

# Crop Wild Relatives in the Netherlands, actors and protection measurements

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# content

- PGR Forum project (5 slides)
- historical context in the Netherlands
- relevant organisations – national level
  - owners of nature preserve areas
  - Netherlands Environmental Assessment Agency
  - NGO's e.g. VOFF & FLORON
- Dutch policy on nature conservation
  - international context
  - red lists, legal protection
- CWR in the Netherlands
  - number of species & relevance
  - conservation

# PGR Forum



- European Crop Wild Relative Diversity Assessment and Conservation Forum
  - funded under 5<sup>th</sup> Framework Program for Energy, Environment and Sustainable Development
    - started 1-11-02, 3 years
  - coordinated by the University of Birmingham
  - 23 partners from 21 countries
  - [www.pgrforum.org](http://www.pgrforum.org)

# a global strategy for CWR conservation & use

- **current situation** (Heywood)
- most countries have no inventory on their CWR
  - base-line data needed:
    - taxonomic identification incl. synonyms
    - ecogeographic information (distribution, biology, ecology, genetic diversity)
    - conservation status (Red Listing, in situ & ex situ gap analysis)
- habitats CWR often under threat
- protected areas mostly have no management plans
- representation in genebanks uneven & incomplete
- only relative few projects address CWR

# Reserve management

- *In situ* genetic conservation is still in its “infancy”  
(Jain, 1975; Hawkes, 1991; Heywood, 2003)
- The long term objective is continuity and stability of management of the reserve
  - Reserves should have a management plan
    - mostly not the case
  - A management plan should be flexible to adapt to changes at the site, as communities are intrinsically dynamic and change is ‘natural’

# preliminary conclusions

- European (world?) database on CWR needed
  - proposed: use EURISCO system to feed the DB
- set priorities based on
  - occurrence / threat
  - value of the crop
- national organisations responsible
  - determine national CWR conservation & threat status
  - develop strategy
    - e.g. select a limited number of areas with the occurrence of the highest number of taxa, to be transformed into nature reserves.

# CWRIS (S. Kell & J. Moore)



## ■ the PGR Forum Crop Wild Relative Information System

- regional catalogue for Europe & the Mediterranean
- backbone: Euro+Med PlantBase + Mansfeld's World DB
- 23.818 CWR taxa
  - =77% of 30.729 spp. in EUR+MED (of 400.000 worldwide [Heywood])
- 243.000 occurrences in 130 geographical units
- hosted by IPGRI on behalf of ECP/GR at:
  - [www.cwris.ecpgr.org](http://www.cwris.ecpgr.org)

## ■ national CWR inventories on-line

- UK: [www.searchnbn.net](http://www.searchnbn.net) , Germany: [www.floraweb.de](http://www.floraweb.de)

# historical context in the Netherlands

- Foundation for flora survey (IVON) founded 1930
  - centralize results of vegetation recordings
  - map the distribution within the Netherlands
- 1950: grid size changed 20.8 → 25 km<sup>2</sup>
  - after Topographic Service started distribution of maps with a kilometre grid
- 1975: standard list Dutch flora approved by florists assembly
  - replacing preliminary list of 1971



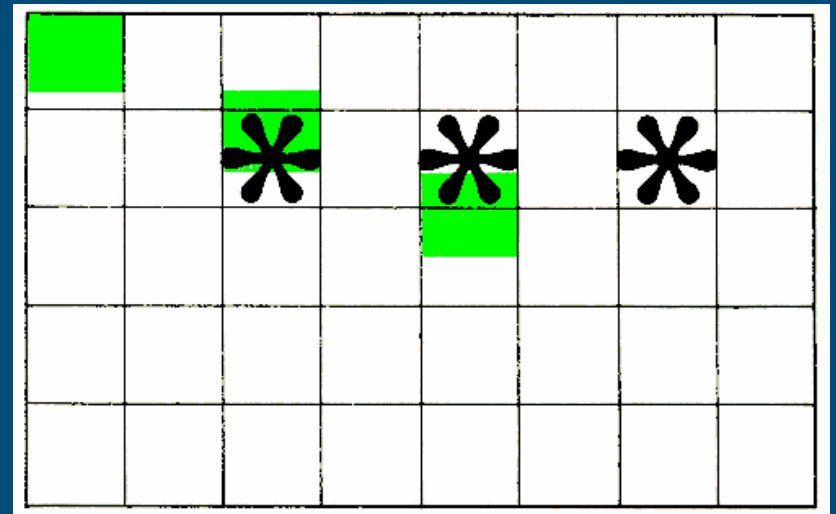
## historical context (2)

- In 1977 Statistics Netherlands (CBS) starts supporting IVON for the Atlas of Dutch Flora
- result: 3 books with distribution maps
  - 1) extinct & very rare plants (1980, 333 taxa)
  - 2) rare & rather rare plants (1985, 560 taxa)
  - 3) less rare & common species (1989, 584 taxa)

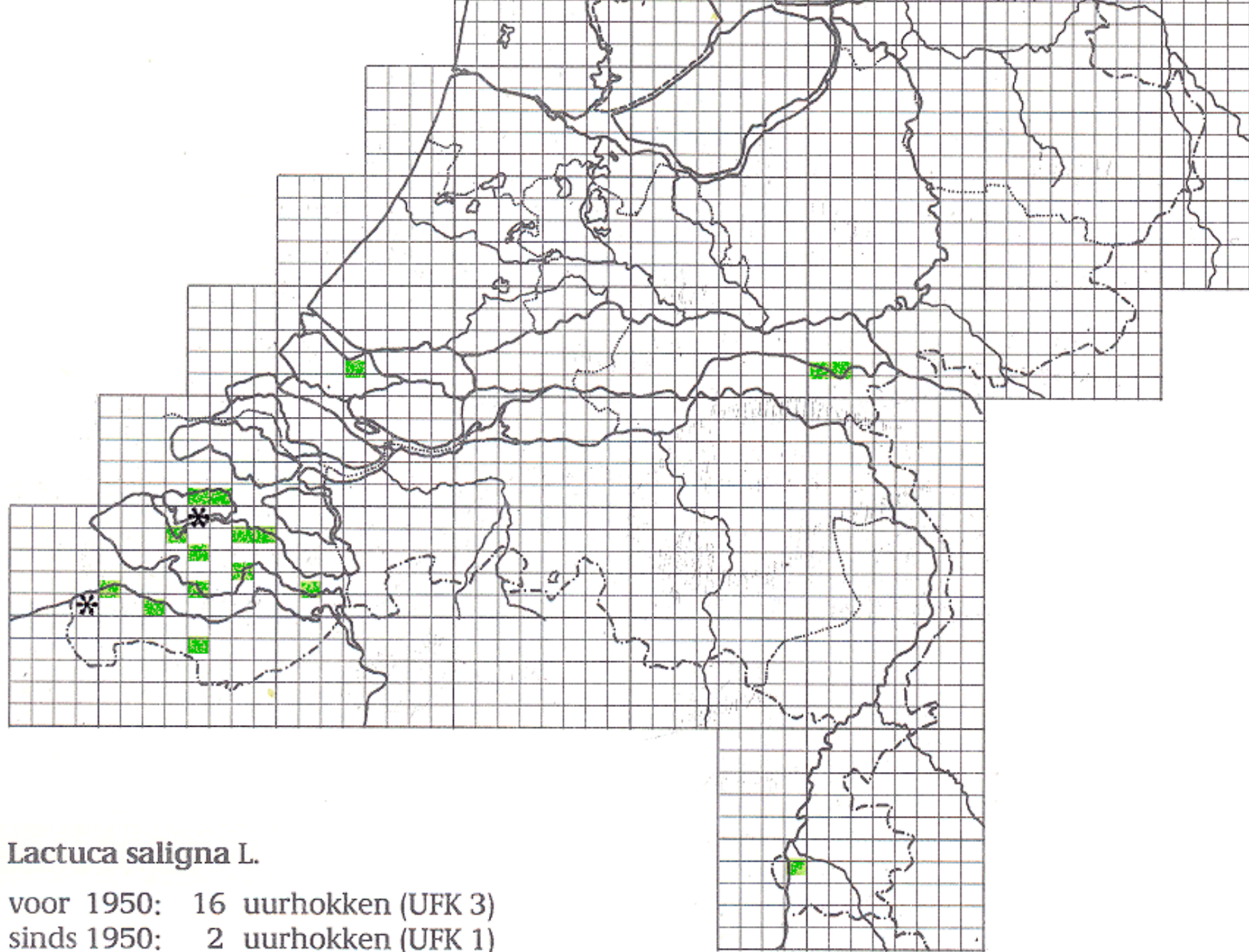


# changed grid size

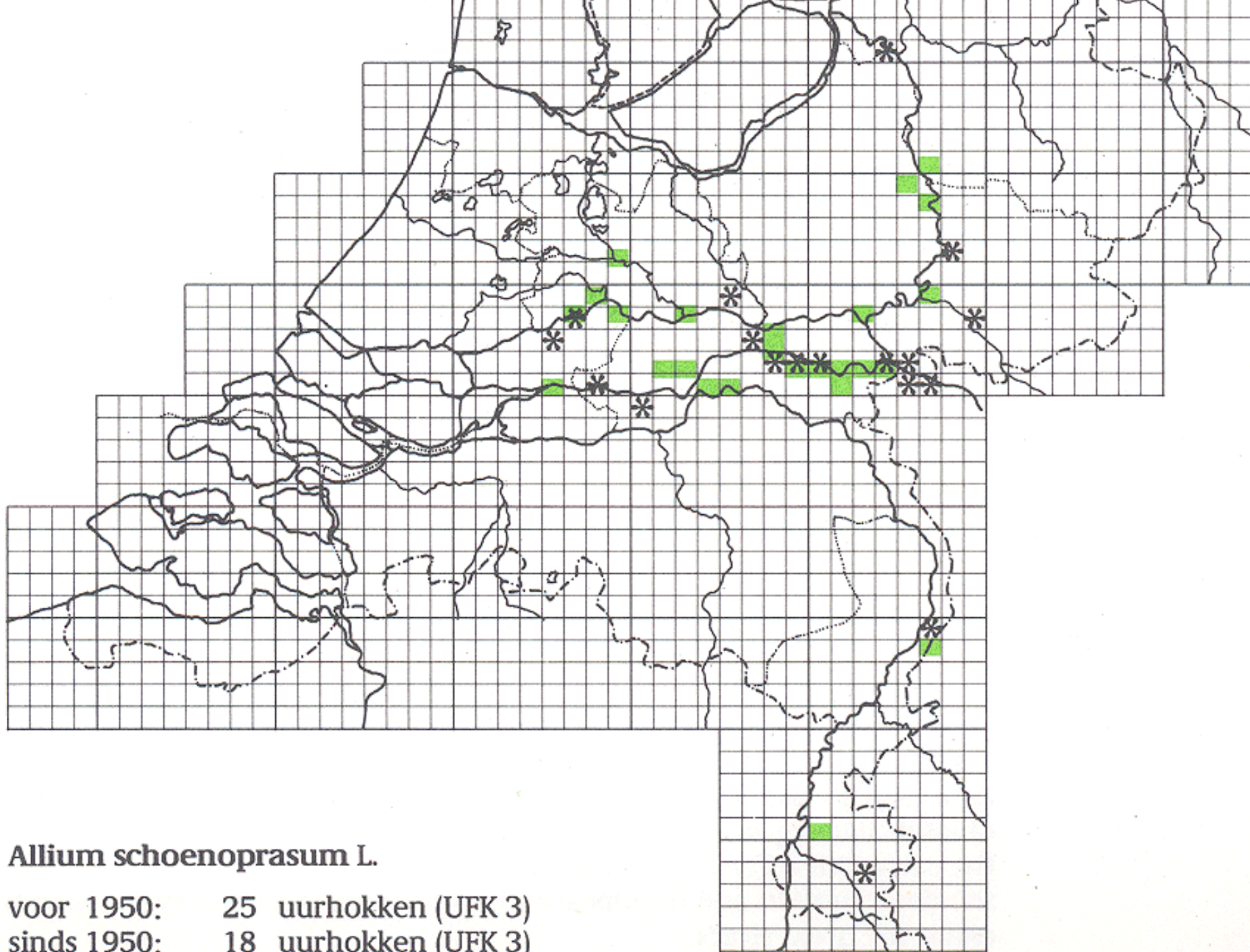
- green square: monitored before 1950 (old)
- black asterix ( \* ): monitored after 1950 (new)

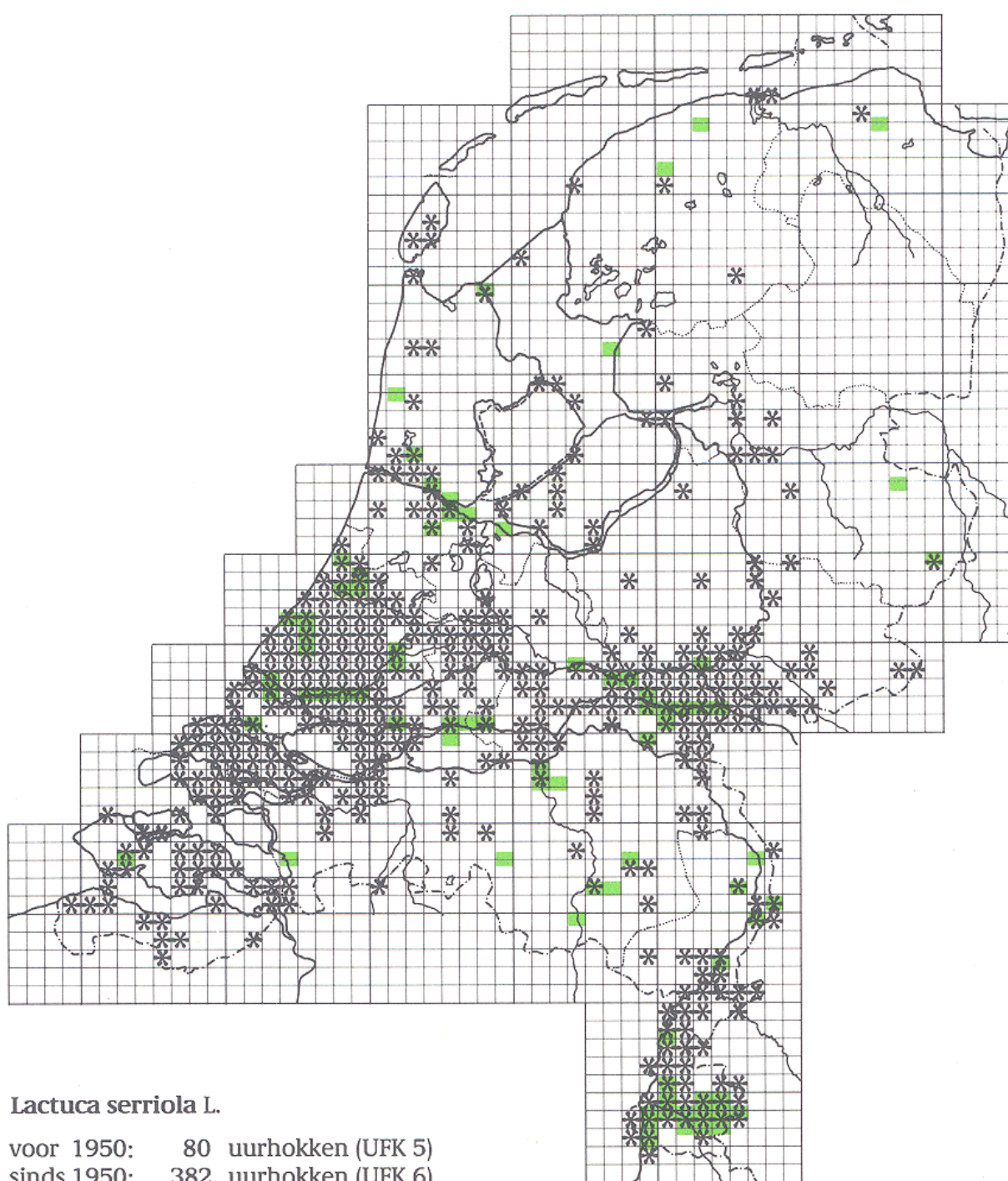


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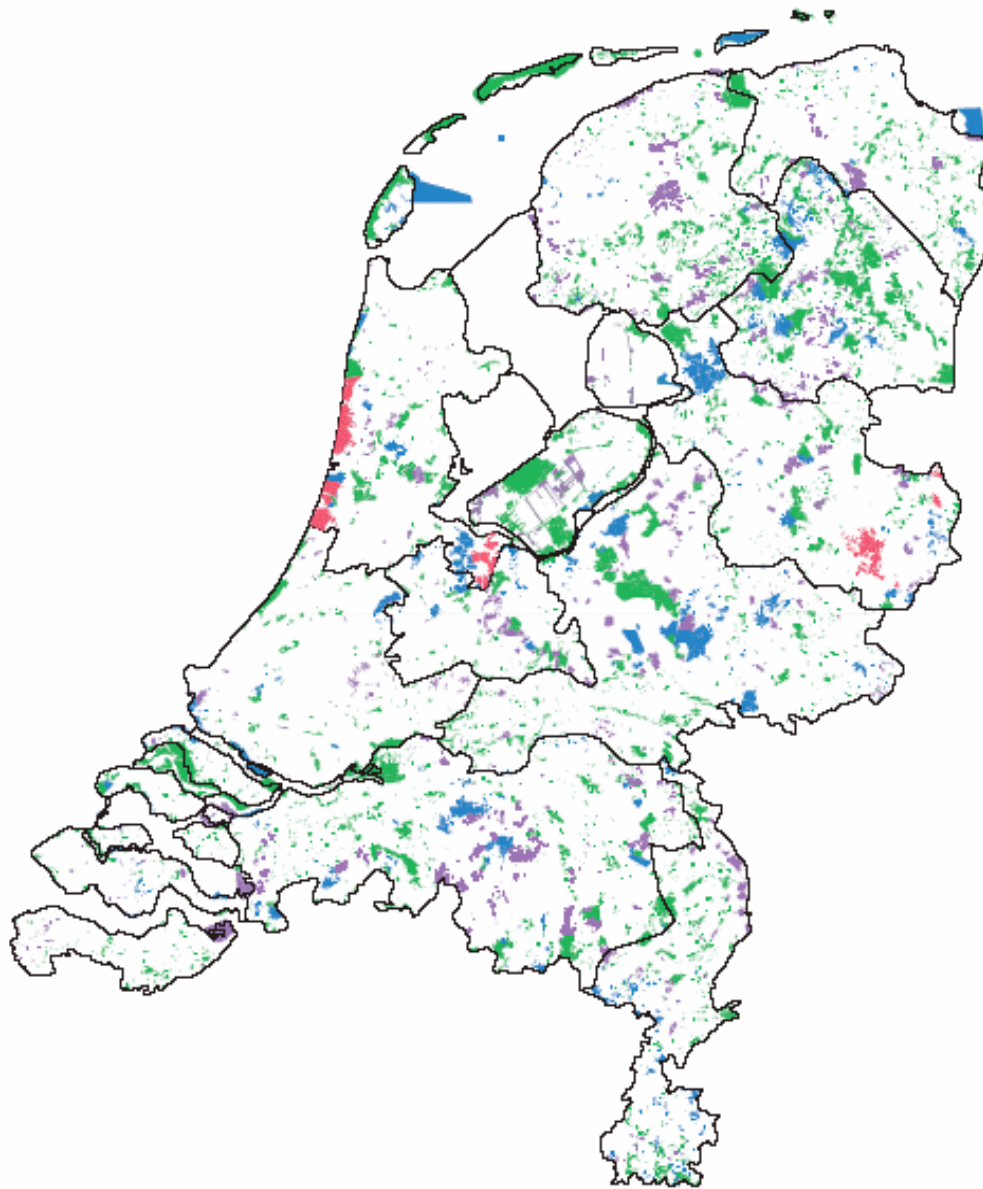


# owners of nature preserve areas

organisation	areas	ha
12 Provincial nature conservation organisations:		
<i>It Fryske Gea</i>	52	19.000
<i>Het Drentse Landschap</i>	34	5.500
<i>Het Groninger Landschap</i>	18	7.300
<i>Landschap Overijssel</i>	42	4.650
<i>Geldersch Landschap &amp; Geldersche Kasteelen</i>	136	10.900
<i>Het Flevo-landschap</i>	54	4.500
<i>Het Utrechts Landschap</i>	70	4.500
<i>Het Brabants Landschap</i>	95	15.300
<i>Het Limburgs Landschap</i>	59	6.700
<i>Landschap Noord-Holland</i>	66	2.850
<i>Het Zuid-Hollands Landschap</i>	92	3.400
<i>Het Zeeuwse Landschap</i>	61	7.900
other		
<i>State Forest Service</i>	89	246.000
<i>Society for preservation of Nature Reserves in the NLD</i>	366	89.900
<b>TOTAL</b>		<b>428.400</b>

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## Land-managing organisations properties and/or areas

-  State Forest Service
-  Society for the Preservation of Nature Reserves in the Netherlands
-  Provincial Nature Conservation Society
-  Local non-governmental organisations (category incomplete)

# Organisations maintaining CWR *ex situ*

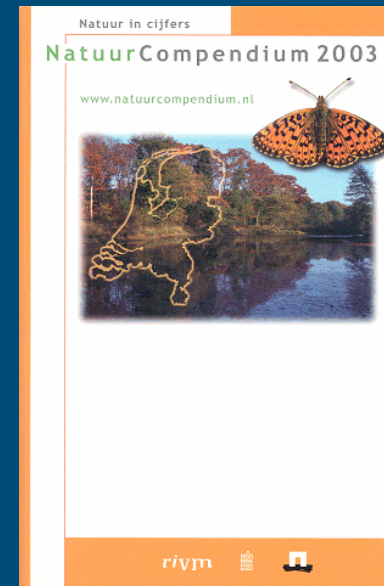
- the Dutch Botanical gardens
  - recognize genebank function
  - common documentation & presentation on the web planned
- several private collections
  - foundations, zoos
- CGN
  - maintaining PGR for agriculture (in a broad sense)



# Netherlands Environmental Assessment Agency (MNP)



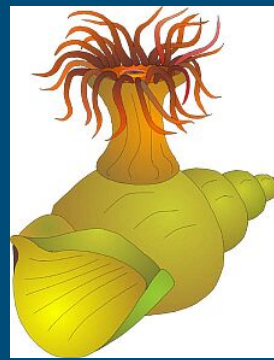
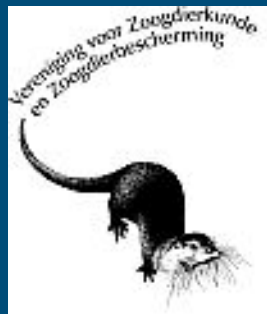
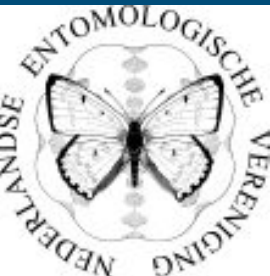
- consists of parts of the National institute for public health & environment (RIVM) and DLO Foundation
- responsible for Environmental Data Compendium
  - printed form incl. CD rom
  - online: [www.mnp.nl/mnc/](http://www.mnp.nl/mnc/)
  - plant distribution data from FlorBase



# the NLD Society for Research on Fauna & Flora

( Vereniging Onderzoek Flora en Fauna )

- joint venture of 12 private data maintaining organisations



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# the NLD Society for Research on Fauna & Flora

- ANEMOON (Stichting ANalyse, Educatie en Marien Oecologisch ONderzoek)
  - molucs & marine fauna
- BLWG (Bryologische & Lichenologische WerkGroep KNNV) - mosses, lichens
- EIS-NL (European Invertebrate Survey Nederland) - grasshopper, libelle
- FLORON - vascular plants
- KNNV (Koninklijke Nederlandse Natuurhistorische Vereniging)
- NEV (Nederlandse Entomologische Vereniging) – insects, millipedes, spiders
- NMV (Nederlandse Mycologische Vereniging) - mushrooms
- RAVON (Reptielen-, Amfibieën- en Vissen Onderzoek Nederland)
- SOVON (Sticht. Vogelonderzoek Nederland) - birds
- TINEA - small butterflies & dragonflies
- The Butterfly foundation
- VZZ (Vereniging voor Zoogdierkunde & Zoogdierbescherming)
  - mammals

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# the NLD Society for Research on Fauna & Flora

- identifies areas of high importance
- locality specific data on-line available ([www.natuurloket.nl](http://www.natuurloket.nl))
  - e.g. for (road) construction projects



## Foundation for floristic survey the Netherlands

- founded 1989, successor of IVON
- training of volunteers for monitoring the flora per grid cell
  - hundreds of volunteers coordinated in districts
- FlorBase: database with observations from 1975 onwards in 1x1 km grid
  - in cooperation with the National Herbarium, Leiden
  - > 8.8 million observations
- FLORIVON: historical data from 1900-1950 (different grid)

# Dutch policy on habitat & species protection

- The international context
  - IUCN (see next slide)
  - Convention of Bern
- Red lists
- Legal protection of habitats & species

# The World Conservation Union (IUCN)



- founded 1948; headquarters: Gland, Switzerland
  - Mission: influence, encourage & assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.
- the Species Survival Commission (SSC)
  - assesses the conservation of taxa on a global scale
  - highlights the ones threatened that need conservation
- IUCN Red List of threatened species
  - <http://www.redlist.org>
  - nine categories for the status of the taxa
    - extinct, extinct in the wild, critically endangered, endangered, vulnerable, near threatened, least concern, data deficient, not evaluated
  - do not provide legal protection

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# Convention of Bern

- Convention on the conservation of **European** Wildlife and Natural Habitats; came into force 1982
- the parties will take measures to ensure the conservation of the habitats of the wild flora & fauna species
  - incl. planning & development policies, pollution control
  - will disseminate the general need to conserve species and habitats
- Three appendices flora (app. I) and fauna (app. II and III) list species for special attention
  - do not provide legal protection
- ratified by NLD

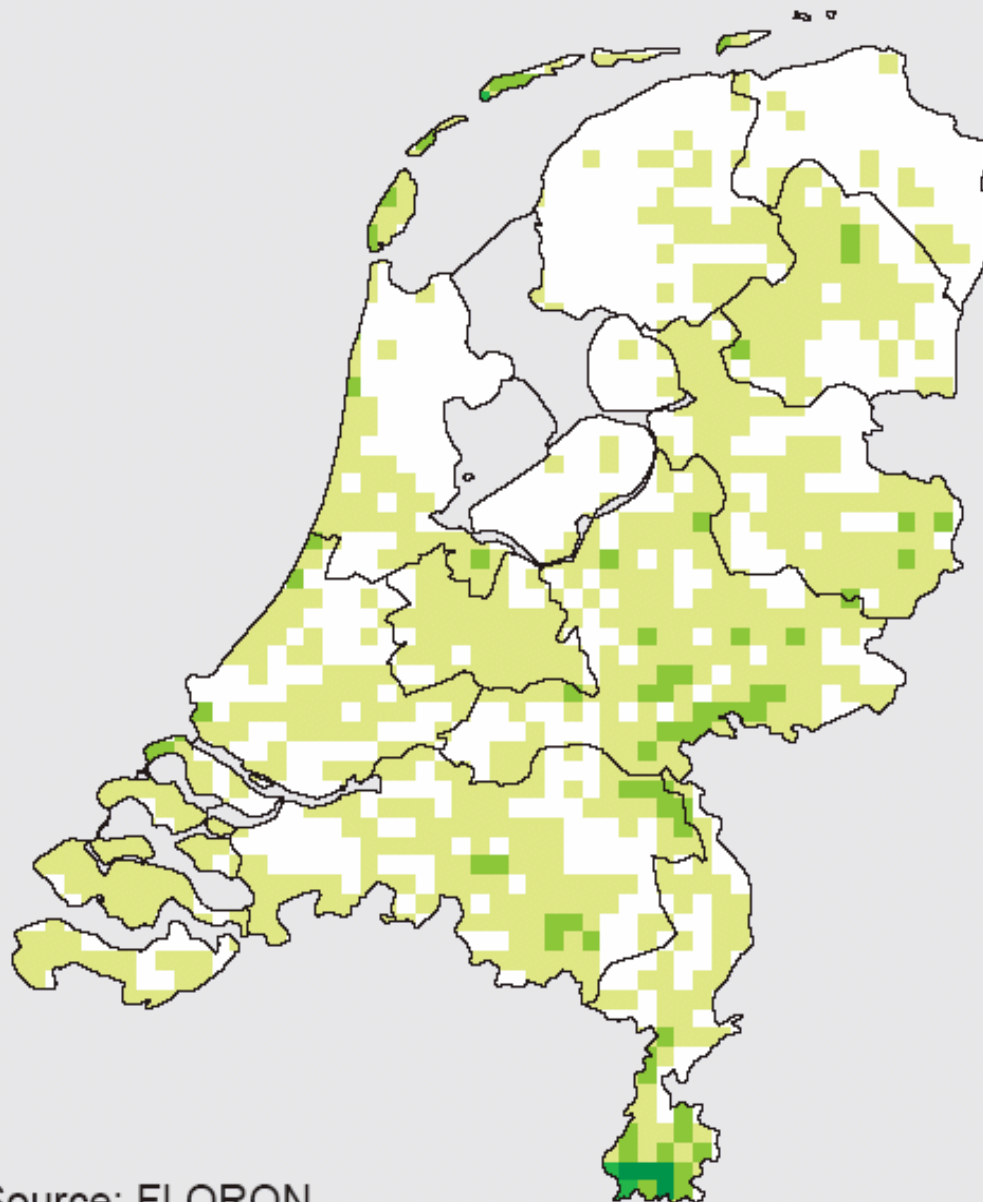


# Red lists in the Netherlands

- nine red lists published from 1994 – 1998
- replaced in 2004 by:
  - mammals (22 species), birds (78), reptiles (6), amphibians (9), caddis flies (86), locusts and crickets (18), stoneflies (19), dragonflies (27), mayflies (39), fishes (35), bees (188), butterflies (48), land and fresh water molluscs (68), flatworms (4), **vascular plants** (498), mosses (245), lichens (241) and mushrooms (1648 species).
- by law regulated that Dutch government will support the protection of red list species
  - regional authorities & NGOs should reckon with red lists when managing terrains
- they do not provide legal protection

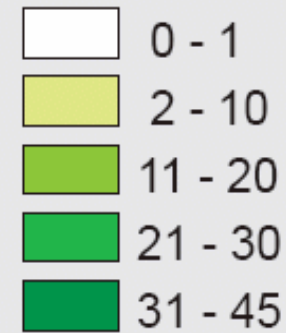
# The red list for vascular plants

- proposed in 1990 & 2000, official since 2004
- contains 498 species
- five categories:
  - near threatened: 114 species (23%)
  - vulnerable: 136 species (27%)
  - endangered: 103 species (20%)
  - critically endangered: 97 species (19%)
  - regionally extinct: 48 species (10%)



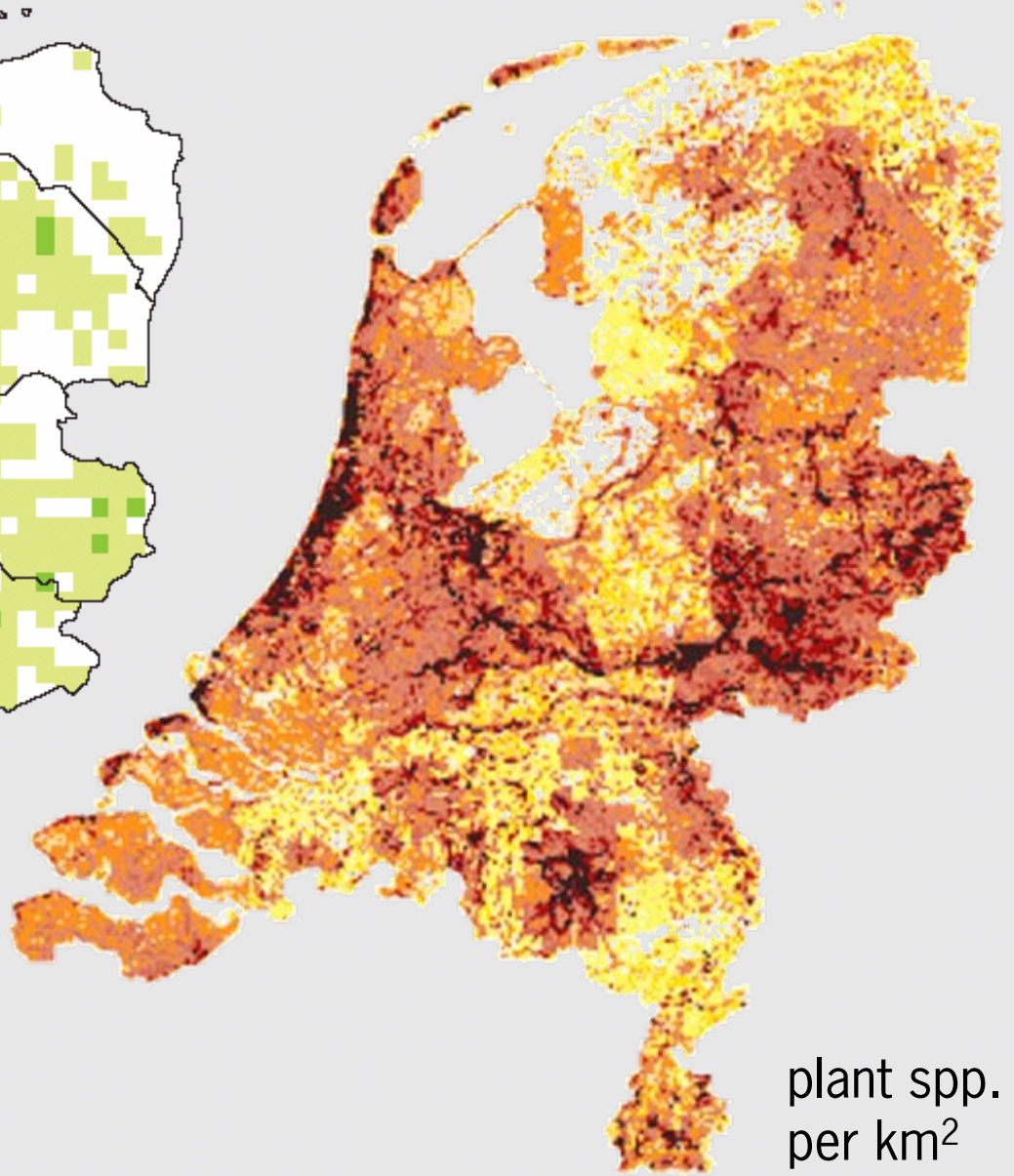
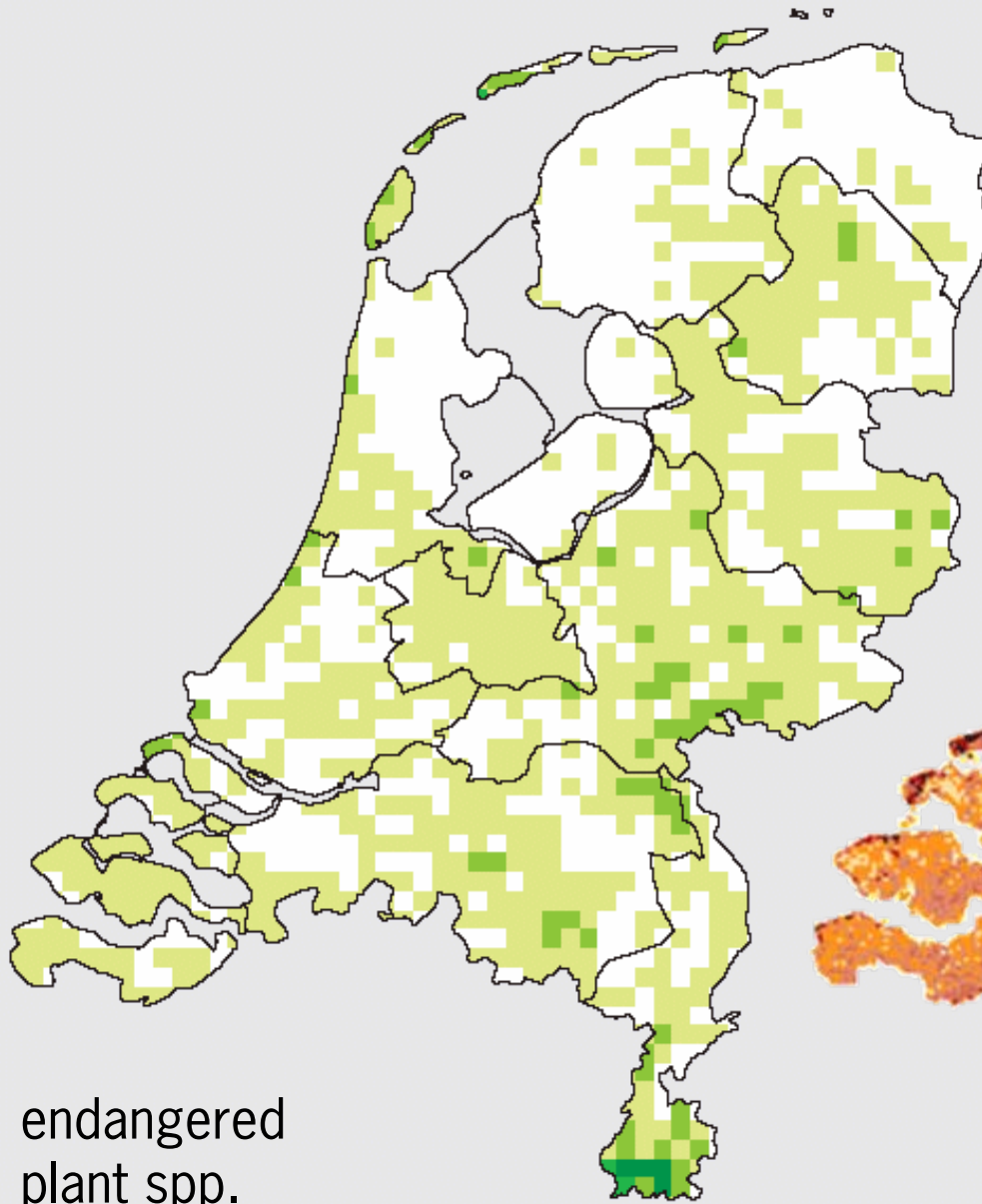
## Occurrence of endangered plant species

No. species



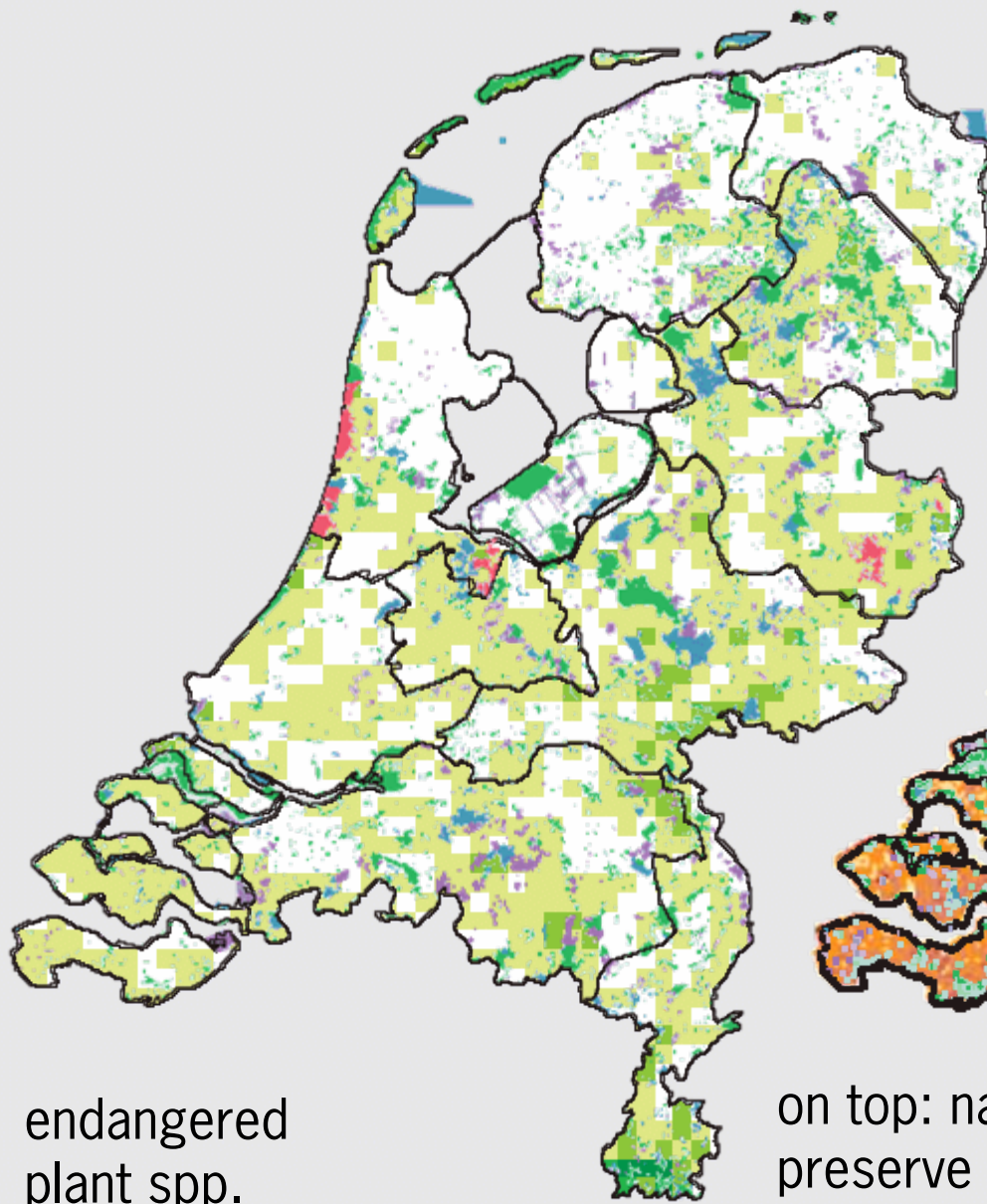
Source: FLORON

RIVM/NC/Oct02/1714



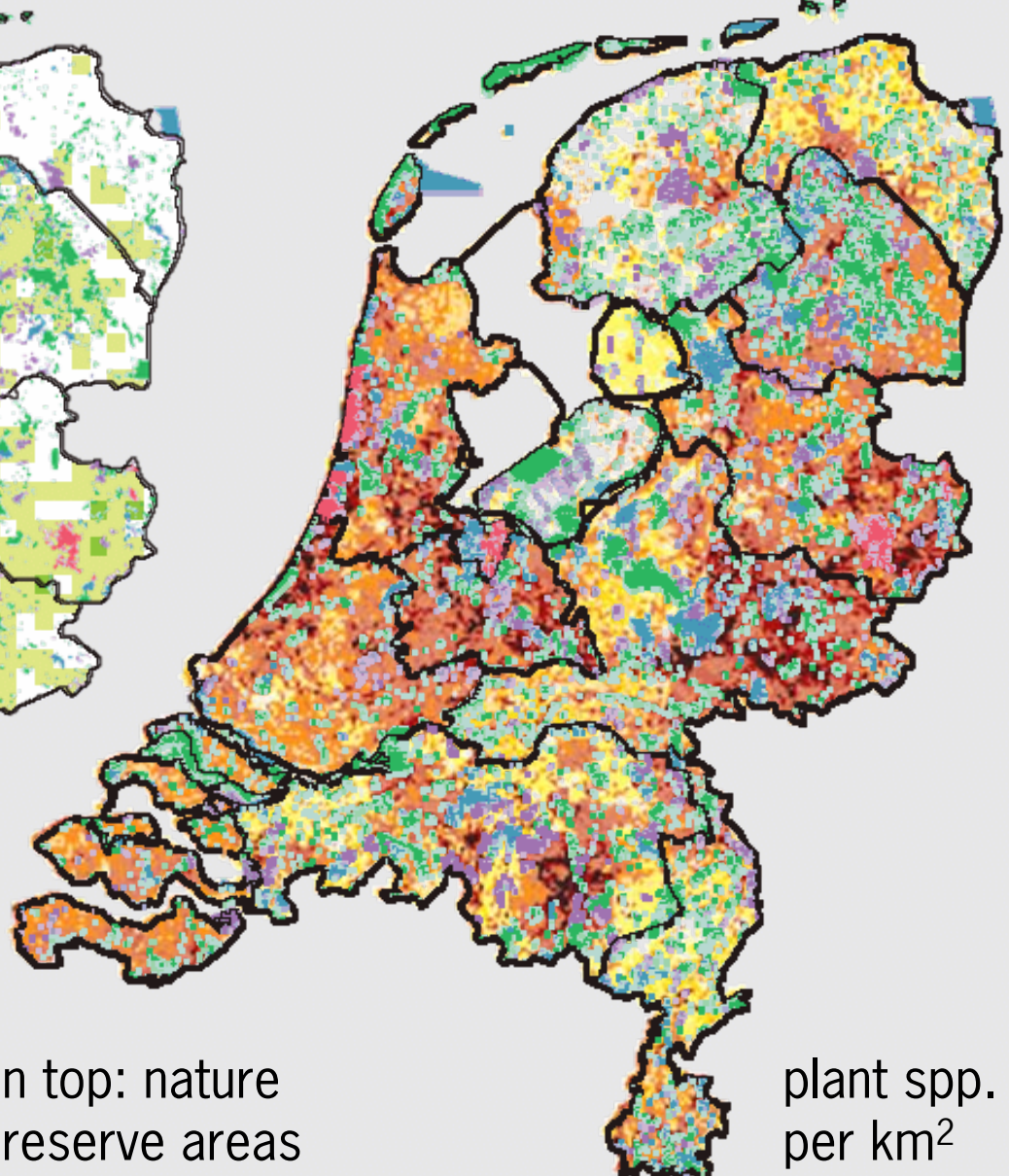
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endangered  
plant spp.

on top: nature  
preserve areas



plant spp.  
per km<sup>2</sup>

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# Legal protection of species & habitats

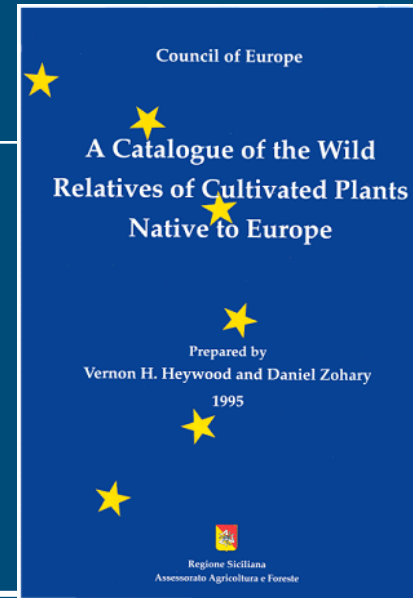
- European Birds and Habitats Directives
  - protects 4 plant species occurring in NLD
- the Dutch Flora and Fauna Act of 2002
  - protects 102 plant species, 72 are on the red list
    - furthermore: protects most birds, mammals (64 species), reptiles (7), amphibians (16), fishes (12), crustaceans (1), ants (4), butterflies (26), beetles (5), dragonflies (8), molluscs (2 species)
  - imposes a duty on citizens and government to care for flora and fauna

# determining CWR in te Netherlands

- definition CWR within PGR Forum: a taxon related on the genus level to a species of direct socio-economic importance
  - include food, fodder and forage crops, medicinal plants, condiments, ornamental and forestry species, as well as plants used for industrial purposes, such as oils and fibres.
- starting point: Standard List of the flora of the Netherlands (FLORON, March 2005)
  - 1536 vascular plant species from 65 genera
- linked on genus level with Mansfeld's World Database of Agricultural and Horticultural Crops (does not incl. ornamentals & forestry plants) as well as the PGR Forum provided list (from: Euro+Med PlantBase and Mansfeld's DB)

# results

Percentage of CWR on Standard List of the Flora (1536 taxa) according to A) Mansfeld, B) PGR Forum, C) Heywood & Zohary (1995), when linked on the species level or on the genus level.



	Mansfeld	PGR Forum	Heywood & Zohary (1995)
species	31 %	71 %	6 %
genus	74 %	82 %	22 %

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# discussion

- project goal: conservation gap analysis and recommendations for in situ and ex situ conservation of European CWR
- > 80% of the flora in NLD considered to be CWR
- usefulness of such a selection ?
- use the red list as a guideline instead ?
- genomics: unrelated taxa may contribute valuable genes to our crops, so why restrict to CWR

## discussion - 2

- only 72 from 498 species on the red list are protected by the Flora & Fauna Act
  - so, 86% of the red list species are protected without engagement
- FLORON: many populations, also within nature preserve areas, are small and may easily be lost (habitat destruction, soil acidification, fertilisation, drought etc).
- climate change threatens species growing in cool and wet habitats

## discussion - 3

- even when growing in nature preserve areas, species may still become extinct in future
- is the current protection system (red list, nature preserve areas, Flora & Fauna Act) effective enough ?
- should we consider ex-situ conservation ?
  - botanical gardens ?
- what should CGN do?

# Red list ↔ list Heywood & Zohary

num	species	NLD name	RL2000	indig	Hey-wood
304	<i>Erysimum cheiri</i>	Muurbloem	critically endangered	a	2
1379	<i>Viola lutea</i> subsp. <i>calaminaria</i>	Zinkviooltje	critically endangered	i	1
79	<i>Apium repens</i>	Kruipend moerasscherm	endangered	i	1
404	<i>Dianthus deltoides</i>	Steenanjer	vulnerable	i	1
734	<i>Leucojum aestivum</i>	Zomerklokje	vulnerable	i	2
1128	<i>Salvia pratensis</i>	Veldsalie	vulnerable	i	1

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# next slide:

## Red list $\leftrightarrow$ genera CGN collections

### Red list – abbreviations

- RE = regionally extinct
- CE = critically endangered
- E = endangered
- V = vulnerable
- NT = near threatened

a = archaeophyte: a plant that existed in ancient times (< year 1500)

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species	NLD-name	indig	RL2000	acc	CGN genus
<i>Lactuca saligna</i>	Wilgsla	i	RE	1 (69)	2645
<i>Lolium temulentum</i>	Dolik	a	RE	0	514
<i>Lolium remotum</i>	Vlasdolik	a	RE	0	514
<i>Chondrilla juncea</i>	Knikbloem	i	CE	0 (5)	25
<i>Festuca ovina</i>	Genaald schapengras	i	CE	0	75
<i>Vicia tetrasperma</i> subsp. <i>gracilis</i>	Slanke wikke	i	CE	0	849
<i>Carum verticillatum</i>	Kranskarwij	i	CE	0	53
<i>Hordeum marinum</i>	Zeegerst	i	E	0 (11)	3490
<i>Trifolium medium</i>	Bochtige klaver	i	V	0	261
<i>Trifolium subterraneum</i>	Onderaardse klaver	i	V	0	261
<i>Trifolium micranthum</i>	Draadklaver	i	V	0	261
<i>Allium oleraceum</i>	Moeslook	i	V	0	632
<i>Linum catharticum</i>	Geelhartje	i	V	0	984
<i>Trifolium ornithopodioides</i>	Vogelpootklaver	i	NT	0	261
<i>Vicia tenuifolia</i>	Stijve wikke	i	NT	0	849
<i>Carum carvi</i>	Karwij	i	NT	0	53
<i>Hordeum secalinum</i>	Veldgerst	i	NT	0	3490

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# Some conclusions

## ■ CGN

- sees no need for action for itself

## ■ PGR Forum

- make priority lists for Europe, based e.g. on the number of countries where each species occurs
- take protection measurements on national level

# links

- [www.pgrforum.org](http://www.pgrforum.org)
- [www.nlbif.nl](http://www.nlbif.nl) (Dutch national focal point for the Global Biodiversity Information Facility GBIF [ [www.gbif.org](http://www.gbif.org) ])
- [www.nederlandsesoorten.nl](http://www.nederlandsesoorten.nl)
- [www.natuurcijfers.nl](http://www.natuurcijfers.nl)
- [www.plant-talk.org/country/netherld.html](http://www.plant-talk.org/country/netherld.html)
- [www.unep-wcmc.org](http://www.unep-wcmc.org)
- [users.pandora.be/guy.de.kinder/links/plantendatabases.htm](http://users.pandora.be/guy.de.kinder/links/plantendatabases.htm)
- [www.iucn.org/themes/ssc/](http://www.iucn.org/themes/ssc/)