



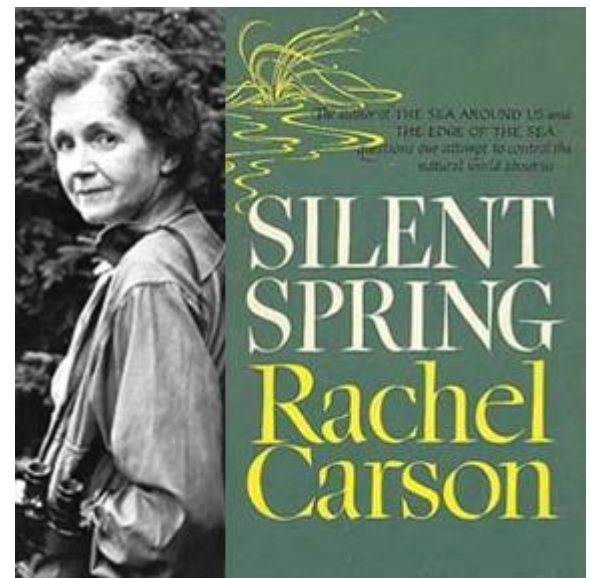
A BIODIVERSITY CRISIS

Seeking solutions and call for community action



Material risk of Biodiversity loss
= risk to life and the global economy
(Dempsey 2013)

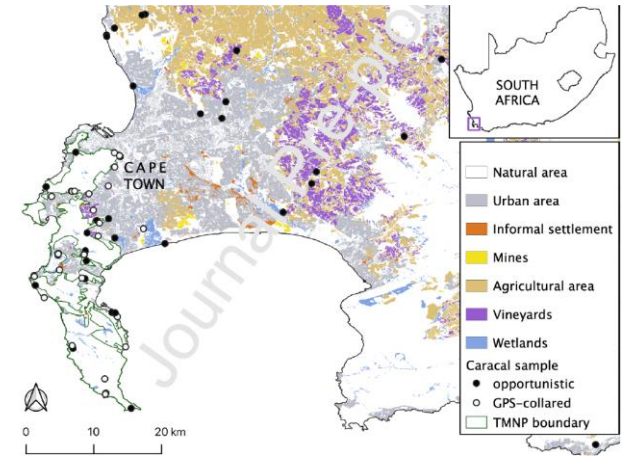
RACHEL CARSON'S SILENT SPRING (1962)



- Rachel Carson flagged the dangers of pesticides, such as organochlorines, and to consequences of exposure to these substances both to humans and to wildlife
- Most famously, dichloro-diphenyl-trichloroethane (DDT) was found to accumulate in the food chain with toxic effect. Top predators, particularly birds of prey were failing to reproduce because of damage to eggs they laid.
- Silent Spring was a Public Science book, aiming to address a wide audience and Rachel Carson influenced the development of the first USA Environmental Protection Agency and eventually DDT and polychlorinated biphenyls (PCBs) were banned in many countries around the World, but not all.

PESTICIDE ACCUMULATION IN FOOD WEBS (SOUTH AFRICA) (LEIGHTON *ET AL.* 2022)

- Exposure based on foraging behaviour
- Blood and tissue samples of top carnivores
- Found widespread exposure to pesticides
- 100% for PCBs, 83% for DTT
- Caracals move around human landscape – e.g. vineyards
- Elevated white cell and platelet count



Caracal (*Caracal caracal*)

Pollinators are declining

- **23 bee and wasp species have gone extinct in the UK since 1850**
- other bee species have declined in half of areas surveyed since the 1980s
- 18 butterfly species extinct in England, many others have declined
- 70% of our commonest moths have declined since 1970s
- 25% of hoverfly species have reduced numbers since the 1980s

(Jeff Ollerton 2019)



Many of UK agricultural and horticultural crops are insect pollinated,
including:

- apples, plums, cherries and other orchard fruit
- runner beans
- oil seed rape
- tomatoes
- courgettes
- soft fruit

**How many pesticides
are still in use?**

**Glyphosate
Slug Pellets**



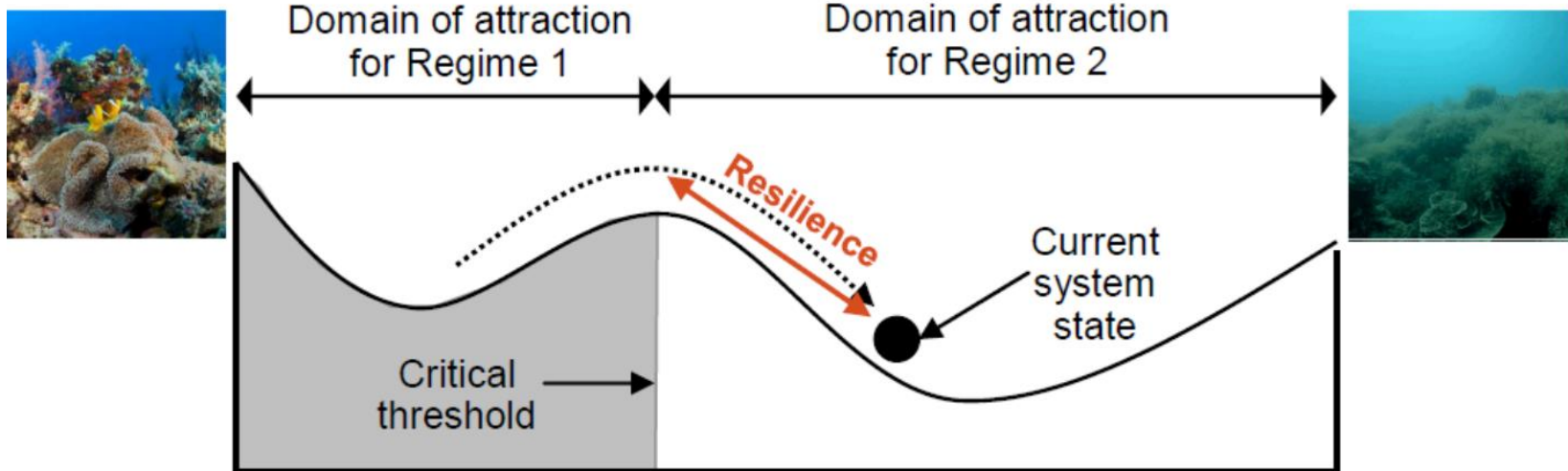
In the UK there are many reasons for Biodiversity loss:

- 90% of unimproved grassland has been lost
- changes in farming practices, e.g. crop rotation, fallow periods
- increased use of pesticides and other chemicals
- removal of hedgerows and native woodland
- loss of wetlands, ponds
- urban development





BIG MESSAGE FOR TODAY – we can not stand by and watch populations decline and species go extinct



Resilience (in this context): Magnitude of change that a system can absorb without undergoing a regime shift

Biggs et al. In press. Sourcebook in Theoretical Ecology.

ECOSYSTEM SERVICES

Benefit mankind through:

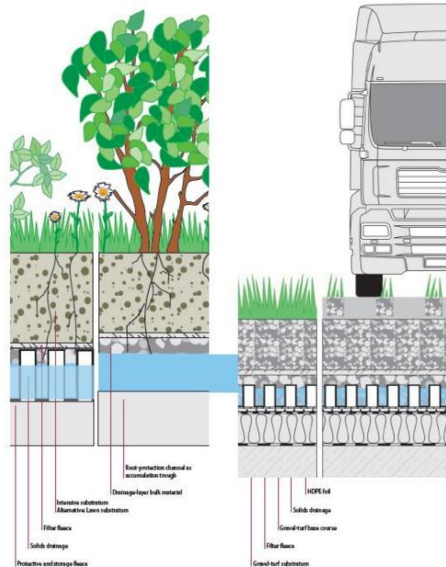
- **Supporting services** – energy and nutrients
- **Regulation** of pollution and impacts
- **Provision** of goods, food and water
- **Cultural values** of place

These are all dependent on maintenance of biodiversity, biotic interactions, nutrient cycling and production (Royal Society 2009)

Working with nature for Natural Resilience

Many aspect of our natural World
can be 'restored' – rescued but we need to start now

We need to urgently combine development with our resilience
to future climate change and biodiversity gain.



Berlin Senate for Urban Development (2010)



Sustainable Urban Drainage
Systems: [SUDS] at Upton,
Northampton



SUDS can provide **natural elements** (green fingers) into new development within a short timescale

SUDS can consist of healthy ecosystems: **enjoyable** green space



SUDS can add **resilience** for climate change with cooling, water recharge, pollution control and carbon capture



Ideas for mitigating flood risk, urban heating

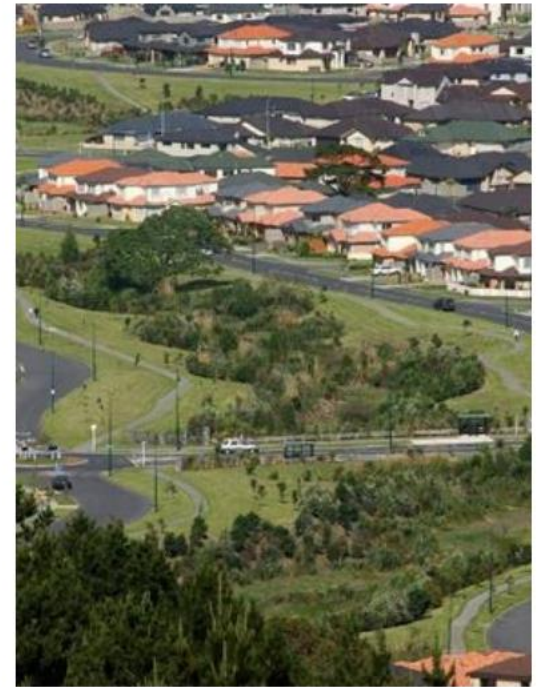
Greening of towns and cities are being demonstrated around the World



Urban water drainage, Malmö, Sweden

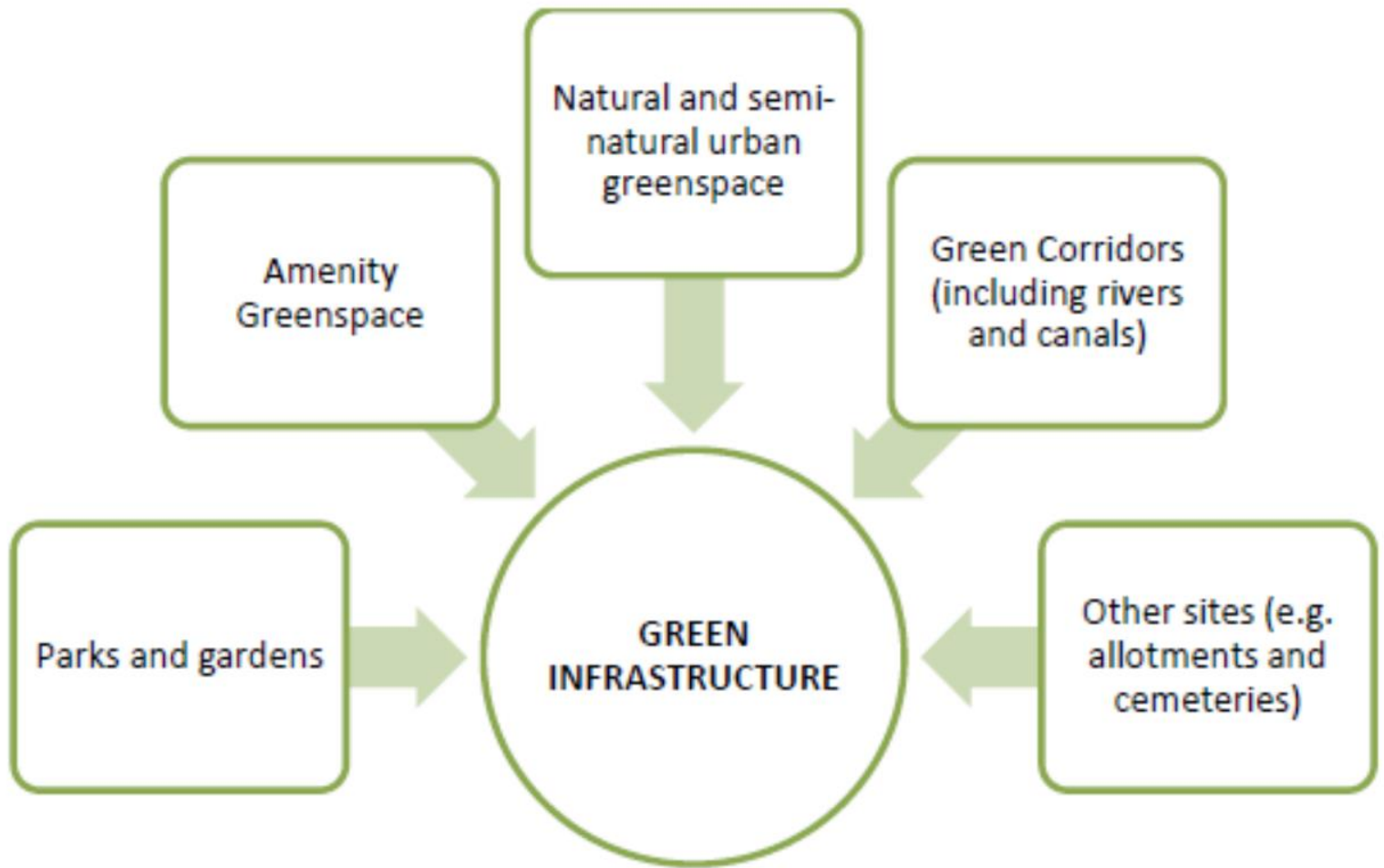


European Environment Agency, Copenhagen



Flatbush, New Zealand

Connecting wildlife and people





Search for it...

Search an Address or Post Code



Information Layers

Habitat Corridors

- Acid Grassland
- Acid Habitat Target Area
- Lowland Meadow
- Woodland

Habitat Corridors Continuation

- Acid Grassland
- Lowland Meadow
- Open Water
- Woodland

Tools

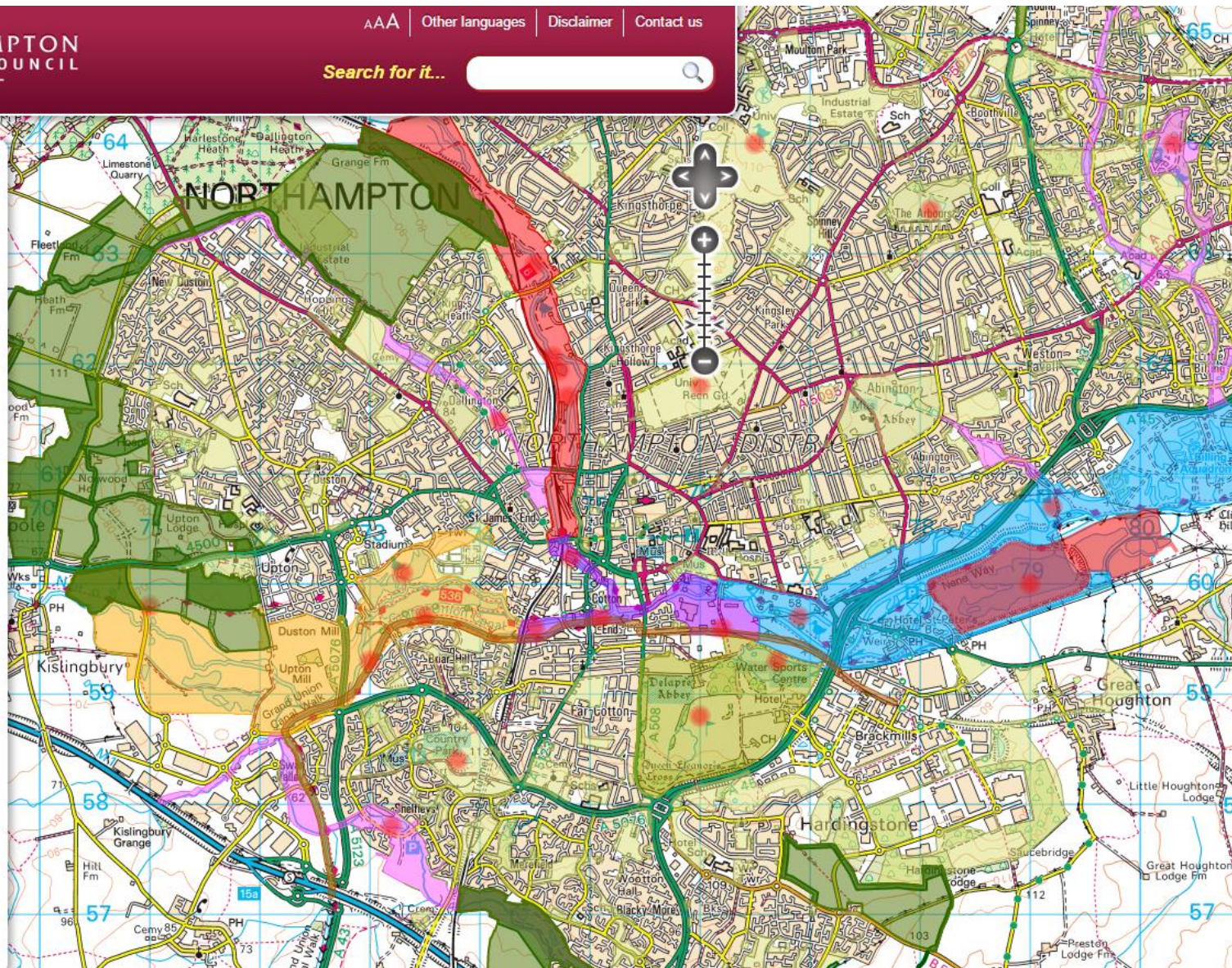
Legend

Component Area A-H

- Brampton Arm of the River Nene
- Western Nene, Upton and Duston Mill
- East-West Pedestrian and Cycle Link
- Town Centre Waterside
- Delapre
- Washlands and Eastern Nene
- Urban Brook Corridors
- Urban Open Spaces

Component Area I

- Proposed Structural Greenspace Associated with SUEs





HOW DO WE VALUE OUR GREEN SPACES AND BIODIVERSITY?

Whose Responsibility?

Some actions in maintaining green spaces and improving natural areas require money, power and authority

- Land ownership – conversion to driveways?
- Statutory duties – Flood Risk Management?
- Community engagement?
- Contracted Private Companies?
- Community Trusts?

WHERE DO POLICIES AND GRASS-ROOT ACTIVITIES MEET?



It is OK to be a little untidy!





University of Northampton Waterside Campus



University of Northampton Waterside Campus



- Green roofs
- Willow whips and Pollards
- Species rich meadow turf
- Wildflower seeding
- RHS flowers for pollinators
- Native species trees and shrubs
- Rough areas for longer grasses
- Wetland depressions
- New hedgerow planting
- Fruit trees

UON Project Awesome: Staff and Student Project



- Otter
- Hedgehogs
- Bats
- 29 species of bird (around the campus)
- 23 species of native bees
- 150 species of plants
- New records for rare species
 - Small-Flowered Catchfly
(Brien Laney 2018)



Education –multiple values of what could be considered waste



