Natural succession.
Horizontal landscape-ecological relations.
Dynamics (time).
Biological values Map.
Flemish ecological network (VEN) ; Natura-2000

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International Master in Architecture. Theme 8.

Course Environmental Sustainability.

Introduction: **ecologically sound rural planning** .

Since we have studied the relation between time (process) and space (pattern) in Theme 4 (Relation Theory, Van Leeuwen 1966), it is important now to go into the details, in order to apply these insights also in rural planning as we did already in urban planning (Theme 5).

The concept 'DYNAMICS' (time)

- Is a change of abiotic ecological conditions over time (by man – anthropogenic - either a natural cause)
- Is a temporal (time) concept.
- **High Dynamic** environments exhibit fast, strong and sharp changes in abiotic conditions in a short time.

  E.g.: the beach and the windward side of the dunes

  E.g.: the city
- **Low Dynamic** environments show great constancy in time. Abiotic conditions hardly change over time.
- The more dynamics, the less number of species will be resistant (20 %). There are fewer species that occur, but in much larger numbers.

NATURAL SUCCESSION (& DEGRADATION):

A ROBUST pioneer community has almost always the ability to evolve to a FRAGILE climax community over time. That is the process of natural succession.

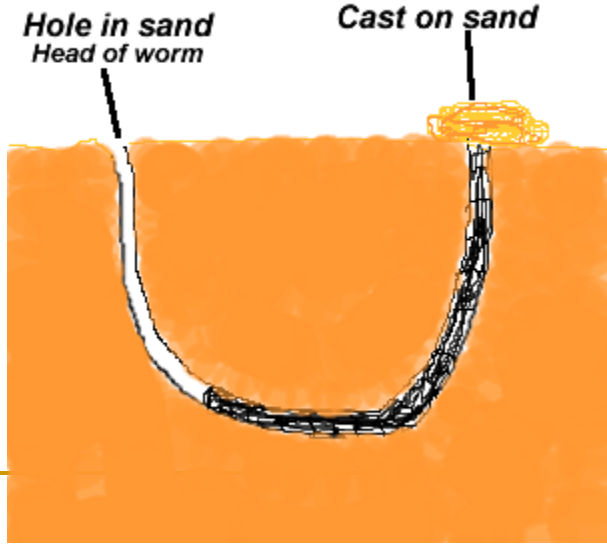
Examples:

- The formation of dunes
- Natural succession to marsh vegetation starting from open water
- Natural succession to woods starting from open areas
- …

The natural process of **dune formation** as the 1st example

The dynamics on the beach and on the windward side of the dunes is very high

Dynamic environments harbor few species, but in large numbers.



The **lugworm** (**zeepier**, *Arenicola marina).* The lugworm lives in a U-shaped pipe into the sand. On one side is the funnel-shaped entrance to the mouth of the lugworm, and at a distance there is a pile of excrement .

http://www.seafishingbaituk.co.uk/lugworm.html

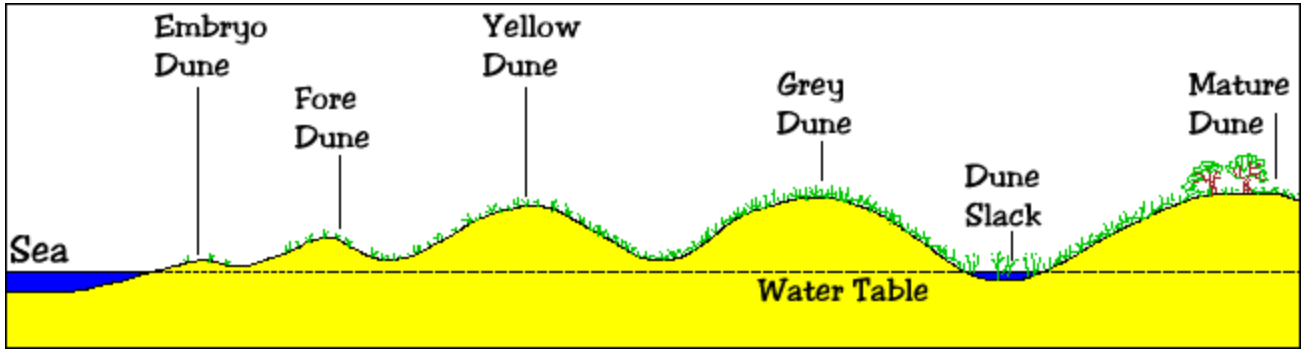
Highly dynamic coastal environment.

The mouth of the river 'Slack', Ambleteuse (F). The circumstances here are too dynamic for deposition of clay or sand, hence the gravel shore (Spit (En) = schoorwal (Nl).

Sea kale, zeekool (*Crambe maritima*) is a pioneer plant

Formation of **embryonic dunes** in Ambleteuse(F)

In the spaces between the grains of sand, fresh rainwater can be stored.



At the coastline, closest to the sea, **embryo** dunes are likely to develop. These are low dunes, often only a metre or so above sea level and they have 80% of the sand exposed. As more sand accumulates, the embryo dunes join to become **foredunes**, which grow in size and are sometimes called **yellow dunes** because of their colour. These are higher (about 5 metres high) and have less sand exposed (20%), due to the vegetation that has taken root, for example, **marram grasses (helmgras**, *Ammophila arenaria*) .
As humus and bacteria from plants and animals are added, the dunes become increasingly grey, more acidic and more covered in vegetation. These are called **grey dunes** or fixed grey dunes because, as the name implies, they are a more permanent feature. These dunes are higher than previous ones at about 8 to 10 metres high, but they can reach up to 30 metres high. Often, but not always there is a drop in the dunes where the water table is reached in an area called the **dune slack**. The dunes then rise again and less than 10% of the sand is exposed as the vegetation cover includes **cotton grass (veenpluis** , *Eriophorum angustifolium*), **heather**, **bramble** (*Rubus sp*.) and **bracken (adelaarsvaren** ,*Pteridium aquilinum)*. As these **mature dunes** progress inland the dunes can take hundreds of years to mature.

http://sd04.co6027.co.uk/Wales/dune%20section.htm

Embryonic dunes. Zwarte Polder in Nieuwvliet (NL)

The embryonic dunes further grow to high calcareous (yellow) sand dunes
Helmgras (*Ammophila arenaria*), **zeewolfsmelk** (*Euphorbia paralias*) en **blauwe zeedistel, sea holly** (*Eryngium maritimum*) are pioneer species of young, calcareous dunes.

Climax Vegetation: dune forest around the dune slack

Voorne (NL): climax dune forest with **Duindoorn, buckthorn** (*Hippophae rhamnoides*) and the **Nachtegaal, Nightingale** (*Luscinia megarhynchos*)

Climax dune forest in Voorne (NL) In the background a dune slack and the young calcareous beach ridge dunes.

Decalcified grey and mature dunes.

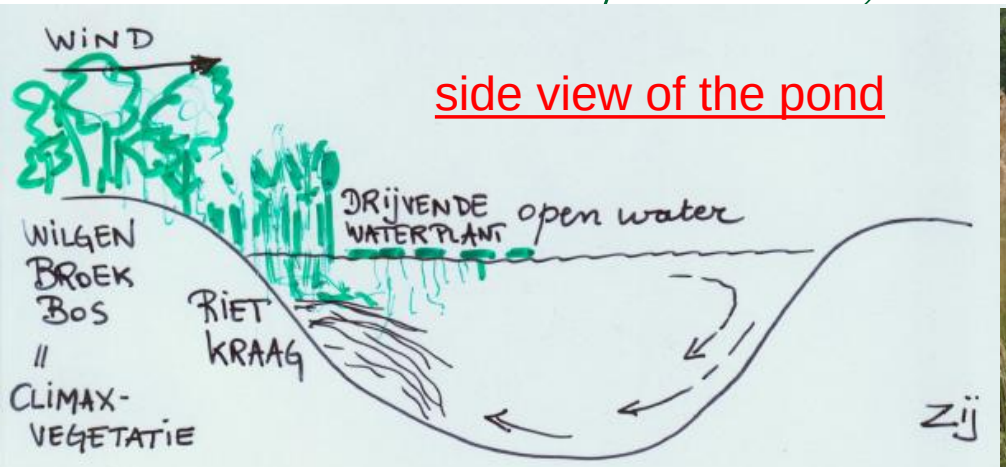
Terschelling (NL): decalcified vegetation of dunes with heather **dopheide** *(Erica tetralix) and* **crowberry, kraaiheide** (*Empetrum nigrum*)

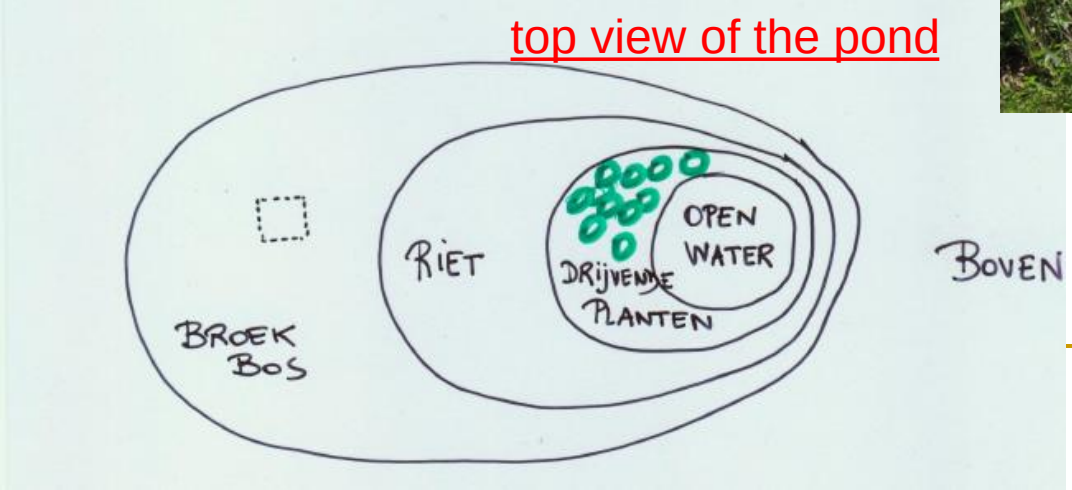
Decalcified grey and mature dunes, used as common pastures.

Ambleteuse (F, Pré communale): Decalcified grey and mature dunes with **Gorse, Gaspeldoorn** (*Ulex europaeus*)

2nd example. **Natural succession** to marsh vegetation, peat swamps and finally to climax swamp forest vegetation is starting from open water:

so the succession process always determines the pattern in landscape.





Once again, the landscape is the result of a process.

This is a universal ecological process, taking place all over the world, within and determined by the local abiotic conditions.

WETLANDS INTERNATIONAL
Thailand Office

Example: Phru Toh Daeng Peat swamp forest (Thailand), http://www.wetlands.org

Meerdonk (B): this creek landscape (*pattern*) is the result of a long *process*, starting from open water…

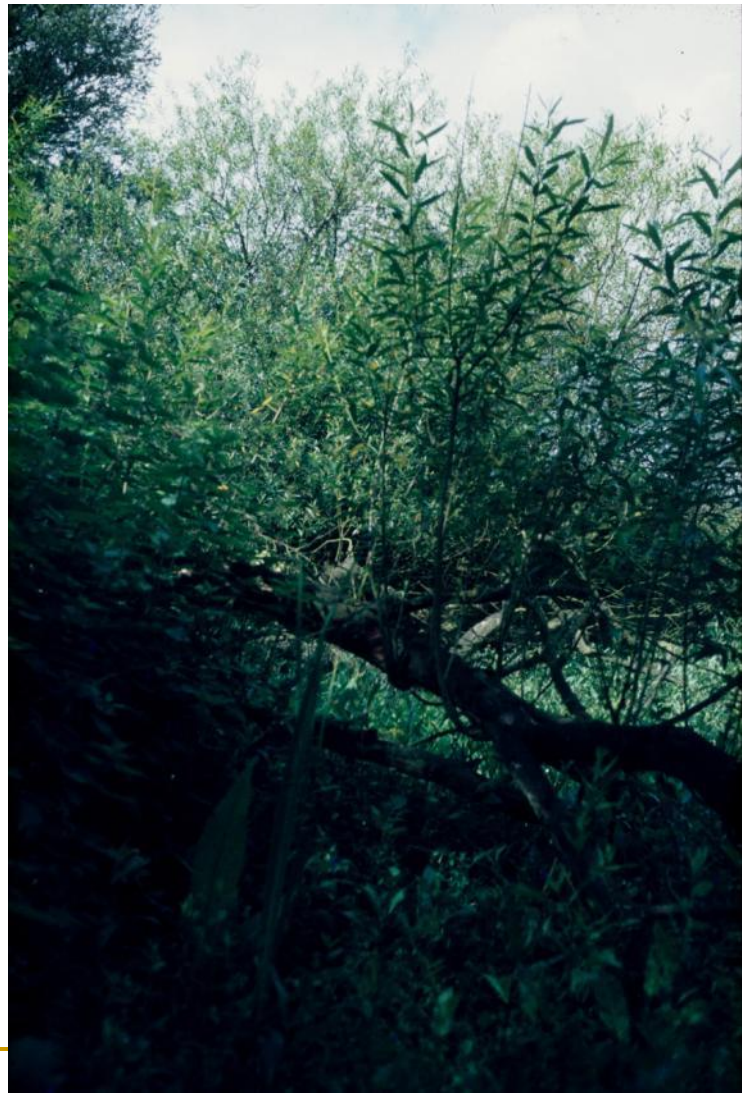
Each stage in this succession process has its own typical bio-indicators.

In the pictures: **Yellow water-lily** ,**Gele plomp** (*Nuphar lutea*), **Grebe, Fuut** (*Podiceps cristatus*)
Arrowhead, Pijlkruid (*Sagittaria sagittifolia*)

Succession stage with **Water violet**, **waterviolier** (*Hottonia palustris*)

Bluethroat, Blauwborst (*Luscinia Svecica*) en **Eurasian Reed-Warbler, Kleine Karekiet** (*Acrocephalus scirpaceus*) are typical reed birds and linked to the reed phase of this process.

The **climax stage** of this process is **willow-alder marsh (wilgen-elzen broekbos) .**



Zoutleeuw (B): Het Vinne

ROBUST pioneer community
high dynamics
few species in large numbers
biomass production is high

dynamics decreasing	succession	dynamics increasing
Slow		Fast
selection and regulation		trivializing and disruption

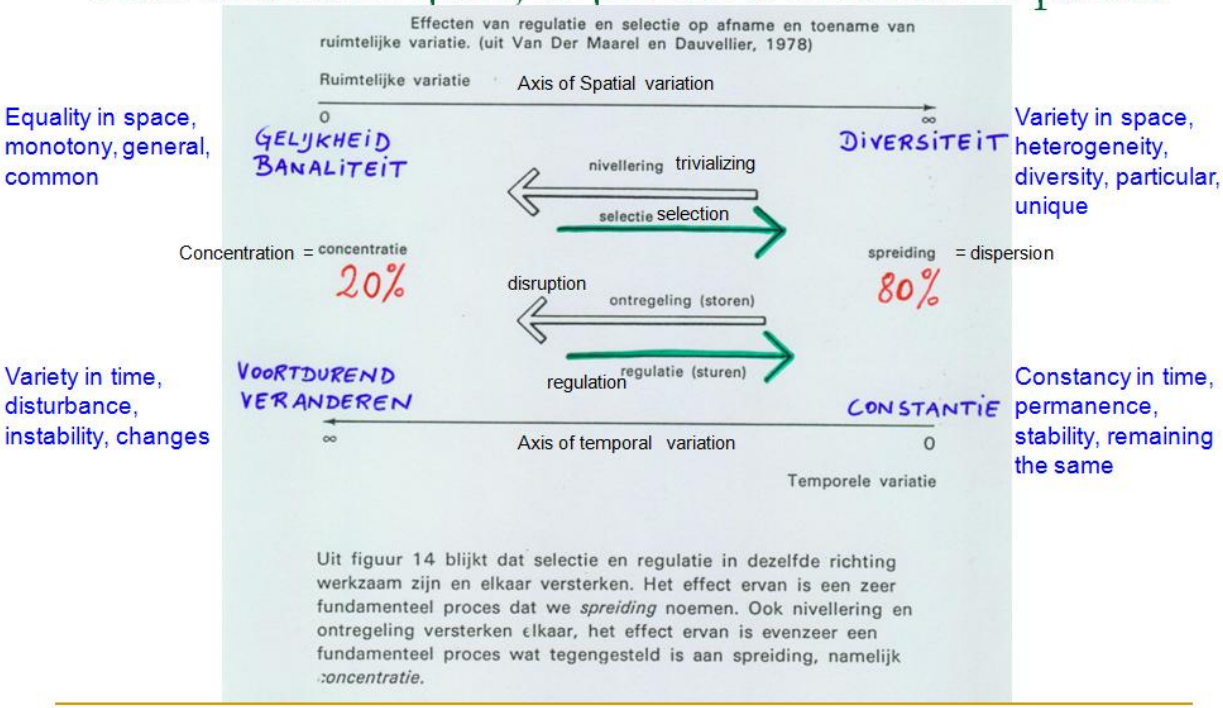
degradation

FRAGILE climax community
low dynamics
many species in low numbers
biomass production is low

SCHEME: NATURAL SUCCESSION & DEGRADATION

Relation theory (VAN LEEUWEN, 1966)

Time dominates space, so process is dominant to pattern



So during the process of natural succession, **regulation** and **selection** are occurring spontaneously. Those were the difficult shifts in the Relation Theory, resulting in more biodiversity with more species, less dynamics and more stability. Remember this scheme in which the green arrows (to the right) were difficult to realise.
On the opposite, degradation processes are linked with **disruption** and thus **trivialisation**: these are fast and easy shifts (to the left)

NATURAL SUCCESSION & DEGRADATION

Design guidelines.

- *Natural succession to marshland:*

  If the designer chooses a landscape with a pool of open water, the natural succession from open water to marsh vegetation has to be blocked. This is possible by the designing the pool surface large, by allowing wind force and by dredging regularly, …

- *Natural succession to forest :*

  If the designer chooses to maintain a heath or grassland, then natural succession to woods starting from open areas has to be blocked. This is possible by grazing, by haying through, taking away heathers sods, …

- In many nature reserves, there is considerable experience with this type of internal management measures.

Gain insight into the many regionally spontaneous succession series. Encourage them or block them according to the design.

Traditional agricultural uses revealed interesting nature management measures

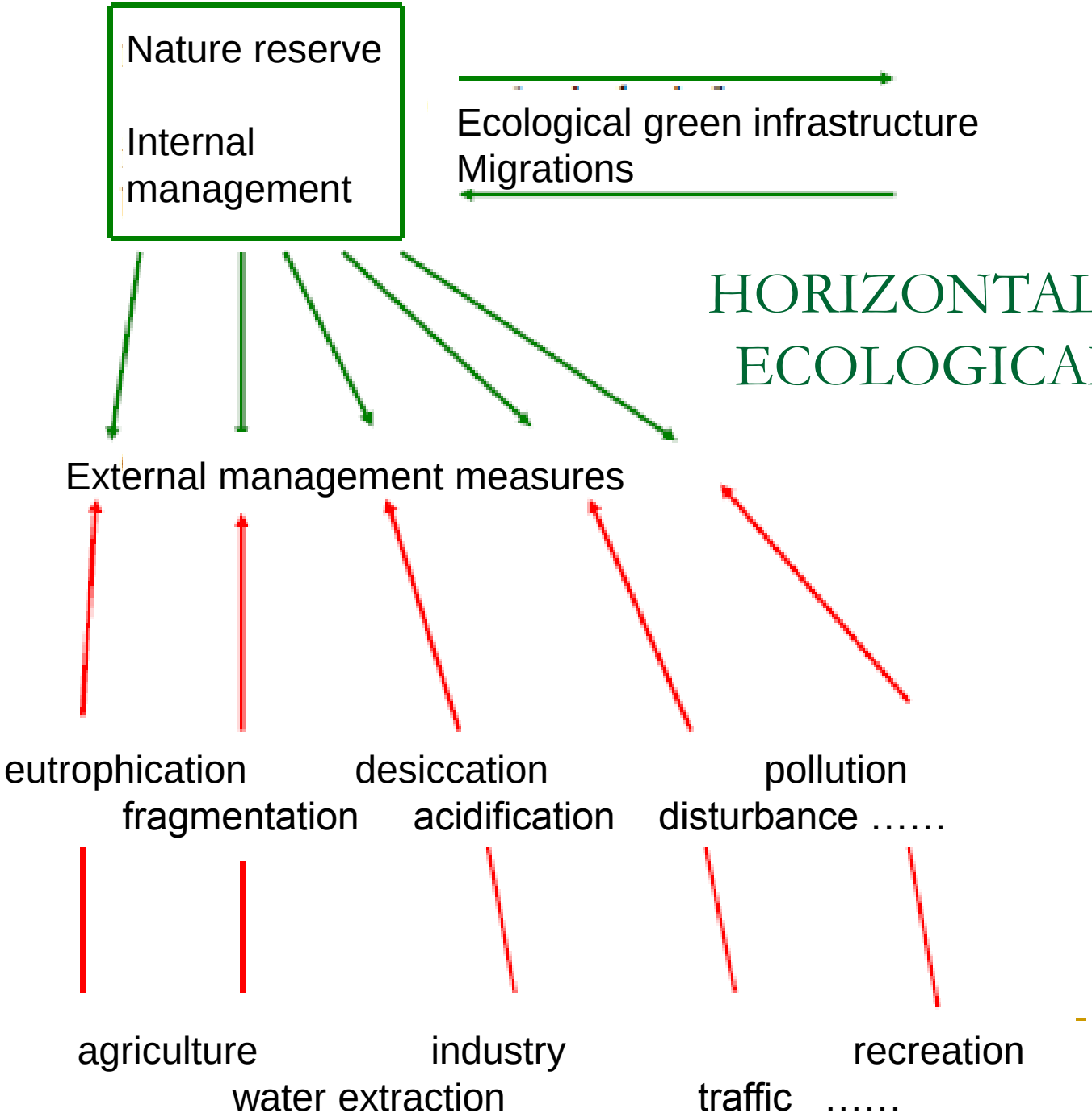
Reed cutting in the winter, is blocking the succession to forest and moreover, a lot of minerals are taken away.

Meerdonk (B): Salegemkreek.

Thatcher at work (Sint-Gillis Waas, B)

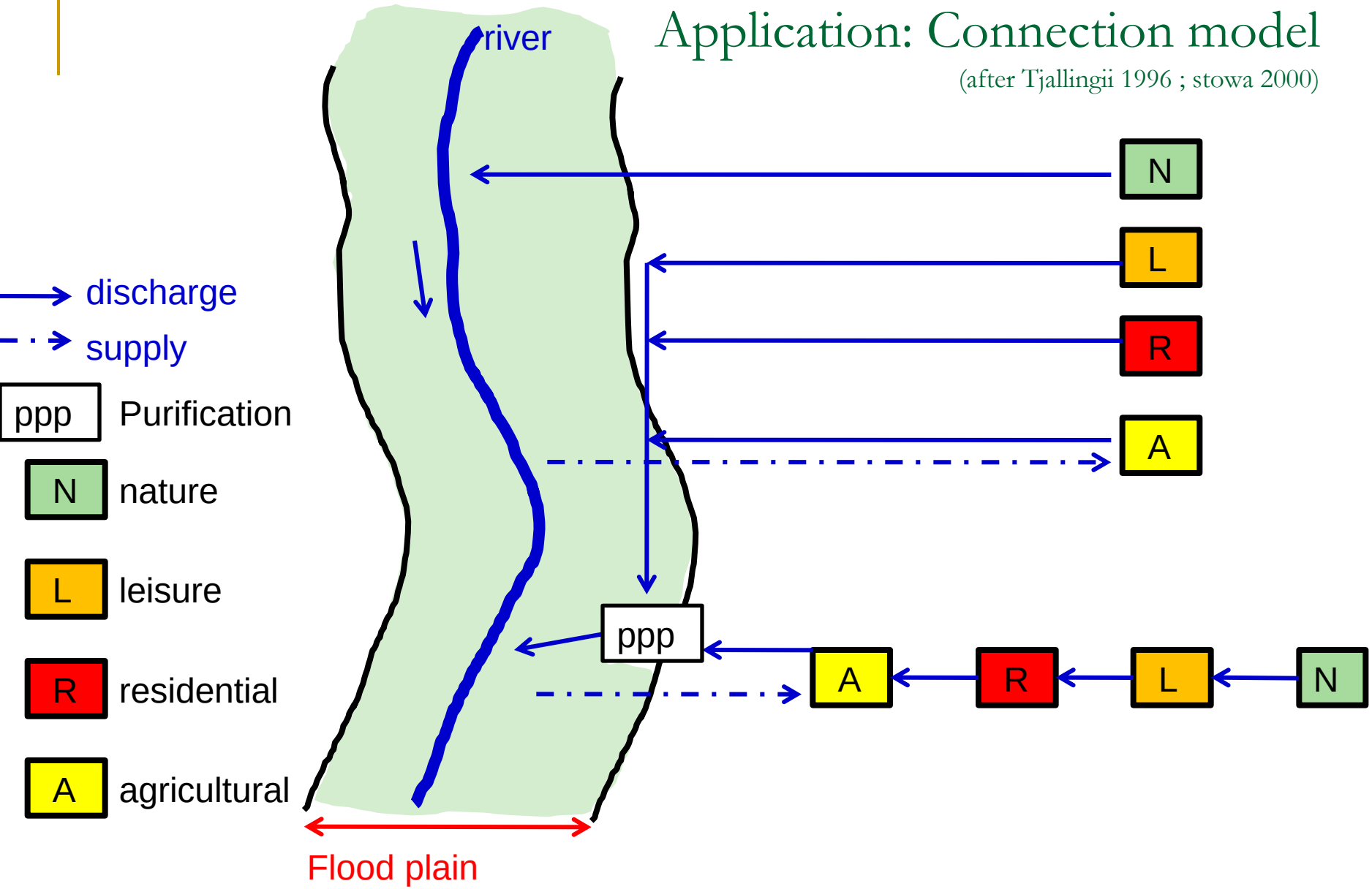
Friesland (NL). Many conservation organizations are using ancient farming methods .

HORIZONTAL LANDSCAPE ECOLOGICAL RELATIONS

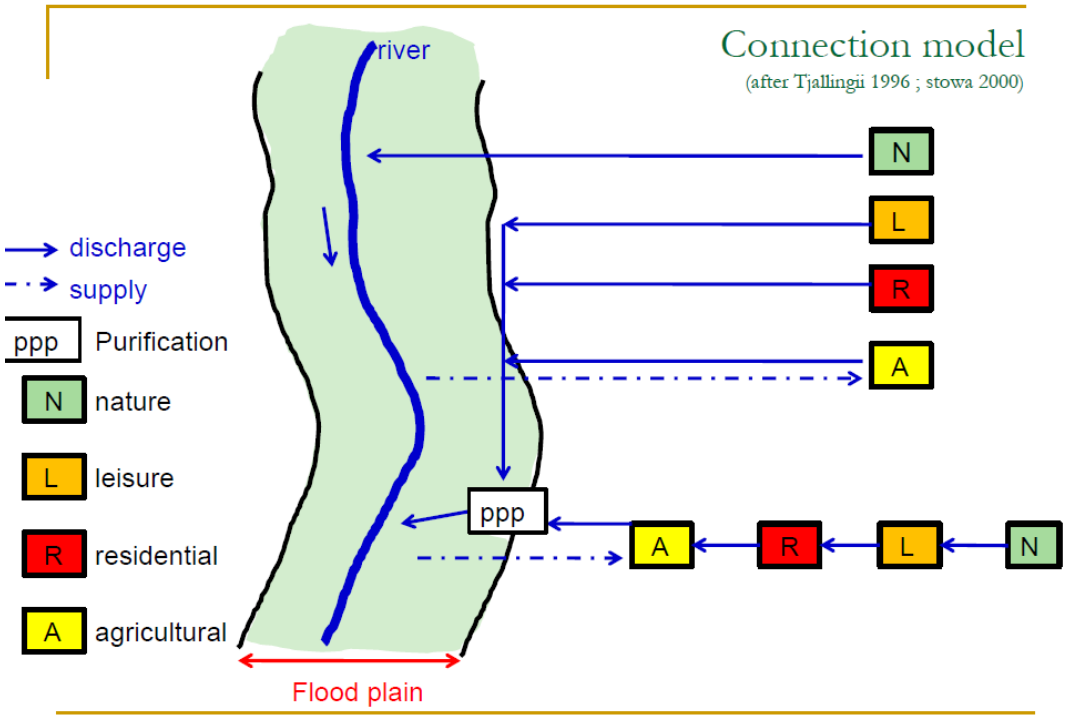


Application: Connection model

(after Tjallingii 1996 ; stowa 2000)



This connection model suggests an ecologically sound water-chain between rural and urban regions and applies the horizontal relations theory.



This connection model can be used to design a sustainable regional water system. In this connection model the underlying ecological principle is to create a stable gradient by allowing water to **flow from clean (in low-dynamic surroundings) to polluted (in high-dynamic surroundings)**, from nutrient-poor to nutrient-rich conditions. There are two possibilities: a series connection and a parallel connection (because ‘dirty’ dominates over ‘clean’). See lesson for examples.

STOWA. STICHTING TOEGEPAST ONDERZOEK WATERBEHEER. 2001. Levende stadswateren: werken aan water in de stad. STOWA, ill. ISBN 90 5773 096 3. www.stowa.nl

Horizontal landscape ecological relations: examples

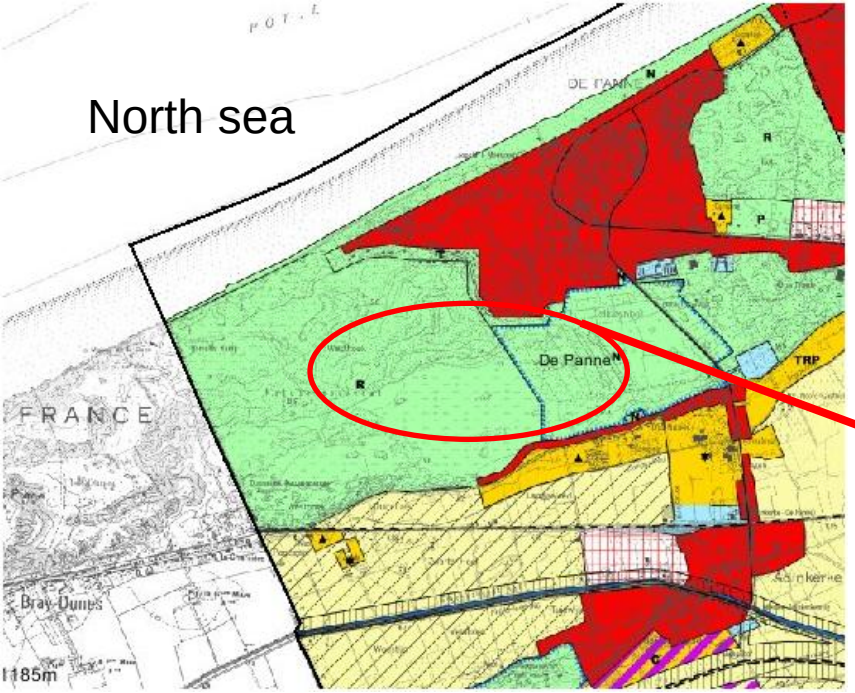
Internal nature management: see lecture
External nature management: aimed at protecting the site from unwanted external influences (Hermy, 1989)
Obviously the best measures are source-oriented (government)
Unfortunately, usually limited to effect-oriented measures (Curator)

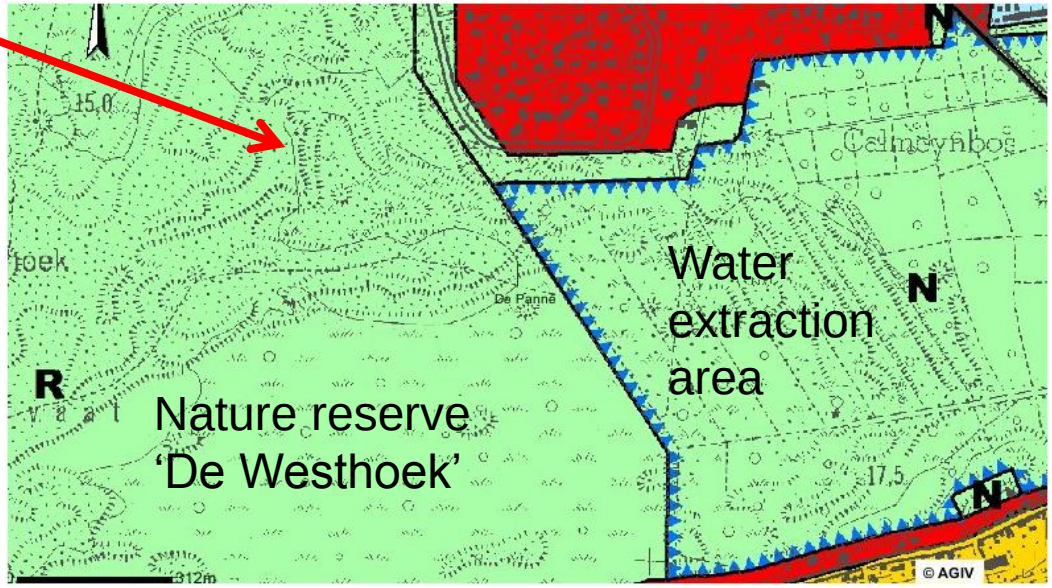
examples:

1. Extraction of ground water and nature conservation are not compatible in dunes, as in the adjacent areas. See lecture.

2. Many marshland birds from salt marshes flight at high tide to nearby dunes and polders (flood refuge areas). At low tide they forage on mudflats. Do not design residences, conference centres, marinas, ... in the ‘Zwin’ nature reserve, but also not beside this nature reserve.

Zoning plan Veurne-West coast: Municipality De Panne





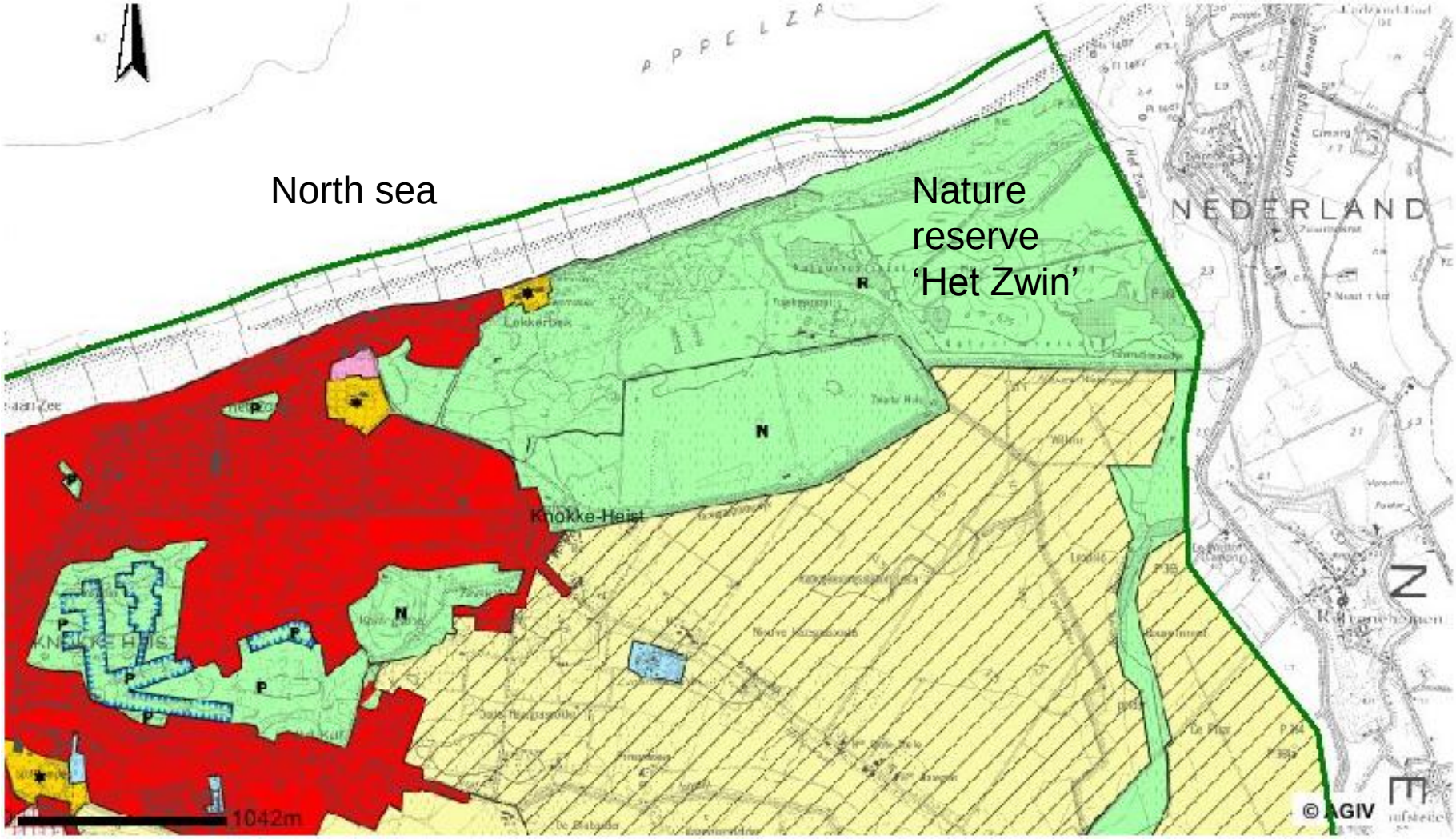
Extraction of ground water is not compatible with nature conservation in dune areas

Nature reserve ‘De Westhoek’

http://www.vbncdenachtegaal.be/nachtegaal.cgi?s_id=65

http://www.natuurenbos.be/nl-BE/Domeinen/West-Vlaanderen/Westhoek.aspx

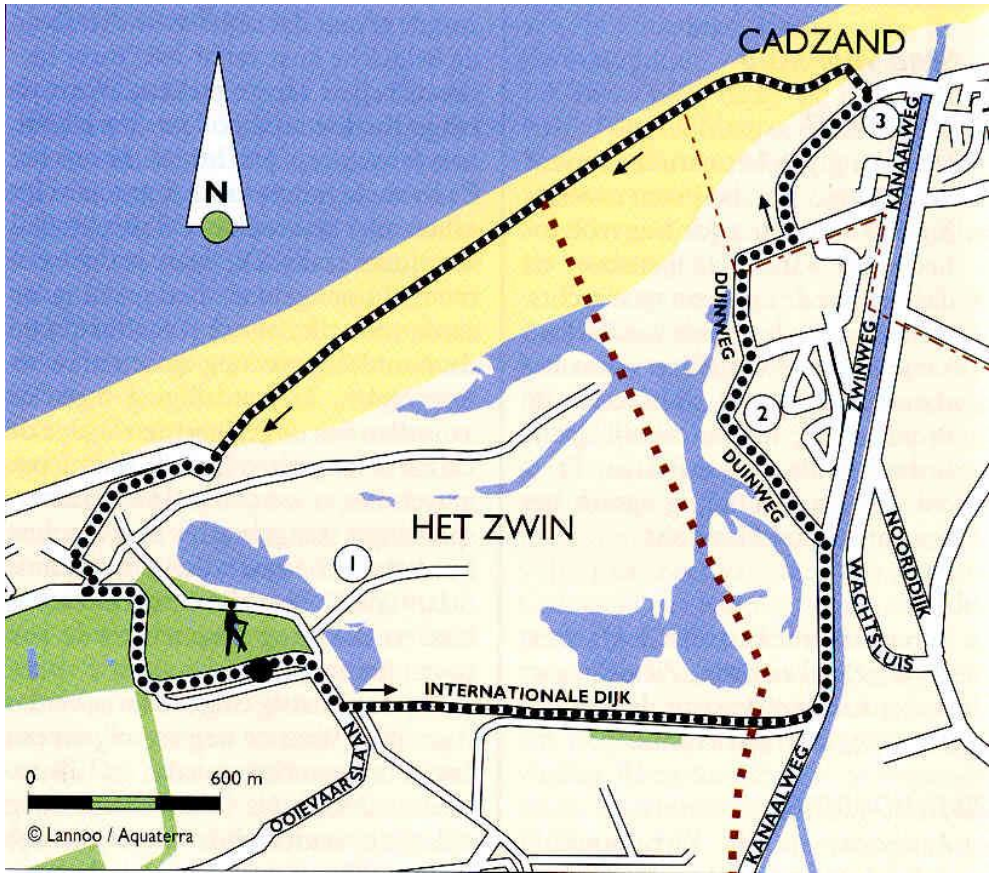
Zoning plan East coast: Municipality Knokke-Heist



Many marshland birds from salt marshes flight at high tide to nearby dunes and polders (flood refuge areas). At low tide they forage on mudflats. So respect the flood refuge areas also outside the nature reserve, because of horizontal relations.

Nature reserve 'Het Zwin' (source: http://www.agripress.be/start/artikel/376365/nl)

Het Zwin, on the border between Belgium and The Netherlands.



http://blogimages.bloggen.be/wandelroutes/19-8e3e329159828c466ab556a21246ca7a.jpg

http://www.fietsen.123.nl/entry/8243/hazegras route/fietsroutes

Rarity and substitutability ?

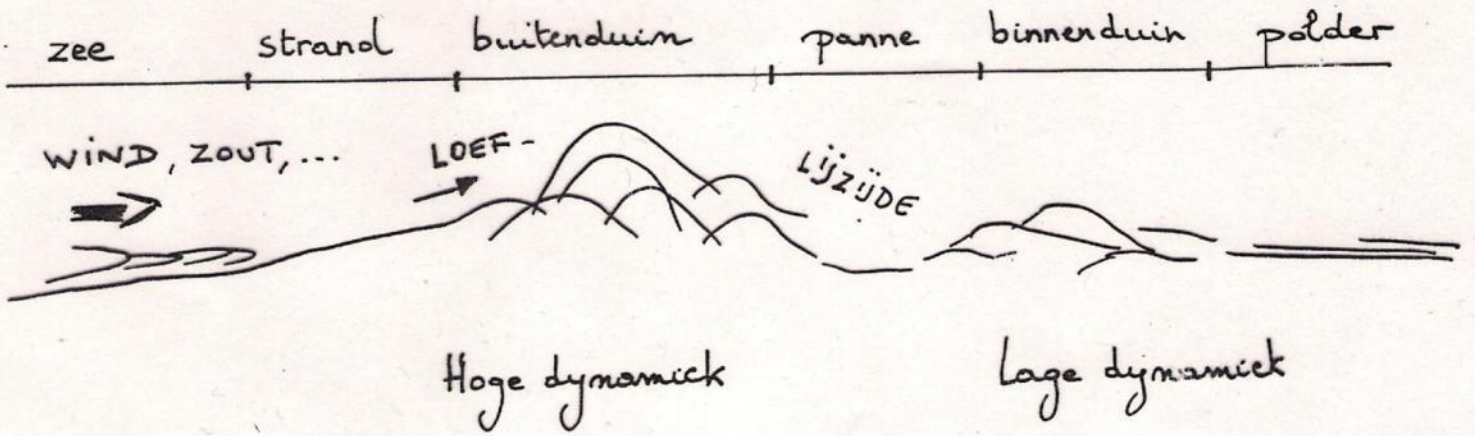
- *Theorem 1:* The substitutability of **ROBUST** pioneer communities is **HUGE**, for creating dynamic, dominant environmental conditions is easy.

- *Theorem 2:* The substitutability of **FRAGILE** climax communities is **DIFFICULT**. Especially when the weak abiotic conditions have been changed (often irreversible) it is not replaceable at that spot.
  - Soil degradation after clearing tropical rainforest
  - Salinization caused by irrigation
  - …

Derivative guidelines when designing.

- Avoid fragile, mature succession stages to localize high-dynamic human activities, but do locate there low-dynamic functions.
- Example: location of Catering (beach pavilion) on the coast is possible on the highly dynamic beach but not in the dunes.

Sea – beach - yellow young dune - dune slack - inland dunes - polder



ROBUST
pioneer

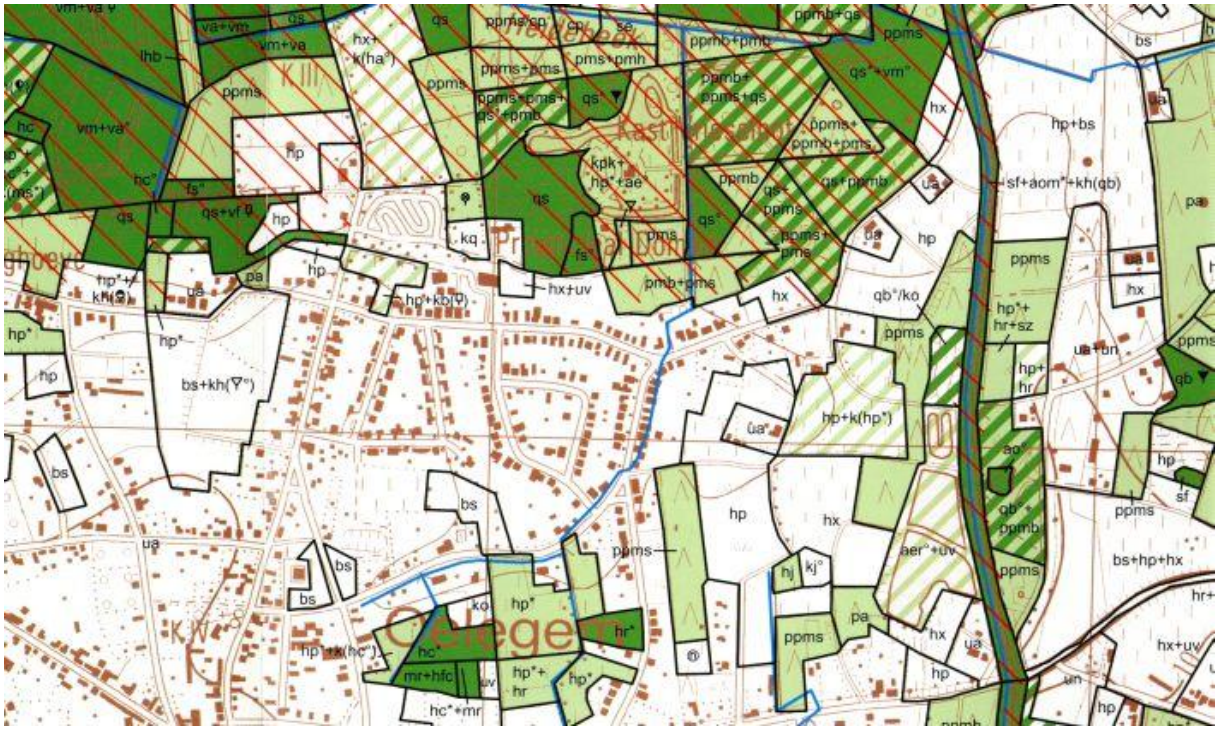
FRAGILE
climax

THE BIOLOGICAL VALUATION MAP OF BELGIUM

- Is a handy tool to find out where the fragile ecosystems are located.
- Start 1978, 52 card sets at 1 / 25000 Institute for Nature and Forest Research (INBO), kliniekstraat 25, 1070 Brussel http://www.inbo.be/content/page.asp?pid=BIO_BWK_start
- **Mapping:**
  - 17 main types. Example: C = heath
  - 161 variants. E.g.: Cg: dry heather vegetation
Ce: wet heath vegetation
  - This mapping on vegetation science base is objective and reproducible.
- **valuating: in 3 classes**
  - Dark green: biologically valuable
  - Light green: biologically valuable
  - Blank: current low biological value

NOTE: There has been valued in terms of nature conservation. This map is a suitability map for the conservation sector and can easily be abused.

- http://geo-vlaanderen.agiv.be/geo-vlaanderen/bwk



Een evaluatie van de biologische waarde:

Criticism of the biological valuation map: the lack of horizontal ecological relationships.

- For the presence of green infrastructure in the cultural landscape (hedges, ditches, ...) was little attention on the biological valuation map.
- However these are very important for migration of organisms between natural areas and are called STEPPING STONES / GREEN CORRIDORS.
- Without them, the risk for isolation of nature reserves from each other is high. Isolation leads to island situations with incest and therefore morbidity and mortality risks.

Ecological green infrastructure.

The **Oxslips, slanke sleutelbloem** (*Primula elatior*) can survive in less intensively managed land divisions.

Hedgerows and tree lines played formerly an important role in the management of the farm (wood clogs, fire wood, ...).

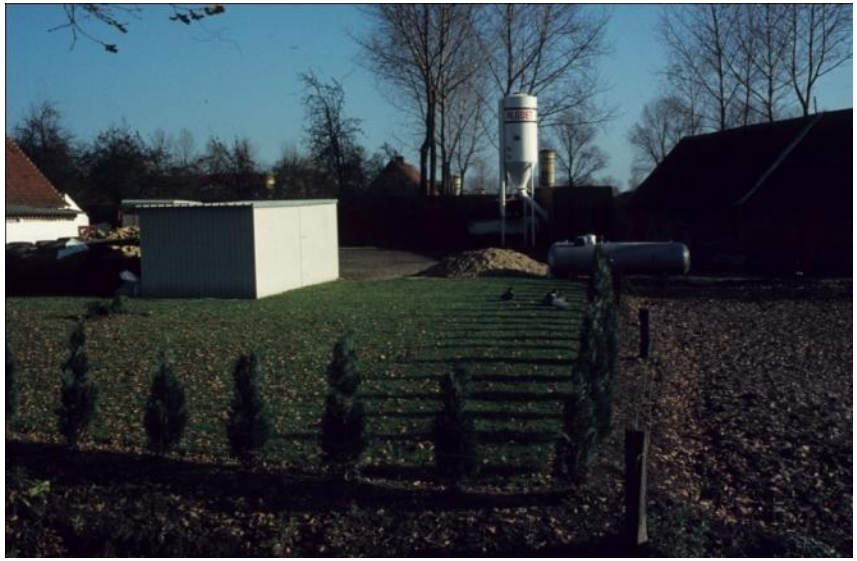
For some species, the presence of such ecological infrastructure is essential for orientation: e.g. sonar system for **Bats, Vleermuizen**.

Today ecological infrastructure often supports the recreational use of landscapes.

Old pollarded willow trees with many nest cavities for the **little owl**, **steenuil** (*Athene Noctua*) is required in landscapes where old trees are rare.

www.zwinstreek.eu

Why not using region-native species?



HORIZONTAL RELATIONSHIPS VERSUS SPATIAL PLANNING: connecting ?

(Island Theory , Mc Arthur & Wilson, 1967)

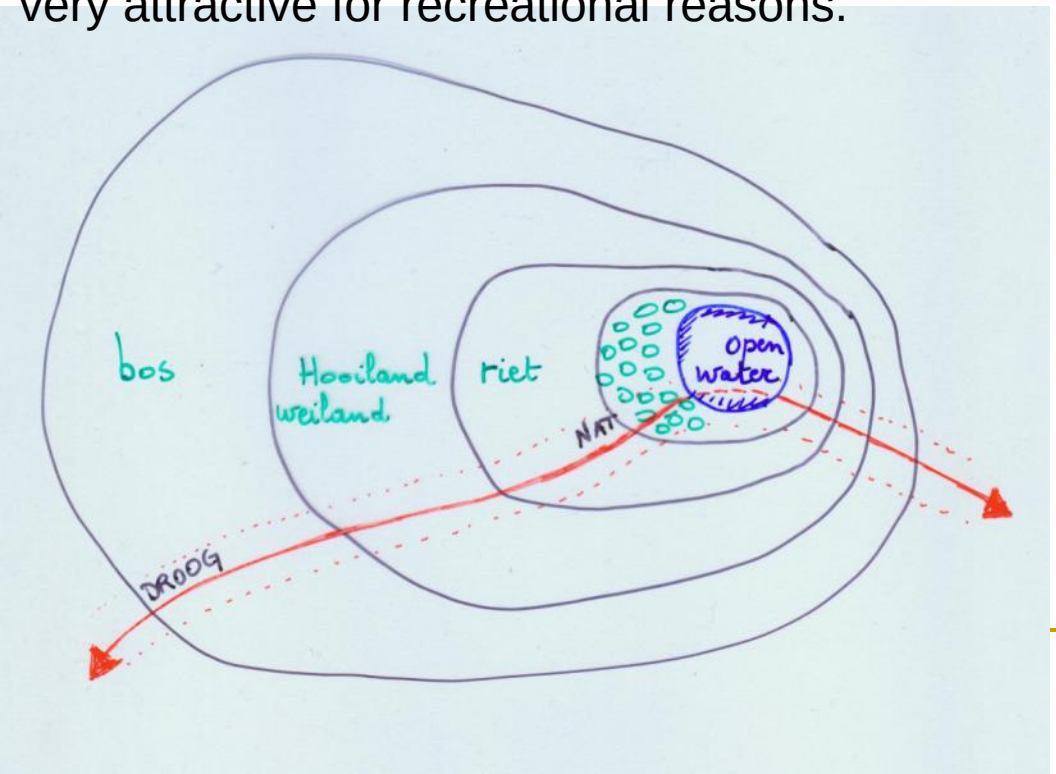
Theorem:

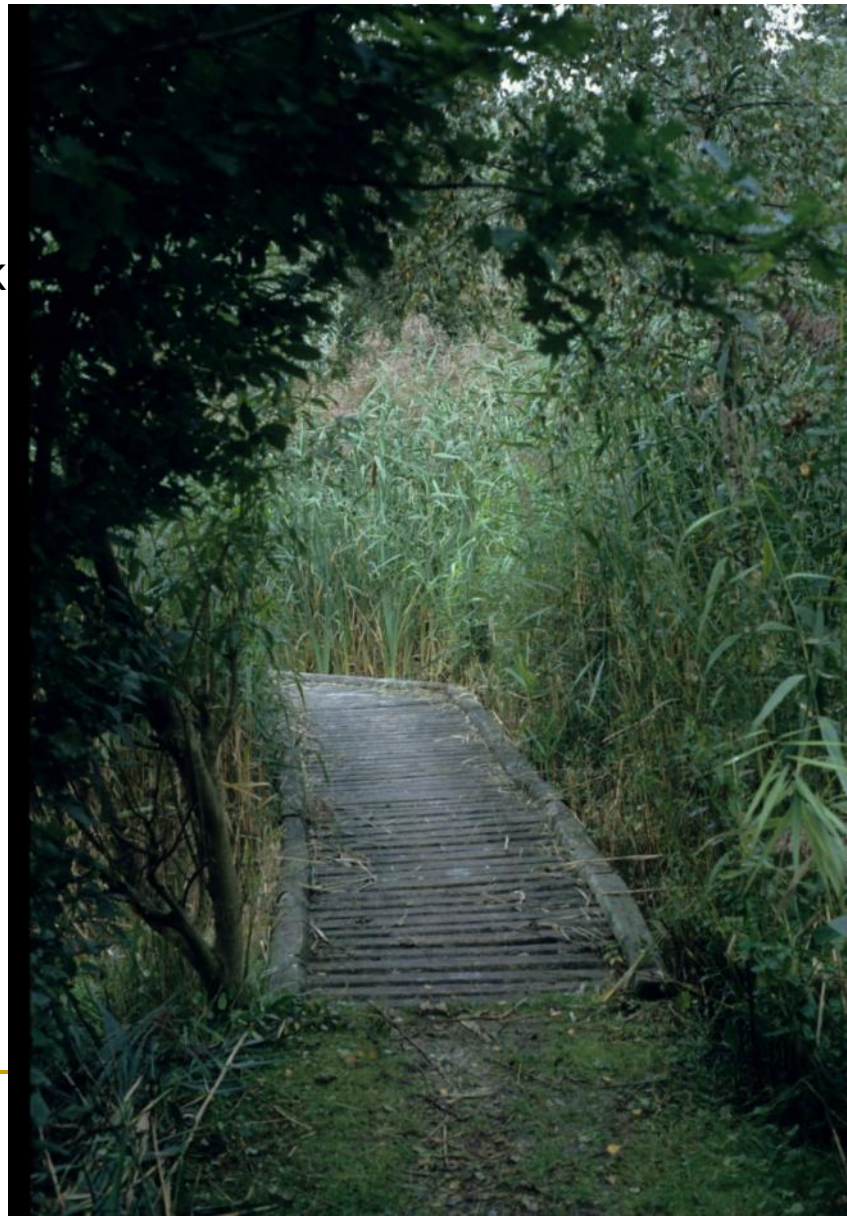
If the insulation between two fragile communities is increasing (= island situations), then migration of species between them becomes impossible. Part populations can become so small that they might easily extinct (genetic isolation, incest, ...).

Design guidelines:

- 1. Design a good environmental quality between fragile ecosystems (environmental quality standards, green infrastructure, corridors, stepping-stones, ...).
- 2. The preservation of existing green infrastructure in the expansion zones for residential areas (combined with wadis), in industrial expansion zones , in land development projects, ..., saves time in achieving higher biodiversity quality (unfortunately often tabula rasa)

•3. Avoiding separation, obstruction and fence effects for plants and animals when designing infrastructure, is very important. This often means building the infrastructure (walking or cycling tracks) perpendicular to the abiotic gradient (slope). This means designing infrastructure perpendicular to the vegetation boundaries instead of parallel. As a consequence people walk or cycle through very different landscapes and vegetations in gardens and parks, which is also very attractive for recreational reasons.





HORIZONTAL RELATIONSHIPS VERSUS SPATIAL PLANNING: separation where necessary, connecting where possible.

(Van Leeuwen, 1973)

- **Theorem:**

  Dominant abiotic factors have the ability to spread rapidly. If the protection of fragile communities against aggression from outside is wanted, then the designer has to isolate and separate in his design.

- **Design guidelines:**

  The maintenance of spatial variation suggests so in that case a certain degree of isolation, to avoid an extension of robust systems at the expense of fragile systems.

Design a separation (buffer) where necessary and maintain connections where possible.

Application: wildlife bridges or ecoducts

In the province of Limburg, Belgium there is already since 5 years such a wildlife crossing, the ecoduct Kikbeek. That this bridge is very useful for animals to pass the highway, is shown with images made by night made by TVLimburg of wildlife crossing the ecoduct.

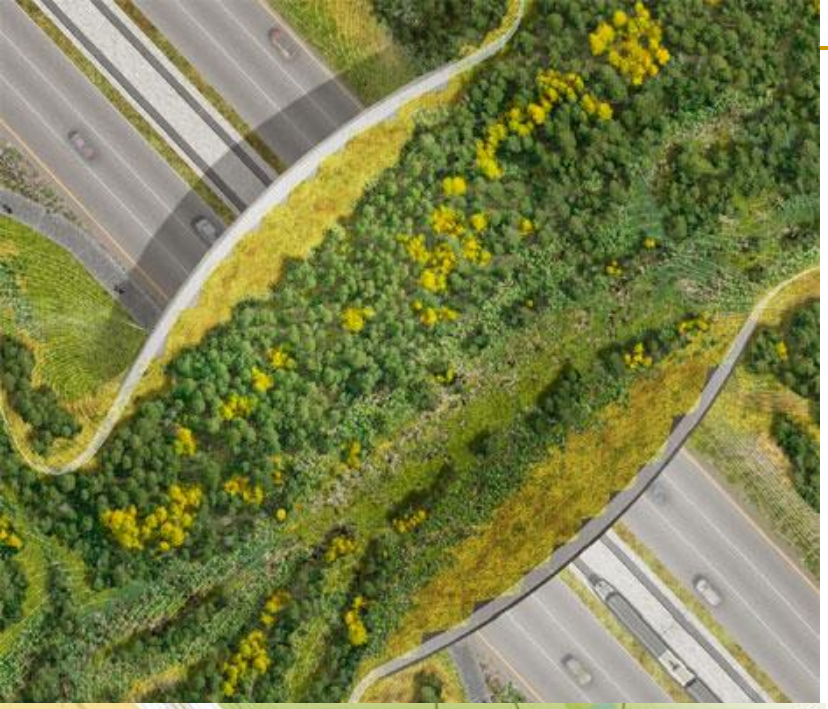
Source: www.weertfm.nl

- http://www.tvl.be/nl/2009-11-18/exclusieve-beelden-van-wild-op-het-ecoduct/
- This is a link to a film of TV Limburg, which documents the use of the ecoduct Kikbeek over the E 314 (Maasmechelen)

Source photo: www.deredactie.be

This ecoduct is build in 2006 on the N25 (Flanders, Belgium). It connects 2 parts of forest (Meerdaalwoud). Monitoring results tell us that it is used by roe deer, badger, wild boar, small mammals, amphibians, insects, spiders, ...

Source: www.iene.info



This wildlife crossing was designed by Olin Studio for West Vail Pass, Colorado as a way to help animals pass safely over the street. The design, called "Wild (X)ing," is one entry in a design competition that aims to find a way for both wildlife and humans to travel safely in the same area. Because a highway runs through the very large White River National Forest, it poses a very real threat to the animals that make their homes there. The green bridge concept would help wildlife in the White River National Forest cross over a busy highway while staying at a safe distance from the vehicles

Source: ecodemica.blogspot.com/2011/01/wildlife-bridg...

HORIZONTAL RELATIONSHIPS VERSUS SPATIAL PLANNING: mutual benefit ?

(Odum, 1969)

- **Theorem: ecosystem services.**

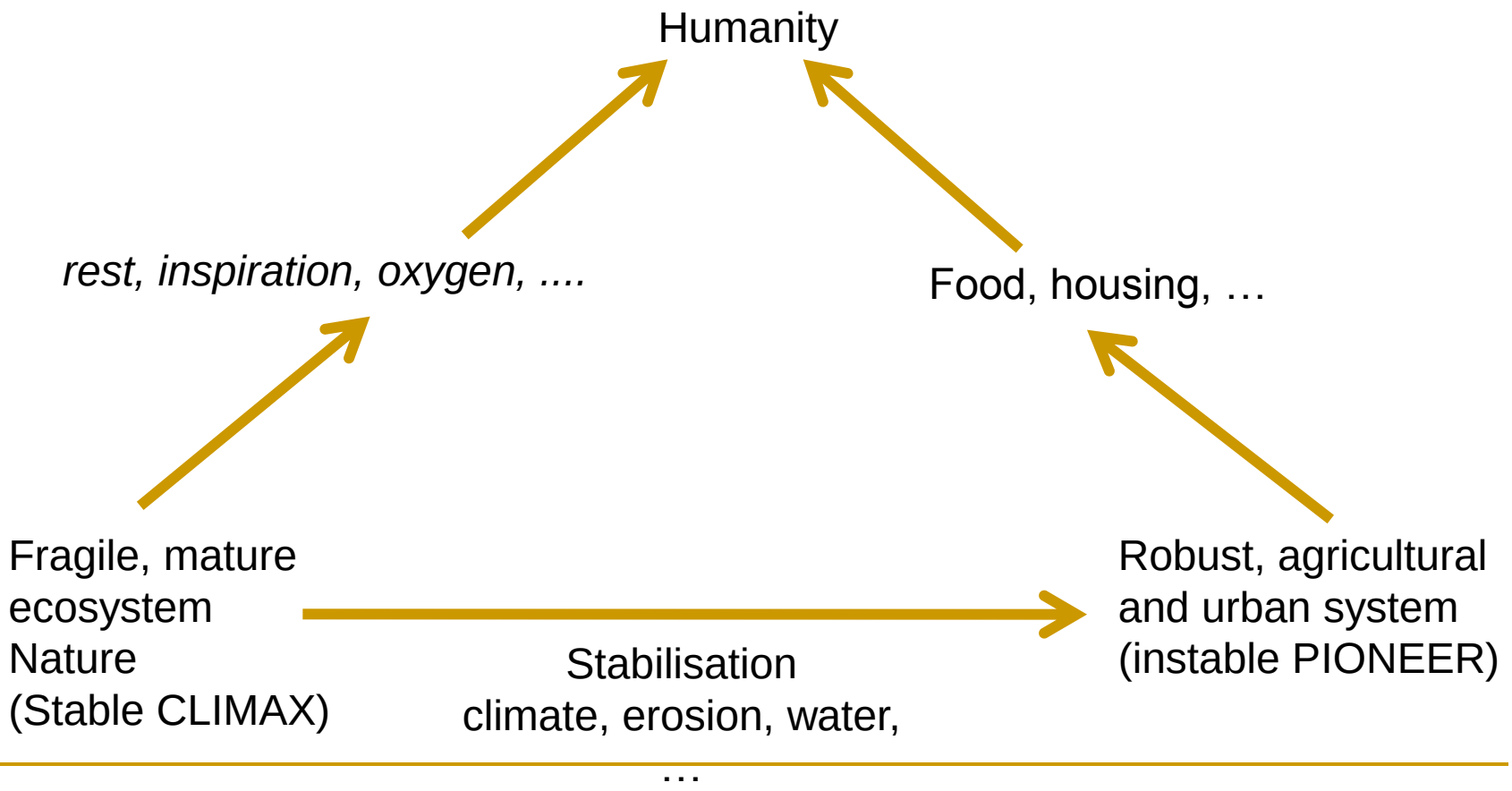
  Many ecologists see the protection of sufficient fragile, mature ecosystems, as a precondition for the good performance of manmade robust production systems (such as agricultural areas as urban systems).

  Fragile, mature ecosystems have a regulating function on

  - Climate
  - Hydrology
  - Erosion,…

These are the so-called ecosystem services for our human society (see theme 10).

So, both fragile (nature) and robust (farming) systems are important for humans:



- **Design guidelines:**

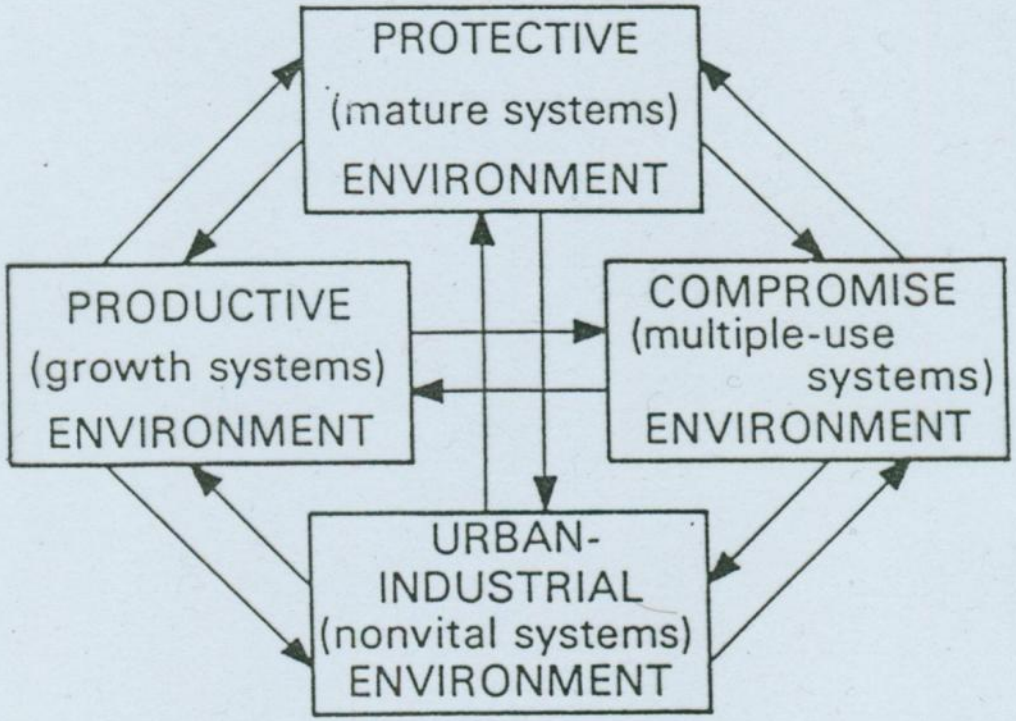
Many authors follow Odum (1969) and argue for the provision of sufficient regulatory, stabilizing ecosystems in the design of a spatial plan. These fragile ecosystems to be protected have

- To be localised in areas with weak ecological conditions (clean, silent, low dynamics, ….)
- To be adequately buffered
- To be linked in networks with each other .

Good performance of urban systems depends on this protection.

Odum (1969) suggested all this in his **compartment model** . Many governmental plans have been inspired by this model:

Compartment model (ODUM, 1969) in spatial planning.



Figuur . Naar ODUM, 1969

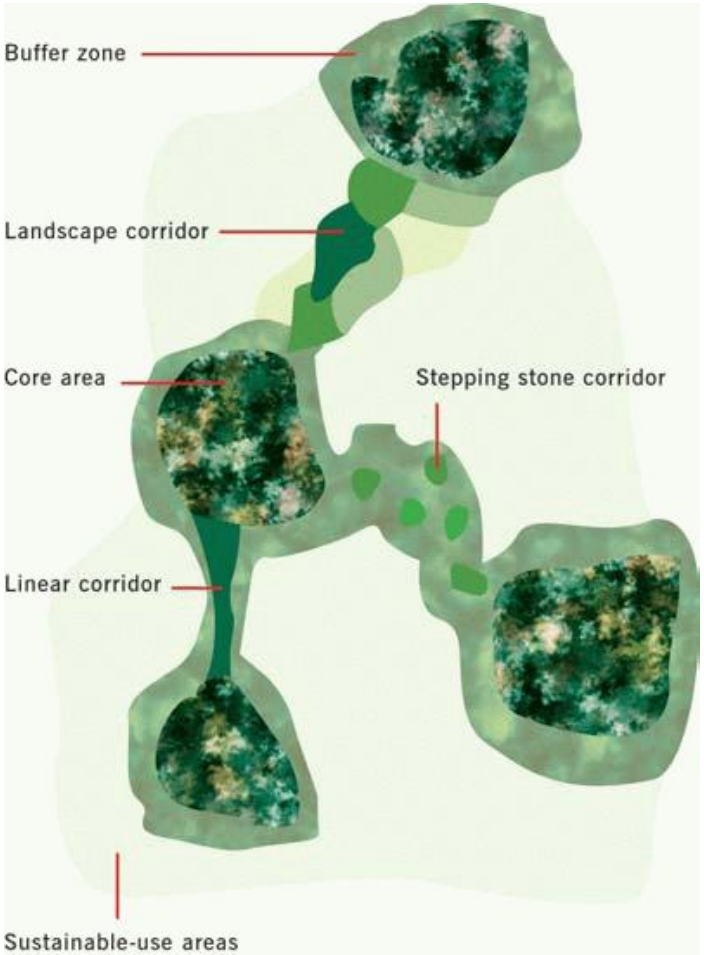
Has been followed in, among:

The Netherlands:
ecological main structure or National Nature Network (NNN).

Flanders:
Flemish ecological network (VEN).

EU(28): Natura-2000 network.

The European NATURA 2000 – Network: principles



NATURA 2000

http://www.countdown2010.net/archive/paneuropean.html

http://www.birdlife.org/eu/EU_policy/Birds_Habitats_Directives/natura2000_intro.html

EU-directive versus EU regulation

- **EU Regulation** (EU verordening) is immediately applicable after publication in the Official Journal (publicatieblad) of the European Communities. If not the member state puts itself outside the EU.

- **EU Directive** (EU richtlijn) has to be implemented in national legislation before it is applicable. E.g. EU Nitrates Directive. If not, a conviction before the European Court of Justice might follow.

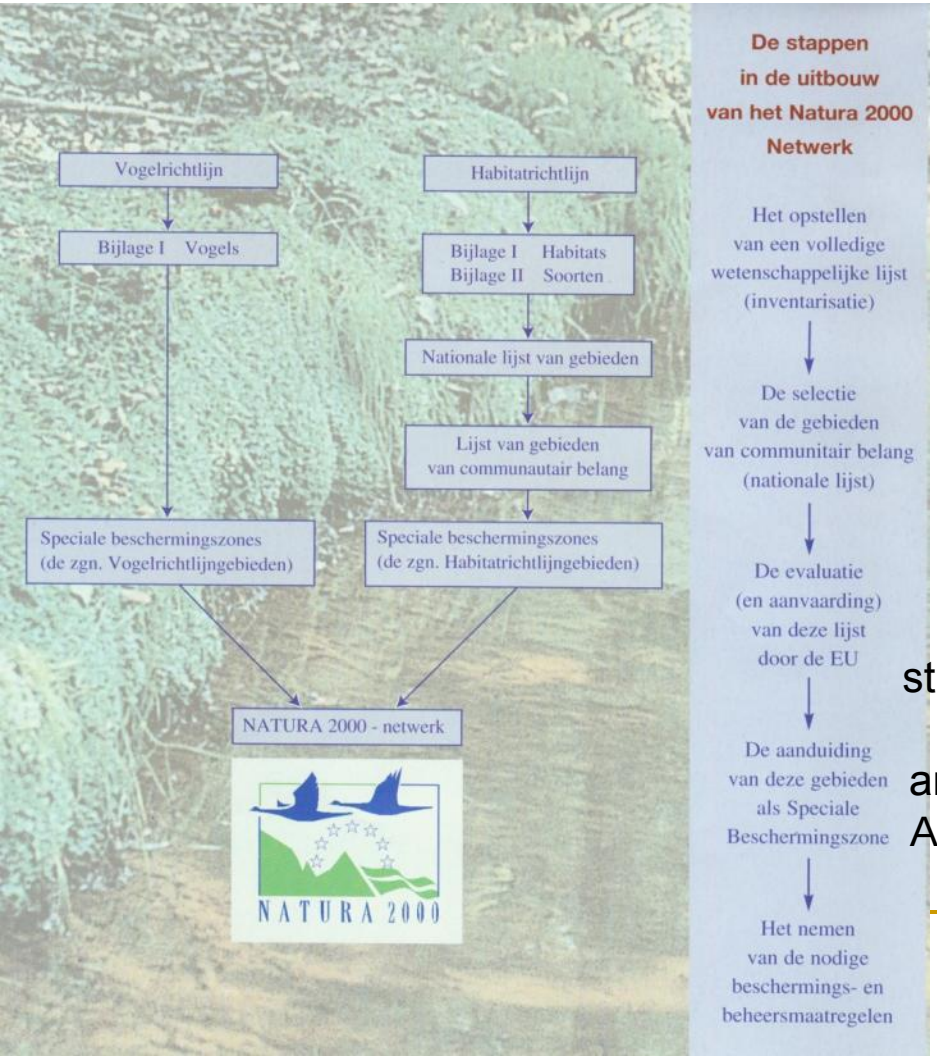
The European NATURA 2000 - Network

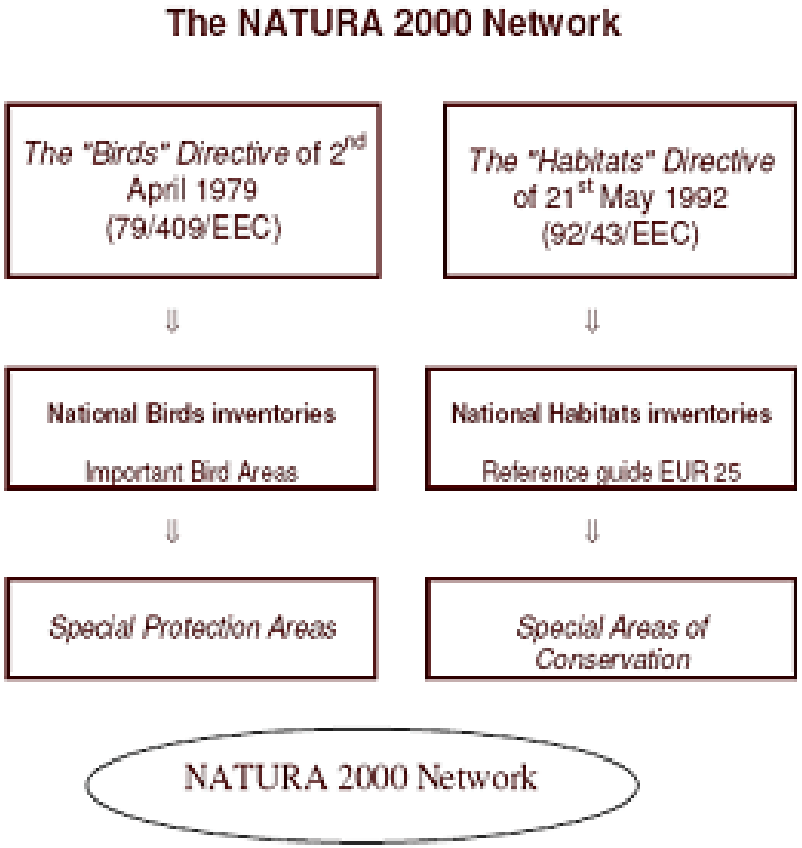
- The Birds Directive: Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (this is the codified version of original Directive 79/409/EEC as amended)
- The Directive was adopted over concerns for migratory birds and the decline of bird populations across the then European Economic Community (EEC). The Directive has special provisions for the protection of bird species and important sites for birds.
- The Habitats Directive: Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
- This Directive provides for the protection of a long list of species (animals other than birds and plants) and habitats within the European Union. For a full listing of these, please see the Annexes to the Directive.
- These two Directives provide a strong and modern framework for the conservation of species, sites and habitats which all EU Member State have to adopt (transpose) into their national legislation. The European Commission has the role to guide, support and monitor the transposition and implementation of the Directives.
- One of the key obligations of the Directives on the EU Member States is to establish a network of protected areas for nature, on land and sea, called Natura 2000 within their European territory. This network, that is expected to cover more than 15% of the EU terrestrial territory when complete is a great conservation achievement and unique in the world.
- The Heads of State and governments of the European Union agreed in 2001 to halt biodiversity decline by 2010 (the so-called “2010 target”). The main tools in this effort are the following two pieces of binding EU legislation, which were adopted by the Member States of the EU and the European Parliament:

http://www.birdlife.org/eu/EU_policy/Birds_Habitats_Directives/index.html

NATURA- 2000 network

Watch and study this film carefully
http://www.youtube.com/watch?v=C5UN9clIaBI

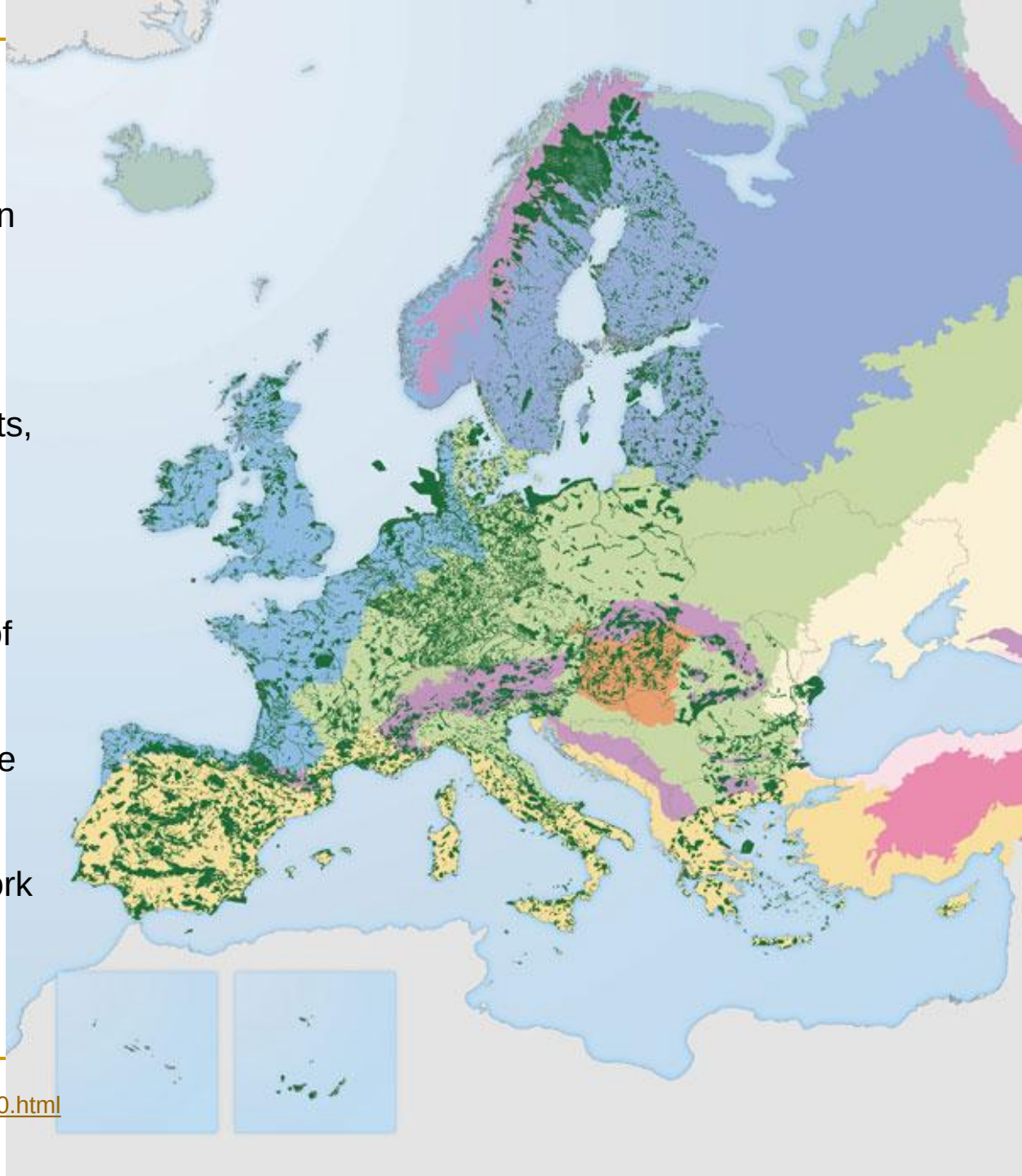




The NATURA 2000 network is composed of areas selected by Member States and the European Commission following strictly scientific criteria according to the two “Nature“ Directives. Special Protection Areas (**SPAs**) are classified under the “Birds” Directive and Special Areas of Conservation (**SACs**) are designated under the “Habitats” Directive

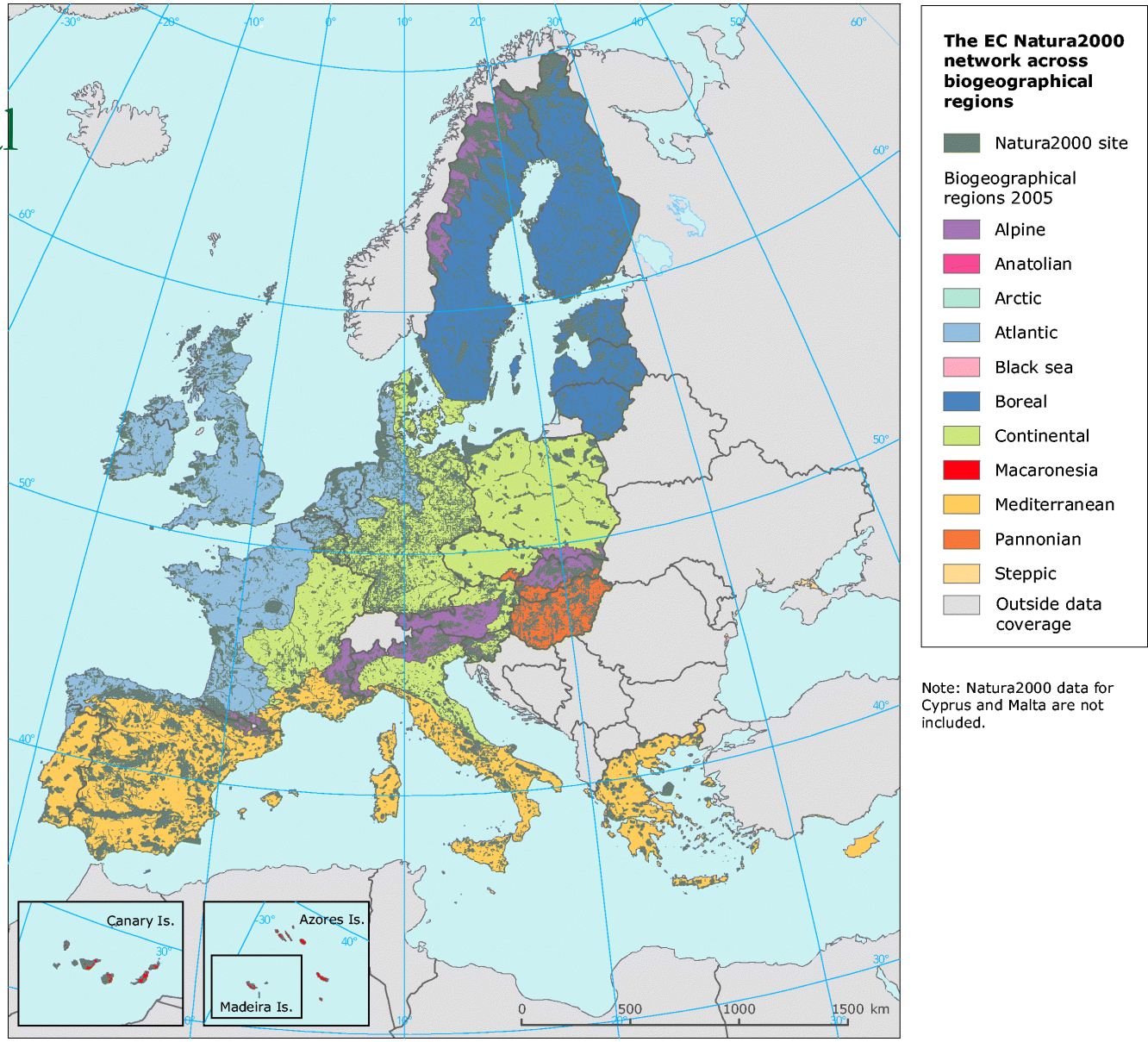
http://www.facenatura2000.net/selection_en.htm

Natura 2000 represents the most ambitious initiative ever undertaken to conserve valuable habitats and species across all 28 EU member states. Thanks to these two Directives, countries are able to coordinate their conservation efforts, irrespective of political or administrative borders.
This network is designed to conserve over a thousand rare, threatened and endemic species of wild animals and plants and some 230 natural and semi-natural habitats listed in the annexes of the two EU Directives.
Around 25,000 sites have been included in the Natura 2000 Network so far making this **the largest network of nature conservation areas anywhere in the world**



http://www.natura2000tourism.eu/aboutnatura2000.html

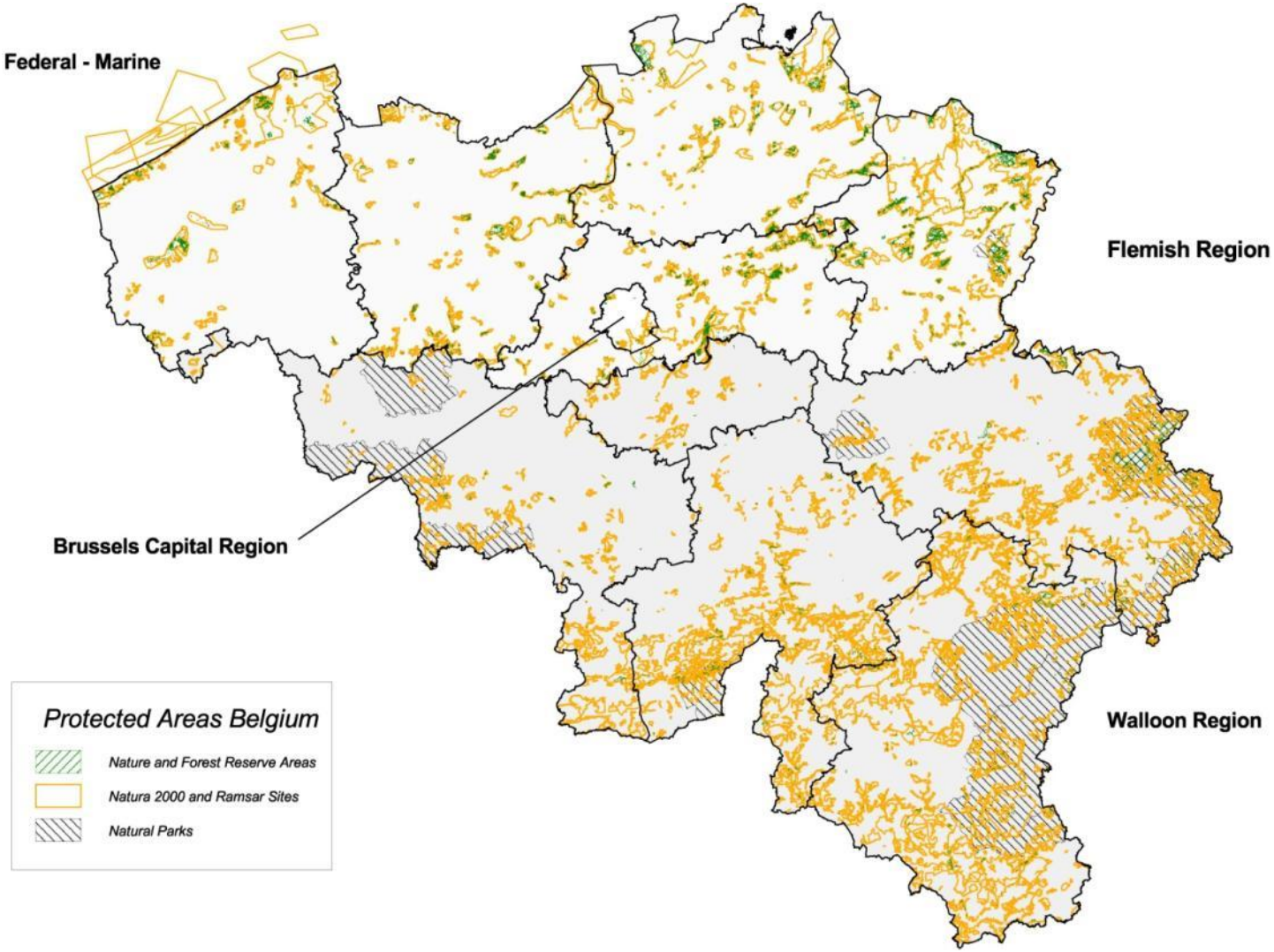
The biogeographical regions of Europe



http://www.ecologicalnetworks.eu/html/maps/EcologicalNetworkMaps.php

- In practice, these special natura-2000 areas in rural zones, are rather isolated from each other . Hence in many countries this Natura 2000 network is being linked together into a national ecological network, to make species conservation over time more effectively

- In the Netherlands this is the so-called **National Nature Network** (NNN), which would have been fully developed by 2018. For Flanders it is the **Flemish Ecological Network** (VEN), enshrined in the Spatial Structure Plan Flanders (RSV, 1997).



http://www.biodiv.be/implementation/docs/reports/them_reports/pa_2007/annex

The total Natura 2000 surface in terrestrial zone comes to 12,6 % of surface of Belgium, in marine zone about 12% of the Belgian territorial sea and it's exclusive economic zone is designated as Natura 2000.

	Brussels-Capital		Flanders		Wallonia		Federal marine		Total	
	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
Nature reserves										
- public nature reserves	9	89	263	13458 [1]	133	6866	1	670	406	21083
- private nature reserves	-	-	641	18506 [2]	126	1926	-	-	767	20432
Natura 2000[3]	3	237562		163499	240	220944	5	42090	310	428908
Forest reserves	6	173543		2273	12	548	-	-	61	4556
Wetlands of biological interst	-	-	-	-	49	1045	-	-	49	1045
Caves	-	-	-	-	63	-	-	-	63	-
Natural parks	-	-	1	5700	9	306971	-	-	10	312167
Ramsar and other wetlands	-	-	4	5572	4	38528	1	1900	9	4600
Dune Protection Act: protected dunes	-	-	±117	1088	-	-	-	-	±117	1088

[1] Of this total area being managed as a reserve, only 5 491 ha have a formal recognition by ministerial decision as nature reserve

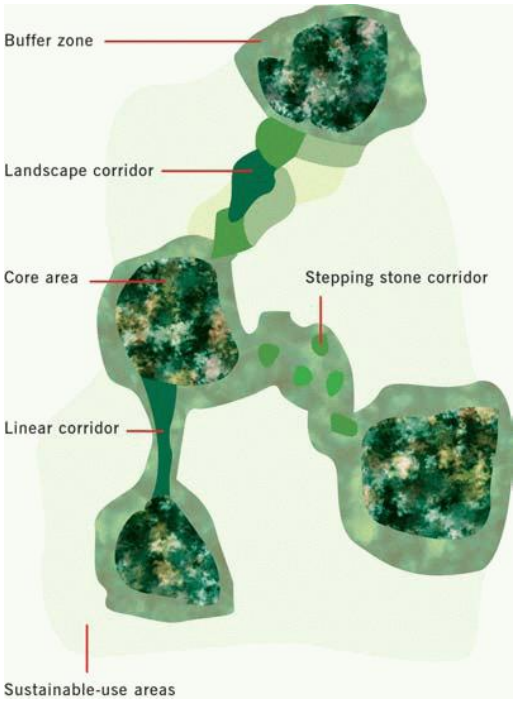
[2] Of this total area, only 11277 ha have a formal recognition by ministerial decision as nature reserve

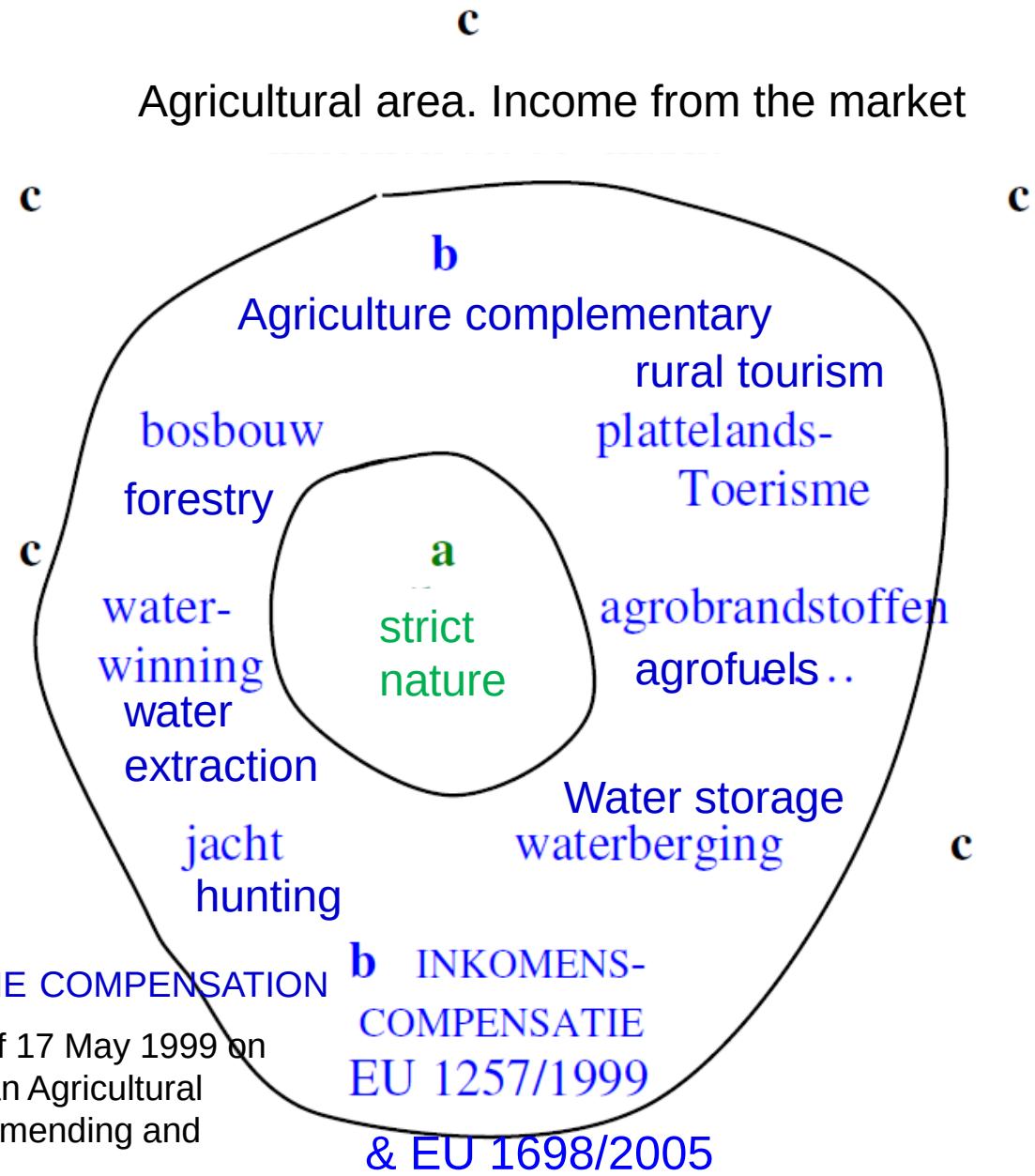
[3]The total surface of the Natura 2000 network in the terrestrial zone reaches 12.6 % of Belgium's territory. In marine waters, about 12% of the Belgian territorial sea and its exclusive economic zone are designated as Natura 2000.

The overview map of main types of PA in Belgium: compiled by Valérie Goethals – INBO (Institute for Nature and Forest Research, Flemish Region)

http://www.biodiv.be/implementation/docs/reports/them_reports/pa_2007/annex

Ecologically-based rural planning





COUNCIL REGULATION (EC) No 1257/1999 of 17 May 1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) and amending and repealing certain Regulations

COUNCIL REGULATION (EC) No 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)

Rural planning. Which agriculture has a future? About the European **C**ommon **A**gricultural **P**olicy (CAP).

- **1987**: *European year of the environment*

European *environmental* budget: 20 million Euro

European *agricultural* budget: 25 billion Euro

- **1998**:

European agricultural budget ca. 42,5 billion Euro

- **2002**: 46,5 billion Euro

Of which ¾ for '*surplus problem*':

minimum intervention prizes (via the European Agricultural Guidance and Guarantee Fund (EAGGF)

transport,

cooling,

Export restitutions,…

E.g. Belgium (**1995**): 1,16 billion Euro restitutions + 372 million Euro interventions

E.g. Belgium (**2003**): 237,53 million euro Wallonia en 258 million Flanders restitutions.

- so: For farmers : more production = more income

- consequences:
  - Environmental problems
  - Food Quality problems for consumers (antibiotics, hormones, pesticides, …)
  - dislocation world prices: GATT-WTO

- European Environmental movement and North-South movement find each other.

Resulted in productive landscapes fitted only for food production. Not attractive for hikers, bikers, hunters, …

North-South movement and environmental movement come together.

What is the link between a European pig and a Brazilian child?

Many famines in the south are caused here in the north

2015

DE MILLENNIUMDOELSTELLINGEN

DE TIJD LOOPT

European beef does
not belong in the Sahel

stop the suffocating food exports to the South

Food aid: more problem than solution

Not only in Europe…

- The United States have given between 2002 and 2005 an annual average of nearly 16 billion U.S. dollars or 11.3 billion euros in agriculture subsidies. According to figures by the U.S. Department of Commerce. It is the first time that Washington announces its farm the amount of subsidies at the World Trade Organization (WTO). The amount varies from 10.1 billion U.S. dollars in 2003 and 18.9 billion U.S. dollars in 2005. (Belga / dm)
- European export subsidies dropped between 1990 and 2001 from 37% to 8% of agricultural expenditure (Barrez, 2007)
- 2008: Meanwhile, the surplus on the world level decreased significantly (e.g. milk), but at European level problems remain. Europe produces more than it can eat itself, exports (often subsidized) to elsewhere and thus imports environmental problems. E.g. animal feed imported from third world countries leading to too much meat and too much manure. The meat is exported (dumped), but not the manure surplus, which is causing environmental and health problems ....)

Future vision of European environmental movement.

- production ≠ income

Make income of the farmer more *independent of production volume.*

Direct income support for agriculture production with environmental constraints :*THROUGH VOLUNTARY MANAGEMENT AGREEMENTS WITH SUBSIDIES*

<u>Examples</u>:

- Directive 75/268/EG **'mountain and hill farming in certain less favoured areas'** (Europese *Bergboerenregeling)*

wish: to expand to farming in zones with environmental restrictions.

- *Relation legislation (Relatienota*, NL 1975)

* *first comment: we do not want to be 'museum farmers'.*

* Years 1980: quota: milk, sugar. success : first contract in 1981, 13000 ha in 1989, Now more than 25000 ha.

- D : *extensivierungsverträge*
- GB : *management agreements*

- Conclusion: *Simultaneity is important*.

Providing grants without a simultaneous reduction of production: does not work (e.g.: NL)

Limiting production without making simultaneous grants available: does not work (e.g.: Flanders manure action plan, MAP)

- *Environmentalists and North-South movement believe that free trade (globalization) is not suitable for agriculture policy* !
- Also the Flemish farmers organization (Boerenbond) has that opinion. Quote:

'Vrijhandel is hoe dan ook niet geschikt voor landbouw. In een vrije markt verpletteren de groten, de kleintjes, vooral in ontwikkelingslanden, die ook hun bevolking moeten kunnen voeden. Er zou een organisatie of instantie moeten komen om dat te bufferen' (citaat Noël Devisch, gewezen voorzitter van de Boerenbond, lente 2008 in *Landgenoten* het magazine van VILT).

Evolution of European legislation

- **Council Regulation (EEC) No 2078/92 of 30 June 1992 on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside**

  Art. 2: Member States are obliged to implement this scheme.

  Member State determines zones in terms of domestic rural planning, determines conditions, control, aid, ...

  Art. 6: support for training in environmentally friendly agriculture and forestry (+ demonstration).

- **Council Regulation (EEC) No 2080/92 of 30 June 1992 establishing a support system for forestry measures in agriculture**

  Art. 1: Objectives: fight global warming by absorbing CO_2.

  Art. 2 & 3: financial support measures.

Common agricultural policy (CAP)

- The 2003 and 2005 reform of the Common Agricultural Policy introduced a new system of direct payments, known as the **Single Payment Scheme**, under which **aid is no longer linked to production**.
- The agricultural expenditure is financed by two funds, which form part of the EU's general budget: the **European Agricultural Guarantee Fund (EAGF)** finances direct payments to farmers and measures to regulate agricultural markets such as intervention and export refunds (first pillar), while the **European Agricultural Fund for Rural Development (EAFRD)** finances the rural development programs of the Member States (second pillar)
- Whereas the first pillar of the common agricultural policy (Cap) of the EU, supports the income of farmers directly, is the second pillar (the rural development) focusing on the multifunctional character of agriculture and the broader societal context. *Rural Development funding helps to improve competitiveness for farming and forestry, to protect the environment and the countryside, to improve the quality of life and diversification of the rural economy and to support locally based approaches to rural development* http://ec.europa.eu/agriculture/grants/

Evolution of European legislation

- **COUNCIL REGULATION (EC) No 1257/1999 of 17 May 1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) and amending and repealing certain Regulations** (Detailed in Regulation 1750/1999 dated. 23 July 1999)

  Main purpose is to coordinate different existing EU initiatives and to implement and *to meet the agreements with World Trade Organisation.*
- Treats investments: farms, establishment of young farmers, training, early retirement, less favored areas and areas with environmental restrictions (no more than 10% state surface), agri-environment, forestry, etc.
- Launched on January 1st , 2000, replacing EU Regulations 2078 and 2080.

- **COUNCIL REGULATION (EC) No 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)** (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:277:0001:0040:EN:PDF)
- From **2006**: substantial reduction of European subsidies under pressure from WTO begins. Result: prices support for agricultural products is replaced by income support to farmers.

- The EC Agricultural budget 2012 is 58,7 billion euro :

  For the first pillar of the Common Agricultural Policy (the direct support for farmers) 44,18 billion euro is available.

  For the second pillar (the rural development) 14,6 billion euro is available.
- (http://eur-lex.europa.eu/budget/data/DB2012/NL/SEC03.pdf)

Management agreements with income compensation, paid within the CAP-second pillar: different programs in Flanders

www.vlm.be/landtuinbouwers/beheerovereenkomsten

- improving the quality of surface and groundwater (reduced fertilization)
- the preservation of endangered species and the area where they survive (farmland birds, grassland birds and hamsters)
- the creation of a protective strip along watercourses, sunken roads and other vulnerable elements (Managing field margins)
- repairing, developing and maintaining of small landscape elements (construction or maintenance of small woody landscape elements, or (re) creating and maintaining pools)
- combating erosion on erosion-prone soils (creating and maintaining grass course, grass buffer strips, no-till agriculture and direct sowing)
- maintaining and developing botanical valuable grasslands and developing herbs communities in fields (environmentally friendly management of grassland and arable land)

Example : management agreement **species protection**

Soortenbescherming

zorgen voor weidevogels	
uitstellen van de maaidatum	517 euro per ha
uitstellen van de beweidingsdatum	389 euro per ha
omzetten akker in grasland en maaien	549 euro per ha
omzetten akker in grasland en beweiden	421 euro per ha
beschermen van nesten	40 euro per vastgesteld nest
vluchtstroken	280 euro per ha vluchtstrook
zorgen voor akkervogels	
aanleggen van gemengde grasstroken	1.570 euro per ha grasstrook
aanleggen van opgeploegde grasstroken	1.600 euro per ha grasstrook
aanleggen van leeuwerikvlakjes	15 euro per vlakje (max. 30 euro per ha)
aanleggen van faunaranden	500 euro per ha faunarand
aanleggen van winterstoppels	50 euro per ha
aanleggen van graanranden	1.500 euro per ha graanrand
aanleggen van vogelvoedselgewassen	1.490 euro per hectare
zorgen voor hamsters	
aanleggen van luzernestroken	600 euro per ha
aanleggen van graanstroken	415 euro per ha

www.vlm.be

Example : management agreement **small landscape elements**

Beheren van kleine landschapselementen

aanplanten van houtige landschapselementen	
aanplanten van een heg	1,41 of 1,54 euro per meter
aanplanten van een haag	2,47 of 3,04 euro per meter
aanplanten van houtkanten en houtwallen	37,20 of 49,68 euro per are
onderhouden van bestaande houtige landschapselementen	
onderhouden van een bestaande heg	1,5 euro per meter
onderhouden van een bestaande haag	1,5 euro per meter
onderhouden van bestaande houtkanten of houtwallen	20,98 euro per are
aanleggen en onderhouden van poelen	
aanleg van een poel tot 50 m²	95,45 euro per poel
aanleg van een poel tussen 51 en 100 m²	120,13 euro per poel
aanleg van een poel tussen 101 en 150 m²	144,57 euro per poel
onderhouden van een bestaande poel	
onderhoud van een poel tot 50 m²	24,80 euro per poel
onderhoud van een poel tussen 51 en 100 m²	34,25 euro per poel
onderhoud van een poel tussen 101 en 150 m²	47,75 euro per poel

www.vlm.be

Management agreements (NL).

This farmer has an agreement to protect nature on this farmland

Management agreements (UK, Kent)

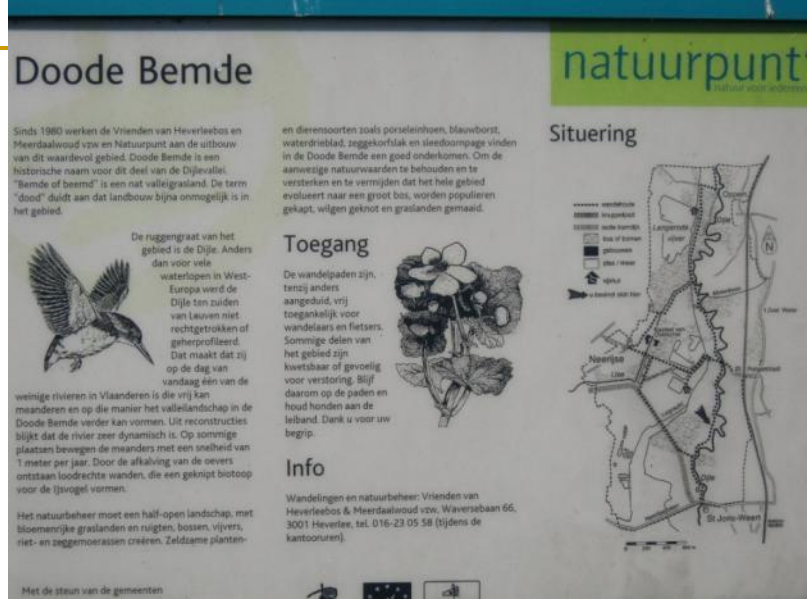
Management agreement in cooperation between the landowner (farmer), recreation (hiking trail North Downs Way), government (Kent County Council) and the expertise of officials (Countryside Commission).

Result of a landscape management agreement (UK, Kent), The agricultural processes became more extensive, so the pattern is more biodiverse, following VAN LEEUWEN's relation theory: process is the cause, pattern is the consequence.
Agriculture became again compatible with landscape diversity and biodiversity

Farmers maintain the walking infrastructure within a management agreement (UK, Kent, North Downs Way).

Other possibilities in the B zones, tourism and water storage.

Complementary income from rural tourism



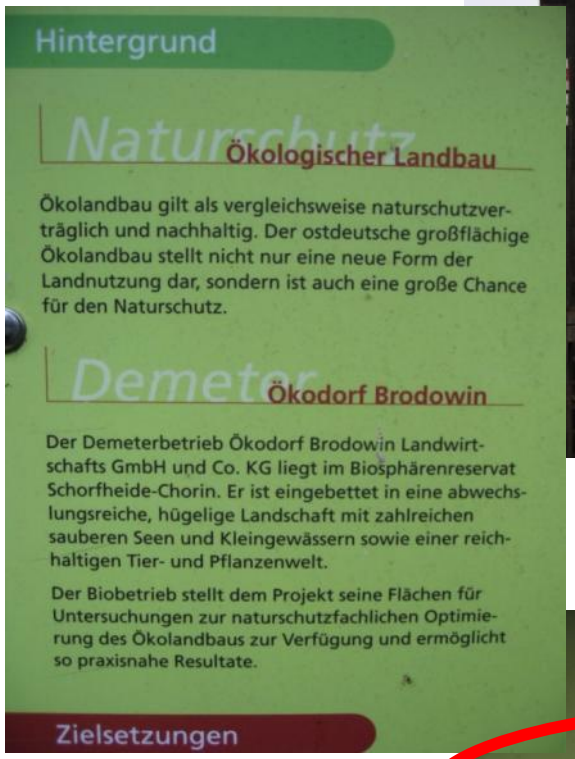
De Doode Bemde along the river Dyle (south of the city of Leuven) protects this city from flooding and is also a beautiful nature and hiking area.

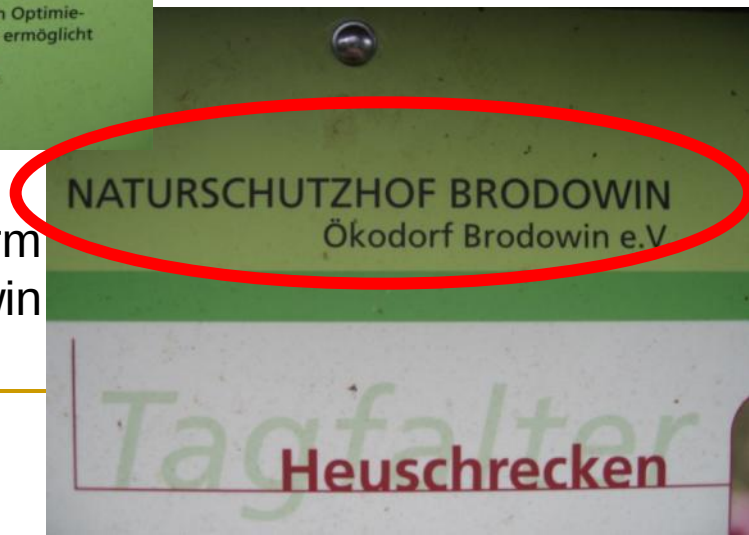
In the B zones is space for organic agriculture

Organic farming processes resulting in landscape patterns with increasing biodiversity.

Denmark

Sweden

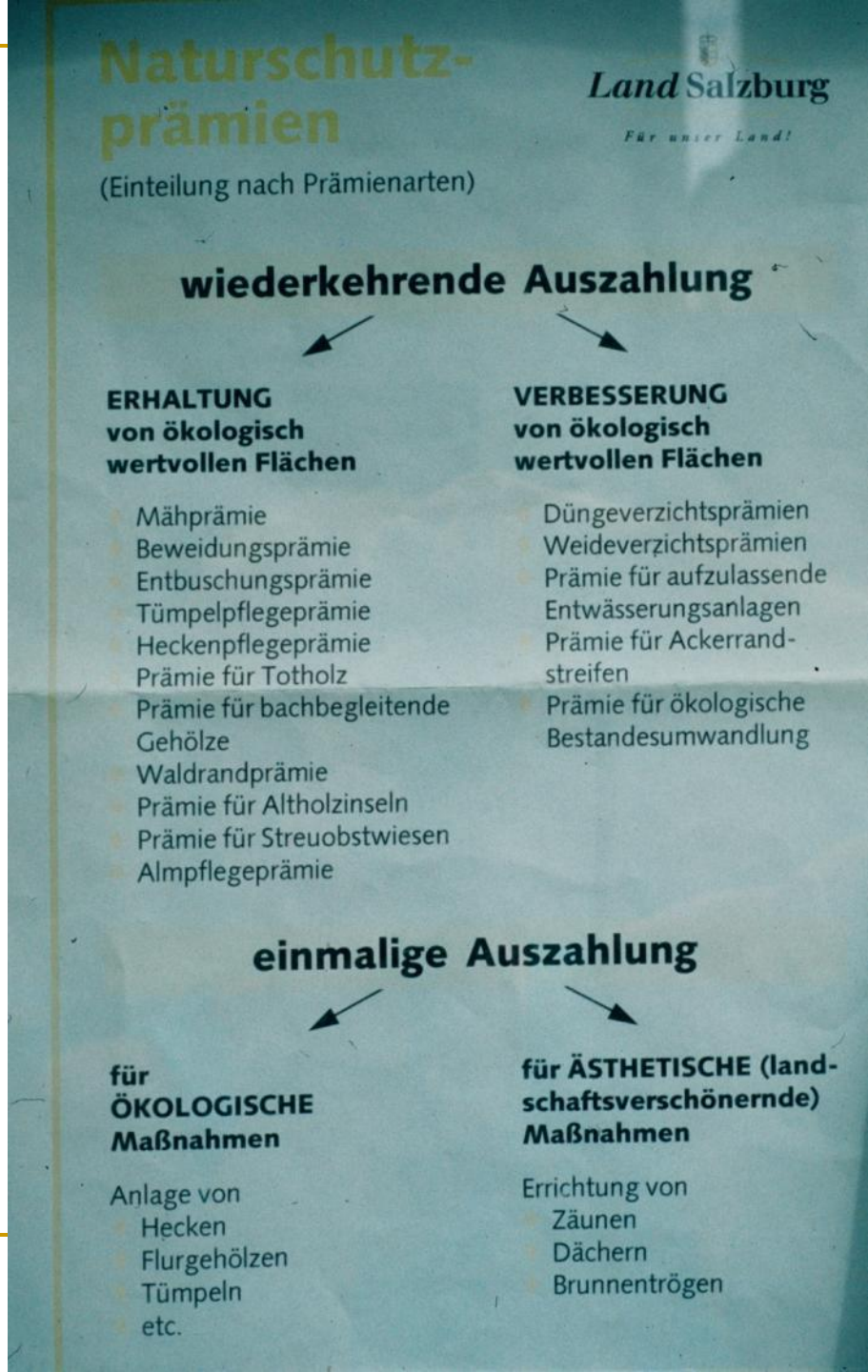




Nature conservation farm Brodowin

Germany

Management agreements in Salzburgerland (Austria)



Naturschutz-prämien

Land Salzburg

Für unser Land!

(Einteilung nach Prämienarten)

wiederkehrende Auszahlung

ERHALTUNG von ökologisch wertvollen Flächen

- Mähprämie
- Beweidungsprämie
- Entbuschungsprämie
- Tümpelpflegeprämie
- Heckenpflegeprämie
- Prämie für Totholz
- Prämie für bachbegleitende Gehölze
- Waldrandprämie
- Prämie für Altholzinseln
- Prämie für Streuobstwiesen
- Almpflegeprämie

VERBESSERUNG von ökologisch wertvollen Flächen

- Düngeverzichtsprämien
- Weideverzichtsprämien
- Prämie für aufzulassende Entwässerungsanlagen
- Prämie für Ackerrand-streifen
- Prämie für ökologische Bestandesumwandlung

einmalige Auszahlung

für ÖKOLOGISCHE Maßnahmen

Anlage von
- Hecken
- Flurgehölzen
- Tümpeln
- etc.

für ÄSTHETISCHE (land-schaftsverschönernde) Maßnahmen

Errichtung von
- Zäunen
- Dächern
- Brunnentrögen

Managing field margins in Zeeland (NL): partridges plan
patrijzenplan (dienst landelijk gebied).

Moreover, recovery of green infrastructure is important to reduce risk of soil erosion(Rutten/Tongeren (B))

See next theme 9 for more details

Conclusion

- Volunteer hunters and/or nature associations are not able to realise appropriate processes for nature conservation and landscape care on the needed large scale in the European countryside.

- In many European countries a part of the landscape management and nature conservation is already done by farmers financed with management agreements. These agreements are co-funded from the second pillar of the new European agricultural policy, with support for rural development by the European Agricultural Fund for Rural Development (EAFRD).

- This is not only interesting for increasing biodiversity and landscape values, but also for tackling the growing problems with **flooding and soil erosion in the European rural areas**: see theme 9 (integral water management in rural areas).