

Europe's crop wild relative diversity: from conservation planning to conservation action

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ENHANCED GENEPOOL UTILIZATION – Capturing wild relative and landrace diversity for crop improvement

16–20 June 2014, NIAB Innovation Farm, Cambridge, United Kingdom

IN THIS PRESENTATION.....

1. **WHY?** Europe's valuable CWR diversity
2. **WHICH?** Not all CWR have equal value – which should we conserve?
3. **WHERE?** Regional distribution – identifying target populations
4. **HOW?** An integrated European CWR conservation strategy



1. EUROPE'S VALUABLE CWR DIVERSITY

- **Europe is an important centre of diversity of many crops and their wild relatives** and these CWR are potential genetic resources for crop improvement and food security
- **Food crops with significant CWR diversity native to region** include **wheat** (*Triticum aestivum* L.), **barley** (*Hordeum vulgare* L.), **oat** (*Avena sativa* L.), **sugar beet** (*Beta vulgaris* L.), **cabbage** and other **brassicas** (*Brassica* L. spp. and allied genera), **onion** and other **alliums** (*Allium* L. spp.), **asparagus** (*Asparagus officinalis* L.), **lettuce** (*Lactuca sativa* L.) and **apple** (*Malus domestica* L.)
- **Forage and fodder crops with CWR native to Europe** include **annual meadow grass** (*Festuca pratensis*), **white clover** (*Trifolium repens*), **alfalfa** (*Medicago sativa* L.) and **common vetch** (*Vicia sativa* L.)



1. EUROPE'S VALUABLE CWR DIVERSITY cont'd

- **Other crops of socio-economic importance with native wild relatives in the region**
 - **Forestry** species such as *Abies alba* Mill., *Populus nigra* L. and *Quercus ilex* L.
 - **Ornamentals** such as species of *Dianthus* L., *Euphorbia* L., *Geranium* L. and *Primula* L.
 - **Medicinal and aromatic plants** such as species of *Anemone* L., *Campanula* L., *Helianthemum* Mill., *Orchis* L. and *Verbascum*
 - **Herb, spice, environmental and industrial crops**

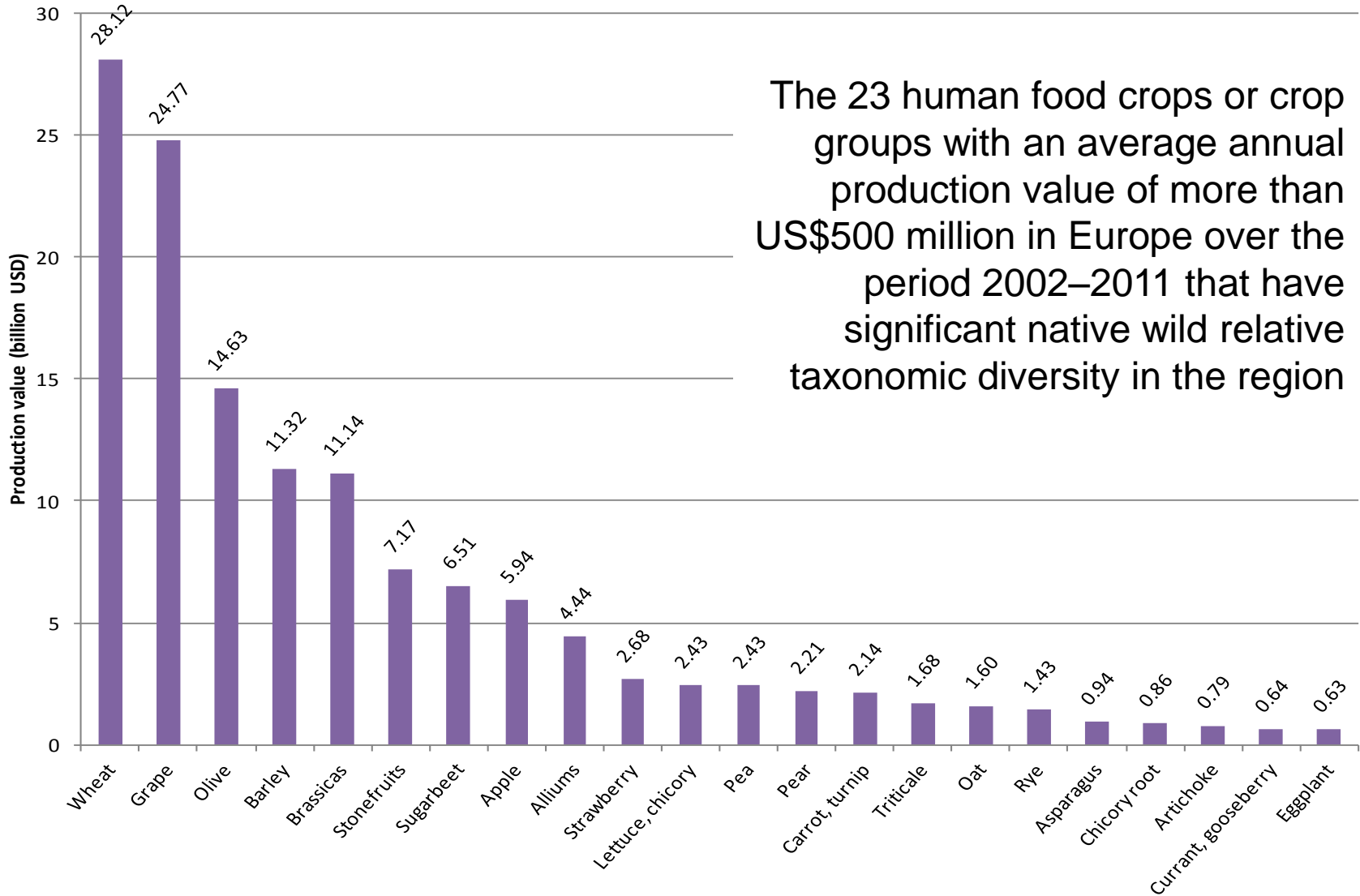


1. EUROPE'S VALUABLE CWR DIVERSITY cont'd

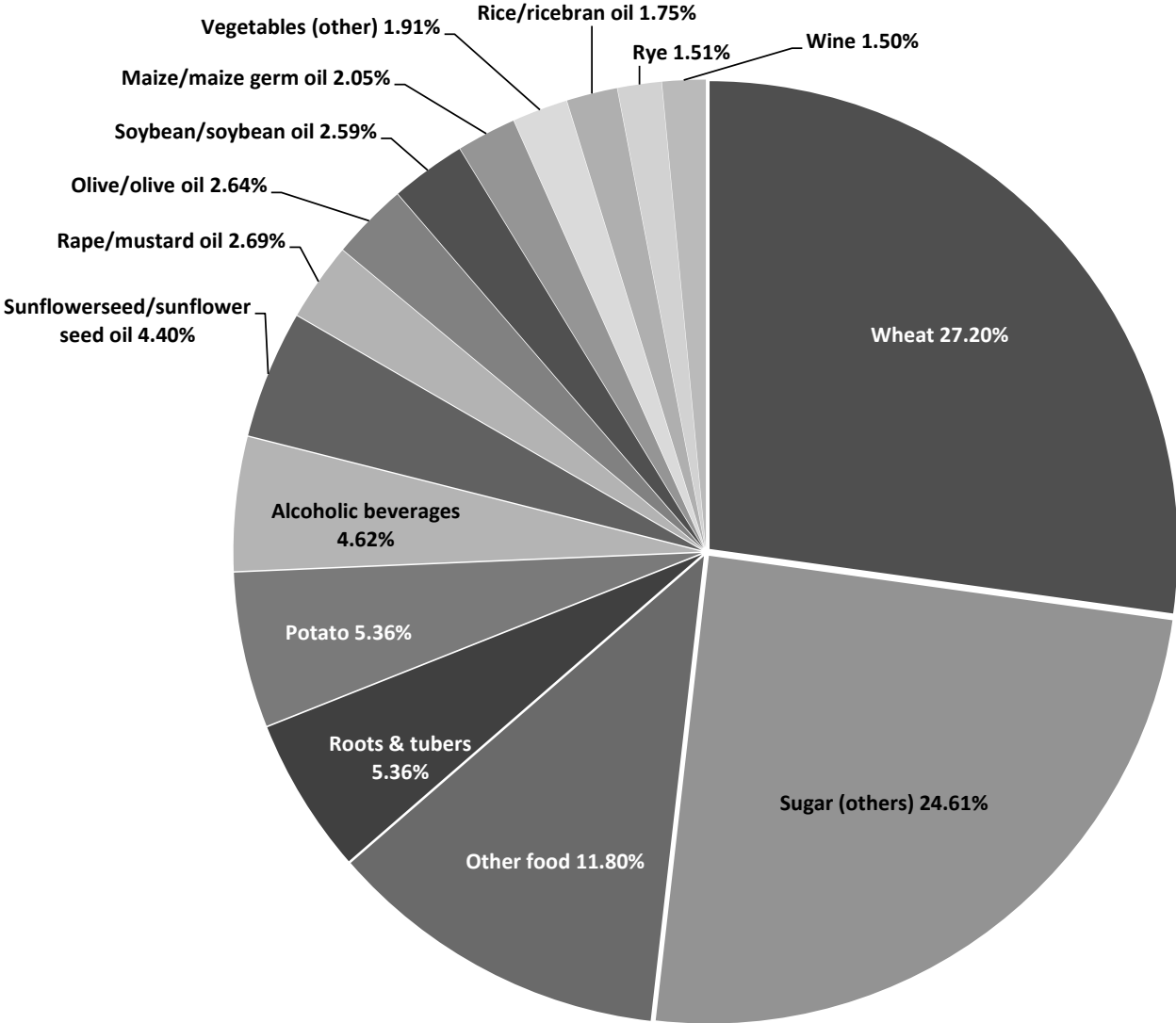
- **Today, agricultural production is challenged by climate change.** Although food production in Europe is likely to be less affected by climate change in the first half of the 21st century than some other regions of the world, **an increase in extreme weather events due to climate change can have far-reaching impacts**
- An **extreme climate event in Europe** in 2003 when temperatures were up to 6C above long-term averages and rainfall shortages up to 300mm (Trenberth *et al.*, 2007) had some **major impacts on crop production** (Easterling *et al.*, 2007) resulting in **uninsured economic losses in the EU agriculture sector of some €13 billion** (Sénat, 2004)



2. WHICH CWR SHOULD WE CONSERVE?

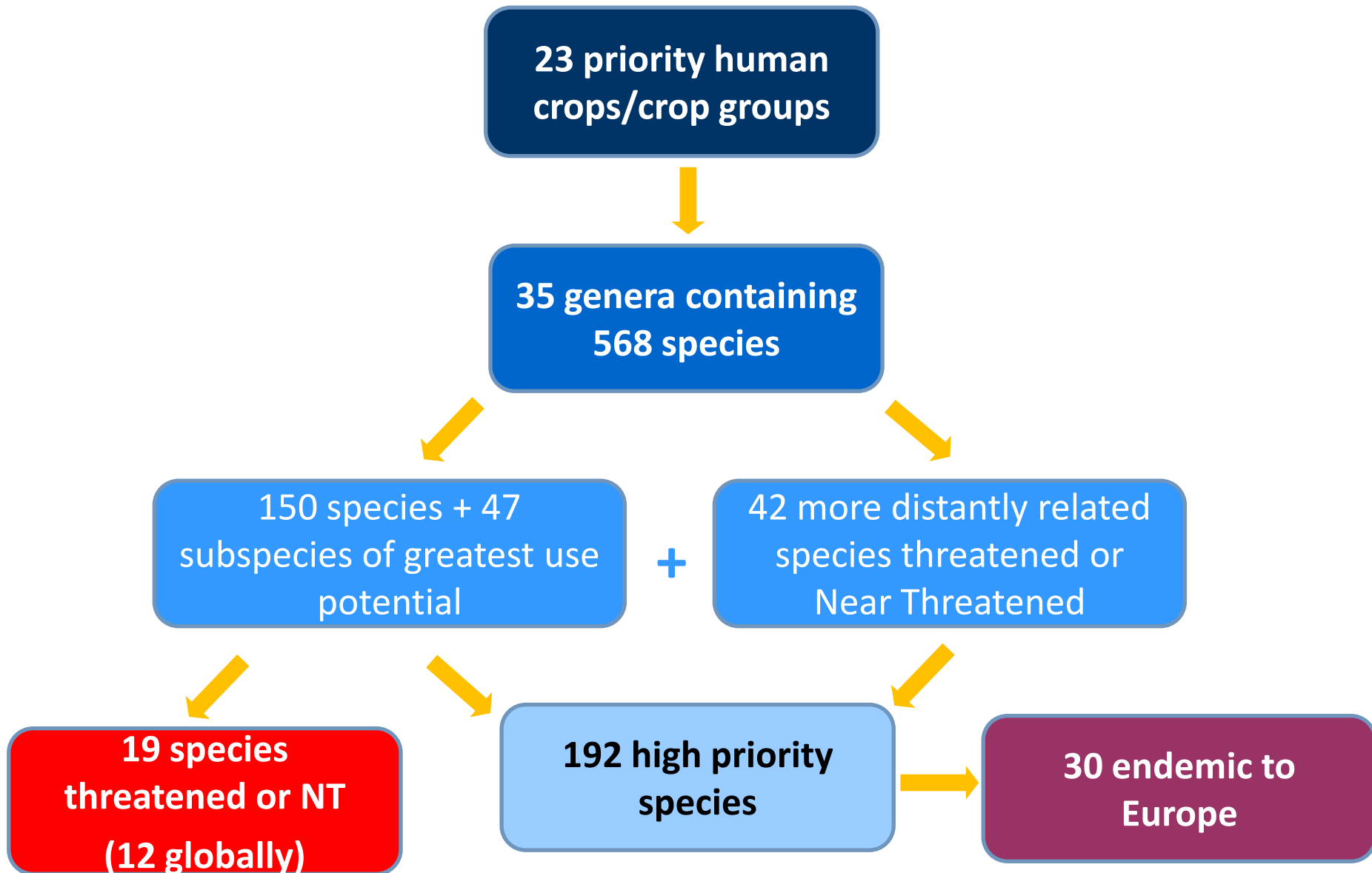


2. WHICH CWR SHOULD WE CONSERVE cont'd?

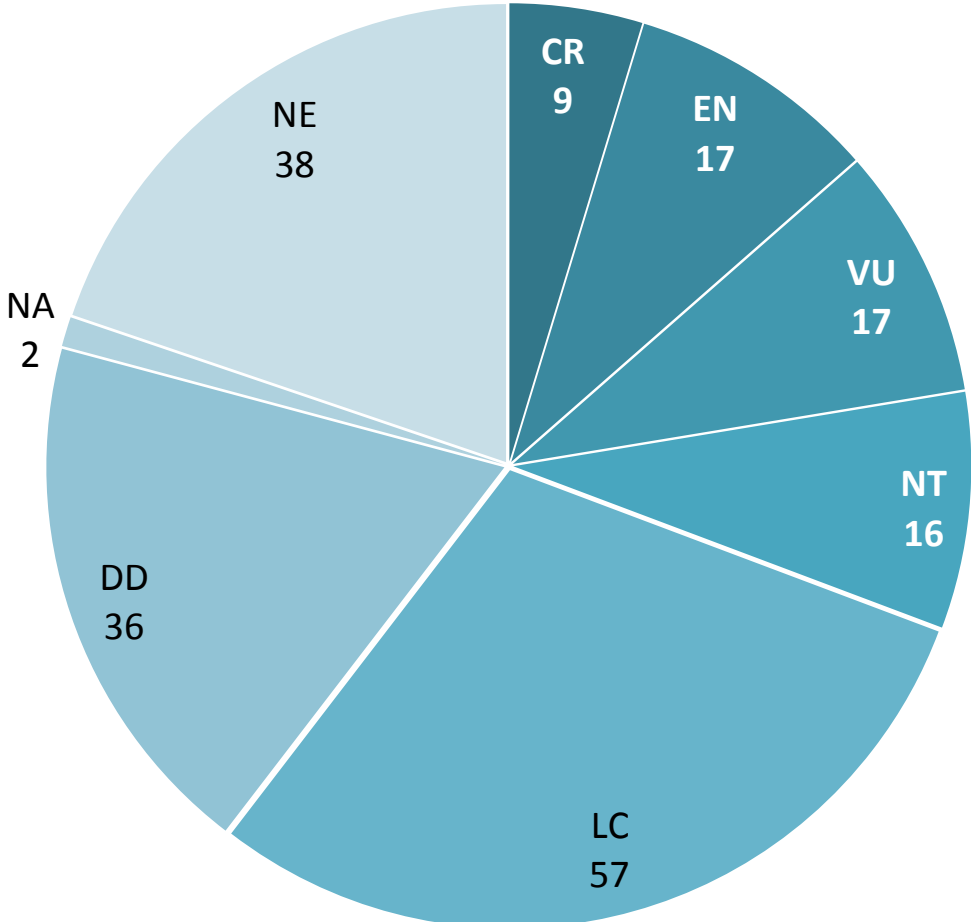


Average annual contributions of human food crops/crop groups to dietary energy (kilocalories) per capita per day of 1.5% or more over the period 2000–2009 in Europe. Data source: FAO (2014)

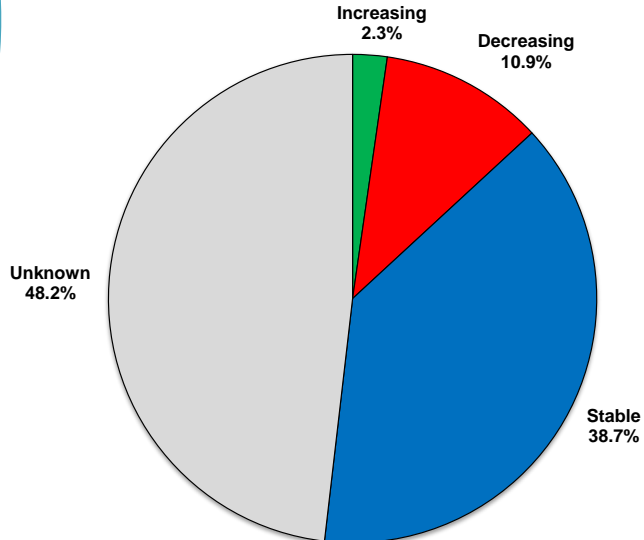
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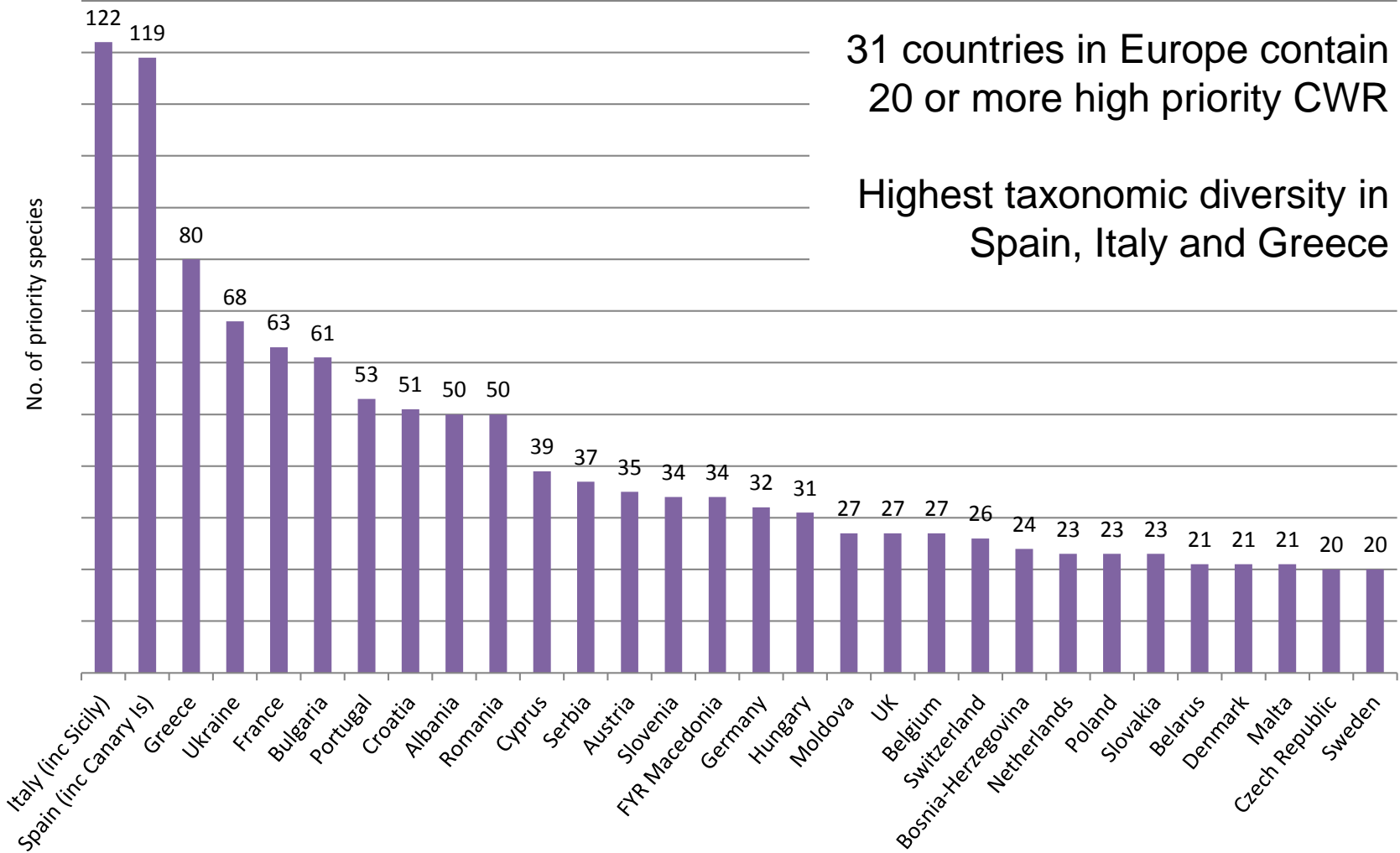
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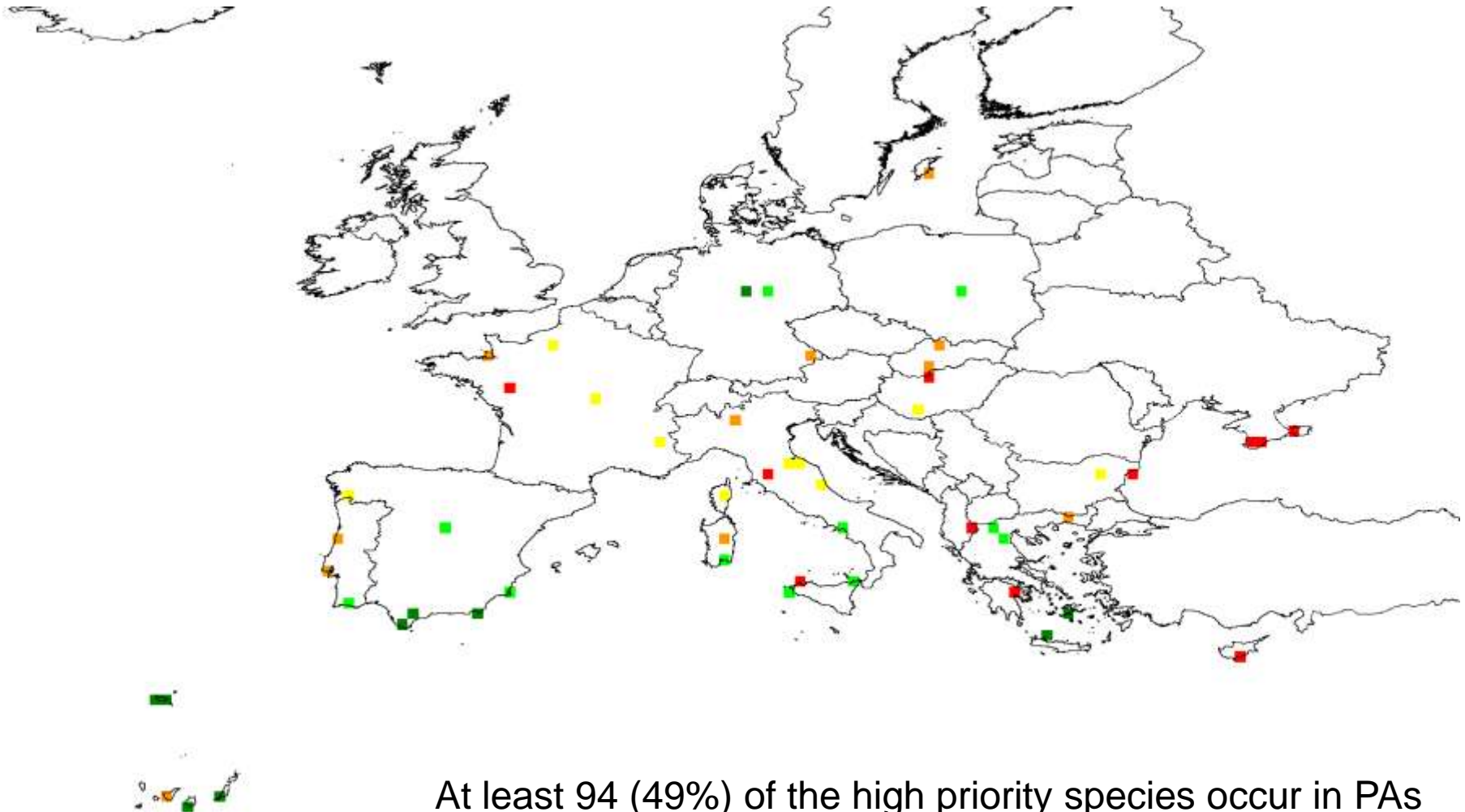
Red List status of 192 high priority European CWR



3. REGIONAL CWR DISTRIBUTION

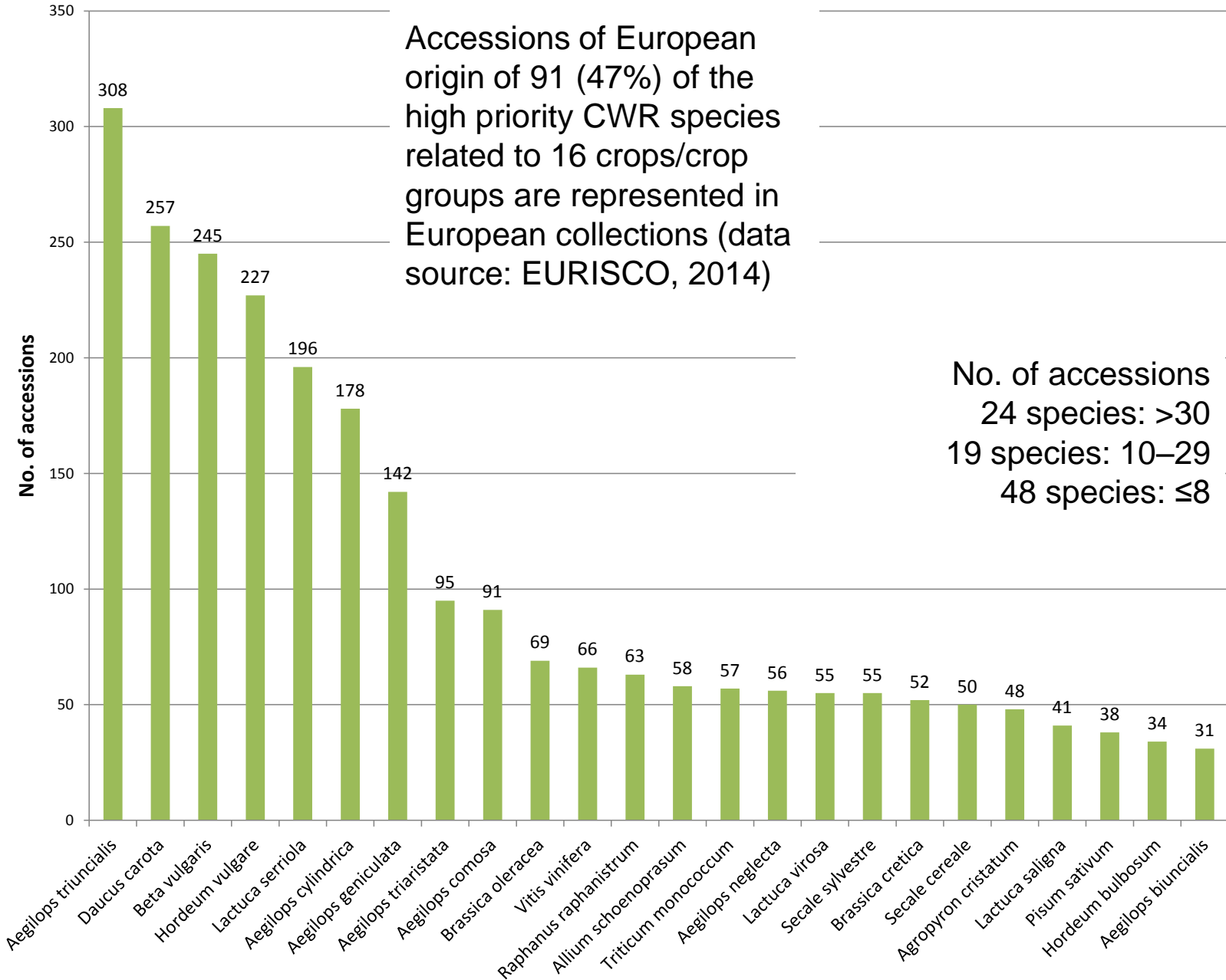


3. IDENTIFYING TARGET POPULATIONS

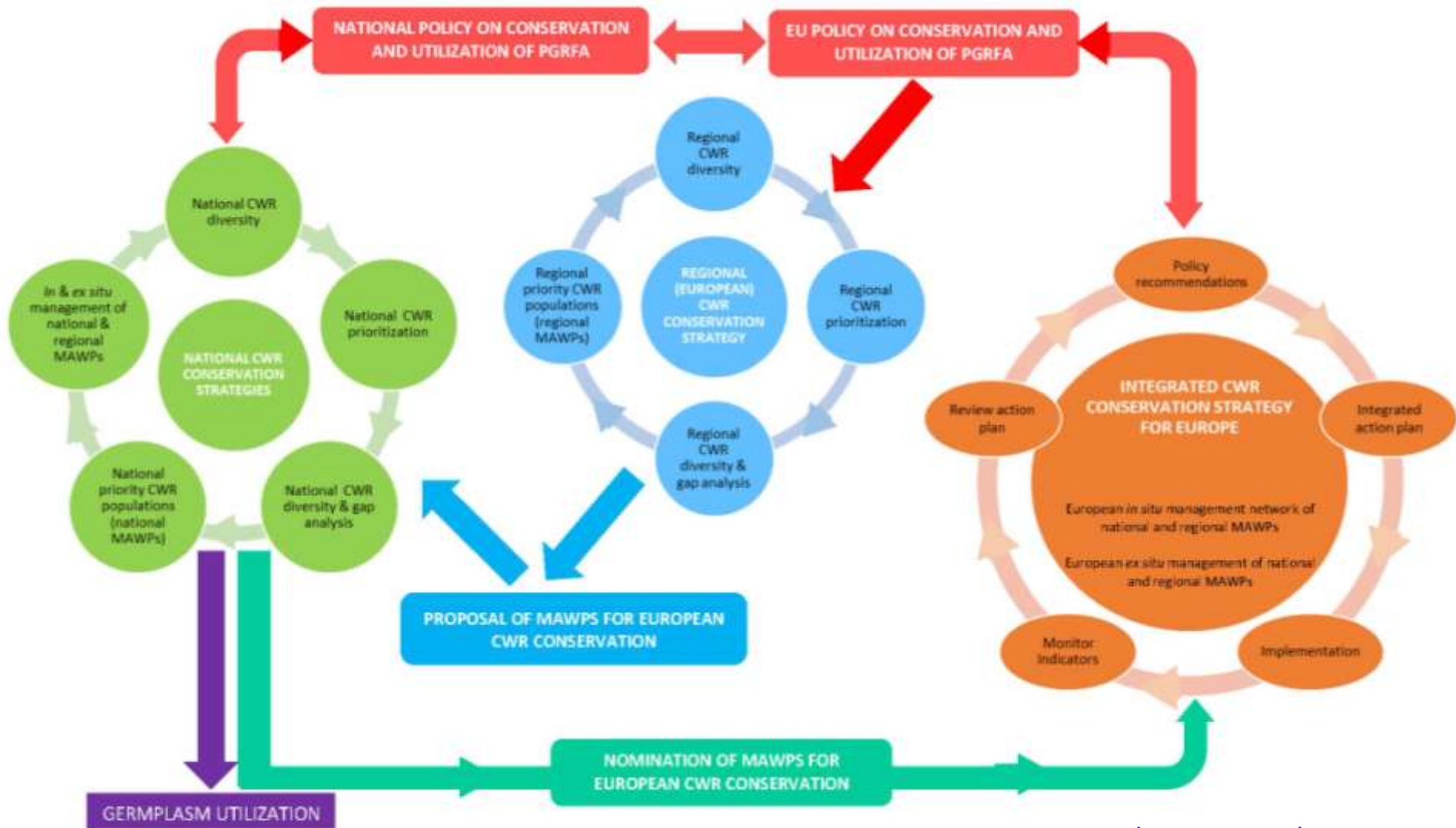


At least 94 (49%) of the high priority species occur in PAs

3. IDENTIFYING TARGET POPULATIONS



4. AN INTEGRATED EUROPEAN CWR CONSERVATION STRATEGY CONCEPT



www.pgrsecure.org/documents/Concept.pdf

4. AN INTEGRATED EUROPEAN CWR CONSERVATION STRATEGY cont'd

FROM PLANNING TO PRACTICE: SOME NEEDS/CHALLENGES



- **A clear EU policy on CWR conservation** (with buy-in from national PGR programmes) (e.g., a specific EU Directive on PGRFA to protect MAWPs in a coordinated way within existing European level biodiversity protection infrastructures such as the EU Habitats Directive)
- **Address the issue of responsibility for CWR conservation** at national and EU levels (agricultural /environmental sectors)
- **Resources** for monitoring and managing *in situ* CWR populations and for collecting and managing CWR germplasm *ex situ*
- **Coordination** of the integrated European CWR conservation strategy

KEY MESSAGES



- 1. Europe is an important centre of diversity of many crops and their wild relatives**, and these CWR are potential genetic resources for crop improvement
- 2. Europe's CWR diversity is an important resource for the maintenance of food security** and for safeguarding the substantial economic gains to Europe through crop production in the region
- Recent advances in our understanding of CWR diversity in the region, as well as in planning for their complementary conservation, provides **a solid foundation for the development of a strategic approach to their conservation in Europe** based on a range of commonly agreed and widely tested scientific concepts and techniques

KEY MESSAGES cont'd

4. Achieving effective conservation and utilization of European CWR diversity will require **a coherent, regionally coordinated policy and the appropriate resources** to fund their conservation, characterization and evaluation
5. To achieve sustainable conservation of CWR and maximize their sustainable exploitation in Europe, there is **an imperative to develop an EU-led policy to harmonize their conservation, characterization and evaluation** with existing biodiversity conservation and agricultural initiatives, and to develop new initiatives where necessary



IN CONCLUSION.....

1. **WHY?** Europe's valuable CWR diversity ✓
2. **WHICH?** Not all CWR have equal value – which should we conserve? ✓
3. **WHERE?** Regional distribution – identifying target populations ✓
4. **HOW?** An integrated European CWR conservation strategy ✓
5. **WHEN?** Action at national, regional and global levels is needed now!



ACKNOWLEDGEMENTS

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Thanks for your attention!