



Developing the national crop wild relative *in situ* conservation strategy for Lithuania

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Aims of the work

- To develop a comprehensive national crop wild relative *in situ* conservation strategy for Lithuania
- To contribute to the development of the regional CWR conservation strategies (Baltic, European)

Country's profile

REPUBLIC OF LITHUANIA
LIETUVOS RESPUBLIKA

Area: 65,300 sq. km
(17th within EU)

Population: 2,944,459
(22nd within EU)

GDP: \$49.308 billion

Climate: Transitional between
maritime and continental

Vegetation zone: Transitional
between coniferous and
broadleaved forests



Cited from: <http://en.wikipedia.org/wiki/Lithuania>

Methods and tasks

- Analysis of foreign sources
- Compilation of checklists
- Prioritization of CWR
- Mapping of CWR
- Gap analysis

Analysis of foreign sources

- United Kingdom
 - Maxted et al., 2007. Creation and use of a national inventory of crop wild relatives
- Portugal
 - Brehm et al., 2010. New approaches for establishing conservation priorities for socio-economically important plant species
 - Brehm et al., 2008. National inventories of crop wild relatives and wild harvested plants: case-study for Portugal
- Finland
 - Fitzgerald, 2013. The National Crop Wild Relative Strategy Report for Finland
- Norway
 - Norwegian Crop Wild Relative *in situ* conservation strategy (unpublished)
- Cyprus
 - Phillips et al., 2014. Development of a national crop wild relative conservation strategy for Cyprus
- United States
 - Khoury et al., 2013. An Inventory of Crop Wild Relatives of the United States

Compilation of checklists

- Checklist of CWR and wild harvested plants
 - Red Data Book of Lithuania, Rašomavičius et al., 2007, 800 p.
 - Vascular Plants of Lithuania, Gudžinskas, 1999, 212 p.
 - Dictionary of Plant Names, Jankevičienė, 1998, 524 p.
 - Flora of the Baltic Countries, 1993–2003, 1–3 volumes.
 - Flora of Lithuania, 1959-1980, 1–6 volumes.
- Priority checklist of CWR and wild harvested plants (WHP)
 - PGR Forum Crop Wild Relative Information System (CWRIS)
 - Databases of the Institute of Botany, Nature Research Centre
- Checklist of potential areas of CWR and WHP
 - Databases of the Institute of Botany, Nature Research Centre
 - Database of Forest Survey Service (indicates land owner)

Prioritization of CWR

- Prioritization of CWR was based on:
 - socioeconomic value
 - size and abundance of populations
 - redlist status
 - cultivation / breeding data
 - known cultivars
- Data focus with priority CWR:
 - distribution
 - genetic diversity / proxies
 - utilization

Mapping of CWR

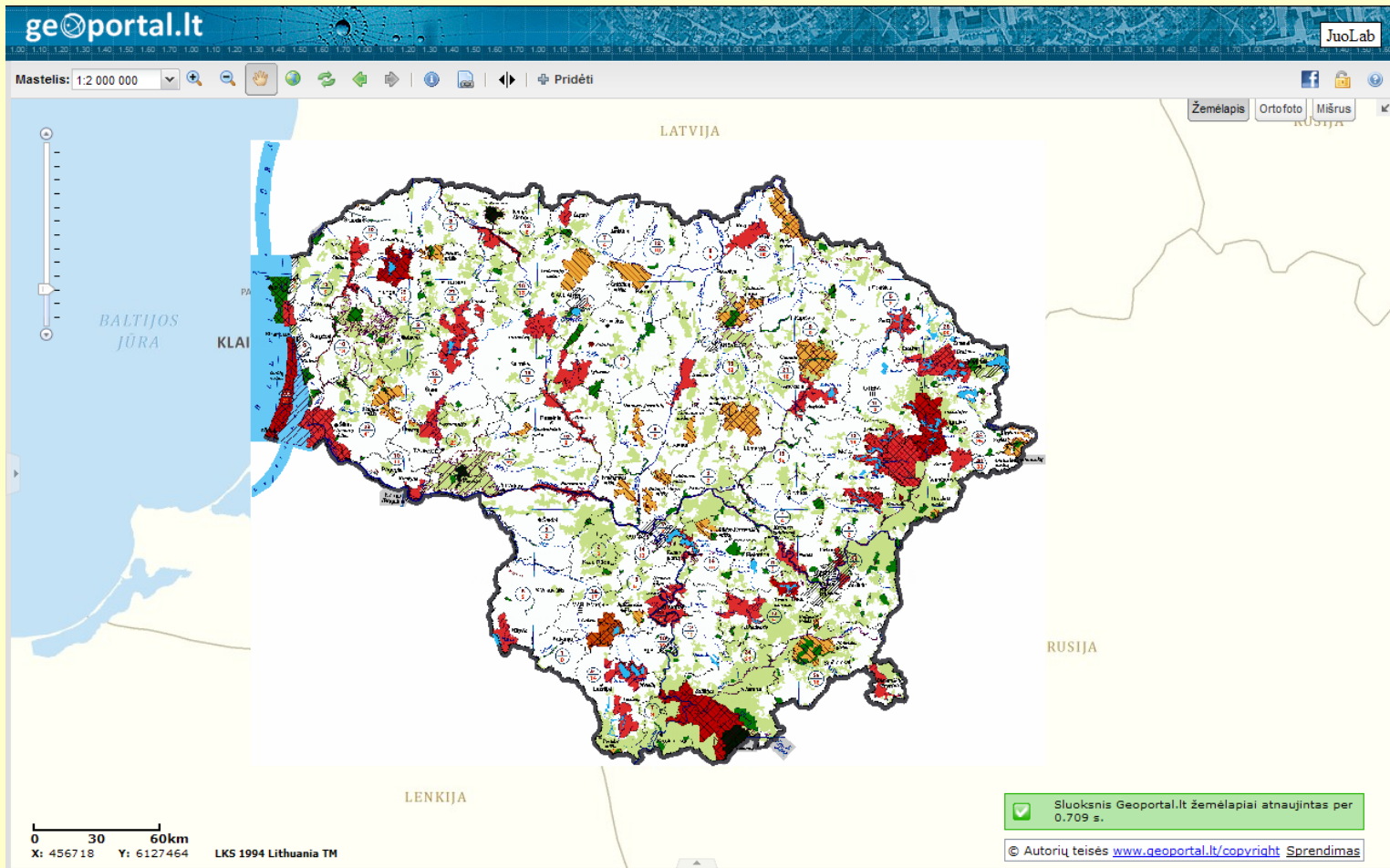
- Mapping of priority CWR with Quantum GIS and:
 - GIS layers from State Service for Protected Areas;
 - Web map service from Geographic Information Portal of Lithuania (www.geoportal.lt)
- Establishing distribution of priority CWR in- and outside protected areas
- Matching the distribution of CWR with natural regions (botanical-geographic, climatic , etc.)
- Establishing hotspots of CWR for conservation action plans

National Atlas of Lithuania

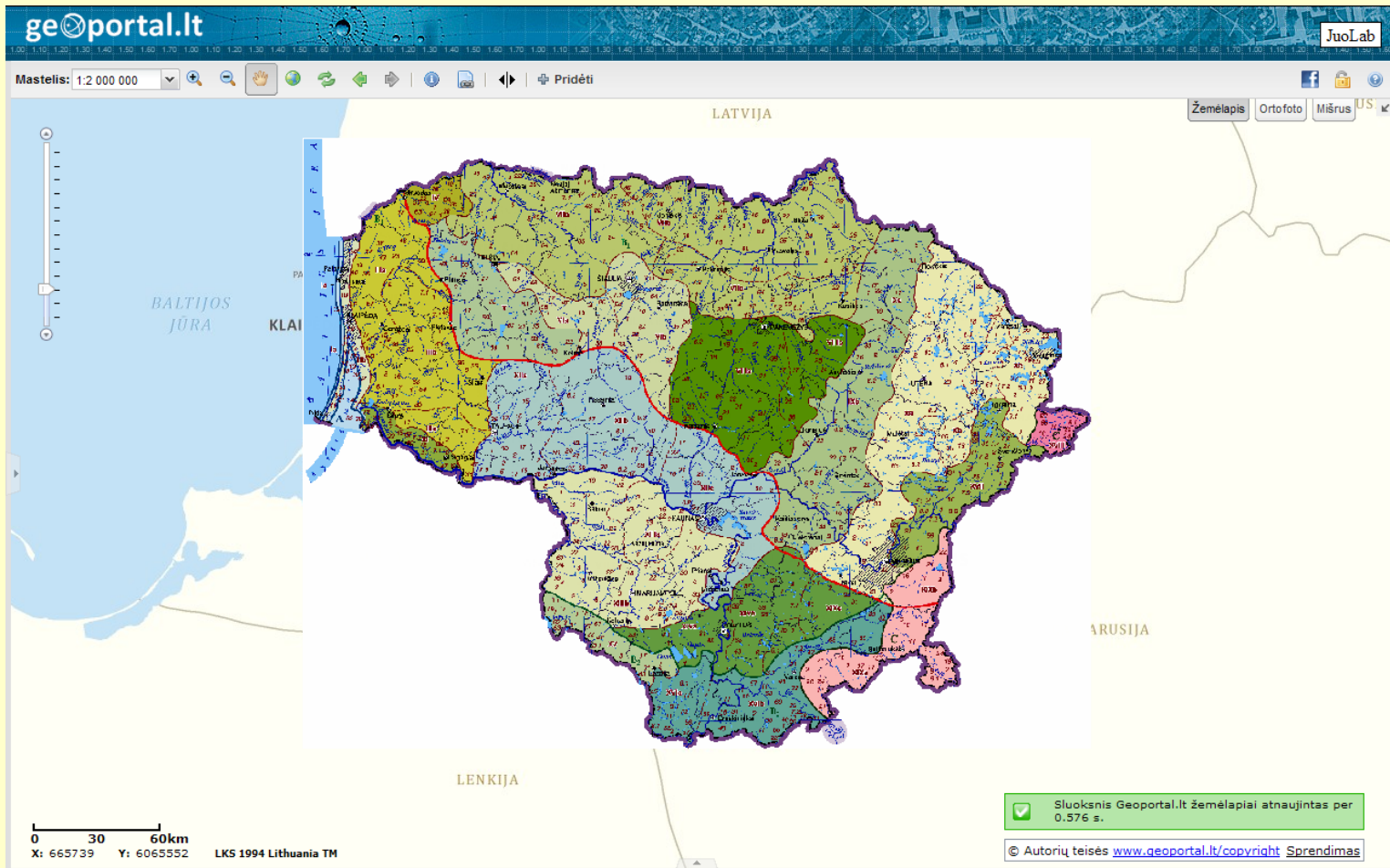
(WMS provided by www.geoportal.lt)

- Map of protected areas
- Botanical-geographic map
- Biogeographic map
- Map of climatic regions
- Map of geomorphological regions
- Natural meadows and pastures
- General vegetation map

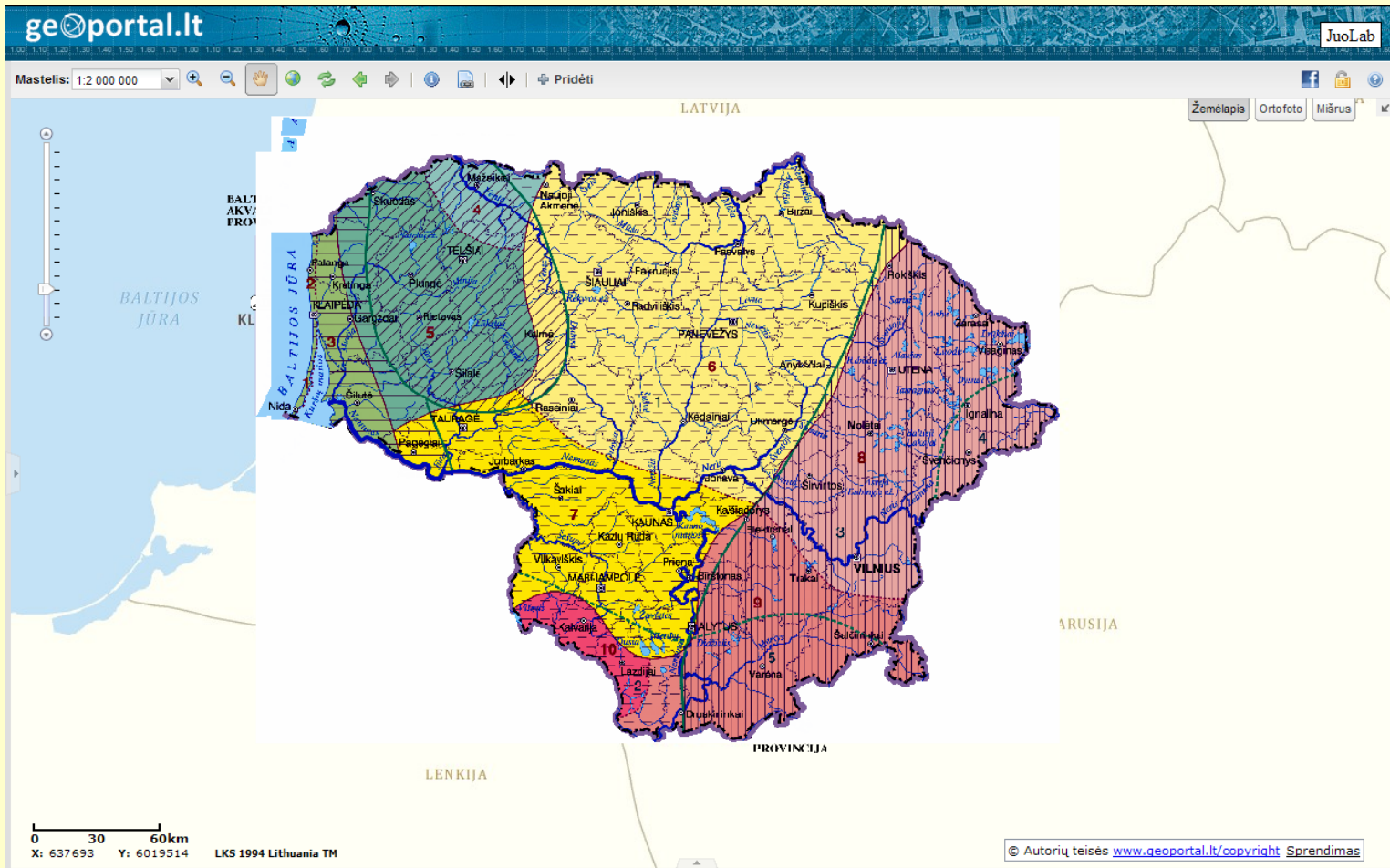
Map of protected areas



Botanical-geographic map



Map of climatic regions



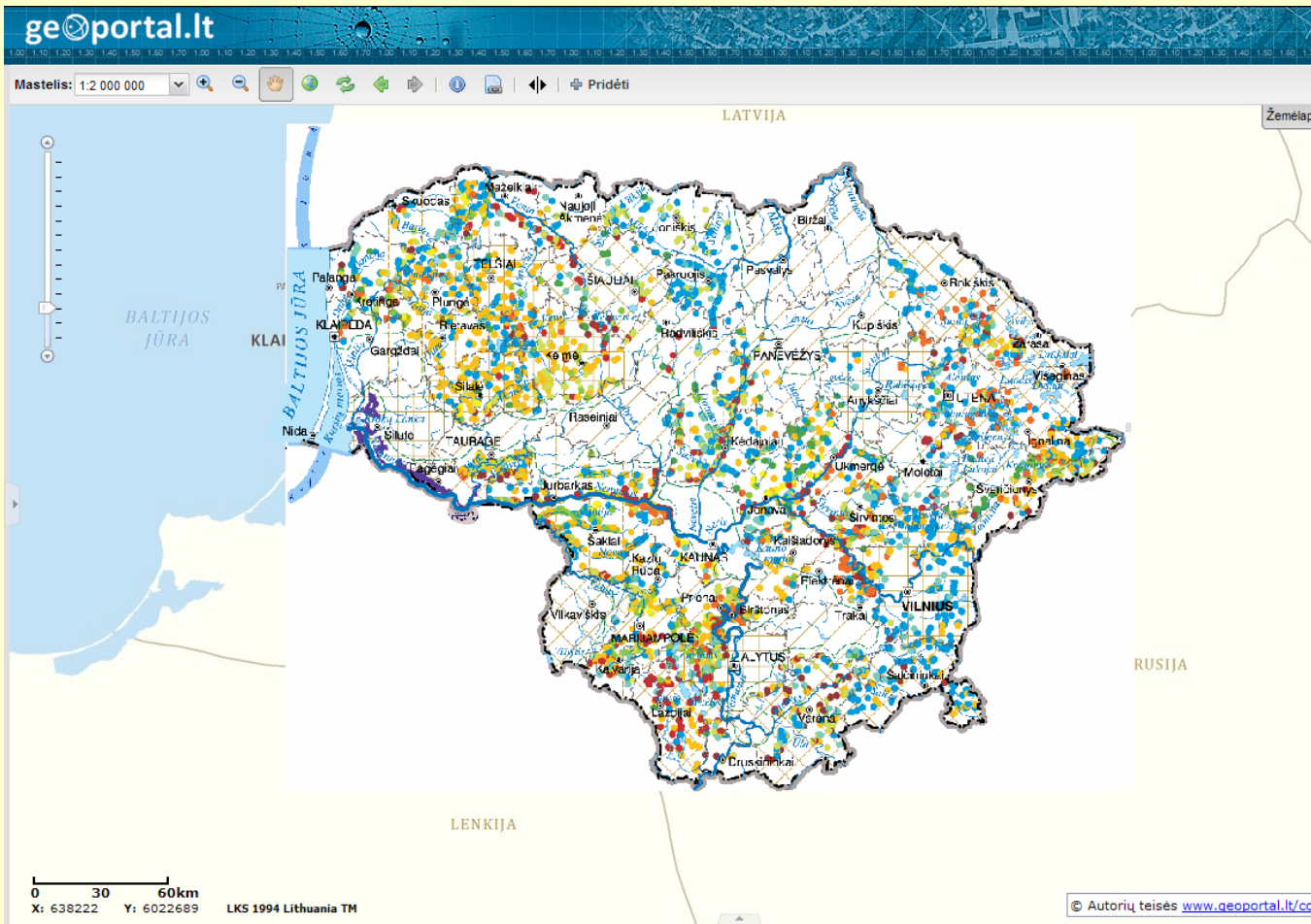
Natural meadows and pastures

NATŪRALIOS PIEVOS IR GANYKLO

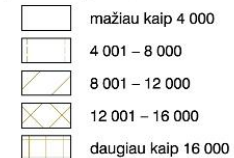
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Vyraujančios pievos

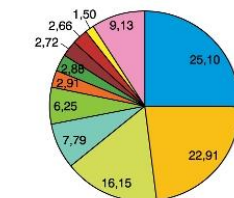
- Smėlynų pievos (Plantagini-Festucion ovinae)
- Stepinės pievos (Bromion erecti)
- Mezofilinės pamiškių pievos (Trifolion medii)
- Dirvonų pievos (Cynosurion cristati)
- Pavėsingų pamiškių bendrijos (Aegopodion podagrariae)
- Tikrosios pievos (Arrhenatherion elatioris)
- Pašiaušėlynai (Alopecurion pratensis)
- Melvenynai (Molinion caeruleae)
- Stambieji viksvynai (Magnocaricion elatae)
- Puriėnynai (Calthion palustris)
- Nemuno žemupio užliejamos pievos
- Nėra rūšinės sudėties duomenų



Pievy ir natūralių ganyklų pasiskirstymas, ha

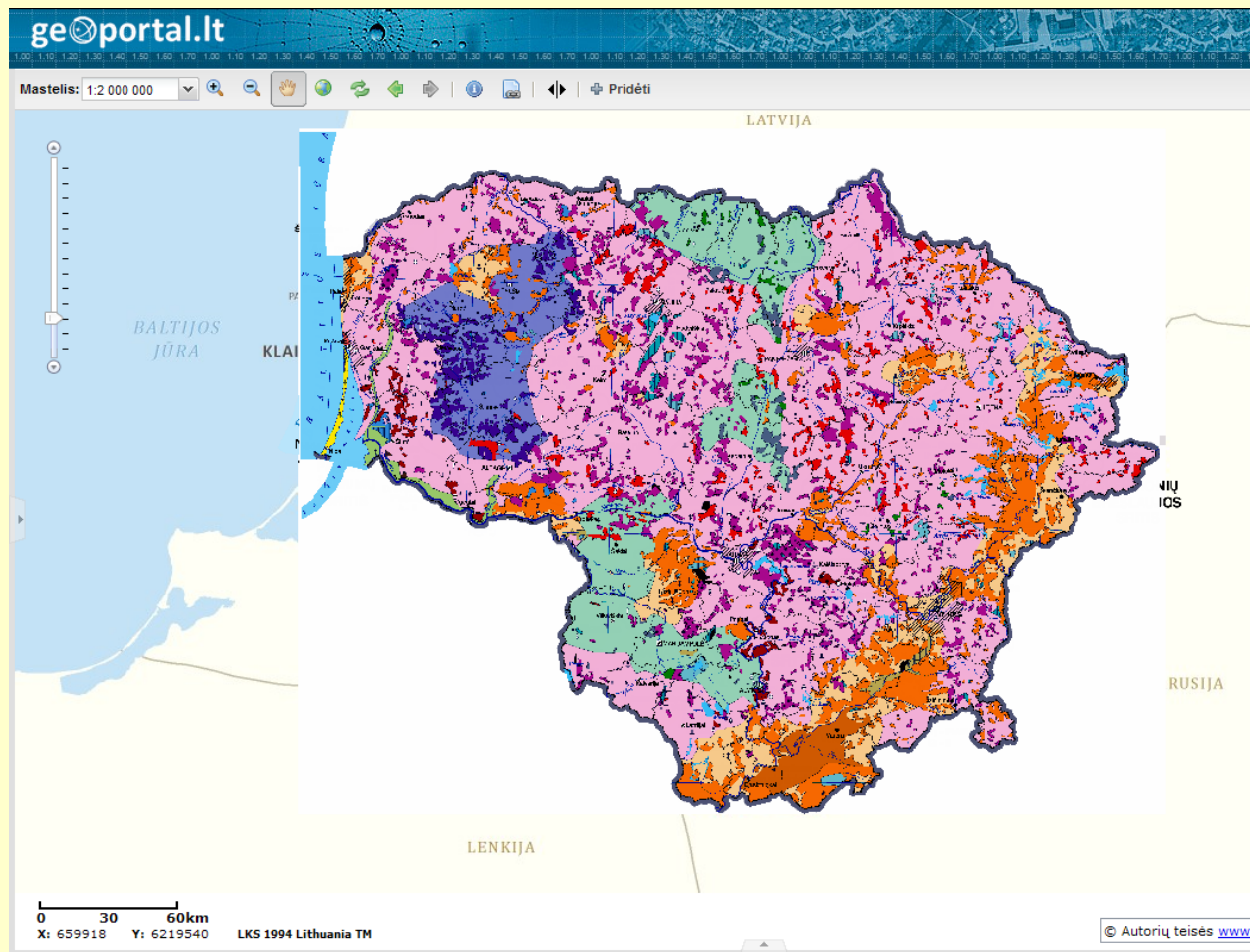


Vyraujančių pievų pasiskirstymas, %



- Smėlynų pievos (Plantagini-Festucion ovinae)
- Stepinės pievos (Bromion erecti)
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- Puriėnynai (Calthion palustris)
- Kitos pievos

General vegetation map



BENDRASIS AUGALIJOS ŽEMĖLAPIS 1:1 000 000

Miškai

- vakarų taigos krūmokšniniai eglynai (*Picea abies*)
- plačialapiai-eglynai (*Picea abies*, *Quercus robur*, *Fraxinus excelsior*) ir eglynai (*Picea abies*) su plačialapių miškų elementais
- minkštieji lapuočiai (*Betula pendula*, *Populus tremula*) eglynų ir plačialapių eglynų vietose
- žaliasamaniai pušynai (*Pinus sylvestris*), dažnai su eglių priemaiša
- kerpiniai krūmokšniniai pušynai (*Pinus sylvestris*)
- termofiliniai kerpiniai pušynai (*Pinus sylvestris*)
- žaliasamaniai pušynai (*Pinus sylvestris*) su plačialapių pušynų fragmentais
- minkštieji lapuočiai (*Betula pendula*) pušynų vietose
- plačialapiai (*Quercus robur*, *Fraxinus excelsior*, *Tilia cordata*)
- minkštieji lapuočiai (*Populus tremula*, *Alnus incana*, *Betula pendula*) plačialapių miškų vietose
- juodalksnynai (*Alnus glutinosa*)
- su paprastuoju skroblo (*Carpinus betulus*) priemaiša

Pajūrio smėlynų augalija

- sutvirtintų pajūrio smėlynų bendrijos (*Pinus mugo*, *Pinus sylvestris*, *Betula pendula*, *Festuca arenaria*)

Piešvos

- užliejamos (salpinės)
- žemuminės
- sausuminės

Pelkės

- vakarinio tipo aukštapelkės (*Sphagnum rubellum*)
- rytinio tipo aukštapelkės (*Sphagnum magellanicum*)
- tarpinio tipo
- žemapelkės
- pakitusios dėl ūkinės žmogaus veiklos

Žemės ūkio naudos

- eglynų ir žemapelkių vietose
- plačialapių ir nemoralinių-žolinių eglynų vietose
- pušynų vietose
- plačialapių miškų vietose
- užpelkėjusių alkšnynų ir pelkinių pievų vietose

Atskiros medžių rūšys

- bekotis ažuolas (*Quercus petraea*)
- paprastasis ažuolas (*Quercus robur*)
- paprastasis skroblas (*Carpinus betulus*)

Introdukuotos rūšys

- šiaurinis ažuolas (*Quercus borealis*)
- bankso pušis (*Pinus banksiana*)
- juodoji pušis (*Pinus nigra*)
- kalninė pušis (*Pinus mugo*)
- kedrinė pušis (*Pinus cembra*)
- veimutinė pušis (*Pinus strobus*)
- europinis maumedis (*Larix decidua*)
- sibirinis maumedis (*Larix sibirica*)
- sukačiovo maumedis (*Larix sukaczewii*)
- europinis kėnis (*Abies alba*)
- didžioji pocūgė (*Pseudotsuga menziesii*)
- graikinis riešutmedis (*Juglans regia*)
- paprastasis bukas (*Fagus sylvatica*)

Gap analysis

- For gap analysis the checklists of CWR were assessed and compared with those:
 - conserved *ex situ* by Plant Gene Bank (seeds) and other institutions (field collections);
 - used by breeding programmes (forage species);
 - covered by Red Data Book of Lithuania and IUCN;
 - covered by related projects (Inventory of Natural Meadows, EU Priority Habitat Inventory);

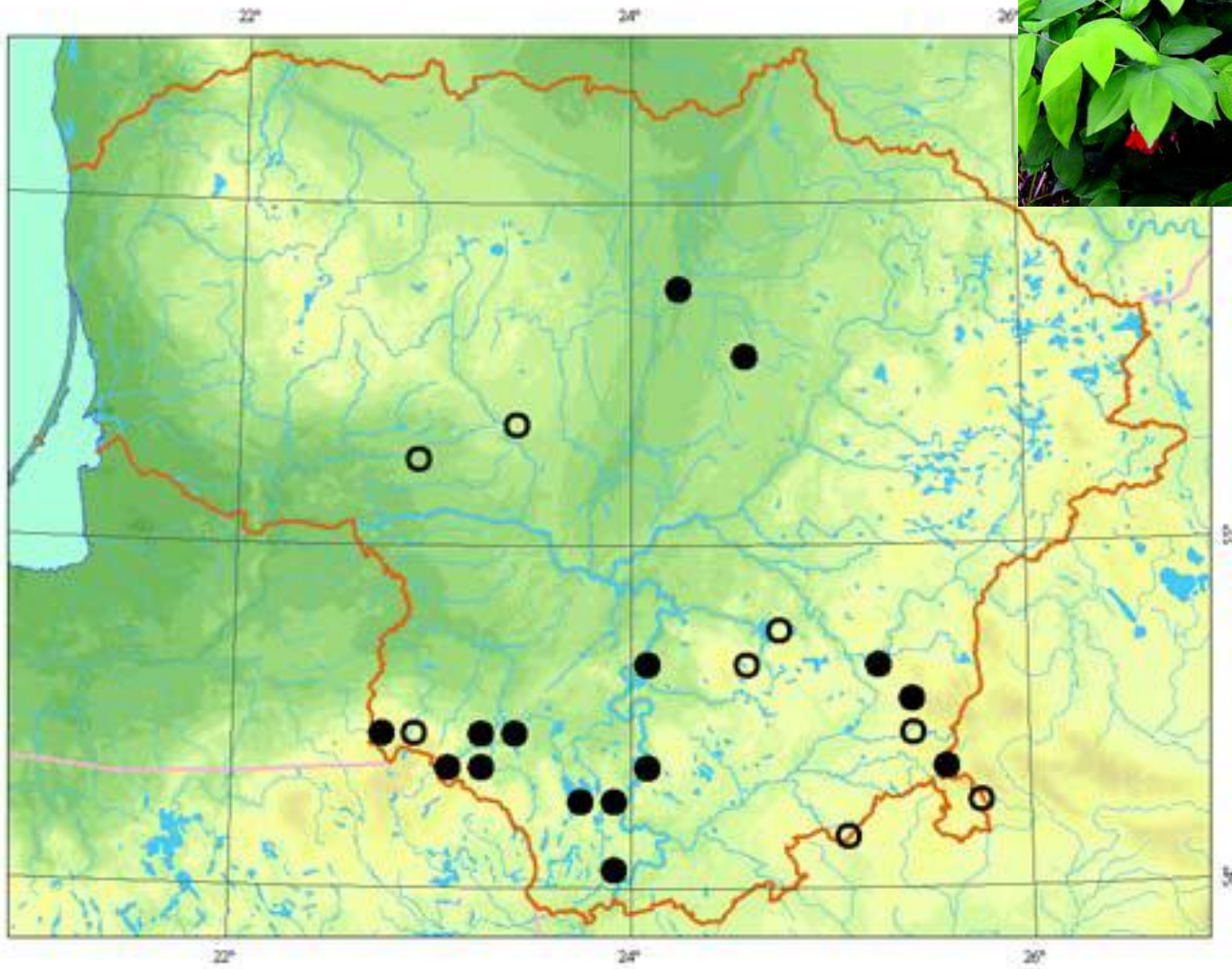
Results achieved

- A checklist of total 1040 species compiled
- Total 160 priority CWR species selected
- CWR priority groups established
- Mapping of rare and endangered CWR species performed
- Detailed studies on several species carried out
- Richest-in-species habitat types established
- 15 actual in situ conservation sites established
- Gap analysis revealed that 10–15 more sites are needed

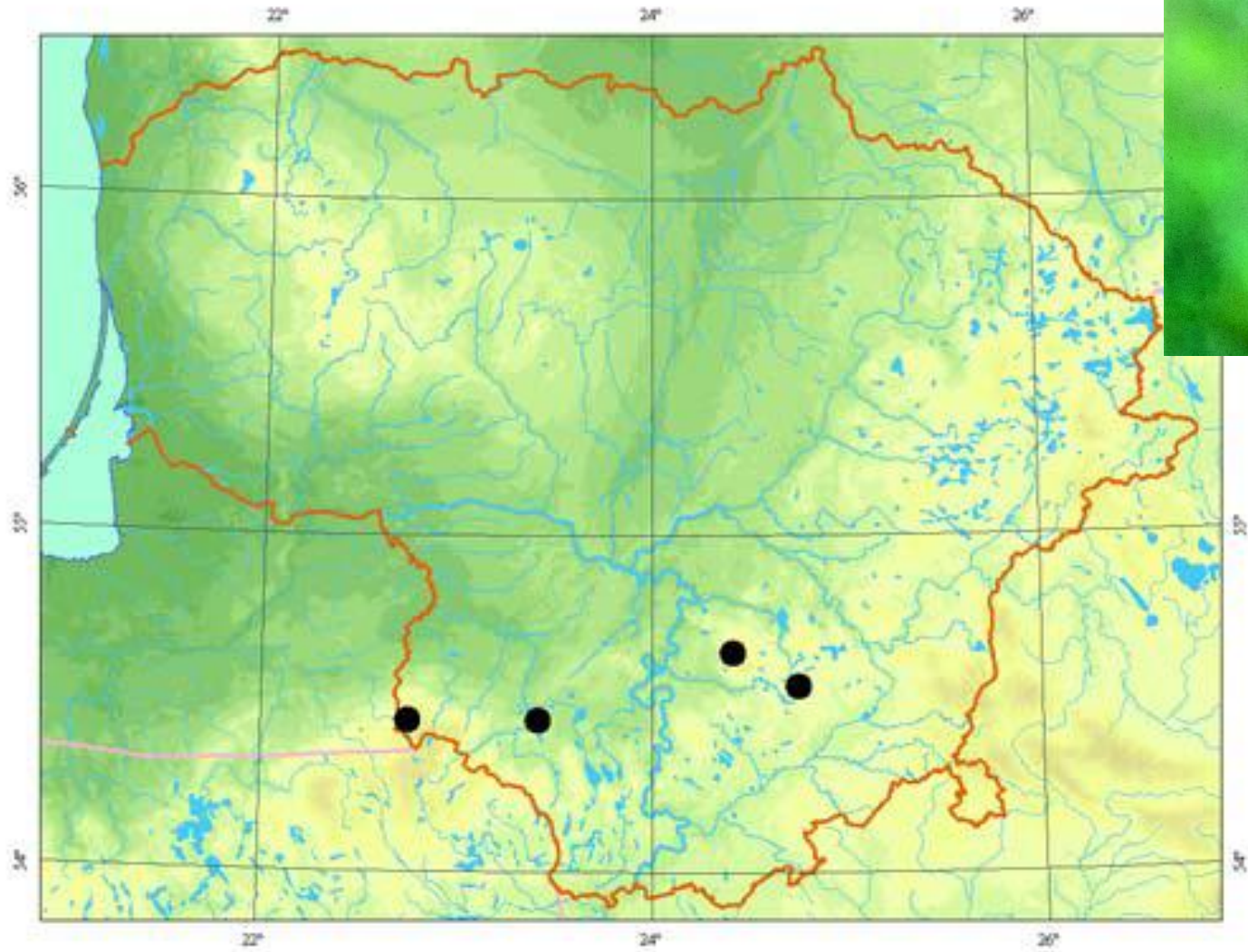
Priority species selected

- About 160 CWR priority species (s. l.) selected:
 - Fabaceae** (Lathyrus, Vicia, Trifolium...) – 57 (35%)
 - Poaceae** (Poa, Festuca, Phleum...) – 57 (35%)
 - Rosaceae** (Fragaria, Rubus, Prunus...) – 12 (8%)
 - Amaryllidaceae (Allium) – 6 (4%)
 - Ericaceae (Vaccinium) – 5 (3%)
 - Apiaceae (Carum, Pastinaca, Angelica) – 3 (2%)
- Mostly forage, food, spice and medicinal plants

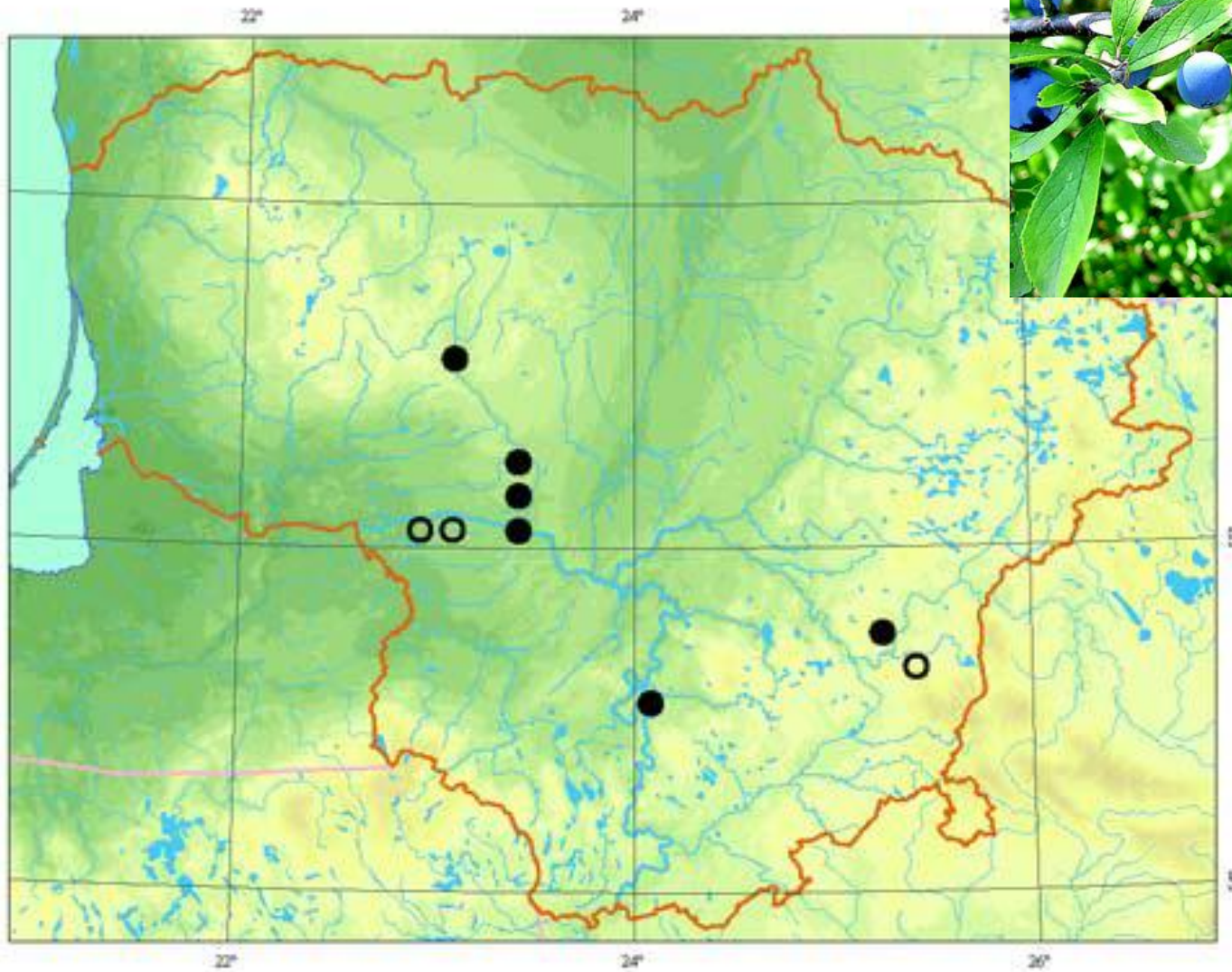
Distribution of Yellow Pea, *Lathyrus laevigatus*, cat. 3(R)



Distribution of Wood Barley, *Hordelymus europaeus*, cat. 1 (E)



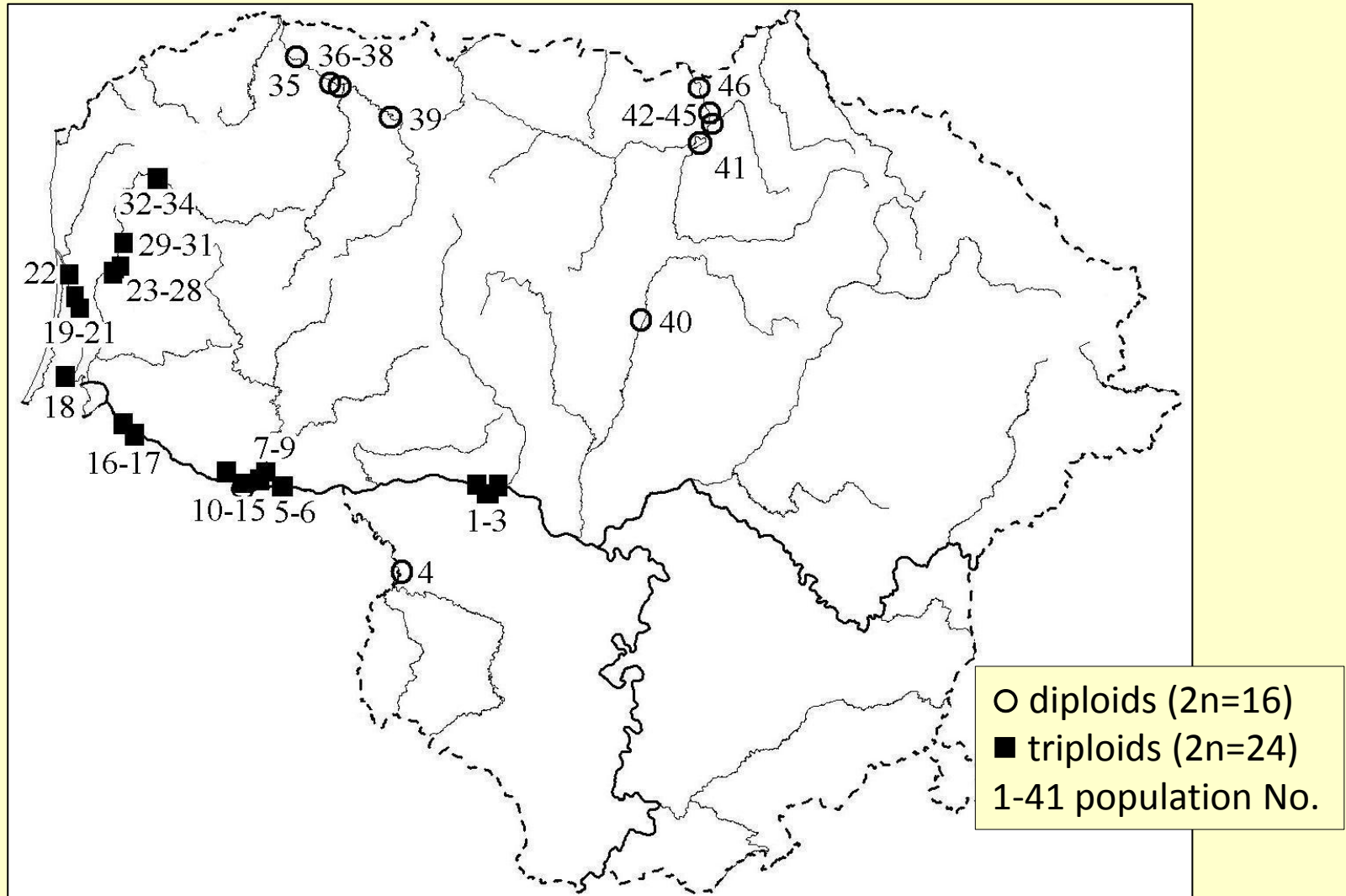
Distribution of Blackthorn, *Prunus spinosa*, cat. 2(V)



Sand Leek, *Allium scorodoprasum*,
Red Data Book Category 3(R)



Distribution of Sand Leek by ploidy, *Allium scorodoprasum*



Richest habitat types established

- River valleys
- Flood plains
- Slopes of lakes
- Hillsides
- Mounds
- Forest glades
- Roadsides

Sites for *in situ* conservation established

- Currently 15 *in situ* conservation sites established in SE, S and SW Lithuania:
 - stress on medicinal and aromatic plants
 - area size from 0,4–30,0 hectares;
 - total species number covered 70;
 - 35 species are in 2 and more sites;
 - 2 species in 8 sites.

Results of gap analysis

- 33 % of priority CWR species conserved *ex situ* by Plant Gene Bank (seeds);
- Some 10 species are used by breeding programmes (forage species);
- 16 % covered by Red Data Book of Lithuania and 27 % mentioned in the IUCN Redlist as category LC, mostly;
- A certain number of CWR species are important as indicators of EU Priority Habitats (e.g., *Alopecurus pratensis*, *Festuca pratensis*, *Lathyrus palustris*, *Phalaroides arundinacea* are indicators of Northern Boreal alluvial meadows, 6450);
- Additional 10–15 sites should be established to achieve 90 % coverage of the priority species.

Discussion

- Studies on genetic diversity of priority CWR species
- Conservation action plans for *in situ* reserves :
 - special CWR targeted plans;
 - integrated with nature management plans
- Implementation of action plans – who and how?
- Monitoring schemes of CWR in their conservation sites
- Status of the *in situ* conservation sites:
 - state protected areas – genetic reserves;
 - ministry level protected areas (status quo);
- Engagement of local communities, users and other stakeholders, let alone the nature conservationists

Conclusions

- Currently all the necessary data exist for the development of the national CWR conservation strategy for Lithuania, although they are much scattered
- Data compilation with information update is one of the main and tedious tasks in building the national strategy
- The Red Data Book species are best studied in terms of distribution
- The data from related projects, like EU Priority Habitat Inventory could significantly facilitate the work
- Cooperation with the nature conservationists, land owners and other stakeholders is indispensable in developing a comprehensive CWR conservation strategy

Acknowledgement

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Thank you for your attention!