

ECOSYSTEM SERVICES

Direct, indirect and aesthetic/ ethical services of ecosystems found across Wales



**BE
THE
WAVE**

**MARINE
CONSERVATION
SOCIETY**



cadwch keep
gymru'n wales
daclus tidy



Lesson Objectives

- Describe what the term ecosystem services means.
- Give examples of services provided by the ocean and categorise them.
- Create an infographic to educate and inform others about the value of ecosystem services.



WHAT IS AN ECOSYSTEM?



WHAT ARE ECOSYSTEM SERVICES?





ECOSYSTEM CARDS

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KELP



- Kelp are a type of brown seaweed which are often mistaken for plants but are actually algae.
- As algae they photosynthesise, and through this they produce oxygen.
- Through photosynthesis they also take up carbon dioxide.
- The structure of the kelp creates an underwater forest, creating a great habitat for many species to shelter.
- This shelter provides a nursery for juvenile fish, including commercially important species such as cod, pollock and haddock.
- Kelp beds can help to reduce wave energy along the coast.

SEAGRASS



- Found in calm, shallow, sunlit coastal waters around the world, including Wales.
- Seagrass is the only flowering plant in the ocean. Seagrass therefore produces oxygen through photosynthesis.
- Seagrass also takes up and stores carbon dioxide. Seagrass captures carbon up to 35 times faster than tropical rainforests.
- Globally, seagrass meadows are known for their value as fish nurseries for many important species, including flatfish and cuttlefish.
- Seagrass meadows are also home to many bivalves, worms, starfish and to rare stalked jellyfish.

SEABED



- It may on first glance look barren but these areas are home to a large variety of animals including sand eels, rays, sea cucumbers, burrowing urchins, starfish, bivalves and many species of fish and crustaceans like shrimp, prawns and crabs.
- Many fish use these areas to hide their eggs in burrows in the seabed.
- Gravel is extracted for use in construction. Each year in the UK around 20 million tonnes of marine sediments are removed.
- The ocean provides us with many valuable resources including oil, gas and minerals.

COASTAL SEAS



- The ocean is home to huge variety of animals from tiny microscopic plankton to huge whales.
- Ours seas provide seafood to millions of people and fishing is an important economic industry.
- We use the power of the sea to harvest wave and tidal energy. The large expanse creates wind and a great place for turbines.
- Ocean currents transport currents around the world, cold water from the poles and warm water from the tropics. This mixing of sea temperatures helps to regulate the climate.
- The ocean hols 97% of the world's water and plays a major role in the water cycle.
- People enjoy spending time on or near the ocean and coastal tourism contributes more than £700 million to the Welsh economy.

SALTMARSH



- The mud in saltmarshes makes them a great habitat for worms and burrowing shellfish. This is why saltmarshes are a great place for birds to feed.
- The plants within saltmarsh habitats produce oxygen and store carbon dioxide through photosynthesis.
- Saltmarshes protect our coast from floods and waves. The structure helps reduce wave energy and the roots of the plants help to stabilise the sediment.
- Healthy saltmarshes have the ability to reduce pollution entering the ocean by filtering nutrients and chemicals coming off land. But too much pollution will damage these habitats.



DIRECT SERVICES

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INDIRECT SERVICES

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AESTHETIC AND ETHICAL SERVICES

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ECOSYSTEM SERVICES PROVIDED BY NATIVE OYSTERS *OSTREA EDULIS*

INCREASED WATER CLARITY

Can benefit recovery of seagrass and other coastal aquatic plants



INCREASED FISH PRODUCTION

Provides a suitable feeding and nursery grounds for fish



INCREASED OYSTER POPULATIONS

Provides a spill over effect to local oyster fisheries



CULTURAL VALUE

Have previously formed the heart of coastal communities



IMPROVED WATER QUALITY

Removes pollutants from the water column



BIODIVERSITY ENHANCEMENT

Form a complex structure that provides shelter and food for a diversity of species



DENITRIFICATION

Removes excess nutrients



STABILISATION OF SEDIMENTS

Reduces the resuspension of fine sediment, improving water clarity

- Provisioning services
- Regulating services
- Cultural services



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School

- Is your school an eco school? Consider joining the national network of eco schools to help improve environmental awareness in your school and empower students.
<https://www.eco-schools.org.uk/about/benefits-of-joining/>
- Does your school have a biodiversity area? Having a small area in your school grounds where nature can thrive is not only a great way to improve your school grounds for the benefit of nature but also a great teaching aid. Biodiversity areas could include a pond, woodland, small meadow or hedgerows. These make great study sites for students to study biodiversity and ecosystems services and help students to connect with, and ultimately care for nature. You can seek advice on how to improve your school grounds for nature through your local Wildlife Trust.
<https://www.wildlifetrusts.org/schools>





Individual

- Stay inspired and learn more by getting out and exploring your local natural space, whether it's a park, a nature reserve or the coastline.
- Help to transform the way people view nature by sharing with friends and family what you have learnt about the incredible services natural ecosystems provide, and how we simply can't survive without healthy ecosystems.
- Think about how you can reduce your footprint to lessen the strain on nature. For example, eat sustainable fish, reduce, reuse, recycle, and be conscious of your energy usage.



EXTENSION ACTIVITES

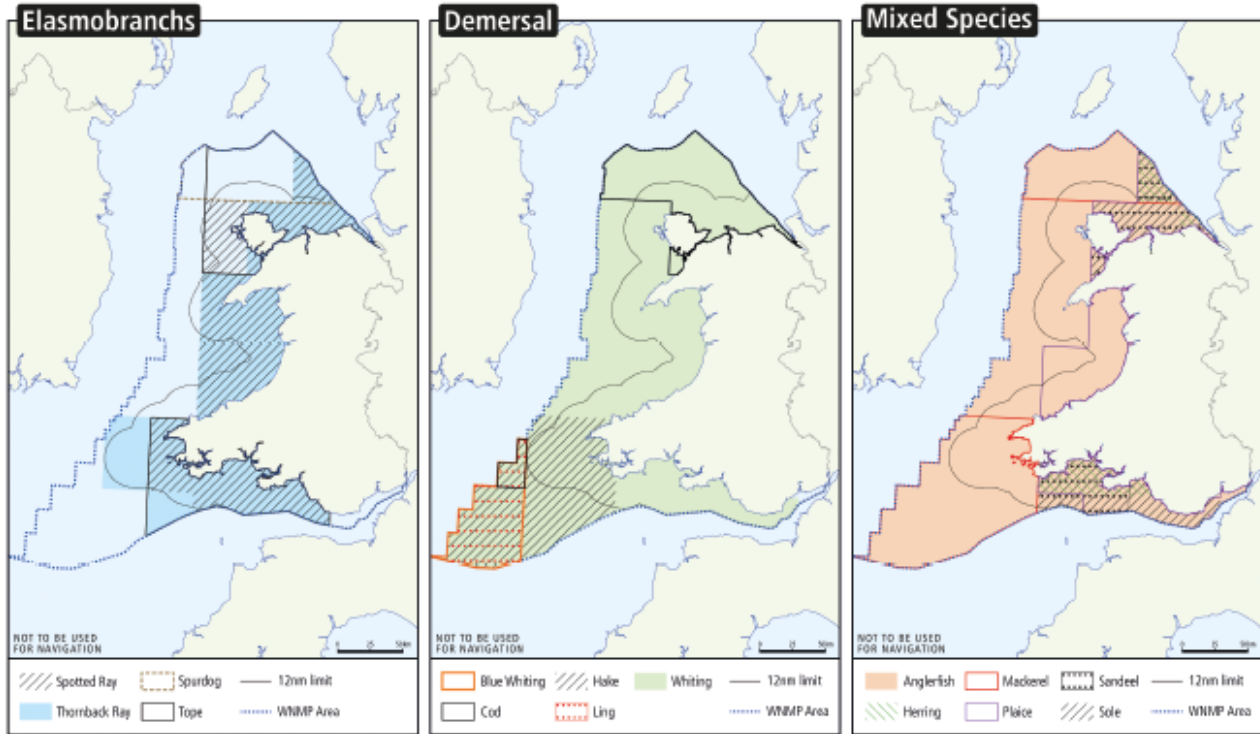


ACTIVITY 1

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Fish Nursery Areas

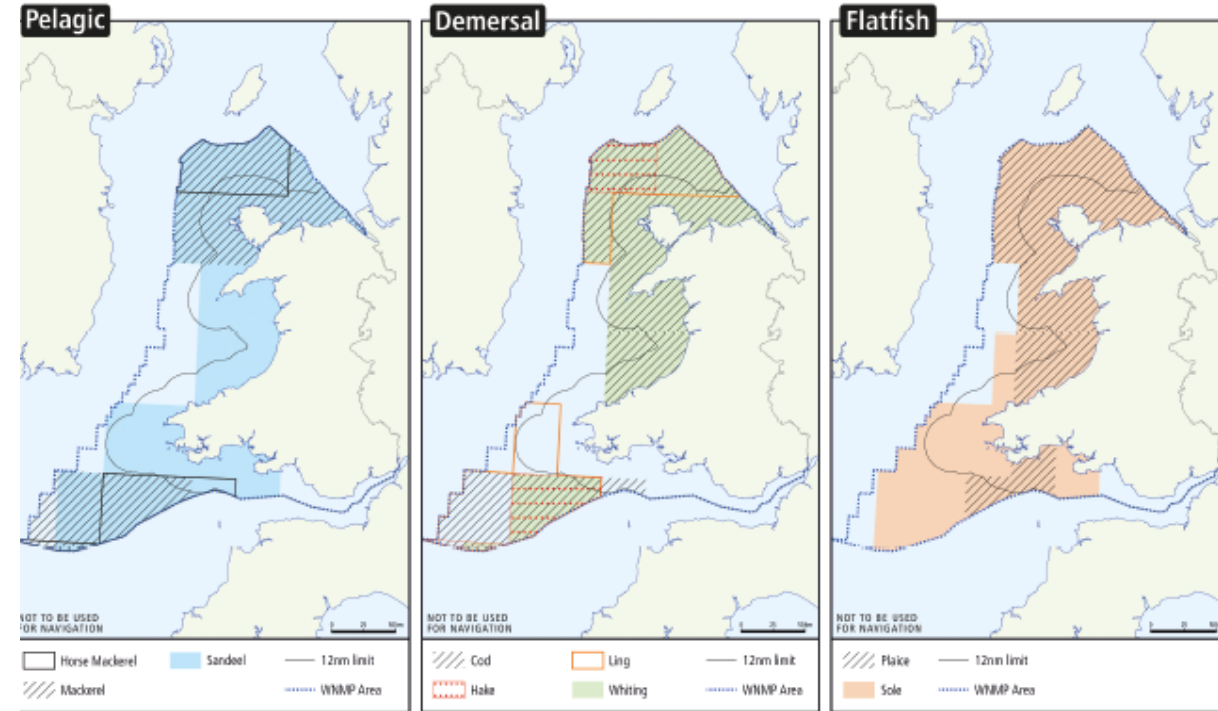
(indicative map relating to policy area: ENV_07)



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September 2017

Fish Spawning Areas

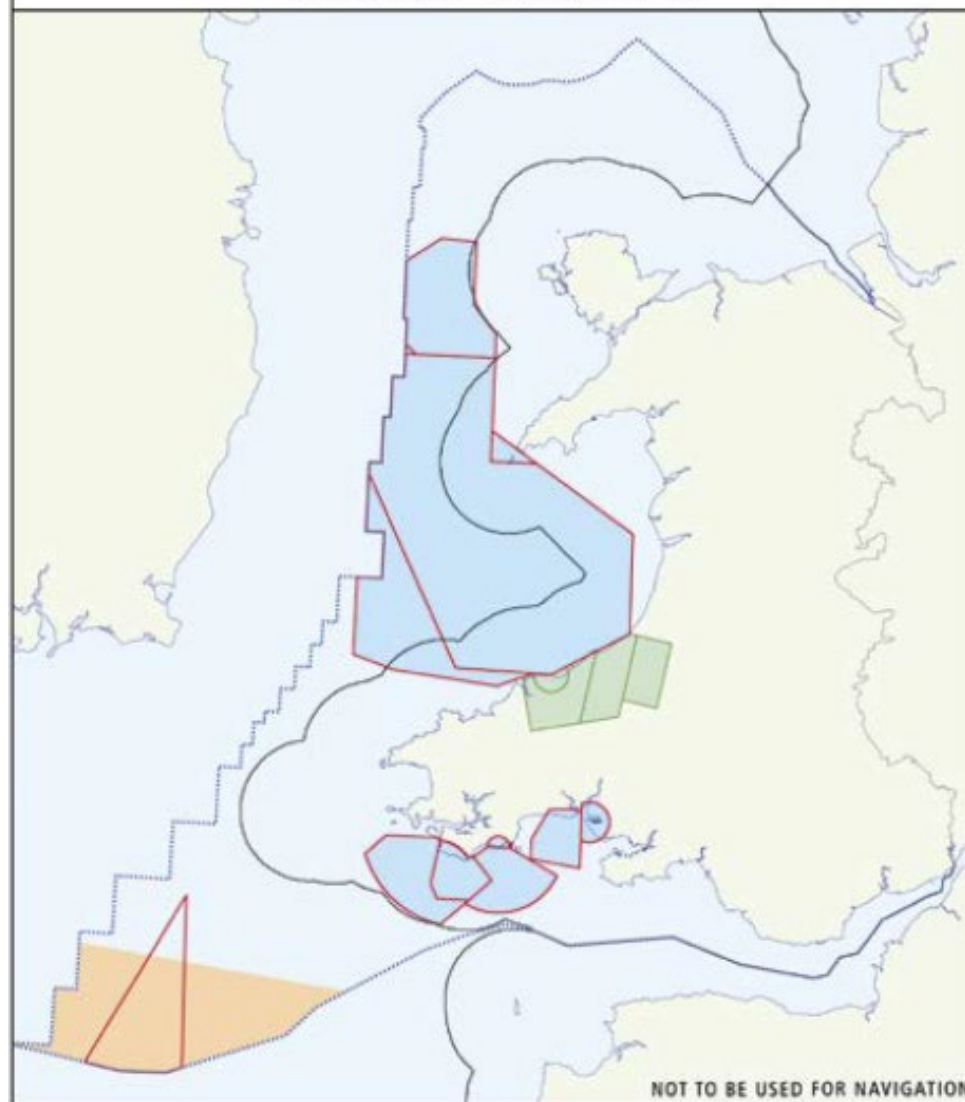
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September 2017

Defence

(indicative map relating to policy area: DEF_01)



- Area of Intense Aerial Activity
- Military Practice Area
- Military Operating Area
- Practice and Exercise Area (Surface Fleet)

- 12nm limit
- WNMP Area

0 25 50 km

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Data source: Civil Aviation Authority, Ordnance Survey, 2018
November 2018

Energy - Oil and Gas

(indicative map relating to policy areas: O&G_01a and b, O&G_2, SAF_01a)



FIELD (O&G_01a and b, SAF_01a)

Gas Oil

POWER STATIONS

Coal Gas Oil

Gas

UNDEVELOPED DISCOVERIES

Gas

WELLS

Completed (operating) Completed (shut in)

31st Round Blocks Offered (O&G_01a and b, SAF_01a)

Licensed Area (O&G_01a and b, SAF_01a)

Pipeline

National Grid High Voltage Cable

Subsea Power Cable

12nm limit

WNMP Area

0 25 50 km

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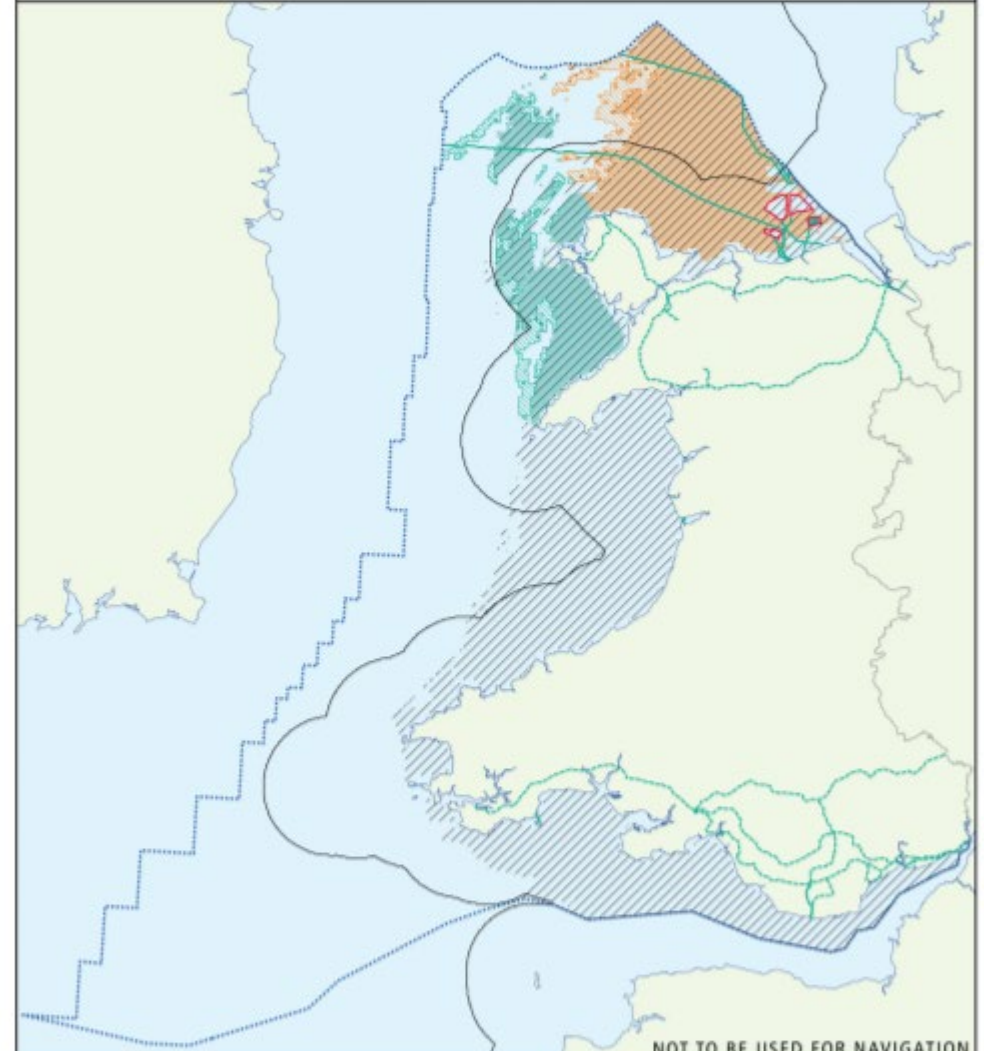
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Cartography: Welsh Government • M&S 1819

April 2019

Energy - Low Carbon (Wind)

(indicative map relating to policy areas: ELC_01a and b, SAF_01a)



TCE Round 4 Offshore Wind Regions - included for further engagement

15 - Anglesey

15 - Anglesey - additional

16 - North Wales

15 - North Wales - additional

TCE Favourable Key Resource Area (suitable technical conditions)

Licensed Wind Farm (SAF_01)

National Grid High Voltage Cable

Subsea Power Cable

12nm limit

WNMP Area

0 25 50 km

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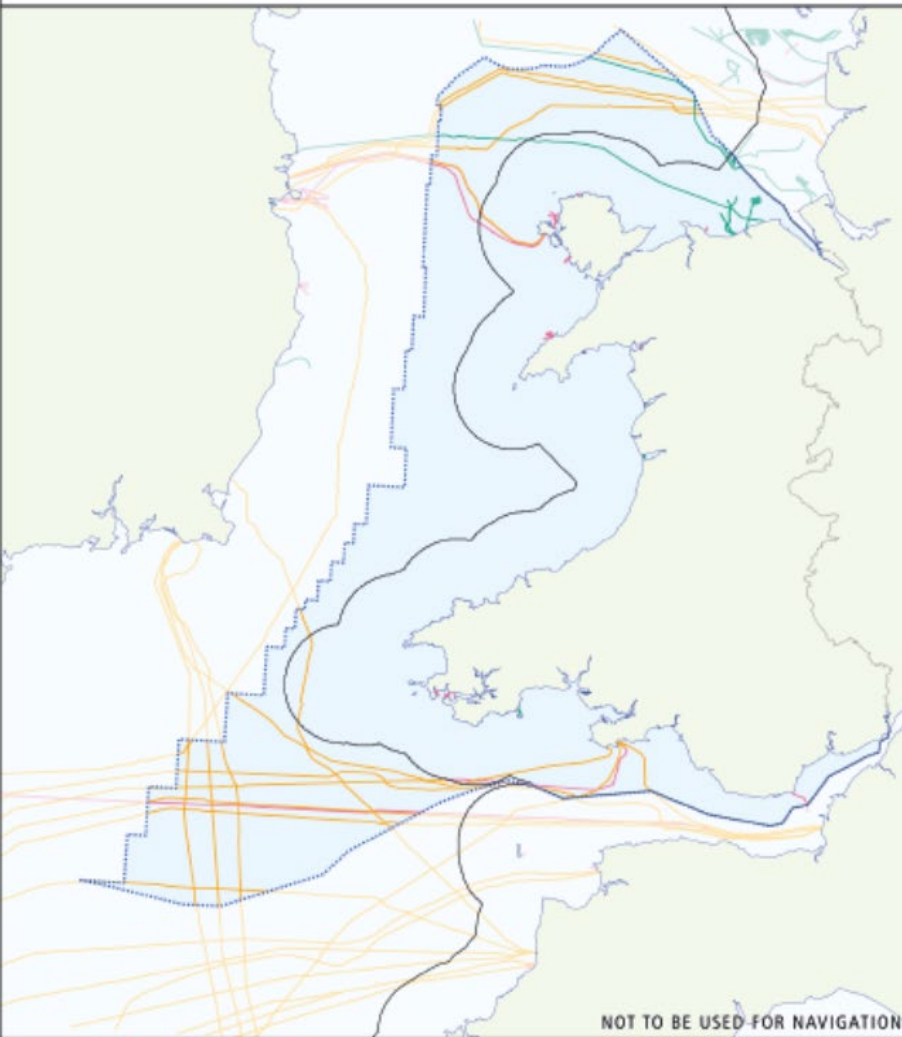
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May 2019

Subsea Cables

(indicative map relating to policy areas: CAB_01, SAF_01a)

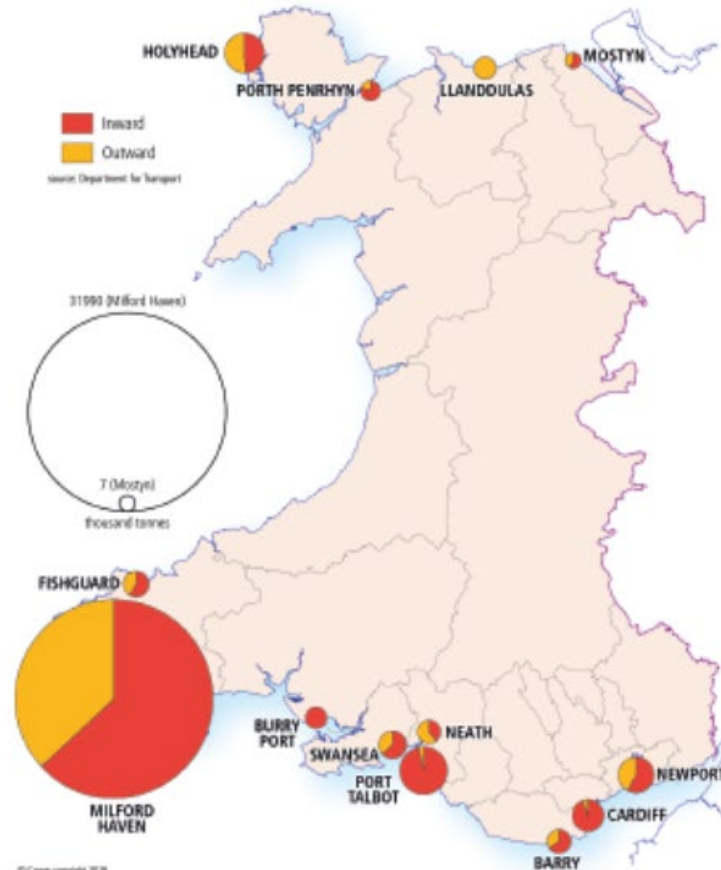


- Subsea Cable - Power (CAB_01, SAF_01a)
- Subsea Cable - Communications (CAB_01, SAF_01a)
- Subsea Cable - Undefined (CAB_01, SAF_01a)
- 12nm limit
- WNMP Area

0 25 50 km

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March 2019

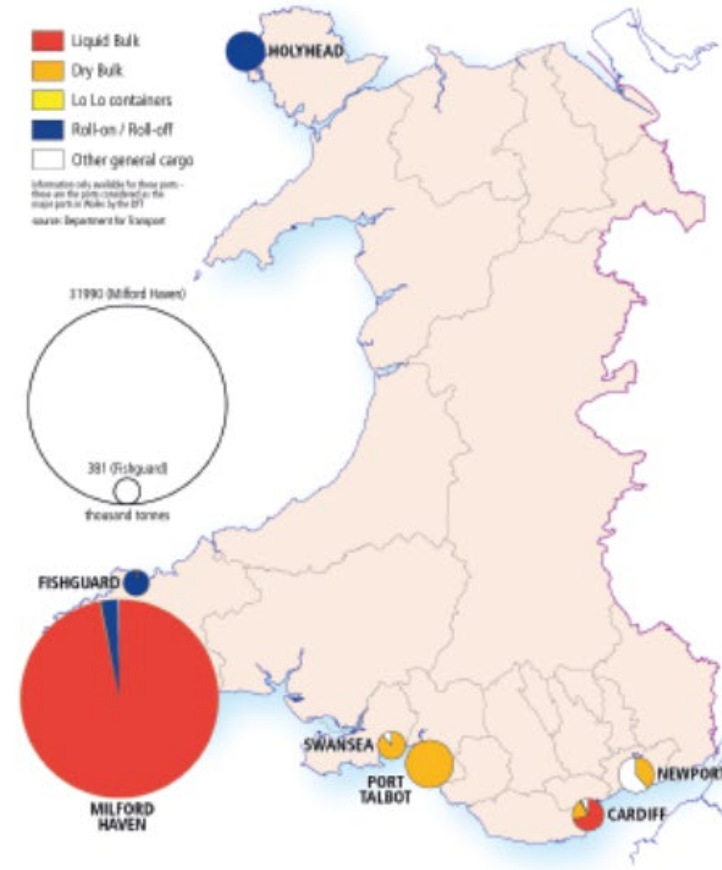
All freight traffic, by port and direction, 2017



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May 2019

OGL

All traffic by cargo type and direction, 2017

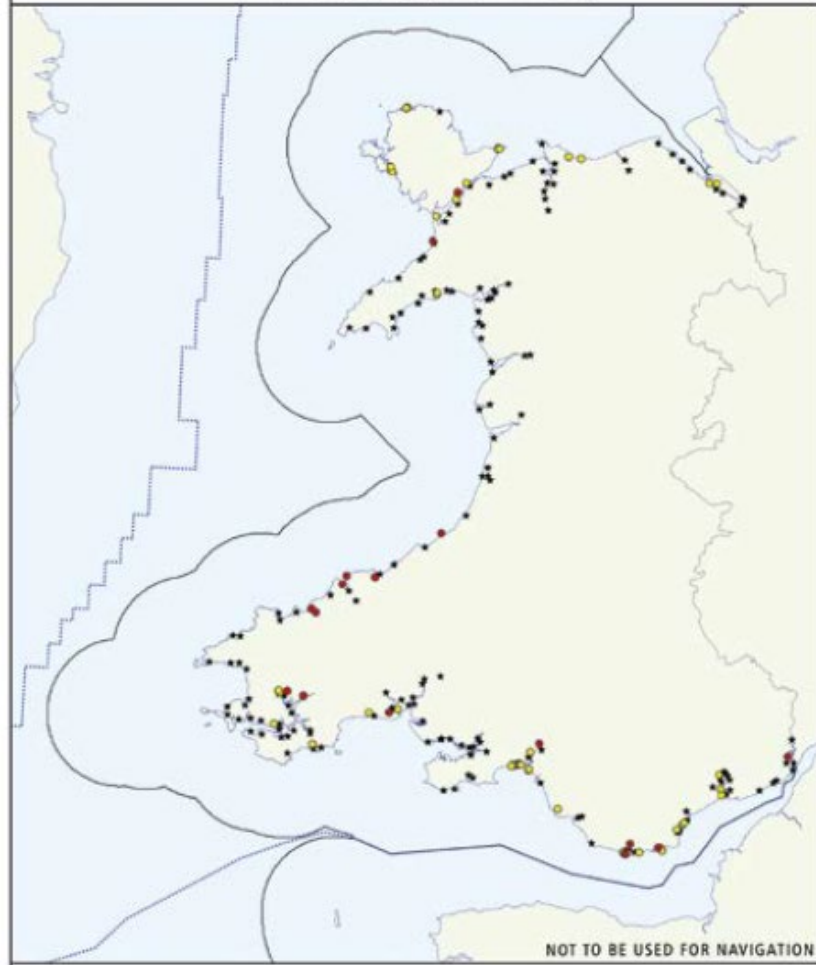


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May 2019

OGL

Surface and Waste Water

(indicative map relating to policy area: SAF_01a)



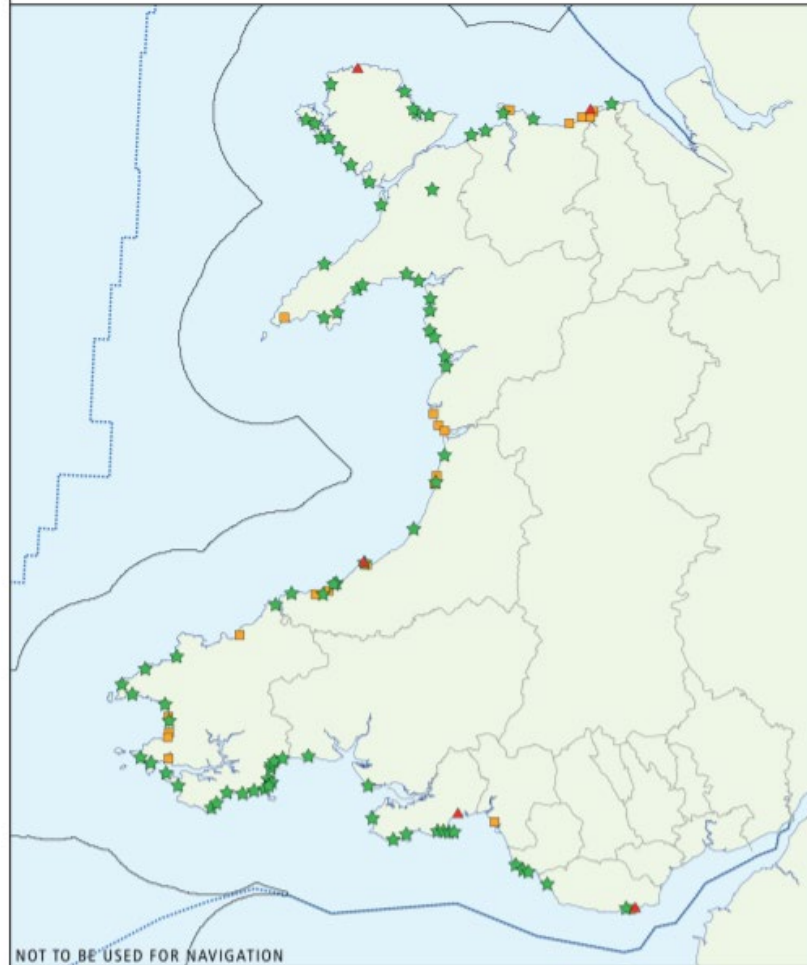
CONSENTED DISCHARGES 2015

- Trade
- Sewage and Trade
- ★ Coastal Water and Waste Water Treatments Works
- 12nm limit
- - - - - WNMP Area

0 25 50km

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October 2017

Bathing Waters - Water Quality



BATHING WATER QUALITY 2018

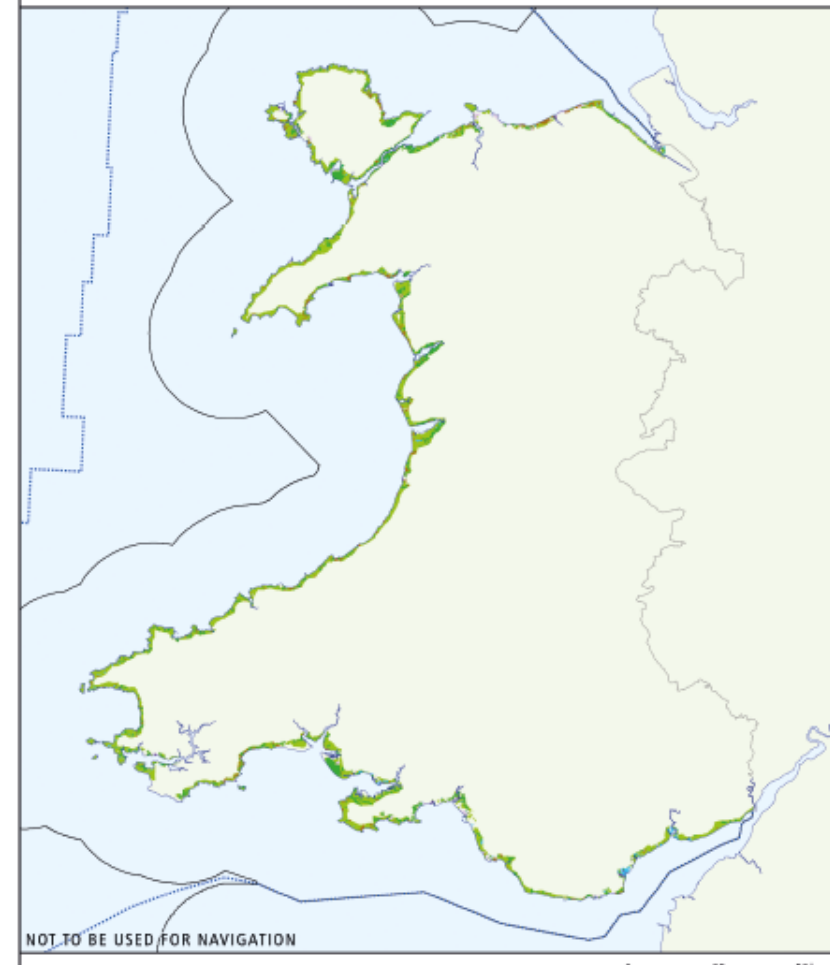
- ★ Excellent
- Good
- ▲ Sufficient
- 12nm limit
- - - - - WNMP Area

0 25 50km

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February 2019

Tourism and Recreation - Coastal Land Use

(indicative map relating to policy areas: T&R_01a and b, SAF_01b)



LAND USE 2014

- Amenity Water
- Caravans
- Inland Water
- Managed Recreation/Sport
- Open Countryside
- Woodland
- 12nm limit
- - - - - WNMP Area

0 25 50km

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Figure 21: Marine Annex 1 Habitats

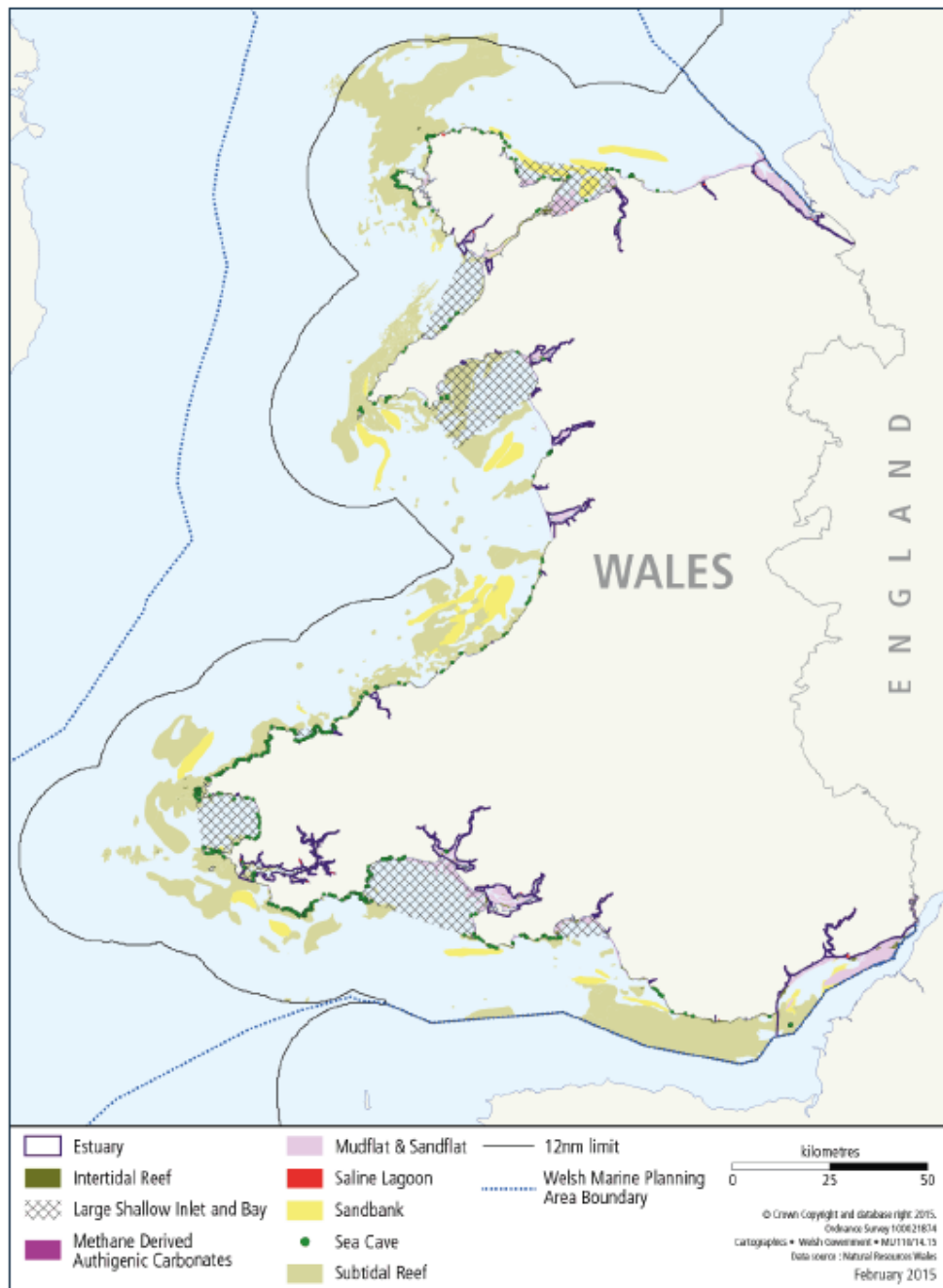


Figure 22: Broadscale Habitats – Subtidal

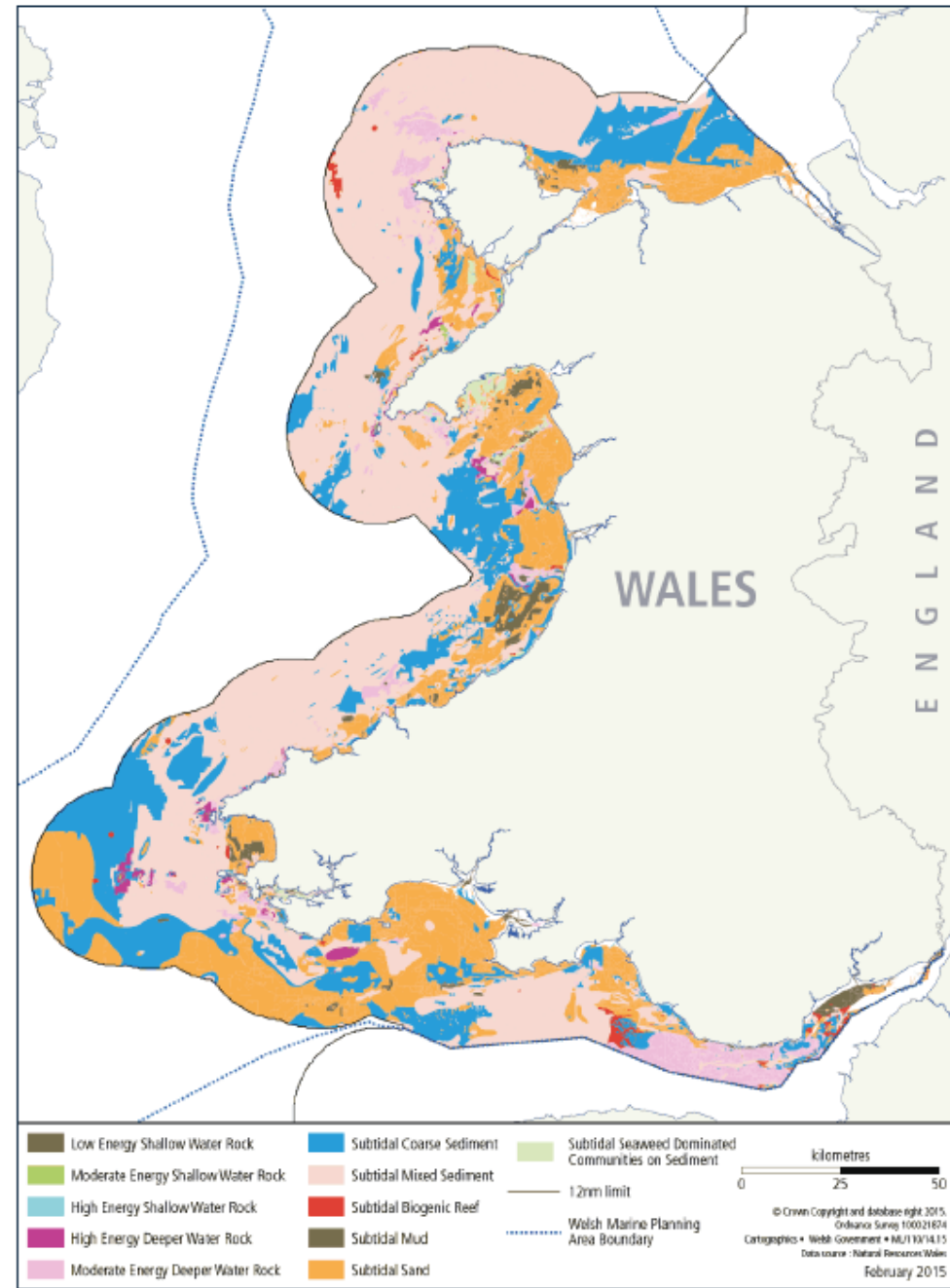


Figure 23: Grey Seal breeding grounds in Welsh waters

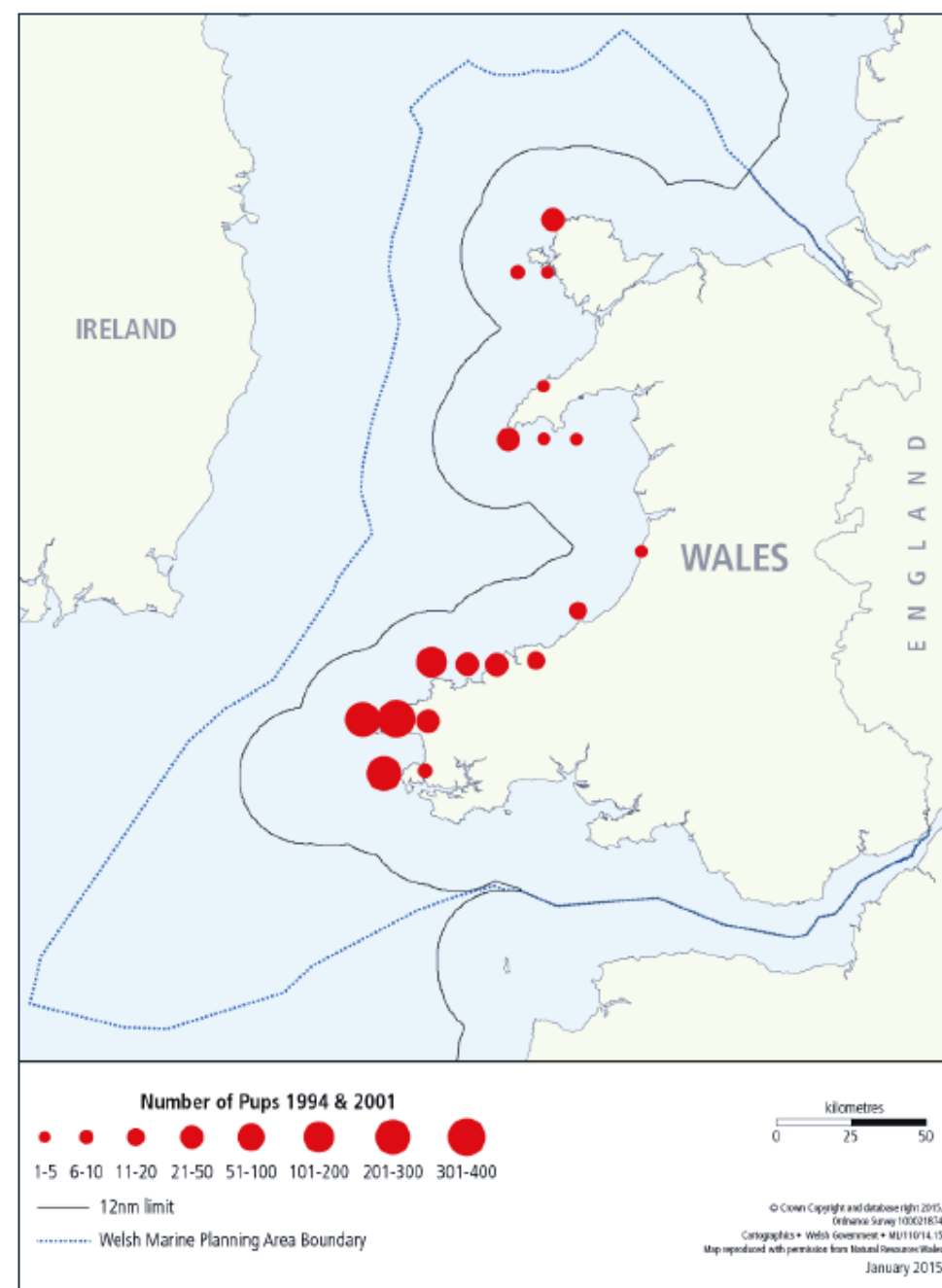
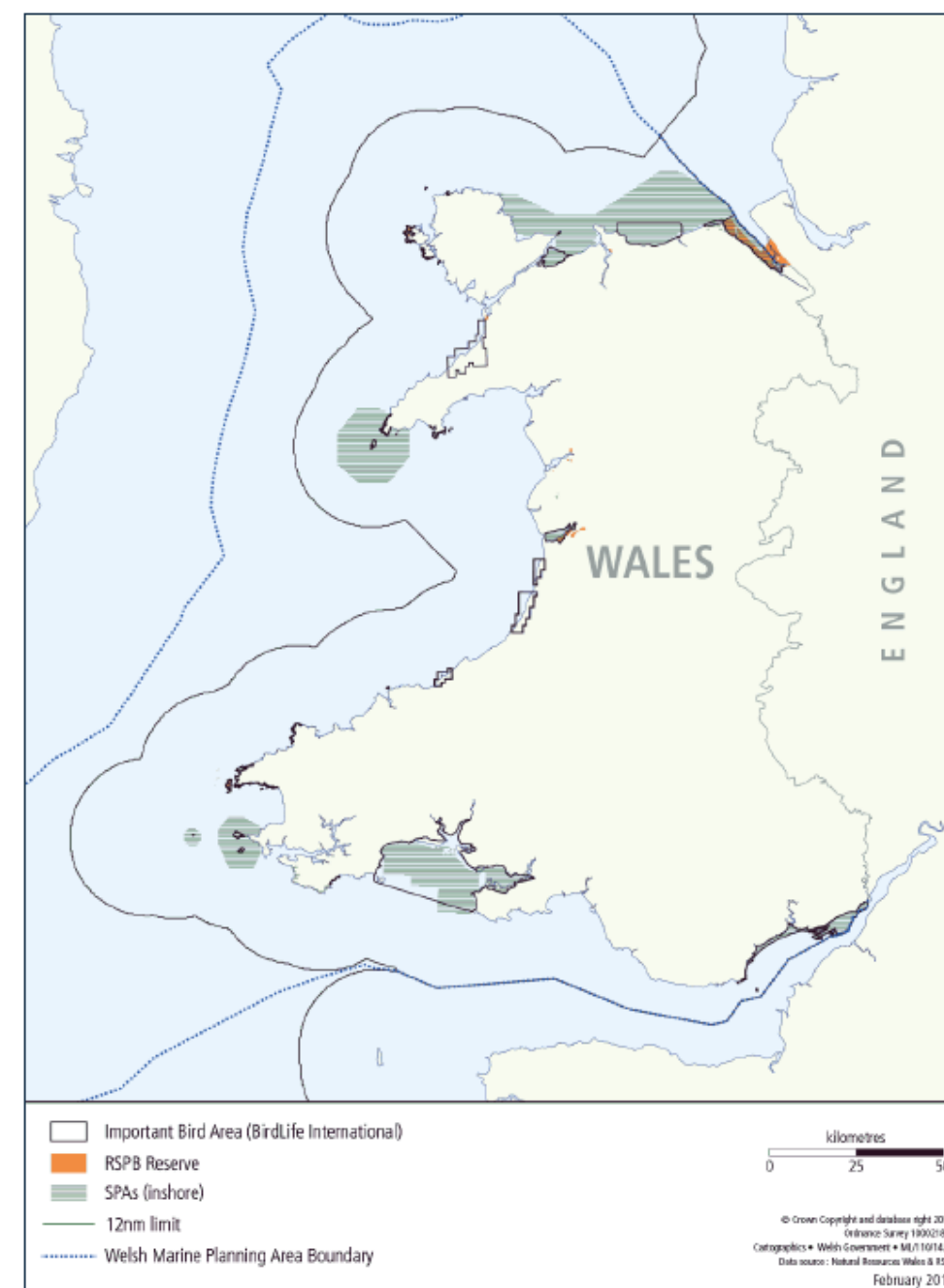
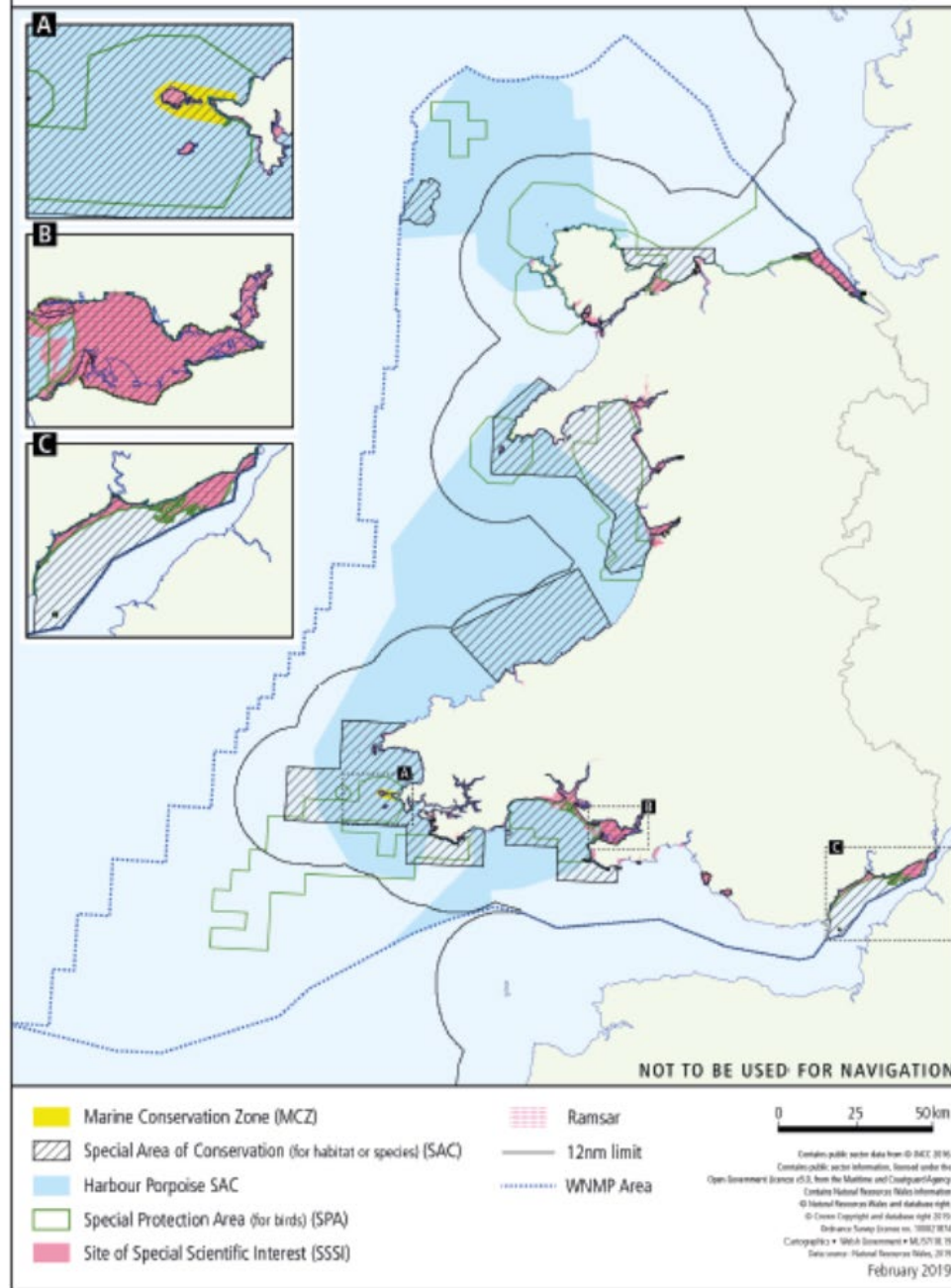


Figure 24: Marine and Coastal areas of Interest for Birds



Marine Protected Areas

(indicative map relating to policy area: ENV_02)





ACTIVITY 2

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Bringing nature back into our lives

EU 2030 Biodiversity strategy

May 2020
#EUGreenDeal



"Making nature healthy again is key to our physical and mental wellbeing and is an ally in the fight against climate change and disease outbreaks. It is at the heart of our growth strategy, the European Green Deal, and is part of a European recovery that gives more back to the planet than it takes away."

Ursula von der Leyen, President of the European Commission



Climate change, the unprecedented loss of biodiversity, and the spread of devastating pandemics are sending a clear message: it is time to fix our broken relationship with nature.

The Biodiversity Strategy will put Europe's biodiversity on the path to recovery by 2030, for the benefit of people, climate and the planet.



Why do we need to protect biodiversity?

- Biodiversity is **essential** for life. Our planet and the economy depend on it. When nature is healthy, it protects and provides.

Biodiversity and ecosystems provide us with food, health and medicines, materials, recreation, and wellbeing. They filter our air and water, help keep the climate in balance, convert waste back into resources, pollinate and fertilise crops and much more.

Nature provides for businesses:
half of global GDP, €40 trillion, depends on nature.

- We are **losing nature** like never before because of unsustainable human activities.

The global population of wild species has fallen by **60% over the last 40 years.**

1 million species are at risk of extinction.

- Biodiversity loss and the **climate crisis** are interdependent and they exacerbate each other.

Restoring forests, soils and wetlands and creating green spaces in cities is essential to achieve the climate change mitigation needed by 2030.



The new EU-wide Biodiversity Strategy will:

- Establish protected areas for at least:



30%
of land in
Europe



30%
of sea in
Europe

With stricter protection of remaining EU primary and old-growth forests legally binding nature restoration targets in 2021.

- Restore degraded ecosystems at land and sea across the whole of Europe by:



Increasing organic farming and biodiversity-rich landscape features on agricultural land



Halting and reversing the decline of pollinators



Restoring at least 25 000 km of EU rivers to a free-flowing state



Reducing the use and risk of pesticides by 50% by 2030



Planting 3 billion trees by 2030

- Unlock 20 billion EUR/year for biodiversity** through various sources, including EU funds, national and private funding. Natural capital and biodiversity considerations will be integrated into business practices.

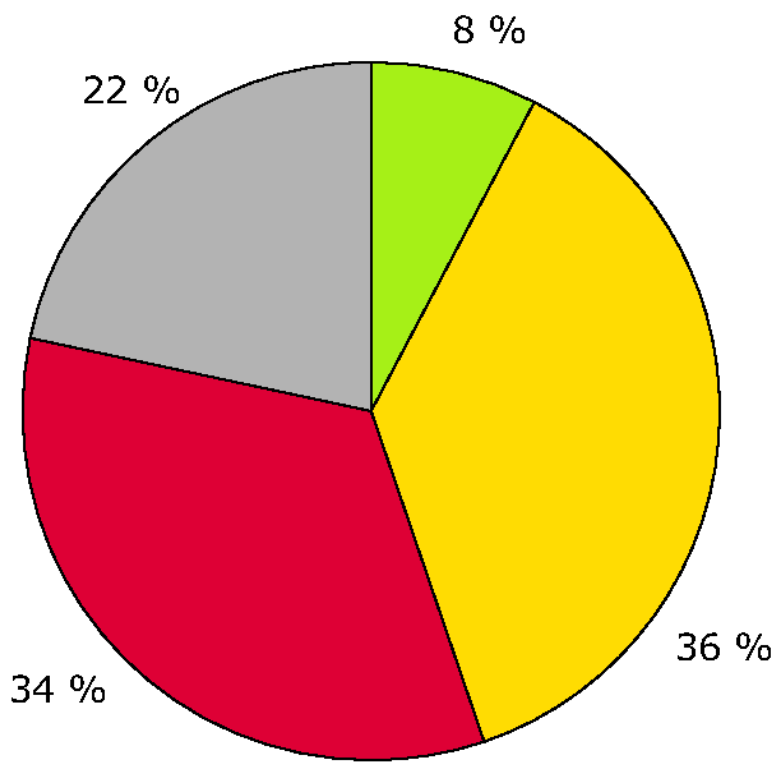
- Put the EU in a **leading position in the world** in addressing the global biodiversity crisis. The Commission will mobilise all tools of external action and international partnerships for an ambitious new UN Global Biodiversity Framework at the Conference of the Parties to the Convention on Biological Diversity in 2021.

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Conservation status of habitats per biogeographical area in coastal ecosystems

All regions



Favourable Unknown Unfavourable — inadequate Unfavourable — bad

