

# 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.....

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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

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- **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

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- **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**



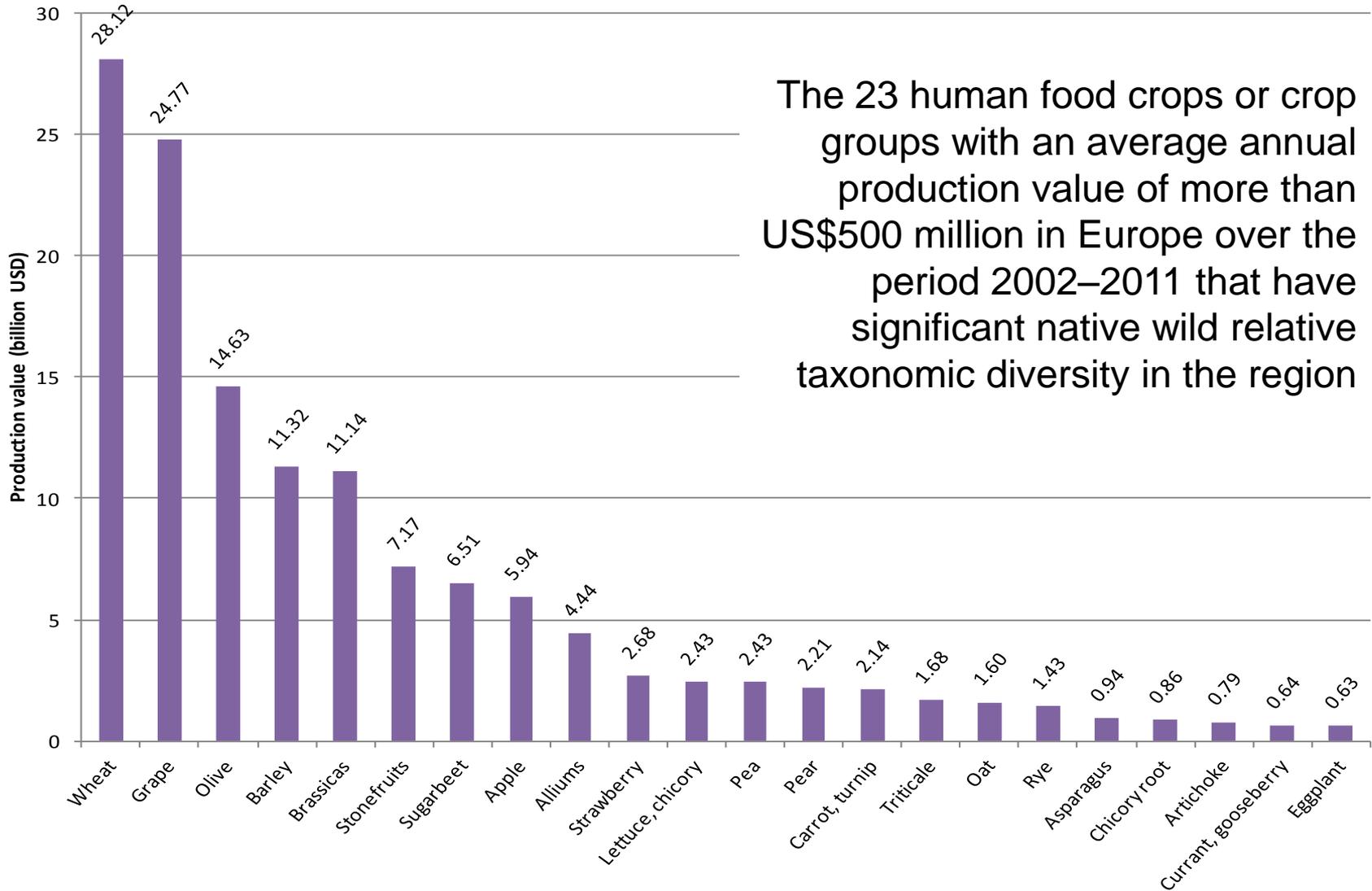
# 1. EUROPE'S VALUABLE CWR DIVERSITY cont'd

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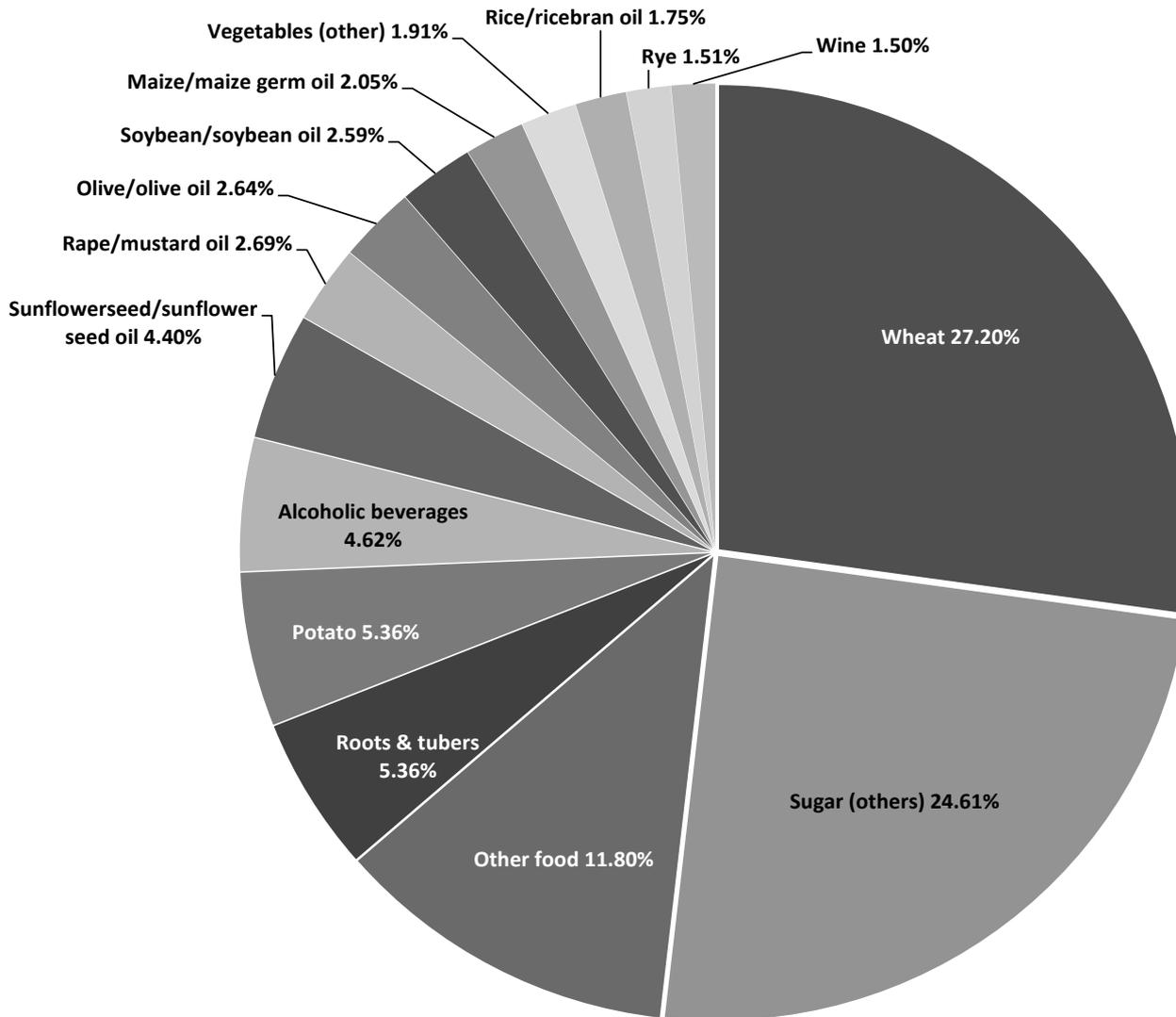
- **Today, agricultural production is challenged by climate change.** Although food production in Europe is likely to be less affected by climate change in the first half of the 21st century than some other regions of the world, **an increase in extreme weather events due to climate change can have far-reaching 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?

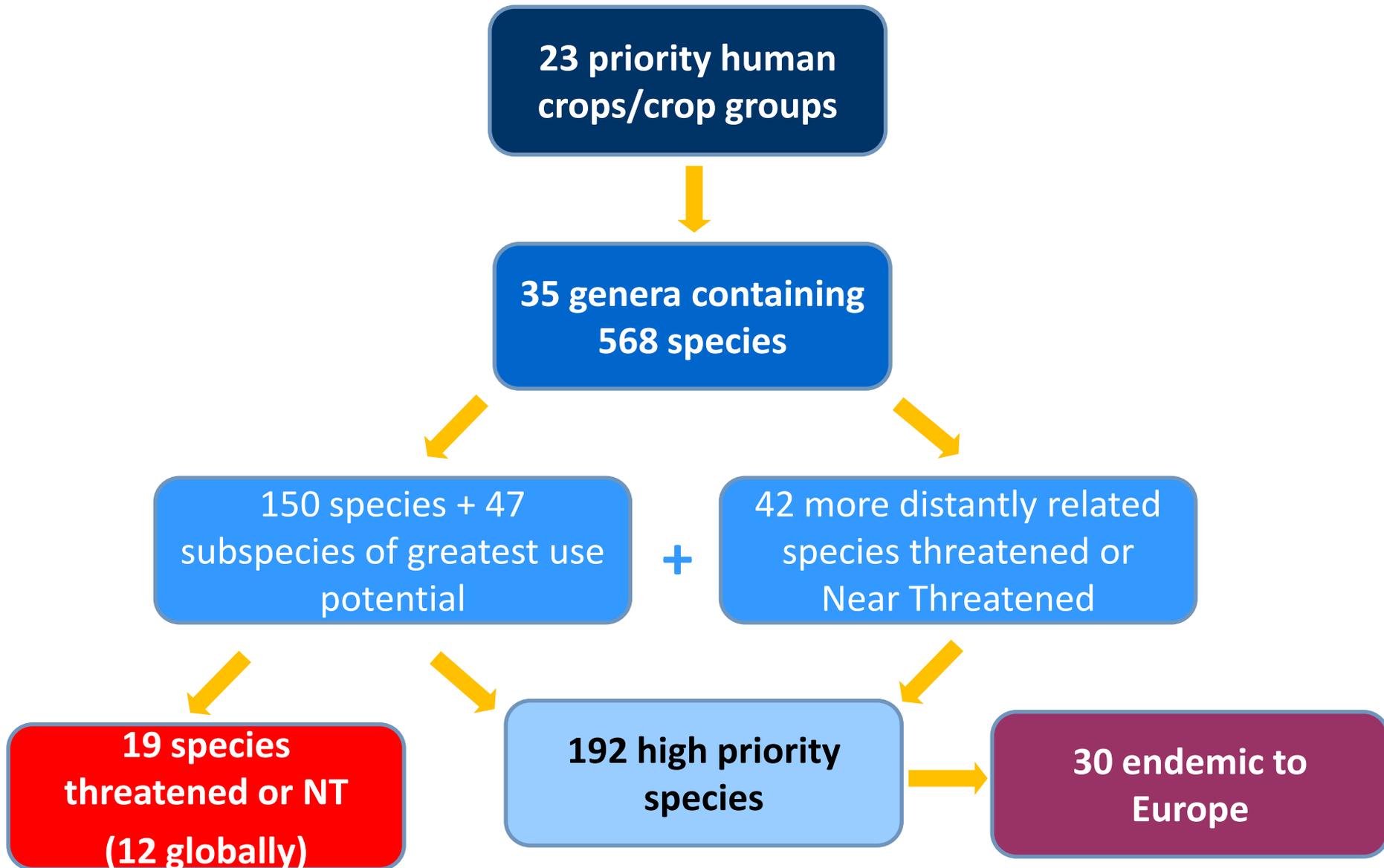


## 2. WHICH CWR SHOULD WE CONSERVE cont'd?

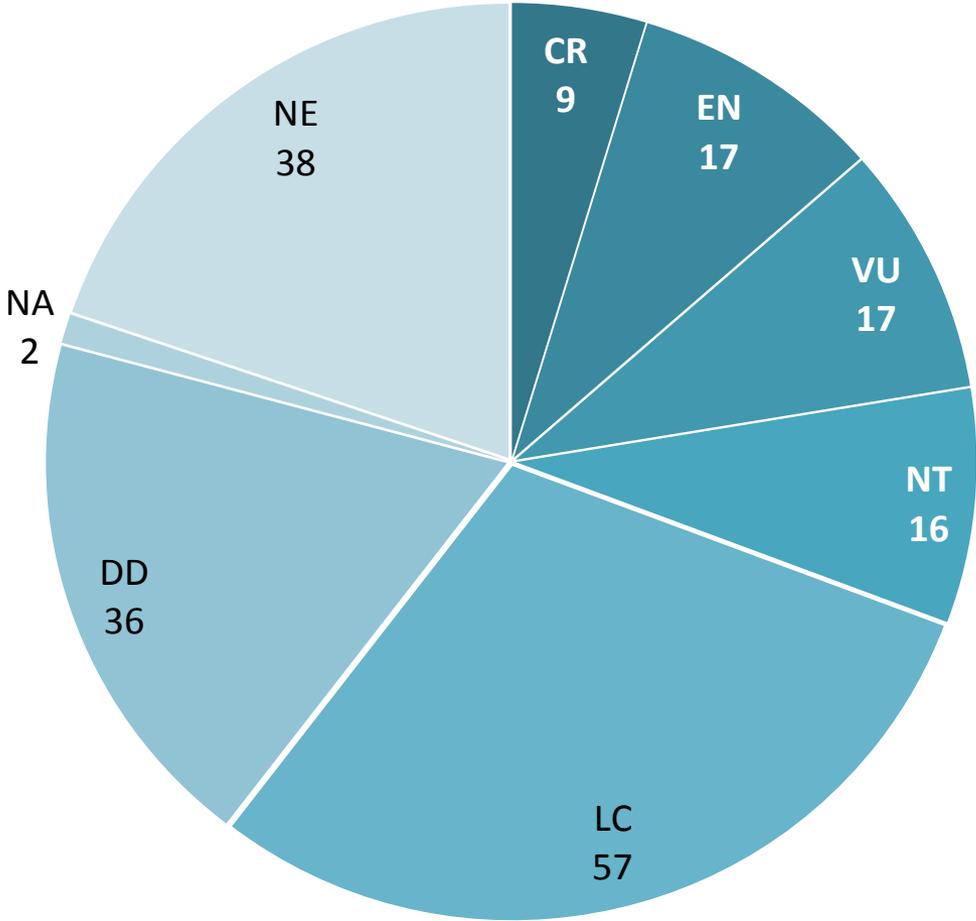


Average annual contributions of human food crops/crop groups to dietary energy (kilocalories) per capita per day of 1.5% or more over the period 2000–2009 in Europe. Data source: FAO (2014)

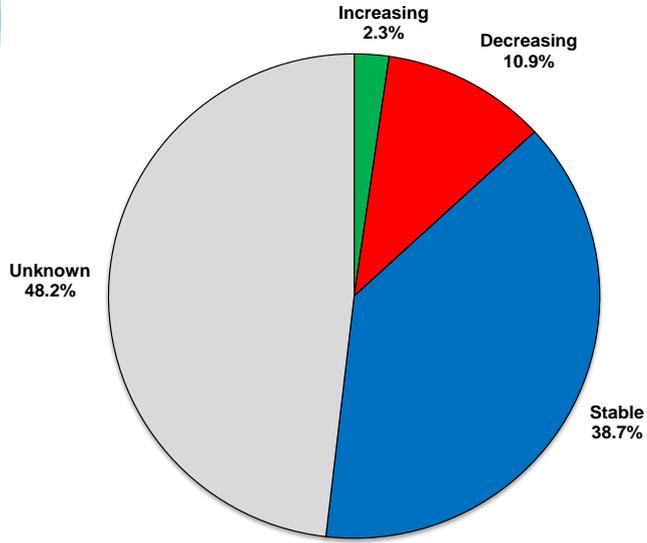
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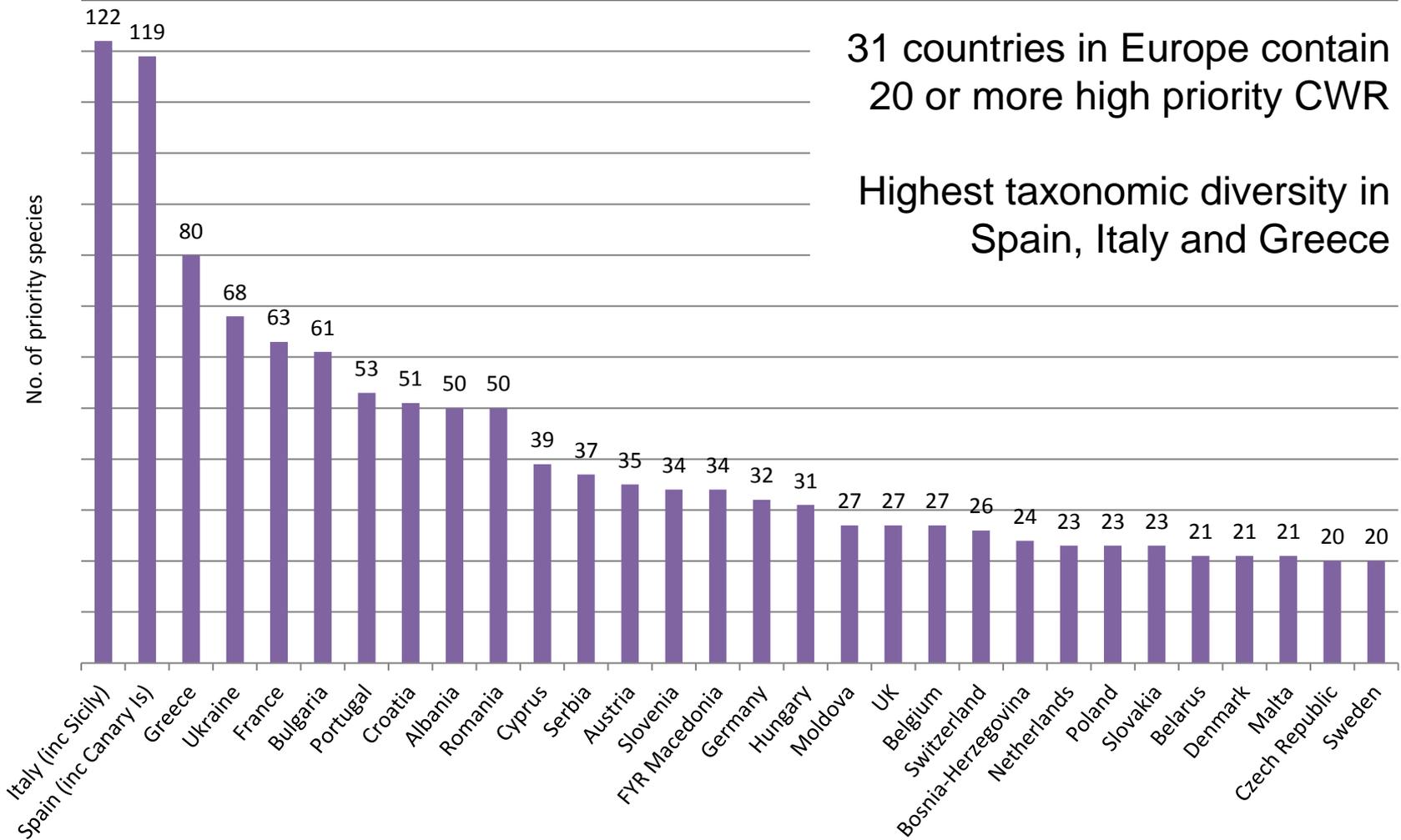
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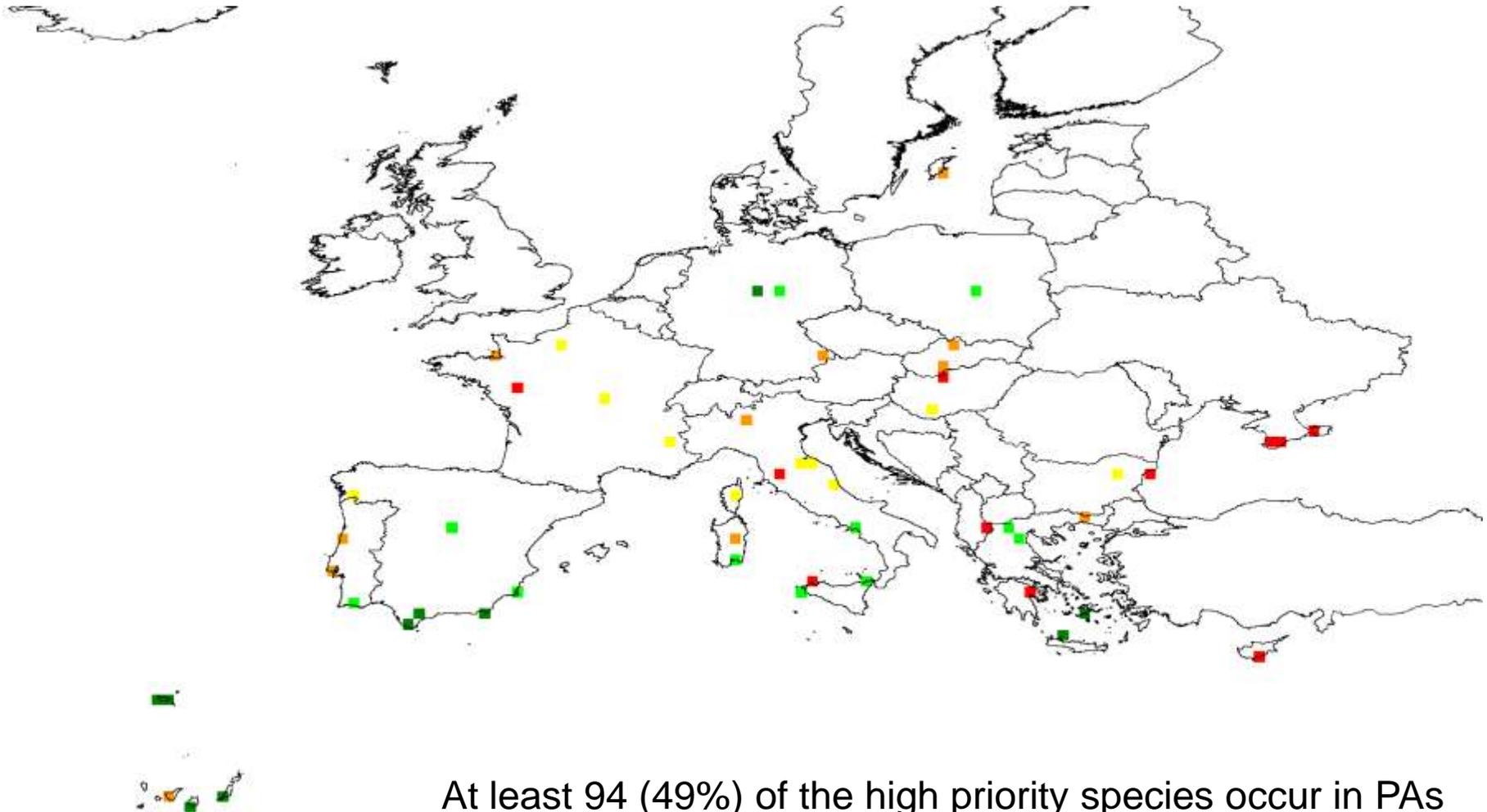
Red List status of 192 high priority European CWR



### 3. REGIONAL CWR DISTRIBUTION

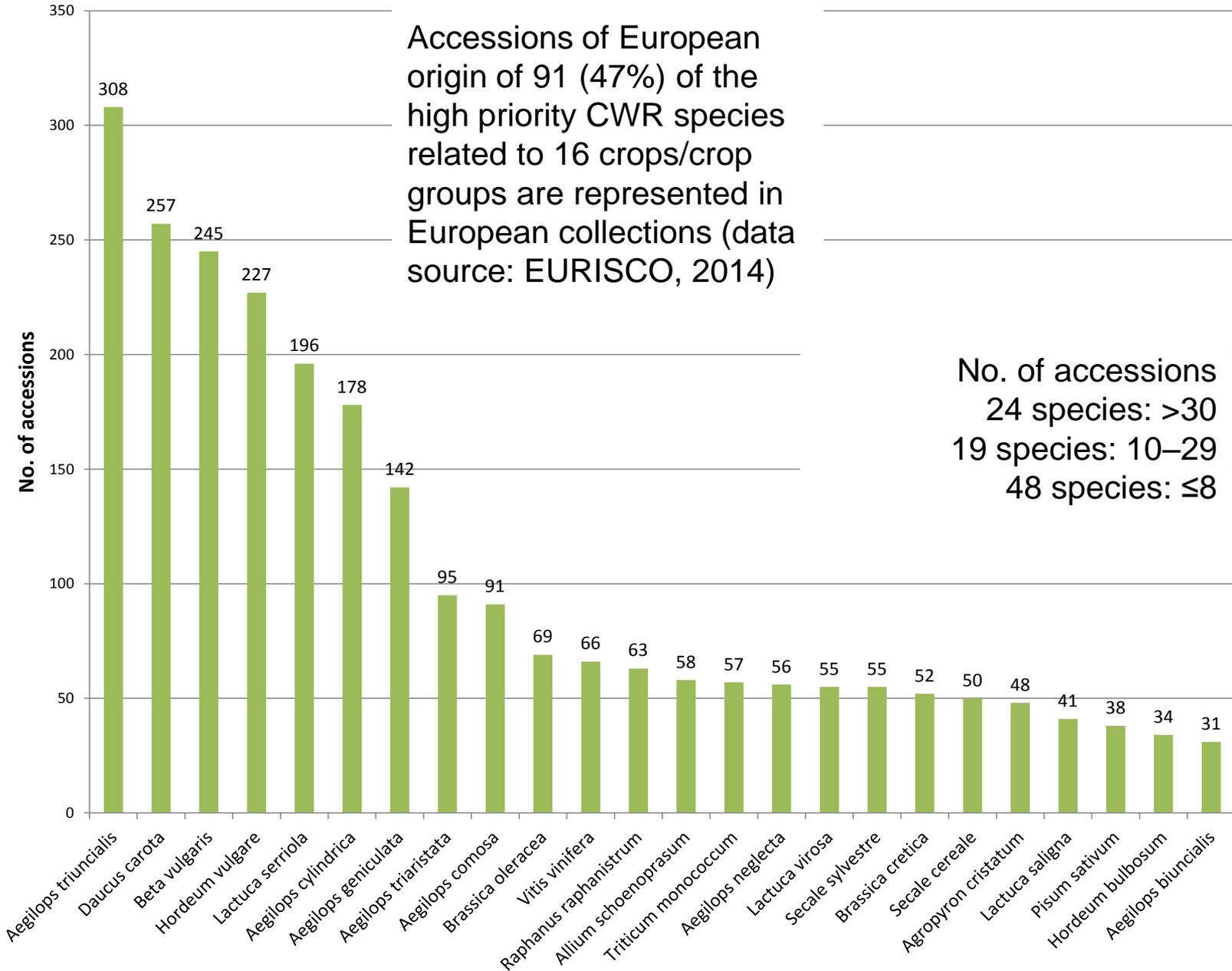


### 3. IDENTIFYING TARGET POPULATIONS

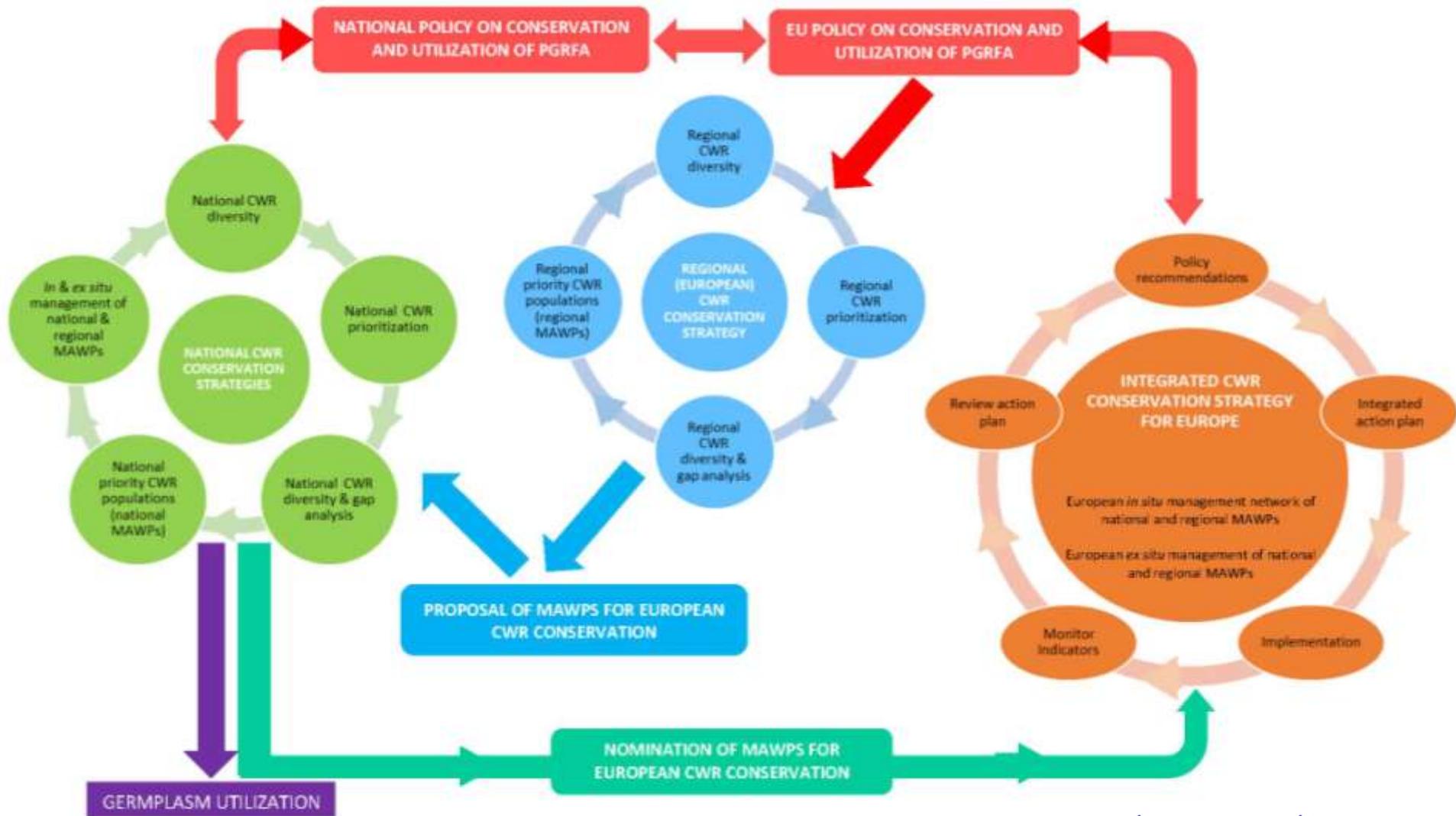


At least 94 (49%) of the high priority species occur in PAs

### 3. IDENTIFYING TARGET POPULATIONS



## 4. AN INTEGRATED EUROPEAN CWR CONSERVATION STRATEGY CONCEPT



[www.pgrsecure.org/documents/Concept.pdf](http://www.pgrsecure.org/documents/Concept.pdf)

## 4. AN INTEGRATED EUROPEAN CWR CONSERVATION STRATEGY cont'd

### FROM PLANNING TO PRACTICE: SOME NEEDS/CHALLENGES

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- **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

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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
3. 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

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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.....

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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!