



# TOWARDS *IN SITU* CONSERVATION OF CROP WILD RELATIVES IN LITHUANIA

Juozas Labokas<sup>1</sup>, Birutė Karpavičienė<sup>1</sup>, Laima Šveistytė<sup>2</sup>, Jolita Radušienė<sup>1</sup>, Kristina Ložienė<sup>1</sup>

<sup>1</sup> – Institute of Botany, Nature Research Centre, Žaliųjų Ežerų g. 49, Vilnius, Lithuania

<sup>2</sup> – Plant Gene Bank, Žaliųjų Ežerų g. 49, Vilnius, Lithuania

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# **1. LEGAL BACKGROUND**

The Law on Protected Areas (2001)

The Law on National Plant Genetic  
Resources (2001)

# The Law on Protected Areas (2001)

- **The purposes of establishing reserves:**
- To protect territorial complexes (values) and areas of natural and cultural heritage;
- To ensure landscape and biological diversity as well as a natural ecological balance;
- To conserve wild plant, animal, and mushroom habitats and species, and their genetically important populations;
- To create conditions for scientific research and informative/educational tourism;
- To promote Lithuania's natural and cultural heritage.

# The Law on National Plant Genetic Resources (2001)

Article 8 states:

“For *in situ* conservation of national plant genetic resources, genetic reserves, gene conservation areas, seed collection parcels shall be established or populations, groups or single trees shall be selected. *In situ* conservation of national plant genetic resources shall not be separated from the conservation of the national habitats, maintenance of vital populations and regeneration through creation of conditions favourable to their development.”

[http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc\\_l?p\\_id=230551](http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=230551)

Priority given to the wild species, particularly forest trees.

# The system of protected areas in Lithuania

Category	Type	Aim
Conservational	Strict reserves Reserves (incl. <a href="#">genetic</a> ) Objects of heritage	Nature, culture and/or combined conservation
Ecological (Preservational)	Protected zones	For water bodies, buffer zones for reserves, etc.
Recuperational	Parcels of natural res. <a href="#">Genetic parcels</a>	For berries, mushrooms, medical plants, marshes... genetic resources recuper.
Integrated	State parks Biosphere monitoring areas	Combined protection in national & regional parks; monitoring in biosphere reserves & polygons

# Special protected areas

- Areas of conservational priority (strict reserves, reserves and objects of heritage) as well as integrated protected areas (state parks and biosphere monitoring areas) are called **Special Protected Areas**. They occupy 998,000 ha, or 15.3 % of the country's territory.
- Genetic reserves of forestry species – total number 156, total area 3811 ha (62 % of all forestry species covered)  
[http://www.mgit.lt/genet\\_draustiniai.html](http://www.mgit.lt/genet_draustiniai.html)

# Recuperational protected areas

Areas of natural resource recuperation – berries, mushrooms, medicinal plants, animals, marshes, underground water resources, etc.

Seed (genetic) parcels – for genetic resources recuperation

# Regulations for seed (genetic) parcels attributed to the national PGR

(Ministry of Environment, 2003)

<http://www3.lrs.lt/c-bin/spec/full/getfmt?C1=e&C2=223621>

- **Seed (genetic) parcel** is a perennial (herbaceous or woody) plant stand designated for a long-term conservation and utilization of genetic material for plant breeding; for cultivation of medicinal plants and berries, establishment of plantations of ornamental and other plant species.
- “**National plant genetic resources** are plant genetic resources, which have been selected and included, in the central database of national plant genetic resources having ecological, selection and economic significance for the Republic of Lithuania.” (Article 2 of the Law on National PGR)

## **2. SELECTION CRITERIA FOR *IN SITU* CONSERVATION OF PGR**

- General PGR selection criteria
- Crop-specific (species-specific) criteria

# GENERAL SELECTION CRITERIA

## (as stated in the Regulations)

- Include biological, ecological, genetic, social and economic value of species; each being scored on a 5-point scale, and an overall score calculated in relation to the population average.
- Seed (genetic) parcels are to be selected in different ecogeographic areas.
- Seed (genetic) parcels are to be selected on a state-owned land.

Crop-specific criteria are to be developed and employed additionally.

# **CROP-SPECIFIC SELECTION CRITERIA**

**Five crop (species) groups established:**

Agricultural species

Horticultural species

Forestry species

Medicinal and aromatic plants

Ornamental plants

# CRITERIA FOR MEDICINAL AND AROMATIC PLANTS

The development of **crop-specific criteria** for medicinal and aromatic plants includes two levels:

- SPECIES LEVEL
- POPULATION LEVEL

# SELECTION CRITERIA AT SPECIES LEVEL

What species could be considered as CWR of medicinal and aromatic plants in Lithuania?

- 1) wild relatives of species utilized mainly through cultivation (mint, camomile, valerian, caraway, etc.)
- 2) species which are not widely cultivated but having cultivars released (arnica, St John's wort, thyme, oregano, etc.)
- 3) species potentially to be cultivated due to increasing utilization and other reasons

# SELECTION CRITERIA AT POPULATION LEVEL

- phenotypic and genetic diversity, including:
  - chemotypical diversity,
  - biological productivity,
  - resistance to pests and diseases,
  - winter hardiness,
  - frost resistance,
  - drought tolerance
- size of populations (subpopulations)
- distribution pattern of populations

### 3. IMPLEMENTATION IN THE FIELD

- The first field-works on selection of seed (genetic) parcels of **medicinal plants** were carried out in 2006.
- Seed (genetic) **parcels were singled out** based on the following criteria:
  - number of target species and their resources,
  - distinctive properties of target species populations (phenotypic, genetic),
  - position of a parcel with respect to physiographic conditions,
  - possibilities to determine natural boundaries.

# WORK-SCHEME USED IN THE FIELD

1. Inventory of target species.
2. Description of plant community according to Braun-Blanquet.
3. Establishing coordinates and boundaries of the parcel.
4. Calculating parcel area with (GPS, [www.maps.it](http://www.maps.it)).
5. Setting forth the motivation of a selection.
6. Mapping of a parcel.

# SEED (GENETIC) PARCELS APPROVED

- 1. Veliuona medicinal plant parcel  
Shrubbery on riverside slope (Cl. *Rhamno-Prunetea spinosae*); size 0.90 ha  
Panemuniai Regional Park, South-Central Lithuania.
- 2. Dusia medicinal plant parcel  
Shrubbery on lakeside hill (Cl. *Rhamno-Prunetea spinosae*), size 0.40 ha  
Meteliai Regional Park, South Lithuania.
- 3. Labanoras lingonberry genetic parcel  
Plain pinewood (Ass. *Peucedano-Pinetum sylvestris*), size 30.0 ha  
Labanoras Regional Park, East Lithuania.

# SEED (GENETIC) PARCELS APPROVED

- 4. Leipalingis hazelnut (*Corylus avellana*) parcel  
Conifer (pine) forest (Cl. *Vaccinio-Picetea*),  
South Lithuania; size 17.5 ha.
- 5. Prienai ramson (*Allium ursinum*) parcel  
Conifer (spruce) forest (Cl. *Vaccinio-Picetea*),  
Nemunas Meanders Regional Park  
South-Central Lithuania; size 18.97 ha.
- 6. Dieveniškės medicinal plant parcel  
*Nardus* grasslands and *Molinia* meadows (Cl. *Nardetea strictae* and *Molinio-Arrhenatheretea elatioris*),  
Dieveniškės Historical Regional Park,  
South-East Lithuania; size 5.0 ha.

# STATISTICAL DATA

- Total number of parcels – 6  
(5 of them within existing protected areas)
- Total area covered 72,77 ha
- Total number of species covered 33
- Mean size of a parcel 12,12 ha
- Size range 0,40–30,0 ha
- Vegetation classes covered – 5
- Habitat types – 3 (forests, shrubs, meadows)
- Ecogeographic areas – 4 (SC, S, E, SE  
Lithuania)

Veliuona seed (genetic)  
parcel, South Central  
Lithuania



## Dusia seed (genetic) parcel, South Lithuania



Diversity of common hawthorn  
(*Crataegus monogyna*) in Dusia  
seed (genetic) parcel



Labanoras lingonberry genetic parcel, East Lithuania

*Vaccinium vitis-idaea* var. *leucocarpum*



# Target species inventoried in genetic parcels

#	Target species	Veliuona	Dusia	Labanoras	Leipalingis	Prienai	Dieveniškės
1	<i>Achillea millefolium</i>		+				
2	<i>Allium oleraceum</i>	+	+				
3	<i>Allium ursinum</i>					++	
4	<i>Arnica montana</i>						+
5	<i>Berberis vulgaris</i>	+					
6	<i>Calluna vulgaris</i>						+
7	<i>Carum carvi</i>		+				
8	<i>Corylus avellana</i>				++	+	
9	<i>Cornus sanguinea</i>	+					
10	<i>Crataegus monogyna</i>	+	++				
11	<i>Filipendula ulmaria</i>					+	+
12	<i>Fragaria vesca</i>	+	+		+		
13	<i>Fragaria viridis</i>	+	+				
14	<i>Gentiana cruciata</i>	+					
15	<i>Hypericum perforatum</i>		+				
16	<i>Juniperus communis</i>	+					25
17	<i>Lithospermum officinale</i>	+					

# Target species inventoried in genetic parcels

#	Target species	Veliuona	Dusia	Labanoras	Leipalingis	Prienai	Dieveniškės
18	<i>Malus sylvestris</i>	+	+				
19	<i>Origanum vulgare</i>	+					
20	<i>Potentilla erecta</i>						+
21	<i>Primula veris</i>	+	+				
22	<i>Prunus spinosa</i>	++					
23	<i>Pyrus communis</i>	+	+				
24	<i>Rhamnus cathartica</i>	+	+				
25	<i>Ribes nigrum</i>					+	
26	<i>Rosa canina</i>		+				
27	<i>Rubus caesius</i>	+	+				
28	<i>Sorbus aucuparia</i>					+	
29	<i>Thymus pulegioides</i>		+				
30	<i>Vaccinium uliginosum</i>						+
31	<i>Vaccinium vitis-idaea</i>			++			+
32	<i>Valeriana officinalis</i>						+
33	<i>Viburnum opulus</i>	+	+				26
	Total number	17	15	1	2	5	9

# Groups of species covered

- Wild gathered and/or utilized economic plants:
  - medicinal and aromatic plants
  - berry, nut and fruit plants
  - European crop wild relatives (*Allium*, *Fragaria*, *Malus*, *Pyrus*, *Prunus*)
- National Red Data Book species (*Gentiana cruciata*, *Prunus spinosa*)
- “Meta-group” of ornamental species



All hazelnuts from one population  
(Leipalingis, S. Lithuania)



Outstanding population of bear's garlic  
(S. Central Lithuania)



Heath plant community with  
lingonberry, bilberry, arnica, etc.  
(SE Lithuania)



Hop population in alluvial forest

## 4. DOCUMENTATION & MONITORING

- Selected seed (genetic) parcels are registered in the Central Database of the National PGR  
[http://www.agb.lt/duomenu\\_baze/lauko\\_kolekcijos.php](http://www.agb.lt/duomenu_baze/lauko_kolekcijos.php)
- The documents of a seed (genetic) parcel are passport and cartographic material, prepared by the Coordinating Centre.
- The Coordinating Centre carries out inventories of the parcels every 10 years or more frequently as it appears necessary due to unfavourable climatic and anthropogenic factors.

## **5. ACTIVE *IN SITU* CONSERVATION**

- Use of pesticides (with some exceptions), construction of roads, parkings, changing of water regime are prohibited.
- Recommendations for the handling, protection and management of the parcels are to be provided by the Coordinating Centre for Medicinal and Aromatic Plants.
- No management plans developed yet.

## 6. RESPONSIBILITIES

- Handling and protection of seed (genetic) parcels is the responsibility of the administrator of the land, where parcels are located.
- The Coordinating Centre controls the status, protection and utilisation of seed (genetic) parcels.

## 7. GAPS OF THE SYSTEM

- Annual and biennial plants are omitted in the Regulations for seed (genetic) parcels.
- Only state-owned land is taken into account in the Regulations when selecting seed (genetic) parcels.
- Lack of compatibility between some provisions of the two laws: Law on Protected Areas and Law on National PGR:
  - no clear difference between genetic reserves and genetic parcels;
  - only 2 categories of genetic areas are defined in the Law on Protected Areas, while that of National PGR defines 4 of them.

## 8. ISSUES TO TACKLE

- **National:**
  - To develop management plans for the established seed (genetic) parcels.
  - To initiate national inventories of CWR.
- **International:**
  - Global CWR strategy should facilitate the national decision makers.
  - Strengthening of regional cooperation (NordGen, ECPGR, etc.) and development of joint projects is welcome.



**Thank you!**