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  Norwegian Crop Wild Relative *in situ* conservation strategy (unpublished)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.

• 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
Biogeographic map
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General vegetation map
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 ploidiness, *Allium scorodoprasum*

- Diploids (2n=16)
- Triploids (2n=24)

1-41 population No.
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!