GREEN INFRASTRUCTURE PLANNING IN EUROPE

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Syzygy

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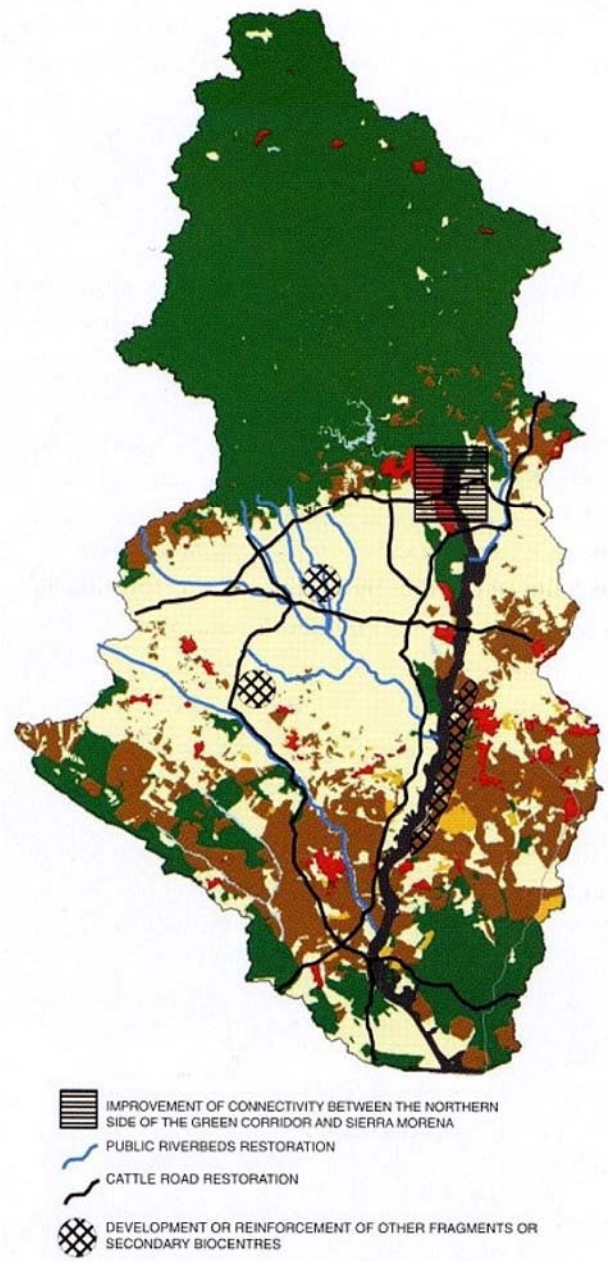
SPAIN



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GREEN INFRASTRUCTURE IN EUROPE

Two Models

Spatial Planning

- Model: A network of high quality green and blue spaces that deliver the natural services which allow a region to grow sustainably and provide a good quality of life for all
- Focus: optimizing sustainable land-use functions
- Features: integrated strategic planning at regional level, spatial planning as primary instrument

Biodiversity Conservation

- Model: An interconnected network of natural areas that maintain ecological coherence and deliver multiple services
- Focus: strengthening ecosystems and delivering ecosystem goods and services
- Features: ecological connectivity, multifunctional land use, biodiversity conservation outside protected areas

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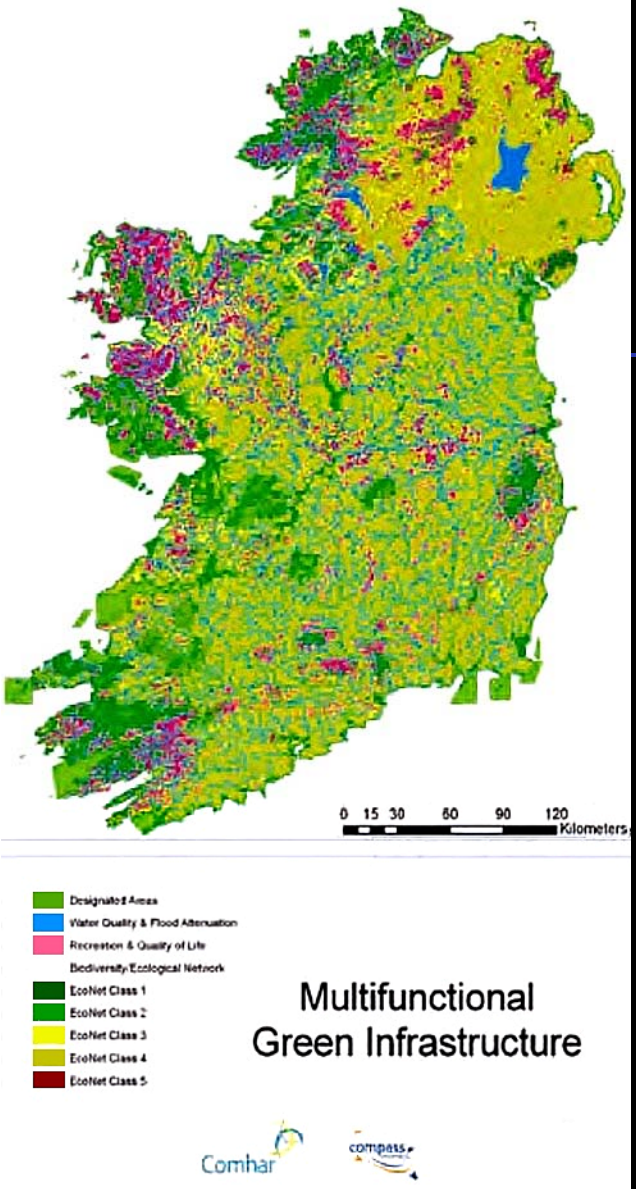
UNDERSTANDING THE CONTEXT

The Institutional Framework

- Public vs. private initiatives:
  - In Europe majority of green infrastructure programs are government-driven
  - But also substantial number of NGO initiatives
  - Implications for funding and implementing process
- EU now developing green infrastructure strategy:
  - EU concept of green infrastructure
  - Common European model will evolve
  - Implementing actions across different policy sectors
  - Institutional, policy and funding implications

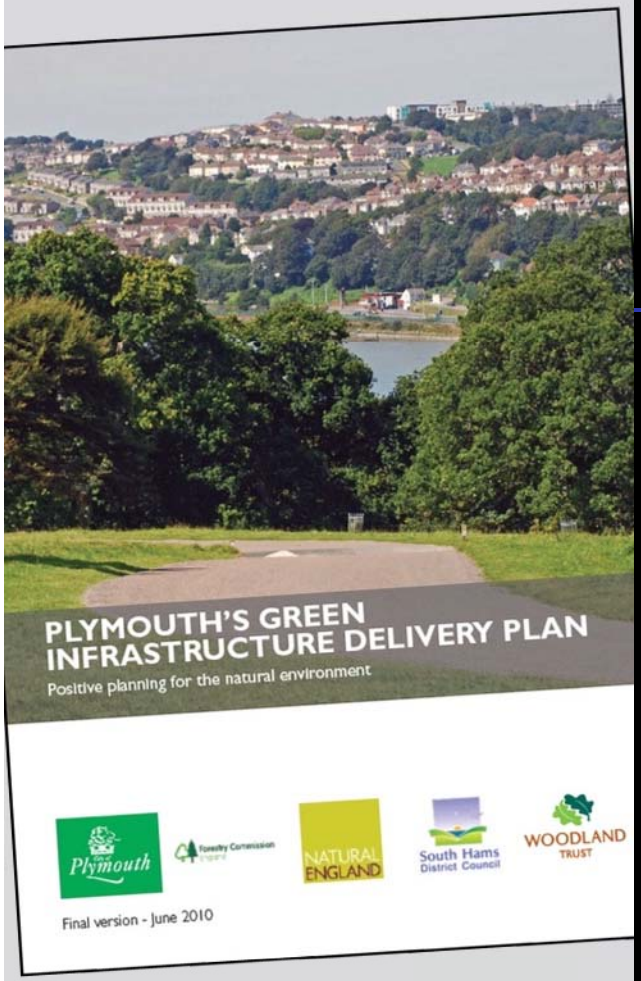
IRELAND



GREEN INFRASTRUCTURE IN EUROPE

Overview

- Over 150 green infrastructure programs and projects in Europe, in all countries
- Main focus: biodiversity conservation, sustainable spatial planning, river basin management, recreation, climate change adaptation
- Partnerships with wide range of stakeholders
- Wide range of funders
- Wide range of scales, from local to international
- 4 examples where a specific goal has offered opportunity to develop a broader green infrastructure program:
  - Spatial planning
  - Reserve network
  - Flood control
  - Climate change adaptation



UNITED KINGDOM: Spatial Planning

Plymouth Green Infrastructure

Strategic Aspiration

- Resource-efficient sustainable community

Objectives for 2021

- Enhance multiple benefits of green spaces
- Improve recreation links within city and with countryside
- Sustainable urban drainage solutions as adaptation to climate change
- Use woodlands to reduce carbon footprint
- Improve health of residents by encouraging active lifestyles

Plymouth Green Infrastructure Benefits

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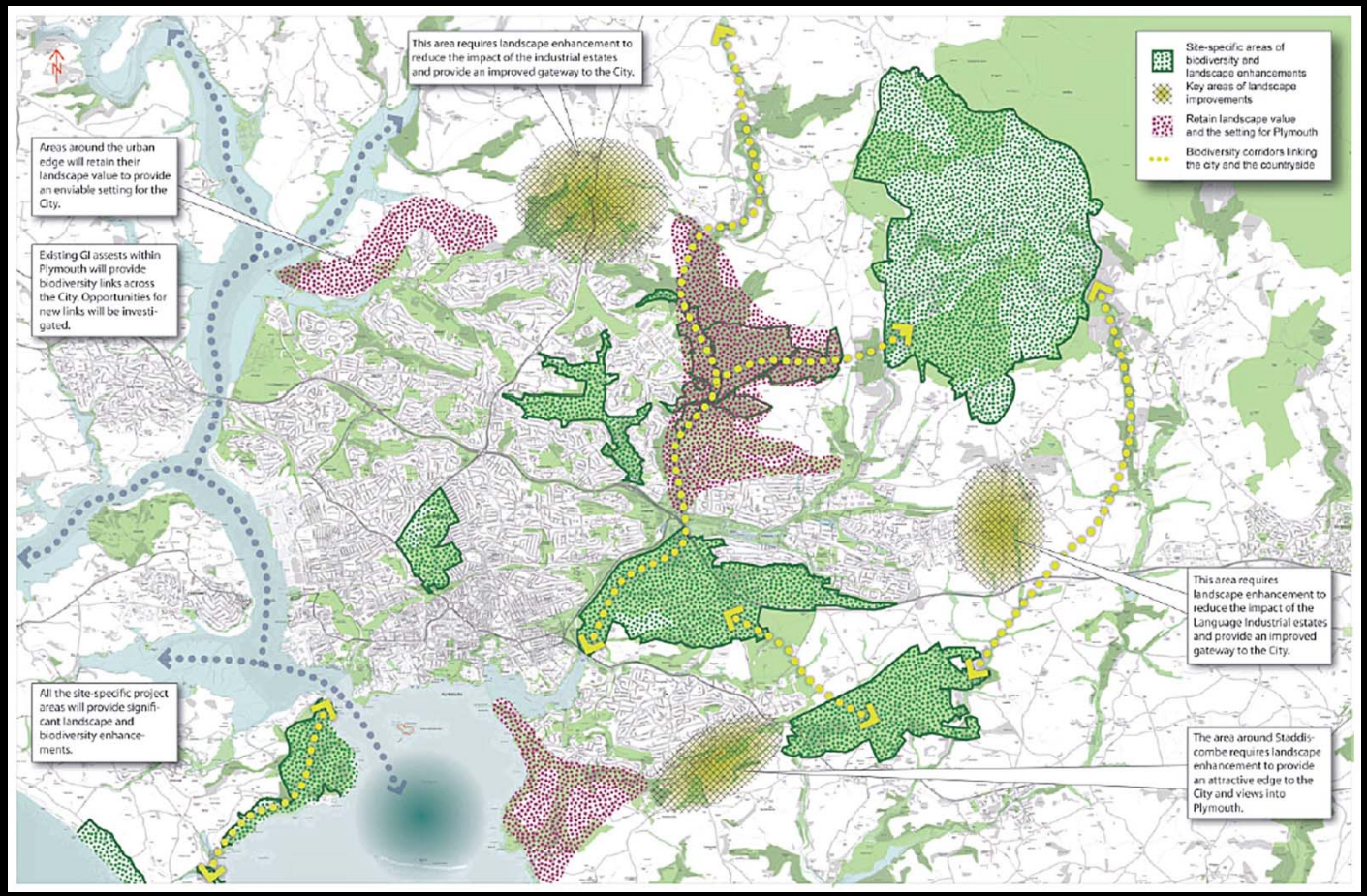
PLYMOUTH GREEN INFRASTRUCTURE

Development, Funding and Implementation

- Multi-agency and multi-stakeholder approach: developed by 5 partners with 19 stakeholders
- Diversified funding: developers, agri-environment, health and education sources, economic exploitation of green assets
- Actions organised into:
  - Site-specific projects
  - Thematic projects (e.g. biodiversity and landscape connectivity)
  - Delivery of projects

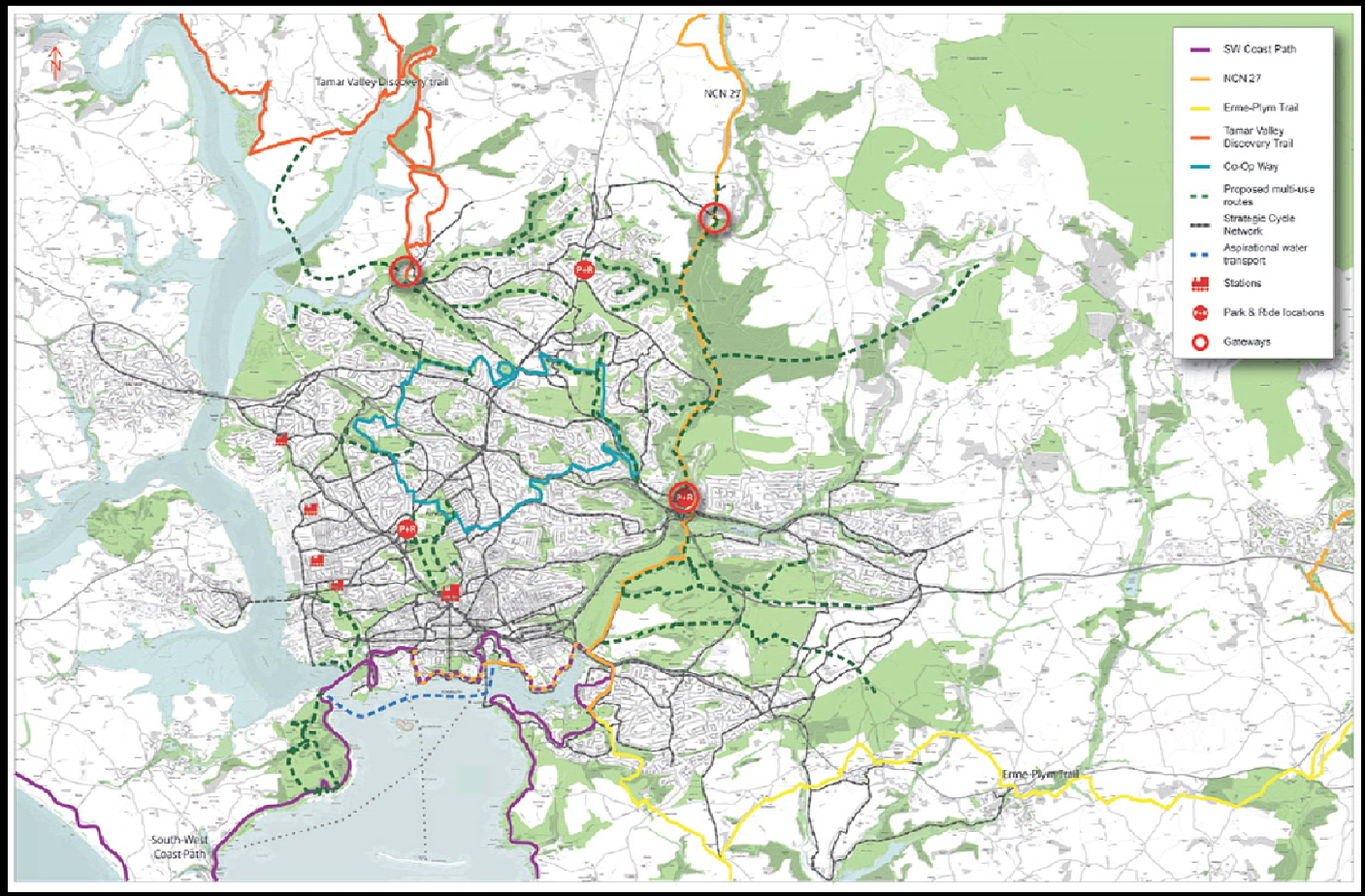
PLYMOUTH GREEN INFRASTRUCTURE

Ecological Connectivity



PLYMOUTH GREEN INFRASTRUCTURE

Sustainable Transport



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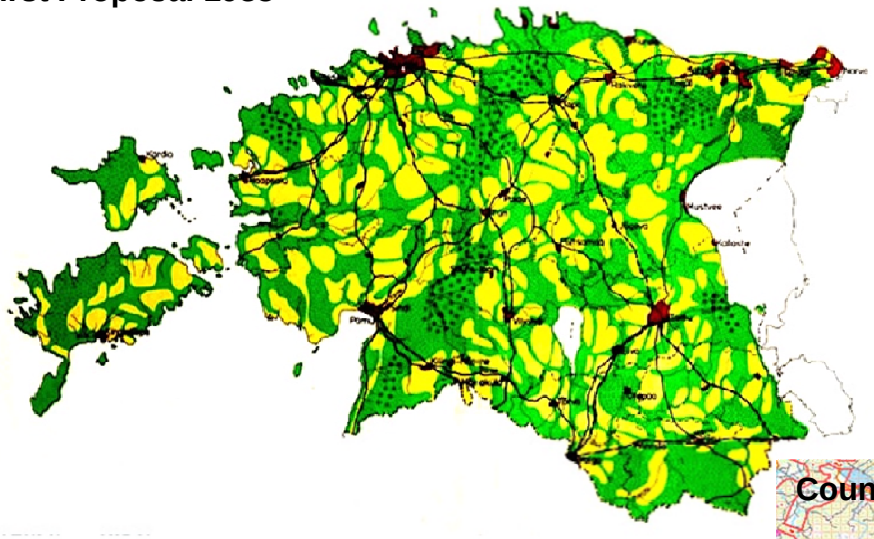
ESTONIA: Reserve Network

The Green Network

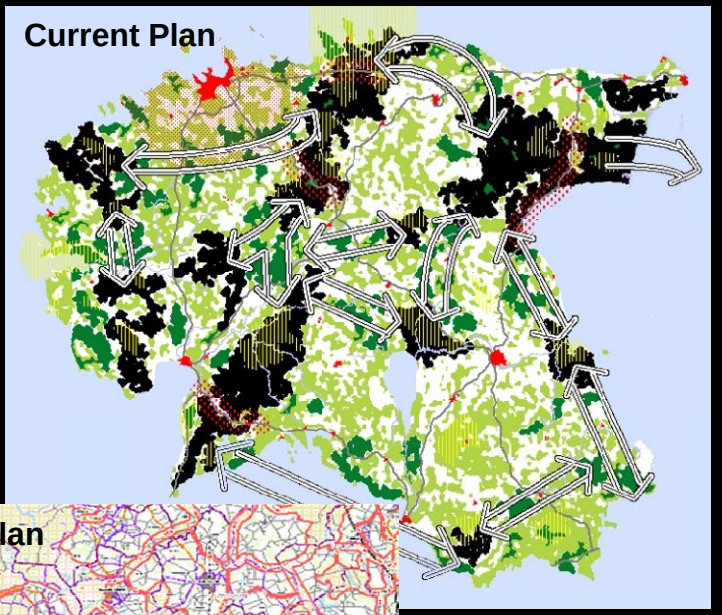
- Network of Ecologically Compensating Areas originally developed in 1970s
- Evolved into national integrated sustainable land-use plan
- Following independence in 1991, plan evolved into reserve network with core areas, corridors and compatible land uses
- Covers about 50% of Estonia's territory
- Implemented through spatial planning, county plans now complete

THE GREEN NETWORK
Development & Implementation

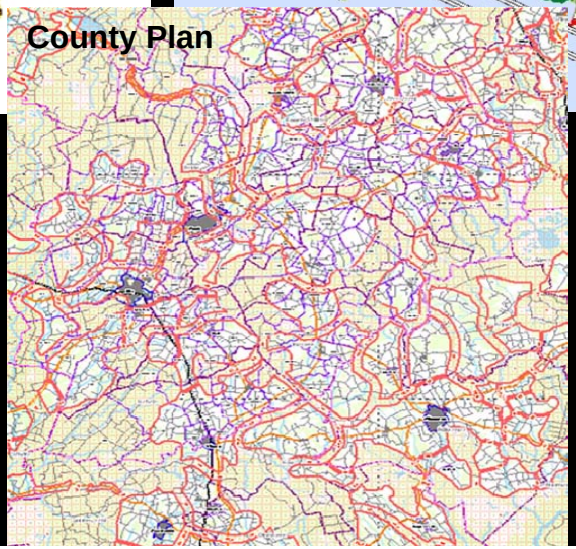
First Proposal 1983



Current Plan



County Plan



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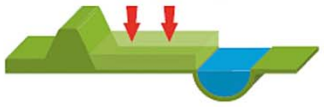
THE NETHERLANDS: Flood Control

Room for the River Program

- The Netherlands lies in the delta of 2 major rivers
- Approx. 4 million people at risk of catastrophic flood
- Climate change projection is for increased rainfall in Rhine and Meuse water basins
- Primary goal: increase maximum safe flow of the Rhine and the Meuse to a level that occurs once in 1250 years
  - For the Rhine = 15,000 m^3/sec to 16,000 m^3 (by 2015), then 18,000 m^3/sec (by 2100)
- Secondary goals: improve spatial quality and enhance biodiversity value of the river basins

ROOM FOR THE RIVER
Methods to Increase Capacity

Uiterwaardvergraving



Door het afgraven van delen van de uiterwaard krijgt de rivier bij hoogwater meer ruimte.

Dijkverlegging

Door dijken landinwaarts te verleggen, worden de uiterwaarden breder en krijgt de rivier meer ruimte.

Ontpoldering

De dijk aan de rivierzijde van een polder wordt verder landinwaarts verlegd. Deze polder is dan ontpolderd en de rivier kan bij hoogwater het gebied in stromen.

Zomerbedverdieping

De rivierbedding wordt verdiept door een bodemlaag af te graven. De rivierbodem komt daardoor dieper te liggen waardoor er meer ruimte voor het water is.

Kribverlaging

Kribben zorgen ervoor dat de rivier op zijn plaats blijft en de juiste diepte houdt. Bij hoogwater zorgen kribben echter voor opstuwing van het water. Door de kribben te verlagen kan het water sneller worden afgevoerd.

Verwijderen van obstakels

Door obstakels in het rivierbed waar mogelijk te verwijderen of aan te passen, kan het water sneller worden afgevoerd.

Waterberging

Bij een uitzonderlijke combinatie van een gesloten stormvloedkering en grote rivierafvoeren richting de zee, doet het Volkerak-Zoommeer dienst als tijdelijke waterberging.

Hoogwatergeul

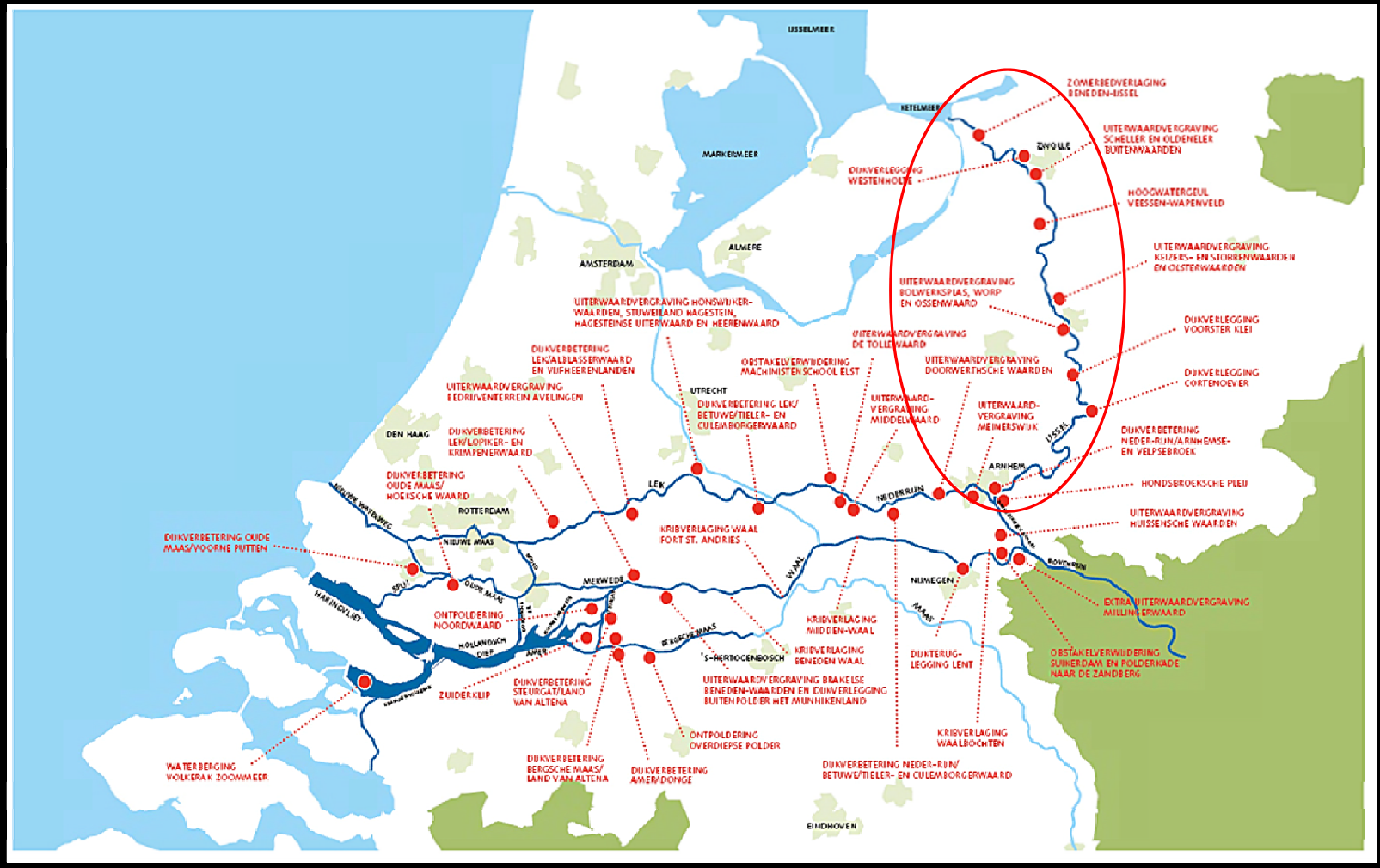
Een hoogwatergeul is een bedijkt gebied, dat aftakt van een rivier om een deel van het water via een andere route af te voeren.

Dijkverbetering

Op een aantal plaatsen waar rivierverruiming geen optie is, wordt de dijk versterkt.

ROOM FOR THE RIVER

39 Projects



ROOM FOR THE RIVER

Project in Deventer: the Ossenwaard

- The Yssel river forms an important aquatic corridor between the marshy areas to south and north, particularly for water birds
- Most of the flood plains along the river are designated under the EU Birds Directive and are part of the National Ecological Network
- 5 Room for the River projects around Deventer
- The Ossenwaard flood plain has been enlarged and parts excavated to create shallows and increase water retention capacity
- Richer vegetation, wet grassland attracts more birds
- Recreational opportunities also improved
- Funded by public authorities and WWF

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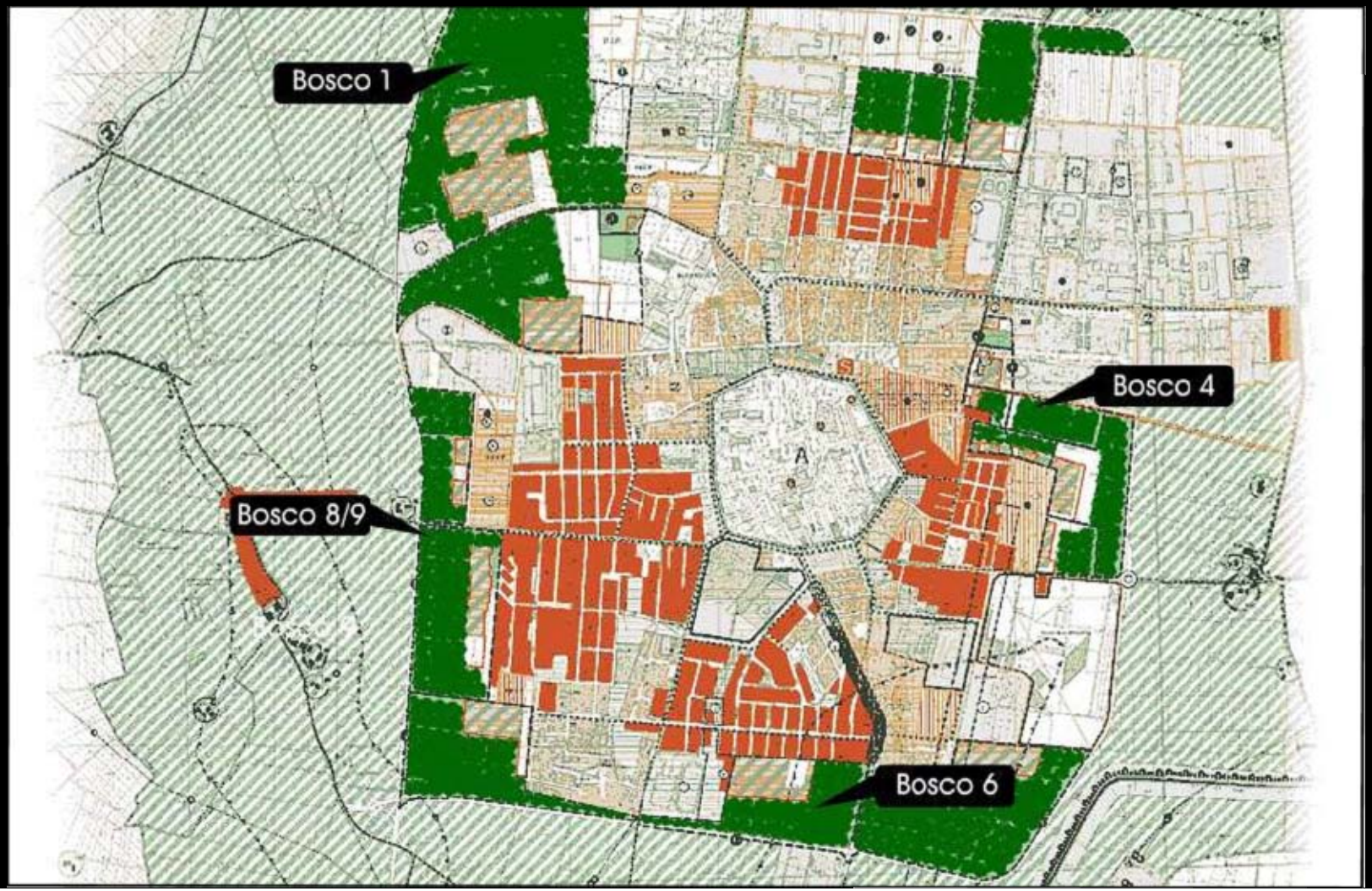
ITALY: Climate Change

Mirandola Urban Green Belt

- Local Energy Plan aims to reduce energy consumption and respond to climate change
- Aim is to create 320-acre forested green belt around the town to provide shading and cooling in summer and to store CO_2
- Multiple objectives: reduce energy consumption by 20%, strengthen connectivity, reduce flood risks, reduce erosion, improve urban quality
- Main implementing instrument is transfer of development rights (more flexible building permits in return for reserving land for the Green Belt)
- Low cost: $68,000
- Started in 2001, areas now 50% forested, completion scheduled for 2020

MIRANDOLA URBAN GREEN BELT

Plan



LEARNING FROM EXPERIENCE

Lessons from Europe

- Green infrastructure model evolved independently in different sectors: biodiversity, spatial planning, recreation
- 30 years experience in implementing green infrastructure:
  - Different scales: local to international
  - Challenge: reconcile short- and long-term objectives
  - Relies on partnerships, cross-sectoral cooperation and multi-stakeholder processes
  - Diverse funding sources
  - Focus on integrated planning
- Effectiveness has been demonstrated
- EU green infrastructure strategy will increase momentum
- Main challenges:
  - Professional process management is essential
  - Establishing long-term policy frameworks at all levels