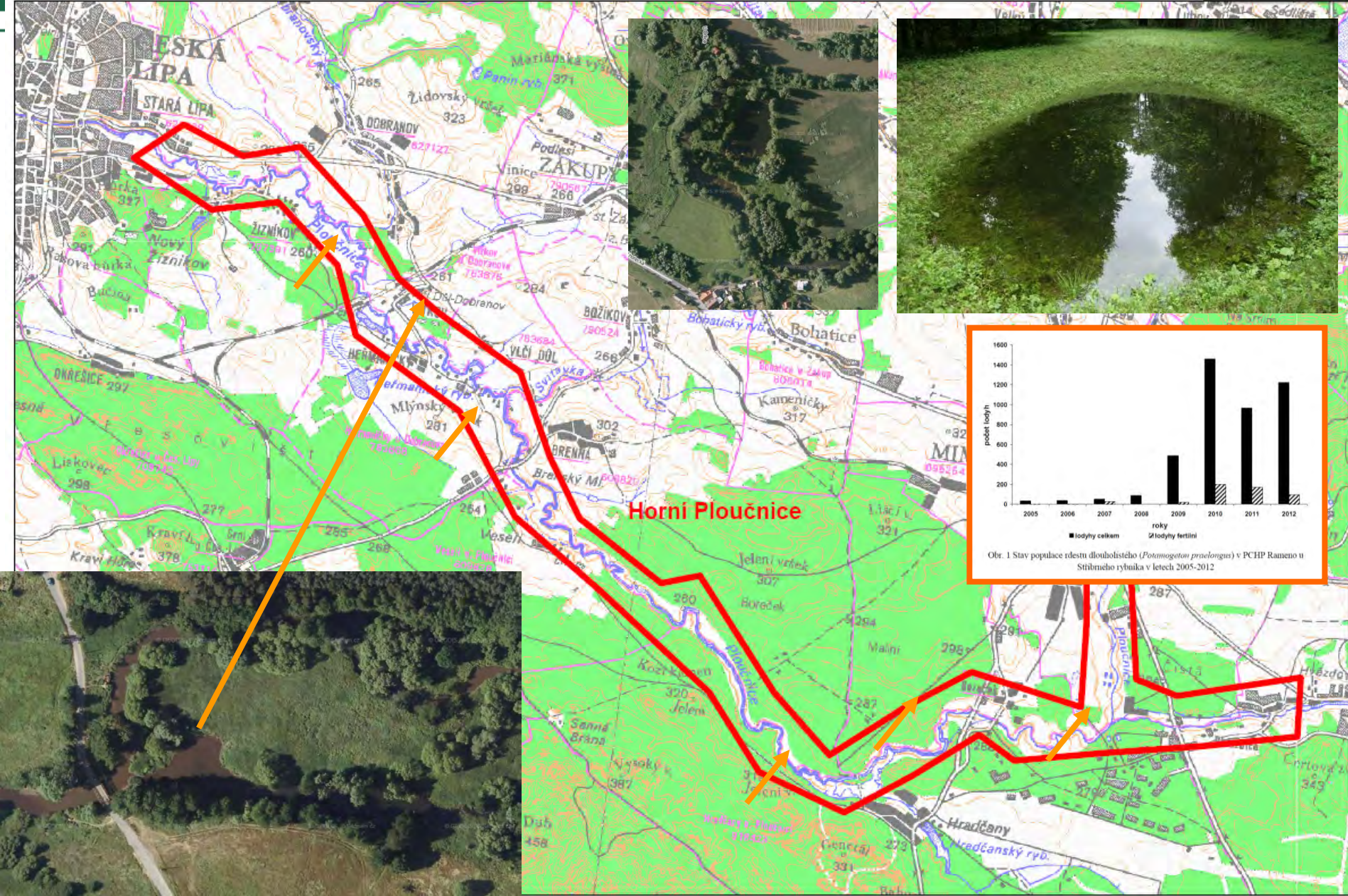
- Poorličí (2008-2012), Kokořínsko (2004), Českolipsko (2008-2012)
- Problem with finding optimal abiotic conditions

→ **last natural population was enforced (>1000 stems), 6 new localities was established** in 3 parts of historical area (sum > 500 stems) but they are not long-term stable





# Long-stalked Pondweed AP







# Bohemian Gentian AP



## Threats and solutions by AP:

- Absence of grassland management → **experimental finding of the most effective management measures**, maintaining regular and good quality management specified for each locality, **education of people responsible for management of localities** (seminars, booklets, field excursions)
- Increased competition of other species → removing shrubs and selected species of herbs
- Destruction of localities → habitat protection
- Application of artificial fertilisers → education of farmers
- Low number and size of populations → enhancement of selected populations by seeds from closed strong populations, identifying priority populations by calculations of minimum viable population size

### *Gentianella praecox* ssp. *bohemica*

- pastures, abandoned fields and short grasslands or meadows
- 73 microlocalities, sub-endemic CZ species
- European priority species
- AP since 2011





# Bohemian Gentian AP



- 73 last microlocalities – 32 priority localities were chosen for special care, some of them spatially limits population growth
- seeds are collected and replaced during one season

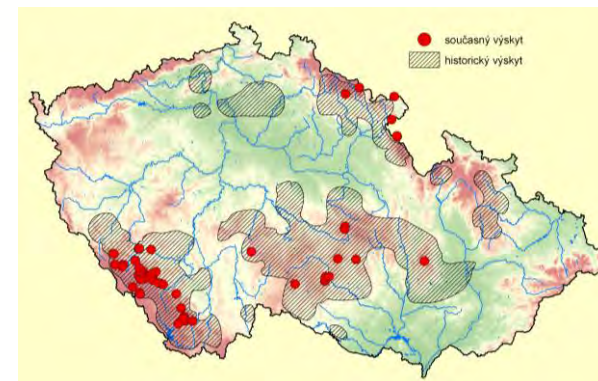
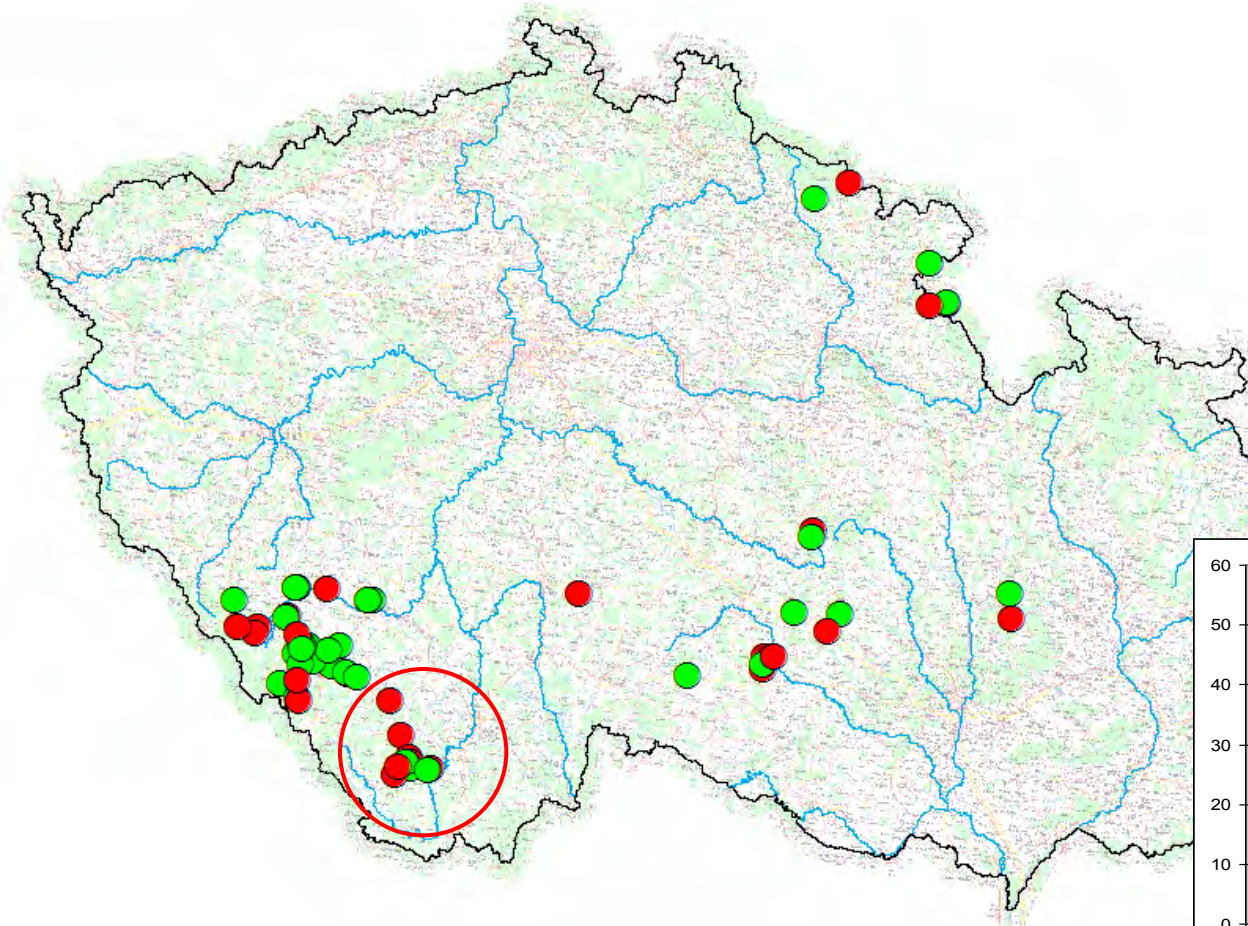
## → **sowing seeds**

- 5 populations are enforced by removing seeds and taking them to managed plots within the locality
- from 1 population 4 500 seeds were removed and 1 new locality (3 x 3 plots managed before) was established in condition of close distance from origin population
- Problem with low moisture of target plots

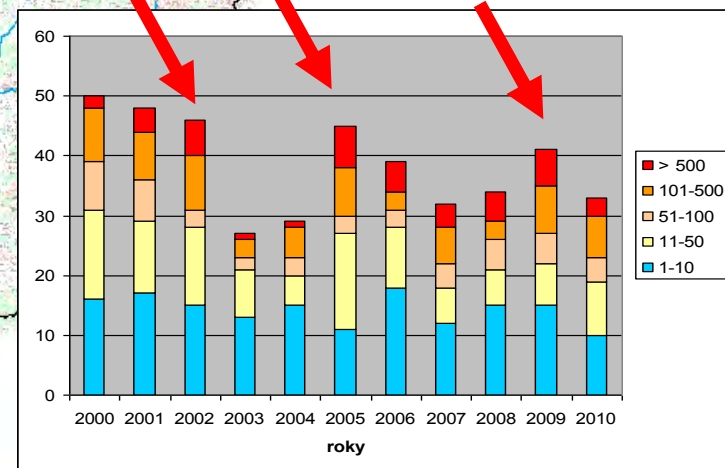
→ new population is trying to be established from population with high number of individuals and space limitation, number of large population is stable but number of small populations decreases every year



# Bohemian Gentian AP



„gentian years“











# Spring Gentian AP



## Threats and solutions by AP:

- Destruction of localities by agriculture → habitat protection
- Degradation of hydrological system with low level of underground water → **plan for irrigation of the last lowland locality**
- Absence of meadow management → regular mowing and harrowing
- Application of artificial fertilisers → education of farmers
- Low density and number of populations → **catalogue of historical and potential repatriation sites**, detailed mapping
- Improving knowledge from applied research (**genetic population structure, minimum population size**, method of micropropagation of the species)

### *Gentiana verna* ssp. *verna*

- mowed and pastured boggy meadows, subalpine spring areas, wet rocks in cirques and subalpine grasslands
- 1 last lowland population and area in the Jeseniky mountains
- AP since 2008 to 2012





# Spring Gentian AP



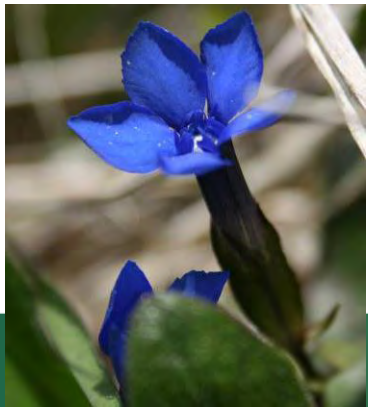
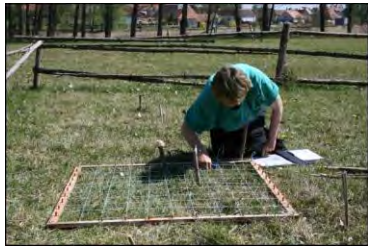
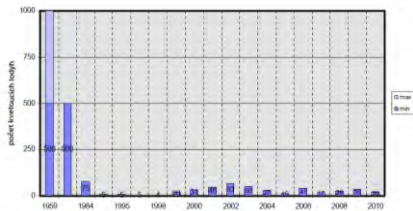
- 1 last locality of lowland form and 1 locality of mountain form
- Seeds were collected and cultivated *ex situ* for research
- all historical localities were checked and judged to possible repatriation

→ **planting adults**

→ **sowing seeds**

- plants were planted in 1999, but till 2004 all plants died, the same had happend in 2009, seed were sown 1999–2005 and in 2008 with the same result
- genotype variability was studied – only 2 origin + 3 foreign genotypes were found. The most similar populations are in Bavaria
- critical size of population was determined – 200 ind., in Rovná max.  
31 ind. was found in last 13 years
- Problem with seed production in natural population

→ **AP was finished** because there was no change to fullfil the goal of AP „re-established generative breeding population from czech plant sources“







## Reintroduction and enforcement of populations ....

- could be a part of an AP but it is **not necessary in all cases**
- **genetic variability analyses** should be done before and its results used not to mix separated conservation units
- has to be **detailed documented** incl. source of individuals, monitoring of effectivity, etc.
- **restoration or improving of the habitats quality is a prerequisite for successful reintroduction**
  
- A list of new candidate species for APs/MPs was prepared by NCA in cooperation with specialists
- TOP plant candidates for new APs: *Adenophora liliifolia*, *Ornithogalum pyrenaicum* ssp. *sphaerocarpum*, *Pulsatilla patens*, *Cirsium brachycephalum* or *Gentianella* sp. div.

# Information sources



- [www.zachranneprogramy.cz](http://www.zachranneprogramy.cz)  
all informations about action and management plans in CZ
- [www.biomonitoring.cz](http://www.biomonitoring.cz)  
monitoring of European priority species, maps of distribution
- <http://portal.nature.cz/c1/rostliny/>  
database of critically endangered plants from Czech Red list, maps of distribution in CZ and Europe
- [www.natura2000.cz](http://www.natura2000.cz)  
information about SCI, SPA
- [www.nature.cz](http://www.nature.cz)  
information about all activities of NCA
- Facebook of Zachranne programy  
aktuality and unformal information about AP/MP
- **email to coordinator**  
**[name.surname@nature.cz](mailto:name.surname@nature.cz)**

Záchranne programy ohrožených druhů

HOME

V České republice se vyskytuje mnoho rostlinných i živočišných druhů, které jsou podle červených seznamů zpracovaných pro **okrajové rostliny**, **bezobratlé** i **obratlovce** ohroženy vyhynutím. Cílem ochrany přírody je zajistit, aby všechny tyto druhy zůstaly součástí naší fauny a flóry. Cesty k dosažení cíle mohou být různé, od pasivní (legislativní) ochrany, přes vymezování chráněných území až po zabezpečování potřebného managementu prostřednictvím dotáčených štulů. Pro některé druhy však tyto nástroje samy o sobě nestačí a je nutné jejich pečlivé sledování a doplnění dalšími typy opatření, včetně například namnožení druhů v zajetí a jejich opětovného vypuštění (vysazení) do přírody. Pro tyto druhy se připravují záchranne programy. Záchranne programy zaměřené na zachování ohrožených druhů jsou velmi oblíbeným nástrojem, stále častěji používaným u nás i v zahraničí. Jeho využití však limituje značná finanční, organizační a personální náročnost záchranne programů a také další důvody. Příprava a realizace programu pro konkrétní druh má smysl pouze po splnění mnoha konkrétních podmínek formulovaných Stálým výborem Bernské úmluvy a Mezinárodním svazem ochrany přírody – IUCN (v angličtině dostupné [zde](#)). Zanedbání těchto pravidel má většinou za následek neúspěšný výsledek programu.

Záchranne programy ohrožených druhů

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AKTUALITY

X. sjezd České botanické společnosti



# Thank you for attention

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