AGENTURA OCHRANY PŘÍRODY A KRAJINY ČESKÉ REPUBLIKY

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CHRÁNĚNÁ KRAJINNÁ OBLAST ČESKÉ STŘEDOHOŘÍ

Dry grassland SCIs in SW part of PLA České středohoří - planned restoration, management, vegetation monitoring - past and future

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NATURA 2000

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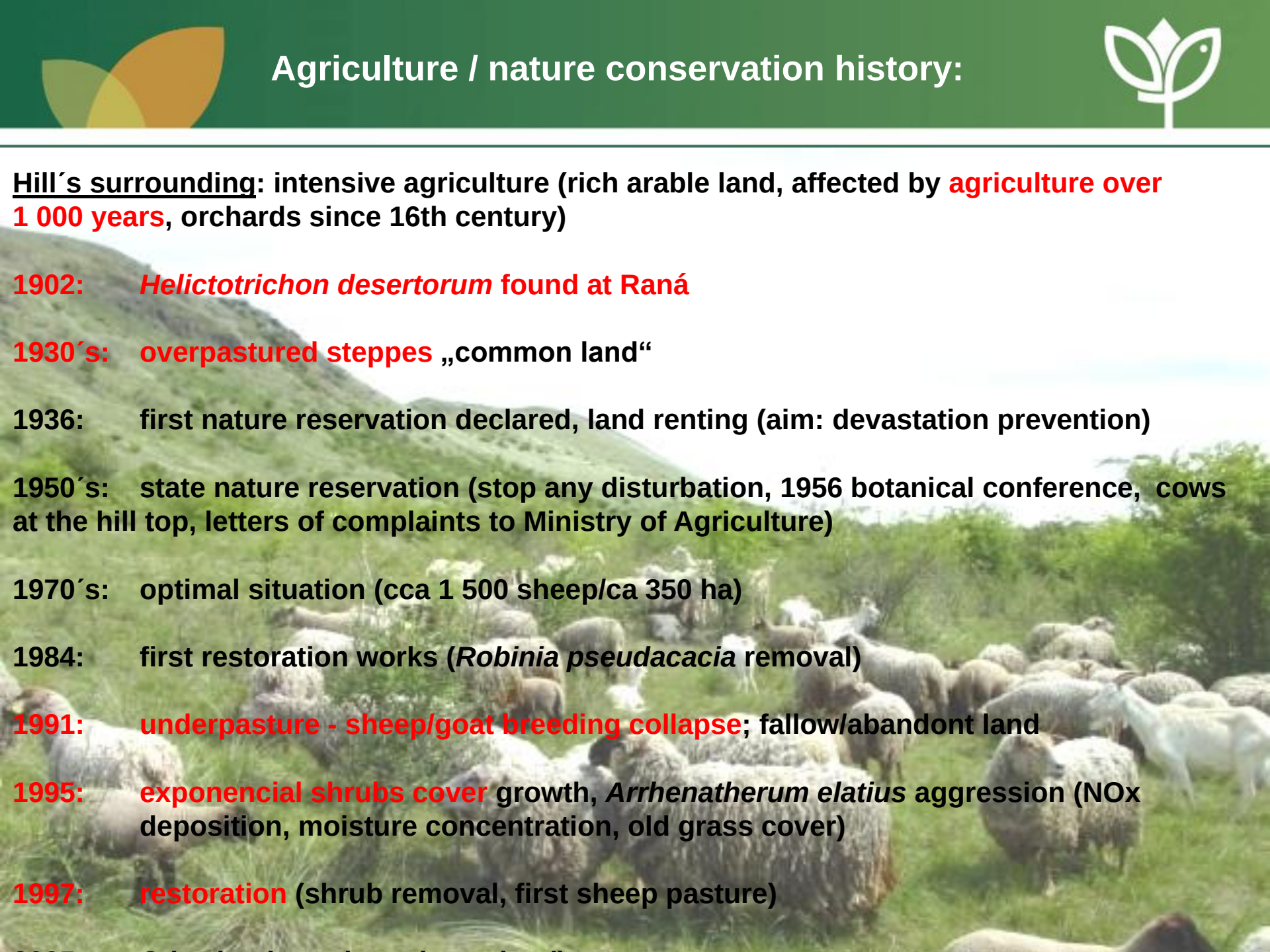
Main N2000 habitats
SCI Oblík, SCI Raná

6210 Festuco-Brometea
6110* Alysso-Sedion albi (round basalt rocks)

Brometalia erecti
marlite – marl soils, subpanonic species

Stipo - Festucetalia
basalts - ranker soils, continental species

Agriculture / nature conservation history:



Hill´s surrounding: intensive agriculture (rich arable land, affected by agriculture over 1 000 years, orchards since 16th century)

1902: *Helictotrichon desertorum* found at Raná

1930´s: overpastured steppes „common land“

1936: first nature reservation declared, land renting (aim: devastation prevention)

1950´s: state nature reservation (stop any disturbation, 1956 botanical conference, cows at the hill top, letters of complaints to Ministry of Agriculture)

1970´s: optimal situation (cca 1 500 sheep/ca 350 ha)

1984: first restoration works (*Robinia pseudacacia* removal)

1991: underpasture - sheep/goat breeding collapse; fallow/abandont land

1995: exponencial shrubs cover growth, *Arrhenatherum elatius* aggression (NOx deposition, moisture concentration, old grass cover)

1997: restoration (shrub removal, first sheep pasture)

Target dry grasslands species

Czech Red Book: over 80 species (cathegories CE, EM, VU) influenced by site restoration

Ex.: *Helictotrichon desertorum* subsp. *basalticum*, *Marrubium vulgare, Astragalus exscapus, A. austriacus, A. danicus, Pulsatilla pratensis, Adonis vernalis, Viola ambigua, Verbascum phoeniceum, Anthericum liliago, Thalictrum foetidum, Aurinia saxatilis, Plantago maritima, Triglochin palustre, Glaucium corniculatum, Erysimum repandum, Sclerochloa dura…..*

7 of all 9 CZ *Stipa* species:

in order from most „xerothermic“ to more moisture „tolerant“:

*Stipa dasyphylla, S. capillata, S. smirnovii, S. zalesskii** Natura 2000, *S. pennata, S. pulcherrima* (with endemitic form *S. p.* f. *nudicostata* at Raná hill), *S. tirsa*

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SCI Oblík, comparism 1950´s / 2012

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LIFE project localities „Lounské středohoří (SCIs and stepping stones)

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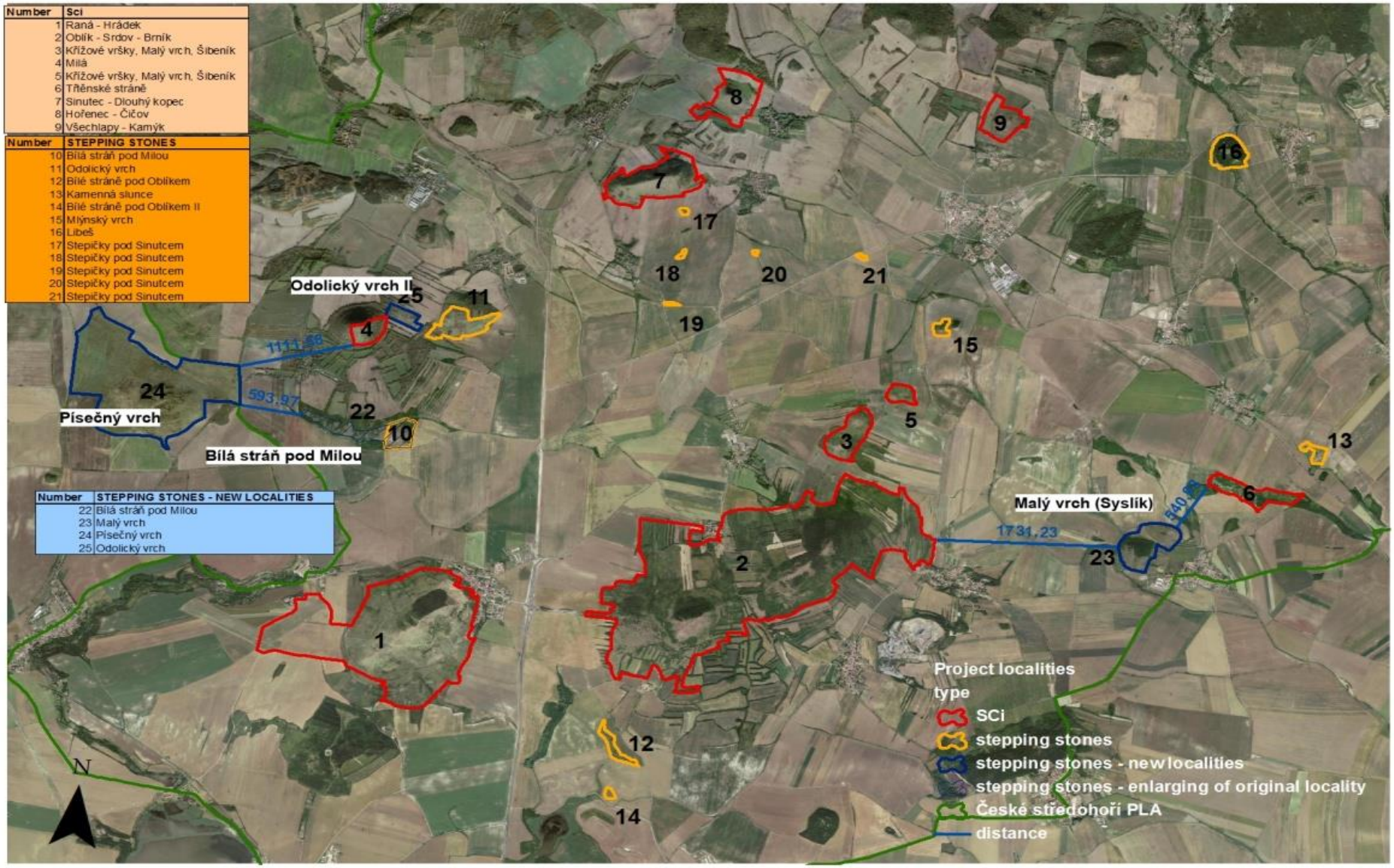


LIFE09 NAT/CZ/000363

„Lounské Středohoří Steppe“ (Active protection of the SCIs with thermophilous habitat types and species in Lounské Středohoří hills)

LIFE PROJECT COST:	**1 395 196 €**
MANAGEMENT COST:	**1 000 040 €**
COFINANCING NCA CZ:	**50 %**
REALIZATION:	**1.1.2011 - 31.3.2017**
FORM OF REALISATION:	**AGREEMENTS/OWNERS, CONTRACTS, ELECTRONIC COMPETITION**
PRICES:	**MAX. PRICES GIVEN BY MOE STANDARDISED CATALOGUE**

Accomplished:

Managements realized:	320 ha (planned 250 ha)
Bush/trees removal (repeated 1 - 6x):	225 ha
Grazing -sheep/goats (repeated 1 - 6x):	220 ha
Old fruit varieties orchards reconstruction:	23 ha
Invasive trees removal (repeated 2 - 6x):	14 ha
Special *Onobrychis* field (butterfly protection):	2 ha
Land purchase (beneficiary - NCA CZ):	15 ha

….gentle mechanical restoration ☺ …

sheep / goats pasture with dogs

(localities with no pasture – fenced)

Monitoring of restoration changes (methodology NCA CZ)

Vegetation changes - fixed sites:

1) fixed phytosociological releves: 5 x 5 m, min. 1 releve/site with management pressure, max, 4 releves/site (2 mngmt + 2 control releves) at selected sites

? transects: no (confusion of management mix)

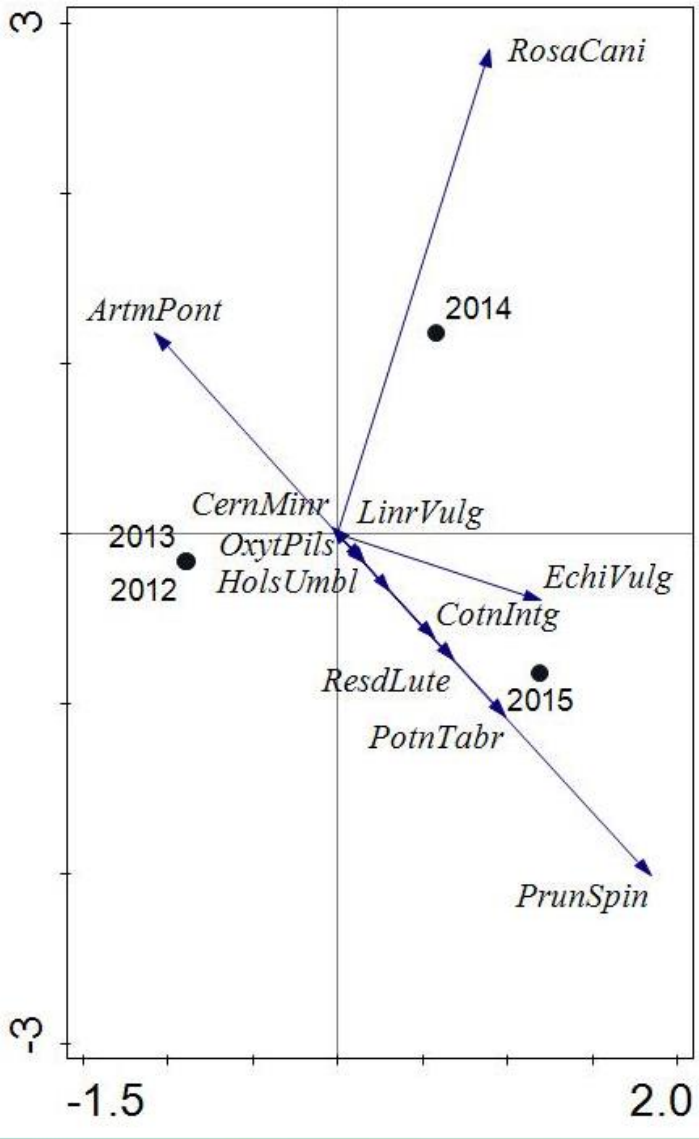
2) visible changes, shifts of abundance: „C“ species (cca 30), 100 x 100 m

Ex.: phytosociological releve, Raná hill (with management)

Species	2011 %	2012 %	2013 %	2014 %	2015 %	2016 %	Remark
Festuca rupicola	4,5	3,4	3	3	2	1	
Agrimonia eupatoria	2	1,9	0,5	1,3	0,5	0,5	Inclination (stup.): 3
Festuca valesiaca	0	0	0	1,5	1,5	0,7	
Achillea collina	0,3	0,25	0,1	0	0	0	Orientation: SW
Filipendula vulgaris	0	0	0	0,1	0,1	0,05	Management: with
Achillea pannonica	1,5	1,25	1	0,3	0,5	0,5	mangementem
Fragaria vesca	0,8	0,5	0,5	0	0	0	
Artemisia pontica	0	0	0	0,8	1,3	1,3	
Fragaria viridis	0,1	0	0	1,8	1,2	1	
Astragalus austriacus	0,8	0	0	6	6	7	
Helictotrichon desertorum	1,7	2,6	2,2	8	4	7	
Astragalus excapus	0,9	1,3	0,7	0,9	1	1,5	
Holosteum umbellatum	0	0	0	0	0,01	0,02	
Botriochloa ischaemum	1,6	1,5	0,9	0	0	0	
Linum tenuifolium	0	0	0	0	0,25	0,25	
Brachypodium pinnatum	1,5	1,2	2	2	1,2	0,5	
Lotus corniculatus	0,1	0	0	0,05	0,05	0	
Bromus erectus	0,7	0,32	0,9	0,2	0,9	0,5	
Origanum vulgare	0,1	0,19	0,9	0,2	0,5	0,3	
Potentilla tabernaemontanii	0,1	3,4	3	0	0,1	0,1	
Carex humilis	1	1	1	0	0	0	
Carex praecox	0,1	0	0	1,5	0,3	0,2	
Reseda lutea	0,5	0	0	0,2	0	0	
Centaurea stoebe	0,1	1,0	0	0	0,00	0	
Rosa canina	1,6	1,3	0,9	0	0	0	
Cirsium acaule	1	0,8	1	0,8	0,3	0,2	
Cirsium oleraceum	1,5	0,9	1	0	0	0	
Sanguisorba minor	0	0	0	0,3	0,2	0,2	
Convolvulus arvensis	0,6	0,3	0,5	0	0	0	
Crataegus monogyna	7	2,5	0	0	0	0,01	
Scabiosa ochroleuca	1,5	1,3	1,5	0,2	0,2	0,2	
Cichorium intybus	0	0	0	0,6	0,8	0,8	
Echinops sphaerocephallus	0,1	0	0	0,1	0,05	0	
Stipa capillata	1	1,4	1	0,5	0,3	0,6	
Echium vulgare	0,5	0,11	0,1	0	0,1	0	
Stipa pennata	0	0	0	5	3	4,5	
Eryngium campestre	1,8	2,1	2,5	3	1,5	1,2	
Stipa pulcherrima	3	3	3	3	3	4	
Teucrium chamaedrys	0,9	0,3	0,3	0	0,1	0,05	
Thymus praecox	0,9	0,9	1	3	1,4	1,5	
Euphorbia cyparissias	0,9	0,7	0,4	0,2	0,2	0,1	
Coverage	49,9	38,08	30,4	46,75	35,6	38,88	

Older releves: problematic change from 7 degree to the decimal system

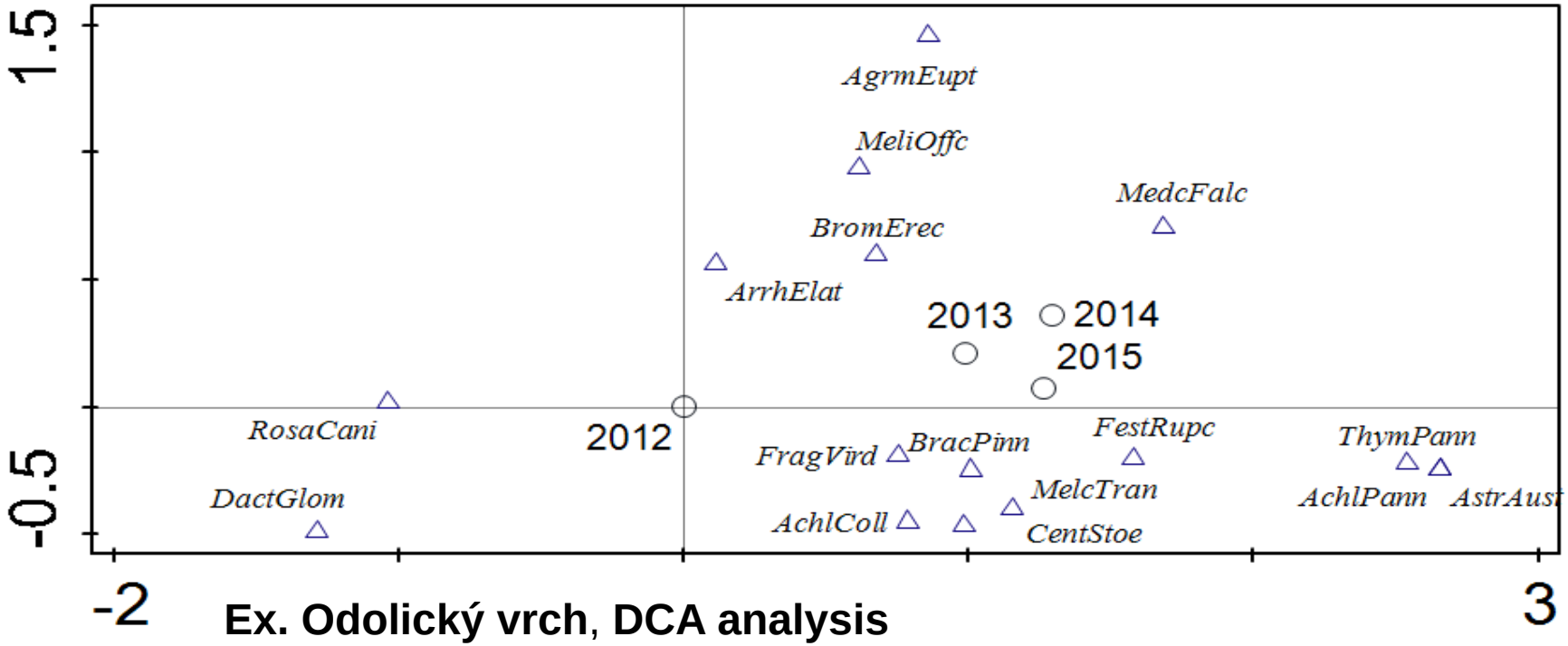
Statistics:
SCI Křížové vršky, site 4D, without management, PCA



PCA analysis (principal component analysis), low data dispersion case

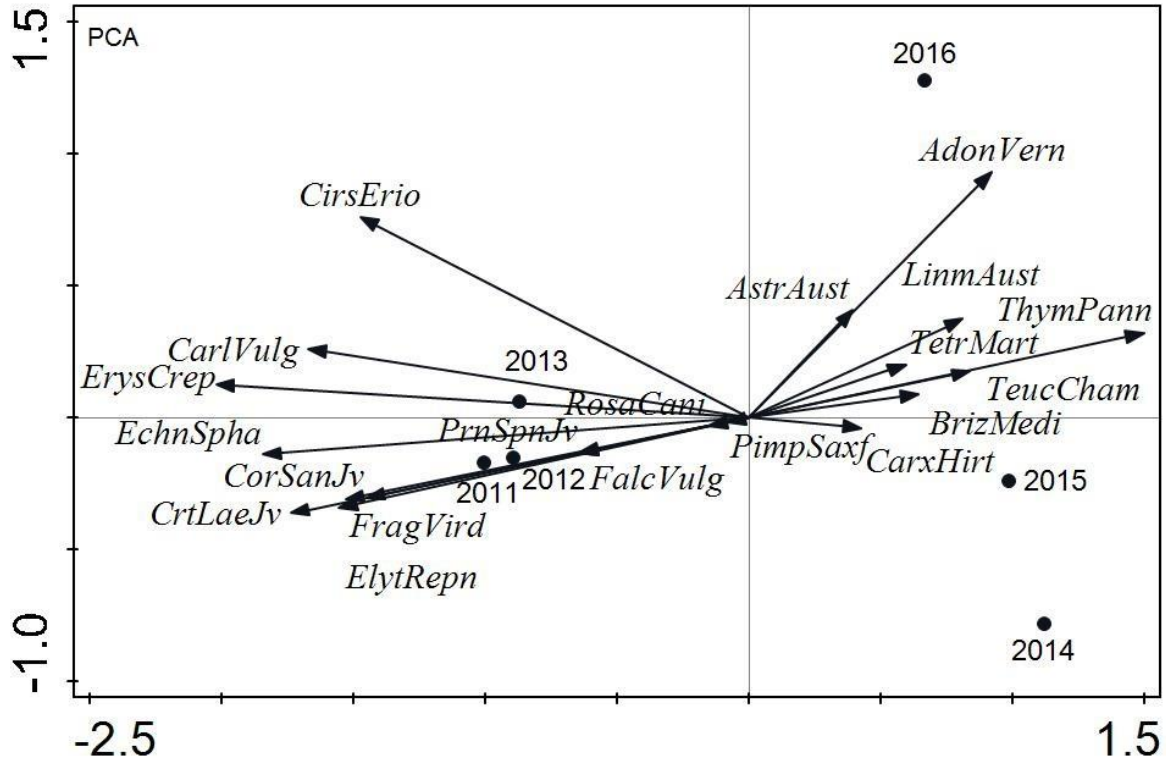
result: spread of *Prunus spinosa* + weeds (*Echium vulgare*)

Statistics:
ex. Odolický vrch, with management, DCA



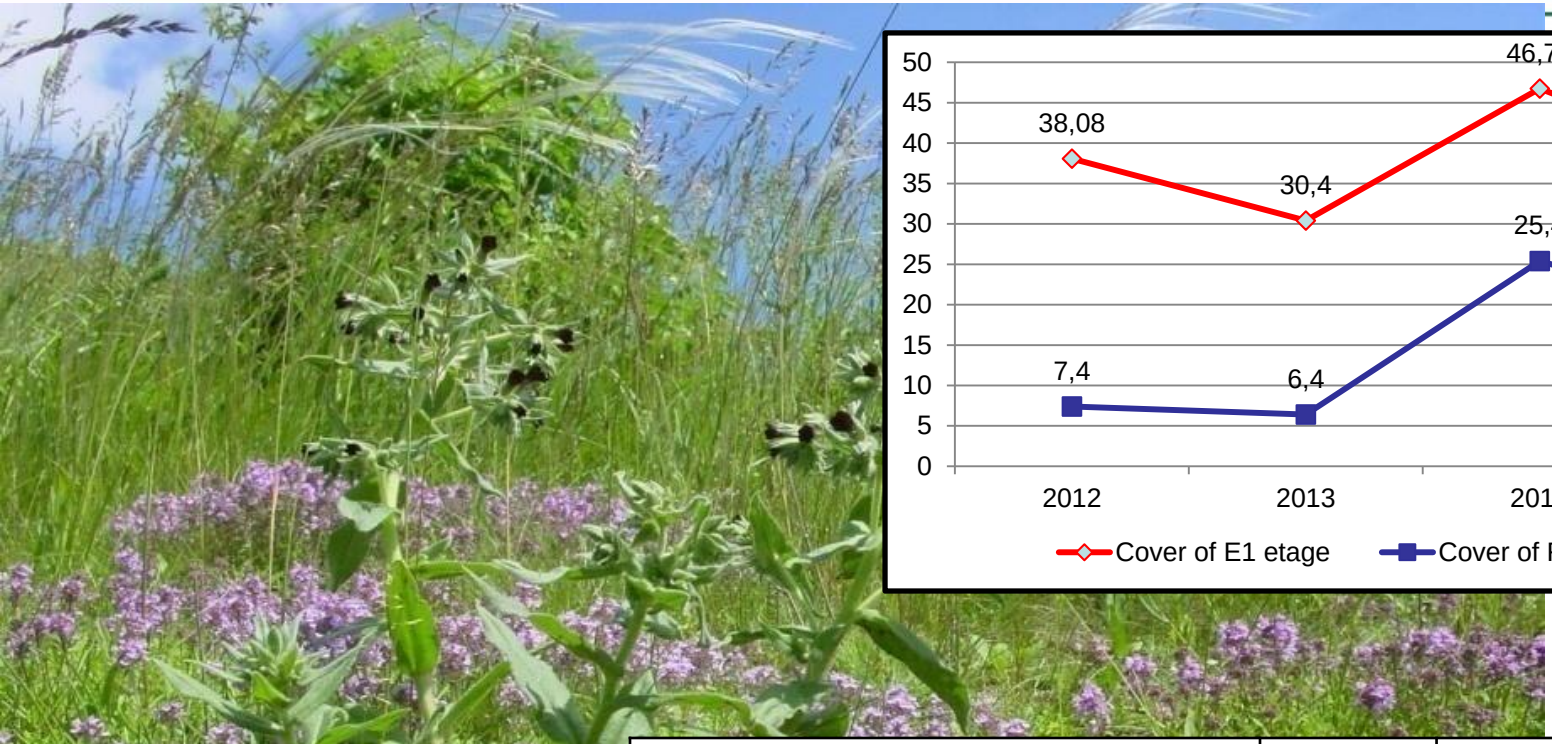
Ex. Odolický vrch, DCA analysis

Statistics:
ex. Oblík hill, site 1, with management, PCA



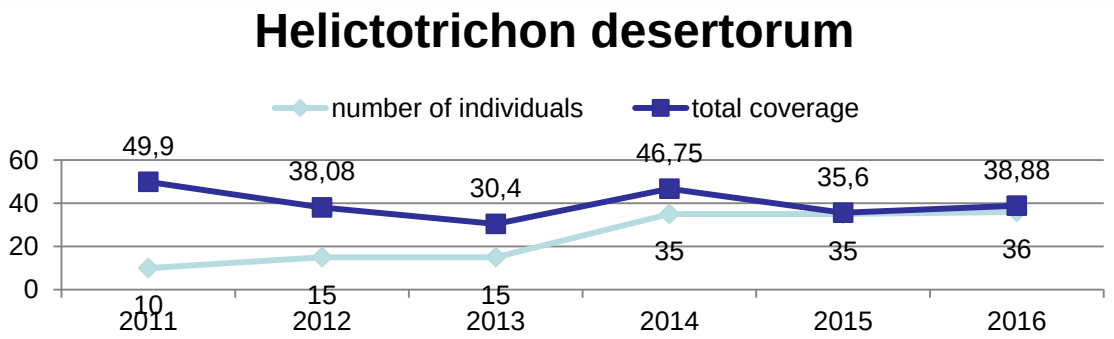
PCA analysis Oblík (2011 - 2016), shifts of species representation. Bushes, mesophilic and synantropic species (ex. *Cornus sanguinea, Prunus spinosa, Crataegus laevigata, Fragaria viridis, Echinops sphaerocephalus, Cirsium eriophorum*) in 2011/2013 are after extensive sheep pasture gradually replaced by charakteristic xerothermic/steppe species (ex. *Adonis vernalis, Astragalus austriacus, Linum austriacum, Teucrium chamaedrys, Thymus pannonicus*)

Overall dominance/cover vs. aim rare species dominance/cover, site Raná



Raná, dominance/cover of selected RB species	year	year	year	year
site with management	2012	2013	2014	2015
Helictorichon desertorum	2,6	2,2	8	4
Astragalus austriacus	0	0	6	6
Astragalus exscapus	1,3	0,7	0,9	1
Stipa capillata	1,4	1	0,5	0,3
Stipa pennata	0	0	5	3
Stipa pulcherrima	2,1	2,5	5	3
Dominace/Cover of E1 etage	38,08	30,4	46,75	35,6
Dominance/Cover of RB species etage	7,4	6,4	25,4	17,3

Helictotrichon desertorum - westernmost distribution border



Raná, comparison of abundance of *Helictotrichon desertorum* with overall dominance in phytosociological releve with management (sheep pasture). High abundance is reached by overall dominance of cca 40%

HD found 1902 at Raná, western distribution border of the species, EU localities: CZ (6): 5 (ČS), + 1 (Pálava); AT (1) Hundsheimer Berg (Hainburg/Donau), LIFE project inspiration

Aim rare species abundance changes in phytosiological releve, ex. Oblík

Species	2011	2012	2013	2014	2015	2016
Adonis vernalis	18	20	20	25	28	37
Astragalus austriacus	0	0	0	2	4	6
Astragalus danicus	10	10	8	10	10	12
Stipa pennata	30	26	26	13	17	18

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N2000 species monitoring: *Stipa zalesskii** (SCI Oblík-Srdov-Brník)

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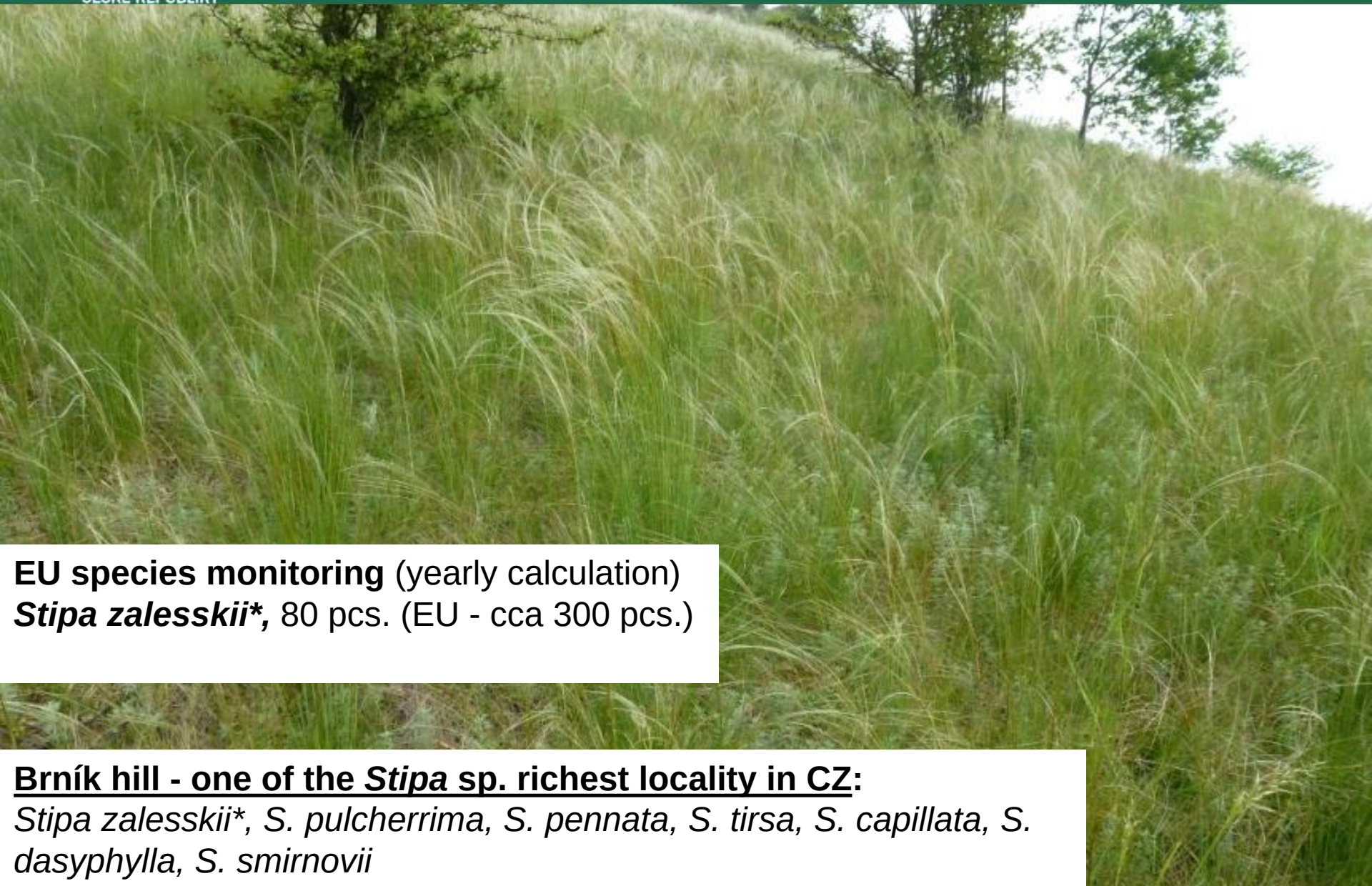
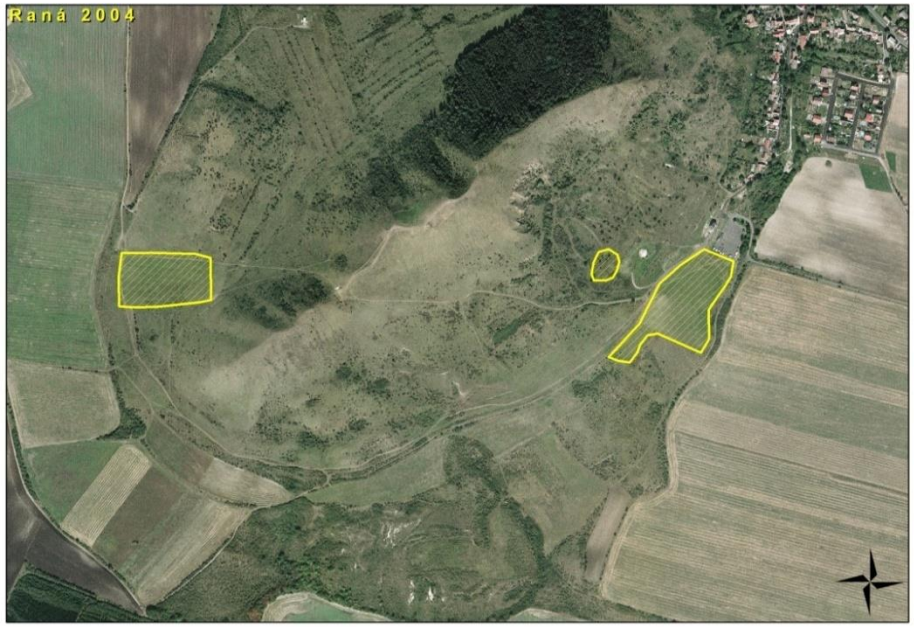
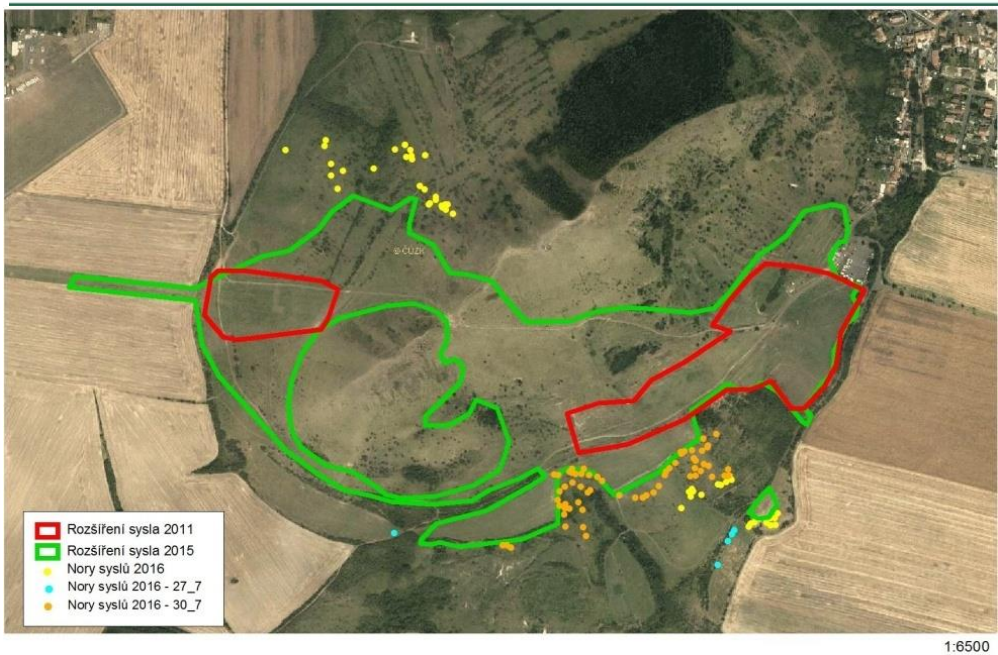


EU species monitoring (yearly calculation)
Stipa zalesskii*, 80 pcs. (EU - cca 300 pcs.)

<u>Brník hill - one of the *Stipa* sp. richest locality in CZ</u>:
Stipa zalesskii, S. pulcherrima, S. pennata, S. tirsa, S. capillata, S. dasyphylla, S. smirnovii*

N2000 species monitoring: suslik - ground squirrel (SCI Raná)

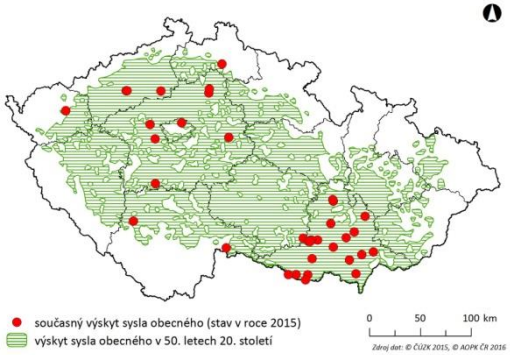




2004 (cca 100 animals)

2016 (500 animals)

<u>polygons</u>: colonies; <u>points</u>:



1945/1952: in 6 local communities 5 083 animals/year caught

Overall vegetation changes *Arrhenatherum growths* - *Bromion* after extenive type of pasture, Ex.: Mlýnský vrch by Libčeves

South oriented slopes, shifting distribution „border“ influeuenced by pasture pressure *Bromus erectus* vs. agressive *Arrhenatherum elatius*

Vegetation changes after more intenzivnější pastvě
Arrhentherum - Bromion – Festucion,
SAC Číčov

<u>After intensive pasture:</u>
6210 *Festuco-Brometea* reduction,
6110* Rupiculous calcareous basophilis grasslands of the *Alysso-Sedion albi* increase
(Arrhenatherum elatius growths - out, today „*Thymus* steppe“ (*T. praecox*, *T. pannonicus)*, increased abundance of *Astragalus austriacus, Artemisia pontica, Stipa capillata, ! newly* ***S. tirsa,*** *slow* retreat of *Bromus erectus*

<u>after 40 years rediscovered:</u>
Stipa pennata +
Astragalus danicus

change positively accepted by locals

? Does optimal pasture pressure exist ?
Stipa tirsa progression at Oblík hill´s base
„succession stop/slowdown“ (shrub removal, sheep/goats pasture)

Shrub removal (3 yrs.) + pasture (4 yrs.) :
from *Rosa canina, Prunus spinosa*
via *Arrhenatherum elatius*
to *Stipa tirsa* + *Vincetoxicum hirundinaria*

… and reverse: regression of *Stipa tirsa* and progression of shrubs after pasture pressure reduction…

Thank you for your attention !

„…Damn, when´ll finally scientists invent the instant hay…“

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