



Ecosystem Services

Tony Whitbread, Chief Executive

Over the past 50 years, humans have changed ecosystems more than in any comparable period in human history. This has resulted in substantial, irreversible loss of the diversity of life on earth.

These changes have resulted in the degradation of ecosystem services which, unless addressed, will substantially diminish the benefits future generations obtain from ecosystems.

The degradation of ecosystem services could get worse and is a barrier to achieving Millennium Development Goals.

- In 300 years the global forest has shrunk by 40%. Forests have gone in 25 countries and 29 have lost more than 90%.
- Since 1900 the world has lost 50% of its wetlands.
- 30% of the worlds coral reefs are seriously damaged.
- 35% of the worlds mangrove forests have disappeared, some countries have lost up to 80%.
- The human-caused extinction rate of species is 1,000 times more rapid than the expected natural rate.
- Approximately 60% of the earths ecosystem services have been degraded in the last 50 years. Further declines are already in train

The well-being of every human population in the world is fundamentally and directly dependant on ecosystem services.

Pavan Sukhdev, (*The Economics of Ecosystems and Biodiversity, 2008*)

- “The world is losing as much capital annually through the destruction of forests as was wiped off the major markets in (the) financial crisis
- Current forest loss means a potential economic cost ... comparable to the amount of capital lost by Wall Street and City firms in the worst financial crisis in the history of the world.
- we're losing that, in natural capital terms, every year for the last 20 years, we'll continue to do that until something really breaks.
- Humanity's ecological footprint was already 25 to 30 times higher than the Earth's capacity to produce.
We are therefore drawing off its capital. We are not eating off its interest."

“Global warming may dominate headlines today

Ecosystem degradation will do so tomorrow”

(World Resource Institute, 2008)

There is a real need to ensure that in the UK our ecosystems are healthy and resilient, so that the natural environment can continue to support our communities and economy



The UK NEA aims to:

- Assess the status and trends of UK ecosystems.
- Describe drivers of change effecting ecosystems
- Examine plausible future scenarios for the UK's ecosystems.
- Outline societal response options to securing continued delivery of ecosystem services.
- Value the contribution of ecosystem services to human well-being.

Ecosystem Services

The benefits provided by ecosystems that contribute to making human life both possible and worth living

Provisional services

Regulating services

Cultural services

Support services

Provisioning services



Fibre

Food

Drinking water

Energy

Drugs

Wild species

Regulating services



Flood control

Waste breakdown

Local climate

Disease control

Pollination

Cultural services



Meaningful places

Access & Recreation

Tourism

Wild species variety

Spiritual enrichment

Supporting services



Nutrient cycling

Weathering

Plant growth

Soil formation

Water cycling

Evolution

Ecological interactions



- eg
- Weathering
 - Plant growth
 - Soil formation
 - Nutrient cycling
 - Climate regulation
 - Pollination

- eg
- Crops, livestock
 - Water
 - Trees
 - Wild species
 - Local climate
 - Purification
 - Wild species
 - Meaningful places

- eg
- Food
 - Drinking water
 - Fibre
 - Energy
 - Flood control
 - Disease control
 - Recreation
 - Good health

Where does Biodiversity fit in?

Ecological functions



Underpins ecological processes and indicates their health

(supporting, regulating)

Genes and species



Species and genetic variety give direct products like crops, livestock, fibre, pharmaceutical products etc.

(provisioning)

Valued by people



Appreciation of wildlife provide spiritual, educational and recreational benefits, improve health and give a sense of place

(Cultural)

Providing ecosystem services on which we depend for the conditions for life



To deliver Primary Ecological Functions –
a Living Landscape



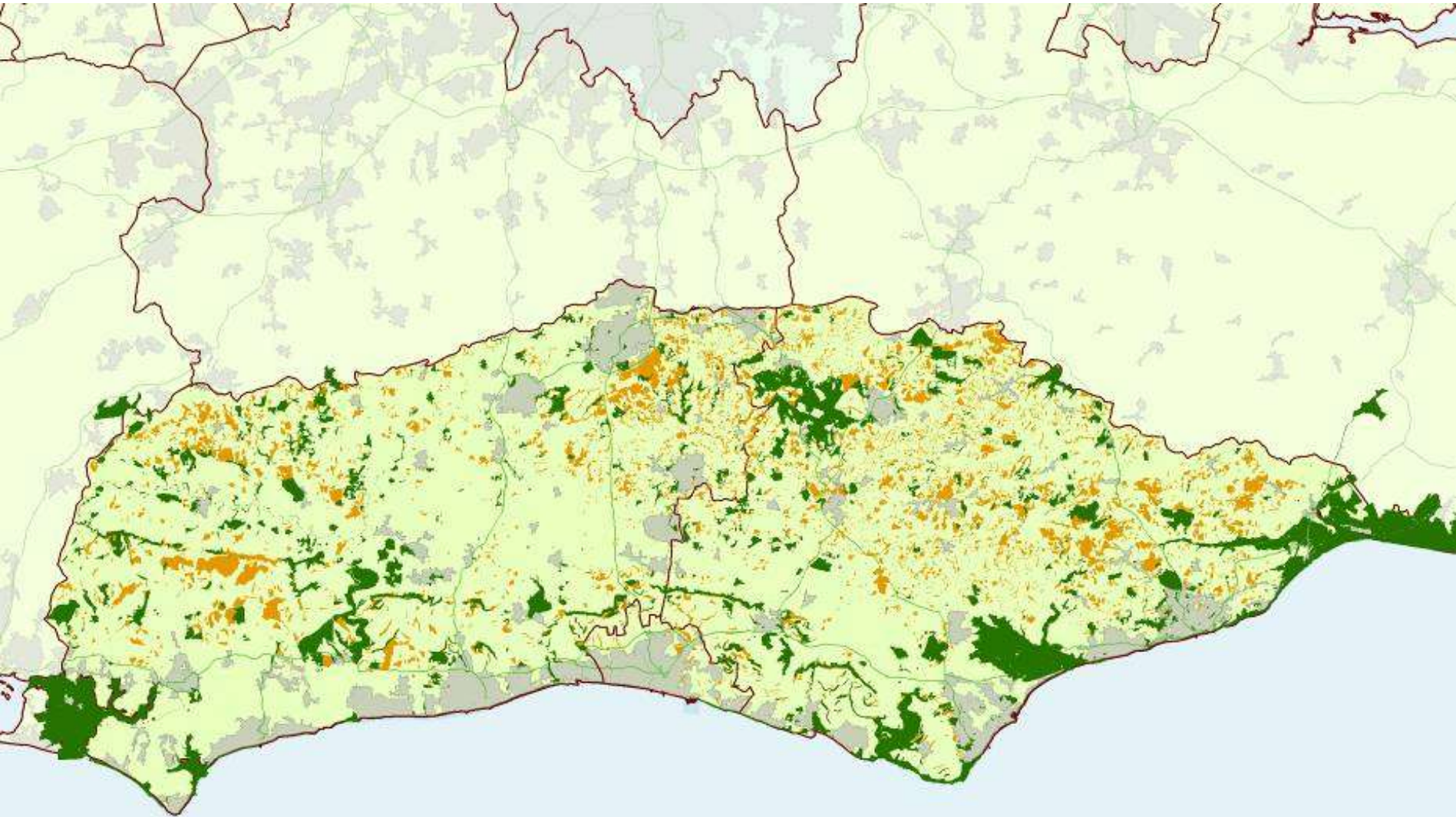
Interacting in healthy ecosystems



Makes rich habitats

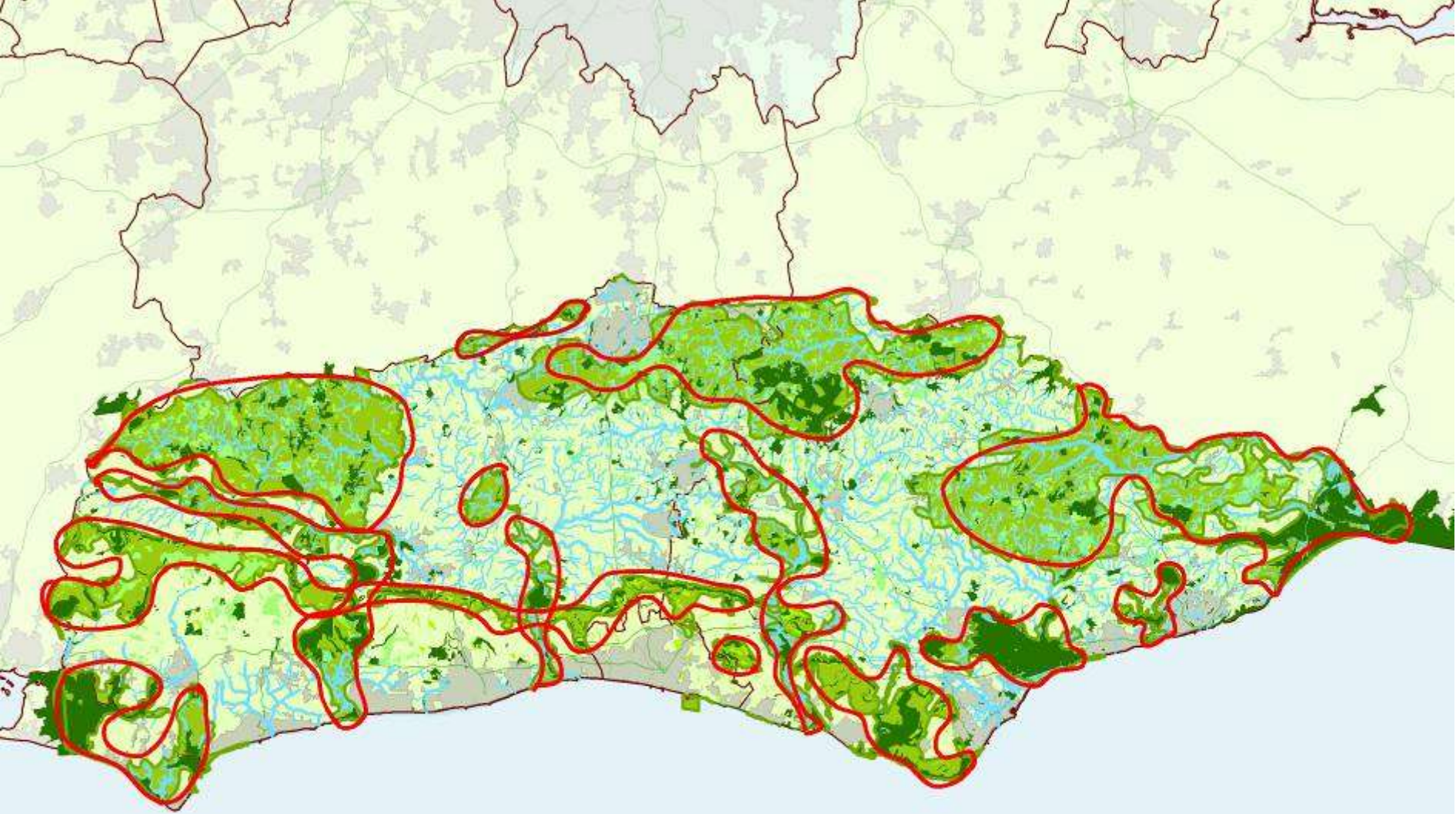


Species diversity



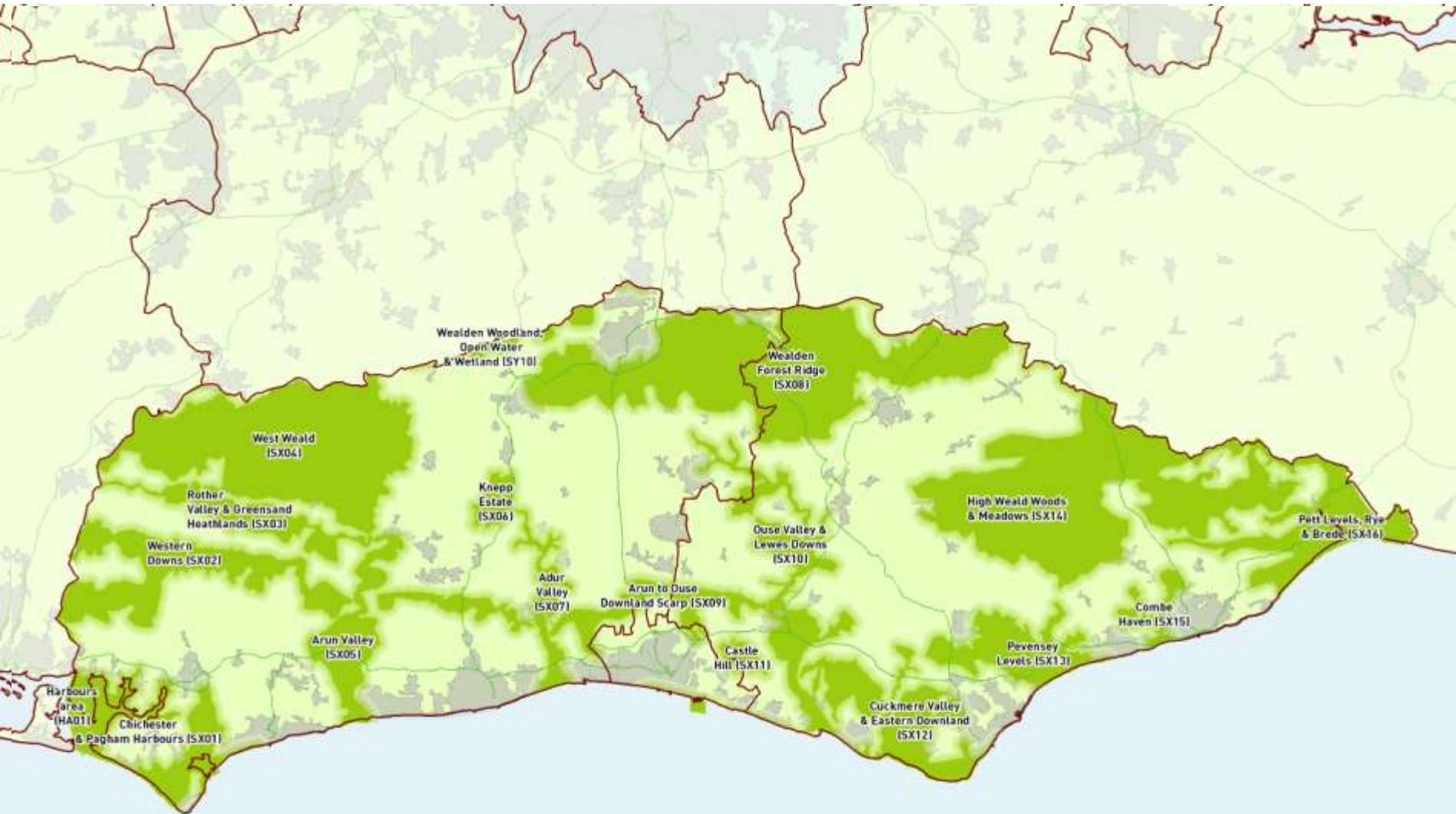
Where appropriate, The Sussex Biodiversity Record Centra would like to acknowledge the following dataset providers: Natural England (RAMSAR, SAC, SPA, NNR, SSSI, ancient woodland, vegetated shingle and saline lagoon data), East Sussex County Council (LNR, SNCI, country park, heathland and notable verge data), West Sussex County Council (LNR, SNCI, country park, notable verge, chalk grassland and heathland data), Brighton & Hove City Council (SNCI & LNR data), The Environment Agency (grazing marsh, urban areas, and hydrological data), The Farming & Rural Conservation Agency (ESA data), South Downs Joint Committee (chalk grassland data), The National Trust (NT properties data), Sussex Wildlife Trust (SWT reserves data), Sussex Otters & Rivers Partnership (Black Poplar data), and Dr. Francis Rose (ghyll woodland data).

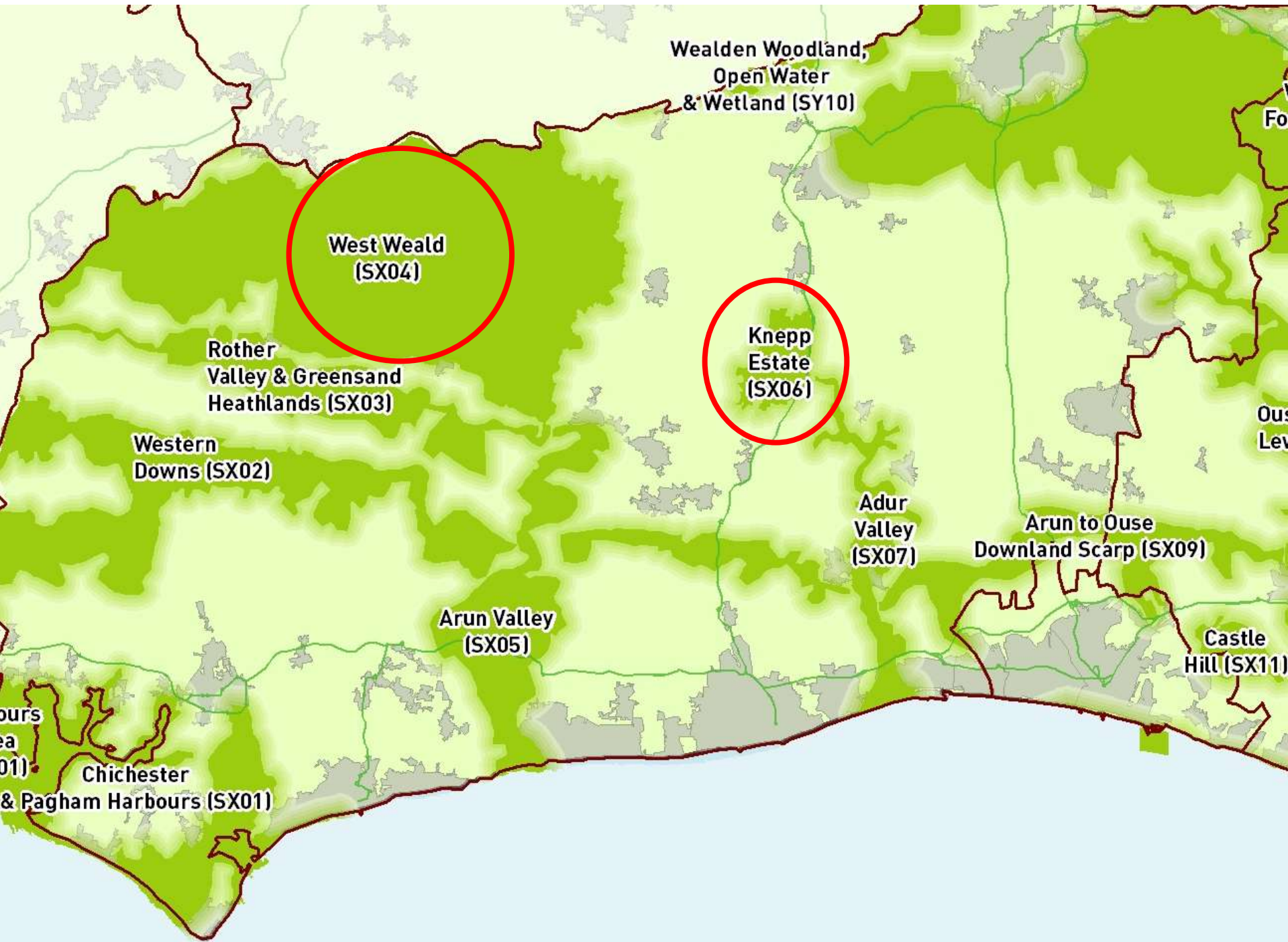
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Walden Woodland,
Open Water
& Wetland (SY10)

West Weald
(SX04)

Rother
Valley & Greensand
Heathlands (SX03)

Knepp
Estate
(SX06)

Western
Downs (SX02)

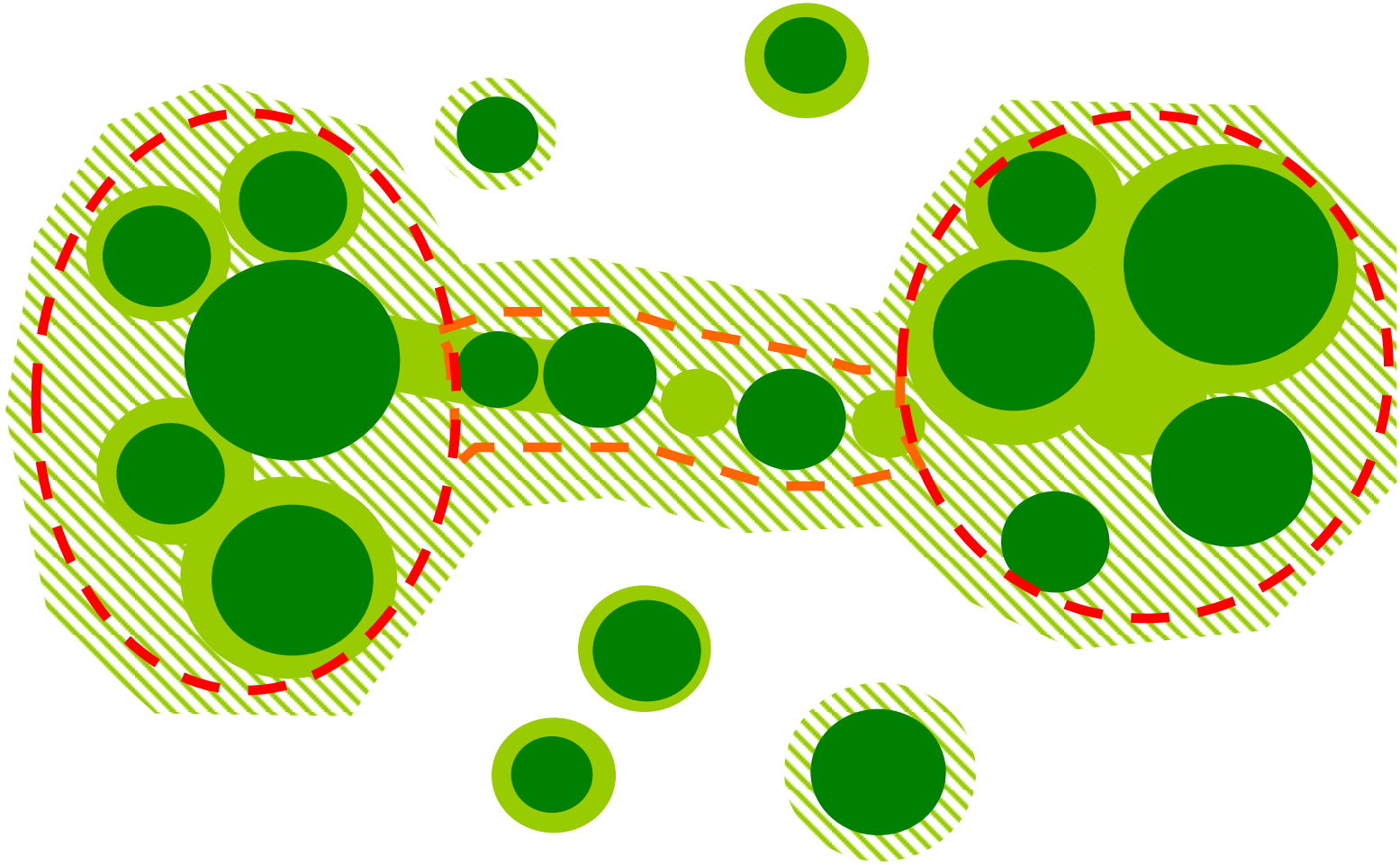
Adur
Valley
(SX07)

Arun to Ouse
Downland Scarp (SX09)

Arun Valley
(SX05)

Chichester
& Pagham Harbours (SX01)

Castle
Hill (SX11)



Better

Bigger

More joined up

An aerial photograph of a rural landscape. A large, dense forest of green trees occupies the central and lower-left portions of the frame. Surrounding the forest are various agricultural fields, some green and some brown, separated by roads and fences. In the foreground, a small farmstead with several buildings is visible. The background shows a hazy horizon under a bright sky.

What does that landscape unit provide?

Timber

Food

Flood amelioration

Water percolation

Carbon sequestration

A world without ecosystem services:

- >95% Carbon dioxide
- 0% Oxygen
- No ozone layer
- 2% nitrogen
- Acid seas
- Wild temperature fluctuations, day to night, summer to winter and with changing solar luminosity.

Globally, some scientists have valued these services as \$33 trillion (total world GDP at the time was about \$17 trillion!)

The implications (my opinion!):

- Ecosystem services once provided freely will increasingly be costed into normal economic activity.
- Carbon trading is perhaps just a taste of what might happen to a much wider range of ecosystem services in the future.
- Some ecosystem services do have a cost, but those that pay the cost are not always those that receive the benefit.
- Business interests that are alive to the issue of valuing ecosystem services are likely to be at a competitive advantage as this becomes an increasingly central part of economic activity.
- Dangers in economically valuing the environment –
 - Its not the economic value of the environment
 - Instead it should be the environmental value of the economy.

ecolog

It's the ~~economy~~, stupid

“You can have an environment without an economy – but you can't have an economy without an environment”

(Pavan Sukhdev)



Thank you!

UKNEA: <http://uknea.unep-wcmc.org>

TEEB: <http://www.teebweb.org/>

Millenium Ecosystem Assessment: <http://www.maweb.org>

Sussex Wildlife Trust: <http://www.sussexwt.org.uk>

<http://tonywhitbread.blogspot.com>